Water Resources Data for Michigan

Water Year 1976

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT MI-76-1

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

CALENDAR FOR WATER YEAR 1976

1975

OCTOBER

S	M	T	W	T	F	S
			1	2	3	4
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NOVEMBER

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1976

JANUARY

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FEBRUARY

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APRIL

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JUNE

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AUGUST

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SEPTEMBER

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Water Year 1976

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT MI-76-1

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

UNITED STATES DEPARTMENT OF THE INTERIOR

Cecil D. Andrus, Secretary

GEOLOGICAL SURVEY

V. E. McKelvey, Director

For information on the water program in Michigan write to
District Chief, Water Resources Division
U.S. Geological Survey
2400 Science Parkway
Okemos, Michigan 48864

1977

PREFACE

This report was prepared by personnel of the Michigan district of the Water Resources Division of the U.S. Geological Survey under the supervision of T. R. Cummings, District Chief, and J. T. Callahan, Regional Hydrologist, Northeastern Region. It was done in cooperation with the State of Michigan and with other agencies.

This report is one of a series issued by State. General direction for the series is by J. S. Cragwall, Jr., Chief Hydrologist, U.S. Geological Survey, and G. W. Whetstone, Assistant Chief Hydrologist for Scientific Publications and Data Management.

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16. Abstracts Water resources data for the 1976 water year for Michigan consist of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels in wells. This report contains discharge records for 194 gaging stations; stage and contents for 5 lakes and reservoirs; water quality for 75 continuous record stations, 28 partial-record stations and 5 lakes; and water levels for 27 observations wells. Also included are 88 crest-stage partial-record stations and 33 low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data-collection program, and are published as miscellaneous measurements. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State and Federal agencies in Michigan.

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*Michigan, *Hydrologic data, *Surface water, *Ground water, *Water quality, flow rate, Gaging stations, Lakes, Reservoirs, Chemical analyses, Sediments, Water temperatures, Sampling sites, Water levels, Water analyses.

17b. Identifiers/Open-Ended Terms

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GAGING STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED

(Letter after station name designates type of data: (d) discharge, (c) chemical, (b) biological, (m) microbiological, (t) water temperature, (s) sediment)

WATER RESOURCES DATA FOR MICHIGAN, 1976

INTRODUCTION

Water resources data for the 1976 water year for Michigan consist of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water-levels and water quality of ground water. This report contains discharge records for 194 gaging stations; stage only records for 1 gaging station; stage and contents for 5 lakes and reservoirs; water quality for 75 continuous-record stations, 28 partial-record stations, and 5 lakes; and water levels for 27 observation wells. Also included are crest-stage partial-record stations and low-flow partial-record stations. Additional water data were collected at various sites, not involved in the systematic data collection program, and are published as miscellaneous measurements. These data represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Michigan.

Records of discharge or stage of streams, and contents or stage of lakes and reservoirs were first published in a series of U.S. Geological Survey water-supply papers entitled, "Surface Water Supply of the United States." Through September 30, 1960, these water-supply papers were in an annual series and then in a 5-year series for 1961-65 and 1966-70. Records of chemical quality, water temperatures, and suspended sediment were published from 1941 to 1970 in an annual series of water-supply papers entitled, "Quality of Surface Waters of the United States." Records of ground-water levels were published from 1935 to 1974 in a series of water-supply papers entitled, "Ground-Water Levels in the United States." Water-supply papers may be consulted in the libraries of the principal cities in the United States or may be purchased from Branch of Distribution, U.S. Geological Survey, 604 South Pickett Street, Alexandria, VA 22304.

For water years 1961 through 1974, streamflow data were released by the Geological Survey in annual reports on a State-boundary basis. Water-quality records for water years 1964 through 1974 were similarly released either in separate reports or in conjunction with streamflow records. Ground-water records beginning with the 1956 calendar year and continuing through calendar year 1975 have been released by the Geological Survey in annual reports on a State-boundary basis. Beginning with the 1975 water year, water data for streamflow, water quality, and ground water are published as an official Survey report on a State-boundary basis. These official Survey reports carry an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report MI-76-1." Water-Data reports are for sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

COOPERATION

The U.S. Geological Survey and organizations of the State of Michigan have had cooperative agreements for the systematic collection of streamflow records since 1930, for ground-water levels since 1932, and for water-quality records since 1951. Organizations that assisted in collecting data through cooperative agreement with the Survey are:

State Department of Natural Resources, H.A. Tanner, director, through Water Management Division, D.W. Granger, chief, and Geological Survey Division, A.E. Slaughter, chief.

State Department of State Highways, J.P. Woodford, director.

State Department of Agriculture, B.D. Ball, director, through Soil and Water Conservation Division, D.J. Schaner, chief.

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army, in collecting records for 29 gaging stations published in this report. Assistance was also furnished by the National Weather Service, National Oceanic Atmospheric Administration, U.S. Department of Commerce, Soil Conservation Service, U.S. Department of Agriculture, Environmental Protection Agency, and the National Park Service.

The following organizations aided in collecting records:

Kalamazoo County Board of Supervisors; Macomb County Board of Supervisors; Macomb County Road Commission; Oakland County Department of Public Works; Oakland County Drain Commission; Genesee County Drain Commission; Southeast Michigan Council of Governments; Tri-County Planning Commission; Washtenaw County Drain Commission; Washtenaw County Planning Commission; Huron-Clinton Metropolitan Authority; Township of Ypsilanti; Cities or villages of Ann Arbor, Battle Creek, Coldwater, Imlay City, Ironwood, Lansing, Saline, and Ypsilanti; Allied Paper Inc.; Consumers Power Co.; Cleveland-Cliffs Iron Co.; Fisher Body Division of General Motors Corp.; Hanna Mining Co.; Michigan Power Co.; Michigan Sugar Co.; Peter Eckrich and Sons, Inc.; Upper Peninsula Power Co.; and Wisconsin-Michigan Power Co.

Organizations that supplied data are acknowledged in station descriptions.

ACKNOWLEDGMENT

Michigan district personnel who contributed significantly to the collection and preparation of the data in this report were: J.B. Miller, chief, data section, assisted by P.W. Anttila, V.D. Herreid, G.C. Hulbert, T. Sieger, G.C. Huffman, and B.A. Kuczera.

HYDROLOGIC CONDITIONS

Annual runoff during the 1976 water year was in the normal range in the Upper Peninsula and in the excessive range (the upper 25% of record) in the Lower Peninsula. The first half of the year was characterized by excessive runoff throughout the State. Runoff for December at Red Cedar River at East Lansing was the highest December runoff in the 46 years of record at the station. The runoff for February was the second highest of record for that month. The monthly mean discharge for March at Muskegon River near Evart was the second highest March runoff in 44 years of record. On March 29, Muskegon River peaked at 7,790 ft^3/s (221 m^3/s) which was the highest discharge since record began in 1930. The yearly mean discharge was also the highest of record. Runoff receded into a normal pattern in the Lower Peninsula for the remainder of the year. In the Upper Peninsula the runoff was characterized by diverse patterns. Five consecutive months (December to April) of excessive runoff was experienced at the station Sturgeon River near Sidnaw, followed by five consecutive months of deficient runoff. Monthly mean discharges for July, August, and September were record lows for these months. A daily discharge of 3.0 ft^3/s (0.085 m^3/s) was the lowest August daily discharge. On September 13, a discharge of 2.7 ft^3/s (0.076 m^3/s) was the lowest ever experienced in 36 years of record at this station.

Monthly and annual mean discharge is compared with medians at the three index gaging stations in figure 1.

Ground-water levels were above average for the year but declined in most wells over the summer months. In the western half of the Upper Peninsula levels declined to below average at years end.

DEFINITION OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also the table for converting English units to International System of units (SI) on the inside of the back cover.

Acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Adenosine triphosphate (ATP) is the primary energy donor in cellular life process. Its central role in living cells makes it an excellent indicator of the presence of living material in water. A measure of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter of the original water sample.

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

Algal growth potential (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample.

Aquifer is a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian means confined and is used to describe a well in which the water level stands above the top of the aquifer, tapped by the well. A flowing artesian well is one in which the water level is above the land surface.

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

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

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

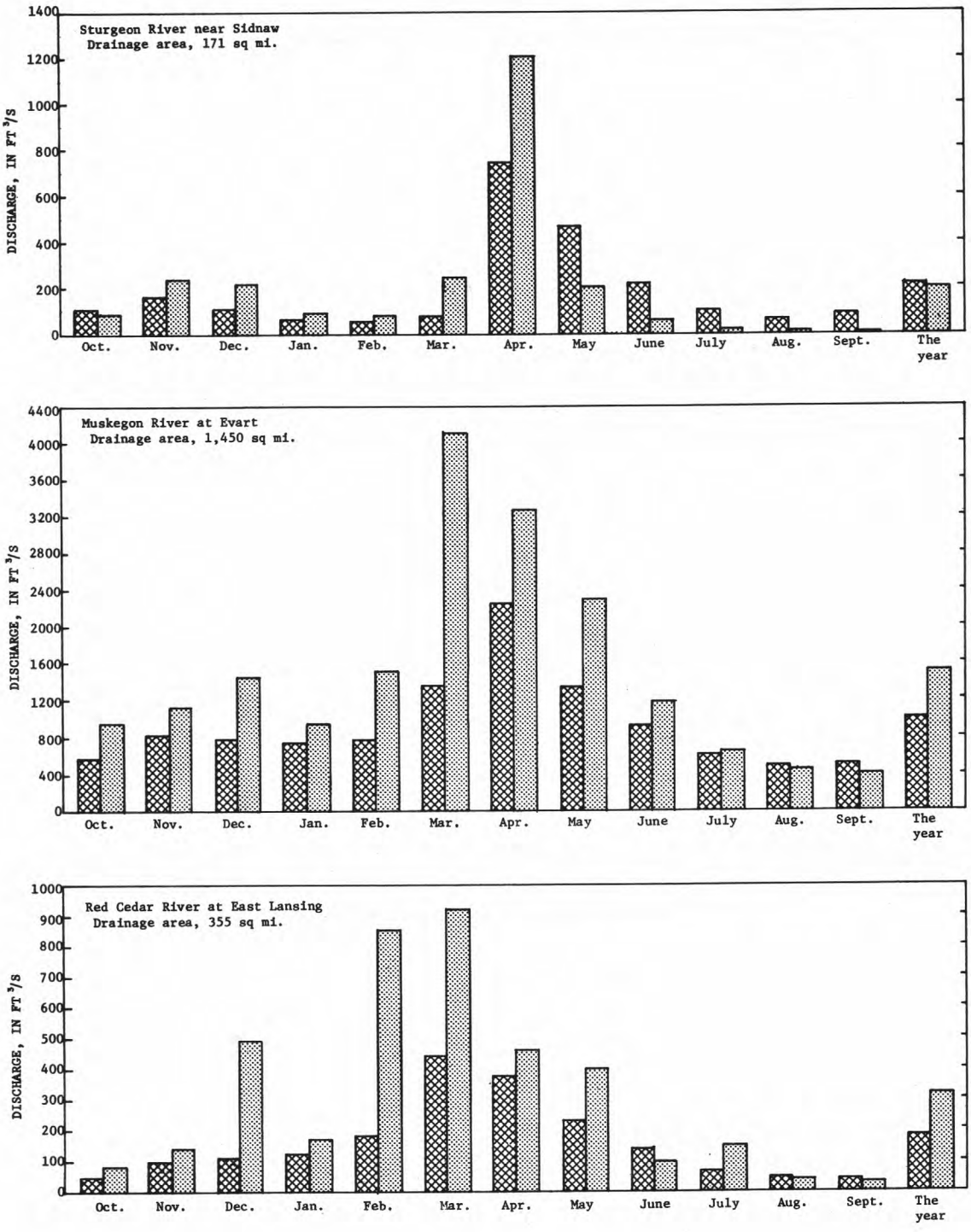


Figure 1. Discharge during 1976 water year compared with median discharge for period 1940 - 70 for three representative stations.

Fecal streptococcal bacteria are bacteria found also in intestines of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35°C ± 1.0°C on M-enterrococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Bed material is the unconsolidated material of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

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

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

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

Dry mass refers to the mass of residue present after drying in an oven at 60°C for zooplankton and 105°C for periphyton, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry mass values are expressed in the same units as ash mass.

Organic mass or volatile mass of the living substance is the difference between the dry mass and ash mass, and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash mass and dry mass.

Wet mass is the mass of living matter plus contained water.

Bottom material: See Bed material.

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually milliliters (mL) or liters (L).

Cfs-day is the volume of water represented by flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-feet, about 646,000 gallons or 2,447 cubic meters.

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

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

Color unit is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, an artificial structure, or a uniform cross section over a long reach of the channel.

Control structure as used in this report is a structure on a stream or canal that is used to regulate the flow or stage of the stream or to prevent the intrusion of salt water.

Cubic feet per second per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

Cubic foot per second (FT^3/s, ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to approximately 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment), that passes a given point within a given period of time.

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

Instantaneous discharge is the discharge at a particular instant of time.

Dissolved refers to the amount of substance present in true chemical solution. In practice, however, the term includes all forms of substance that will pass through a 0.45-micrometer membrane filter, and thus may include some very small (coloidal) suspended particles. Analyses are performed on filtered samples.

Diversity index is a numerical expression of evenness of distribution of aquatic organisms. The formula for diversity index is:

$$\bar{d} = -\sum_{i=1}^{s} \frac{n_i}{n} \log_2 \frac{n_i}{n}$$

Where n_i is the number of individuals per taxon, n is the total number of individuals, and s is the total number of taxa in the sample of the community. Diversity index values range from zero, when all the organisms in the sample are the same, to some positive number, when some or all of the organisms in the sample are different.

Drainage area of a stream at a specific location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the river above the specified point. Figures of drainage area given herein include all closed basins, or noncontribution areas, within the area unless otherwise noted.

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

Gage height (G.H.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage", although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate ($CaCO_3$).

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an 8-digit number.

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

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

Micrograms per gram (ug/g) is a unit expressing the concentration of a chemical element as the mass (micrograms) of the element sorbed per unit mass (gram) of sediment.

Micrograms per liter (UG/L, ug/L) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligrams per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represent the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in mg/L, and is based on the mass of sediment per liter of water-sediment mixture.

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

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

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliters (mL) or liters (L). Numbers of planktonic organisms can be expressed in these terms.

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

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

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

Particle-size classification used in this report agrees with recommendations made by the American Geophysical Union Subcommittee on Sediment Terminology.

The classification is as follows:

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

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

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

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

Pesticides are chemical compounds used to control undesirable plants and animals. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides. Insecticides and herbicides, which control insects and plants respectively, are the two categories reported.

Picocurie (PC, pCi) is one trillionth (1×10^{12}) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radio activity that yields 3.7×10^{10} radio active disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

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

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

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells/mL of sample.

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

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

Polychlorinated biphenyls (PCBs) are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organochlorine insecticides.

Primary productivity is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly green plants). The rate of primary production is estimated by measuring the amount of oxygen released (oxygen method) or the amount of carbon assimilated by the plants (carbon method).

Milligrams of carbon per area or volume per unit time [mg C/(m^2·time)] for periphyton and macrophytes and [mg C/(m^3·time)] for phytoplankton are units for expressing primary productivity. They define the amount of carbon dioxide consumed as measured by radioactive carbon (carbon 14). The carbon 14 method is of greater sensitivity than the oxygen light and dark bottle method, and is preferred for use in unenriched waters. Unit time may be either the hour or day, depending on the incubation period.

Milligrams of oxygen per area or volume per unit time [mg O_2/(m^2·time)] for periphyton and macrophytes and [mg O_2/(m^3·time)] for phytoplankton are the units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

Runoff in inches (IN, in) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

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

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

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

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

Suspended-sediment load is quantity of suspended sediment passing a section in a specified period.

Total sediment discharge (tons/day) is the sum of the suspended-sediment discharge and the bed-load discharge. It is the total quantity of sediment, as measured by dry weight or volume, that passes a section during a given time.

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

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

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

Stage-discharge relation is the relation between gage height (stage) and volume of water per unit of time, flowing in a channel.

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

Substrate is the physical surface upon which an organism lived.

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

Artificial substrate is a device which is purposely placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is taken. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multi-plate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton collection.

Surface area of a lake is that area outlined on the latest U.S.G.S. topographic map as the boundary of the lake and measured by a planimeter in acres. In localities not covered by topographic maps, the areas are computed from the best maps available at the time planimetered. All areas shown are those for the stage when the planimetered map was made.

Surficial bed material is that part (0.1 to 0.2 ft) of the bed material that is sampled using U.S. Series Bed-Material Samplers.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of the total concentration in a water-sediment mixture. The water-sediment mixture is associated with (or sorbed on) that material retained on a 0.45 micrometer filter.

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

Kingdom	Animal
Phylum	Arthropoda
Class	Insecta
Order	Ephemeroptera
Family	Ephemeridae
Genus	Hexageria
Species	Hexagenia limbata

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

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

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

Total load (tons) is the total quantity of any individual constituent, as measured by dry mass or volume, that is dissolved in a specific amount of water (discharge) during a given time. It is computed by multiplying the total discharge, times the mg/L of the constituent, times the factor 0.0027, times the number of days.

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

WDR is used as an abbreviation for "Water-Data Report: in reference to published reports beginning in 1975.

WRD is used as an abbreviation for "Water-Resources Data" in the REVISED RECORDS paragraph to refer to State annual basic-data reports published before 1975.

WSP is used as an abbreviation for "Water-Supply Paper" in references to previously published reports.

DOWNSTREAM ORDER AND STATION NUMBER

Since October 1, 1950, the order of listing hydrologic-station records in Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a main-stream station are listed before that station. A station on a tributary that enters between two main-stream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary on which a station is situated with respect to the stream to which it is immediately tributary is indicated by an indention in a list of stations in the front of the report. Each indention represents one rank. This downstream order and system of indention show which stations are on tributaries between any two stations and the rank of the tributary on which each station is situated.

As an added means of identification, each hydrologic station, and partial-record station has been assigned a station number. These are in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record and continuous-record stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete 8-digit number for each station, such as 04058500, which appears just to the left of the station name, includes the 2-digit part number "04" plus the 6-digit downstream order number "058500".

NUMBERING SYSTEM FOR WELLS

Each well is identified by means of (1) a 15-digit number that is based on the grid system of latitude and longitude followed by (2) a local number that is provided for continuity with older reports and for other use as dictated by local needs.

Each well is located as a point on a map by a number based on the universal system of latitude and longitude. In this report, this is the first set of numbers shown for each well. For maximum utility, latitude and longitude numbers are determined to seconds. The first six digits denote degrees, minutes, and seconds of north latitude; the next seven digits denote degrees, minutes, and seconds of west longitude. The last two numbers are sequential numbers assigned in the order that the wells were recorded within a designated latitude-longitude grid.

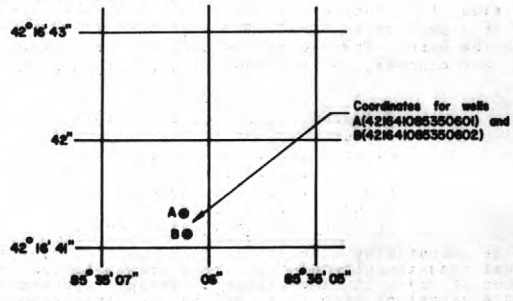


Figure 2. System for numbering wells (latitude and longitude).

The local well number indicates the location of wells within the rectangular subdivision of land with reference to the Michigan meridian and base line. The first two segments of the well number designate township and range, the third segment of the number designates the section and the letters A thru D designate successively smaller subdivisions of the section as shown in figure 3. Thus, a well designated as 32N 6E 16CCCB would be located to the nearest 2.5 acres (1 hectare) and would be within the shaded area in section 16. In the event that two or more wells are located in the same 2.5 acre (1 hectare) tract, a sequential number designation follows the letter designations--for example, 16CCCB1, 16CCCB2, 16CCCB3, etc.

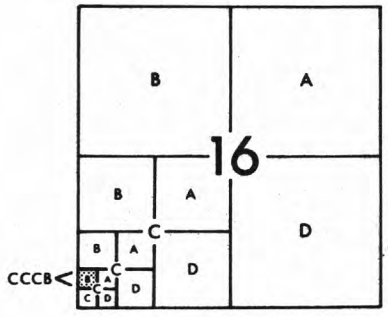


Figure 3. Well numbering system in Michigan.

SPECIAL NETWORKS AND PROGRAMS

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.

National stream-quality accounting network (NASQAN) is a data collection network designed by the U.S. Geological Survey to meet many of the information demands of agencies or groups involved in national or regional water-quality planning and management. Both accounting and broad-scale monitoring objectives have been incorporated in the network design. Areal configuration of the network is based on river-basin accounting units (identified by 8-digit hydrologic-unit numbers) designated by the Office of Water Data Coordination in consultation with the Water Resources Council. Primary objectives of the network are (1) to depict areal variability of streamflow and water-quality conditions nationwide on a year-by-year basis and (2) to detect and assess long-term changes in stream quality.

Pesticide program is a network of regularly sampled water-quality stations where samples are collected to determine the concentration and distribution of pesticides in streams where potential contamination could result from the application of the commonly used insecticides and herbicides. Operation of the network is a Federal interagency activity.

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

Tritium network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

EXPLANATION OF STAGE AND WATER-DISCHARGE

Collection and computation of data

The base data collected at gaging stations consist of records of stage and measurements of discharge of streams or canals, and stage, surface area, and contents of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records, and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from either direct readings on a nonrecording gage or from a water-stage recorder that gives either a continuous graph of the fluctuations or a tape punched at selected time intervals. Measurements of discharge are made with a current meter, using the general methods adopted by the Geological Survey. These methods are described in standard textbooks, in Water-Supply Paper 888, and in U.S. Geological Survey Techniques of Water Resources Investigations, book 3, chapter A6.

For stream-gaging stations, rating tables giving the discharge for any stage are prepared from stage-discharge relation curves. If extensions to the rating curves are necessary to express discharge greater than measured, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, computation of flow over dams or weirs), step-backwater techniques, velocity-area studies, and logarithmic plotting. The daily mean discharge is computed from gage heights and rating tables, then the monthly and yearly mean discharge are computed from the daily figures. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is computed by the shifting-control method, in which correction factors based on individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is basically the shifting-control method.

At some stream-gaging stations the stage-discharge relation is affected by backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage; at these stations the rate of change in stage is used as a factor in computing discharge.

At some northern stream-gaging stations the stage-discharge relation is affected by ice in the winter, and it becomes impossible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed on the basis of the gage-height record and occasional winter discharge measurements. Consideration is given to the available information on temperature and precipitation, notes by gage observers and hydrologist, and comparable records of discharge for other stations in the same or nearby basins.

For a lake or reservoir station, capacity tables giving the contents for any stage are prepared from stage-area relation curves defined by surveys. The application of the stage to the capacity table gives the contents, from which the daily, monthly, or yearly change in contents is computed.

If the stage-capacity curve is subject to changes because of deposition of sediment in the reservoir, periodic resurveys of the reservoir are necessary to define new stage-capacity curves. During the period between reservoir surveys the computed contents may be increasingly in error due to the gradual accumulation of sediment.

For some gaging stations there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods the daily discharges are estimated on the basis of recorded range in stage, prior and subsequent records, discharge measurements, weather records, and comparison with records for other stations in the same or nearby basins. Likewise, daily contents may be estimated on the basis of operator's log, prior and subsequent records, inflow-outflow studies, and other information.

The data in this report generally comprise a description of the station and tabulations of daily and monthly figures. For gaging stations on streams or canals a table showing the daily discharge and monthly and yearly discharge is given. For gaging stations on lakes and reservoirs a monthly summary table of stage and contents or a table showing the daily contents is given. Tables of daily mean gage heights are included for some streamflow stations and for some reservoir stations. Records are published for the water year which begins on October 1 and ends on September 30.

The description of the gaging stations gives the location, drainage area, period of record, notations of revisions of previously published records, type and history of gages, general remarks, average discharge, and extremes of discharge or contents. The location of the gaging station and the drainage area are obtained from the most accurate maps available. River mileage, given under "LOCATION" for some stations, is that determined and used by the Corps of Engineers or other agencies. Periods for which there are published records for the present station or for stations generally equivalent to the present one are given under "PERIOD OF RECORD."

Previously published streamflow records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published along with the current records in one of the annual or compilation reports. In order to make it easier to find such revised records, a paragraph headed "REVISED RECORDS" has been added to the description of

all stations for which revised records have been published. Listed therein are all the reports in which revisions have been published, each followed by the water years for which figures are revised in that report. In listing the water years only one number is given; for instance, 1965 stands for the water October 1, 1964, to September 30, 1965. If no daily, monthly, or annual figures of discharge are affected by the revision, the fact is brought out by notations after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the revised figure was first published is given. It should be noted that for all stations for which cubic feet per second per square mile and runoff in inches are published, a revision of the drainage area necessitates corresponding revision of all figures based on the drainage area. Revised figures of cubic feet per second per square mile and runoff in inches resulting from a revision of the drainage area only are usually not published in the annual series of reports.

The type of gage currently in use, the datum of the present gage above mean sea level, and a condensed history of the types, locations, and datums of previous gages used during the period of record are given under "GAGE." In references to datum of gage, the phrase "mean sea level" denotes "Sea Level Datum of 1929" as used by the Topographic Division of the Geological Survey unless otherwise qualified.

Information pertaining to the accuracy of the discharge records and to conditions which affect the natural flow of the gaging station is given under "REMARKS." For reservoir stations information on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir is given under "REMARKS."

The average discharge for the number of years indicated is given under "AVERAGE DISCHARGE"; it is not given for stations having fewer than 5 complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "EXTREMES" are given first, the extremes for the period of record, second, information available outside the period of record, and last, those for the current year. Unless otherwise qualified, the maximum discharge (or contents) is the instantaneous maximum corresponding to the crest stage obtained by use of a water-stage recorder (graphic or digital), a crest-stage gage, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur on the same day as the maximum discharge (or contents), it is given separately. Similarly, the minimum is the instantaneous minimum unless otherwise qualified. For some stations peak discharges are listed with "EXTREMES FOR THE CURRENT YEAR"; if they are, all independent peaks, including the maximum for the year, above the selected base with the time of occurrence and corresponding gage heights are published in tabular format. The base discharge, which is given in the table heading, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for any canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time; for example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimums for these stations are published in a separate paragraph following the table of peaks.

The daily table for stream-gaging stations gives the mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also may be expressed in cubic feet per second per square mile (line headed "CFSM"), or in inches (line headed "IN."), or in acre-feet (line headed "AC-FT"). Figures for cubic feet per second per square mile and runoff in inches are omitted if there is extensive regulation or diversion, if the drainage area includes large noncontributing areas, or if the average annual rainfall over the drainage basin is usually less than 20 inches. In the yearly summary below the monthly summary, the figures shown are the appropriate daily discharges for the calendar and water years.

Footnotes to the table of daily discharges are introduced by the word "NOTE." Footnotes are used to indicate periods for which the discharge is computed or estimated by special methods because of no gage-height record, backwater from various sources, or other unusual conditions. Periods of no gage-height record are indicated if the period is continuous for a month or more or includes the maximum discharge for the year. Periods of backwater from an unusual source, of indefinite stage-discharge relation, or of any other unusual condition at the gage site are indicated only if they are a month or more in length and the accuracy of the records is affected. Days on which the stage-discharge relation is affected by ice are not indicated. The methods used in computing discharge for various unusual conditions have been explained in preceding paragraphs.

For most gaging stations on lakes and reservoirs the data presented comprise a description of the station and a monthly summary table of stage and contents. For some reservoirs a table showing daily contents or stage is given. A skeleton table of capacity at given stages is published for most reservoirs for which records are published on a daily basis, but is not published for reservoirs for which only monthly data are given.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. Occasionally, a series of discharge measurements are made within a short time period to investigate the seepage gains or losses along a reach of a stream or to determine the low-flow characteristics of an area. Such measurements are also given in special tables following the tables of partial-record stations.

Accuracy of data

The accuracy of streamflow data depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and interpretation of records.

The station description under "REMARKS" states the degree of accuracy of the records. "Excellent" means that about 95 percent of the daily discharges are within 5 percent; "good" within 10 percent; and "fair" within 15 percent. "Poor" means that daily discharges have less than "fair" accuracy.

Figures of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 cfs; to tenths between 1.0 and 10 cfs; to whole numbers between 10 and 1,000 cfs; and to 3 significant figures above 1,000 cfs. The number of significant figures used is based solely on the magnitude of the figure. The same rounding rules apply to discharge figures listed for partial-record stations.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff in inches are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

Other data available

Information of a more detailed nature than that published for most of the gaging stations, such as observations of water temperatures, discharge measurements, gage-height records, and rating tables, is on file in the district office. Also, most gaging-station records are available in computer-usable form and many statistical analyses have been made.

Information on the availability of unpublished data or statistical analyses may be obtained from the district office.

EXPLANATION OF WATER QUALITY RECORDS

Collection and examination of data

Surface-water samples for analyses usually are collected at or near gaging stations. The quality-of-water records are given immediately following the discharge records at these stations.

The descriptive heading for water-quality records gives the period of record for all water-quality data; the period of daily record for parameters that are measured on a daily basis (specific conductance, pH, dissolved oxygen, water temperature, sediment discharge, etc.); extremes for the period of daily record; extremes for the current year; and general remarks.

For ground-water records, no descriptive statements are given; however, the well number, depth of well, date of sampling and/or other pertinent data are given in the table containing the chemical analyses of the ground water.

Water analysis

Most methods for collecting and analyzing water samples are described in the U.S. Geological Survey Techniques of Water Resources Investigations listed on a following page.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load.

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

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

Water temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small daily temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharge.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published.

Sediment

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

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

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

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

EXPLANATION OF GROUND-WATER LEVEL RECORDS

Collection of the data

Only ground-water level data from a basic national network of observation wells are published herein. This basic network contains observation wells so located (figure 9) that the most significant data are obtained from the fewest wells in the most important aquifers.

Each well is indentified by means of (1) a 15-digit number that is based on latitude and longitude, and (2) a local number that is provided for local needs. See figures 2 and 3.

Measurements are made in many types of wells under varying conditions of access and of different temperatures, hence neither the method of measurement nor the equipment can be standardized. At each observation well, however, the equipment and techniques used are those that will insure that measurements at each well are consistent.

Water-level measurements in this report are given in feet with reference to either mean sea level (msl) or land-surface datum (lsd). Mean sea level is the datum plane on which the national network of precise levels is based; land-surface datum is a datum plane that is approximately at land surface at each well. If known, the altitude of the land-surface datum above mean sea level is given in the well description. The height of the measuring point (MP) above or below land-surface datum is given in each well description. Water levels in wells equipped with recording gages are reported for every fifth day and the end of each month (eom).

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth to water of several hundred feet, the error of determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water, the accuracy is greater. Accordingly, most measurements are reported to a hundredth of a foot, but some are given only to a tenth of a foot or a larger unit.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

Thirty-two manuals by the U.S. Geological Survey have been published to date in the series on techniques describing procedures for planning and executing specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) is on surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises. The reports listed below are for sale by the U.S. Geological Survey, Branch of Distribution, 604 South Pickett Street, Alexandria, VA 22304 (authorized agent of the Superintendent of Documents, Government Printing Office).

NOTE: When ordering any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations".

1-D1. Water temperature-influential factors, field measurement, and data presentation, by H.H. Stevens Jr., J.F. Ficke, and G.F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages. $1.60.

2-D1. Application of surface geophysics to ground-water investigations, by A.A.R. Zohdy, G.P. Eaton, and D.R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages. $1.90.

2-E1. Application of borehole geophysics to water-resources investigations, by W.S. Keys and L.M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages. $1.75.

3-A1. General field and office procedures for indirect discharge measurements, by M.A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages. $0.25.

3-A2. Measurement of peak discharge by the slope-area method, by Tate Dalrymple and M.A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages. $0.20.

3-A3. Measurement of peak discharge at culverts by indirect methods, by G.L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages $0.40.

3-A4. Measurement of peak discharge at width contractions by indirect methods, by H.F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 pages. $1.00.

3-A5. Measurement of peak discharge at dams by indirect methods, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages, $0.30.

3-A6. General procedure for gaging streams, by R.W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6, 1968. 13 pages. $0.20.

3-A7. Stage measurements at gaging stations, by T.J. Buchanan and W.P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages. $0.45.

3-A8. Discharge measurements at gaging stations, by T.J. Buchanan and W.P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages. $1.25

3-A11. Measurement of discharge by moving-boat method, by G.F. Smoot and C.E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages. $0.40.

3-A12. Fluorometric procedures for dye tracing, by J.F. Wilson Jr.: USGS--TWRI Book 3, Chapter A12. 1968. 31 pages. $1.35. Not currently available.

3-B1. Aquifer-test design, observation, and data analysis, by R.W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages. $0.70.

3-B2. Introduction to ground-water hydraulics-a programed text for self-instruction, by D.S. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.

3-C1. Fluvial sediment concepts, by H.P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages. $0.65.

3-C2. Field methods for measurement of fluvial sediment, by H.P. Guy and V.W. Norman: USGS--TWRI Book 3, Chapter C2, 1970. 59 pages. $0.70.

3-C3. Computation of fluvial-sediment discharge, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages. $1.15.

4-A1. Some statistical tools in hydrology, by H.C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages. $0.30.

4-A2. Frequency curves, by H.C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages. $0.20.

4-B1. Low-flow investigations, by H.C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972, 18 pages. $0.65.

4-B2. Storage analyses for water supply, by H.C. Riggs and C.H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages. $0.75.

4-B3. Regional analyses of streamflow characteristics, by H.C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages. $0.75.

4-D1. Computation of rate and volume of stream depletion by wells, by C.T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages. $0.65.

5-A1. Methods for collection and analysis of water samples for dissolved minerals and gases, by Eugene Brown, M.W. Skougstad, and M.J. Fishman: USGS--TWRI Book 5, Chapter A1. 1970. 160 pages. $2.40.

5-A2. Determination of minor elements in water by emission spectroscopy, by P.R. Barnett and E.C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages. $0.80.

5-A3. Methods for analysis of organic substances in water, by D.F. Goerlitz and Eugene Brown: USGS--TWRI Book 5, Chapter A3. 1972. 40 pages. $0.90.

5-A4. Methods for collection and analysis of aquatic biological and microbiological samples, by K.V. Slack, R.C. Averett, P.E. Greeson, and R.G. Lipscomb: USGS--TWRI Book 5, Chapter A4. 1973. 165 pages. $1.95.

5-C1. Laboratory theory and methods for sediment analysis, by H.P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages. $0.65.

7-C1. Finite-difference model for aquifer simulation in two dimensions with results of numerical experiments, by P.C. Trescott, G.F. Pinder, and S.P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.

8-A1. Methods of measuring water levels in deep wells, by M.S. Garber and F.C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages. $0.70.

8-B2. Calibration and maintenance of vertical-axis type current meters, by G.F. Smoot and C.E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages. $0.40.

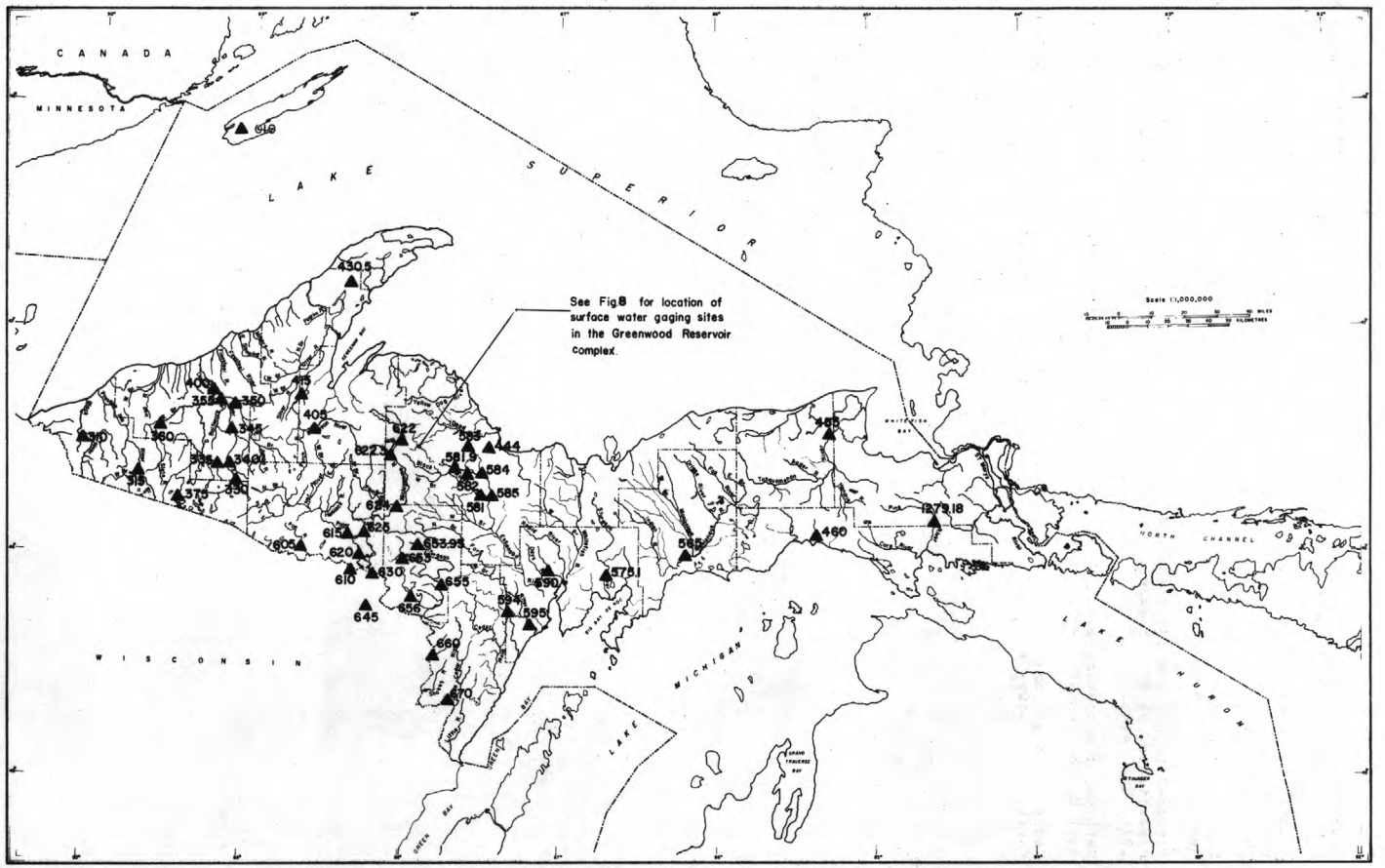


FIGURE 4.--Map showing identification number and location of gaging stations in Upper Peninsula of Michigan.

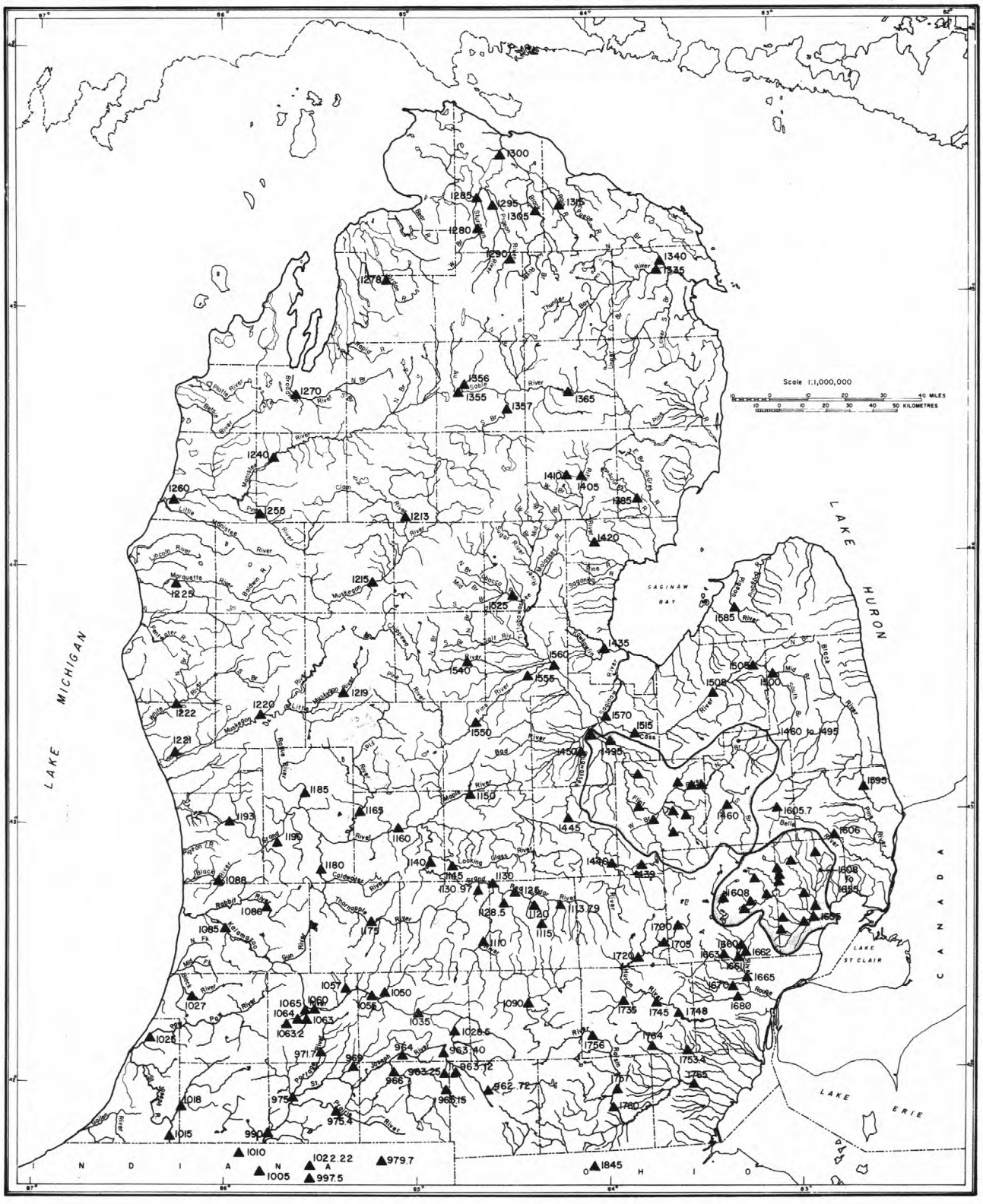


FIGURE 5.--Map showing identification number and location of gaging stations in Lower Peninsula of Michigan.

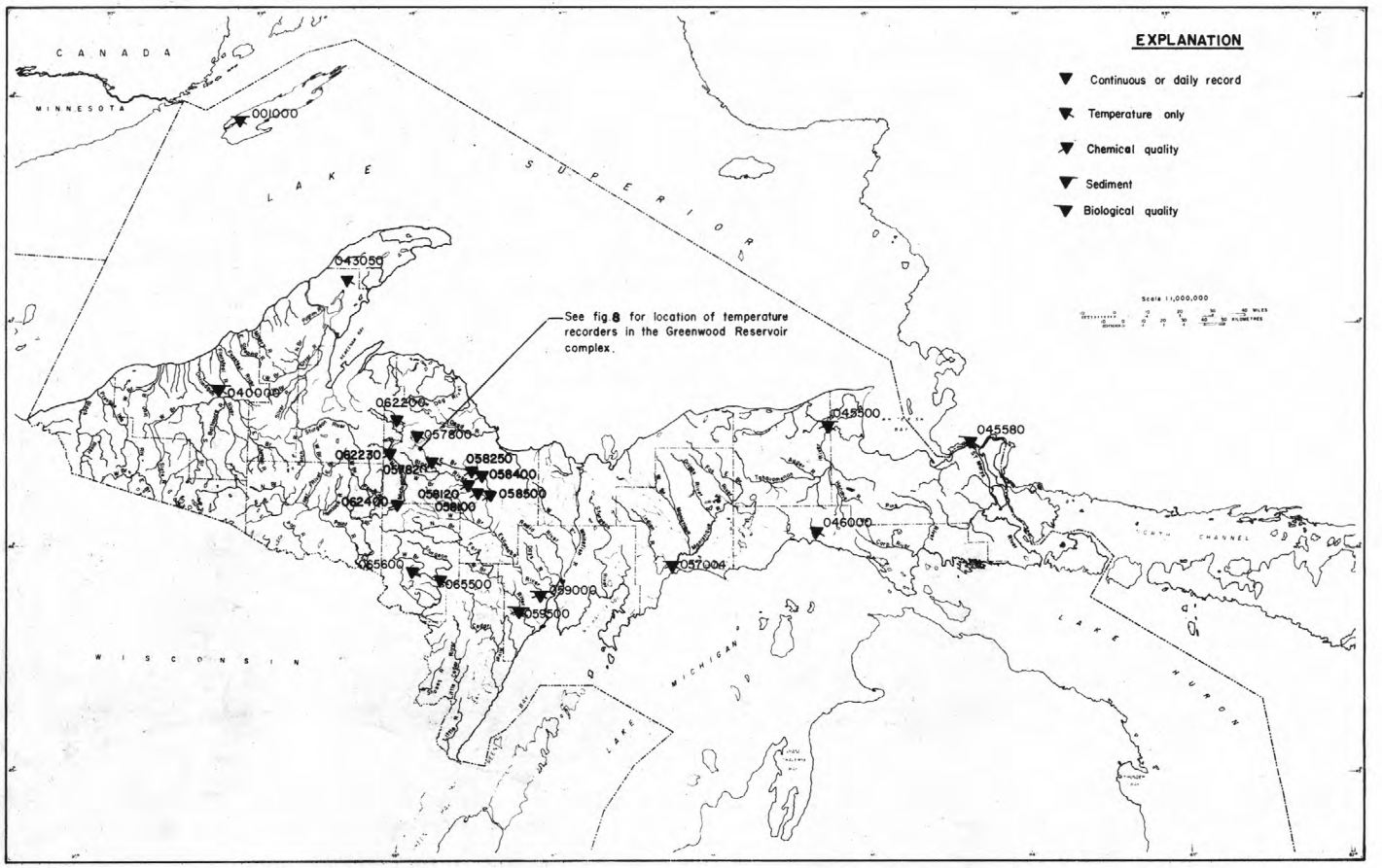


FIGURE 6.--Map showing identification number and location of water-quality stations in Upper Peninsula of Michigan.

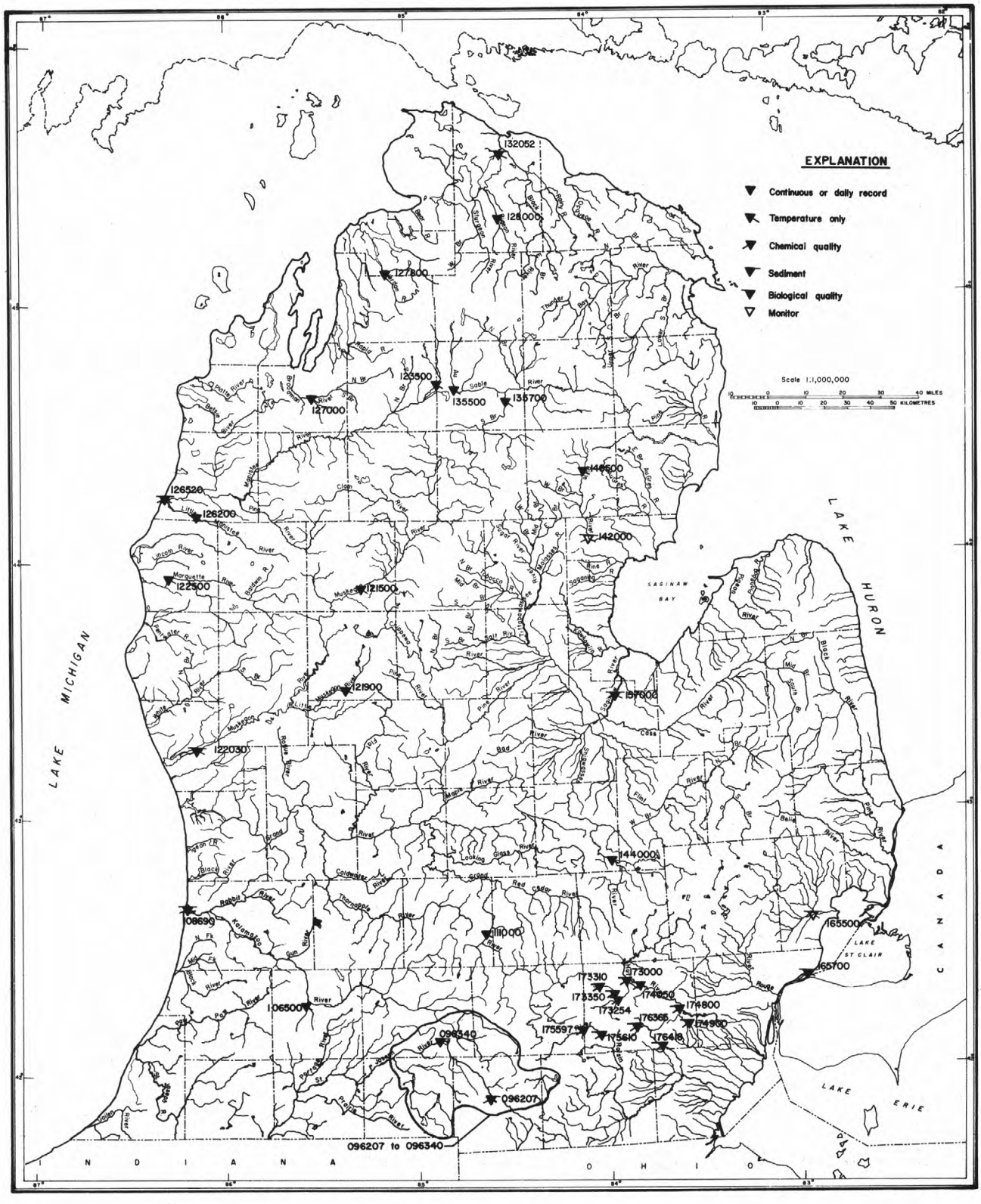


FIGURE 7.--Map showing identification number and location of water-quality stations in Lower Peninsula of Michigan.

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

LOCATION.--Lat 47°55'23", long 89°08'42", in NW¼ sec.28, T.64 N., R.38 W., Keweenaw County, Isle Royale National Park, Hydrologic Unit 04020300, on left bank 0.8 mi (1.3 km) northeast of Windigo, and 35 mi (56 km) southwest of Rock Harbor.

DRAINAGE AREA.--13.2 mi^2 (34.2 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 605 ft (184.4 m) from topographic map (nearest 5 ft).

REMARKS.--Water-discharge records good except those for the winter period and those below 2.0 ft^3/s (0.057 m^3/s), which are fair. ERTS satellite telemeter and recording rain gage at station. Capacity rain gage located near mouth. Hydrologic bench-mark stations are installed in specially selected areas where water resources have not yet been affected by works of man. Continuous records of natural hydrologic conditions, such as streamflow and water quality, will make possible assessment of changes which occur as a result of changes in climate and other natural factors. These data will provide a frame of reference against which hydrologic changes wrought by man may be evaluated.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 480 ft^3/s (13.6 m^3/s) May 1, 1972, gage height, 6.82 ft (2.079 m), from rating curve extended above 160 ft^3/s (4.53 m^3/s) based on runoff characteristics of nearby stations; maximum gage height, 6.88 ft (2.097 m) Jan. 13, 1975, backwater from ice; minimum discharge, 0.49 ft^3/s (0.014 m^3/s) Aug. 29, 30, 1976; minimum gage height, 2.55 ft (0.777 m) Aug. 29, 30, 31, Sept. 2, 3, 7, 9, 10, 11, 12, 1976.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 346 ft^3/s (9.80 m^3/s) Apr. 18, gage height, 6.48 ft (1.975 m) only peak above base of 110 ft^3/s (3.12 m^3/s); minimum, 0.49 ft^3/s (0.014 m^3/s) Aug. 29, 30; minimum gage height, 2.55 ft (0.777 m) Aug. 29, 30, 31, Sept. 2, 3, 7, 9, 10, 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	5.9	43	5.4	3.6	4.0	44	30	3.1	5.8	.90	.57
2	2.5	5.6	29	5.4	3.6	4.0	44	28	2.7	4.8	.92	.53
3	2.3	5.2	18	5.3	3.6	4.0	44	24	2.4	4.2	.89	.53
4	2.1	4.8	15	5.2	3.5	4.2	52	22	2.3	3.5	.86	.56
5	2.1	4.5	16	5.2	3.2	4.2	71	21	2.2	3.0	.95	.58
6	2.1	4.3	16	5.1	3.2	4.2	81	19	2.2	2.8	.99	.58
7	2.1	4.3	13	5.0	3.2	4.1	82	17	2.0	3.7	.83	.56
8	1.9	4.1	11	4.9	3.3	4.0	72	15	1.7	3.6	.80	.55
9	1.9	3.9	10	4.8	3.3	4.0	68	14	4.9	4.5	.77	.53
10	3.1	34	9.2	4.7	3.5	3.9	74	13	5.6	4.9	.74	.51
11	3.4	29	8.4	4.6	3.4	3.8	70	12	4.1	4.1	.82	.50
12	2.9	27	8.0	4.5	3.5	3.8	61	11	3.2	3.3	.82	.52
13	2.8	20	7.6	4.4	3.4	3.9	63	11	4.1	2.8	.83	.52
14	2.8	17	7.6	4.3	3.4	3.9	93	12	3.3	2.6	.71	.52
15	3.4	12	7.4	4.2	3.6	3.8	192	11	11	2.3	.66	.52
16	3.8	11	7.2	4.2	3.8	3.9	253	10	21	2.1	.63	.52
17	3.4	11	7.0	4.0	3.9	3.8	223	9.0	15	1.8	.65	.52
18	3.0	11	6.9	4.0	3.9	3.7	232	8.2	49	1.7	.64	.52
19	2.9	22	6.7	4.0	3.9	3.8	234	7.4	37	1.5	.69	.56
20	2.7	28	6.6	3.9	3.9	12	110	6.7	31	1.7	.68	.62
21	2.6	28	6.5	3.9	3.9	13	73	5.9	22	1.5	.64	.66
22	2.6	24	6.4	3.8	3.9	15	89	5.7	15	1.2	.61	.67
23	2.9	21	6.2	3.8	3.9	17	79	5.4	10	1.2	.55	.69
24	14	18	6.1	3.8	3.9	18	58	5.1	7.8	1.1	.54	.68
25	25	15	6.0	3.8	4.0	22	48	4.7	9.5	.99	.55	.65
26	15	11	6.0	3.8	4.0	25	40	4.4	14	1.0	.56	.62
27	12	10	5.9	3.8	4.0	30	35	4.3	11	1.0	.60	.61
28	10	9.2	5.8	3.7	4.0	33	32	4.0	9.8	.95	.55	.60
29	8.2	12	5.6	3.7	4.0	38	31	3.7	9.1	.89	.51	.58
30	7.2	44	5.5	3.7	---	46	30	3.3	7.0	.90	.49	.57
31	6.4	---	5.4	3.7	---	48	---	3.5	---	.90	.56	---
TOTAL	159.8	456.8	319.0	134.6	106.3	392.0	2678	351.3	323.0	76.33	21.94	17.15
MEAN	5.15	15.2	10.3	4.34	3.67	12.6	89.3	11.3	10.8	2.46	.71	.57
MAX	25	44	43	5.4	4.0	48	253	30	49	5.8	.99	.69
MIN	1.9	3.9	5.4	3.7	3.2	3.7	30	3.3	1.7	.89	.49	.50
CFSM	.39	1.15	.78	.33	.28	.95	6.77	.86	.82	.19	.05	.04
IN.	.45	1.29	.90	.38	.30	1.10	7.55	.99	.91	.22	.06	.05

CAL YR 1975 TOTAL 5422.20 MEAN 14.9 MAX 225 MIN 1.0 CFSM 1.13 IN 15.28
WTR YR 1976 TOTAL 5036.22 MEAN 13.8 MAX 253 MIN .49 CFSM 1.05 IN 14.19

04001000 WASHINGTON CREEK AT WINDIGO, MI--CONTINUED

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1964 to current year.

INSTRUMENTATION.--Temperature recorder since Oct. 20, 1964.

REMARKS.--Temperature recorder clock stopped Oct. 29 to Jan. 28 (range in temperature 0.0 to 7.0°C), Apr. 18 to May 4 (range in temperature 0.5 to 8.0°C); no record Sept. 21-30. Complete ice cover during winter period. In addition to the temperature recorder record, samples were collected approximately bimonthly.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 22.0°C July 26, 30, 31, 1970, July 18, Aug. 1, 1975; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 20.5°C July 23, 27, Aug. 10, 20-22, 27; minimum, 0.0°C on many days during December to April.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	AIR TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)
OCT												
07...	1700	2.0	170	7.6	10.5	18.0	9.7	88	240	230	40	87
JAN												
29...	1445	2.7	--	7.8	.0	-17.0	12.9	90	--	--	--	72
MAR												
04...	1415	3.9	--	7.2	.0	-9.0	13.6	95	2	2	<1	72
MAY												
04...	1630	25	85	8.1	7.5	16.0	11.3	95	70	25	1	34
AUG												
11...	1000	.83	192	7.6	17.0	16.0	7.3	77	290	200	140	100
SEP												
21...	1100	.48	230	7.5	8.0	4.0	9.2	79	800	710	85	120

DATE	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)
OCT												
07...	9	24	6.6	3.8	9	.2	.9	95	0	78	3.8	5.3
JAN												
29...	12	20	5.3	3.0	8	.2	.6	73	0	60	1.9	7.6
MAR												
04...	10	19	6.0	3.0	8	.2	.8	75	0	62	7.6	6.1
MAY												
04...	3	9.1	2.8	1.2	7	.1	.2	38	0	31	.5	5.9
AUG												
11...	9	28	8.3	5.7	11	.2	.8	116	0	95	4.7	4.9
SEP												
21...	10	30	10	7.6	12	.3	.8	129	0	106	6.5	6.3

DATE	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT											
07...	4.5	.5	13	129	105	.70	.21	.01	4	.02	100
JAN											
29...	4.1	.2	14	110	91	.80	.11	.01	26	.19	100
MAR											
04...	3.0	.3	15	134	90	1.41	.12	.02	2	.02	100
MAY											
04...	1.6	.1	7.9	62	48	4.18	.04	.02	5	.34	100
AUG											
11...	6.5	.1	14	148	125	.33	.05	.02	4	.01	100
SEP											
21...	15	.1	14	154	147	.20	.05	.02	6	.01	100

04001000 WASHINGTON CREEK AT WINDIGO, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	TOTAL FILTRABLE RESIDUE (MG/L)	TOTAL NON-FILTRABLE RESIDUE (MG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL BARIUM (BA) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)
OCT											
07...	1700	130	1	0	0	0	<10	0	560	0	20
MAY											
04...	1630	--	--	0	0	0	10	0	320	0	20

DATE	TOTAL MERCURY (HG) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUSPENDED GROSS ALPHA AS U-NAT. (UG/L)	DISSOLVED GROSS BETA AS CS-137 (PC/L)	SUSPENDED GROSS BETA AS CS-137 (PC/L)	DISSOLVED GROSS BETA AS SR90 /Y90 (PC/L)	SUSPENDED GROSS BETA AS SR90 /Y90 (PC/L)	DISSOLVED RA-226 (RADON METHOD) (PC/L)	DISSOLVED URANIUM (U) (UG/L)
OCT											
07...	.1	0	0	20	<.4	3.0	<.4	<1.4	<.4	.02	.03
MAY											
04...	<.5	0	0	10	--	--	--	--	--	--	--

DATE	CYANIDE (CN) (MG/L)	TOTAL PCB (UG/L)	PCB IN BOTTOM MATERIAL (UG/KG)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL CHLORDANE (UG/L)	CHLORDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MATERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MATERIAL (UG/KG)
OCT											
07...	.00	.0	6	.00	.0	.0	0	.00	.0	.00	.0
MAY											
04...	.00	--	--	--	--	--	--	--	--	--	--

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MATERIAL (UG/KG)	TOTAL DIELDRIN (UG/L)	DIELDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR (UG/L)	HEPTACHLOR IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	HEPTACHLOR EPOXIDE IN BOTTOM MATERIAL (UG/KG)
OCT										
07...	.00	.0	.00	.0	.00	.0	.00	.0	.00	.0
MAY										
04...	--	--	--	--	--	--	--	--	--	--

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL TOXAPHENE (UG/L)	TOXAPHENE IN BOTTOM MATERIAL (UG/KG)	TOTAL 2,4-D (UG/L)	2,4-D IN BOTTOM MATERIAL (UG/KG)	TOTAL 2,4,5-T (UG/L)	2,4,5-T IN BOTTOM MATERIAL (UG/KG)	TOTAL SILVEX (UG/L)	SILVEX IN BOTTOM MATERIAL (UG/KG)
OCT										
07...	.00	.0	0	0	.00	0	.00	0	.00	0
MAY										
04...	--	--	--	--	--	--	--	--	--	--

04001000 WASHINGTON CREEK AT WINDIGO, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	0.0	0.0	---	---	16.5	13.5	17.5	15.0	19.5	17.0	15.5	12.5
2	0.0	0.0	---	---	15.5	12.5	17.0	15.0	18.5	15.5	13.5	11.0
3	0.0	0.0	---	---	16.0	13.0	18.0	15.0	19.5	15.5	15.0	12.5
4	0.0	0.0	7.5	---	17.0	14.0	18.5	15.5	18.0	17.5	15.0	14.5
5	0.0	0.0	8.5	7.5	18.0	14.5	18.5	16.0	19.5	17.0	14.5	12.5
6	0.0	0.0	8.5	7.0	18.0	15.0	18.5	16.5	19.5	15.5	17.0	13.5
7	0.0	0.0	8.5	7.0	18.0	15.5	18.5	16.5	19.0	15.0	17.5	14.0
8	0.0	0.0	8.5	6.5	17.5	15.5	18.5	16.0	19.5	15.5	17.5	15.5
9	0.0	0.0	10.5	7.5	17.0	14.5	18.5	17.0	18.5	16.5	16.5	14.5
10	0.0	0.0	11.0	9.5	16.5	14.0	17.0	16.0	20.5	17.5	15.5	12.5
11	0.0	0.0	11.0	8.5	17.0	16.0	16.5	16.0	20.0	17.0	15.5	12.0
12	0.0	0.0	11.0	8.5	16.5	14.0	16.5	14.0	20.0	17.5	15.5	12.0
13	0.0	0.0	10.5	9.5	17.0	14.5	16.0	14.5	19.0	17.0	15.5	14.0
14	0.0	0.0	12.0	8.5	17.0	16.0	16.5	14.5	17.0	14.5	14.5	13.5
15	0.0	0.0	14.0	9.5	17.0	15.5	16.5	15.0	16.5	12.5	13.5	11.0
16	0.0	0.0	13.0	11.0	15.0	13.5	16.0	14.5	17.0	12.5	12.5	9.5
17	0.5	0.0	13.0	10.0	13.5	13.0	15.5	13.5	16.5	12.5	11.5	9.0
18	---	---	12.5	9.5	13.0	12.0	17.5	15.0	17.0	14.0	12.5	9.5
19	---	---	12.0	9.0	13.5	13.0	18.5	16.5	18.5	16.0	11.5	10.0
20	---	---	13.5	9.5	15.0	13.0	20.0	18.0	20.5	17.5	11.0	8.5
21	---	---	14.0	11.0	17.0	14.0	19.5	17.0	20.5	18.5	---	---
22	---	---	14.0	10.0	18.0	16.0	19.5	17.5	20.5	17.5	---	---
23	---	---	13.0	10.0	18.5	16.5	20.5	18.0	20.0	16.0	---	---
24	---	---	12.5	9.5	18.0	16.5	20.0	18.0	19.0	15.5	---	---
25	---	---	14.0	9.5	18.0	15.5	18.5	16.5	19.5	16.0	---	---
26	---	---	14.5	10.0	16.0	14.5	20.0	17.0	20.0	17.0	---	---
27	---	---	14.0	11.0	17.0	15.5	20.5	17.5	20.5	18.0	---	---
28	---	---	15.5	11.5	17.0	15.5	19.5	17.0	19.0	16.5	---	---
29	---	---	16.5	12.5	16.5	15.0	19.5	17.0	17.0	13.5	---	---
30	---	---	16.5	14.0	17.0	15.0	19.0	18.0	16.5	12.5	---	---
31	---	---	16.5	13.5	---	---	19.5	17.0	16.0	14.0	---	---
MONTH	---	---	16.5	6.5	18.5	12.0	20.5	13.5	20.5	12.5	---	---

04031000 BLACK RIVER NEAR BESSEMER, MI

LOCATION.--Lat 46°30'41", long 90°04'28", in NE¼ SE¼ sec.32, T.48 N., R.46 W., Gogebic County, Hydrologic Unit 04020101, on right bank 450 ft (137 m) downstream from bridge on county highway, 500 ft (152 m) downstream from Powder Mill Creek, and 2.5 mi (4.0 km) northwest of Bessemer.

DRAINAGE AREA.--200 mi^2 (518 km^2).

PERIOD OF RECORD.--October 1954 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,154.3 ft (351.83 m) above mean sea level (levels by registered surveyor).

REMARKS.--Records good except those for the winter period and those below 15 ft^3/s (0.4 m^3/s), which are fair. Prior to 1967, some ground water pumped from mines at Bessemer. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--22 years, 237 ft^3/s (6.712 m^3/s), 16.09 in/yr (409 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,800 ft^3/s (419 m^3/s) Apr. 24, 1960, gage height, 14.27 ft (4.349 m), from flood-mark, from rating curve extended above 5,300 ft^3/s (150 m^3/s) on basis of slope-area measurement of peak flow; minimum daily, 6.8 ft^3/s (0.19 m^3/s) Sept. 25, 1976; minimum gage height, 0.36 ft (0.110 m) Sept. 9, 1970.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft^3/s (42.5 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Mar. 30	0700	2,070	58.6	5.86	1.786	Apr. 15	0500	*3,310	93.7	*7.66	2.335
Apr. 9	2300	2,510	71.1	6.56	1.999						

Minimum daily discharge, 6.8 ft^3/s (0.19 m^3/s) Sept. 25; minimum gage height observed, 0.38 ft (0.116 m) Aug. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	56	141	330	90	74	90	1450	329	67	101	15	8.0
2	58	125	330	90	74	88	1390	356	60	76	15	8.6
3	55	108	330	92	74	86	1480	377	54	59	15	8.6
4	51	95	300	92	74	86	1400	368	47	49	17	8.0
5	51	83	270	90	76	86	1540	326	44	41	24	8.0
6	46	76	240	86	76	86	1830	275	40	37	20	8.6
7	47	79	220	84	76	84	2020	239	37	35	17	8.0
8	45	143	200	82	74	84	1970	213	36	32	16	8.0
9	43	147	190	82	74	82	2070	189	35	36	15	8.0
10	43	849	180	82	76	82	2400	170	33	35	17	7.6
11	42	1230	170	82	78	82	1950	140	31	31	17	7.6
12	41	1110	170	80	80	82	1660	128	29	28	16	7.6
13	41	914	170	80	80	82	1680	112	36	27	15	7.6
14	40	701	170	80	82	82	2340	108	33	26	14	10
15	42	565	170	80	84	84	3170	97	140	26	12	8.0
16	45	486	180	80	88	84	2660	132	250	28	11	8.0
17	43	499	180	80	90	96	2310	184	213	25	10	8.0
18	42	494	190	80	92	170	1870	157	582	23	9.6	8.6
19	42	1010	180	78	92	270	1630	136	754	22	8.8	9.8
20	41	1220	170	76	92	420	1210	120	541	28	8.2	10
21	40	840	150	76	90	840	933	103	379	27	7.8	9.2
22	38	700	140	78	90	800	1100	88	261	24	7.6	8.6
23	44	600	130	80	90	800	904	77	182	24	7.4	7.6
24	216	500	120	78	90	820	709	70	132	21	7.2	7.2
25	514	450	115	74	92	860	565	64	104	20	7.2	6.8
26	380	400	110	74	92	920	458	59	82	20	7.2	8.0
27	306	370	100	76	92	1000	390	53	64	20	8.2	9.2
28	263	340	98	78	92	1150	336	48	52	18	8.2	7.6
29	220	320	96	76	90	1400	279	46	136	17	8.0	7.2
30	186	300	94	74	---	1980	261	55	146	17	8.0	7.6
31	165	---	92	74	---	1660	---	67	---	16	8.0	---
TOTAL	3286	14895	5585	2504	2424	14536	43965	4886	4600	989	377.4	245.6
MEAN	106	497	180	80.8	83.6	469	1466	158	153	31.9	12.2	8.19
MAX	514	1230	330	92	92	1980	3170	377	754	101	24	10
MIN	38	76	92	74	74	82	261	46	29	16	7.2	6.8
CFSM	.53	2.49	.90	.40	.42	2.35	7.33	.79	.77	.16	.06	.04
IN.	.61	2.77	1.04	.47	.45	2.70	8.18	.91	.86	.18	.07	.05

CAL YR 1975 TOTAL 85964.0 MEAN 236 MAX 3340 MIN 13 CFSM 1.18 IN 15.99
WTR YR 1976 TOTAL 98293.0 MEAN 269 MAX 3170 MIN 6.8 CFSM 1.35 IN 18.28

04031500 PRESQUE ISLE RIVER AT MARENISCO, MI

LOCATION.--Lat 46°22'20", long 89°41'32", in SE¼ NW¼ sec.21, T.46 N., R.43 W., Gogebic County, Hydrologic Unit 04020101, on left bank 0.3 mi (0.5 km) upstream from highway bridge in Marenisco, and 1.5 mi (2.4 km) downstream from confluence of East and West Branches.

DRAINAGE AREA.--171 mi^2 (443 km^2).

PERIOD OF RECORD.--February 1945 to current year.

REVISED RECORDS.--WSP 1707: 1954. WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,489.30 ft (453.939 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to May 27, 1949, nonrecording gage at site 0.3 mi (0.5 km) downstream at different datum.

REMARKS.--Records good except those for the winter period, which are fair. Occasional regulation for lake or pond level control at several locations in the headwaters. Since 1959, occasional regulation by Presque Isle Flooding Reservoir, usable capacity, about 3,000 acre-ft (3.7 hm^3), 2.5 mi (4.0 km) upstream. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--31 years, 178 ft^3/s (5.041 m^3/s), 14.14 in/yr (359 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,520 ft^3/s (99.7 m^3/s) Apr. 25, 1960, gage height, 11.25 ft (3.429 m); minimum observed, 13 ft^3/s (0.37 m^3/s) Sept. 30, 1948, gage height, 2.25 ft (0.686 m), site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,140 ft^3/s (32.3 m^3/s) Apr. 16, gage height, 7.51 ft (2.289 m); minimum, 18 ft^3/s (0.51 m^3/s) Sept. 12, 13, gage height, 3.06 ft (0.933 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	80	400	120	100	120	816	294	128	110	34	24
2	50	77	420	120	100	115	818	326	114	105	32	31
3	46	70	370	115	100	115	809	392	103	95	31	25
4	45	65	350	115	100	115	818	422	92	86	31	21
5	45	60	320	115	100	115	840	380	83	78	36	20
6	43	59	300	110	100	115	837	328	78	71	36	20
7	42	58	270	110	100	115	835	294	74	68	33	20
8	41	66	250	110	100	115	853	282	70	65	30	20
9	41	68	220	110	100	115	884	271	70	62	28	20
10	41	325	200	110	105	115	961	262	69	61	28	19
11	40	515	190	110	105	115	973	179	71	58	30	19
12	42	525	180	110	110	115	923	100	74	54	30	18
13	42	457	170	110	110	115	873	122	91	52	28	19
14	42	389	200	110	110	115	891	142	85	51	27	22
15	41	330	220	110	110	115	1020	150	150	52	26	24
16	42	297	230	110	110	115	1110	159	201	58	25	24
17	39	277	220	110	110	115	1120	257	186	56	25	25
18	34	263	210	110	110	120	1060	284	220	53	24	22
19	33	288	190	110	110	140	995	215	274	50	25	22
20	33	321	180	110	110	170	889	80	244	59	24	23
21	33	300	170	110	110	230	768	95	203	61	24	24
22	32	270	160	110	110	290	724	106	168	56	23	24
23	55	247	155	110	110	280	728	110	137	52	23	24
24	110	226	150	110	110	280	676	110	119	49	22	23
25	176	210	145	110	110	310	514	110	115	45	22	22
26	169	200	140	105	115	350	356	107	105	42	22	23
27	149	190	135	105	115	400	468	100	98	39	25	23
28	126	180	130	105	120	470	428	92	94	36	22	24
29	106	196	125	105	120	554	392	90	110	37	22	23
30	94	309	125	100	---	665	324	116	123	37	21	23
31	87	---	120	100	---	766	---	134	---	36	24	---
TOTAL	1968	6918	6645	3405	3120	6985	23703	6109	3749	1834	833	671
MEAN	63.5	231	214	110	108	225	790	197	125	59.2	26.9	22.4
MAX	176	525	420	120	120	766	1120	422	274	110	36	31
MIN	32	58	120	100	100	115	324	80	69	36	21	18
CFSM	.37	1.35	1.25	.64	.63	1.32	4.62	1.15	.73	.35	.16	.13
IN.	.43	1.50	1.45	.74	.68	1.52	5.16	1.33	.82	.40	.18	.15

CAL YR 1975 TOTAL 62357 MEAN 171 MAX 1370 MIN 31 CFSM 1.00 IN 13.57
WTR YR 1976 TOTAL 65940 MEAN 180 MAX 1120 MIN 18 CFSM 1.05 IN 14.34

04033000 MIDDLE BRANCH ONTONAGON RIVER NEAR PAULDING, MI

LOCATION.--Lat 46°21'25", long 89°04'38", in SE¼ NE¼ sec.29, T.46 N., R.38 W., Ontonagon County, Hydrologic Unit 0402102, Ottawa National Forest, on right bank 25 ft (8 m) downstream from bridge on Forest Service Road 172, 2.4 mi (3.9 km) upstream from Bond Falls Reservoir, and 5.7 mi (9.2 km) southeast of Paulding.

DRAINAGE AREA.--164 mi^2 (425 km^2).

PERIOD OF RECORD.--June 1942 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,485.66 ft (452.829 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to Sept. 28, 1942, nonrecording gage at same site and datum.

REMARKS.--Records good except those for the winter period, and those for period of no gage-height record, Apr. 8-20, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--34 years, 173 ft^3/s (4.899 m^3/s), 14.33 in/yr (364 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,050 ft^3/s (58.1 m^3/s) Apr. 30, 1951, gage height, 10.0 ft (3.048 m), from high-water mark; minimum, 27 ft^3/s (0.76 m^3/s) Nov. 22, 1946, result of freezeup; minimum gage height, 2.96 ft (0.902 m) Nov. 26, 1942, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 940 ft^3/s (26.6 m^3/s) Apr. 17; minimum discharge, 75 ft^3/s (2.12 m^3/s) Aug. 23, 24, gage height, 3.37 ft (1.027 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	120	123	230	125	110	130	428	269	158	117	85	85
2	119	119	220	125	110	125	407	271	149	114	84	84
3	115	116	210	125	110	125	430	281	139	109	83	84
4	112	118	200	125	110	125	424	275	132	104	85	83
5	111	119	190	120	110	125	433	272	125	101	94	83
6	109	119	185	120	110	125	478	261	121	98	97	83
7	109	120	180	120	110	125	527	247	117	97	92	83
8	108	123	170	120	110	125	600	231	114	96	89	83
9	109	122	165	120	115	125	650	217	112	96	87	83
10	109	196	160	120	115	120	740	206	110	97	87	83
11	108	210	155	120	115	120	700	193	109	97	90	82
12	109	210	155	120	120	120	640	182	115	94	92	82
13	110	210	165	120	120	120	660	177	120	92	90	82
14	110	220	175	120	120	120	720	174	127	90	88	86
15	112	220	180	120	120	120	800	169	124	91	87	90
16	112	199	175	115	120	120	900	170	134	91	85	90
17	113	191	170	115	120	120	940	201	138	91	84	88
18	108	186	160	115	120	120	880	195	135	89	85	86
19	107	197	160	115	120	130	800	182	144	88	84	86
20	108	211	155	115	120	160	720	169	143	102	82	90
21	109	215	150	115	120	220	620	158	133	103	81	93
22	109	225	150	115	120	240	602	149	123	98	80	96
23	113	218	140	115	120	230	578	143	115	94	79	93
24	135	198	140	115	120	220	501	140	110	92	79	91
25	179	176	135	115	120	220	423	138	107	91	80	89
26	180	170	130	115	125	230	363	135	106	89	81	89
27	156	160	130	115	130	240	324	130	103	89	82	91
28	137	170	125	115	130	260	300	125	101	90	81	95
29	129	192	125	115	130	295	279	122	100	88	80	91
30	124	248	125	110	---	395	265	130	111	87	79	89
31	123	---	125	110	---	448	---	154	---	86	81	---
TOTAL	3712	5301	5035	3650	3420	5498	17132	5866	3675	2961	2633	2613
MEAN	120	177	162	118	118	177	571	189	123	95.5	84.9	87.1
MAX	180	248	230	125	130	448	940	281	158	117	97	96
MIN	107	116	125	110	110	120	265	122	100	86	79	82
CFSM	.73	1.08	.99	.72	.72	1.08	3.48	1.15	.75	.58	.52	.53
IN.	.84	1.20	1.14	.83	.78	1.25	3.89	1.33	.83	.67	.60	.59

CAL YR 1975 TOTAL 61275 MEAN 168 MAX 1010 MIN 83 CFSM 1.02 IN 13.90
WTR YR 1976 TOTAL 61496 MEAN 168 MAX 940 MIN 79 CFSM 1.02 IN 13.95

04033500 BOND FALLS CANAL NEAR PAULDING, MI

LOCATION.--Lat 46°23'57", long 89°08'47", in SW¼ NE¼ sec.11, T.46 N., R.39 W., Ontonagon County, Hydrologic Unit 04020102, on left bank 40 ft (12 m) upstream from intake to pipeline No. 2, 0.8 mi (1.3 km) downstream from Bond Falls Reservoir on Middle Branch Ontonagon River, and 1.6 mi (2.6 km) east of Paulding.

PERIOD OF RECORD.--July 1942 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,441.59 ft (439.397 m) above mean sea level. Prior to Oct. 1, 1968, nonrecording gage at datum 3.00 ft (0.914 m) higher.

REMARKS.--Records excellent except those below 10 ft^3/s (0.28 m^3/s), which are poor. Canal diverts water from Bond Falls Reservoir (see sta 04034000) to South Branch Ontonagon River; water is used for power production at Victoria Dam near Rockland. One observation of water temperature was made during the year.

AVERAGE DISCHARGE.--34 years, 139 ft^3/s (3.936 m^3/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 373 ft^3/s (10.6 m^3/s) Sept. 23, 1960, gage height, 6.17 ft (1.881 m); no flow at times each year since 1961; minimum gage height observed, -0.03 ft (-0.009 m) Apr. 17, 1963, present datum (two drain holes in weir open and canal gate closed).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	103	93	218	212	298	31	211	297	138	126	114
2	14	104	67	217	243	296	32	211	297	137	125	114
3	15	84	42	218	275	291	22	257	296	137	125	113
4	14	39	34	217	272	288	13	296	294	137	125	113
5	14	26	22	217	270	286	12	205	293	137	125	113
6	15	26	23	247	267	207	12	207	292	137	124	112
7	15	26	23	276	284	143	11	260	297	136	124	112
8	15	26	69	274	299	226	11	304	238	135	123	112
9	15	27	115	269	299	293	10	304	195	135	123	82
10	15	27	70	268	302	270	9.9	303	195	135	122	55
11	15	27	25	266	298	277	9.1	302	194	134	122	55
12	15	27	99	225	296	304	8.6	301	194	133	121	55
13	32	27	170	193	295	301	8.2	300	193	133	121	54
14	60	27	171	217	290	300	4.8	299	192	132	121	54
15	60	27	165	239	292	298	3.0	299	193	132	120	54
16	60	27	168	236	291	296	4.1	298	192	132	120	54
17	60	27	170	232	289	297	2.4	297	192	131	120	54
18	60	27	170	231	294	296	1.5	297	191	131	119	54
19	60	28	170	235	298	243	1.3	296	191	131	119	54
20	60	28	170	237	295	115	1.8	296	191	130	119	54
21	60	28	169	235	291	45	2.2	295	190	130	118	54
22	60	28	169	166	290	36	2.8	294	189	130	117	54
23	60	28	168	104	291	27	12	292	189	129	117	54
24	60	28	167	130	294	28	161	292	167	129	117	54
25	60	28	166	153	292	28	262	298	140	128	116	54
26	60	62	165	150	289	28	134	303	140	128	116	54
27	60	92	164	144	298	28	16	302	140	128	116	54
28	60	92	163	144	304	29	15	299	139	127	115	54
29	79	93	192	175	301	29	119	300	139	127	115	54
30	91	93	220	212	---	31	210	299	139	127	115	54
31	100	---	219	212	---	31	---	298	---	126	114	---
TOTAL	1378	1332	3998	6557	8311	5665	1142.7	8815	6189	4092	3720	2122
MEAN	44.5	44.4	129	212	287	183	38.1	284	206	132	120	70.7
MAX	100	104	220	276	304	304	262	304	297	138	126	114
MIN	14	26	22	104	212	27	1.3	205	139	126	114	54

CAL YR 1975 TOTAL 47397.00 MEAN 130 MAX 300 MIN 0
WTR YR 1976 TOTAL 53321.70 MEAN 146 MAX 304 MIN 1.3

04034000 BOND FALLS RESERVOIR NEAR PAULDING, MI

LOCATION.--Lat 46°24'29", long 89°07'42", in SW¼ sec.1, T.46 N., R.39 W., Ontonagon County, Hydrologic Unit 04020102, at Bond Falls Dam on Middle Branch Ontonagon River, 2.5 mi (4.0 km) east of Paulding.

DRAINAGE AREA.--190 mi^2 (492 km^2).

PERIOD OF RECORD.--June 1942 to current year. Prior to October 1950, monthend contents only published in WSP 1307.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Nonrecording gage read once daily. Datum of gage is 1,335.59 ft (407.088 m) above mean sea level.

REMARKS.--Reservoir is formed by earthfill and concrete dam with one taintor gate; dam completed 1937. Usable capacity, 39,720 acre-ft (49.0 hm^3) between gage heights of 120 ft (36.6 m) (maximum drawdown) and 141 ft (43.0 m) (full pond). Dead storage unknown. Water diverted to South Branch Ontonagon River through Bond Falls Canal (see sta 04033500); water used for power production at Victoria Dam near Rockland.

COOPERATION.--Gage-height record furnished by Upper Peninsula Power Co. and converted to acre-feet by Geological Survey.

EXTREMES FOR PERIOD OF RECORD (SINCE 1947).--Maximum contents observed, 42,880 acre-ft (52.9 hm^3) July 3, 1953, gage height, 141.66 ft (43.178 m), of which 1,610 acre-ft (2.0 hm^3) was uncontrolled storage; no usable storage at times; minimum gage height observed, 115.98 ft (35.351 m) Mar. 21, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 39,240 acre-ft (48.4 hm^3) May 3, gage height, 140.14 ft (42.715 m); minimum, 2,560 acre-ft (3.16 hm^3) Mar. 19, 20, gage height, 121.71 ft (37.097 m).

MONTHEND GAGE HEIGHT AND CONTENTS AT 0930, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)	Change in contents (equivalent in ft^3/s)
Sept. 30	130.5	18550	--	--
Oct. 31	131.5	20500	+1950	+31.7
Nov. 30	134.8	27180	+6680	+112
Dec. 31	135.2	28040	+860	+14.0
CAL YR 1975	--	--	+9110	+12.6
Jan. 31	131.5	20500	-7540	-123
Feb. 29	125.5	9100	-11400	-198
Mar. 31	125.2	8560	-540	-8.8
Apr. 30	140.0	38900	+30340	+510
May 31	136.3	30460	-8440	-137
June 30	132.1	21700	-8760	-147
July 31	129.4	16460	-5240	-85.2
Aug. 31	126.7	11330	-5130	-83.4
Sept. 30	126.1	10190	-1140	-19.2
WTR YR 1976	--	--	-8360	-11.5

04034500 MIDDLE BRANCH ONTONAGON RIVER NEAR TROUT CREEK, MI

LOCATION.--Lat 46°28'40", long 89°05'25", in SW¼ sec.8, T.47 N., R.38 W., Ontonagon County, Hydrologic Unit 04020102, on right bank 0.1 mi (0.2 km) upstream from State Highway 28, 3.8 mi (6.1 km) west of village of Trout Creek, and 7.5 mi (12.1 km) downstream from Bond Falls Reservoir.

DRAINAGE AREA.--203 mi^2 (526 km^2).

PERIOD OF RECORD.--June 1942 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,132.03 ft (345.043 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to November 4, 1942, nonrecording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are fair. Flow regulated by Bond Falls Reservoir 7.5 mi (12.1 km) upstream (see sta 04034000). Diversion to South Branch Ontonagon River 8.5 mi (13.7 km) above station by Bond Falls Canal (see sta 04033500). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--34 years, 69.6 ft^3/s (1.971 m^3/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,750 ft^3/s (49.6 m^3/s) Nov. 7, 1951, gage height, 5.05 ft (1.539 m); minimum, 14 ft^3/s (0.40 m^3/s) sometime during period Jan. 23 to Feb. 13, 1947, gage height, 1.14 ft (0.347 m), from recorded range in stage, caused by ice jams upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 162 ft^3/s (4.59 m^3/s) Apr. 26, 27, gage height, 2.21 ft (0.674 m); minimum, 21 ft^3/s (0.59 m^3/s) Feb. 13, gage height, 1.34 ft (0.408 m), result of freezeup; minimum daily, 41 ft^3/s (1.16 m^3/s) Aug. 7-9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	55	53	44	45	43	68	53	49	54	45	52
2	44	54	50	44	45	44	67	55	56	54	44	45
3	44	53	48	44	45	46	69	56	55	54	44	44
4	44	53	47	44	45	45	67	54	55	53	45	44
5	44	54	51	44	45	44	70	53	55	54	43	45
6	44	54	46	44	44	45	75	51	55	54	42	44
7	44	54	46	44	44	45	76	49	55	54	41	44
8	44	54	45	44	44	45	73	48	55	55	41	44
9	44	56	45	44	44	45	75	47	55	56	41	44
10	45	101	44	44	44	44	86	46	55	55	46	44
11	45	67	43	44	44	45	73	46	55	55	46	44
12	45	67	43	44	45	45	64	45	54	55	46	44
13	45	63	46	44	45	45	68	46	58	55	55	44
14	46	61	52	44	45	44	89	46	55	55	55	47
15	46	68	46	44	45	45	94	45	59	56	55	45
16	45	68	46	44	45	44	76	49	57	56	55	44
17	45	68	46	44	44	45	68	48	56	56	55	44
18	45	60	46	44	44	45	63	46	58	56	55	44
19	45	62	46	44	44	48	61	45	57	55	54	45
20	45	62	46	45	44	59	56	45	55	54	54	45
21	45	50	45	45	43	56	56	44	55	51	53	46
22	45	48	45	44	43	54	67	45	55	50	54	45
23	54	47	44	44	44	52	59	44	54	48	53	45
24	70	46	45	45	45	57	53	45	54	48	54	44
25	66	46	45	45	45	57	50	45	55	48	54	44
26	63	46	45	43	46	58	93	45	55	47	54	45
27	63	46	44	44	45	58	129	45	54	46	54	45
28	61	47	44	44	45	57	50	45	54	46	54	45
29	60	50	45	45	45	64	49	46	56	46	55	44
30	59	64	45	46	---	89	50	50	55	46	55	44
31	56	---	44	45	---	77	---	48	---	45	55	---
TOTAL	1535	1724	1426	1371	1291	1590	2094	1475	1656	1617	1557	1343
MEAN	49.5	57.5	46.0	44.2	44.5	51.3	69.8	47.6	55.2	52.2	50.2	44.8
MAX	70	101	53	46	46	89	129	56	59	56	55	52
MIN	44	46	43	43	43	43	49	44	49	45	41	44

CAL YR 1975 TOTAL 19025 MEAN 52.1 MAX 139 MIN 43
WTR YR 1976 TOTAL 18679 MEAN 51.0 MAX 129 MIN 41

04035000 EAST BRANCH ONTONAGON RIVER NEAR MASS, MI

LOCATION.--Lat 46°41'24", long 89°04'24", in SW¼ NW¼ sec.33, T.50 N., R.38 W., Ontonagon County, Hydrologic Unit 04020102, on right bank 700 ft (213 m) downstream from abandoned highway bridge, 1,000 ft (305 m) downstream from Adventure Creek, 5.0 mi (8.0 km) south of Mass, and 7.5 mi (12.1 km) upstream from mouth.

DRAINAGE AREA.--272 mi^2 (704 km^2).

PERIOD OF RECORD.--July 1942 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 873.55 ft (266.258 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to October 1, 1949, nonrecording gage at site 700 ft (213 m) upstream at same datum.

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--34 years, 260 ft^3/s (7.363 m^3/s), 12.98 in/yr (330 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,590 ft^3/s (130 m^3/s) July 1, 1953, gage height, 10.57 ft (3.222 m); maximum gage height, 10.65 ft (3.246 m) Apr. 24, 1960; minimum discharge, 60 ft^3/s (1.70 m^3/s) Aug. 25, 1948, gage height, 3.55 ft (1.082 m), site then in use; minimum gage height, 3.28 ft (1.000 m) Sept. 13, 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,400 ft^3/s (40 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Mar. 30	2000	1,760	49.8	7.44	2.268	Apr. 14	2400	*2,250	63.7	*8.14	2.481

Minimum discharge, 85 ft^3/s (2.41 m^3/s) Sept. 13, gage height, 3.28 ft (1.000 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	135	141	510	200	155	180	1020	330	204	119	95	92
2	134	137	450	190	155	180	801	420	184	113	94	93
3	131	134	360	190	155	180	948	520	166	111	93	92
4	127	131	340	190	155	180	868	430	155	108	95	91
5	123	129	310	185	155	180	938	370	149	106	110	91
6	120	129	300	180	155	180	1090	350	144	105	110	93
7	119	130	280	175	155	180	1140	266	141	104	103	92
8	119	147	265	170	160	180	1040	243	142	103	99	89
9	118	144	260	170	160	180	1070	220	145	115	97	87
10	119	993	260	165	160	185	1280	200	147	143	98	88
11	123	840	270	165	160	185	954	190	143	128	99	88
12	125	577	280	160	160	185	788	185	138	117	99	88
13	124	504	285	160	165	185	908	180	162	111	97	87
14	127	358	300	160	165	185	1460	180	164	121	98	95
15	133	343	315	160	170	190	1900	180	190	113	96	100
16	134	266	320	160	170	190	1510	200	212	116	95	98
17	131	224	310	160	170	190	1290	247	210	112	95	96
18	127	236	310	160	170	190	1020	233	202	107	93	95
19	125	351	300	155	170	200	892	205	220	103	93	96
20	125	370	290	155	170	260	675	190	189	120	92	100
21	125	293	275	155	170	350	552	180	155	122	90	109
22	124	283	270	155	175	400	829	170	136	111	88	110
23	136	270	260	155	175	500	827	165	126	105	88	105
24	180	255	250	150	175	600	606	165	120	103	88	101
25	301	250	240	150	175	660	470	165	119	102	88	98
26	285	250	230	150	180	730	382	160	122	100	89	98
27	221	250	225	150	180	780	325	144	120	99	95	101
28	184	295	220	155	180	860	298	140	116	98	91	102
29	165	400	210	155	180	992	279	147	114	98	89	100
30	151	879	205	155	---	1360	275	160	120	96	88	100
31	145	---	200	155	---	1560	---	209	---	97	92	---
TOTAL	4536	9709	8900	5095	4825	12557	26435	7144	4655	3406	2937	2875
MEAN	146	324	287	164	166	405	881	230	155	110	94.7	95.8
MAX	301	993	510	200	180	1560	1900	520	220	143	110	110
MIN	118	129	200	150	155	180	275	140	114	96	88	87
CFSM	.54	1.19	1.06	.60	.61	1.49	3.24	.85	.57	.40	.35	.35
IN.	.62	1.33	1.22	.70	.66	1.72	3.62	.98	.64	.47	.40	.39

CAL YR 1975 TOTAL 99586 MEAN 273 MAX 2500 MIN 99 CFSM 1.00 IN 13.62
WTR YR 1976 TOTAL 93074 MEAN 254 MAX 1900 MIN 87 CFSM .93 IN 12.73

04035500 MIDDLE BRANCH ONTONAGON RIVER NEAR ROCKLAND, MI

LOCATION.--Lat 46°41'57", long 89°09'36", in SE¼ sec.27, T.50 N., R.39 W., Ontonagon County, Hydrologic Unit 04020102, on left bank 10 ft (3 m) upstream from bridge on U.S. Highway 45, 700 ft (213 m) downstream from East Branch, and 2.8 mi (4.5 km) southeast of Rockland.

DRAINAGE AREA.--671 mi^2 (1,738 km^2).

PERIOD OF RECORD.--July 1942 to current year.

GAGE.--Water-stage recorder. Datum of gage is 661.1 ft (201.50 m) above mean sea level. Prior to April 1, 1959, nonrecording gage at site 400 ft (122 m) upstream at same datum. April 1, 1959, to October 21, 1968, nonrecording gage at present site and datum.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, Oct. 13 to Dec. 2, which are fair. Regulation by Bond Falls Reservoir 30.0 mi (48.3 km) above station (see sta 04034000). Diversion to South Branch Ontonagon River 31.0 mi (49.9 km) above station by Bond Falls Canal (see sta 04033500). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--34 years, 529 ft^3/s (14.98 m^3/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,000 ft^3/s (765 m^3/s) Aug. 22, 1942, gage height, 21.2 ft (6.46 m), from flood-marks, from rating curve extended above 7,500 ft^3/s (212 m^3/s) on basis of slope-area measurement of peak flow; minimum observed, 142 ft^3/s (4.02 m^3/s) Dec. 3, 1963, discharge measurement; minimum daily, 145 ft^3/s (4.11 m^3/s) Dec. 3, 1963.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,850 ft^3/s (166 m^3/s) Mar. 30, gage height, 9.11 ft (2.777 m); minimum daily, 165 ft^3/s (4.67 m^3/s) Aug. 22, Aug. 25 to Sept 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	254	240	900	365	305	390	2670	591	327	225	170	165
2	246	240	700	350	310	390	2000	730	304	216	170	165
3	252	235	660	350	310	385	2580	932	283	215	170	165
4	250	230	640	340	310	380	2180	775	274	211	170	165
5	246	230	600	330	305	370	2340	620	264	208	191	165
6	246	230	570	325	300	370	2780	528	249	203	191	165
7	249	240	530	320	305	370	2800	471	244	203	182	165
8	263	250	510	315	305	370	2340	420	243	199	175	165
9	261	400	480	310	305	370	2460	387	240	220	170	165
10	245	2000	470	310	310	370	3240	364	263	270	175	165
11	239	1400	480	305	310	370	2090	337	261	239	180	165
12	248	1000	490	300	310	370	1650	322	247	218	175	165
13	240	800	510	300	320	370	2010	318	278	210	175	165
14	240	640	540	300	320	370	3380	319	292	224	175	175
15	235	570	560	300	330	370	4040	317	330	215	175	180
16	235	460	570	300	335	370	2820	337	378	215	175	185
17	230	400	580	300	340	380	2220	436	362	214	175	182
18	225	500	560	300	340	390	1680	404	345	208	175	180
19	220	620	550	300	340	400	1410	354	431	199	175	183
20	225	640	530	300	340	450	1130	316	356	224	175	191
21	225	520	500	295	340	800	939	301	309	221	170	201
22	230	480	490	290	350	1580	1870	279	282	207	165	199
23	265	520	470	290	360	1580	1640	272	263	197	170	189
24	410	490	450	290	365	1500	1080	276	255	192	170	182
25	500	480	430	290	380	1550	835	273	240	188	165	180
26	460	470	420	295	390	1650	648	270	233	186	165	181
27	360	480	410	300	390	1750	669	252	233	184	165	188
28	310	580	400	300	390	1980	531	251	222	175	165	187
29	290	800	390	300	390	2490	476	259	220	175	165	186
30	270	1200	380	300	---	4590	462	283	227	170	165	186
31	250	---	370	300	---	4630	---	342	---	170	165	---
TOTAL	8419	17345	16140	9570	9705	31705	56970	12336	8455	6401	5349	5300
MEAN	272	578	521	309	335	1023	1899	398	282	206	173	177
MAX	500	2000	900	365	390	4630	4040	932	431	270	191	201
MIN	220	230	370	290	300	370	462	251	220	170	165	165

CAL YR 1975 TOTAL 184891 MEAN 507 MAX 6440 MIN 185
WTR YR 1976 TOTAL 187695 MEAN 513 MAX 4630 MIN 165

04036000 WEST BRANCH ONTONAGON RIVER NEAR BERGLAND, MI

LOCATION.--Lat 46°35'15", long 89°32'30", in SW¼ NE¼ sec.3, T.48 N., R.42 W., Ontonagon County, Hydrologic Unit 04020102, on right bank 0.4 mi (0.6 km) downstream from dam at outlet of Gogebic Lake and 1.5 mi (2.4 km) east of Bergland.

DRAINAGE AREA.--162 mi^2 (420 km^2).

PERIOD OF RECORD.--July 1942 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,290.81 ft (393.439 m) above mean sea level. Prior to November 5, 1942, nonrecording gage 0.4 mi (0.6 km) upstream at different datum.

REMARKS.--Records good except those for periods of no gage-height record, Oct. 1 to Nov. 15 and July 19 to Sept. 30, which are poor. Flow regulated by Gogebic Lake, usable capacity, 35,200 acre-ft (43.4 hm^3). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--34 years, 176 ft^3/s (4.984 m^3/s), 14.75 in/yr (375 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,400 ft^3/s (39.6 m^3/s) Apr. 26, 1960, gage height, 5.98 ft (1.823 m); minimum daily, 0.70 ft^3/s (0.020 m^3/s) Sept. 26 to Oct. 19, 1963.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,000 ft^3/s (28.3 m^3/s) Apr. 18, gage height, 5.10 ft (1.554 m); minimum daily, 1.0 ft^3/s (0.028 m^3/s) Sept. 28-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	2.0	535	214	240	173	384	149	25	106	4.5	2.8
2	2.4	1.9	726	230	233	173	406	151	25	115	4.5	2.5
3	2.3	1.9	710	257	250	175	427	184	25	104	4.0	2.4
4	2.4	1.9	504	254	278	172	454	273	25	100	4.0	2.4
5	2.4	1.8	271	279	272	181	478	217	25	92	4.5	2.2
6	2.1	1.8	210	304	263	180	509	208	24	92	4.5	2.2
7	2.1	1.9	155	295	258	177	546	201	24	80	5.0	2.2
8	1.9	2.0	300	274	246	173	584	215	22	54	5.0	2.0
9	1.9	2.0	368	255	238	170	624	198	41	23	5.0	2.0
10	1.9	165	219	246	235	169	664	168	62	29	5.0	2.2
11	1.9	174	248	238	239	166	699	85	55	30	5.0	2.2
12	1.9	3.5	389	249	233	172	722	32	61	26	5.0	2.4
13	1.9	3.5	308	281	225	177	739	28	64	25	5.0	2.4
14	1.9	3.5	267	282	225	176	773	27	57	24	5.0	2.4
15	1.9	5.0	274	267	225	171	828	27	67	23	5.0	2.4
16	1.9	22	209	257	219	169	879	26	59	22	5.0	2.4
17	1.9	79	169	252	211	165	918	25	57	22	5.0	2.4
18	1.9	116	288	250	204	164	937	26	65	22	4.2	2.4
19	1.9	380	315	259	203	164	934	27	84	10	4.2	2.4
20	1.9	537	303	253	202	170	901	26	119	6.8	4.2	2.4
21	1.9	580	294	241	197	170	873	25	124	6.8	4.2	2.4
22	1.9	737	277	301	195	179	880	25	114	6.8	4.2	2.2
23	1.9	784	266	305	193	185	863	26	109	6.8	4.2	1.8
24	1.9	759	257	294	188	193	824	26	111	5.6	4.2	1.8
25	2.0	517	246	284	183	203	799	27	154	5.6	4.2	1.3
26	2.0	477	233	274	182	223	778	26	118	5.6	4.2	1.3
27	2.0	301	224	268	177	238	618	25	116	5.6	4.2	1.3
28	2.0	260	217	262	176	251	387	24	99	6.2	4.2	1.0
29	2.0	286	266	257	176	273	192	24	92	4.2	3.2	1.0
30	2.0	326	255	249	---	312	151	24	84	4.2	3.0	1.0
31	2.0	---	224	245	---	356	---	25	---	4.2	3.0	---
TOTAL	62.5	6532.7	9527	8176	6366	6020	19771	2570	2107	1067.4	136.4	61.8
MEAN	2.02	218	307	264	220	194	659	82.9	70.2	34.4	4.40	2.06
MAX	2.5	784	726	305	278	356	937	273	154	115	5.0	2.8
MIN	1.9	1.8	155	214	176	164	151	24	22	4.2	3.0	1.0

CAL YR 1975 TOTAL 61555.1 MEAN 169 MAX 853 MIN 1.8 CFSM 1.04 IN 14.13
WTR YR 1976 TOTAL 62397.8 MEAN 170 MAX 937 MIN 1.0 CFSM 1.05 IN 14.33

04037500 CISCO BRANCH ONTONAGON RIVER AT CISCO LAKE OUTLET, MI

LOCATION.--Lat 46°15'12", long 89°27'05", in NE¼ sec.32, T.45 N., R.41 W., Gogebic County, Hydrologic Unit 04020102, on left bank 80 ft (24 m) downstream from Cisco Lake Dam, 2.5 mi (4.0 km) upstream from Langford Creek, 5.0 mi (8.0 km) upstream from U.S. Highway 2, and 13 mi (21 km) west of Watersmeet.

DRAINAGE AREA.--50.7 mi^2 (131.3 km^2).

PERIOD OF RECORD.--October 1944 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,672.69 ft (509.836 m) above mean sea level. Prior to October 1, 1968, nonrecording gage at same site and at datum 4.00 ft (1.219 m) higher.

REMARKS.--Records good except those below 25 ft^3/s (0.71 m^3/s), which are fair. Flow completely regulated by Cisco Lake, usable capacity, 15,600 acre-ft (19.2 hm^3). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--32 years, 47.1 ft^3/s (1.334 m^3/s), 12.62 in/yr (321 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 288 ft^3/s (8.16 m^3/s) May 1-4, 1951, gage height, 6.10 ft (1.859 m), present datum; minimum daily, 0.13 ft^3/s (0.004 m^3/s) Aug. 4-7, Aug. 22 to Sept. 5, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 148 ft^3/s (4.19 m^3/s) Oct. 25, gage height, 5.42 ft (1.652 m); minimum daily, 0.19 ft^3/s (0.005 m^3/s) Aug. 28, Sept. 3, 4, 6-9; minimum gage height, 3.86 ft (1.177 m) Aug. 28, Sept. 2, 3, 4, 5, 6-9, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.70	113	94	34	38	36	100	12	15	1.2	.40	.22
2	.70	110	93	36	38	38	101	12	24	1.3	.37	.22
3	.70	104	92	36	39	38	101	13	17	1.3	.25	.19
4	.70	103	91	37	40	38	101	13	19	.85	.28	.19
5	.85	100	89	37	39	40	102	13	27	1.2	.28	.22
6	.70	95	76	45	40	62	102	19	27	1.2	.28	.19
7	.70	93	67	52	40	82	103	24	26	1.2	.31	.19
8	.70	91	66	53	40	80	103	24	25	1.3	.31	.19
9	.70	89	65	52	39	78	105	23	25	1.6	.28	.19
10	.70	100	65	52	40	62	107	22	24	1.4	.25	.22
11	.55	103	56	53	41	51	109	22	25	1.3	.28	.22
12	.85	104	49	53	40	52	109	22	26	1.3	.28	.22
13	23	105	49	51	40	53	110	20	26	1.4	.31	.22
14	53	106	54	51	40	52	106	19	25	1.2	.31	.22
15	57	104	63	51	40	52	93	18	26	1.2	.31	.25
16	65	102	71	51	40	51	92	16	25	1.2	.31	.25
17	81	100	70	51	47	51	77	20	26	1.2	.28	.25
18	86	98	68	51	58	51	98	22	25	1.0	.25	.25
19	84	96	68	51	58	51	105	22	26	.85	.25	.25
20	81	96	67	51	57	52	103	30	26	.85	.22	.25
21	78	98	66	51	56	53	55	38	12	.70	.22	.25
22	76	100	65	51	56	54	18	38	1.9	.70	.22	.25
23	98	98	48	52	56	54	19	37	1.8	.55	.25	.25
24	124	98	35	52	56	55	19	22	1.6	.70	.22	.22
25	138	95	35	53	55	69	19	12	1.4	.70	.22	.25
26	140	93	35	52	55	81	19	5.9	1.3	.55	.22	.25
27	132	90	35	52	55	81	16	1.2	.85	.70	.22	.25
28	126	89	35	41	44	81	12	.70	.85	.40	.19	.22
29	122	89	35	37	37	84	12	.37	1.0	.37	.22	.25
30	122	93	35	38	---	92	12	1.2	.91	.37	.22	.25
31	119	---	34	38	---	100	---	1.4	---	.37	.22	---
TOTAL	1813.55	2955	1871	1465	1324	1874	2228	543.77	508.61	30.16	8.23	6.84
MEAN	58.5	98.5	60.4	47.3	45.7	60.5	74.3	17.5	17.0	.97	.27	.23
MAX	140	113	94	53	58	100	110	38	27	1.6	.40	.25
MIN	.55	89	34	34	37	36	12	.37	.85	.37	.19	.19

CAL YR 1975 TOTAL 16249.66 MEAN 44.5 MAX 140 MIN .36 CFSM .88 IN 11.92
WTR YR 1976 TOTAL 14628.16 MEAN 40.0 MAX 140 MIN .19 CFSM .79 IN 10.73

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI

LOCATION.--Lat 46°43'15", long 89°12'25", in NE¼ sec.20, T.50 N., R.39 W., Ontonagon County, Hydrologic Unit 04020102, on left bank 50 ft (15 m) downstream from bridge on Victoria Road, 1.8 mi (2.9 km) southwest of Rockland, and 2.4 mi (3.9 km) downstream from confluence of Middle and West Branches.

DRAINAGE AREA.--1,340 mi^2 (3,470 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1942 to current year.

REVISED RECORDS.--WSP 1387: 1943, 1946-47. WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 638.72 ft (194.682 m) above mean sea level. Prior to November 23, 1943, nonrecording gage and November 23, 1943, to October 17, 1967, water-stage recorder at site 50 ft (15 m) upstream at same datum.

REMARKS.--Water-discharge records good except those for the winter period, which are fair. Considerable regulation by powerplant on West Branch 5 mi (8 km) above station; Bond Falls Reservoir 25 mi (40 km) above station (see sta 04034000); Gogebic and Cisco Lakes, combined useable capacity, 50,800 acre-ft (62.6 hm^3); in headwaters.

AVERAGE DISCHARGE.--34 years, 1,413 ft^3/s (40.02 m^3/s), 14.32 in/yr (364 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,000 ft^3/s (1,190 m^3/s) Aug. 22, 1942, gage height, 28.6 ft (8.73 m) from flood-mark, from rating curve extended above 14,000 ft^3/s (396 m^3/s) on basis of slope-area measurement of peak flow; minimum daily, 192 ft^3/s (5.44 m^3/s) July 28, 29, 1963.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 9,000 ft^3/s (255 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	(m^3/s)	Gage height (ft)	(m)	Date	Time	Discharge (ft^3/s)	(m^3/s)	Gage height (ft)	(m)
Mar. 27	1800	ice jam		*14.92	4.548	Apr. 14	2400	10,400	295	13.46	4.103
Mar. 30	2100	*10,600	300	13.54	4.127						

Minimum discharge, 212 ft^3/s (6.00 m^3/s) Aug. 25, 26, Sept. 11, gage height, 5.27 ft (1.606 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	446	548	3840	1150	1000	1200	7170	1390	836	446	386	358
2	355	623	2800	1100	960	1200	5910	1590	791	600	383	344
3	290	695	2180	1000	1030	1250	6450	1920	700	600	390	222
4	380	685	1700	910	1050	1210	5800	1900	675	492	446	278
5	272	536	1600	950	1080	1200	6290	1880	853	525	245	366
6	414	661	1500	1000	1090	1190	6280	1710	660	450	439	320
7	505	567	1350	1030	1010	1180	6970	1540	630	590	314	390
8	369	621	1300	1010	1020	1100	6640	1470	881	660	376	436
9	334	564	1250	1030	1140	1030	6720	1400	897	460	386	305
10	334	5380	1250	1080	1040	1150	7740	1170	766	386	338	418
11	311	5980	1150	1080	1030	1100	6310	1130	700	620	411	236
12	400	3610	1100	1080	1050	1100	5180	965	620	414	400	248
13	808	3000	1350	1050	1050	1050	5630	1040	772	418	355	327
14	404	1980	1400	1030	1060	1080	7850	851	530	575	358	220
15	281	1730	1440	1010	1070	1080	9380	842	796	266	272	344
16	296	1570	1440	1000	1100	1090	7640	951	807	492	450	225
17	344	1510	1400	1000	1150	1030	6580	1130	873	428	348	327
18	278	1520	1300	1010	1100	1100	4970	1030	748	386	303	245
19	275	1900	1300	1020	1080	1150	4420	935	1110	422	407	476
20	436	3160	1320	1050	1080	1200	3350	993	981	496	377	287
21	468	2630	1350	1080	1080	2000	2750	836	933	414	293	278
22	330	2220	1300	1050	1070	3500	4320	819	760	414	360	257
23	555	2120	1280	970	1020	3650	4540	811	650	418	346	348
24	630	2800	1230	960	1130	4000	3420	917	862	400	293	245
25	1160	1830	1150	940	1240	4500	2740	806	772	380	220	278
26	1170	1270	1100	1000	1260	5900	2530	796	580	362	344	414
27	848	1360	1050	990	1260	5300	2260	792	468	404	317	293
28	844	1310	1050	960	1260	5900	1710	771	600	404	355	330
29	891	1290	1100	960	1270	7840	1430	764	796	380	380	248
30	562	4040	1110	1000	---	8870	1310	784	436	362	464	305
31	894	---	1110	1030	---	9430	---	847	---	338	380	---
TOTAL	15884	57710	44800	31530	31780	83580	154290	34780	22483	14002	11136	9368
MEAN	512	1924	1445	1017	1096	2696	5143	1122	749	452	359	312
MAX	1170	5980	3840	1150	1270	9430	9380	1920	1110	660	464	476
MIN	272	536	1050	910	960	1030	1310	764	436	266	220	220

CAL YR 1975 TOTAL 512827 MEAN 1405 MAX 14400 MIN 251 CFSM 1.05 IN 14.24
WTR YR 1976 TOTAL 511343 MEAN 1397 MAX 9430 MIN 220 CFSM 1.04 IN 14.20

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967, 1972 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1974 to current year.
WATER TEMPERATURES: October 1974 to current year.

INSTRUMENTATION.--Water quality monitor since October 1975.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. Monthly samples are collected as a cross-section sample at cableway 200 ft (61 m) upstream from bridge on Victoria Road.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 190 micromhos July 11, 1975; minimum, 45 micromhos Dec. 2, 1975.
WATER TEMPERATURES: Maximum daily, 27.0°C July 31, Aug. 1, 1975; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 180 micromhos Aug. 25; minimum, 45 micromhos Dec. 2.
WATER TEMPERATURES: Maximum, 25.5°C June 14; minimum, 0.0°C on many days during November to April.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT												
14...	1615	645	157	8.1	12.5	10.3	100	2	5	2	81	0
NOV												
06...	1600	656	128	7.9	7.5	11.5	98	140	4	16	79	5
DEC												
02...	1500	1460	102	7.2	.0	13.8	98	208	160	72	47	3
FEB												
03...	1530	1030	114	7.4	.0	13.7	96	43	8	3	61	0
MAR												
17...	1000	1030	125	7.5	.0	13.8	98	13	1	3	61	0
APR												
19...	1230	2660	--	8.1	10.0	10.8	98	41	--	4	43	0
MAY												
11...	1450	1170	91	7.9	12.0	10.3	99	8	3	3	45	0
JUN												
07...	1330	655	100	7.7	21.0	9.2	100	51	14	13	71	0
JUL												
06...	1345	630	127	8.2	22.0	8.8	100	22	13	42	72	1
AUG												
17...	1015	308	164	7.3	16.0	8.7	91	70	6	69	90	0
SEP												
15...	1100	302	162	7.6	14.5	10.3	100	27	24	240	80	2
28...	0830	236	171	7.9	8.0	10.3	90	--	<1	46	86	1

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT												
14...	22	6.3	2.9	.1	1.2	102	0	75	1.3	8.2	2.2	.2
NOV												
06...	22	5.8	2.6	.1	1.1	90	0	74	1.8	6.8	3.0	.6
DEC												
02...	13	3.6	1.8	.1	1.5	54	0	44	5.5	9.6	2.3	.4
FEB												
03...	17	4.5	2.2	.1	.9	90	0	57	5.7	5.8	2.5	.1
MAR												
17...	17	4.6	2.2	.1	1.0	76	0	62	3.8	5.4	2.4	.1
APR												
19...	13	2.6	1.0	.1	.8	52	0	43	.7	5.6	.7	.1
MAY												
11...	12	3.7	1.6	.1	.8	58	0	43	1.2	7.6	2.3	.1
JUN												
07...	23	3.4	2.2	.1	1.4	96	0	79	3.1	2.2	3.2	.1
JUL												
06...	20	5.4	2.3	.1	1.2	86	0	71	.9	4.5	1.5	.1
AUG												
17...	24	7.2	3.0	.1	1.0	110	0	90	8.8	3.9	2.3	.1
SEP												
15...	22	6.1	2.5	.1	1.2	100	0	78	4.0	11	1.5	.1
28...	24	6.3	2.4	.1	1.0	104	0	85	2.1	5.1	2.6	.1

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT											
14...	9.5	78	103	136	.00	.24	1.1	.01	14	24	--
NOV											
06...	9.3	102	96	181	.04	.32	1.4	.03	11	19	100
DEC											
02...	8.8	98	68	386	.13	.66	2.9	.08	48	189	100
FEB											
03...	9.8	86	87	239	.13	.52	2.3	.05	38	106	100
MAR											
17...	11	100	81	278	.19	.52	2.3	.02	--	--	--
APR											
19...	6.1	61	56	438	.08	.66	2.9	.14	340	2440	91
MAY											
11...	6.8	76	63	240	.05	.43	1.9	.05	26	82	100
JUN											
07...	7.4	88	90	156	.04	.54	2.4	.04	16	28	100
JUL											
06...	7.5	93	85	158	.03	.46	2.0	.03	15	26	100
AUG											
17...	9.7	98	105	81.5	.00	.30	1.3	.02	18	15	100
SEP											
15...	11	110	105	89.7	.01	.21	.93	.04	20	16	100
28...	10	111	103	70.7	.04	.17	.75	.02	12	7.6	100

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
OCT												
14...	1615	1	1	0	0	<10	3	0	0	14	3	490
FEB												
03...	1530	1	1	0	0	<10	0	0	0	13	3	670
APR												
19...	1230	0	0	1	0	10	10	3	0	10	10	2800
JUL												
06...	1345	1	0	0	0	10	10	1	0	0	0	390

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT												
14...	90	5	0	--	30	.0	.0	0	0	30	10	8.0
FEB												
03...	100	13	0	30	0	.1	.0	0	0	20	10	8.6
APR												
19...	140	3	2	90	20	<.5	<.5	0	0	--	20	12
JUL												
06...	90	2	1	30	10	<.5	<.5	0	0	10	0	6.8

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
PERIPHYTON

DATE	LENGTH OF EXPOSURE (DAYS)	PERIPHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERIPHYTON BIOMASS ASH WEIGHT G/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL A MG/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL B MG/SQ M
NOV 06...	23	6.90	2.50	6.80	.400
FEB 03...	28	2.80	2.10	1.00	.200
JUN 07...	27	95.8	91.5	8.25	.000
AUG 17...	42	25.5	22.0	6.79	.139

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

OCT. 14, 1975
1615 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,900 CELLS/ML

	ORGANISM NAME	COMMON NAME	CELLS/ML	PER CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		32	1
D	....MELOSIRA		1,400	47
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		32	1
	....COCCONEIS		63	2
	...CYMBELLACEAE			
	....CYMBELLA		110	4
L	....EPITHEMIA			0
	...FRAGILARIACEAE			
D	....ASTERIONELLA		470	16
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		63	2
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		140	5
	...NITZSCHIACEAE			
	....NITZSCHIA		130	4
		TOTALS	2,400	82
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....DINOBRYON		32	1
		TOTALS	32	1
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
D	....CYLINDROSPERMUM		470	16
		TOTALS	470	16

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

NOV. 6, 1975
1600 HOURS

IDENTIFICATION OF PHYTOPLANKTON

490 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...CHARACIACEAE			
	....SCHROEDERIA		32	6
		TOTALS	32	6
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....MELOSIRA		16	3
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		95	19
L	....COCCONEIS			0
	...CYMBELLACEAE			
L	....EPITHEMIA			0
	...DIATOMACEAE			
D	....DIATOMA		130	26
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
	....SYNEDRA		32	6
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		63	13
	...NAVICULACEAE	NAVICULOID		
L	....AMPHIPLEURA			0
	....NAVICULA		47	10
	...NITZSCHIACEAE			
D	....NITZSCHIA		79	16
	...SURIRELLACEAE			
L	....SURIRELLA			0
		TOTALS	460	93

DEC. 2, 1975
1500 HOURS

IDENTIFICATION OF PHYTOPLANKTON

200 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
L	....MELOSIRA			0
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....COCCONEIS			0
	...CYMBELLACEAE			
	....CYMBELLA		26	13
	...DIATOMACEAE			
	....DIATOMA		13	7
	...FRAGILARIACEAE			
	....FRAGILARIA		13	7
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		13	7
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		66	33
	...NITZSCHIACEAE			
	....DENTICULA		13	7
D	....NITZSCHIA		53	27
		TOTALS	200	101
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
L	....OSCILLATORIA			0

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

FEB. 3, 1976
1530 HOURS

IDENTIFICATION OF PHYTOPLANKTON

150 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....TETRAEDRON		5	3
		TOTALS	5	3
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....COCCONEIS		5	3
	...CYMBELLACEAE			
	....CYMBELLA		21	13
	...DIATOMACEAE			
	....DIATOMA		10	7
	...EUNOTIACEAE			
L	....EUNOTIA			0
	...FRAGILARIACEAE			
D	....SYNEDRA		31	20
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		21	13
	...MERIDIONACEAE			
	....MERIDION		10	7
	...NAVICULACEAE	NAVICULOID		
L	....GYROSIGMA			0
D	....NAVICULA		46	30
	...NITZSCHIACEAE			
	....NITZSCHIA		5	3
		TOTALS	150	96
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
L	....APHANIZOMENON			0

MAR. 17, 1976
1000 HOURS

IDENTIFICATION OF PHYTOPLANKTON

350 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..ZYGNEMATALES			
	...DESMIDIACEAE	PLACODERM DESMIDS		
	....STAURASTRUM		11	3
		TOTALS	11	3
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....MELOSIRA		11	3
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		11	3
	...CYMBELLACEAE			
	....CYMBELLA		43	13
	...DIATOMACEAE			
	....DIATOMA		43	13
	...FRAGILARIACEAE			
	....FRAGILARIA		11	3
	...GOMPHONEMATACEAE			
D	....GOMPHONEMA		110	31
	...MERIDIONACEAE			
	....MERIDION		11	3
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		22	6
	...NITZSCHIACEAE			
D	....NITZSCHIA		76	22
		TOTALS	340	97

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

APR. 19, 1976
1230 HOURS

IDENTIFICATION OF PHYTOPLANKTON

200 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		29	14
	...MERIDIONACEAE			
L	....MERIDION			0
	...NAVICULACEAE	NAVICULOID		
	....PINNULARIA		29	14
	...NITZSCHIACEAE			
	....NITZSCHIA		29	14
		TOTALS	86	42
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....ANACYSTIS		120	57
		TOTALS	120	57

MAY 11, 1976
1450 HOURS

710 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...HYDRODICTYACEAE			
D	....PEDIASTRUM		150	21
	...OOCYSTACEAE			
	....ANKISTRODESMUS		9	1
	....OOCYSTIS		38	5
		TOTALS	200	27
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		47	7
	....MELOSIRA		38	5
	..PENNALES	PENNATE		
	...CYMBELLACEAE			
	....CYMBELLA		28	4
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
	....ASTERIONELLA		9	1
	....SYNEDRA		38	5
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		84	12
	...MERIDIONACEAE			
	....MERIDION		19	3
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		47	7
	...NITZSCHIACEAE			
D	....NITZSCHIA		160	22
	...SURIRELLACEAE			
L	....SURIRELLA			0
	...TABELLARIACEAE			
	....TABELLARIA		9	1
		TOTALS	480	67
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		19	3
		TOTALS	19	3
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
	....TRACHELOMONAS		9	1
		TOTALS	9	1
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..GYMNODINIALES			
	...GYMNODINIACEAE			
	....GYMNODINIUM		9	1
		TOTALS	9	1

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JUNE 7, 1976
1330 HOURS

IDENTIFICATION OF PHYTOPLANKTON

790 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		20	3
	....DICTYOSPHAERIUM		14	2
	...SCENEDESMACEAE			
	....SCENEDESMUS		54	7
	..ZYGNEMATALES			
	...DESMIDIACEAE	PLACODERM DESMIDS		
	....CLOSTERIUM		7	1
		TOTALS	95	13
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		14	2
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....COCCONEIS		7	1
	...CYMBELLACEAE			
	....CYMBELLA		75	9
	...DIATOMACEAE			
D	....DIATOMA		130	16
	...FRAGILARIACEAE			
	....FRAGILARIA		82	10
	....SYNEDRA		82	10
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		34	4
	...MERIDIONACEAE			
	....MERIDION		7	1
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		130	16
	...NITZSCHIACEAE			
	....NITZSCHIA		88	11
		TOTALS	650	80
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		27	3
		TOTALS	27	3
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
	....TRACHELOMONAS		14	2
		TOTALS	14	2
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...PERIDINIACEAE			
	....PERIDINIUM		7	1
		TOTALS	7	1

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JULY 6, 1976
1345 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,400 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		75	5
	....DICTYOSPHAERIUM		50	4
	....TETRAEDRON		13	1
	...SCENEDESMACEAE			
D	....CRUCIGENIA		250	18
	....SCENEDESMUS		150	11
	..ZYGNEMATALES			
	...DESMIDIACEAE	PLACODERM DESMIDS		
	....COSMARIUM		13	1
		TOTALS	550	40
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		25	2
	....MELOSIRA		50	4
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		88	6
	....COCCONEIS		25	2
	...CYMBELLACEAE			
L	....AMPHORA			0
	....CYMBELLA		75	5
	...DIATOMACEAE			
	....DIATOMA		63	4
	...FRAGILARIACEAE			
	....ASTERIONELLA		25	2
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		140	10
	...MERIDIONACEAE			
	....MERIDION		13	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		130	9
	....PINNULARIA		50	4
	...NITZSCHIACEAE			
	....NITZSCHIA		180	12
		TOTALS	850	61
	.XANTHOPHYCEAE	YELLOW-GREEN ALGAE		
	..HETEROCOCCALES			
	...CHLOROTHECIACEAE			
	....OPHIOCYTIUM		13	1
		TOTALS	13	1
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		13	1
		TOTALS	13	1

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

AUG. 17, 1976
1015 HOURS

IDENTIFICATION OF PHYTOPLANKTON

870 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		29	3
		TOTALS	29	3
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		7	1
L	....MELOSIRA			0
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....COCCONEIS		43	5
	...CYMBELLACEAE			
	....CYMBELLA		43	5
	....EPITHEMIA		14	2
	...DIATOMACEAE			
	....DIATOMA		29	3
	...FRAGILARIACEAE			
	....ASTERIONELLA		14	2
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		14	2
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		150	17
	....NEIDIUM		7	1
	...NITZSCHIACEAE			
	....NITZSCHIA		43	5
	...SURIRELLACEAE			
	....SURIRELLA		7	1
		TOTALS	380	44
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....AGMENELLUM		58	7
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		340	39
	...RIVULARIACEAE			
	....CALOTHRIX		72	8
		TOTALS	470	54

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

SEP. 15, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

11,000 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....SCENEDESMUS		110	1
	..ZYGNEMATALES			
	...DESMIDIACEAE	PLACODERM DESMIDS		
	....COSMARIUM		57	1
		TOTALS	170	2
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
L	....MELOSIRA			0
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....COCCONEIS			0
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		57	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		450	4
	...NITZSCHIACEAE			
	....NITZSCHIA		170	2
		TOTALS	740	7
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....GOMPHOSPHAERIA		2,600	24
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		7,400	68
		TOTALS	9,900	92

SEP. 28, 1976
0830 HOURS

5,500 CELLS/ML

	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....SCENEDESMUS		110	2
		TOTALS	110	2
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....ACHNANTHES			0
	....COCCONEIS		53	1
	...CYMBELLACEAE			
	....AMPHORA		160	3
	...FRAGILARIACEAE			
	....SYNEDRA		53	1
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		130	2
	...NITZSCHIACEAE			
	....NITZSCHIA		110	2
		TOTALS	550	9
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
D	....APHANIZOMENON		4,900	88
		TOTALS	4,900	88

NOTE: D - DOMINANT ORGANISM; GREATER OR EQUAL TO 15%
L - LESS THEN 1%; MAY NOT HAVE BEEN ACTUALLY COUNTED

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	154	142	147	95	76	88	96	95	95
2	---	---	---	154	141	145	100	45	79	97	96	96
3	---	---	---	152	140	143	49	46	47	98	97	98
4	---	---	---	153	136	142	49	46	48	99	96	97
5	---	---	---	156	136	145	53	47	49	101	101	101
6	---	---	---	147	137	143	59	49	53	101	100	100
7	---	---	---	166	145	151	54	54	54	104	102	103
8	---	---	---	166	146	151	56	55	55	106	105	106
9	---	---	---	172	146	157	59	55	57	108	107	108
10	---	---	---	164	78	127	60	58	58	109	109	109
11	---	---	---	115	93	103	68	61	65	111	111	111
12	---	---	---	98	94	96	73	64	69	113	112	113
13	---	---	---	95	91	93	73	65	70	115	113	114
14	---	---	---	94	90	92	72	69	70	118	116	117
15	---	164	130	98	92	94	75	70	73	121	120	121
16	164	161	162	100	97	98	79	75	78	123	122	122
17	161	156	158	104	100	103	82	78	80	125	124	125
18	156	155	156	104	102	103	90	82	86	127	127	127
19	157	155	156	111	103	107	90	90	90	129	128	129
20	160	155	157	106	92	98	90	88	90	132	131	131
21	161	157	159	94	90	92	90	89	90	132	131	131
22	161	157	160	91	85	89	89	89	89	133	131	132
23	159	152	156	89	86	88	89	89	89	133	133	133
24	162	153	157	95	80	87	90	89	89	133	131	131
25	161	156	158	93	75	86	90	89	89	131	130	131
26	156	149	151	90	85	88	90	89	90	132	130	131
27	150	147	148	106	88	93	92	90	91	133	132	132
28	148	146	148	107	83	99	94	92	93	132	130	131
29	148	143	146	122	106	110	94	93	93	131	130	131
30	150	143	146	130	65	98	94	93	94	131	130	130
31	145	142	143	---	---	---	95	94	94	130	130	130
MONTH	---	---	---	172	65	112	100	45	76	133	95	118

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	101	100	100	---	---	---	94	89	92
2	---	---	---	101	100	100	---	---	---	95	90	93
3	124	123	124	101	84	96	---	---	---	93	89	91
4	124	123	124	97	91	95	---	---	---	90	85	87
5	125	123	125	104	97	103	---	---	---	88	85	86
6	123	122	123	104	87	99	---	---	---	89	86	87
7	123	118	121	86	69	76	---	---	---	90	88	89
8	118	117	117	77	72	74	---	---	---	91	88	89
9	118	117	118	72	68	70	---	---	---	97	91	93
10	118	117	118	69	65	68	---	---	---	103	97	99
11	120	118	119	73	65	69	---	---	---	105	92	97
12	119	118	119	71	64	67	---	---	---	102	93	99
13	119	118	119	66	63	64	---	---	---	103	95	98
14	118	114	116	73	65	69	---	---	---	107	102	106
15	115	114	114	73	68	70	---	---	---	108	106	107
16	117	114	115	---	---	---	---	---	---	113	101	106
17	115	114	115	---	---	---	---	---	---	115	106	110
18	116	115	116	---	---	---	---	---	---	114	106	111
19	116	115	116	---	---	---	---	52	55	112	106	111
20	117	115	116	---	---	---	62	52	58	114	106	110
21	116	116	116	---	---	---	65	60	62	115	114	114
22	117	116	117	---	---	---	72	62	68	116	114	115
23	117	114	115	---	---	---	63	57	59	117	115	116
24	114	113	114	---	---	---	58	56	57	118	111	115
25	114	109	113	---	---	---	63	57	60	118	114	118
26	109	94	100	---	---	---	64	61	63	119	118	118
27	98	94	96	---	---	---	75	63	70	120	118	119
28	98	97	97	---	---	---	78	70	74	122	120	121
29	100	98	99	---	---	---	84	77	81	123	121	122
30	---	---	---	---	---	---	90	83	87	126	122	124
31	---	---	---	---	---	---	---	---	---	128	126	127
MONTH	125	94	115	---	---	---	---	---	---	128	85	105

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	129	125	128	157	127	141	171	155	164	172	162	167
2	128	125	126	134	131	132	169	155	161	170	162	166
3	129	126	128	136	131	133	170	154	162	172	165	169
4	129	126	128	149	132	137	168	154	160	169	160	166
5	130	121	125	146	133	136	173	157	168	166	159	162
6	133	123	130	149	133	138	171	156	162	168	158	163
7	133	129	131	136	133	134	172	156	164	171	157	163
8	161	122	135	151	129	136	171	155	161	168	158	161
9	131	123	126	157	129	142	174	156	163	171	158	165
10	161	125	138	162	138	151	176	158	166	166	157	160
11	160	125	137	143	137	140	173	160	166	170	160	167
12	158	125	137	157	137	146	176	159	168	171	161	167
13	137	125	132	157	137	146	175	161	169	168	161	164
14	158	133	142	154	135	142	172	159	165	168	165	167
15	139	133	136	161	141	156	172	159	166	166	156	162
16	147	134	141	160	141	148	170	160	163	167	160	164
17	139	131	135	160	141	149	172	161	166	168	159	164
18	140	132	137	165	144	153	176	161	170	169	161	167
19	141	135	137	164	146	153	176	165	169	169	161	164
20	141	133	136	161	143	151	179	165	171	167	163	166
21	137	131	134	165	148	156	178	165	173	167	164	165
22	153	130	137	166	148	157	179	165	172	168	164	166
23	154	130	141	166	150	157	178	165	171	168	164	166
24	135	128	131	167	149	157	178	165	172	170	166	169
25	133	128	131	167	150	158	180	174	178	173	168	171
26	159	127	141	172	152	161	179	167	173	172	168	170
27	160	127	142	167	153	158	178	167	173	172	168	172
28	136	131	133	168	155	160	172	163	167	170	165	167
29	131	125	128	170	153	161	172	164	168	172	167	170
30	159	126	142	171	154	162	167	163	164	173	168	170
31	---	---	---	169	154	160	173	164	167	---	---	---
MONTH	161	121	134	172	127	149	180	154	167	173	156	166

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	0.0	0.0	0.0	0.0	0.0	0.0	---	---	---	9.0	7.5	8.0
2	0.0	0.0	0.0	0.0	0.0	0.0	---	---	---	8.0	7.0	7.5
3	0.0	0.0	0.0	0.0	0.0	0.0	---	---	---	7.5	6.0	6.5
4	0.0	0.0	0.0	0.0	0.0	0.0	---	---	---	9.0	5.5	7.0
5	0.0	0.0	0.0	0.0	0.0	0.0	---	---	---	8.0	7.0	7.5
6	0.0	0.0	0.0	0.0	0.0	0.0	---	---	---	9.0	6.0	7.5
7	0.0	0.0	0.0	0.5	0.0	0.0	---	---	---	9.5	7.0	8.0
8	0.0	0.0	0.0	1.0	0.0	0.0	---	---	---	10.0	7.0	8.5
9	0.0	0.0	0.0	1.0	0.0	0.0	---	---	---	12.5	8.0	10.0
10	0.0	0.0	0.0	1.5	0.0	0.5	---	---	---	13.0	10.5	11.5
11	0.0	0.0	0.0	2.5	0.5	1.5	---	---	---	13.0	10.0	11.5
12	0.0	0.0	0.0	2.0	1.0	1.5	---	---	---	14.5	10.0	12.0
13	0.0	0.0	0.0	2.0	0.5	1.5	---	---	---	12.5	11.5	12.0
14	0.0	0.0	0.0	2.5	0.5	1.5	---	---	---	15.0	10.5	13.0
15	0.0	0.0	0.0	3.5	1.5	2.5	---	---	---	16.0	12.0	14.0
16	0.0	0.0	0.0	---	---	---	---	---	---	14.0	12.5	13.0
17	0.0	0.0	0.0	---	---	---	---	---	---	15.0	12.0	13.0
18	0.0	0.0	0.0	---	---	---	---	---	---	15.5	11.5	13.5
19	0.0	0.0	0.0	---	---	---	---	---	---	16.0	11.5	14.0
20	0.0	0.0	0.0	---	---	---	10.5	---	---	16.5	13.5	15.0
							10.5	9.0	9.5			
21	0.0	0.0	0.0	---	---	---						
22	0.0	0.0	0.0	---	---	---	9.0	8.5	9.0	17.0	13.5	15.0
23	0.0	0.0	0.0	---	---	---	8.5	7.5	8.0	17.0	13.5	15.0
24	0.0	0.0	0.0	---	---	---	8.0	7.0	7.5	16.5	13.0	14.5
25	0.0	0.0	0.0	---	---	---	8.0	7.0	7.5	16.5	13.0	14.5
							8.0	6.5	7.5	17.5	13.0	15.5
26	0.0	0.0	0.0	---	---	---						
27	0.0	0.0	0.0	---	---	---	7.5	6.0	7.0	18.0	13.5	16.0
28	0.0	0.0	0.0	---	---	---	7.5	6.0	6.5	18.0	14.5	16.5
29	0.0	0.0	0.0	---	---	---	8.5	5.5	7.0	17.5	15.5	16.5
30	---	---	---	---	---	---	8.5	6.5	7.5	16.5	15.5	16.0
31	---	---	---	---	---	---	9.5	7.5	8.5	16.5	15.5	16.0
							---	---	---	17.5	15.0	16.0
MONTH	0.0	0.0	0.0	---	---	---	---	---	---	18.0	5.5	12.5

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

04040500 STURGEON RIVER NEAR SIDNAW, MI

LOCATION.--Lat 46°35'03", long 88°34'33", in NE¼ SE¼ sec.5, T.48 N., R.34 W., Baraga County, Hydrologic Unit 04020104, on right bank 30 ft (9 m) downstream from highway bridge, 3.0 mi (4.8 km) downstream from Rock River, 3.5 mi (5.6 km) northwest of Covington, 6.5 mi (10.5 km) upstream from Perch River, 8.5 mi (13.7 km) northeast of Sidnaw, and at mile 71 (114 km).

DRAINAGE AREA.--171 mi^2 (443 km^2).

PERIOD OF RECORD.--October 1912 to September 1915, April 1943 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1507: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,214.40 ft (370.149 m) above mean sea level. October 1912 to September 1915, non-recording gage at site 200 ft (61 m) upstream at different datum. April 2, 1943, to October 1, 1946, nonrecording gage at present site and datum.

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--36 years, 212 ft^3/s (6.004 m^3/s), 16.84 in/yr (428 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,630 ft^3/s (131 m^3/s) Apr. 24, 1960, gage height, 11.63 ft (3.545 m); minimum, 2.7 ft^3/s (0.076 m^3/s) Sept. 13, 1976, gage height, 3.17 ft (0.966 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,680 ft^3/s (75.9 m^3/s) Apr. 17, gage height, 8.81 ft (2.685 m); minimum, 2.7 ft^3/s (0.076 m^3/s) Sept. 13, gage height, 3.17 ft (0.966 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	119	91	460	117	76	88	795	416	108	24	11	3.2
2	112	86	410	117	75	86	710	436	105	22	11	3.4
3	105	81	370	121	75	86	735	436	91	21	10	3.4
4	96	75	350	119	75	84	715	399	78	19	11	3.4
5	90	70	325	115	74	86	750	368	67	18	12	3.6
6	78	66	300	110	73	88	872	350	59	16	12	3.8
7	72	65	260	105	73	88	983	318	50	15	11	4.0
8	66	65	230	102	72	90	990	282	44	14	10	3.6
9	63	67	210	100	72	92	1050	252	39	15	10	3.4
10	61	265	200	98	73	94	1240	225	38	16	11	3.8
11	65	372	190	96	74	94	1010	198	35	20	12	3.2
12	74	375	180	94	75	96	990	175	31	20	13	2.9
13	75	396	170	92	77	100	1100	161	39	18	12	2.7
14	72	361	190	90	80	110	1410	159	52	17	11	3.0
15	77	319	230	88	82	110	2070	153	57	17	9.5	3.2
16	77	280	225	86	84	110	2450	151	69	16	8.3	3.8
17	79	286	220	84	86	115	2620	180	77	15	7.4	3.8
18	78	283	215	82	85	130	2580	182	77	14	6.5	4.0
19	71	364	210	81	84	160	2360	167	105	13	6.2	4.0
20	67	458	195	80	82	230	1920	149	102	18	5.6	4.4
21	65	438	185	80	80	270	1430	131	77	17	5.2	5.6
22	63	403	177	80	78	310	1400	119	59	15	4.8	6.8
23	66	347	165	79	77	350	1350	105	48	14	4.6	7.1
24	96	292	157	80	80	390	1160	94	40	13	4.4	6.8
25	163	250	145	81	85	410	902	90	38	12	4.2	6.5
26	151	220	137	81	88	440	725	84	39	12	4.0	6.5
27	137	200	130	80	90	470	590	78	35	12	3.8	6.8
28	122	195	130	79	92	500	488	74	30	12	3.2	7.7
29	114	188	128	78	90	585	420	69	28	13	3.0	7.4
30	103	280	122	77	---	824	382	74	26	14	3.0	7.1
31	97	---	121	76	---	920	---	91	---	12	3.0	---
TOTAL	2774	7238	6737	2848	2307	7606	36197	6166	1743	494	243.7	138.9
MEAN	89.5	241	217	91.9	79.6	245	1207	199	58.1	15.9	7.86	4.63
MAX	163	458	460	121	92	920	2620	436	108	24	13	7.7
MIN	61	65	121	76	72	84	382	69	26	12	3.0	2.7
CFSM	.52	1.41	1.27	.54	.47	1.43	7.06	1.16	.34	.09	.05	.03
IN.	.60	1.57	1.47	.62	.50	1.65	7.87	1.34	.38	.11	.05	.03

CAL YR 1975 TOTAL 81159.0 MEAN 222 MAX 1780 MIN 12 CFSM 1.30 IN 17.66
WTR YR 1976 TOTAL 74492.6 MEAN 204 MAX 2620 MIN 2.7 CFSM 1.19 IN 16.21

04041500 STURGEON RIVER NEAR ALSTON, MI

LOCATION.--Lat 46°43'35", long 88°39'43", in SE¼ sec.15, T.50 N., R.35 W., Baraga County, Hydrologic Unit 04020104, on right bank in powerhouse of Upper Peninsula Power Co. at Prickett Dam, 4.0 mi (6.4 km) upstream from Clear Creek, 5.0 mi (8.0 km) southeast of Alston, and at mile 45 (72 km).

DRAINAGE AREA.--346 mi^2 (896 km^2).

PERIOD OF RECORD.--February 1932 to June 1941, October 1942 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 710.3 ft (216.50 m) above mean tide at New York City (levels by Corps of Engineers). Prior to October 1, 1963, at datum 40.00 ft (12.192 m) lower.

REMARKS.--Records good except those for no gage-height record, Dec. 18 to Jan. 21, July 6 to Aug. 7, which are fair and those below 20 ft^3/s (0.57 m^3/s), which are poor. Flow regulated by powerplant at station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--42 years, (1932-40, 1942-76), 420 ft^3/s (11.89 m^3/s), 16.48 in/yr (419 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,360 ft^3/s (208 m^3/s) Apr. 24, 1960, gage height, 13.09 ft (3.990 m) present datum; minimum daily, 1 ft^3/s (0.03 m^3/s) Aug. 14-19, 1960.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,680 ft^3/s (104 m^3/s) Apr. 17, gage height, 8.84 ft (2.694 m); minimum, 6.2 ft^3/s (0.176 m^3/s) Sept. 3, 4, 6, 7, 9, 10, 18, 19, 24, 25, 26, 27, 28, 29, gage height, 2.41 ft (0.735 m); minimum daily, 6.2 ft^3/s (0.176 m^3/s) Sept. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	302	15	665	270	14	370	1300	710	323	225	13	51
2	302	15	715	270	244	366	940	767	330	229	95	51
3	298	208	660	270	241	366	620	866	327	15	95	50
4	298	211	655	270	244	366	989	713	325	14	95	6.2
5	208	211	650	270	241	390	1230	657	292	14	95	6.4
6	208	211	650	270	241	390	1380	646	14	220	100	6.4
7	211	211	650	270	241	358	1520	656	269	200	12	42
8	205	211	640	280	14	358	1530	655	228	230	12	45
9	208	16	450	280	238	354	1470	652	226	210	102	49
10	211	419	455	250	234	354	1880	645	227	12	103	50
11	169	660	442	240	234	354	1590	446	227	12	90	6.4
12	158	665	342	240	238	350	1400	442	14	185	90	6.4
13	163	665	258	240	234	346	1420	356	280	185	95	51
14	155	665	258	240	238	350	1980	369	210	185	11	90
15	140	660	350	240	227	350	2920	369	205	185	11	90
16	10	595	346	240	234	350	3050	320	278	185	360	89
17	12	414	346	240	234	342	3460	320	281	12	530	193
18	17	460	350	240	230	346	3180	317	227	12	114	71
19	17	655	350	240	234	266	2780	315	228	170	309	6.4
20	193	660	350	240	224	362	2480	318	15	185	100	90
21	196	665	350	240	234	605	1840	313	215	175	11	88
22	199	665	350	241	234	605	1920	315	207	150	11	89
23	199	665	350	241	234	660	1820	272	286	160	87	114
24	199	394	350	244	234	765	1660	278	285	12	99	112
25	14	630	350	14	230	845	1310	276	230	12	101	111
26	14	665	350	241	234	1030	983	248	226	95	102	113
27	202	460	350	238	230	906	815	246	16	95	97	113
28	208	390	350	342	234	860	659	225	226	12	11	111
29	208	338	350	342	283	1020	659	230	228	12	10	112
30	208	410	350	241	---	1490	661	14	203	85	101	113
31	205	---	270	238	---	1620	---	14	---	13	50	---
TOTAL	5337	13109	13352	7722	6426	17494	49446	12970	6648	3506	3112	2126.2
MEAN	172	437	431	249	222	564	1648	418	222	113	100	70.9
MAX	302	665	715	342	283	1620	3460	866	330	230	530	193
MIN	10	15	258	14	14	266	620	14	14	12	10	6.2
CFSM	.50	1.26	1.25	.72	.64	1.63	4.76	1.21	.64	.33	.29	.20
IN.	.57	1.41	1.44	.83	.69	1.88	5.32	1.39	.71	.38	.33	.23

CAL YR 1975 TOTAL 156054.0 MEAN 428 MAX 2890 MIN 10 CFSM 1.24 IN 16.78
WTR YR 1976 TOTAL 141248.2 MEAN 386 MAX 3460 MIN 6.2 CFSM 1.12 IN 15.19

04043050 TRAP ROCK RIVER NEAR LAKE LINDEN, MI

LOCATION.--Lat 47°13'43", long 88°23'07", in SE¼ SE¼ sec.20, T.56 N., R.32 W., Houghton County, Hydrologic Unit 04020103, on right bank 20 ft (6 m) upstream from bridge on county highway, 2.0 mi (3.2 km) northeast of Lake Linden, and 3.0 mi (4.8 km) upstream from mouth.

DRAINAGE AREA.--28.0 mi^2 (72.5 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1964 and 1966. October 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 621.7 ft (189.49 m) above mean sea level.

REMARKS.--Water-discharge records good except those for the winter period, which are fair. Since 1973, flow includes about 0.1 ft^3/s (0.003 m^3/s) mine pumpage. Small diversions for sprinkler irrigation.

AVERAGE DISCHARGE.--10 years, 43.3 ft^3/s (1.226 m^3/s), 21.00 in/yr (533 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,180 ft^3/s (33.4 m^3/s) May 2, 1972, gage height, 9.30 ft (2.835 m); minimum, 7.0 ft^3/s (0.20 m^3/s) Sept. 17, 1971, gage height, 3.86 ft (1.177 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 380 ft^3/s (10.8 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Nov. 30	1100	386	10.9	6.18	1.884	Apr. 22	2400	470	13.3	6.59	2.009
Apr. 15	2400	*978	27.7	*8.73	2.661						

Minimum discharge, 7.5 ft^3/s (0.21 m^3/s) Sept. 7, gage height, 3.88 ft (1.183 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	16	150	24	20	23	138	67	18	12	11	9.1
2	15	16	110	24	20	23	119	63	17	12	10	8.9
3	14	15	80	24	20	23	149	53	16	11	9.9	9.1
4	13	14	62	24	20	22	130	47	16	11	9.9	8.8
5	13	14	58	23	20	21	146	44	15	11	11	8.9
6	13	14	52	23	20	21	236	39	15	11	11	9.6
7	13	14	50	23	21	21	298	37	14	11	11	8.5
8	13	15	47	22	21	20	260	34	14	11	11	9.2
9	13	16	42	22	21	20	272	32	14	15	11	9.2
10	13	79	40	22	21	20	392	31	16	18	12	8.2
11	14	87	35	22	21	20	268	29	15	14	12	8.2
12	15	113	33	22	20	20	196	28	14	14	12	8.2
13	15	92	31	22	19	20	278	27	17	12	12	8.0
14	14	57	31	22	19	20	456	27	17	13	11	8.2
15	14	46	32	22	19	20	819	27	26	13	11	8.2
16	14	45	34	22	19	20	744	28	54	13	11	8.2
17	15	40	28	22	19	20	677	35	36	12	11	8.2
18	14	35	27	22	20	20	580	29	29	12	11	8.2
19	14	99	26	22	20	21	554	25	30	11	11	9.2
20	14	173	26	22	19	34	296	25	23	11	10	11
21	13	100	26	22	19	43	191	23	19	11	10	11
22	13	71	26	22	20	48	320	22	16	11	10	11
23	14	59	25	22	20	52	337	21	15	11	10	11
24	26	45	25	22	20	56	175	20	14	10	10	11
25	48	37	25	21	20	66	116	20	14	10	10	11
26	34	34	25	20	21	74	90	20	14	12	10	13
27	26	32	24	20	21	91	75	19	13	13	10	12
28	22	31	24	20	22	101	66	19	13	12	10	11
29	20	35	24	20	22	105	62	18	13	13	9.9	11
30	18	303	25	20	---	138	62	18	13	12	9.7	10
31	17	---	25	20	---	163	---	19	---	11	9.2	---
TOTAL	527	1747	1268	680	584	1366	8502	946	560	374	328.6	287.1
MEAN	17.0	58.2	40.9	21.9	20.1	44.1	283	30.5	18.7	12.1	10.6	9.57
MAX	48	303	150	24	22	163	819	67	54	18	12	13
MIN	13	14	24	20	19	20	62	18	13	10	9.2	8.0
CFSM	.61	2.08	1.46	.78	.72	1.58	10.1	1.09	.67	.43	.38	.34
IN.	.70	2.32	1.68	.90	.78	1.81	11.30	1.26	.74	.50	.44	.38

CAL YR 1975 TOTAL 16417.0 MEAN 45.0 MAX 498 MIN 10 CFSM 1.61 IN 21.81
WTR YR 1976 TOTAL 17169.7 MEAN 46.9 MAX 819 MIN 8.0 CFSM 1.68 IN 22.81

04043050 TRAP ROCK RIVER NEAR LAKE LINDEN, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1971 to current year.

INSTRUMENTATION.--Temperature recorder since Oct. 1, 1971.

REMARKS.--Complete ice cover during winter period.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 24.5°C July 30, 1975; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 23.5°C Aug. 20; minimum, 0.0°C on many days during November to March.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04043050 TRAP ROCK RIVER NEAR LAKE LINDEN, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	2.0	0.5	10.5	8.0	18.0	12.5	18.5	14.0	19.5	16.5	15.0	12.0
2	2.5	0.5	11.0	7.5	18.0	12.5	17.5	15.0	19.5	15.0	13.5	11.0
3	1.5	0.5	9.0	6.5	19.5	13.0	19.5	14.5	20.5	16.0	16.5	12.0
4	2.0	0.5	10.5	6.5	20.0	14.0	20.5	16.0	18.0	17.0	15.0	13.5
5	2.5	0.5	10.0	8.0	20.5	14.5	20.5	16.5	20.0	16.5	14.0	11.5
6	2.0	0.5	11.0	6.5	20.5	15.0	20.5	17.0	19.5	15.0	17.0	12.5
7	2.0	0.5	11.5	7.5	21.5	15.5	20.5	17.0	20.0	15.0	18.5	14.5
8	3.0	1.0	11.5	7.0	21.0	17.5	21.0	16.5	21.0	16.0	19.0	15.5
9	3.5	1.0	14.5	8.5	19.5	15.5	19.0	16.0	21.5	18.0	18.0	16.0
10	1.5	1.0	14.5	10.5	21.0	15.0	19.5	14.5	21.5	18.0	16.0	13.5
11	3.0	1.0	14.0	10.0	20.5	16.5	19.5	15.5	21.5	19.0	17.0	13.5
12	4.0	1.0	15.0	9.0	19.0	14.5	17.5	13.5	20.5	18.0	17.0	14.0
13	5.5	1.5	11.0	10.0	21.0	15.5	17.5	14.5	19.5	17.5	17.5	15.0
14	3.5	1.5	16.0	9.5	22.5	17.0	19.5	15.0	18.0	15.0	17.0	14.0
15	4.0	1.5	16.5	11.0	21.0	16.0	18.5	16.5	18.0	14.0	15.0	12.5
16	6.5	2.5	14.0	11.0	16.0	14.5	18.5	14.5	19.0	14.5	14.0	11.0
17	7.0	3.0	14.5	10.0	14.5	13.5	19.5	15.0	19.0	14.5	14.5	11.0
18	6.0	4.5	15.0	10.0	16.0	13.5	20.5	16.5	20.5	16.0	14.0	11.5
19	7.5	5.0	15.0	10.0	17.5	13.0	20.5	17.5	22.5	18.5	13.5	12.0
20	7.0	4.5	17.0	11.5	20.0	14.5	22.0	18.5	23.5	19.5	12.0	10.5
21	7.0	5.5	16.5	11.5	21.0	14.5	21.0	17.0	22.5	18.5	11.0	9.5
22	6.0	5.5	17.0	11.5	21.5	15.0	20.5	16.5	22.5	19.0	9.5	8.5
23	8.0	5.5	16.0	11.5	21.5	16.0	22.5	18.5	21.5	17.5	9.0	8.0
24	8.0	6.0	17.0	10.5	19.5	16.0	20.5	17.5	21.5	16.5	10.0	7.5
25	8.5	5.5	17.5	11.0	18.5	16.0	18.0	15.5	21.0	16.5	10.5	8.5
26	7.0	5.5	18.5	11.0	20.0	15.0	21.0	16.0	20.0	18.0	9.0	8.5
27	7.5	4.5	17.5	12.5	20.0	15.5	20.0	16.5	20.5	17.5	9.5	8.5
28	9.0	5.0	19.0	12.5	18.5	15.5	19.0	16.5	17.5	15.0	8.5	7.5
29	10.0	6.0	17.5	13.0	17.5	14.5	20.5	15.5	15.5	13.0	11.0	8.0
30	10.0	8.5	16.0	13.0	18.5	14.0	19.5	17.5	16.0	12.5	11.5	9.0
31	---	---	17.5	12.5	---	---	20.0	16.5	15.0	13.5	---	---
MONTH	10.0	0.5	19.0	6.5	22.5	12.5	22.5	13.5	23.5	12.5	19.0	7.5

463025087365001 TEAL LAKE, SITE 1, AT NEGAUNEE, MI

LOCATION.--Lat 46°30'25", long 87°36'50", in secs.31, 35 and 36, T.48 N., R.26 and 27 W., Marquette County, Hydrologic Unit 04020105, at Negaunee. Sampling site No. 1 is 1,680 ft (512 m) from southern-most point on lake; at azimuth 0°.

DRAINAGE AREA.--3.36 mi^2 (8.70 km^2), at outlet.

PERIOD OF RECORD.--Water years 1975-76.

REMARKS.--Surface area of lake, 466 acres (189 ha). Maximum depth, 32 ft (9.8 m). Inlet, small unnamed tributary at north side of lake. Outlet at northeast side of lake flows intermittently into Carp River. Datum of lake gage is 1,362.2 ft (415.2 m) above mean sea level. Teal Lake serves as the water supply for city of Negaunee.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	DEPTH (FT)	DEPTH OF RESER-VOIR (FT)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	AIR TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TRANS-PAR-ENCY (SECCHI DISK) (IN)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)
OCT 23...	1030	3.0	32	108	7.2	11.5	6	140	48	21	14	3.1
DEC 30...	1030	3.0	32	128	7.3	-3.5	0	239	54	19	15	4.0
FEB 06...	1135	3.0	34	126	7.4	-11.5	0	166	56	20	15	4.4
MAR 09...	1120	3.0	30	125	7.8	2.5	0	156	55	23	15	4.3
APR 23...	1250	3.0	33	110	8.1	14.0	2	202	48	15	13	3.8
MAY 21...	1045	3.0	34	110	7.8	11.0	2	250	46	11	13	3.4
JUN 25...	1200	3.0	34	108	7.8	18.5	1	177	46	11	13	3.4
JUL 26...	1050	3.0	34	115	8.1	23.0	2	117	47	12	13	3.6
SEP 23...	1135	3.0	30	129	7.4	8.5	4	53	49	12	13	3.9

DATE	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)
OCT 23...	3.9	15	.2	.5	32	0	26	3.2	12	8.0	.1	8.8
DEC 30...	4.4	15	.3	.7	43	0	35	3.4	13	8.0	.1	8.4
FEB 06...	4.4	15	.3	.7	43	0	35	2.7	12	8.9	.2	8.1
MAR 09...	4.2	14	.2	.6	39	0	32	1.0	12	8.3	.1	8.2
APR 23...	3.6	14	.2	.6	40	0	33	.5	11	7.6	.1	7.2
MAY 21...	3.6	14	.2	.4	43	0	35	1.1	12	7.8	.1	7.3
JUN 25...	6.6	23	.4	.5	43	0	35	1.1	10	6.2	.1	7.0
JUL 26...	4.2	16	.3	.7	43	0	35	.5	12	6.5	.1	7.5
SEP 23...	4.0	15	.3	.6	45	0	37	2.9	7.7	8.1	.1	11

DATE	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)
OCT 23...	91	66	.01	.00	.01	.01	.39	.40	.41	1.8	.01	.00
DEC 30...	88	75	.05	.00	.05	.04	.17	.21	.26	1.2	.01	.00
FEB 06...	38	75	.01	.01	.02	.04	.33	.37	.39	1.7	.01	.00
MAR 09...	84	72	.04	.00	.04	.05	.18	.23	.27	1.2	.01	.02
APR 23...	75	67	.09	.01	.10	.01	.24	.25	.35	1.6	.02	.01
MAY 21...	65	69	.04	.01	.05	.02	.33	.35	.40	1.8	.02	.00
JUN 25...	75	69	.00	.01	.01	.01	.29	.30	.31	1.4	.06	.04
JUL 26...	77	69	.00	.01	.01	.01	.39	.40	.41	1.8	.03	.00
SEP 23...	72	71	.01	.00	.01	.02	.48	.50	.51	2.3	.03	.01

463025087365001 TEAL LAKE, SITE 1, AT NEGAUNEE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TOTAL HYDRO-LYZABLE PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO + HYDRO. PHOS-PHORUS (P) (MG/L)	TOTAL ORGANIC PHOS-PHORUS (P) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	TOTAL SESTON (MG/L)	SESTON ASH WEIGHT (MG/L)	CHLORO-PHYLL A (UG/L)	CHLORO-PHYLL B (UG/L)	POTEN-TIAL ALGAL GROWTH BOTTLE TEST (MG/L)
OCT 23...	.00	--	.01	10	0	4.6	--	.0	.0	31.0	.000	--
DEC 30...	.00	--	.01	0	0	4.2	--	.0	.0	.000	.000	.7
FEB 06...	.02	--	.00	20	0	7.8	--	.0	.0	.000	.000	1.4
MAR 09...	.00	--	.00	10	0	4.2	--	.0	.0	.400	.000	.9
APR 23...	.01	--	.00	40	60	3.2	--	.0	.0	2.00	.000	.4
MAY 21...	.01	--	.01	70	10	4.0	--	.0	.0	.000	.000	.5
JUN 25...	.02	--	.00	500	60	4.3	1	.0	.0	.000	.000	.3
JUL 26...	.01	--	.02	0	0	4.9	--	.0	.0	3.14	.859	.3
SEP 23...	.03	.04	.00	60	0	4.2	--	.0	.0	.000	.000	.4

DATE	TOTAL ARSENIC (AS) (UG/L)	TOTAL BARIUM (BA) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL ZINC (ZN) (UG/L)
DEC 30...	0	10	0	<10	0	3	0	3	0	.1	0	20

DATE	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR-DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTA-CHLOR (UG/L)	TOTAL HEPTA-CHLOR EPOXIDE (UG/L)
OCT 23...	.0	.00	.0	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL LINDANE (UG/L)	TOTAL MALA-THION (UG/L)	TOTAL METH-OXY-CHLOR (UG/L)	TOTAL METHYL PARA-THION (UG/L)	TOTAL METHYL TRI-THION (UG/L)	TOTAL PARA-THION (UG/L)	TOTAL TOX-APHENE (UG/L)	TOTAL TRI-THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 23...	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

463025087365001 TEAL LAKE, SITE 1, AT NEGAUNEE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DEPTH (FT)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION
OCT						
23...	1.0	--	--	10.0	9.3	86
23...	5.0	--	--	10.0	9.4	87
23...	10	--	--	10.0	9.4	87
23...	15	106	7.5	10.0	9.4	87
23...	20	--	--	10.0	9.5	88
23...	25	106	7.6	10.0	9.4	87
23...	30	--	--	10.0	9.4	87
DEC						
30...	1.0	--	--	1.0	14.8	110
30...	5.0	--	--	1.5	14.4	108
30...	10	--	--	2.0	14.0	106
30...	15	117	7.1	2.0	13.8	105
30...	20	--	--	2.0	13.8	105
30...	25	117	7.0	2.5	12.6	97
30...	30	--	--	3.0	8.2	64
FEB						
06...	1.0	--	--	1.0	13.4	99
06...	5.0	--	--	2.0	12.2	92
06...	10	--	--	2.5	11.4	88
06...	15	103	7.8	3.0	7.4	57
06...	20	--	--	3.0	5.6	43
06...	25	110	7.2	4.0	3.6	29
06...	30	--	--	4.0	.6	5
MAR						
09...	1.0	--	--	.0	12.5	90
09...	5.0	--	--	1.0	12.5	93
09...	10	--	--	2.0	11.9	90
09...	15	130	7.6	2.5	11.2	86
09...	20	--	--	3.0	9.6	74
09...	25	130	7.3	4.0	5.4	43
09...	28	--	--	4.5	2.4	20
APR						
23...	1.0	--	--	7.0	11.9	102
23...	5.0	--	--	6.0	10.7	90
23...	10	--	--	6.0	10.7	90
23...	15	82	7.8	6.0	10.6	89
23...	20	--	--	6.0	10.6	89
23...	25	74	7.9	6.0	10.6	89
23...	30	--	--	6.0	10.7	90
MAY						
21...	1.0	--	--	12.0	10.8	105
21...	5.0	--	--	12.5	10.7	105
21...	10	--	--	12.5	10.8	106
21...	15	102	7.8	12.0	10.4	101
21...	20	--	--	12.0	10.6	103
21...	25	108	7.5	11.0	9.2	87
21...	30	--	--	10.0	7.2	67
JUN						
25...	1.0	--	--	19.0	9.1	102
25...	5.0	--	--	19.5	8.9	101
25...	10	--	--	19.5	8.9	101
25...	15	107	8.0	19.5	8.9	101
25...	20	--	--	19.5	8.9	101
25...	25	119	7.1	19.5	9.0	102
25...	30	--	--	15.0	2.4	25
JUL						
26...	1.0	--	--	22.0	8.4	101
26...	5.0	--	--	21.5	8.4	99
26...	10	--	--	21.5	8.4	99
26...	15	115	8.1	21.5	8.4	99
26...	20	--	--	21.5	8.3	98
26...	25	115	8.0	21.0	8.3	97
26...	30	--	--	17.0	.5	5
SEP						
23...	1.0	--	--	13.0	10.0	100
23...	5.0	--	--	13.5	9.7	97
23...	10	--	--	14.0	9.6	97
23...	15	122	7.9	14.0	9.6	97
23...	20	--	--	14.0	9.5	96
23...	25	124	7.8	14.0	9.5	96
23...	30	--	--	14.0	9.5	96

463025087365001 TEAL LAKE, SITE 1, AT NEGAUNEE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

OCT. 23, 1975
1030 HOURS

IDENTIFICATION OF PHYTOPLANKTON

9,200 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...CHARACIACEAE			
L	....SCHROEDERIA			0
	...OOCYSTACEAE			
L	....ANKISTRODESMUS			0
		TOTALS	37	0
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
L	....MELOSIRA			0
	..PENNALES	PENNATE		
	...FRAGILARIACEAE			
	....ASTERIONELLA		150	2
L	....SYNEDRA			0
	...NAVICULACEAE	NAVICULOID		
L	....NAVICULA			0
	...TABELLARIACEAE			
L	....TABELLARIA			0
		TOTALS	180	2
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
L	....DINORRYON			0
		TOTALS	18	0
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....ANACYSTIS		7,900	86
L	....GOMPHOSPHAERIA			0
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
	....ANABAENA		1,100	12
L	....APHANIZOMENON			0
	...OSCILLATORIACEAE			
L	....LYNGBYA			0
		TOTALS	9,000	98
	EUGLENOPHYTA	EUGLENOIDS		
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
L	....TRACHELOMONAS			0

DEC. 30, 1975
1030 HOURS

IDENTIFICATION OF PHYTOPLANKTON

33 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...CHARACIACEAE			
D	....SCHROEDERIA		8	25
		TOTALS	8	25
	CHRYSOPHYTA			
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
D	....DINOBRYON		25	75
		TOTALS	25	75
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
L	....ANACYSTIS			0

463025087365001 TEAL LAKE, SITE 1, AT NEGAUNEE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

FEB. 6, 1976
1135 HOURS

IDENTIFICATION OF PHYTOPLANKTON

140 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....ANACYSTIS		140	100
		TOTALS	140	100

MAR. 9, 1976
1120 HOURS

IDENTIFICATION OF PHYTOPLANKTON

3 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
L	....GOMPHOSPHAERIA			0
	EUGLENOPHYTA	EUGLENOIDS		
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
D	....TRACHELOMONAS		3	100
		TOTALS	3	100

APR. 23, 1976
1250 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,200 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
L	....ANKISTRODESMUS			0
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
L	....MELOSIRA			0
L	....STEPHANODISCUS			0
	..PENNALES	PENNATE		
	...CYMBELLACEAE			
L	....CYMBELLA			0
	...FRAGILARIACEAE			
	....ASTERIONELLA		96	8
D	....FRAGILARIA		190	16
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		72	6
L	....PINNULARIA			0
	...NITZSCHIACEAE			
	....NITZSCHIA		72	6
		TOTALS	430	36
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...MALLOMONADACEAE			
	....MALLOMONAS		24	2
		TOTALS	24	2
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS			
D	.....A.INSERTA		770	63
		TOTALS	770	63

463025087365001 TEAL LAKE, SITE 1, AT NEGAUNEE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAY 21, 1976
1045 HOURS

IDENTIFICATION OF PHYTOPLANKTON

460 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....MELOSIRA		96	21
	....STEPHANODISCUS		11	2
	..PENNALES	PENNATE		
	...FRAGILARIACEAE			
	....ASTERIONELLA		43	9
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		11	2
	...NITZSCHIACEAE			
	....NITZSCHIA		11	2
		TOTALS	170	36
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
D	....DINOBRYON		270	58
		TOTALS	270	58
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		11	2
		TOTALS	11	2
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
	....TRACHELOMONAS		11	2
		TOTALS	11	2

JUNE 25, 1976
1200 HOURS

IDENTIFICATION OF PHYTOPLANKTON

16,000 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...FRAGILARIACEAE			
L	....SYNEDRA			0
	...NAVICULACEAE	NAVICULOID		
L	....STAURONEIS			0
		TOTALS	77	0
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....ANACYSTIS		16,000	100
		TOTALS	16,000	100

463025087365001 TEAL LAKE, SITE 1, AT NEGAUNEE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JULY 26, 1976
1050 HOURS

IDENTIFICATION OF PHYTOPLANKTON

15,000 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...CHARACIACEAE			
L	....SCHROEDERIA			0
	...OOCYSTACEAE			
L	....ANKISTRODESMUS			0
	...SCENEDESMACEAE			
	....SCENEDESMUS		82	1
		TOTALS	120	1
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
	...NITZSCHIACEAE			
	....NITZSCHIA		82	1
		TOTALS	82	1
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....ANACYSTIS		15,000	98
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
L	....ANABAENA			0
		TOTALS	15,000	98
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...CERATIACEAE			
L	....CERATIUM			0
	...PERIDINIACEAE			
L	....PERIDINIUM			0

SEP, 23, 1976
1135 HOURS

IDENTIFICATION OF PHYTOPLANKTON

130,000 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..TETRASPORALES			
	...PALMELLACEAE			
	....GLOEOCYSTIS		4,400	3
		TOTALS	4,400	3
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
D	....ANABAENA		120,000	97
		TOTALS	120,000	97

NOTE: D - DOMINANT ORGANISM: GREATER OR EQUAL TO 15%
L - LESS THEN 1%: MAY NOT HAVE BEEN ACTUALLY COUNTED

463025087365002 TEAL LAKE, SITE 2, AT NEGAUNEE, MI

LOCATION.--Lat 46°30'25", long 87°36'50", in secs.31, 35 and 36, T.48 N., R.26 and 27 W., Marquette County, Hydrologic Unit 04020105, at Negaunee. Sampling site No. 2 is 5,150 ft (1,570 m) from southern-most point on Lake; at azimuth 301°.

DRAINAGE AREA.--3.36 mi^2 (8.70 km^2), at outlet.

PERIOD OF RECORD.--Water year 1975 to October 1975 (discontinued).

REMARKS.--Surface area of lake, 466 acres (189 ha). Maximum depth, 32 ft (9.8 m). Inlet, small unnamed tributary at north side of lake. Outlet at northeast side of lake flows intermittently into Carp River. Datum of lake gage is 1,362.2 ft (415.2 m) above mean sea level. Teal Lake serves as the water supply for city of Negaunee.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	DEPTH (FT)	DEPTH OF RESER-VOIR (FT)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	AIR TEMPER-ATURE (DEG C)	TRANS-PAR-ENCY (SECCHI DISK) (IN)
OCT							
23...	1144	3.0	28	108	7.4	14.0	139

DATE	DEPTH (FT)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	DIS-SOLVED OXYGEN (MG/L)	PER-CENT SATUR-ATION
OCT						
23...	1.0	--	--	10.0	9.4	87
23...	5.0	--	--	10.0	9.4	87
23...	10	--	--	10.0	9.4	87
23...	15	108	7.6	10.0	9.4	87
23...	20	--	--	10.0	9.4	87
23...	25	108	7.6	10.0	9.5	88
23...	27	--	--	10.0	9.5	88

04044400 CARP RIVER NEAR NEGAUNEE, MI

LOCATION.--Lat 46°31'29", long 87°34'25", in SE¼ sec.29, T.48 N., R.26 W., Marquette County, Hydrologic Unit 04020105, on right bank 30 ft (9 m) downstream from bridge on U.S. Highway 41, and 2.0 mi (3.2 km) northeast of Negaunee.

DRAINAGE AREA.--51.4 mi^2 (133.1 km^2).

PERIOD OF RECORD.--July 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,319.90 ft (402.306 m) above mean sea level (Michigan Department of Highway and Transportation bench mark). Prior to Aug. 24, 1961, nonrecording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are fair. Flow regulated by Deer Lake storage reservoir (capacity, 22,500 acre-ft or 27.7 hm^3) 5 mi (8 km) above station. The city of Ishpeming diverted an average of 3.5 ft^3/s (0.099 m^3/s) into basin as waste effluent (see sta 04058200). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--15 years, 60.2 ft^3/s (1.705 m^3/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 351 ft^3/s (9.94 m^3/s) June 27, 28, 1968, gage height, 4.68 ft (1.426 m); maximum gage height, 5.24 ft (1.597 m) Mar. 2, 1972, (backwater from ice); minimum discharge, 3.7 ft^3/s (0.10 m^3/s) July 29, 1965; minimum gage height, 1.94 ft (0.591 m) Aug. 1, 1962; minimum daily discharge, 3.9 ft^3/s (0.11 m^3/s) July 29, 30, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 184 ft^3/s (5.21 m^3/s) Apr. 15, gage height, 3.83 ft (1.167 m); maximum gage height, 3.87 ft (1.180 m) Jan. 23, (backwater from ice); minimum discharge, 24 ft^3/s (0.680 m^3/s) Apr. 29, gage height, 2.49 ft (0.759 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	63	100	52	92	88	57	69	95	76	45	34
2	29	63	90	53	92	91	52	68	86	75	45	32
3	29	62	80	52	92	101	49	68	86	74	44	31
4	28	62	74	52	92	109	42	68	85	73	41	30
5	28	62	65	52	92	110	49	73	84	72	38	30
6	28	62	70	52	92	110	65	67	83	71	37	30
7	28	62	74	51	92	110	75	63	82	72	36	30
8	28	70	62	52	91	110	64	61	83	71	35	29
9	33	69	56	70	91	109	64	60	84	80	35	30
10	48	86	56	100	91	108	82	60	83	89	35	30
11	54	81	56	105	90	108	66	62	83	81	35	29
12	54	76	57	105	90	108	52	62	82	78	36	28
13	54	94	54	105	90	108	65	62	128	77	36	28
14	54	71	76	105	90	107	100	66	108	74	37	31
15	56	62	86	100	91	106	175	64	90	61	36	35
16	55	61	76	100	90	106	152	108	87	57	36	45
17	58	64	72	100	90	106	154	108	86	57	36	46
18	63	67	70	100	90	105	135	77	88	57	36	47
19	64	76	68	98	90	108	96	71	92	56	36	48
20	64	107	64	97	89	125	56	71	86	61	35	49
21	63	87	62	96	88	137	50	70	83	59	34	52
22	63	76	58	96	89	139	127	73	81	57	34	52
23	70	70	57	96	90	68	75	72	80	57	35	50
24	78	63	54	95	89	68	43	74	79	56	35	48
25	80	60	54	94	90	70	34	80	80	55	35	47
26	75	59	53	94	91	71	29	79	81	57	37	47
27	69	59	53	94	91	74	27	79	79	57	39	48
28	65	58	52	94	90	71	25	79	78	55	37	47
29	65	59	52	94	89	71	36	79	78	50	37	47
30	64	111	52	93	---	92	66	88	78	47	37	46
31	64	---	52	93	---	100	---	102	---	45	37	---
TOTAL	1640	2122	2005	2640	2624	3094	2162	2283	2578	2007	1147	1176
MEAN	52.9	70.7	64.7	85.2	90.5	99.8	72.1	73.6	85.9	64.7	37.0	39.2
MAX	80	111	100	105	92	139	175	108	128	89	45	52
MIN	28	58	52	51	88	68	25	60	78	45	34	28

CAL YR 1975 TOTAL 23120 MEAN 63.3 MAX 239 MIN 28
WTR YR 1976 TOTAL 25478 MEAN 69.6 MAX 175 MIN 25

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI

LOCATION.--Lat 46°34'30", long 85°16'10", in NE¼ sec.11, T.48 N., R.8 W., Luce County, Hydrologic Unit 04020202, on left bank 0.7 mi (1.1 km) upstream from Tahquamenon (Big) Falls, 11.5 mi (18.5 km) west of Tahquamenon Paradise, and 19 mi (31 km) northeast of Newberry.

DRAINAGE AREA.--790 mi^2 (2,046 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1953 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 697 ft (212.4 m) from river-profile map (nearest ft).

REMARKS.--Water-discharge record good.

AVERAGE DISCHARGE.--23 years, 924 ft^3/s (26.17 m^3/s), 15.88 in/yr (403 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,990 ft^3/s (198 m^3/s) May 10, 1960, gage height, 10.26 ft (3.127 m); minimum, 157 ft^3/s (4.45 m^3/s) July 26, 1955; minimum gage height, 2.86 ft (0.872 m) July 7, 1963.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,360 ft^3/s (152 m^3/s) Apr. 18, 19, gage height, 9.17 ft (2.795 m); minimum, 199 ft^3/s (5.64 m^3/s) Aug. 28, gage height, 2.98 ft (0.908 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	476	527	1170	589	380	465	3200	2840	443	308	268	223
2	464	520	1170	560	380	465	3500	2580	435	300	272	234
3	440	497	1170	528	380	470	3800	2320	416	288	265	240
4	427	474	1180	516	380	470	4100	2130	395	275	260	230
5	422	481	1200	512	380	470	4400	1880	375	261	243	233
6	380	473	1240	506	370	475	4700	1690	349	254	248	246
7	388	467	1240	503	370	480	4890	1530	330	242	250	242
8	368	571	1220	500	370	485	5070	1400	305	241	249	243
9	357	676	1180	489	370	490	5170	1260	297	250	249	239
10	356	863	1130	473	369	492	5200	1140	330	283	247	250
11	353	1100	1060	467	365	491	5110	1010	330	313	243	261
12	362	1250	970	464	372	493	5100	922	346	328	252	269
13	354	1360	880	446	381	490	5010	833	344	328	288	265
14	356	1460	989	437	385	483	4980	762	339	322	304	252
15	347	1480	1320	430	390	479	5030	763	355	321	299	257
16	338	1480	1420	424	400	475	5130	791	392	317	290	263
17	336	1430	1440	422	410	476	5250	908	411	316	281	264
18	335	1390	1410	417	415	475	5330	1010	375	310	278	261
19	336	1350	1350	412	423	477	5280	1060	354	312	271	256
20	340	1300	1280	407	426	526	5170	1030	353	299	263	255
21	331	1350	1220	408	426	648	5050	966	348	306	261	256
22	332	1440	1140	414	427	728	4960	905	324	319	246	274
23	369	1470	1060	400	434	786	4790	813	305	302	244	275
24	501	1440	976	400	438	879	4590	728	286	290	246	286
25	612	1320	897	390	439	1070	4320	660	283	292	238	276
26	655	1230	825	390	449	1220	4110	611	283	278	234	279
27	668	1140	772	380	459	1570	3870	559	286	265	233	275
28	637	1060	723	380	460	1810	3630	510	285	265	222	284
29	615	965	683	380	460	2050	3390	469	277	254	220	274
30	599	1060	646	380	---	2290	3120	448	288	261	226	280
31	575	---	619	380	---	2800	---	445	---	259	223	---
TOTAL	13429	31624	33580	13804	11708	25478	137250	34973	10239	8959	7913	7742
MEAN	433	1054	1083	445	404	822	4575	1128	341	289	255	258
MAX	668	1480	1440	589	460	2800	5330	2840	443	328	304	286
MIN	331	467	619	380	365	465	3120	445	277	241	220	223
CFSM	.55	1.33	1.37	.56	.51	1.04	5.79	1.43	.43	.37	.32	.33
IN.	.63	1.49	1.58	.65	.55	1.20	6.46	1.65	.48	.42	.37	.36

CAL YR 1975 TOTAL 343746 MEAN 942 MAX 4570 MIN 234 CFSM 1.19 IN 16.19
WTR YR 1976 TOTAL 336699 MEAN 920 MAX 5330 MIN 220 CFSM 1.16 IN 15.85

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967, 1973 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1974 to current year.
WATER TEMPERATURES: October 1974 to current year.

INSTRUMENTATION.--Water quality monitor since October 1975.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. In addition to the water-quality monitor record, monthly samples are collected as a cross-section sample at cableway 40 ft (12 m) downstream from gage or by wading 300 ft (91 m) downstream.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (Water year 1976): Maximum, 209 micromhos Aug. 27, 28, 1976; minimum, 34 micromhos Apr. 17, 18, 1976.
WATER TEMPERATURES (Water year 1976): Maximum, 23.5°C June 14, 1976; minimum, 0.0°C on many days during winter period.

EXTREMES OUTSIDE PERIOD OF DAILY RECORD.--A water temperature of 26.5°C was observed July 4, 1975, during a period of incomplete daily record for which extremes were not published.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 209 micromhos Aug. 27, 28; minimum, 34 micromhos Apr. 17, 18.
WATER TEMPERATURES: Maximum, 23.5°C June 14; minimum, 0.0°C on many days during winter period.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT 28...	1115	606	155	7.1	9.5	10.6	94	53	3	14	85	16
NOV 11...	0900	1080	135	7.2	8.0	10.2	88	23	13	29	78	16
DEC 09...	1215	1170	106	7.9	.0	9.3	65	18	4	11	51	17
JAN 13...	1400	445	157	7.5	.0	9.8	69	6	1	5	71	2
FEB 10...	1125	368	157	7.4	.0	9.7	68	2	<1	1	83	16
MAR 09...	1305	491	158	7.4	.0	7.6	53	76	<1	2	82	8
APR 06...	1130	4720	51	7.1	1.0	9.2	66	2	1	1	27	1
MAY 04...	1320	2110	74	7.2	7.0	8.7	73	36	1	<1	40	7
JUN 01...	1315	449	140	7.8	18.5	8.5	92	17	--	3	70	4
JUL 01...	1200	305	172	8.1	21.0	7.8	90	9	2	136	100	8
AUG 04...	1345	266	181	8.0	20.5	7.9	89	43	15	160	96	6
SEP 01...	1400	214	190	8.1	18.0	7.6	83	>100	3	3	96	0

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 28...	24	6.2	1.7	.1	.9	84	0	69	11	15	2.5	.2
NOV 11...	22	5.7	1.6	.1	.9	76	0	62	7.7	14	2.0	.2
DEC 09...	15	3.3	1.6	.1	.6	42	0	34	.8	14	2.0	.3
JAN 13...	20	5.2	1.7	.1	.7	84	0	69	4.3	12	2.2	.1
FEB 10...	23	6.2	2.0	.1	.8	82	0	67	5.2	12	2.3	.2
MAR 09...	23	6.0	1.9	.1	.8	90	0	74	5.7	13	1.8	.2
APR 06...	7.4	2.1	.7	.1	.7	32	0	26	4.1	9.6	1.7	.0
MAY 04...	11	3.0	.8	.1	.6	40	0	33	4.0	9.9	1.9	.1
JUN 01...	18	6.0	1.4	.1	.7	80	0	66	2.0	12	2.3	.1
JUL 01...	28	7.2	1.0	.0	.7	112	0	92	1.4	13	--	.1
AUG 04...	27	7.0	1.5	.1	.6	110	0	90	1.8	12	3.3	.1
SEP 01...	26	7.5	2.0	.1	.6	119	0	98	1.5	13	2.7	.1

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT											
28...	7.4	108	98	177	.09	.49	2.2	.03	3	4.9	100
NOV											
11...	7.3	99	91	289	.13	.58	2.6	.02	3	8.7	100
DEC											
09...	7.1	81	65	256	.13	.52	2.3	.02	5	16	100
JAN											
13...	8.2	84	92	101	.15	.28	1.2	.02	4	4.8	100
FEB											
10...	9.8	117	97	116	.17	.46	2.0	.01	2	2.0	100
MAR											
09...	9.9	104	101	138	.15	.22	.97	.02	2	2.7	100
APR											
06...	4.7	47	43	599	.16	.69	3.1	.02	10	127	100
MAY											
04...	2.4	--	49	--	.04	.59	2.6	.02	1	5.7	100
JUN											
01...	3.3	98	83	119	.06	.61	2.7	.04	4	4.8	100
JUL											
01...	5.0	122	111	100	.01	.31	1.4	.03	8	6.6	100
AUG											
04...	6.2	115	112	82.6	.01	.71	3.1	.03	2	1.4	100
SEP											
01...	6.2	118	117	68.2	.01	.24	1.1	.05	3	1.7	100

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
JAN												
13...	1400	0	0	1	0	20	0	0	0	14	6	520
APR												
06...	1130	0	0	0	0	<10	<10	0	0	--	10	380
JUL												
01...	1200	0	0	1	0	<10	<10	0	0	0	0	320

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
JAN												
13...	290	11	6	20	20	.2	.0	0	0	30	0	4.0
APR												
06...	260	--	4	20	20	<.5	<.5	0	0	--	20	17
JUL												
01...	140	7	2	30	0	<.5	<.5	0	0	20	10	9.1

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL CHLORDANE (UG/L)	CHLORDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MATERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDT (UG/L)	DDT IN BOTTOM MATERIAL (UG/KG)
NOV											
11...	0900	ND	ND	ND	ND	ND	--	ND	--	ND	ND
MAY											
04...	1320	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG											
04...	1345	ND	--	ND	--	ND	--	ND	--	ND	--

DATE	TOTAL DIAZINON (UG/L)	DIAZINON IN BOTTOM MATERIAL (UG/KG)	TOTAL DIELDRIN (UG/L)	DIELDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ETHION (UG/L)	ETHION IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR (UG/L)	HEPTACHLOR IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR EPOXIDE (UG/L)
NOV											
11...	ND	ND	ND	.1	ND	ND	ND	ND	ND	ND	ND
MAY											
04...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG											
04...	ND	--	ND	--	ND	--	ND	--	ND	--	ND

DATE	HEPTACHLOR EPOXIDE IN BOTTOM MATERIAL (UG/KG)	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL MALATHION (UG/L)	MALATHION IN BOTTOM MATERIAL (UG/KG)	TOTAL METHOXYCHLOR (UG/L)	TOTAL METHYL PARATHION (UG/L)	METHYL PARATHION IN BOTTOM MATERIAL (UG/KG)	TOTAL METHYL TRITHION (UG/L)	METHYL TRITHION IN BOTTOM MATERIAL (UG/KG)	TOTAL PARATHION (UG/L)
NOV											
11...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY											
04...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG											
04...	--	ND	--	ND	--	ND	ND	--	ND	--	ND

DATE	PARATHION IN BOTTOM MATERIAL (UG/KG)	TOTAL TOXAPHENE (UG/L)	TOXAPHENE IN BOTTOM MATERIAL (UG/KG)	TOTAL TRITHION (UG/L)	TRITHION IN BOTTOM MATERIAL (UG/KG)	TOTAL 2,4-D (UG/L)	2,4-D IN BOTTOM MATERIAL (UG/KG)	TOTAL 2,4,5-T (UG/L)	2,4,5-T IN BOTTOM MATERIAL (UG/KG)	TOTAL SILVEX (UG/L)	SILVEX IN BOTTOM MATERIAL (UG/KG)
NOV											
11...	ND	ND	ND	ND	ND	ND	--	ND	--	ND	--
MAY											
04...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG											
04...	--	ND	--	ND	--	ND	--	ND	--	ND	--

ND--NOT DETECTED

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
PERIPHYTON

DATE	LENGTH OF EXPOSURE (DAYS)	PERIPHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERIPHYTON BIOMASS ASH WEIGHT G/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL A MG/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL B MG/SQ M	BIOMASS CHLOROPHYLL RATIO PERIPHYTON (UNITS)
OCT						
28...	29	9.00	6.30	18.0	1.00	--
FEB						
10...	28	.000	.000	.000	.000	--
MAY						
04...	28	1.62	1.23	1.00	.036	--
AUG						
04...	34	11.4	9.15	4.44	.045	500

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

OCT. 28, 1975
1115 HOURS

IDENTIFICATION OF PHYTOPLANKTON

210 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		10	5
L	....MELOSIRA			0
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		48	23
	....COCCONEIS		10	5
	...CYMBELLACEAE			
	....CYMBELLA		10	5
	...FRAGILARIACEAE			
D	....SYNEDRA		39	18
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		39	18
	...NITZSCHIACEAE			
D	....NITZSCHIA		58	27
		TOTALS	210	101

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

NOV. 11, 1975
0900 HOURS

IDENTIFICATION OF PHYTOPLANKTON

260 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		7	3
	..ZYGNEMATALES			
	...DESMIDIACEAE	PLACODERM DESMIDS		
	....CLOSTERIUM		7	3
		TOTALS	13	6
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		20	8
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		13	5
	....COCCONEIS		7	3
	...CYMBELLACEAE			
	....CYMBELLA		7	3
	...FRAGILARIACEAE			
D	....FRAGILARIA		46	18
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		7	3
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		20	8
	...NITZSCHIACEAE			
D	....NITZSCHIA		72	28
		TOTALS	190	76
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....LYNGBYA		53	21
		TOTALS	53	21

DEC. 9, 1975
1215 HOURS

IDENTIFICATION OF PHYTOPLANKTON

47 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		13	29
L	....COCCONEIS			0
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		27	57
	...NITZSCHIACEAE			
	....NITZSCHIA		7	14
		TOTALS	47	100

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JAN. 13, 1976
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

31 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		13	43
	...NITZSCHIACEAE			
D	....NITZSCHIA		17	57
	...TABELLARIACEAE			
L	....TABELLARIA		1	0
		TOTALS	31	100

FEB. 10, 1976
1125 HOURS

IDENTIFICATION OF PHYTOPLANKTON

49 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		5	11
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		5	11
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		22	44
	...NITZSCHIACEAE			
D	....NITZSCHIA		11	22
	...TABELLARIACEAE			
	....TABELLARIA		5	11
		TOTALS	49	99
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
L	....OSCILLATORIA			0

MAR. 9, 1976
1305 HOURS

IDENTIFICATION OF PHYTOPLANKTON

28 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		6	22
D	....COCCONEIS		12	44
	...FRAGILARIACEAE			
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
D	....GOMPHONEMA		6	22
	...MERIDIONACEAE			
L	....MERIDION			0
	...NITZSCHIACEAE			
	....NITZSCHIA		3	11
		TOTALS	28	99

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

APR. 6, 1976
1130 HOURS

IDENTIFICATION OF PHYTOPLANKTON

49 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		4	9
		TOTALS	4	9
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		4	9
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		4	9
L	....COCCONEIS			0
	...EUNOTIACEAE			
D	....EUNOTIA		9	18
	...FRAGILARIACEAE			
D	....FRAGILARIA		9	18
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		4	9
L	....PINNULARIA			0
	...NITZSCHIACEAE			
D	....NITZSCHIA		13	27
		TOTALS	45	90

MAY 4, 1976
1320 HOURS

IDENTIFICATION OF PHYTOPLANKTON

130 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		11	9
		TOTALS	11	9
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		14	11
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....COCCONEIS		4	3
	...DIATOMACEAE			
	....DIATOMA		4	3
	...EUNOTIACEAE			
D	....EUNOTIA		22	17
	...FRAGILARIACEAE			
D	....SYNEDRA		22	17
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...MERIDIONACEAE			
	....MERIDION		4	3
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		7	6
	...NITZSCHIACEAE			
	....NITZSCHIA		7	6
		TOTALS	83	66
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....AGMENELLUM		29	23
		TOTALS	29	23
	EUGLENOPHYTA	EUGLENOIDS		
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
	....TRACHELOMONAS		4	3
		TOTALS	4	3

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JUNE 1, 1976
1315 HOURS

IDENTIFICATION OF PHYTOPLANKTON

510 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		58	11
	....KIRCHNERIELLA		15	3
		TOTALS	73	14
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....MELOSIRA		15	3
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....COCCONEIS		15	3
	...CYMBELLACEAE			
	....CYMBELLA		15	3
	...FRAGILARIACEAE			
	....SYNEDRA		15	3
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		58	11
	...NITZSCHIACEAE			
D	....NITZSCHIA		160	31
	...SURIRELLACEAE			
	....SURIRELLA		15	3
		TOTALS	290	57
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...MALLOMONADACEAE			
	....MALLOMONAS		15	3
	...OCHROMONADACEAE			
D	....DINOBRYON		130	26
		TOTALS	150	29

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JULY 1, 1976
1200 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,100 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...MICRACTINIACEAE			
	....GOLENKINIA		14	1
	...SCENEDESMACEAE			
L	....SCENEDESMUS			0
	..TETRASPORALES			
	...PALMELLACEAE			
	....SPHAEROCYSTIS		14	1
		TOTALS	27	2
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		520	48
	....MELOSIRA		14	1
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....COCCONEIS		14	1
	...FRAGILARIACEAE			
	....SYNEDRA		27	3
	...NITZSCHIACEAE			
	....NITZSCHIA		41	4
		TOTALS	620	57
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....DINOBRYON		110	10
		TOTALS	110	10
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOCHRYSIDACEAE			
	....CHROOMONAS		110	10
	...CRYPTOMONODACEAE			
D	....CRYPTOMONAS		160	15
		TOTALS	270	25
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
	....TRACHELOMONAS		14	1
		TOTALS	14	1
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...GLENODINIACEAE			
	....GLENODINIUM		41	4
		TOTALS	41	4

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

AUG. 4, 1976
1345 HOURS

IDENTIFICATION OF PHYTOPLANKTON

7,600 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...HYDRODICTYACEAE				
L	....PEDIASTRUM				0
	...MICRACTINIACEAE				
	....MICRACTINIUM			390	5
	...OOCYSTACEAE				
	....ANKISTRODESMUS			290	4
	....DICTYOSPHAERIUM			1,100	14
	....WESTELLA			590	8
	...SCENEDESMACEAE				
L	....SCENEDESMUS				0
	..VOLVOCALES				
	...CHLAMYDOMONADACEAE				
	....CARTERIA			49	1
	....CHLAMYDOMONAS			98	1
			TOTALS	2,500	33
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
D	....CYCLOTELLA			3,100	41
	....MELOSIRA			880	12
	..PENNALES	PENNATE			
	...FRAGILARIACEAE				
L	....SYNEDRA				0
	...NAVICULACEAE	NAVICULOID			
L	....NEIDIUM				0
	...NITZSCHIACEAE				
	....NITZSCHIA			98	1
			TOTALS	4,100	54
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...MALLOMONADACEAE				
	....MALLOMONAS			98	1
	...OCHROMONADACEAE				
	....DINOBRYON			440	6
			TOTALS	540	7
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..CHROOCOCCALES	COCCOID			
	...CHROOCOCCACEAE				
	....ANACYSTIS			290	4
			TOTALS	290	4
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOMONODACEAE				
	....CRYPTOMONAS			150	2
			TOTALS	150	2
	PYRRHOPHYTA	FIRE ALGAE			
	.DINOPHYCEAE	DINOFLAGELLATES			
	..PERIDINIALES				
	...GLENODINIACEAE				
L	....GLENODINIUM				0

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

SEP. 1, 1976
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,200 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...MICRACTINIACEAE				
L	....MICRACTINIUM				0
	...OOCYSTACEAE				
	....ANKISTRODESMUS			70	3
L	....DICTYOSPHAERIUM				0
L	....KIRCHNERIELLA				0
	...SCENEDESMACEAE				
	....SCENEDESMUS			280	13
			TOTALS	350	16
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
D	....CYCLOTELLA			910	42
	....MELOSIRA			140	6
	...RHIZOSOLENIACEAE				
	....RHIZOSOLENIA			140	6
	..PENNALES	PENNATE			
	...NITZSCHIACEAE				
	....NITZSCHIA			210	10
			TOTALS	1,400	64
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...MALLOMONADACEAE				
	....MALLOMONAS			70	3
	...OCHROMONADACEAE				
	....DINOBRYON			140	6
	....OCHROMONAS			140	6
			TOTALS	350	15
	.XANTHOPHYCEAE	YELLOW-GREEN ALGAE			
	..HETEROCOCCALES				
	...CHLOROTHECIACEAE				
L	....OPHIOCYTIUM				0
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOMONODACEAE				
	....CRYPTOMONAS			70	3
			TOTALS	70	3
	.EUGLENOPHYCEAE				
	..EUGLENALES				
	...EUGLENACEAE				
L	....TRACHELOMONAS				0

NOTE: D - DOMINANT ORGANISM; GREATER OR EQUAL TO 15%
L - LESS THEN 1%; MAY NOT HAVE BEEN ACTUALLY COUNTED

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	134	132	134	---	---	---	102	100	100	127	124	126
2	137	133	134	---	---	---	102	96	99	130	127	129
3	139	136	137	---	---	---	97	96	96	132	130	131
4	141	139	140	---	---	---	97	95	95	134	132	133
5	144	142	143	---	---	---	96	91	94	137	134	136
6	145	145	145	---	---	---	100	92	97	139	138	139
7	146	144	145	---	---	---	102	99	100	141	139	140
8	148	146	147	---	---	---	101	97	98	143	140	142
9	150	148	149	---	---	---	102	97	99	143	142	143
10	151	150	151	---	---	---	104	101	103	144	143	143
11	153	151	152	133	123	124	107	104	105	145	144	144
12	152	151	152	130	115	122	108	106	107	146	145	146
13	154	151	153	115	106	111	109	108	109	146	146	146
14	156	155	155	106	103	104	108	98	102	149	147	147
15	158	156	157	103	101	102	99	91	96	149	148	148
16	159	158	158	103	101	102	90	85	86	150	148	149
17	160	159	160	102	101	101	87	85	86	152	148	150
18	162	160	161	102	101	101	86	84	85	151	150	150
19	162	162	162	101	101	101	93	87	90	153	151	152
20	162	162	162	102	100	101	98	93	96	153	152	153
21	163	161	162	100	96	98	100	98	99	153	152	153
22	164	163	164	97	91	94	101	100	101	153	151	152
23	164	160	162	91	89	90	104	101	102	154	151	153
24	162	161	161	93	89	91	107	104	106	154	151	153
25	161	158	160	94	92	93	109	107	108	153	152	152
26	158	151	153	97	94	96	111	109	110	153	151	152
27	150	149	150	101	97	99	113	111	113	154	152	152
28	152	149	150	106	102	104	116	114	115	154	151	153
29	---	---	---	107	103	106	119	116	117	155	152	154
30	---	---	---	103	99	100	122	119	120	155	152	154
31	---	---	---	---	---	---	124	122	123	155	153	154
MONTH	164	132	152	---	---	---	124	84	102	155	124	146

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	155	153	154	149	148	149	61	59	60	67	62	64
2	154	153	154	148	147	148	65	59	61	69	67	68
3	155	153	154	147	144	146	64	55	61	---	---	69
4	154	154	154	145	144	144	58	47	54	---	---	71
5	155	154	154	145	145	145	50	42	47	75	71	73
6	154	153	154	146	146	146	52	37	41	79	75	77
7	154	152	153	147	146	147	41	35	38	81	79	79
8	153	151	152	148	147	148	37	35	36	85	80	82
9	153	151	153	148	147	148	41	35	38	89	85	86
10	154	150	152	148	147	147	41	37	38	93	89	91
11	153	151	152	148	147	147	38	36	37	96	93	94
12	153	150	151	149	147	148	41	37	40	101	96	98
13	151	150	150	149	147	148	43	39	42	104	101	102
14	153	151	152	150	148	149	42	39	41	109	104	106
15	154	152	153	149	148	149	39	37	38	112	108	110
16	153	152	152	151	150	150	37	35	36	113	112	112
17	152	151	152	151	148	150	36	34	35	112	111	111
18	151	150	151	151	148	150	37	34	36	112	107	110
19	150	150	150	151	125	137	42	38	40	107	106	106
20	151	150	151	125	120	122	45	42	44	107	106	107
21	150	149	150	142	126	140	48	45	47	107	106	106
22	150	149	149	142	137	139	48	47	47	109	107	108
23	150	144	149	137	120	126	48	47	47	111	109	110
24	145	137	141	119	112	114	50	47	49	114	111	113
25	144	133	138	114	111	112	52	49	51	117	114	116
26	145	123	133	111	100	106	53	51	52	120	117	119
27	146	145	146	100	88	94	57	52	54	123	116	121
28	147	145	146	88	81	84	56	54	55	126	123	125
29	148	145	147	81	77	79	59	55	57	131	126	128
30	---	---	---	77	70	73	62	59	61	134	131	132
31	---	---	---	69	61	65	---	---	---	139	134	136
MONTH	155	123	150	151	61	131	65	34	46	139	62	101

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	142	138	140	186	181	183	---	---	---	203	187	194
2	147	142	144	186	182	184	---	---	---	189	187	188
3	150	146	148	185	180	182	---	---	---	189	188	188
4	157	150	152	185	179	183	183	178	181	191	189	190
5	160	152	156	185	181	184	188	178	183	192	190	191
6	164	156	161	188	182	183	190	180	185	191	190	190
7	170	159	163	188	183	184	188	179	184	193	190	191
8	167	161	163	192	184	184	192	182	187	193	192	191
9	167	160	164	192	185	188	193	184	188	193	191	188
10	171	162	165	191	183	186	190	183	185	194	191	192
11	172	165	168	188	184	185	195	186	185	194	191	190
12	174	169	171	185	180	182	193	188	187	195	193	192
13	175	167	172	184	178	182	195	188	189	195	194	195
14	179	172	176	183	178	181	195	189	192	196	194	195
15	178	174	176	181	176	179	192	181	187	194	194	194
16	176	171	174	181	177	179	188	181	185	195	194	195
17	175	169	172	186	179	183	189	183	186	---	---	---
18	174	168	172	191	184	180	192	186	190	---	---	---
19	173	170	171	187	184	182	199	186	192	---	---	---
20	174	168	171	186	183	184	198	191	196	---	---	---
21	177	172	175	185	182	184	201	190	197	---	---	---
22	180	173	177	---	---	---	203	196	201	---	---	---
23	183	176	180	---	---	---	204	198	202	---	---	---
24	184	180	182	---	---	---	205	196	202	---	---	---
25	185	182	184	---	---	---	207	198	202	---	---	---
26	186	181	184	---	---	---	208	199	204	---	---	---
27	186	181	184	---	---	---	209	202	205	---	---	---
28	184	179	182	---	---	---	209	200	203	---	---	---
29	183	181	182	---	---	---	206	202	204	---	---	---
30	186	179	182	---	---	---	206	198	203	---	---	---
31	---	---	---	---	---	---	203	198	202	---	---	---
MONTH	186	138	170	---	---	---	209	178	193	---	---	---

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	12.5	12.0	12.0	---	---	---	0.0	0.0	0.0	0.0	0.0	0.0
2	12.0	11.5	12.0	---	---	---	0.0	0.0	0.0	0.0	0.0	0.0
3	12.0	11.5	11.5	---	---	---	0.0	0.0	0.0	0.0	0.0	0.0
4	12.0	11.0	11.5	---	---	---	0.0	0.0	0.0	0.0	0.0	0.0
5	12.0	11.5	12.0	---	---	---	0.0	0.0	0.0	0.0	0.0	0.0
6	12.5	11.5	12.0	---	---	---	0.0	0.0	0.0	0.0	0.0	0.0
7	11.5	11.0	11.0	---	---	---	0.5	0.0	0.5	0.0	0.0	0.0
8	11.5	11.0	11.0	---	---	---	0.5	0.5	0.5	0.0	0.0	0.0
9	11.5	11.0	11.5	---	---	---	0.5	0.5	0.5	0.0	0.0	0.0
10	11.5	11.0	11.5	---	---	---	0.5	0.0	0.5	0.0	0.0	0.0
11	12.0	11.0	11.5	---	7.5	---	0.5	0.0	0.5	0.0	0.0	0.0
12	11.0	11.0	11.0	7.5	7.0	7.5	0.5	0.0	0.0	0.0	0.0	0.0
13	12.0	11.0	11.5	7.0	5.0	6.0	0.5	0.0	0.5	0.0	0.0	0.0
14	11.5	11.0	11.0	5.0	4.5	4.5	0.5	0.0	0.0	0.0	0.0	0.0
15	11.5	11.0	11.5	4.5	3.0	3.5	0.5	0.0	0.0	0.0	0.0	0.0
16	11.0	11.0	11.0	3.0	2.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0
17	11.0	10.5	11.0	3.0	2.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0
18	10.5	10.0	10.5	3.0	2.5	3.0	0.0	0.0	0.0	0.0	0.0	0.0
19	10.5	9.5	10.0	4.5	3.5	4.0	0.0	0.0	0.0	0.0	0.0	0.0
20	10.0	9.5	10.0	4.5	4.5	4.5	0.0	0.0	0.0	0.0	0.0	0.0
21	10.0	9.5	9.5	4.5	4.5	4.5	0.0	0.0	0.0	0.0	0.0	0.0
22	9.5	9.0	9.5	4.5	3.0	4.0	0.0	0.0	0.0	0.0	-0.5	0.0
23	9.0	9.0	9.0	3.0	2.0	2.5	0.0	0.0	0.0	0.0	-0.5	0.0
24	9.5	9.0	9.5	1.5	0.5	1.0	0.0	0.0	0.0	0.0	-0.5	0.0
25	10.0	9.0	9.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	-0.5	0.0
26	9.0	9.0	9.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
27	9.5	9.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	9.5	9.5	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	---	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	---	---	---	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	---	---	---	---	---	---	0.0	0.0	0.0	0.0	0.0	0.0
MONTH	12.5	9.0	10.5	---	---	---	0.5	0.0	0.0	0.0	-0.5	0.0

04045500 TAHQUAMENON RIVER NEAR TAHQUAMENON PARADISE, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	9.5	9.0	9.5
2	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5	1.0	9.5	8.5	9.0
3	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5	1.0	---	---	8.0
4	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5	1.0	---	---	8.0
5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	7.5	7.0	7.5
6	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.0	1.0	7.5	7.0	7.0
7	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.0	1.0	7.5	7.0	7.5
8	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.0	1.5	8.0	7.0	7.5
9	0.5	0.0	0.0	0.0	0.0	0.0	3.5	1.5	3.0	9.5	8.0	8.5
10	0.5	0.0	0.0	0.0	0.0	0.0	3.5	3.0	3.5	10.0	9.5	10.0
11	0.0	0.0	0.0	0.0	0.0	0.0	3.5	3.0	3.0	11.5	10.0	10.5
12	0.0	0.0	0.0	0.0	0.0	0.0	4.0	3.0	3.5	12.5	11.0	11.5
13	0.0	0.0	0.0	0.0	0.0	0.0	5.5	4.0	5.0	13.0	12.0	12.5
14	0.0	0.0	0.0	0.0	0.0	0.0	6.5	5.0	6.0	13.5	12.5	13.0
15	0.0	0.0	0.0	0.0	0.0	0.0	8.0	6.0	7.5	14.0	13.0	13.5
16	0.0	0.0	0.0	0.0	0.0	0.0	9.5	7.0	8.0	14.5	14.0	14.0
17	0.0	0.0	0.0	0.0	0.0	0.0	10.0	8.0	9.0	14.0	13.5	13.5
18	0.0	0.0	0.0	0.5	0.0	0.5	10.5	9.0	10.5	13.5	13.0	13.5
19	0.0	0.0	0.0	0.5	0.0	0.0	11.5	10.5	11.0	13.5	13.0	13.0
20	0.0	0.0	0.0	0.0	0.0	0.0	11.5	11.0	11.5	14.0	13.0	13.5
21	0.0	0.0	0.0	0.0	0.0	0.0	11.0	10.5	11.0	14.5	13.5	14.0
22	0.0	0.0	0.0	0.5	0.0	0.0	10.5	9.5	10.0	15.0	14.0	14.5
23	0.0	0.0	0.0	0.5	0.0	0.0	10.0	9.0	9.5	15.5	14.5	15.0
24	0.0	0.0	0.0	0.5	0.0	0.0	10.0	9.0	9.5	15.5	15.0	15.0
25	0.0	0.0	0.0	0.5	0.5	0.5	10.0	9.0	9.5	16.0	15.0	15.0
26	0.0	0.0	0.0	0.5	0.5	0.5	9.0	8.0	8.5	16.5	15.0	15.5
27	0.0	0.0	0.0	0.5	0.5	0.5	8.0	7.5	8.0	17.5	15.5	16.5
28	0.0	0.0	0.0	0.5	0.5	0.5	8.0	7.5	8.0	18.0	16.5	17.0
29	0.0	0.0	0.0	0.5	0.5	0.5	8.5	8.0	8.5	18.5	17.5	18.0
30	---	---	---	0.5	0.5	0.5	9.5	8.5	9.0	18.5	18.0	18.5
31	---	---	---	0.5	0.5	0.5	---	---	---	19.0	18.5	18.5
MONTH	0.5	0.0	0.0	0.5	0.0	0.0	11.5	0.5	6.0	19.0	7.0	12.5

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	19.5	18.0	18.5	21.5	20.0	21.0	---	---	---	19.0	18.0	18.5
2	19.5	18.0	18.5	22.0	20.0	21.0	---	---	---	18.0	17.0	17.5
3	19.5	18.5	19.0	22.0	20.0	21.0	---	---	---	17.5	17.0	17.0
4	20.5	18.5	19.5	22.0	20.0	21.0	21.0	20.5	21.0	17.0	16.5	17.0
5	21.5	19.0	20.0	21.5	20.5	21.0	21.5	20.0	20.5	17.5	16.0	16.5
6	22.0	19.5	20.5	22.5	21.0	21.5	21.5	19.5	20.5	17.0	15.5	16.0
7	22.5	21.0	21.5	23.0	21.5	22.0	20.5	19.5	20.0	18.0	16.0	16.5
8	22.5	21.5	22.0	23.0	21.5	22.5	21.0	19.5	20.5	18.5	16.5	17.5
9	23.0	21.5	22.0	23.0	22.0	22.5	22.5	20.0	21.0	18.0	17.0	17.5
10	23.0	21.5	22.5	23.5	22.0	22.5	21.0	20.5	20.5	18.0	16.5	17.0
11	23.0	22.0	22.5	23.5	22.0	22.5	21.5	20.5	21.0	17.5	16.0	16.5
12	22.5	22.0	22.0	22.5	21.0	22.0	22.0	21.0	21.5	17.5	16.0	17.0
13	23.0	21.5	22.0	22.0	20.5	21.5	21.5	21.0	21.5	17.5	16.5	17.0
14	23.5	21.5	22.5	22.0	21.0	21.5	21.5	20.5	21.0	17.5	17.0	17.5
15	22.5	22.0	22.5	22.5	20.5	21.5	21.5	19.5	20.0	17.5	17.0	17.0
16	22.0	21.0	21.5	21.5	20.5	21.0	21.0	19.0	19.5	---	---	16.5
17	21.0	20.0	20.5	21.5	20.0	20.5	20.5	18.5	19.5	---	---	---
18	20.5	19.5	20.0	22.0	20.0	21.0	20.5	19.0	19.5	---	---	---
19	20.5	19.0	19.5	22.0	20.5	21.0	21.5	19.5	20.5	---	---	---
20	21.0	19.0	20.0	22.0	21.0	21.0	22.5	20.0	21.0	---	---	---
21	22.0	19.5	20.5	22.0	20.5	21.0	22.5	21.0	21.5	---	---	---
22	21.0	19.5	20.5	---	---	---	23.0	21.5	22.0	---	---	---
23	22.0	20.5	21.5	---	---	---	23.0	21.5	22.0	---	---	---
24	22.0	21.0	21.5	---	---	---	23.0	21.5	22.0	---	---	---
25	22.0	21.0	21.5	---	---	---	22.5	21.5	22.0	---	---	---
26	22.5	20.5	21.5	---	---	---	22.5	21.5	22.0	---	---	---
27	22.5	21.0	21.5	---	---	---	23.0	22.0	22.5	---	---	---
28	21.5	20.5	21.0	---	---	---	23.0	21.5	22.5	---	---	---
29	21.5	20.5	21.0	---	---	---	22.0	20.0	21.0	---	---	---
30	21.5	20.5	21.0	---	---	---	21.0	19.5	20.0	---	---	---
31	---	---	---	---	---	---	19.5	18.5	19.0	---	---	---
MONTH	23.5	18.0	21.0	---	---	---	23.0	18.5	21.0	---	---	---

04045580 ST. MARYS RIVER ABOVE SAULT STE. MARIE, MI
(National stream-quality accounting network and radiochemical station)

LOCATION.--Lat 46°29'29", long 84°25'17", in NW¼ sec.10, T.47 N., R.1 W., Chippewa County, Hydrologic Unit 04020300, at Sault Ste. Marie municipal raw-water intake at Big Point, 1 mi (1.6 km) west of Sault Ste. Marie.

DRAINAGE AREA.--80,900 mi^2 (210,000 km^2), approximately.

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

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: March 1974 to current year.
WATER TEMPERATURES: March 1974 to current year.

REMARKS.--Primary sampling point is at raw-water tap in Sault Ste. Marie municipal water plant at Big Point. Intake is 1,500 ft (457 m) out at a depth of 30 ft (9 m), 10 ft (3 m) above the bottom of the channel. Discharge estimates obtained from U.S. Army Corps of Engineers, Sault Ste. Marie.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 96 micromhos Apr. 15, 1974; minimum daily, 76 micromhos Apr. 24, 1975.
WATER TEMPERATURES: Maximum daily, 20.5°C Aug. 22-28, 1976; minimum daily, 0.0°C Mar. 14, 15, 1974.

EXTREMES OUTSIDE PERIOD OF DAILY RECORD.--A specific conductance of 100 micromhos was observed Jan. 29, 1974.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 90 micromhos Jan. 19, 21, Feb. 2-4, 6-8; minimum daily, 81 micromhos Apr. 7, 9, 10, 15, 16, 22.
WATER TEMPERATURES: Maximum daily, 20.5°C Aug. 22-28; minimum daily, 1.0°C on several days during January to March.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT												
29...	0820	E68600	84	7.2	11.0	11.6	97	10	<1	<1	48	3
NOV												
11...	1430	E68600	86	7.6	10.0	11.9	99	9	2	4	46	0
DEC												
10...	0900	E65000	86	7.1	6.0	13.6	96	<1	<1	32	44	0
JAN												
14...	0915	E65000	90	8.1	1.5	--	--	<1	<1	<1	47	0
FEB												
11...	0815	E65000	96	8.0	1.5	13.8	100	<1	<1	1	48	0
MAR												
10...	0845	E69500	88	6.9	1.5	13.6	95	<1	<1	<1	44	0
APR												
07...	0830	E70000	87	7.8	1.5	12.1	84	2	<1	<1	44	0
MAY												
05...	0930	E78500	87	7.7	5.5	11.7	98	2	<1	1	44	0
JUN												
02...	0920	E86500	88	8.1	8.5	11.0	100	<1	1	<1	44	0
30...	1415	E80500	83	8.2	13.0	9.8	100	2	<1	2	39	0
AUG												
05...	0945	E80000	84	7.6	18.5	8.6	93	21	3	1	46	3
SEP												
02...	0900	E80000	84	8.1	18.0	10.0	94	33	<1	<1	44	0

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT												
29...	14	3.1	1.0	.1	.5	54	0	44	5.5	3.0	1.4	.0
NOV												
11...	14	2.7	1.1	.1	.5	60	0	49	2.4	2.8	1.2	.0
DEC												
10...	14	2.2	1.2	.1	.5	56	0	46	7.1	1.9	1.0	.4
JAN												
14...	14	2.8	1.3	.1	.5	64	0	52	.8	2.6	1.7	.0
FEB												
11...	15	2.5	1.4	.1	.5	68	0	56	1.1	3.0	1.7	.1
MAR												
10...	14	2.3	1.4	.1	.5	58	0	48	12	2.3	1.1	.1
APR												
07...	13	2.7	1.1	.1	.5	54	0	44	1.4	3.6	1.8	.1
MAY												
05...	13	2.8	.9	.1	.4	54	0	44	1.7	3.0	1.9	.1
JUN												
02...	13	2.8	1.0	.1	.5	58	0	48	.7	3.8	2.1	.0
30...	13	1.5	.9	.1	.5	62	0	51	.6	3.2	.8	.1
AUG												
05...	14	2.7	1.1	.1	.5	52	0	43	2.1	5.1	--	.1
SEP												
02...	13	2.9	1.1	.1	.5	57	0	47	.7	4.3	--	.1

04045580 ST. MARYS RIVER ABOVE SAULT STE.MARIE, MI

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)
OCT 29...	2.4	47	52	.25	.36	1.6	.01
NOV 11...	2.2	42	54	.26	.33	1.5	.00
DEC 10...	2.4	54	51	.26	.41	1.8	.01
JAN 14...	2.4	53	57	.26	.26	1.2	.01
FEB 11...	2.5	58	60	.28	.41	1.8	.00
MAR 10...	2.5	47	53	.28	.45	2.0	.01
APR 07...	2.4	46	52	.31	.46	2.0	.01
MAY 05...	2.2	49	51	.30	.48	2.1	.01
JUN 02...	2.2	46	54	.25	.40	1.8	.02
30...	2.1	54	53	.27	.35	1.6	.02
AUG 05...	1.9	46	55	.24	.37	1.6	.01
SEP 02...	2.0	50	52	.23	.28	1.2	.02

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
JAN 14...	0915	0	0	0	0	<10	0	0	0	12	3	40
APR 07...	0830	0	0	0	0	10	0	0	0	10	10	90
JUN 30...	1415	0	0	0	0	<10	<10	0	0	0	0	50

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
JAN 14...	0	10	0	0	0	.0	.0	0	0	80	40	4.2
APR 07...	30	--	2	10	0	<.5	<.5	0	0	40	30	3.7
JUN 30...	0	5	1	10	0	<.5	<.5	0	0	60	60	5.4

DATE	TIME	TOTAL FILT-RABLE RESIDUE (MG/L)	TOTAL NON-FILT-RABLE RESIDUE (MG/L)	SUS-PENDED GROSS ALPHA AS U-NAT. (UG/L)	DIS-SOLVED GROSS BETA AS CS-137 (PC/L)	SUS-PENDED GROSS BETA AS CS-137 (PC/L)	DIS-SOLVED GROSS BETA AS SR90 /Y90 (PC/L)	SUS-PENDED GROSS BETA AS SR90 /Y90 (PC/L)	DIS-SOLVED RA-226 (RADON METHOD) (PC/L)
MAY 05...	0930	48	<1	<.4	2.0	<.4	1.6	<.4	.04

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
PERIPHYTON

DATE	LENGTH OF EXPOSURE (DAYS)	PERIPHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERIPHYTON BIOMASS ASH WEIGHT G/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL A MG/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL B MG/SQ M
OCT					
29...	29	3.50	2.10	4.20	.000
JUN					
02...	28	39.8	33.8	8.18	.431

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

OCT. 29, 1975
0820 HOURS

IDENTIFICATION OF PHYTOPLANKTON

660 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
L	....CYCLOTELLA			0
L	....MELOSIRA			0
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		62	9
	...CYMBELLACEAE			
L	....CYMBELLA			0
	...FRAGILARIACEAE			
	....ASTERIONELLA		62	9
	....FRAGILARIA		62	9
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		21	3
L	....PINNULARIA			0
	...NITZSCHIACEAE			
	....NITZSCHIA		21	3
	...TABELLARIACEAE			
L	....TABELLARIA			0
		TOTALS	230	33
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
D	....DINOBRYON		440	66
		TOTALS	440	66

04045580 ST. MARYS RIVER ABOVE SAULT STE.MARIE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

NOV. 11, 1975
1430 HOURS

IDENTIFICATION OF PHYTOPLANKTON

3,100 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			420	14
	....COCCONEIS			21	1
	...CYMBELLACEAE				
	....CYMBELLA			130	4
	...DIATOMACEAE				
	....DIATOMA			21	1
	...FRAGILARIACEAE				
	....ASTERIONELLA			21	1
	....FRAGILARIA			42	1
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			42	1
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			150	5
	...NITZSCHIACEAE				
	....NITZSCHIA			84	3
			TOTALS	920	31
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...OCHROMONADACEAE				
	....DINOBRYON			150	5
			TOTALS	150	5
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..CHROOCOCCALES	COCCOID			
	...CHROOCOCCACEAE				
D	....ANACYSTIS			2,000	65
			TOTALS	2,000	65

DEC. 10, 1975
0900 HOURS

IDENTIFICATION OF PHYTOPLANKTON

170 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....TETRAEDRON			6	3
	...SCENEDESMACEAE				
	....SCENEDESMUS			12	7
			TOTALS	17	10
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			6	3
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			12	7
	...CYMBELLACEAE				
	....CYMBELLA			17	10
	...FRAGILARIACEAE				
D	....ASTERIONELLA			58	33
	....SYNEDRA			6	3
	...NAVICULACEAE	NAVICULOID			
D	....NAVICULA			29	17
	...NITZSCHIACEAE				
	....NITZSCHIA			17	10
	...TABELLARIACEAE				
	....TABELLARIA			6	3
			TOTALS	150	86
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...OCHROMONADACEAE				
	....DINOBRYON			6	3
			TOTALS	6	3

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JAN. 14, 1976
0915 HOURS

IDENTIFICATION OF PHYTOPLANKTON

780 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....SCENEDESMUS		37	5
		TOTALS	37	5
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		120	15
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		28	4
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
	....SYNEDRA		9	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		9	1
	...NITZSCHIACEAE			
	....NITZSCHIA		9	1
	...TABELLARIACEAE			
	....TABELLARIA		9	1
		TOTALS	190	23
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....GOMPHOSPHAERIA		560	71
		TOTALS	560	71

FEB. 11, 1976
0815 HOURS

IDENTIFICATION OF PHYTOPLANKTON

280 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
D	....SCENEDESMUS		94	33
		TOTALS	94	33
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		47	17
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....ACHNANTHES			0
	...CYMBELLACEAE			
	....CYMBELLA		24	8
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
L	....FRAGILARIA			0
	...NITZSCHIACEAE			
D	....NITZSCHIA		71	25
	...TABELLARIACEAE			
D	....TABELLARIA		47	17
		TOTALS	190	67

04045580 ST. MARYS RIVER ABOVE SAULT STE.MARIE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAR. 10, 1976
0845 HOURS

IDENTIFICATION OF PHYTOPLANKTON

61 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		9	15
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....ACHNANTHES			0
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
D	....ASTERIONELLA		9	15
L	....FRAGILARIA			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		3	5
	...NITZSCHIACEAE			
L	....NITZSCHIA			0
	...TABELLARIACEAE			
D	....TABELLARIA		12	20
		TOTALS	34	55
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
L	....DINOBRYON			0
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		28	45
		TOTALS	28	45

APR. 7, 1976
0830 HOURS

IDENTIFICATION OF PHYTOPLANKTON

110 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
D	....SCENEDESMUS		25	24
		TOTALS	25	24
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		8	8
	...RHIZOSOLENIACEAE			
	....RHIZOSOLENIA		4	4
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		8	8
	....COCCONEIS		4	4
	...FRAGILARIACEAE			
D	....ASTERIONELLA		17	16
D	....FRAGILARIA		17	16
	...NITZSCHIACEAE			
	....DENTICULA		4	4
D	....NITZSCHIA		17	16
	...TABELLARIACEAE			
L	....TABELLARIA			0
		TOTALS	81	76

04045580 ST. MARYS RIVER ABOVE SAULT STE.MARIE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAY 5, 1976
0930 HOURS

IDENTIFICATION OF PHYTOPLANKTON

830 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
L	....ANKISTRODESMUS			0
	...SCENEDESMACEAE			
D	....SCENEDESMUS		200	25
		TOTALS	200	25
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		78	9
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		78	9
	....COCCONEIS		31	4
	...CYMBELLACEAE			
	....CYMBELLA		16	2
	...EUNOTIACEAE			
	....EUNOTIA		16	2
	...FRAGILARIACEAE			
	....ASTERIONELLA		78	9
	....SYNEDRA		78	9
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		47	6
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		31	4
	...NITZSCHIACEAE			
	....DENTICULA		16	2
	....NITZSCHIA		94	11
	...TABELLARIACEAE			
	....TABELLARIA		62	8
		TOTALS	620	75

04045580 ST. MARYS RIVER ABOVE SAULT STE.MARIE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JUNE 2, 1976
0920 HOURS

IDENTIFICATION OF PHYTOPLANKTON

740 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....TETRAEDRON			7	1
	...SCENEDESMACEAE				
	....SCENEDESMUS			43	6
	..TETRASPORALES				
	...COCCOMYXACEAE				
	....ELAKATOTHRIX			43	6
			TOTALS	93	13
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			110	14
	..PENNALES	PENNATE			
	...CYMBELLACEAE				
	....CYMBELLA			7	1
	...FRAGILARIACEAE				
	....ASTERIONELLA			21	3
	...NAVICULACEAE	NAVICULOID			
L	....NAVICULA				0
	...NITZSCHIACEAE				
	....NITZSCHIA			50	7
	...TABELLARIACEAE				
L	....TABELLARIA			0	0
			TOTALS	190	25
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...OCHROMONADACEAE				
	....DINOBRYON			7	1
			TOTALS	7	1
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..CHROOCOCCALES	COCCOID			
	...CHROOCOCCACEAE				
D	....ANACYSTIS			310	41
	..OSCILLATORIALES	FILAMENTOUS			
	...OSCILLATORIACEAE				
D	....OSCILLATORIA			150	20
			TOTALS	460	61

04045580 ST. MARYS RIVER ABOVE SAULT STE.MARIE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JUNE 30, 1976
1415 HOURS

IDENTIFICATION OF PHYTOPLANKTON

260 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		7	3
		TOTALS	7	3
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		33	13
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		7	3
	...CYMBELLACEAE			
	....CYMBELLA		4	1
	...FRAGILARIACEAE			
D	....ASTERIONELLA		40	16
	....SYNEDRA		4	1
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		4	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		37	14
	...NITZSCHIACEAE			
D	....NITZSCHIA		51	20
	...TABELLARIACEAE			
	....TABELLARIA		7	3
		TOTALS	190	72
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....DINOBRYON		11	4
		TOTALS	11	4
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....ANACYSTIS		51	20
		TOTALS	51	20

04045580 ST. MARYS RIVER ABOVE SAULT STE.MARIE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

AUG. 5, 1976
0945 HOURS

IDENTIFICATION OF PHYTOPLANKTON

240 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		4	2
		TOTALS	4	2
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		54	22
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		12	5
	...FRAGILARIACEAE			
D	....ASTERIONELLA		54	22
	....SYNEDRA		21	9
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		8	3
	...NITZSCHIACEAE			
	....DENTICULA		8	3
	....NITZSCHIA		8	3
	...TABELLARIACEAE			
	....TABELLARIA		8	3
		TOTALS	170	70
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...CHROMULINACEAE			
	....CHRYSOCOCCUS		4	2
	...OCHROMONADACEAE			
D	....DINOBRYON		50	21
		TOTALS	54	23
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...PERIDINIACEAE			
	....PERIDINIUM		8	3
		TOTALS	8	3

04045580 ST. MARYS RIVER ABOVE SAULT STE.MARIE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

SEP. 2, 1976
0900 HOURS

IDENTIFICATION OF PHYTOPLANKTON

280 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....DICTYOSPHAERIUM			33	11
	...SCENEDESMACEAE				
	....TETRASTRUM			33	11
			TOTALS	65	22
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			16	6
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			33	11
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			8	3
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			41	14
	...NITZSCHIACEAE				
D	....NITZSCHIA			57	20
			TOTALS	150	54
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...OCHROMONADACEAE				
	....DINOBRYON			41	14
			TOTALS	41	14
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..OSCILLATORIALES	FILAMENTOUS			
	...OSCILLATORIACEAE				
	....OSCILLATORIA			24	9
			TOTALS	24	9

NOTE: D - DOMINANT ORGANISM; GREATER OR EQUAL TO 15%
L - LESS THEN 1%; MAY NOT HAVE BEEN ACTUALLY COUNTED

04045580 ST. MARYS RIVER ABOVE SAULT STE.MARIE, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	86	83	86	88	89	85	83	84	84	84	87	87
2	85	84	84	87	90	86	84	84	85	85	86	87
3	87	82	86	88	90	86	84	83	84	86	88	87
4	86	85	84	88	90	85	84	83	84	86	86	86
5	86	86	84	88	88	85	82	83	85	86	86	87
6	87	85	85	88	90	86	82	84	85	87	85	85
7	86	87	85	86	90	86	81	84	84	87	86	87
8	87	87	84	85	90	86	82	85	84	88	86	87
9	86	87	84	85	86	86	81	85	85	87	86	88
10	87	86	85	84	84	86	81	84	85	86	87	86
11	87	86	84	85	85	84	82	84	84	86	87	87
12	87	86	85	85	86	85	82	85	84	84	87	87
13	86	84	85	84	85	86	83	84	85	85	86	87
14	86	87	87	86	87	86	82	85	87	85	87	88
15	87	87	85	88	87	85	81	85	86	86	87	87
16	86	86	84	85	86	85	81	87	85	87	86	87
17	87	86	84	87	86	86	82	84	85	85	87	87
18	87	87	82	89	85	87	83	85	84	87	86	87
19	87	85	83	90	84	86	82	83	85	86	87	87
20	87	86	86	84	86	85	82	86	85	87	87	87
21	87	85	87	90	84	86	83	84	87	86	87	87
22	87	86	85	85	84	84	81	86	87	87	87	87
23	87	85	86	87	85	84	82	85	87	86	86	87
24	87	84	86	85	85	85	83	84	86	87	87	86
25	87	86	85	84	85	86	83	85	86	87	87	87
26	86	86	86	87	84	85	83	84	86	86	86	87
27	87	85	87	87	85	86	83	86	86	86	86	87
28	86	85	88	88	86	86	82	86	86	86	87	87
29	86	86	88	88	87	84	83	86	86	86	87	87
30	82	87	88	89	---	85	82	87	86	87	87	87
31	83	---	88	89	---	83	---	85	---	87	87	---
MAX	87	87	88	90	90	87	84	87	87	88	88	88
MIN	82	82	82	84	84	83	81	83	84	84	85	85

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
ONCE-DAILY

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

04046000 BLACK RIVER NEAR GARNET, MI

LOCATION.--Lat 46°07'05", long 85°21'55", in SE¼ sec.13, T.43 N., R.9 W., Mackinac County, Hydrologic Unit 04060107, on right bank 10 ft (3 m) upstream from highway bridge, 15 ft (5 m) downstream from Peters Creek entering from right, 3.5 mi (5.6 km) upstream from Lake Michigan, and 4 mi (6 km) southwest of Garnet.

DRAINAGE AREA.--28 mi^2 (73 km^2), approximately.

PERIOD OF RECORD.--September 1951 to current year.

REVISED RECORDS.--WSP 1707: 1959.

GAGE.--Water-stage recorder. Datum of gage is 629.7 ft (191.93 m) above mean sea level.

REMARKS.--Records good. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--25 years, 29.2 ft^3/s (0.827 m^3/s), 14.16 in/yr (360 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 860 ft^3/s (24.4 m^3/s) May 7, 1960, gage height, 8.55 ft (2.606 m), from rating curve extended above 400 ft^3/s (11.3 m^3/s); minimum, 4.9 ft^3/s (0.14 m^3/s) Mar. 11, 1956, gage height, 2.10 ft (0.640 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 120 ft^3/s (3.40 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Apr. 4	1900	*269	7.62	*5.28	1.609	Apr. 18	0300	213	6.03	4.83	1.472

Minimum discharge, 6.4 ft^3/s (0.18 m^3/s) Sept. 30; minimum gage height, 2.25 ft (0.686 m) Sept. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	14	56	18	12	13	184	43	20	17	9.3	7.9
2	12	13	47	18	12	13	177	40	18	16	9.1	7.7
3	12	12	40	18	12	13	210	37	17	15	9.1	7.8
4	12	12	36	17	11	13	224	36	16	14	9.2	7.8
5	12	12	38	17	11	13	228	38	16	13	9.1	8.1
6	11	11	45	16	11	13	218	46	15	12	8.9	7.9
7	11	13	40	16	11	13	201	42	14	12	8.7	7.9
8	11	25	33	16	11	13	181	38	14	12	8.7	7.6
9	11	25	29	17	11	13	165	35	14	12	8.6	8.1
10	11	73	27	16	11	13	162	33	14	12	8.6	7.8
11	11	86	24	15	11	13	149	30	14	11	8.6	7.6
12	11	77	22	15	11	12	133	28	14	11	9.6	7.5
13	11	73	21	15	11	12	124	26	14	11	9.2	7.1
14	12	60	69	14	11	12	137	38	17	13	8.7	7.7
15	11	52	78	14	11	12	169	35	19	12	8.5	7.8
16	11	46	60	14	12	12	176	41	22	11	8.4	7.6
17	11	41	49	13	12	11	193	45	21	11	8.2	7.3
18	11	37	44	13	12	11	186	41	20	10	8.2	7.2
19	10	41	40	13	12	12	151	35	20	10	7.9	7.2
20	11	41	33	13	11	16	119	31	19	12	7.9	7.1
21	10	68	28	13	11	19	118	28	17	11	7.8	7.0
22	10	57	26	13	11	19	120	25	16	11	7.7	7.0
23	15	48	24	13	12	20	105	24	15	10	7.6	7.0
24	20	40	23	13	13	22	88	23	14	10	7.7	7.1
25	19	33	22	12	14	29	75	21	14	10	7.6	7.0
26	18	28	21	12	14	35	65	20	13	10	7.6	7.0
27	18	25	20	12	13	78	59	19	13	9.9	7.6	6.8
28	17	23	19	12	13	68	54	18	13	9.8	7.8	6.8
29	16	24	19	12	13	70	49	18	15	9.6	7.5	6.7
30	15	62	18	12	---	113	46	18	19	9.6	7.6	6.7
31	14	---	18	12	---	183	---	20	---	9.6	7.7	---
TOTAL	398	1172	1069	444	341	909	4266	972	487	357.5	258.7	221.8
MEAN	12.8	39.1	34.5	14.3	11.8	29.3	142	31.4	16.2	11.5	8.35	7.39
MAX	20	86	78	18	14	183	228	46	22	17	9.6	8.1
MIN	10	11	18	12	11	11	46	18	13	9.6	7.5	6.7
CFSM	.46	1.40	1.23	.51	.42	1.05	5.07	1.12	.58	.41	.30	.26
IN.	.53	1.56	1.42	.59	.45	1.21	5.67	1.29	.65	.47	.34	.29

CAL YR 1975 TOTAL 11003.3 MEAN 30.1 MAX 219 MIN 8.2 CFSM 1.08 IN 14.62
WTR YR 1976 TOTAL 10896.0 MEAN 29.8 MAX 228 MIN 6.7 CFSM 1.06 IN 14.48

04056500 MANISTIQUE RIVER NEAR MANISTIQUE, MI

LOCATION.--Lat 46°01'50", long 86°09'40", in SE¼ sec.15, T.42 N., R.15 W., Schoolcraft County, Hydrologic Unit 04060106, on left bank 1.0 mi (1.6 km) downstream from West Branch, 6.0 mi (9.7 km) northeast of Manistique, and at mile 19.5 (31.4 km).

DRAINAGE AREA.--1,100 mi^2 (2,849 km^2), approximately.

PERIOD OF RECORD.--March 1938 to current year.

REVISED RECORDS.--WSP 1387: 1940-42(M), 1943, 1945. WSP 1627, 1727: 1938, 1939.

GAGE.--Water-stage recorder. Altitude of gage is 608 ft (185.3 m) from river-profile map (nearest ft). Prior to July 15, 1939, non-recording gage at site 1,600 ft (487.7 m) upstream at different datum.

REMARKS.--Records good except those for the winter period, which are fair. Since July 1948, slight regulation by dam on outlet of Manistique Lake. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--38 years, 1,414 ft^3/s (40.04 m^3/s), 17.46 in/yr (443 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,900 ft^3/s (479 m^3/s) May 11, 1960, gage height, 12.85 ft (3.917 m); minimum, 288 ft^3/s (8.16 m^3/s) Oct. 4, 1948; minimum gage height, 1.01 ft (0.308 m) Aug. 23, 1941.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,270 ft^3/s (263 m^3/s) Apr. 8, gage height, 11.28 ft (3.438 m); maximum gage height, 11.68 ft (3.560 m) Apr. 1, 2, backwater from ice; minimum discharge, 352 ft^3/s (9.97 m^3/s) Sept. 13, gage height, 1.93 ft (0.588 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1120	927	1500	1450	930	1100	5800	2870	1650	745	505	375
2	1080	903	1700	1400	920	1100	6600	2690	1750	731	496	374
3	1040	888	1900	1350	920	1100	7200	2560	1700	707	489	377
4	1010	872	1950	1350	920	1100	7600	2460	1610	686	480	383
5	968	858	2000	1300	920	1100	7990	2370	1510	667	480	378
6	948	845	2050	1250	920	1100	8410	2300	1390	652	479	380
7	929	843	2050	1250	920	1100	8900	2260	1290	640	478	382
8	915	870	2050	1200	920	1100	9100	2190	1210	609	475	375
9	902	949	2000	1150	920	1150	8780	2110	1150	611	468	371
10	894	1090	1950	1150	920	1200	8250	2030	1110	616	460	366
11	884	1370	1900	1150	920	1200	7740	1950	1070	611	449	362
12	873	1630	1800	1100	920	1200	7310	1840	1030	609	454	359
13	872	1760	1800	1100	920	1200	6830	1770	1010	598	475	356
14	875	1800	1800	1050	920	1200	6350	1740	982	631	487	364
15	872	1770	1900	1050	920	1150	6010	1720	959	661	473	369
16	871	1720	1950	1050	920	1150	5910	1780	969	676	459	377
17	862	1640	2000	1000	940	1150	6040	2020	978	680	445	386
18	850	1570	2100	1000	960	1150	6250	2240	988	663	433	397
19	843	1510	2100	1000	980	1200	6450	2330	1010	658	424	393
20	833	1490	2100	980	1000	1300	6540	2370	998	656	417	396
21	823	1560	2050	960	1020	1400	6490	2340	974	607	410	399
22	816	1690	2050	960	1020	1500	6140	2190	928	584	404	400
23	838	1730	2000	950	1050	1700	5750	2020	877	567	395	408
24	961	1700	1950	950	1050	1950	5380	1850	844	548	389	417
25	1070	1500	1900	950	1080	2200	5050	1710	804	534	385	420
26	1090	1410	1850	950	1100	2500	4630	1610	763	524	382	414
27	1080	1300	1800	940	1120	3000	4180	1530	775	520	382	407
28	1040	1200	1750	940	1120	3500	3790	1460	760	511	383	399
29	1010	1200	1700	940	1120	4000	3430	1380	750	506	378	397
30	972	1300	1600	940	---	4500	3120	1340	747	504	371	394
31	942	---	1550	930	---	5200	---	1420	---	512	372	---
TOTAL	29083	39895	58800	33740	28290	54500	192020	62450	32586	19024	13577	11575
MEAN	938	1330	1897	1088	976	1758	6401	2015	1086	614	438	386
MAX	1120	1800	2100	1450	1120	5200	9100	2870	1750	745	505	420
MIN	816	843	1500	930	920	1100	3120	1340	747	504	371	356
CFSM	.85	1.21	1.72	.99	.89	1.60	5.82	1.83	.99	.56	.40	.35
IN.	.98	1.35	1.99	1.14	.96	1.84	6.49	2.11	1.10	.64	.46	.39

CAL YR 1975 TOTAL 591022 MEAN 1619 MAX 9100 MIN 580 CFSM 1.47 IN 19.99
WTR YR 1976 TOTAL 575540 MEAN 1573 MAX 9100 MIN 356 CFSM 1.43 IN 19.46

04057004 MANISTIQUE RIVER ABOVE MANISTIQUE, MI
(National stream-quality accounting network station)

LOCATION.--Lat 45°58'18", long 86°14'35", in SE¼ SE¼ sec.1, T.41 N., R.16 W., Schoolcraft County, Hydrologic Unit 04060106, at Wyman State Nursery, 0.7 mi (1.1 km) downstream from Indian River, 0.8 mi (1.3 km) upstream from U.S. Highway 2 and 1.8 mi (2.9 km) upstream from mouth.

DRAINAGE AREA.--1,445 mi^2 (3,740 km^2), approximately.

PERIOD OF RECORD.--October 1975 to September 1976.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1975 to September 1976.
WATER TEMPERATURES: October 1975 to September 1976.

REMARKS.--Monthly samples are collected as a cross-section sample at the Wyman State Nursery site or at railroad bridge 1,200 ft (366 m) downstream. Intermittent ice cover during winter period. Station replaces discontinued station, 04057005 Manistique River at Manistique, MI.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 223 micromhos Oct. 9, 1975; minimum daily, 77 micromhos Apr. 12, 1976.
WATER TEMPERATURES: Maximum daily, 25.0°C July 8, 9, 1976; minimum daily, 0.0°C on many days during winter period.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT												
17...	1100	1030	--	7.8	10.0	9.1	82	19	4	3	93	0
NOV												
14...	1300	2020	140	7.4	4.0	12.3	96	64	--	33	73	11
DEC												
12...	1045	2630	146	7.3	.0	12.8	89	25	12	2	78	19
JAN												
23...	1245	1700	250	7.2	.0	11.0	77	30	20	<1	100	26
FEB												
18...	1020	1480	175	7.4	.5	11.8	84	5	2	<1	98	6
APR												
02...	1115	8120	80	7.3	1.0	12.0	87	15	4	5	40	6
30...	1130	4060	110	7.6	7.5	11.6	98	13	3	13	57	13
MAY												
26...	1100	1860	144	7.8	15.0	9.1	91	24	6	<1	77	13
JUN												
24...	1400	1220	166	7.5	22.5	8.1	95	72	28	2	92	18
JUL												
21...	1430	995	--	8.0	23.5	--	--	31	46	14	100	18
AUG												
26...	1500	508	200	7.5	23.0	8.3	98	120	5	9	100	6
SEP												
21...	1100	601	198	7.9	15.0	9.8	98	41	38	24	96	24

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT												
17...	27	6.1	1.4	.1	.7	118	0	97	3.0	23	1.4	.3
NOV												
14...	21	4.9	1.1	.1	.8	76	0	62	4.8	16	2.4	.2
DEC												
12...	23	5.1	1.1	.1	.6	72	0	59	5.8	22	1.9	.2
JAN												
23...	31	6.4	4.2	.2	.8	90	0	74	9.1	26	2.4	.1
FEB												
18...	29	6.2	1.6	.1	.7	112	0	92	7.1	23	1.8	.2
APR												
02...	11	3.0	.9	.1	.5	42	0	34	3.4	9.0	2.0	.1
30...	17	3.5	.8	.0	.4	54	0	44	2.2	14	1.6	.1
MAY												
26...	22	5.4	.8	.0	.6	78	0	64	2.0	22	2.1	.1
JUN												
24...	27	6.0	1.2	.1	.7	90	0	74	4.6	22	.7	.1
JUL												
21...	27	7.8	1.1	.0	.7	100	0	82	1.6	25	1.1	.1
AUG												
26...	29	7.4	1.3	.1	.7	114	0	94	5.8	28	3.1	.1
SEP												
21...	28	6.4	1.3	.1	.7	88	0	72	1.8	26	2.9	.1

04057004 MANISTIQUE RIVER ABOVE MANISTIQUE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT											
17...	7.1	125	126	348	.14	.47	2.1	.01	5	14	100
NOV											
14...	6.4	98	90	534	.19	.73	3.2	.01	6	33	100
DEC											
12...	6.4	106	96	753	.12	.60	2.7	.01	5	36	100
JAN											
23...	7.6	128	123	--	.11	.36	1.6	.02	--	--	--
FEB											
18...	7.9	142	126	567	.12	.58	2.6	.01	6	24	100
APR											
02...	5.0	--	52	--	.25	.80	3.5	.03	12	263	100
30...	3.9	82	68	899	.10	.53	2.3	.02	5	55	100
MAY											
26...	4.2	102	96	512	.05	.48	2.1	.02	3	15	100
JUN											
24...	5.5	122	108	402	.06	.51	2.3	.04	4	13	100
JUL											
21...	6.1	121	118	325	.07	.37	1.6	.01	6	16	100
AUG											
26...	6.5	129	132	177	.07	.37	1.6	.02	5	6.9	100
SEP											
21...	6.1	121	115	196	.06	.29	1.3	.02	3	4.9	100

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
OCT												
17...	1100	0	0	1	0	<10	0	0	0	6	1	1000
JAN												
23...	1245	0	0	1	0	<10	10	0	0	14	1	680
APR												
30...	1130	0	0	1	1	10	<10	1	1	10	0	630
JUL												
21...	1430	3	0	1	1	<10	<10	0	0	10	0	600

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT												
17...	380	8	0	30	30	.0	.0	0	0	20	10	9.6
JAN												
23...	370	19	0	20	20	.2	.0	0	0	120	10	7.2
APR												
30...	400	10	6	30	20	<.5	<.5	0	0	--	30	13
JUL												
21...	240	7	7	30	10	<.5	<.5	1	0	30	10	5.9

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
PERIPHYTON

DATE	LENGTH OF EXPO-SURE (DAYS)	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M	UNCOR-RECTED PERI-PHYTON CHLORO-PHYLL A MG/SQ M	UNCOR-RECTED PERI-PHYTON CHLORO-PHYLL B MG/SQ M
NOV					
14...	28	11.0	5.50	1.00	.100
FEB					
18...	26	2.20	.900	.700	.100
MAY					
26...	26	.692	.308	.121	.000

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

NOV. 14, 1975
1300 HOURS

IDENTIFICATION OF PHYTOPLANKTON

11,000 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
L	....SCENEDESMUS			0
	..ZYGNEMATALES			
	...DESMIDIACEAE	PLACODERM DESMIDS		
L	....STAURASTRUM			0
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		110	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		110	1
	...NITZSCHIACEAE			
	....NITZSCHIA		56	1
		TOTALS	280	3
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....ANACYSTIS		11,000	98
		TOTALS	11,000	98

04057004 MANISTIQUE RIVER ABOVE MANISTIQUE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DEC. 12, 1975
1045 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,400 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...HYDRODICTYACEAE			
L	....PEDIASTRUM			0
	...SCENEDESMACEAE			
	....SCENEDESMUS		50	3
		TOTALS	50	3
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
L	....CYCLOTELLA			0
L	....MELOSIRA			0
	...RHIZOSOLENIACEAE			
L	....RHIZOSOLENIA			0
	..PENNALES	PENNATE		
	...CYMBELLACEAE			
L	....CYMBELLA			0
	...FRAGILARIACEAE			
	....ASTERIONELLA		120	9
L	....FRAGILARIA			0
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NITZSCHIACEAE			
L	....NITZSCHIA			0
		TOTALS	120	9
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....DINOBRYON		75	5
		TOTALS	75	5
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
L	....AGMENELLUM			0
D	....ANACYSTIS		1,200	83
		TOTALS	1,200	83

JAN. 23, 1976
1245 HOURS

50 CELLS/ML

	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
L	....CRUCIGENIA			0
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		6	11
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....ACHNANTHES			0
	...FRAGILARIACEAE			
	....ASTERIONELLA		6	11
D	....SYNEDRA		17	33
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		6	11
	...NITZSCHIACEAE			
D	....NITZSCHIA		17	33
		TOTALS	50	99
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
L	....AGMENELLUM			0
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
L	....OSCILLATORIA			0

04057004 MANISTIQUE RIVER ABOVE MANISTIQUE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

FEB. 18, 1976
1020 HOURS

IDENTIFICATION OF PHYTOPLANKTON

250 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...HYDRODICTYACEAE				
D	....PEDIASTRUM			97	39
	...OOCYSTACEAE				
	....WESTELLA			12	5
	...SCENEDESMACEAE				
	....SCENEDESMUS			12	5
			TOTALS	120	49
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....MELOSIRA			30	12
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			12	5
	...DIATOMACEAE				
	....DIATOMA			24	10
	...FRAGILARIACEAE				
L	....ASTERIONELLA				0
	....FRAGILARIA			24	10
	...GOMPHONEMATACEAE				
L	....GOMPHONEMA				0
	...MERIDIONACEAE				
L	....MERIDION				0
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			24	10
	...NITZSCHIACEAE				
	....NITZSCHIA			12	5
			TOTALS	130	52

APR. 2, 1976
1115 HOURS

270 CELLS/ML

	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			7	3
	...SCENEDESMACEAE				
	....SCENEDESMUS			21	8
			TOTALS	28	11
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			11	4
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			21	8
	...CYMBELLACEAE				
	....AMPHORA			4	1
	....CYMBELLA			11	4
	...DIATOMACEAE				
	....DIATOMA			4	1
	...FRAGILARIACEAE				
	....ASTERIONELLA			4	1
D	....FRAGILARIA			60	22
	....SYNEDRA			11	4
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			4	1
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			7	3
	...NITZSCHIACEAE				
	....NITZSCHIA			4	1
			TOTALS	140	50
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..OSCILLATORIALES	FILAMENTOUS			
	...OSCILLATORIACEAE				
D	....OSCILLATORIA			110	39
			TOTALS	110	39

APR. 30, 1976
1130 HOURS

IDENTIFICATION OF PHYTOPLANKTON

380 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....SELENASTRUM		4	1
	...SCENEDESMACEAE			
L	....SCENEDESMUS			0
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		46	12
		TOTALS	50	13
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		18	5
	....MELOSIRA		39	10
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		4	1
	....COCCONEIS		7	2
	...DIATOMACEAE			
	....DIATOMA		4	1
	...EUNOTIACEAE			
	....EUNOTIA		7	2
	...FRAGILARIACEAE			
	....FRAGILARIA		11	3
	....SYNEDRA		18	5
	...MERIDIONACEAE			
	....MERIDION		4	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		14	4
	...NITZSCHIACEAE			
D	....NITZSCHIA		85	23
		TOTALS	210	57
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....DINOBRYON		4	1
		TOTALS	4	1
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....AGMENELLUM		96	25
	....ANACYSTIS		14	4
		TOTALS	110	29
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...GLENODINIACEAE			
	....GLENODINIUM		4	1
		TOTALS	4	1

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAY 26, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

4,100 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		28	1
L	....CHODATELLA			0
L	....TETRAEDRON			0
	...SCENEDESMACEAE			
	....CRUCIGENIA		56	1
	....SCENEDESMUS		84	2
	..TETRASPORALES			
	...COCCOMYXACEAE			
	....ELAKATOTHRIX		28	1
	...PALMELLACEAE			
L	....SPHAEROCYSTIS			0
		TOTALS	240	5
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		140	3
	....MELOSIRA		140	3
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		42	1
	...CYMBELLACEAE			
L	....CYMBELLA			0
	...FRAGILARIACEAE			
	....ASTERIONELLA		42	1
L	....SYNEDRA			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		42	1
	...NITZSCHIACEAE			
	....NITZSCHIA		210	5
	...TABELLARIACEAE			
	....TABELLARIA		28	1
		TOTALS	670	15
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...MALLOMONADACEAE			
L	....MALLOMONAS			0
	...OCHROMONADACEAE			
	....DINOBRYON		28	1
		TOTALS	28	1
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....ANACYSTIS		3,100	77
		TOTALS	3,100	77

04057004 MANISTIQUE RIVER ABOVE MANISTIQUE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JUNE 24, 1976
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

41,000 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....SCENEDESMUS		370	1
		TOTALS	370	1
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		370	1
	...RHIZOSOLENIACEAE			
L	....RHIZOSOLENIA			0
	..PENNALES	PENNATE		
	...NITZSCHIACEAE			
L	....NITZSCHIA			0
		TOTALS	750	1
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS			
D	.....A.INSERTA		39,000	97
		TOTALS	39,000	97
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
L	....CRYPTOMONAS			0
		TOTALS	190	0

JULY 21, 1976
1430 HOURS

8,300 CELLS/ML

	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		130	2
	....DICTYOSPHAERIUM		1,100	13
	....KIRCHNERIELLA		130	2
	...SCENEDESMACEAE			
	....SCENEDESMUS		530	6
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		44	1
		TOTALS	1,900	24
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		310	4
	....MELOSIRA		44	1
	..PENNALES	PENNATE		
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		44	1
	...NITZSCHIACEAE			
	....NITZSCHIA		130	2
	...SURIRELLACEAE			
	....SURIRELLA		44	1
		TOTALS	580	9
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS			
D	.....A.INSERTA		1,800	21
L	....AGMENELLUM			0
	....ANACYSTIS		270	3
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		3,800	45
		TOTALS	5,800	69

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

AUG. 26, 1976
1500 HOURS

IDENTIFICATION OF PHYTOPLANKTON

9,200 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		180	2
	....DICTYOSPHAERIUM		540	6
	...SCENEDESMACEAE			
	....CRUCIGENIA		180	2
	....SCENEDESMUS		90	1
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
L	....CHLAMYDOMONAS			0
	..ZYGNEMATALES			
	...DESMIDIACEAE	PLACODERM DESMIDS		
	....SPONDYLOSIUM		90	1
L	....STAURASTRUM			0
		TOTALS	1,200	12
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		180	2
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....ACHNANTHES			0
	...FRAGILARIACEAE			
	....SYNEDRA		90	1
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		90	1
	...NITZSCHIACEAE			
	....NITZSCHIA		220	2
		TOTALS	670	6
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....DINOBRYON		90	1
		TOTALS	90	1
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS			
D	.....A.INSERTA		6,900	75
	....ANACYSTIS		180	2
		TOTALS	7,100	77
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		220	2
		TOTALS	220	2

04057004 MANISTIQUE RIVER ABOVE MANISTIQUE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

SEP. 21, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,800 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
L	....ANKISTRODESMUS			0
	...SCENEDESMACEAE			
L	....CRUCIGENIA			0
	....SCENEDESMUS		32	2
		TOTALS	32	2
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		16	1
	....MELOSIRA		260	14
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		16	1
	...NITZSCHIACEAE			
	....NITZSCHIA		110	6
		TOTALS	400	22
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
L	....ANACYSTIS			0
D	....GOMPHOSPHAERIA		960	53
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
D	....ANABAENA		430	24
		TOTALS	1,400	77

NOTE: D - DOMINANT ORGANISM; GREATER OR EQUAL TO 15%
L - LESS THEN 1%; MAY NOT HAVE BEEN ACTUALLY COUNTED

04057004 MANISTIQUE RIVER ABOVE MANISTIQUE, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	197	214	155	174	206	189	115	127	173	199	198	204
2	197	213	155	177	214	190	---	127	166	203	196	204
3	195	---	155	179	203	197	115	127	166	203	196	204
4	201	---	155	185	201	191	100	127	166	195	195	205
5	197	---	155	166	200	195	100	139	166	195	208	204
6	---	---	---	168	200	201	94	139	166	195	201	203
7	---	---	---	167	199	198	104	140	174	195	200	203
8	212	203	155	173	200	199	91	140	175	200	195	206
9	223	---	155	141	200	194	92	143	174	199	195	205
10	216	201	155	175	199	192	---	141	178	196	196	205
11	---	---	157	172	201	195	116	146	183	199	194	205
12	---	198	162	175	202	191	77	147	187	194	196	206
13	---	---	161	178	199	195	80	147	187	194	204	207
14	---	---	167	175	195	193	81	150	193	185	194	207
15	220	---	171	175	194	192	94	151	193	186	207	207
16	211	---	163	174	194	202	98	151	190	186	204	207
17	208	158	153	173	195	200	97	140	190	187	204	206
18	---	167	153	169	195	191	91	139	190	182	204	205
19	---	164	163	166	195	192	100	138	190	182	204	206
20	209	---	163	170	196	188	94	143	195	187	204	216
21	215	182	163	172	193	188	99	145	203	187	205	200
22	215	186	166	172	195	191	112	139	195	187	204	200
23	214	---	165	173	189	176	91	139	190	205	204	200
24	219	---	165	187	196	165	97	146	199	205	205	200
25	---	---	169	200	192	177	116	160	196	206	209	200
26	---	186	168	198	192	165	116	160	202	196	203	200
27	221	186	168	198	195	161	114	161	197	192	204	200
28	214	207	170	202	191	142	114	168	197	192	206	205
29	218	156	170	202	189	137	114	166	197	196	209	205
30	212	156	169	198	---	126	117	168	193	196	203	207
31	214	---	170	196	---	128	---	173	---	196	204	---
MAX	---	---	171	202	214	202	117	173	203	206	209	216
MIN	---	---	153	141	189	126	77	127	166	182	194	200

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
ONCE-DAILY

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

04057510 STURGEON RIVER NEAR NAHMA JUNCTION, MI

LOCATION.--Lat 45°56'35", long 86°42'20", in SW¼ SE¼ sec.17, T.41 N., R.19 W., Delta County, Hydrologic Unit 04030112, Hiawatha National Forest, on left bank 30 ft (9 m) upstream from bridge on Forest Service Road 2231, 500 ft (152 m) downstream from Mormon Creek, 0.1 mi (0.2 km) east of Federal Forest Highway 13, and 3.2 mi (5.1 km) north of Nahma Junction.

DRAINAGE AREA.--183 mi^2 (474 km^2).

PERIOD OF RECORD.--October 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 610.99 ft (186.230 m) above mean sea level.

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--10 years, 204 ft^3/s (5.777 m^3/s), 15.14 in/yr (385 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,580 ft^3/s (44.7 m^3/s) Apr. 18, 1971, Apr. 30, 1972, gage height, 9.85 ft (3.002 m); minimum, 35 ft^3/s (0.991 m^3/s) Sept. 11, 12, 13, 14, 1976, gage height, 3.58 ft (1.091 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 975 ft^3/s (27.6 m^3/s) Apr. 18, gage height, 7.84 ft (2.390 m); minimum, 35 ft^3/s (0.991 m^3/s) Sept. 11, 12, 13, 14, gage height, 3.58 ft (1.091 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	101	99	469	165	115	100	600	309	377	77	56	43
2	98	95	376	165	115	105	650	308	309	72	50	40
3	96	91	340	160	110	105	708	294	254	68	47	40
4	93	88	310	160	110	105	706	279	212	66	46	39
5	91	85	290	155	110	105	726	273	181	64	50	39
6	87	84	270	150	110	105	782	286	158	62	53	39
7	84	84	250	145	110	105	876	295	142	62	53	39
8	82	91	230	140	105	105	924	272	132	61	50	37
9	82	97	210	135	105	105	917	252	140	59	48	37
10	80	176	190	130	105	105	926	232	142	61	46	37
11	81	277	180	130	100	105	889	214	129	61	49	36
12	81	270	170	125	100	105	818	197	119	61	57	36
13	82	263	160	125	98	110	766	186	113	59	63	35
14	81	229	433	120	98	110	761	202	107	58	59	38
15	84	202	639	120	98	115	820	211	105	58	57	44
16	82	181	586	120	100	120	895	331	123	60	55	44
17	80	168	470	120	100	125	950	534	116	58	52	43
18	78	159	410	120	100	130	971	471	107	56	50	43
19	76	155	370	120	100	140	946	407	117	54	49	42
20	76	156	330	120	100	200	859	367	110	56	47	44
21	76	222	280	120	100	250	763	324	100	56	46	45
22	75	235	250	120	100	240	709	281	92	53	44	43
23	99	209	230	120	100	230	641	245	88	52	42	43
24	149	183	220	120	100	250	577	219	83	50	42	43
25	159	172	210	115	100	270	518	200	83	48	41	43
26	145	165	200	115	100	290	462	186	79	49	41	42
27	132	160	190	115	100	330	416	177	76	48	42	42
28	123	155	185	115	100	370	378	164	74	46	40	42
29	115	166	180	115	100	400	343	159	90	47	38	42
30	108	397	175	115	---	470	316	167	87	49	38	41
31	102	---	170	115	---	550	---	264	---	78	40	---
TOTAL	2978	5114	8973	4010	2989	5955	21613	8306	4045	1809	1491	1221
MEAN	96.1	170	289	129	103	192	720	268	135	58.4	48.1	40.7
MAX	159	397	639	165	115	550	971	534	377	78	63	45
MIN	75	84	160	115	98	100	316	159	74	46	38	35
CFSM	.53	.93	1.58	.70	.56	1.05	3.93	1.46	.74	.32	.26	.22
IN.	.61	1.04	1.82	.82	.61	1.21	4.39	1.69	.82	.37	.30	.25

CAL YR 1975 TOTAL 72116 MEAN 198 MAX 1190 MIN 43 CFSM 1.08 IN 14.66
WTR YR 1976 TOTAL 68504 MEAN 187 MAX 971 MIN 35 CFSM 1.02 IN 13.93

04057800 MIDDLE BRANCH ESCANABA RIVER AT HUMBOLDT, MI

LOCATION.--Lat 46°29'57", long 87°53'11", in SW¼ sec.1, T.47 N., R.29 W., Marquette County, Hydrologic Unit 04030110, on left bank 15 ft (5 m) upstream from county highway, 0.3 mi (0.5 km) north of Humboldt, and 1.5 mi (2.4 km) downstream from Halfway Creek.

DRAINAGE AREA.--46.0 mi^2 (119.1 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1959 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. V-notch sharp-crested weir since Oct. 3, 1960. Datum of gage is 1,521.20 ft (463.662 m) above mean sea level (Cleveland-Cliffs Iron Co. bench mark). Prior to Sept. 1, 1960, nonrecording gage at same site and datum.

REMARKS.--Water-discharge record good. From July 1960 to June 1972, some diversion 100 ft (30 m) above station by industry for iron ore processing; figures of runoff adjusted.

AVERAGE DISCHARGE.--17 years, 60.9 ft^3/s (1.725 m^3/s), 17.98 in/yr (457 mm/yr), adjusted for diversion 1960 to 1972.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,640 ft^3/s (46.4 m^3/s) Apr. 24, 1960, gage height, 8.30 ft (2.530 m), from floodmark; minimum, 4.0 ft^3/s (0.11 m^3/s) Sept. 12, 1976; minimum gage height, 1.07 ft (0.326 m) Aug. 24, 1960.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 862 ft^3/s (24.4 m^3/s) Apr. 17, gage height, 6.43 ft (1.960 m); minimum, 4.0 ft^3/s (0.11 m^3/s) Sept. 12, gage height, 1.46 ft (0.445 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	17	135	37	27	25	169	118	64	15	6.7	4.9
2	14	16	130	36	27	25	183	118	53	12	6.6	4.9
3	14	15	114	37	27	26	202	119	46	12	6.3	4.9
4	14	15	94	38	27	26	202	111	41	11	6.6	4.7
5	13	14	87	37	27	27	214	126	37	11	8.0	4.7
6	13	14	90	35	26	27	234	117	32	10	7.3	4.8
7	12	14	75	33	26	27	266	98	29	11	6.6	4.7
8	12	21	66	32	26	27	277	86	28	11	6.3	4.4
9	13	20	60	31	26	26	277	78	30	16	6.0	4.6
10	12	38	54	30	26	26	292	73	27	20	6.7	4.6
11	12	73	52	30	25	26	268	64	25	15	7.5	4.4
12	12	70	49	29	24	27	264	60	21	13	6.6	4.2
13	12	94	47	29	24	27	257	57	35	11	6.5	4.3
14	12	87	73	29	23	27	286	64	33	14	6.4	5.0
15	13	66	106	29	25	28	481	60	28	12	6.0	5.0
16	14	57	93	28	26	30	692	84	28	11	5.7	4.9
17	14	55	71	28	26	32	796	126	26	10	5.5	4.8
18	13	55	62	28	25	31	774	98	27	9.3	5.5	4.7
19	13	59	59	28	26	35	644	75	31	8.8	5.4	4.8
20	12	91	56	28	25	57	460	67	26	13	5.3	5.3
21	12	100	52	28	25	71	342	59	24	11	4.9	6.3
22	12	92	48	28	23	69	371	54	22	9.4	4.9	6.2
23	21	80	46	28	23	65	441	49	18	8.7	4.7	5.6
24	27	70	43	28	23	72	338	47	16	8.1	4.8	5.2
25	37	64	42	28	25	79	258	45	16	7.6	4.6	4.9
26	33	58	41	28	26	83	205	42	16	7.8	4.6	4.9
27	26	54	41	27	27	94	168	39	14	7.4	4.8	4.9
28	22	50	40	27	26	108	141	37	14	7.1	4.8	4.9
29	20	46	39	28	26	106	120	35	15	7.1	4.6	4.9
30	19	69	40	28	---	132	110	45	26	7.0	4.7	4.9
31	18	---	39	27	---	164	---	71	---	7.1	4.8	---
TOTAL	505	1574	2044	937	738	1625	9732	2322	848	334.4	179.7	147.3
MEAN	16.3	52.5	65.9	30.2	25.4	52.4	324	74.9	28.3	10.8	5.80	4.91
MAX	37	100	135	38	27	164	796	126	64	20	8.0	6.3
MIN	12	14	39	27	23	25	110	35	14	7.0	4.6	4.2
CFSM	.35	1.14	1.43	.66	.55	1.14	7.04	1.63	.62	.23	.13	.11
IN.	.41	1.27	1.65	.76	.60	1.31	7.87	1.88	.69	.27	.15	.12

CAL YR 1975 TOTAL 22503.0 MEAN 61.7 MAX 635 MIN 6.6 CFSM 1.34 IN 18.20
WTR YR 1976 TOTAL 20986.4 MEAN 57.3 MAX 796 MIN 4.2 CFSM 1.25 IN 16.97

04057800 MIDDLE BRANCH ESCANABA RIVER AT HUMBOLDT, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: November 1972 to current year.

INSTRUMENTATION.--Temperature recorder since Nov. 10, 1972.

REMARKS.--Complete ice cover during winter period.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 25.5°C July 30, 31, 1975; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 24.0°C June 14; minimum, 0.0°C on many days during winter period.

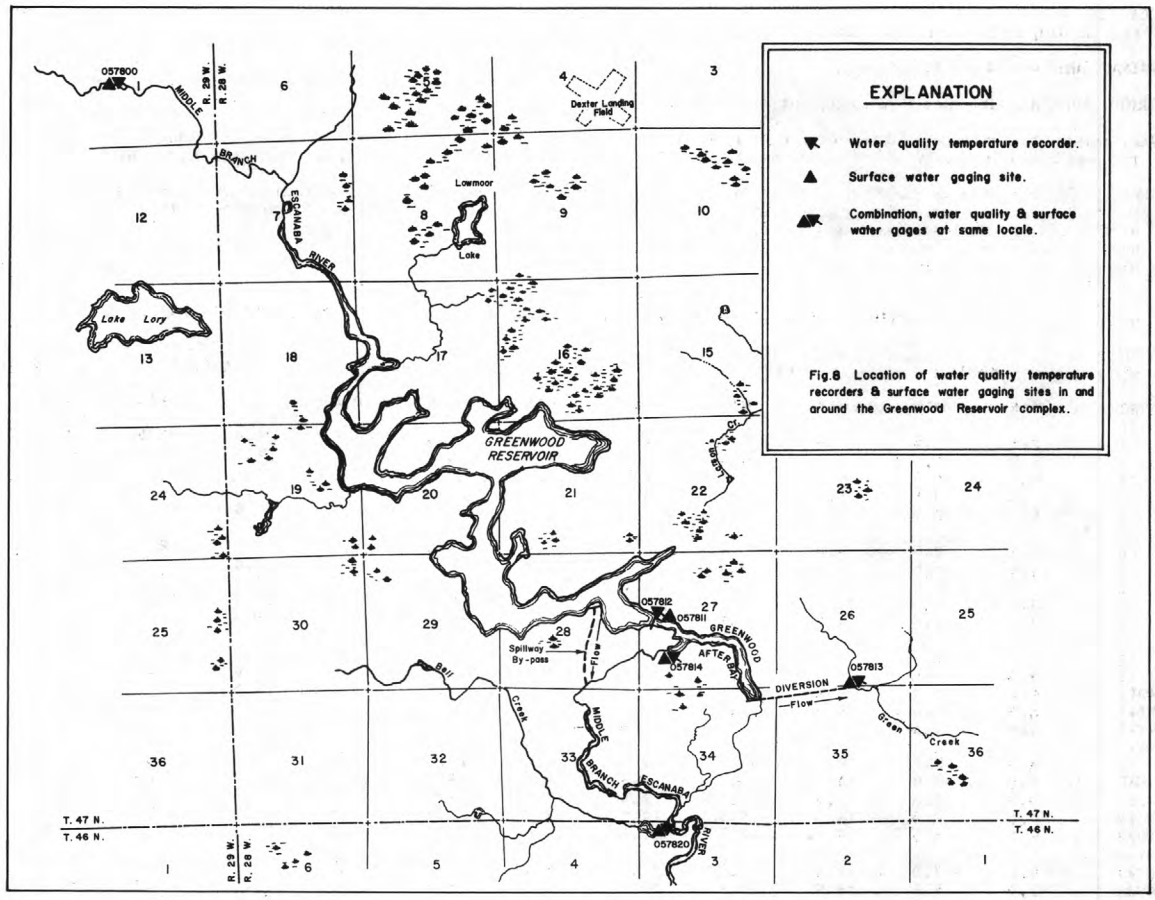
TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04057800 MIDDLE BRANCH ESCANABA RIVER AT HUMBOLDT, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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



Greenwood Reservoir is formed by an earth/rockfill main dam (Greenwood Dam) and several earthfill dikes surrounding the storage area. Storage began Dec. 22, 1972, and the fixed-crest concrete spillway was completed in September 1973. The usable capacity of the reservoir is 23,300 acre-ft (28.7 hm^3) at a spillway elevation of 1515 ft (461.8 m). At pool elevation exceeding 1515 ft (461.8 m), water flows over the spillway into the Middle Branch Escanaba River below Greenwood Release (04057814). At lower pool elevations, outflow from Greenwood Reservoir into Greenwood Afterbay is completely regulated by the multiport outlet of Greenwood Dam. Greenwood Afterbay has two outlets; one for diversion by pipeline into Green Creek and the second for releasing flows to Middle Branch Escanaba River. Water temperatures are measured directly below Greenwood Dam (Greenwood Afterbay, 04057813), and the gaging station below the release from the afterbay to Middle Branch Escanaba River (Greenwood Release, 04057814).

04057811 GREENWOOD RESERVOIR NEAR GREENWOOD, MI

LOCATION.--Lat 46°26'32", long 87°48'02", in NW¼ SW¼ sec.27, T.47 N., R.28 W., Marquette County, Hydrologic Unit 04030110, at downstream side of dam, on Middle Branch Escanaba River, 3.7 mi (6.0 km) southwest of Greenwood.

DRAINAGE AREA.--67.4 mi^2 (174.6 km^2).

PERIOD OF RECORD.--December 1972 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft (246.720 m) above mean sea level (levels by Cleveland Cliffs Iron Co.). Gage readings have been converted to elevations above mean sea level. Prior to Feb. 20, 1973, nonrecording gage at same site and datum.

REMARKS.--The reservoir is formed by an earth/rockfill main dam and several earthfill dykes surrounding the storage area. Storage began Dec. 22, 1972. The fixed-crest concrete spillway was completed in September 1973. The usable capacity of the reservoir is 23,300 acre-ft (28.7 hm^3) at spillway elevation 1,515 ft (461.8 m). Above elevation of 1,515 ft (461.8 m), water flows over concrete spillway into Middle Branch Escanaba River about 2,000 ft (610 m) below sta 04057814. The main dam is equipped with an outlet structure with 4 valves to control flow to afterbay (conservation pool) which has a capacity of 420 acre-ft (518,000 m^3) at elevation 1,480 ft (451.1 m). Two outlet systems from the afterbay provide for diversion and release flow. Diverted flow gaged at Greenwood Diversion (see sta 04057813); released flow to Middle Branch Escanaba River gaged at Greenwood Release (see sta 04057814). Reservoir impounds water for diversion to Schweitzer Reservoir (see sta 04058190), for use in iron ore processing.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 25,260 acre-ft (31.1 hm^3) Apr. 18, 1976, elevation, 1,516.4 ft (462.20 m); minimum since first filling, 14,900 acre-ft (18.4 hm^3) Sept. 30, 1976, elevation, 1,507.9 ft (459.61 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 25,260 acre-ft (31.1 hm^3) Apr. 18, elevation, 1,516.4 ft (462.20 m); minimum, 14,900 acre-ft (18.4 hm^3) Sept. 30, elevation, 1,507.9 ft (459.61 m).

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)	Change in contents (equivalent in ft^3/s)
Sept. 30	1511.9	19380	--	--
Oct. 31	1511.4	18780	-600	-9.8
Nov. 30	1513.6	21480	+2700	+45.4
Dec. 31	1515.1	23440	+1960	+31.9
CAL YR 1975	--	--	+400	+.6
Jan. 31	1515.0	23300	-140	-2.3
Feb. 29	1514.8	23040	-260	-4.5
Mar. 31	1515.4	23860	+820	+13.3
Apr. 30	1515.5	24000	+140	+2.4
May 31	1515.2	23580	-420	-6.8
June 30	1514.5	22650	-930	-15.6
July 31	1512.7	20340	-2310	-37.6
Aug. 31	1510.3	17460	-2880	-46.8
Sept. 30	1507.9	14900	-2560	-43.0
WTR YR 1976	--	--	-4480	-6.2

04057812 GREENWOOD AFTERBAY NEAR GREENWOOD, MI

LOCATION.--Lat 46°26'32", long 87°48'02", in NW¼ SW¼ sec.27, T.47 N., R.28 W., Marquette County, Hydrologic Unit 04030110, in control house on downstream side of Greenwood Dam on the Middle Branch Escanaba River, 3.5 miles (5.6 km) southwest of Greenwood.

DRAINAGE AREA.--67.4 mi^2 (174.6 km^2).

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: January 1973 to current year.

INSTRUMENTATION.--Temperature recorder since Jan. 31, 1973.

REMARKS.--Temperature recorder clock stopped Sept. 1-12 (range in temperature 16.5 to 17.0°C). Flow regulated by the multi-port outlets of Greenwood Reservoir. Altitude of outlets are: (No. 1) 1,505 ft (458.7 m), (No. 2) 1,495 ft (455.7 m), (No. 3) 1,485 ft (452.6 m), (No. 4) 1,478 ft (450.5 m) above mean sea level. Outlets open were: Oct. 1 to Dec. 18, No. 3; Dec. 18 to Apr. 30, No. 4; Apr. 30 to June 18, No. 1; June 18 to July 6, No. 2; July 6 to Aug. 23, No. 3 and Aug. 23 to Sept. 30, Nos. 3 and 4.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 24.5°C July 14, 15, 1974; minimum, freezing point on many days during January to March 1973.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 20.0°C June 11, 15, 16; minimum, 2.0°C Apr. 5-16.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	13.5	13.0	8.5	8.5	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5
2	13.0	12.5	8.5	8.5	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5
3	13.0	12.5	8.5	8.5	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5
4	12.5	12.5	8.5	8.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5
5	12.5	12.0	8.0	8.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5
6	12.5	12.0	8.0	8.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5
7	12.0	12.0	8.0	8.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5
8	12.0	12.0	8.5	8.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5
9	12.0	12.0	8.5	8.5	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5
10	12.0	12.0	8.5	8.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5
11	12.0	11.5	8.0	7.5	3.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5
12	11.5	11.5	7.5	7.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
13	11.5	11.5	7.0	6.5	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
14	11.5	11.5	6.5	5.5	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
15	11.5	11.5	5.5	5.5	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
16	11.5	11.0	5.5	5.5	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
17	11.0	11.0	5.5	5.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
18	11.0	10.5	5.0	5.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
19	11.5	10.5	5.0	5.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
20	10.5	10.5	5.0	5.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
21	10.5	10.0	5.0	4.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
22	10.0	10.0	4.0	3.5	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
23	10.0	10.0	3.5	3.5	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
24	10.0	10.0	3.5	3.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
25	10.0	9.5	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
26	9.5	9.5	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
27	9.5	9.5	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
28	9.5	9.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
29	9.0	9.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5
30	9.0	9.0	3.0	3.0	3.0	3.0	3.0	3.0	---	---	2.5	2.5
31	9.0	8.5	---	---	3.0	3.0	3.0	3.0	---	---	2.5	2.5
MONTH	13.5	8.5	8.5	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5

04057812 GREENWOOD AFTERBAY NEAR GREENWOOD, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	2.5	2.5	7.0	7.0	15.5	14.5	17.5	17.5	16.5	16.0	---	---
2	2.5	2.5	7.0	6.5	15.5	15.0	17.5	17.5	16.5	16.5	---	---
3	2.5	2.5	6.5	6.5	16.0	15.5	18.0	17.5	16.5	16.5	---	---
4	2.5	2.5	7.0	6.5	16.5	16.0	18.0	18.0	16.5	16.5	---	---
5	2.5	2.0	7.0	6.5	16.5	16.0	18.0	18.0	16.5	16.5	---	---
6	2.0	2.0	7.5	6.5	17.5	16.0	18.0	12.0	16.5	16.5	---	---
7	2.0	2.0	7.0	7.0	18.5	17.0	12.5	12.0	16.5	16.0	---	---
8	2.0	2.0	7.5	7.0	18.5	18.0	12.5	12.0	16.5	16.0	---	---
9	2.0	2.0	7.5	7.0	19.0	18.0	13.0	12.0	16.5	16.0	---	---
10	2.0	2.0	8.5	7.5	19.5	18.0	13.0	12.5	16.5	16.5	---	---
11	2.0	2.0	9.0	8.0	20.0	19.0	13.0	12.5	16.5	16.5	---	---
12	2.0	2.0	9.5	8.5	19.0	16.5	13.5	13.0	16.5	16.5	---	---
13	2.0	2.0	9.5	8.5	19.0	16.5	13.5	13.5	16.5	16.5	16.5	16.5
14	2.0	2.0	10.5	9.0	19.5	18.5	14.0	13.5	17.0	16.5	16.5	16.5
15	2.0	2.0	10.0	9.5	20.0	19.5	14.5	14.0	17.0	17.0	16.5	16.5
16	2.5	2.0	11.5	10.0	20.0	19.0	14.5	14.0	17.0	16.5	16.5	16.5
17	3.0	2.5	11.5	10.5	19.0	18.0	15.0	14.5	17.0	16.5	16.5	16.5
18	3.5	3.0	11.0	10.5	18.0	14.5	15.0	14.5	17.0	17.0	16.5	16.5
19	4.0	3.5	11.5	11.0	15.5	14.5	15.0	14.5	17.5	17.0	16.5	16.5
20	4.0	4.0	13.5	11.0	15.0	15.0	15.5	15.0	17.5	17.5	16.5	16.5
21	4.5	4.0	14.0	13.0	15.5	15.0	15.5	15.0	17.5	17.5	16.0	16.0
22	5.0	4.5	14.0	13.5	15.5	15.5	15.5	15.5	17.5	17.5	16.0	15.5
23	5.0	5.0	14.0	13.5	15.5	15.5	15.5	15.5	17.5	13.5	15.5	15.0
24	5.5	5.0	14.0	14.0	15.5	15.5	15.5	15.5	13.5	13.5	15.0	14.5
25	5.5	5.5	14.0	14.0	16.0	15.5	15.5	15.5	14.0	13.5	14.0	13.5
26	5.5	5.5	14.5	14.0	16.5	16.0	16.0	15.5	14.0	14.0	13.5	13.5
27	6.0	5.5	15.0	14.0	17.0	16.0	16.0	15.5	14.5	14.0	13.5	13.5
28	6.5	6.0	15.0	14.0	17.0	16.5	16.0	15.5	15.0	14.5	13.5	13.0
29	6.0	6.0	15.0	15.0	17.0	17.0	16.0	16.0	15.5	15.0	13.0	13.0
30	7.0	6.0	15.0	14.5	18.0	17.0	16.0	16.0	15.5	15.5	13.0	13.0
31	---	---	15.0	14.5	---	---	16.5	16.0	16.0	15.5	---	---
MONTH	7.0	2.0	15.0	6.5	20.0	14.5	18.0	12.0	17.5	13.5	---	---

04057813 GREENWOOD DIVERSION NEAR GREENWOOD, MI

LOCATION.--Lat 46°26'04", long 87°46'10", in NW¼ NE¼ sec.35, T.47 N., R.28 W., Marquette County, Hydrologic Unit 04030110, on left bank at downstream end of pipeline, 200 ft (61 m) upstream from Green Creek, 0.7 mi (1.1 km) downstream from Greenwood Afterbay, and 3.6 mi (5.8 km) south of Greenwood.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1972 to current year.

GAGE.--Water-stage recorder and concrete flume. Altitude of gage is 1,460 ft (445 m) from topographic map (nearest 10 ft). Prior to Aug. 22, 1973, nonrecording gage at same site and datum.

REMARKS.--Water-discharge record good. Flow completely regulated. A pipeline, 0.7 mi (1.1 km) long, diverts water from Greenwood Reservoir (see sta 04057811) into Green Creek, tributary to Schweitzer Reservoir (see sta 04058190). Water is used for iron ore processing and some returned to Middle Branch Escanaba River via another Green Creek (tributary to Middle Branch Escanaba River); 27 mi (43 km) below station.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 28 ft^3/s (0.79 m^3/s) Sept. 6-11, 1974, Jan. 7, 13, 14, 1975; no flow Dec. 27, 1972 to Jan. 6, 1973.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.6	16	10	6.8	6.7	11	12	11	12	11	11	19
2	5.6	16	6.9	6.8	6.8	11	12	11	12	11	11	19
3	5.6	16	6.8	6.8	6.8	11	12	11	12	11	11	20
4	5.6	16	6.7	6.8	6.8	11	12	11	12	11	11	21
5	5.6	16	6.6	6.8	6.8	11	12	11	12	11	11	21
6	5.6	16	6.6	6.8	6.8	11	12	11	12	11	11	21
7	5.6	16	6.5	6.9	6.8	11	12	11	12	11	11	21
8	5.6	16	6.4	6.9	6.8	11	12	11	12	11	11	21
9	5.6	16	6.4	6.8	7.6	11	12	11	11	12	13	21
10	7.1	16	6.4	6.8	8.8	11	12	11	11	12	15	21
11	9.5	16	6.4	6.8	8.8	11	12	11	11	12	15	21
12	9.5	16	6.3	6.8	8.7	11	12	11	11	12	15	21
13	9.3	16	6.3	6.8	8.7	11	12	11	11	12	15	21
14	9.3	16	6.4	6.8	8.6	11	12	11	11	12	15	21
15	9.3	16	6.4	6.8	8.6	11	12	11	11	12	15	21
16	9.2	16	6.4	6.8	8.5	11	12	12	11	12	19	21
17	9.2	16	6.4	6.8	8.7	11	12	12	11	12	22	21
18	9.2	16	6.4	6.7	8.7	11	12	12	11	12	22	21
19	9.2	16	6.4	6.6	8.8	11	12	12	11	12	22	21
20	11	16	6.4	6.6	8.8	11	12	12	11	12	22	21
21	12	16	6.3	6.7	8.8	11	12	12	11	11	22	21
22	12	16	6.4	6.7	8.8	11	12	12	11	11	21	21
23	14	16	6.4	6.8	9.7	11	12	11	11	11	18	21
24	16	15	6.4	6.7	11	11	12	11	11	11	15	21
25	16	11	6.6	6.8	11	11	12	11	11	11	15	21
26	16	11	6.6	6.8	11	11	12	11	11	11	15	21
27	16	11	6.6	6.7	11	11	11	11	11	11	15	21
28	16	11	6.6	6.6	11	11	11	11	11	11	15	21
29	16	11	6.6	6.6	11	11	11	12	11	11	15	22
30	16	11	6.7	6.6	---	11	11	12	11	11	17	22
31	16	---	6.8	6.6	---	11	---	12	---	11	19	---
TOTAL	318.2	449	205.1	209.3	250.9	341	356	351	338	353	485	627
MEAN	10.3	15.0	6.62	6.75	8.65	11.0	11.9	11.3	11.3	11.4	15.6	20.9
MAX	16	16	10	6.9	11	11	12	12	12	12	22	22
MIN	5.6	11	6.3	6.6	6.7	11	11	11	11	11	11	19

CAL YR 1975 TOTAL 4900.8 MEAN 13.4 MAX 28 MIN 5.2
WTR YR 1976 TOTAL 4283.5 MEAN 11.7 MAX 22 MIN 5.6

04057813 GREENWOOD DIVERSION NEAR GREENWOOD, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: September 1973 to current year.

INSTRUMENTATION.--Temperature recorder since Aug. 31, 1973.

REMARKS.--Flow regulated by inlet structure of pipeline from Greenwood Afterbay 0.7 mile (1.1 km) above station. Temperature recorder clock stopped Sept. 8-13 (range in temperature 15.5 to 17.0°C).

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 22.5°C July 18, 19, 1974; minimum, 1.5°C on many days in 1975 and Mar. 19-21, 1976.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 20.0°C June 16, 17; minimum, 1.5°C Mar. 19-21.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04057813 GREENWOOD DIVERSION NEAR GREENWOOD, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	2.0	2.0	6.5	6.5	15.0	15.0	18.0	18.0	18.5	18.5	16.5	16.5
2	2.0	2.0	7.0	6.5	15.0	15.0	18.5	18.0	18.5	18.0	16.5	16.0
3	2.0	2.0	7.0	6.5	15.0	15.0	18.5	18.5	18.5	18.0	16.0	15.5
4	2.0	2.0	6.5	6.0	15.0	15.0	18.5	18.5	18.5	18.5	16.5	16.0
5	2.5	2.0	7.0	6.0	15.5	15.0	18.5	18.5	18.5	18.0	16.5	15.5
6	2.5	2.5	7.5	7.0	16.0	15.5	19.0	18.5	18.0	18.0	15.5	15.5
7	3.0	2.5	8.0	7.0	16.0	16.0	19.0	19.0	18.0	17.0	15.5	15.5
8	3.0	3.0	8.0	7.5	16.5	16.0	19.0	17.5	17.5	17.0	---	---
9	3.0	3.0	7.5	7.5	17.0	16.5	17.5	17.0	17.5	17.5	---	---
10	3.0	3.0	7.5	7.5	17.0	17.0	17.0	16.5	18.0	17.5	---	---
11	3.5	3.0	8.0	7.5	17.5	17.0	16.5	16.5	18.0	18.0	---	---
12	3.5	3.5	10.0	8.0	18.0	17.5	16.5	16.5	18.0	18.0	---	---
13	3.5	3.0	10.0	10.0	18.5	18.0	16.5	16.5	18.0	18.0	---	---
14	3.0	3.0	10.5	10.0	19.0	18.5	16.5	16.0	18.0	17.5	17.0	17.0
15	3.5	3.0	10.5	10.5	19.5	19.0	16.5	16.5	17.5	17.5	17.0	16.0
16	3.5	3.0	11.0	10.5	20.0	19.5	17.0	16.5	17.5	17.5	16.0	16.0
17	4.5	3.0	13.0	11.0	20.0	18.5	17.0	16.5	17.5	17.5	16.0	16.0
18	4.5	4.0	13.0	12.5	18.5	18.5	17.0	16.5	17.5	17.5	16.0	16.0
19	5.0	4.5	12.5	12.0	18.5	18.0	17.0	17.0	18.0	17.5	16.5	16.0
20	5.5	5.0	12.0	12.0	18.0	17.5	17.5	17.0	18.5	18.0	16.5	15.5
21	6.5	5.5	12.0	12.0	17.5	17.5	18.0	17.5	18.5	18.5	15.5	15.0
22	7.5	6.5	12.5	12.0	18.0	17.5	18.0	18.0	19.0	18.5	15.0	13.5
23	7.5	7.0	13.5	12.5	18.0	18.0	18.0	18.0	19.0	19.0	13.5	13.0
24	7.0	6.5	14.0	13.5	18.0	18.0	18.0	18.0	19.0	18.5	13.0	12.5
25	7.5	6.5	14.0	14.0	18.5	18.0	18.0	18.0	18.5	17.0	12.5	12.0
26	7.5	7.0	14.0	14.0	18.5	18.0	18.0	18.0	17.0	17.0	12.0	12.0
27	7.0	6.5	14.5	14.0	18.5	18.5	18.5	18.0	17.0	17.0	12.0	12.0
28	7.0	6.5	15.0	14.5	18.5	18.5	18.5	18.5	17.5	17.0	12.0	12.0
29	7.0	6.5	15.0	15.0	18.5	18.5	18.5	18.5	17.5	16.0	12.0	12.0
30	6.5	6.5	15.0	15.0	18.5	18.0	18.5	18.5	16.0	16.0	12.0	12.0
31	---	---	15.0	15.0	---	---	18.5	18.5	16.5	16.0	---	---
MONTH	7.5	2.0	15.0	6.0	20.0	15.0	19.0	16.0	19.0	16.0	17.0	12.0

04057814 GREENWOOD RELEASE NEAR GREENWOOD, MI

LOCATION.--Lat 46°26'22", long 87°47'52", in NW¼ SW¼ sec.27, T.47 N., R.28 W., Marquette County, Hydrologic Unit 04030110, on left bank at outlet of Greenwood Afterbay releasing to Middle Branch Escanaba River, 2.6 mi (4.2 km) upstream from Bell Creek and 3.8 mi (6.1 km) southwest of Greenwood.

DRAINAGE AREA.--67.4 mi^2 (174.6 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1972 to current year.

GAGE.--Water-stage recorder and concrete flume. Altitude of gage is 1,480 ft (451 m) from topographic map (nearest 10 ft). Prior to Nov. 7, 1973, nonrecording gage at same site and different datum.

REMARKS.--Water discharge record good. Since December 1972, flow from Greenwood Reservoir (see sta 04057811) below spillway elevation 1,515 ft (462 m) is completely regulated by the release structure from the afterbay into the Middle Branch Escanaba River. Since January 1973, water is diverted immediately above this station (see sta 04057813) to Green Creek for iron ore processing and some returned via another Green Creek to Middle Branch Escanaba River 27 mi (43 km) below this station. During times when reservoir spills, flow bypasses this station and returns to the Middle Branch Escanaba River 0.5 mi (0.8 km) below this station.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge (prior to regulation), 290 ft^3/s (8.21 m^3/s) Oct. 1, 1972; (since regulation began), 63 ft^3/s (1.78 m^3/s) July 10, 11, 1974; minimum daily, 10 ft^3/s (0.28 m^3/s) Dec. 29, 30, 1972, result of construction.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	26	26	26	26	25	31	41	43	33	26	25
2	27	26	26	26	26	25	35	41	44	33	26	25
3	27	26	26	26	26	25	36	41	44	33	26	25
4	27	26	26	26	26	25	36	41	44	33	26	25
5	27	26	26	26	26	25	36	41	44	33	26	25
6	27	26	26	26	26	25	39	41	44	32	26	25
7	27	26	26	26	26	25	42	40	43	32	26	25
8	27	26	25	26	26	25	42	40	41	32	26	25
9	27	26	25	26	26	25	42	40	39	32	26	25
10	27	26	25	26	26	25	42	40	38	32	26	25
11	26	26	25	26	26	25	42	40	37	33	27	25
12	26	26	25	26	25	25	42	40	36	33	27	25
13	26	27	24	26	25	25	41	39	36	33	28	25
14	25	27	25	26	25	25	42	39	36	32	28	25
15	25	26	25	26	25	25	43	39	36	32	28	25
16	25	26	25	26	25	25	43	40	35	32	27	24
17	25	26	25	26	25	25	43	40	35	32	26	25
18	24	26	25	26	25	26	43	40	34	32	26	25
19	24	26	25	26	25	26	43	40	34	32	26	25
20	24	26	25	26	25	27	43	40	34	31	26	25
21	25	26	25	26	25	26	42	41	34	30	25	24
22	26	26	25	26	26	27	43	41	35	29	25	25
23	26	26	25	26	26	28	43	40	34	29	25	25
24	26	26	25	26	26	28	42	40	34	28	25	25
25	26	26	25	26	26	28	42	40	34	28	25	25
26	26	26	25	26	26	28	42	40	33	28	25	25
27	26	26	25	26	26	28	41	40	33	28	25	25
28	26	26	25	26	26	28	41	40	33	28	25	25
29	26	27	25	26	26	28	41	40	34	28	25	25
30	26	27	26	26	---	28	41	42	34	26	25	25
31	26	---	26	26	---	28	---	43	---	26	25	---
TOTAL	805	784	783	806	744	809	1224	1250	1115	955	804	748
MEAN	26.0	26.1	25.3	26.0	25.7	26.1	40.8	40.3	37.2	30.8	25.9	24.9
MAX	27	27	26	26	26	28	43	43	44	33	28	25
MIN	24	26	24	26	25	25	31	39	33	26	25	24

CAL YR 1975 TOTAL 10908 MEAN 29.9 MAX 43 MIN 23
WTR YR 1976 TOTAL 10827 MEAN 29.6 MAX 44 MIN 24

04057814 GREENWOOD RELEASE NEAR GREENWOOD, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: September 1973 to current year.

INSTRUMENTATION.--Temperature recorder since Sept. 1, 1973.

REMARKS.--Flow regulated by valve at outlet of Greenwood Afterbay. Temperature recorder clock stopped Sept. 11-13 (range in temperature 15.5 to 17.0°C).

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES.--Maximum, 23.5°C July 14, 15, 1974; minimum, 1.0°C on many days during winter periods 1973-75.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 21.0°C June 14, 15; minimum, 2.0°C on several days during March and April.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	13.0	11.5	8.0	7.5	3.0	2.5	3.0	3.0	2.5	2.5	2.5	2.5
2	11.5	11.0	8.0	7.5	3.0	2.5	3.0	2.5	2.5	2.5	2.5	2.5
3	12.5	11.0	8.0	8.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
4	12.0	11.0	8.0	7.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
5	11.5	11.5	8.0	8.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
6	12.5	11.5	8.0	8.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5
7	12.0	11.5	8.0	8.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
8	12.0	12.0	8.0	8.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
9	12.0	12.0	8.0	8.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
10	12.0	11.5	8.0	7.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
11	11.5	11.5	7.0	7.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
12	11.5	11.5	7.0	5.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
13	12.0	11.5	5.5	5.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
14	12.0	12.0	5.5	5.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
15	12.0	11.0	5.5	5.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5
16	11.0	10.5	5.5	5.5	3.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5
17	10.5	10.5	5.5	5.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
18	10.5	10.0	5.5	5.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
19	10.5	9.5	5.0	5.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
20	10.5	10.0	5.0	4.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
21	10.0	10.0	4.0	3.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.0
22	10.0	9.5	3.5	3.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
23	9.5	9.5	3.5	3.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
24	10.0	9.5	3.5	3.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
25	10.0	9.0	3.5	3.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.0
26	9.0	9.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
27	9.0	9.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
28	9.0	9.0	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5	3.0	2.5
29	9.0	8.5	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5	3.0	2.5
30	8.5	8.0	3.0	3.0	3.0	3.0	2.5	2.5	---	---	2.5	2.5
31	8.0	7.5	---	---	3.0	3.0	2.5	2.5	---	---	2.5	2.5
MONTH	13.0	7.5	8.0	3.0	3.0	2.5	3.0	2.5	2.5	2.5	3.0	2.0

04057814 GREENWOOD RELEASE NEAR GREENWOOD, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	2.5	2.0	7.5	7.0	16.5	14.5	18.5	16.5	18.0	16.0	16.5	15.0
2	3.5	2.0	7.5	6.5	17.0	15.0	18.0	16.5	18.0	15.5	16.0	15.0
3	3.5	2.5	6.5	6.0	17.5	16.0	19.0	17.0	18.0	16.0	17.0	15.5
4	3.5	2.5	8.5	6.5	18.0	16.5	19.0	17.5	18.0	16.5	17.0	16.5
5	3.5	2.5	8.0	7.0	18.0	17.0	20.0	18.0	16.5	16.0	17.5	16.0
6	4.0	2.5	8.5	6.5	19.0	17.0	19.5	16.0	17.5	15.5	17.0	16.0
7	4.0	2.5	8.0	7.0	19.0	17.0	16.0	14.0	17.5	15.5	18.0	16.0
8	3.5	2.5	8.5	7.0	19.0	18.0	16.0	13.5	18.5	16.0	18.5	16.5
9	4.0	2.5	10.0	7.5	19.0	18.0	16.0	13.5	18.0	16.5	18.0	16.0
10	3.5	2.5	10.0	8.0	20.0	18.5	15.5	14.0	17.5	16.5	17.0	15.5
11	3.5	2.0	10.5	8.5	20.0	19.0	16.0	14.0	18.5	16.5	---	---
12	3.5	2.5	11.5	9.0	20.0	18.0	16.0	13.0	18.5	16.5	---	---
13	4.5	2.5	10.5	9.5	20.0	17.5	15.0	14.0	18.0	17.0	---	---
14	4.0	3.0	12.5	9.5	21.0	19.0	17.0	15.0	17.5	16.0	17.0	16.0
15	4.0	3.5	12.0	10.5	21.0	19.5	16.0	14.5	18.5	16.0	16.5	15.5
16	5.5	3.0	12.0	11.5	20.0	18.5	15.0	14.0	18.5	16.0	17.0	15.5
17	5.5	4.5	12.0	11.0	18.5	18.0	16.0	14.0	18.0	16.5	16.5	15.5
18	6.0	5.0	12.5	10.5	18.0	17.5	17.5	14.5	17.5	17.0	17.0	15.5
19	6.0	5.0	13.0	10.5	17.5	14.5	17.0	15.0	18.5	17.5	16.0	15.5
20	6.0	5.0	15.0	12.0	17.5	15.0	17.5	15.5	18.5	17.5	16.0	15.0
21	6.0	5.5	15.5	13.0	17.5	15.5	17.0	15.0	18.5	17.0	15.5	14.5
22	5.5	5.5	15.5	13.0	17.5	16.0	17.0	15.5	19.5	17.5	14.5	14.0
23	7.0	5.5	15.0	13.5	17.5	16.0	18.0	16.0	19.0	17.0	14.5	13.5
24	7.0	6.0	15.5	13.5	17.0	16.0	17.5	15.0	17.0	14.5	14.5	13.5
25	7.5	6.0	15.5	14.0	16.5	15.5	17.0	15.5	15.5	13.5	14.5	13.5
26	7.0	6.0	16.0	14.0	18.5	15.5	18.5	16.0	16.0	14.5	14.0	13.0
27	6.5	6.0	16.0	14.5	18.5	16.5	18.5	16.0	18.0	14.5	13.5	13.0
28	8.0	6.5	15.5	14.5	18.5	16.5	18.0	16.5	16.5	14.5	13.5	12.5
29	7.5	7.0	15.5	15.0	18.0	16.5	17.5	16.0	16.5	13.0	14.0	12.5
30	7.0	6.5	15.0	15.0	18.5	16.0	17.5	16.5	16.0	14.0	13.5	12.5
31	---	---	15.5	15.0	---	---	18.5	16.0	16.0	15.5	---	---
MONTH	8.0	2.0	16.0	6.0	21.0	14.5	20.0	13.0	19.5	13.0	18.5	12.5

04057820 MIDDLE BRANCH ESCANABA RIVER NEAR GREENWOOD, MI

LOCATION.--Lat 46°25'12", long 87°47'50", in NW¼ sec.3, T.46 N., R.28 W., Marquette County, Hydrologic Unit 04030110, on right bank 10 ft (3 m) downstream from county highway bridge, 100 ft (30 m) downstream from Bell Creek and 5.0 mi (8.0 km) southwest of Greenwood.

DRAINAGE AREA.--73.3 mi^2 (189.8 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1961-71, and annual maximum, water years 1970-72, October 1972 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,400 ft (427 m) from topographic map (nearest 10 ft). Prior to Sept. 20, 1973, nonrecording gage and crest-stage gage at same site and datum.

REMARKS.--Water-discharge record good. Since December 1972, considerable regulation 2.1 mi (3.4 km) above station (see sta 04057814) and 2.6 mi (4.2 km) above station (see sta 04057811). Since January 1973, flow diverted 2.3 mi (3.7 km) above station at Greenwood Afterbay to Green Creek (see sta 04057813) for iron ore processing and some returned to Middle Branch Escanaba River 24 mi (39 km) below station via another Green Creek.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,060 ft^3/s (30.0 m^3/s) May 5, 1972, gage height, 13.35 ft (4.069 m); minimum daily, 12 ft^3/s (0.34 m^3/s) Dec. 28, 1972, Jan. 2-4, Nov. 5, 1973, result of construction upstream.

EXTREMES OUTSIDE PERIOD OF RECORD.--A discharge of 8.62 ft^3/s (0.24 m^3/s) was measured Aug. 22, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 978 ft^3/s (27.7 m^3/s) Apr. 18, gage height, 12.71 ft (3.874 m); minimum daily, 27 ft^3/s (0.76 m^3/s) Sept. 1-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	32	40	40	30	29	195	170	78	40	32	27
2	31	31	37	42	30	29	188	176	75	40	32	27
3	31	31	35	43	30	29	203	174	69	39	32	27
4	31	31	34	41	30	29	206	161	62	39	32	27
5	31	31	34	40	30	29	224	165	57	39	31	27
6	31	31	34	39	30	29	252	166	53	38	30	27
7	31	31	33	38	30	29	283	155	50	38	29	27
8	31	31	32	37	30	29	310	140	47	38	29	27
9	32	31	32	36	30	29	334	127	47	39	29	27
10	31	35	32	35	29	28	368	118	48	41	29	27
11	31	38	31	34	29	29	360	106	47	40	30	27
12	31	39	31	33	29	29	340	93	45	40	31	27
13	31	39	30	33	29	29	334	86	54	39	31	27
14	31	36	36	32	29	29	354	88	51	39	31	27
15	32	34	38	32	29	29	448	87	48	39	31	27
16	31	34	54	32	29	29	653	126	46	39	30	27
17	30	34	69	32	29	29	844	151	45	39	29	27
18	30	33	74	31	29	29	962	151	45	39	29	27
19	29	34	66	31	29	31	938	140	44	39	29	27
20	29	35	62	31	29	33	789	127	44	39	29	27
21	29	35	58	31	29	34	614	112	43	37	28	27
22	30	35	55	31	29	34	564	94	43	36	28	27
23	32	33	53	31	29	34	540	90	42	35	28	27
24	34	33	50	31	29	47	514	84	42	35	28	27
25	38	32	48	31	29	61	423	80	41	35	28	27
26	34	32	46	31	29	75	331	76	40	35	28	27
27	33	32	44	30	29	90	268	74	40	35	28	27
28	32	32	43	30	29	96	224	72	40	35	28	27
29	32	33	41	30	29	118	190	72	40	35	28	27
30	32	40	40	30	---	164	173	72	40	33	28	27
31	32	---	40	30	---	185	---	80	---	32	28	---
TOTAL	975	1008	1352	1048	850	1523	12426	3613	1466	1166	913	810
MEAN	31.5	33.6	43.6	33.8	29.3	49.1	414	117	48.9	37.6	29.5	27.0
MAX	38	40	74	43	30	185	962	176	78	41	32	27
MIN	29	31	30	30	29	28	173	72	40	32	28	27

CAL YR 1975 TOTAL 26952 MEAN 73.8 MAX 735 MIN 27
WTR YR 1976 TOTAL 27150 MEAN 74.2 MAX 962 MIN 27

04057820 MIDDLE BRANCH ESCANABA RIVER NEAR GREENWOOD, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1973 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: August 1973 to current year.

INSTRUMENTATION.--Temperature recorder since Aug. 22, 1973.

REMARKS.--Flow regulated by Greenwood Release (see sta 04057814) 2.1 mi (3.4 km) above station. In addition to the temperature recorder record, samples were collected once a month.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 26.0°C July 8, 1974; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 24.0°C June 14, 15; minimum, 0.0°C on many days during winter period.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)
OCT								
30...	0900	32	68	8.1	-1.0	5.0	100	4
NOV								
20...	1315	36	52	7.1	-.5	4.0	90	4
DEC								
16...	1015	54	60	7.3	-5.0	.5	100	3
JAN								
22...	1030	31	64	7.3	-16.0	.0	110	4
FEB								
18...	1400	29	62	7.9	-1.5	1.0	100	4
MAR								
31...	0845	187	56	7.8	1.5	1.5	70	3
APR								
21...	1315	592	50	7.1	8.0	6.5	--	--
28...	1200	232	46	7.4	10.0	6.5	44	2
MAY								
18...	0830	149	50	7.5	8.5	10.5	90	1
JUN								
14...	1615	50	31	6.7	30.0	24.0	48	2
JUL								
14...	0900	40	55	7.1	20.0	15.5	60	2
AUG								
13...	0915	27	50	6.9	18.5	17.0	60	3
SEP								
10...	1500	26	49	6.9	21.0	16.0	85	9

DATE	HARDNESS (CA,MG) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL IRON (FE) (UG/L)	DISSOLVED IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT								
30...	28	7.3	2.4	.60	--	1600	240	170
NOV								
20...	22	5.8	1.8	.18	1900	1200	130	120
DEC								
16...	30	8.3	2.2	.24	2000	1200	300	130
JAN								
22...	34	9.9	2.2	.39	1900	1100	--	180
FEB								
18...	33	9.1	2.4	.42	1900	1300	--	260
MAR								
31...	31	9.1	2.1	.48	1800	980	180	120
APR								
21...	--	--	--	--	--	--	180	140
28...	24	7.5	1.3	.24	970	430	120	90
MAY								
18...	21	6.0	1.4	.14	650	350	70	50
JUN								
14...	20	5.0	1.8	.12	870	550	140	110
JUL								
14...	21	5.5	1.7	.13	1100	580	160	110
AUG								
13...	25	5.9	2.4	.11	1900	820	210	160
SEP								
10...	27	6.5	2.5	.08	2700	1300	250	220

STREAMS TRIBUTARY TO LAKE MICHIGAN

04057820 MIDDLE BRANCH ESCANABA RIVER NEAR GREENWOOD, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	13.0	11.0	7.5	7.0	1.0	0.5	1.5	1.0	0.5	0.0	1.0	0.5
2	12.5	9.5	7.5	6.0	0.5	0.5	1.0	1.0	0.5	0.0	0.0	0.0
3	13.0	10.5	7.5	6.5	0.5	0.5	1.0	0.5	0.0	0.0	0.5	0.0
4	13.0	10.5	7.5	6.5	1.0	0.5	0.5	0.5	0.0	0.0	1.0	0.5
5	12.5	11.5	7.5	6.5	2.0	1.0	1.0	0.5	0.0	0.0	1.0	0.5
6	12.5	11.0	8.5	6.5	2.0	0.5	0.5	0.5	0.0	0.0	1.0	0.5
7	12.5	10.0	8.5	8.0	0.5	0.5	0.5	0.5	0.0	0.0	0.5	0.5
8	13.0	11.0	8.5	7.5	1.0	0.5	1.0	0.5	0.0	0.0	1.0	0.5
9	12.5	11.5	7.5	6.5	1.5	1.0	1.0	0.5	0.5	0.0	1.5	0.5
10	12.0	11.0	6.5	5.5	1.0	1.0	0.5	0.5	1.0	0.5	2.0	1.5
11	11.0	11.0	5.5	4.5	1.0	0.5	0.5	0.5	1.0	0.0	1.5	0.5
12	11.5	11.0	4.5	2.5	1.0	0.5	0.5	0.5	1.0	0.0	0.5	0.5
13	12.5	10.5	2.5	2.0	1.5	1.0	0.5	0.5	1.0	0.0	0.5	0.5
14	12.0	11.5	2.5	2.0	1.5	1.0	0.5	0.5	0.5	0.0	1.5	0.5
15	11.5	10.5	3.0	2.5	1.0	0.5	1.0	0.5	1.0	0.0	1.5	1.0
16	10.5	9.5	3.5	3.0	0.5	0.5	0.5	0.5	1.0	0.5	1.0	0.5
17	10.0	9.0	4.0	3.5	0.5	0.5	1.5	0.5	1.5	1.0	0.5	0.5
18	9.5	8.0	4.0	3.5	0.5	0.5	0.5	0.0	1.5	0.5	3.5	0.5
19	9.0	8.0	4.5	4.0	1.0	0.5	0.0	0.0	1.0	0.5	4.5	2.0
20	10.0	8.0	4.5	3.0	1.5	1.0	0.0	0.0	2.0	1.0	4.0	3.0
21	9.5	8.5	3.0	2.0	1.5	1.0	0.0	0.0	1.5	1.5	3.5	2.0
22	9.0	8.0	2.0	2.0	1.0	1.0	0.0	0.0	2.0	1.0	2.0	1.0
23	9.5	8.5	2.0	1.5	1.0	1.0	0.0	0.0	1.0	1.0	3.5	2.0
24	10.5	9.5	2.0	1.5	1.0	0.5	0.0	0.0	2.0	1.0	3.0	2.0
25	10.5	8.5	1.5	1.0	1.0	1.0	0.0	0.0	2.5	1.0	3.0	1.5
26	8.5	7.0	1.5	1.0	1.0	1.0	0.0	0.0	2.5	1.0	2.0	2.0
27	8.0	7.5	1.5	1.0	1.5	0.5	0.0	0.0	2.0	1.0	2.0	1.5
28	8.0	8.0	1.5	1.0	1.0	0.5	0.0	0.0	1.5	0.5	3.5	1.0
29	8.0	7.0	1.5	1.5	1.0	1.0	0.0	0.0	1.0	1.0	2.0	2.0
30	7.0	6.0	1.5	1.0	1.5	1.0	0.0	0.0	---	---	2.0	2.0
31	7.0	6.5	---	---	1.5	1.5	0.5	0.0	---	---	2.0	1.5
MONTH	13.0	6.0	8.5	1.0	2.0	0.5	1.5	0.0	2.5	0.0	4.5	0.0

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	1.5	1.5	7.0	6.5	18.5	15.0	21.0	17.5	20.0	16.5	15.5	13.5
2	3.5	1.5	7.0	6.0	18.5	15.0	20.0	17.5	19.0	15.5	14.5	12.0
3	2.5	2.0	6.0	6.0	19.5	16.5	22.0	18.0	19.5	16.5	17.0	14.0
4	3.5	2.0	8.5	5.5	21.0	17.0	23.0	18.5	19.0	17.5	16.0	15.0
5	3.5	2.0	7.5	6.5	20.5	17.0	23.0	18.5	17.5	16.5	16.0	13.0
6	3.5	2.0	9.0	6.0	22.5	18.0	22.0	19.0	18.5	15.0	18.0	14.5
7	3.0	2.0	8.0	7.0	22.0	18.5	22.0	18.0	19.5	15.5	19.0	15.5
8	3.0	2.0	10.0	7.0	21.5	19.5	20.0	16.5	19.5	15.5	19.5	17.0
9	3.5	2.5	12.5	8.0	22.0	19.0	18.0	17.0	20.0	17.0	18.5	15.5
10	2.5	2.5	12.5	9.0	23.0	20.0	19.0	16.0	19.5	17.0	16.0	14.0
11	3.0	2.5	12.5	8.5	23.5	21.0	19.0	16.5	20.5	18.0	17.5	14.0
12	3.5	2.5	13.5	8.5	22.5	20.0	18.5	14.5	19.0	18.0	17.0	14.5
13	4.0	3.0	12.5	10.5	23.5	19.5	18.5	15.5	18.5	16.5	17.5	15.5
14	4.0	3.0	14.5	10.0	24.0	22.0	21.0	16.5	17.5	15.0	17.5	15.5
15	3.5	3.0	14.5	11.0	24.0	21.0	20.0	17.0	18.0	15.0	16.0	14.5
16	4.0	3.0	13.5	12.5	21.0	19.0	18.0	16.0	19.0	15.0	16.0	13.5
17	4.0	4.0	12.5	11.5	20.0	18.0	19.0	15.0	19.0	15.0	16.5	13.5
18	4.0	4.0	13.5	10.5	19.5	18.0	20.0	16.0	20.0	16.0	16.5	13.5
19	4.5	4.0	14.5	10.5	18.5	16.0	21.0	17.5	21.5	17.0	16.0	14.5
20	5.0	4.5	16.5	12.5	20.5	16.5	21.0	18.5	21.5	18.5	14.5	13.0
21	5.0	5.0	16.0	13.0	21.0	16.5	20.0	17.0	21.0	17.0	14.0	13.0
22	5.0	5.0	16.5	12.5	21.0	17.0	20.5	16.5	21.0	18.0	13.0	12.0
23	6.5	5.0	16.0	13.0	20.5	18.0	21.5	17.5	20.0	16.5	12.5	12.0
24	6.0	6.0	16.5	12.5	19.5	17.5	20.5	17.5	19.0	16.0	13.0	10.5
25	7.0	5.5	18.0	13.5	19.0	17.5	19.0	16.5	18.0	15.0	13.0	11.5
26	6.0	6.0	18.5	13.5	21.0	16.5	21.0	17.5	18.0	16.0	12.0	11.5
27	6.5	6.0	18.0	14.5	21.0	17.5	21.0	17.5	19.0	15.5	12.5	12.0
28	8.0	6.0	18.0	15.0	21.0	17.0	19.5	17.0	18.0	14.5	12.0	10.0
29	7.0	6.0	16.5	15.0	19.5	17.5	20.5	16.5	15.5	12.5	13.5	11.5
30	7.0	6.5	15.5	15.0	20.5	17.0	20.0	17.5	16.0	12.0	13.0	11.0
31	---	---	16.0	15.0	---	---	19.5	17.0	16.0	14.5	---	---
MONTH	8.0	1.5	18.5	5.5	24.0	15.0	23.0	14.5	21.5	12.0	19.5	10.0

04058100 MIDDLE BRANCH ESCANABA RIVER NEAR PRINCETON, MI

LOCATION.--Lat 46°19'02", long 87°30'07", in NW¼ sec.12, T.45 N., R.26 W., Marquette County, Hydrologic Unit 04030110, on right bank 400 ft (122 m) downstream from powerplant, 0.3 mi (0.5 km) upstream from Green Creek, and 2.2 mi (3.5 km) northwest of Princeton.

DRAINAGE AREA.--210 mi^2 (544 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1961 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,100 ft (335 m) from topographic map (nearest 20 ft).

REMARKS.--Water-discharge record good. Flow regulated by powerplant above station. Since December 1972, additional regulation 27 mi (43 km) above station (see sta 04057814). Since January 1973, flow diverted to Green Creek 27 mi (43 km) above station (see sta 04057813) by industry for iron ore processing and some returned via another Green Creek 0.3 mi (0.5 km) below this station.

AVERAGE DISCHARGE.--15 years, 221 ft^3/s (6.259 m^3/s), 14.29 in/yr (363 mm/yr), adjusted for storage and diversion since December 1972.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,580 ft^3/s (73.1 m^3/s) May 6, 1972, gage height, 7.85 ft (2.393 m); minimum recorded, 2.2 ft^3/s (0.062 m^3/s) Oct. 5, 1964; minimum daily, 4.1 ft^3/s (0.12 m^3/s) Feb. 4, 1967.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 25 and 26, 1960, reached a stage of 10.5 ft (3.20 m) from floodmark, discharge, 3,850 ft^3/s (109 m^3/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,860 ft^3/s (52.7 m^3/s) Apr. 19, gage height, 6.98 ft (2.128 m); minimum, 3.4 ft^3/s (0.10 m^3/s) Aug. 2, gage height, 0.67 ft (0.204 m); minimum daily, 20 ft^3/s (0.57 m^3/s) Sept. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	104	118	295	123	122	114	524	428	194	108	92	83
2	104	118	357	132	121	118	530	398	257	117	47	84
3	100	118	257	141	143	116	557	446	310	117	43	56
4	93	118	255	142	159	118	560	434	286	117	40	37
5	93	118	252	138	159	121	587	437	251	117	98	41
6	90	117	251	119	144	121	647	455	247	106	101	43
7	93	115	244	120	126	121	724	440	155	102	96	99
8	90	115	156	123	127	123	777	413	119	102	96	118
9	93	115	110	140	151	122	826	383	170	101	96	110
10	93	115	127	148	153	129	882	378	179	100	94	49
11	93	117	139	141	136	128	882	372	197	102	94	26
12	73	119	139	116	130	114	833	337	196	102	58	29
13	72	117	139	108	124	112	791	281	200	117	45	58
14	100	164	141	109	118	110	816	272	205	123	49	95
15	105	214	220	118	119	111	931	219	283	102	52	112
16	108	197	264	127	111	126	1090	233	314	119	110	110
17	104	189	215	127	108	145	1300	470	308	118	140	65
18	95	182	188	129	107	146	1530	527	193	95	108	22
19	95	177	251	133	106	143	1720	476	150	68	100	26
20	95	255	260	128	111	141	1670	416	152	96	64	89
21	95	381	254	117	116	144	1460	392	174	96	40	108
22	95	334	194	118	115	176	1330	383	185	96	35	103
23	95	269	151	121	117	170	1210	362	163	96	82	103
24	95	195	174	121	121	181	1160	219	131	96	98	64
25	96	100	186	119	131	215	1030	187	121	96	97	20
26	97	82	164	118	130	336	858	188	134	96	96	23
27	159	82	151	115	121	401	701	188	132	95	58	84
28	198	83	153	117	113	386	599	188	121	95	42	103
29	182	88	151	118	113	370	524	186	117	85	45	99
30	141	156	150	120	---	378	464	186	117	69	101	99
31	135	---	138	119	---	446	---	190	---	95	119	---
TOTAL	3281	4668	6126	3865	3652	5682	27513	10484	5761	3144	2436	2158
MEAN	106	156	198	125	126	183	917	338	192	101	78.6	71.9
MAX	198	381	357	148	159	446	1720	527	314	123	140	118
MIN	72	82	110	108	106	110	464	186	117	68	35	20

CAL YR 1975 TOTAL 78601 MEAN 215 MAX 1370 MIN 14 MEAN+ 229 CFSM+ 1.09 IN+ 14.81
WTR YR 1976 TOTAL 78770 MEAN 215 MAX 1720 MIN 20 MEAN+ 220 CFSM+ 1.05 IN+ 14.26

+Adjusted for diversion and change in contents in Greenwood Reservoir.

04058100 MIDDLE BRANCH ESCANABA RIVER NEAR PRINCETON, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1963, 1965, 1967 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)
OCT 29...	1015	198	72	7.9	2.0	7.0	55	2
NOV 19...	1100	177	74	7.2	10.0	2.0	50	3
DEC 17...	1130	185	72	7.8	-15.0	.0	80	1
JAN 20...	1230	135	92	7.9	-6.0	.0	60	3
FEB 19...	0945	105	90	7.7	-1.0	.0	70	3
MAR 25...	1000	340	69	7.2	3.5	.0	70	3
APR 27...	1115	707	49	7.2	2.0	5.0	60	2
MAY 17...	1010	542	51	7.8	8.0	12.5	16	2
JUN 15...	1425	320	52	7.4	26.0	23.0	90	2
JUL 13...	1130	125	83	7.3	20.0	19.5	39	3
AUG 12...	1035	6.5	85	7.5	24.5	22.0	25	2
SEP 09...	1045	109	88	7.5	16.0	19.0	35	6

DATE	HARDNESS (CA+MG) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL IRON (FE) (UG/L)	DISSOLVED IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT 29...	36	8.9	3.3	.56	1200	630	75	70
NOV 19...	31	8.1	2.6	.21	850	490	60	50
DEC 17...	40	11	3.1	.21	890	600	30	30
JAN 20...	42	11	3.5	.19	1200	690	50	50
FEB 19...	45	12	3.6	.22	1200	860	30	10
MAR 25...	36	9.9	2.8	.36	920	600	50	40
APR 27...	24	7.0	1.5	.16	990	420	50	30
MAY 17...	24	6.0	2.1	.12	590	360	50	30
JUN 15...	33	8.4	2.9	.13	1000	650	80	60
JUL 13...	41	11	3.3	.09	980	540	130	100
AUG 12...	44	11	3.9	.07	880	460	110	70
SEP 09...	45	11	4.2	.07	1300	650	90	60

04058120 GREEN CREEK NEAR PALMER, MI

LOCATION.--Lat 46°22'22", long 87°36'21", in NW¼ sec.19, T.46 N., R.26 W., Marquette County, Hydrologic Unit 04030110, at culvert on County Road 565, 4.5 miles (7.2 km) south of Palmer.

DRAINAGE AREA.--8.42 mi^2 (21.81 km^2).

PERIOD OF RECORD.--Water years 1964-65, 1969 to current year.

REMARKS.--Since 1970, industrial diversion into headwaters from Schweitzer Reservoir (see sta 04058190), for iron ore processing.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)
OCT								
29...	1525	16	360	8.0	2.0	6.5	5	2
NOV								
19...	1320	30	377	7.9	10.5	4.5	25	2
DEC								
18...	1130	26	426	8.1	-12.0	.0	0	1
JAN								
23...	1115	15	404	8.0	-13.0	.0	0	1
FEB								
18...	1045	27	398	8.1	-1.0	1.0	10	2
MAR								
24...	1130	35	394	8.0	10.5	2.5	10	2
APR								
20...	1535	65	330	8.0	16.5	12.5	--	--
27...	1515	35	338	8.2	8.0	6.0	6	2
MAY								
17...	1000	32	343	8.2	8.0	11.5	15	1
JUN								
15...	1140	22	374	8.1	23.0	23.0	7	2
JUL								
13...	1630	17	407	8.0	25.5	23.0	7	1
AUG								
12...	1400	13	407	8.1	20.0	22.0	6	1
SEP								
09...	1350	8.9	426	8.1	16.5	19.0	8	3

DATE	HARDNESS (CA,MG) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL IRON (FE) (UG/L)	DISSOLVED IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT								
29...	110	19	14	.79	550	110	90	70
NOV								
19...	110	19	14	.19	320	80	60	60
DEC								
18...	110	19	15	.60	300	90	--	130
JAN								
23...	110	18	16	.74	360	100	340	340
FEB								
18...	110	17	16	.76	400	130	--	440
MAR								
24...	110	17	16	.85	460	90	350	350
APR								
20...	--	--	--	--	--	--	120	90
27...	91	15	13	.63	500	150	130	120
MAY								
17...	120	22	15	.43	300	60	70	30
JUN								
15...	110	19	15	.21	360	90	150	50
JUL								
13...	120	18	17	.19	370	80	130	40
AUG								
12...	120	17	18	.05	240	40	100	20
SEP								
09...	120	19	18	.03	330	80	90	50

04058190 SCHWEITZER RESERVOIR NEAR PALMER, MI

LOCATION.--Lat 46°25'00", long 87°38'48", in SE¼ NW¼ sec.2, T.46 N., R.27 W., Marquette County, Hydrologic Unit 04030110, on left bank 120 ft (36 m) upstream from dam on Schweitzer Creek, and 3.0 mi (4.8 km) southwest of Palmer.

DRAINAGE AREA.--23.1 mi^2 (59.8 km^2).

PERIOD OF RECORD.--January 1963 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is 1,300.00 ft (396.240 m) above mean sea level (Cleveland-Cliffs Iron Co. bench mark). Gage readings have been converted to elevations above mean sea level. Prior to Oct. 25, 1967, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by an earthfill dam with fixed crest concrete spillway completed in 1963. Usable capacity of reservoir is 5,300 acre-ft (6.53 hm^3) at spillway elevation 1,338.00 ft (407.822 m). The dam includes a discharge pipe equipped with valve to control release flow to Schweitzer Creek (see sta 04058200). An average of 3.5 ft^3/s (0.099 m^3/s) was diverted from the headwaters of basin by the city of Ishpeming for municipal supply and the effluent discharged to the Carp River basin. An average of 24 ft^3/s (0.68 m^3/s) was diverted from reservoir for iron ore processing and some returned to the Middle Branch Escanaba River basin by Green Creek. Since January 1973, controlled diversion from Greenwood Reservoir (see sta 04057811) via Greenwood Diversion (see sta 04057813) into Schweitzer Reservoir. Controlled inflow averaged 11.7 ft^3/s (0.33 m^3/s) for the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents recorded, 5,900 acre-ft (7.27 hm^3) May 31, 1970, elevation, 1,339.5 ft (408.28 m); minimum recorded since first filling, 2,920 acre-ft (3.60 hm^3) Apr. 10, 1974, elevation, 1,329.7 ft (405.29 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 5,580 acre-ft (6.88 hm^3) Apr. 17, elevation, 1,338.7 ft (408.04 m); minimum, 4,020 acre-ft (4.96 hm^3) Sept. 5, 6, elevation, 1,333.9 ft (406.57 m).

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)	Change in contents (equivalent in ft^3/s)
Sept. 30	1336.4	4770	--	--
Oct. 31	1335.7	4560	-210	-3.4
Nov. 30	1338.3	5420	+860	+14.5
Dec. 31	1337.7	5200	-220	-3.6
CAL YR 1975	--	--	+550	+0.8
Jan. 31	1336.3	4740	-460	-7.5
Feb. 29	1335.1	4380	-360	-6.3
Mar. 31	1338.4	5460	+1080	+17.6
Apr. 30	1338.2	5380	-80	-1.3
May 31	1338.2	5380	0	0
June 30	1337.7	5200	-180	-3.0
July 31	1335.8	4590	-610	-9.9
Aug. 31	1334.0	4050	-540	-8.8
Sept. 30	1334.4	4170	+120	+2.0
WTR YR 1976	--	--	-600	-.8

04058200 SCHWEITZER CREEK NEAR PALMER, MI

LOCATION.--Lat 46°24'40", long 87°37'27", in SW¼ sec.1, T.46 N., R.27 W., Marquette County, Hydrologic Unit 04030110, on right bank 10 ft (3 m) upstream from highway bridge, 2.5 mi (4.0 km) southwest of Palmer.

DRAINAGE AREA.--23.6 mi^2 (61.1 km^2).

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

GAGE.--Water-stage recorder. Concrete control since Oct. 1, 1963. Altitude of gage is 1,270 ft (387 m) from topographic map (nearest 10 ft). Prior to Aug. 21, 1961, nonrecording gage at same site and datum.

REMARKS.--Records good. Since August 1962, flow completely regulated by Schweitzer Reservoir (see sta 04058190), 1.0 mi (1.6 km) above station. An average of 3.5 ft^3/s (0.099 m^3/s) was diverted from headwaters of basin by the city of Ishpeming for municipal supply and the effluent discharged to the Carp River basin. An average of 24 ft^3/s (0.68 m^3/s) was diverted from Schweitzer Reservoir by industry for iron ore processing and some returned to the Middle Branch Escanaba River via Green Creek. Diversion into Schweitzer Reservoir from Greenwood Reservoir via Greenwood Diversion (see sta 04057813). Several observations of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 860 ft^3/s (24.4 m^3/s) May 31, 1970, gage height, 6.50 ft (1.981 m); minimum, 0.4 ft^3/s (0.011 m^3/s) Sept. 6, 1962, gage height, 1.22 ft (0.372 m); minimum daily, 1.0 ft^3/s (0.028 m^3/s) Apr. 9-18, May 5, 6, 1963.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 145 ft^3/s (4.11 m^3/s) Apr. 15, 17; minimum discharge, 3.1 ft^3/s (0.088 m^3/s) Sept. 14, 22, gage height, 2.77 ft (0.844 m); minimum daily, 4.1 ft^3/s (0.12 m^3/s) Mar. 7, 8, 11, 14-17, Sept. 22, 25, 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	4.4	36	4.7	4.4	4.2	77	30	40	4.7	4.5	4.5
2	4.4	4.3	36	4.7	4.4	4.2	67	31	29	4.7	4.5	4.5
3	4.4	4.3	26	4.7	4.4	4.2	73	31	18	4.7	4.5	4.4
4	4.4	4.3	19	4.5	4.3	4.2	69	32	14	4.7	4.6	4.4
5	4.4	4.4	15	4.5	4.2	4.2	77	45	11	4.4	4.7	4.4
6	4.4	4.4	17	4.5	4.2	4.2	88	45	9.0	4.4	4.6	4.4
7	4.4	4.4	14	4.5	4.2	4.1	107	36	8.0	4.4	4.5	4.4
8	4.4	4.5	9.7	4.5	4.2	4.1	99	28	6.3	4.7	4.5	4.4
9	4.4	4.9	5.9	4.5	4.3	4.2	88	23	6.6	4.9	4.5	4.4
10	4.4	5.1	5.0	4.5	4.3	4.2	97	20	8.2	4.7	4.5	4.4
11	4.4	4.7	4.7	4.5	4.2	4.1	88	15	7.4	4.4	4.5	4.4
12	4.4	5.1	4.7	4.5	4.2	4.2	72	12	5.6	4.7	4.6	4.3
13	4.4	4.9	4.5	4.5	4.2	4.2	71	12	33	4.4	4.6	4.3
14	4.6	4.9	10	4.5	4.2	4.1	87	14	47	4.7	4.6	4.5
15	4.4	4.9	31	4.5	4.4	4.1	145	14	26	4.6	4.5	4.2
16	4.4	4.7	32	4.5	4.2	4.1	141	53	14	4.6	4.5	4.2
17	4.4	4.7	23	4.5	4.2	4.1	145	95	7.8	4.6	4.5	4.2
18	4.4	4.7	15	4.5	4.3	4.2	141	68	9.3	4.5	4.5	4.3
19	4.4	4.7	9.5	4.4	4.2	4.5	136	45	7.1	4.5	4.4	4.2
20	4.4	4.9	8.8	4.5	4.2	5.0	92	33	5.7	4.9	4.4	4.3
21	4.4	4.9	7.3	4.5	4.2	5.2	70	24	5.0	4.5	4.4	4.5
22	4.2	4.9	6.5	4.5	4.2	5.0	92	19	4.9	4.5	4.4	4.1
23	4.6	4.7	6.1	4.5	4.2	4.9	127	16	4.9	4.5	4.4	4.2
24	4.5	4.7	5.1	4.5	4.2	5.1	92	13	4.9	4.5	4.4	4.2
25	4.6	4.9	4.7	4.5	4.3	5.3	60	11	4.8	4.5	4.4	4.1
26	4.4	4.7	4.7	4.5	4.3	6.1	45	10	4.9	4.5	4.4	4.2
27	4.3	4.7	4.7	4.3	4.2	6.0	39	9.9	4.7	4.5	4.4	4.2
28	4.4	4.7	4.7	4.5	4.2	5.5	33	9.8	4.9	4.5	4.4	4.2
29	4.4	5.5	4.7	4.4	4.2	5.7	32	10	4.9	4.5	4.4	4.1
30	4.4	25	4.7	4.5	---	8.8	28	17	4.7	4.5	4.4	4.1
31	4.4	---	4.7	4.4	---	53	---	39	---	4.4	4.4	---
TOTAL	136.8	161.9	384.7	139.6	123.2	195.0	2578	860.7	361.6	141.6	138.9	129.0
MEAN	4.41	5.40	12.4	4.50	4.25	6.29	85.9	27.8	12.1	4.57	4.48	4.30
MAX	4.6	25	36	4.7	4.4	53	145	95	47	4.9	4.7	4.5
MIN	4.2	4.3	4.5	4.3	4.2	4.1	28	9.8	4.7	4.4	4.4	4.1

CAL YR 1975 TOTAL 4402.4 MEAN 12.1 MAX 237 MIN 3.8
WTR YR 1976 TOTAL 5351.0 MEAN 14.6 MAX 145 MIN 4.1

04058250 WARNER CREEK TRIBUTARY NEAR PALMER, MI

LOCATION.--Lat 46°25'20", long 87°36'09", in NW¼ SE¼ sec.31, T.47 N., R.26 W., Marquette County, Hydrologic Unit 04030110, at double culvert on County Road 565, 0.3 mile (0.5 km) upstream from mouth, and 0.8 mile (1.3 km) south of Palmer.

DRAINAGE AREA.--4.05 mi^2 (10.49 km^2).

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)
OCT								
21...	1345	2.2	381	7.8	17.0	6.5	0	0
NOV								
21...	1030	2.3	233	8.0	2.0	.0	35	4
DEC								
18...	1030	3.3	274	7.2	-18.0	.0	70	8
JAN								
23...	1315	.78	315	7.9	-3.5	.0	30	6
FEB								
18...	1150	.89	318	7.9	-1.0	.5	60	15
MAR								
31...	1030	21	136	7.2	1.0	.0	30	10
APR								
27...	1545	4.5	135	7.3	8.0	6.0	45	2
MAY								
17...	1415	8.4	132	7.3	9.0	11.0	45	2
JUN								
15...	1100	2.1	182	7.4	23.0	22.0	60	2
JUL								
14...	1245	.62	244	7.2	24.5	18.0	27	3
AUG								
12...	1535	3.1	311	7.4	20.0	20.5	6	2
SEP								
09...	1610	.35	311	7.2	19.0	17.5	17	3

DATE	HARDNESS (CA,MG) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL IRON (FE) (UG/L)	DISSOLVED IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT								
21...	140	33	13	.70	390	40	200	200
NOV								
21...	98	25	8.7	.52	840	150	200	200
DEC								
18...	110	26	10	.62	720	210	--	460
JAN								
23...	100	25	9.7	.40	840	270	1100	1000
FEB								
18...	100	24	10	.22	1100	150	--	1500
MAR								
31...	65	16	6.1	.51	970	200	170	170
APR								
27...	57	15	4.8	.18	470	290	220	220
MAY								
17...	56	13	5.8	.13	500	220	90	80
JUN								
15...	100	28	8.3	.04	1100	710	140	130
JUL								
14...	110	26	10	.03	1300	640	370	370
AUG								
12...	140	31	15	.05	260	30	70	60
SEP								
09...	150	34	16	.01	390	80	130	120

04058300 WARNER CREEK NEAR PALMER, MI

LOCATION.--Lat 46°24'09", long 87°32'39", in NW¼ sec.10, T.46 N., R.26 W., Marquette County, Hydrologic Unit 04030110, on left bank 10 ft (3 m) upstream from bridge on county highway, 0.1 mi (0.2 km) upstream from confluence with Schweitzer Creek, and 3.5 mi (5.6 km) southeast of Palmer.

DRAINAGE AREA.--14.2 mi^2 (36.8 km^2).

PERIOD OF RECORD.--July 1961 to September 1968, October 1972 to current year. Occasional low-flow measurements, water years 1969-70, and annual maximum, water-years 1970-72 (corrected).

GAGE.--Water-stage recorder. Altitude of gage is 1,190 ft (363 m) from topographic map (nearest 10 ft). Prior to Aug. 22, 1961, non-recording gage at present site and datum.

REMARKS.--Records poor. Headwaters are affected by waste effluent and mine pumpage. Discharge during the year includes flow resulting from the dewatering of Gribben Lake basin 1.0 mi (1.6 km) above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--7 years, (1962-68), 15.8 ft^3/s (0.447 m^3/s), 15.11 in/yr (384 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 600 ft^3/s (17.0 m^3/s) corrected, May 31, 1970, gage height, 8.95 ft (2.728 m), backwater from Schweitzer Creek; minimum discharge, 0.5 ft^3/s (0.014 m^3/s) Sept. 10, 1961, gage height, 0.79 ft (0.241 m).

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 115 ft^3/s (3.26 m^3/s) Apr. 16; maximum gage height, 4.69 ft (1.430 m) Apr. 1 (backwater from Schweitzer Creek); minimum discharge, 2.1 ft^3/s (0.059 m^3/s) Sept. 8, gage height, 1.01 ft (0.308 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	4.6	40	10	8.4	9.5	54	28	25	5.9	16	9.4
2	7.9	5.0	45	10	8.4	9.5	68	29	20	5.0	14	9.1
3	4.8	4.6	35	11	45	9.5	66	32	18	4.8	15	10
4	4.5	5.0	28	11	40	9.5	64	33	15	4.5	16	8.8
5	4.2	5.0	26	10	8.5	9.5	66	35	13	4.4	24	3.6
6	4.1	5.5	34	10	8.5	9.5	70	28	11	4.4	35	2.8
7	4.1	5.2	24	10	8.5	9.5	78	24	9.2	5.0	26	2.8
8	4.0	7.0	18	9.5	8.5	9.5	86	22	9.6	6.0	18	2.3
9	4.3	7.5	15	9.5	8.5	9.5	86	20	9.5	6.0	15	2.5
10	5.2	13	14	9.5	8.5	9.5	90	17	9.3	7.5	14	2.5
11	5.7	14	14	9.5	8.8	9.5	80	16	8.8	6.6	14	2.6
12	6.0	13	14	9.0	8.8	9.5	74	15	8.0	5.5	14	3.4
13	5.9	16	14	9.0	8.8	9.5	68	14	23	5.0	14	3.6
14	5.6	14	20	9.0	8.8	9.5	74	18	33	4.8	14	3.6
15	5.6	12	33	9.0	8.8	9.5	100	17	17	5.0	14	3.6
16	5.8	11	30	9.0	8.8	9.5	115	30	18	4.8	13	3.6
17	5.4	10	22	9.0	9.0	9.5	105	50	13	5.2	13	3.6
18	5.7	10	20	9.0	9.0	9.5	95	40	12	5.0	14	3.6
19	6.1	12	18	9.0	9.0	10	75	30	13	5.2	14	3.6
20	6.0	13	17	8.8	9.0	12	40	26	11	10	13	4.0
21	5.5	14	16	8.5	9.0	15	35	24	7.6	16	14	4.6
22	5.9	14	16	8.5	9.0	14	50	19	8.2	18	14	4.6
23	5.7	12	16	8.5	9.0	14	70	19	8.2	16	12	3.7
24	6.8	10	15	8.5	9.0	18	58	19	7.3	19	12	3.6
25	7.9	10	14	8.5	9.0	23	48	17	6.6	18	7.9	3.6
26	7.0	10	13	8.5	9.0	27	40	16	6.8	16	9.1	3.6
27	6.1	10	12	8.4	9.0	30	34	14	6.3	15	9.4	3.6
28	5.7	9.4	11	8.4	9.0	30	30	14	6.3	14	7.9	3.6
29	6.3	10	11	8.4	9.0	35	29	13	6.1	17	7.0	3.6
30	5.9	22	11	8.4	---	42	28	16	6.1	19	8.8	3.6
31	4.6	---	11	8.4	---	48	---	27	---	18	9.7	---
TOTAL	173.1	308.8	627	283.8	322.6	489.0	1976	722	365.9	296.6	441.8	127.1
MEAN	5.58	10.3	20.2	9.15	11.1	15.8	65.9	23.3	12.2	9.57	14.3	4.24
MAX	7.9	22	45	11	45	48	115	50	33	19	35	10
MIN	4.0	4.6	11	8.4	8.4	9.5	28	13	6.1	4.4	7.0	2.3

CAL YR 1975 TOTAL 5333.4 MEAN 14.6 MAX 190 MIN 2.5
WTR YR 1976 TOTAL 6133.7 MEAN 16.8 MAX 115 MIN 2.3

04058400 GOOSE LAKE OUTLET NEAR SANDS STATION, MI

LOCATION.--Lat 46°23'36", long 87°29'40", in SE¼ SE¼ sec.12, T.46 N., R.26 W., Marquette County, Hydrologic Unit 04030110, on left bank 0.8 mi (1.3 km) upstream from mouth, and 3 mi (5 km) west of Sands Station.

DRAINAGE AREA.--37.5 mi^2 (97.1 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1965 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,160 ft (354 m) from topographic map (nearest 10 ft).

REMARKS.--Water-discharge record good. Some mine water pumped into basin at headwaters. Discharge during the year includes flow resulting from the dewatering of Gribben Lake basin about 3 mi (5 km) above station.

AVERAGE DISCHARGE.--10 years (1966-75), 32.8 ft^3/s (0.929 m^3/s), 11.88 in/yr (302 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 458 ft^3/s (13.0 m^3/s) May 31, 1970, gage height, 5.89 ft (1.795 m); minimum, 4.0 ft^3/s (0.113 m^3/s) Aug. 26, Sept. 6, 8, 10, 13, 25, 28, 30, 1976, gage height, 1.37 ft (0.418 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 259 ft^3/s (7.33 m^3/s) Apr. 15, gage height, 4.90 ft (1.494 m); minimum, 4.0 ft^3/s (0.113 m^3/s) Aug. 26, Sept. 6, 8, 10, 13, 25, 28, 30, gage height, 1.37 ft (0.418 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	9.9	39	23	15	17	113	68	56	18	5.8	4.5
2	11	9.6	45	22	15	16	146	67	50	17	5.6	4.6
3	10	9.3	50	23	15	18	143	66	45	16	5.4	4.5
4	10	9.6	47	20	15	18	134	64	43	16	5.7	4.4
5	9.6	9.0	45	20	15	17	136	65	40	15	6.0	4.4
6	9.4	9.0	40	19	15	17	142	62	37	15	5.8	4.4
7	9.7	9.4	39	18	15	17	171	58	35	14	5.5	4.4
8	9.9	9.6	37	18	15	17	182	53	35	14	5.3	4.4
9	9.7	10	35	18	15	17	178	49	34	16	5.2	4.3
10	9.4	14	33	18	16	17	192	46	32	16	5.3	4.3
11	9.3	13	31	18	16	17	178	43	30	15	5.3	4.3
12	9.3	16	28	17	15	17	158	40	29	15	7.3	4.3
13	9.2	23	29	17	15	16	144	39	27	15	6.6	4.2
14	9.0	23	45	17	15	16	160	41	25	16	5.8	5.5
15	8.9	22	41	17	15	16	234	38	30	14	5.6	4.5
16	9.0	21	46	15	15	17	246	73	33	14	5.2	4.5
17	9.1	21	46	15	15	17	228	87	31	14	5.1	4.4
18	9.1	21	41	14	16	17	209	83	31	14	5.1	4.3
19	8.9	23	40	17	16	17	175	73	30	12	5.1	4.4
20	8.8	27	37	16	16	21	135	65	28	13	4.9	4.4
21	8.8	28	33	16	16	28	121	58	26	9.2	4.9	4.6
22	10	33	32	16	16	24	147	52	24	8.0	4.7	4.5
23	9.8	30	30	16	15	27	162	48	23	7.3	4.7	4.4
24	10	32	28	15	16	35	132	45	22	6.9	4.7	4.3
25	9.9	27	29	15	17	43	116	43	22	6.7	4.6	4.3
26	10	28	27	15	17	56	102	40	21	6.5	4.5	4.3
27	9.4	27	26	15	17	64	93	38	20	6.4	4.6	4.3
28	9.6	26	23	15	17	66	85	36	19	6.2	4.4	4.3
29	9.5	28	24	15	18	80	78	34	19	6.1	4.7	4.3
30	9.3	43	24	15	---	94	73	40	18	6.1	5.2	4.3
31	11	---	24	15	---	106	---	54	---	6.0	4.9	---
TOTAL	296.6	611.4	1094	530	454	965	4513	1668	915	374.4	163.5	132.6
MEAN	9.57	20.4	35.3	17.1	15.7	31.1	150	53.8	30.5	12.1	5.27	4.42
MAX	11	43	50	23	18	106	246	87	56	18	7.3	5.5
MIN	8.8	9.0	23	14	15	16	73	34	18	6.0	4.4	4.2

CAL YR 1975 TOTAL 10969.5 MEAN 30.1 MAX 354 MIN 6.1
WTR YR 1976 TOTAL 11717.5 MEAN 32.0 MAX 246 MIN 4.2

04058400 GOOSE LAKE OUTLET NEAR SANDS STATION, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1962-63, 1967, 1971 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)
OCT						
09...	1235	9.6	150	8.9	17.0	10.0
21...	1230	8.2	117	7.3	12.0	6.0
NOV						
25...	1130	28	250	8.4	-6.5	.5
DEC						
15...	1200	41	200	7.6	-4.0	.0
FEB						
04...	1300	15	210	7.4	-12.0	.5
MAR						
24...	0830	41	199	7.6	2.0	1.0
APR						
20...	1145	133	200	7.2	14.5	6.5
MAY						
14...	1200	40	181	7.9	15.0	10.0
JUN						
03...	1030	46	160	6.9	19.0	13.5
JUL						
13...	1500	14	178	7.2	25.0	14.0
AUG						
11...	1300	5.6	110	7.5	27.0	14.5

04058500 EAST BRANCH ESCANABA RIVER AT GWINN, MI

LOCATION.--Lat 46°17'10", long 87°26'00", in NE¼ sec.21, T.45 N., R.25 W., Marquette County, Hydrologic Unit 04030110, on right bank in county park at Gwinn, 1.1 mi (1.8 km) upstream from mouth.

DRAINAGE AREA.--124 mi^2 (321 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1954 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,079.2 ft (328.94 m) above mean sea level.

REMARKS.--Water-discharge records good except those for the winter period, which are fair. Since August 1962, some regulation by Schweitzer Reservoir (see sta 04058190) about 16 mi (26 km) above station. An average of 3.5 ft^3/s (0.099 m^3/s) was diverted from headwaters of basin by the city of Ishpeming for municipal supply and the effluent discharged to the Carp River Basin. An average of 24 ft^3/s (0.68 m^3/s) was diverted from Schweitzer Reservoir by industry for iron ore processing and some returned to the Middle Branch Escanaba River via Green Creek. Diversion into Schweitzer Reservoir from Greenwood Reservoir via Greenwood Diversion (see sta 04057813). Discharge during the year includes flow resulting from the dewatering of Gribben Lake Basin in the headwaters.

AVERAGE DISCHARGE.--22 years, 112 ft^3/s (3.172 m^3/s), 12.27 in/yr (312 mm/yr), adjusted for storage and diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,390 ft^3/s (67.7 m^3/s) June 1, 1970, gage height, 14.97 ft (4.563 m); minimum, 19 ft^3/s (0.54 m^3/s) July 30, Oct. 11, 1963; minimum gage height, 6.46 ft (1.969 m) Sept. 14, 1976.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 778 ft^3/s (22.0 m^3/s) Apr. 16, gage height, 10.81 ft (3.295 m); minimum, 20 ft^3/s (0.57 m^3/s) Sept. 14, gage height, 6.46 ft (1.969 m).

DISCHARGE+ IN CUBIC FEET PER SECOND+ WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	39	204	62	46	55	416	181	200	52	39	31
2	41	39	220	63	46	53	439	176	166	49	38	31
3	41	38	200	63	46	54	466	188	137	46	38	31
4	37	37	170	60	46	54	424	179	117	44	40	31
5	36	37	145	58	46	53	433	194	103	43	44	30
6	35	38	135	56	47	54	469	198	93	42	49	26
7	36	38	124	54	47	53	535	179	85	42	54	26
8	38	39	115	54	47	52	545	161	80	45	47	24
9	37	41	95	54	48	52	516	145	78	42	41	24
10	38	55	86	54	48	52	542	134	78	49	40	23
11	39	68	81	53	48	52	519	122	74	46	40	23
12	41	61	81	50	48	52	456	112	70	43	41	22
13	42	79	75	49	48	52	419	104	104	41	50	21
14	41	77	116	49	48	52	456	114	130	41	41	24
15	40	69	180	49	48	52	646	112	118	43	40	33
16	40	66	190	49	48	52	760	273	111	42	38	34
17	40	66	160	49	48	51	713	437	96	41	36	33
18	39	66	140	49	50	51	675	351	83	40	36	33
19	39	68	120	48	50	54	604	257	85	39	37	31
20	40	79	104	47	51	71	480	203	78	41	36	32
21	39	89	93	47	51	99	385	173	68	46	35	35
22	39	85	85	47	50	136	529	143	61	45	34	40
23	41	115	80	46	51	126	614	131	59	44	34	35
24	47	76	76	46	51	134	474	122	56	41	33	33
25	46	72	74	46	52	152	369	114	55	44	32	31
26	46	71	73	46	55	178	299	110	55	43	29	32
27	43	69	69	46	57	219	256	105	53	41	30	32
28	41	66	66	46	59	246	228	100	57	39	29	32
29	40	67	66	46	58	253	202	97	69	39	29	30
30	41	144	65	46	---	297	187	112	58	41	28	30
31	40	---	64	46	---	398	---	187	---	41	30	---
TOTAL	1244	1954	3552	1578	1438	3309	14056	5214	2677	1335	1168	893
MEAN	40.1	65.1	115	50.9	49.6	107	469	168	89.2	43.1	37.7	29.8
MAX	47	144	220	63	59	398	760	437	200	52	54	40
MIN	35	37	64	46	46	51	187	97	53	39	28	21

CAL YR 1975 TOTAL 34992 MEAN 95.9 MAX 1100 MIN 29 MEAN+ 116 CFSM+ 0.94 IN+ 12.70
WTR YR 1976 TOTAL 38418 MEAN 105 MAX 760 MIN 21 MEAN+ 120 CFSM+ 0.97 IN+ 13.18

+Adjusted for diversion and change in contents in Schweitzer Reservoir. Records of diversion furnished by Cleveland Cliffs Iron Co. and Michigan Department of Environmental Health.

04058500 EAST BRANCH ESCANABA RIVER AT GWINN, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1955 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)
OCT								
20...	1440	39	136	7.6	16.0	5.5	30	2
NOV								
19...	0940	68	144	7.7	8.5	3.0	60	4
DEC								
17...	1030	185	119	7.3	-10.0	.0	80	4
JAN								
20...	1030	E45	162	7.3	-10.5	.0	40	3
FEB								
19...	1045	52	157	7.5	.0	.0	40	3
MAR								
25...	1130	152	132	7.7	4.0	.5	40	5
APR								
28...	1545	222	125	7.5	14.5	6.5	38	1
MAY								
18...	1230	352	92	7.4	12.5	11.0	66	2
JUN								
15...	1515	115	113	7.6	26.0	21.5	48	2
JUL								
13...	1030	42	132	7.5	18.0	15.5	33	2
AUG								
12...	0945	40	148	7.4	19.0	18.5	27	2
SEP								
08...	1510	24	154	7.3	32.5	17.0	13	2

DATE	HARDNESS (CA,MG) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL IRON (FE) (UG/L)	DISSOLVED IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT								
20...	65	18	4.9	.03	880	510	10	8
NOV								
19...	71	20	5.0	.25	1000	570	50	50
DEC								
17...	57	16	4.2	.27	790	380	40	40
JAN								
20...	74	21	5.3	.21	870	550	40	30
FEB								
19...	74	21	5.2	.22	1000	600	40	30
MAR								
25...	55	15	4.2	.36	830	240	60	40
APR								
28...	49	14	3.5	.17	500	320	60	50
MAY								
18...	35	9.0	3.1	.09	690	250	30	20
JUN								
15...	56	15	4.5	.10	660	390	50	30

04059000 ESCANABA RIVER AT CORNELL, MI

LOCATION.--Lat 45°54'31", long 87°12'49", in NW¼ sec.32, T.41 N., R.23 W., Delta County, Hydrologic Unit 04030110, on right bank 50 ft (15 m) downstream from bridge on County Road 519, 0.4 mi (0.6 km) downstream from Bobs Creek, 0.7 mi (1.1 km) northeast of Cornell, and 16 mi (26 km) upstream from mouth.

DRAINAGE AREA.--870 mi^2 (2,253 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1903 to December 1912, January 1913 to November 1915 (gage heights only), October 1950 to current year. Monthly discharge only for some periods, published in WSP 1307. Published as "near Escanaba" 1903-15.

REVISED RECORDS.--WSP 1387: 1904.

GAGE.--Water-stage recorder. Datum of gage is 749.26 ft (228.374 m) above mean sea level (levels by Michigan Department of Natural Resources). August 1903 to November 1915, nonrecording gage at site 10 mi (16 km) downstream at different datum.

REMARKS.--Water-discharge records good except those for the winter period, which are fair. Since 1950, diurnal fluctuation and occasional slight regulation caused by Boney Falls powerplant, 7 mi (11 km) upstream. Since August 1962, some regulation by Schweitzer Reservoir, about 50 mi (80 km) upstream (see sta 04058190). Since December 1972, some regulation by Greenwood Reservoir about 60 mi (97 km) upstream (see sta 04057811).

AVERAGE DISCHARGE.--35 years, (1903-12, 1950-76), 894 ft^3/s (25.32 m^3/s), 13.95 in/yr (354 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,500 ft^3/s (297 m^3/s) May 7, 1960, gage height, 4.90 ft (1.494 m); maximum gage height, 6.40 ft (1.951 m) Apr. 9, 1971, backwater from ice; minimum discharge observed, 90 ft^3/s (2.55 m^3/s) July 5, 1910, gage height, 1.5 ft (0.46 m), site and datum then in use, but may have been less during extended periods of no gage-height record during winter periods of 1903-12, or periods of ice effect in 1959.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,920 ft^3/s (168 m^3/s) Apr. 18, gage height, 3.97 ft (1.210 m); maximum gage height, 5.18 ft (1.579 m) Mar. 30, backwater from ice; minimum discharge, 126 ft^3/s (3.57 m^3/s) Sept. 4, gage height, 1.24 ft (0.378 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	363	402	1340	380	360	450	2770	1710	1730	422	251	195
2	354	375	1200	370	360	430	3100	1660	1610	386	260	187
3	316	285	1150	370	360	420	3550	1600	1420	429	247	187
4	322	346	1100	370	370	420	3770	1660	1210	313	247	186
5	339	349	1050	360	380	420	3980	1600	958	322	211	180
6	333	345	993	360	380	420	4410	1590	861	318	224	182
7	330	345	850	350	380	420	4580	1560	760	322	228	185
8	322	381	700	350	380	420	4480	1470	654	307	278	188
9	320	413	640	350	390	420	4490	1290	510	314	268	184
10	284	509	540	350	390	430	4590	1220	831	328	258	177
11	256	679	560	360	390	420	4180	1130	828	340	252	190
12	264	727	580	370	380	410	3840	1060	724	329	271	186
13	296	724	620	370	380	390	3570	974	717	316	261	180
14	302	761	800	370	370	370	3640	925	1010	325	242	246
15	279	769	1300	380	370	390	4360	987	911	331	237	183
16	283	727	1000	380	370	420	5030	1940	941	320	223	180
17	312	644	850	380	380	430	5290	3280	855	317	221	187
18	326	626	770	380	380	450	5800	3480	735	327	271	187
19	294	646	700	370	390	470	5700	2970	591	325	259	198
20	300	691	650	370	400	540	5180	2390	601	311	275	198
21	292	1010	620	360	410	640	4570	1970	546	296	259	195
22	307	901	580	360	420	750	4670	1610	515	305	240	194
23	327	819	540	360	420	850	4710	1430	495	291	214	203
24	376	747	510	350	420	950	4250	1220	435	294	184	199
25	425	636	480	350	430	1100	3720	921	438	275	204	235
26	425	399	460	350	440	1300	3060	864	391	259	194	196
27	424	370	440	350	450	1500	2520	840	430	261	220	200
28	481	420	420	350	460	1800	2250	749	426	270	201	197
29	479	531	410	360	460	2000	1920	722	406	266	189	200
30	411	959	400	360	---	2300	1810	894	423	255	194	202
31	408	---	390	360	---	2620	---	1530	---	252	197	---
TOTAL	10550	17536	22643	11250	11470	24350	119790	47246	22962	9726	7280	5807
MEAN	340	585	730	363	396	785	3993	1524	765	314	235	194
MAX	481	1010	1340	380	460	2620	5800	3480	1730	429	278	246
MIN	256	285	390	350	360	370	1810	722	391	252	184	177
CFSM	.39	.67	.84	.42	.46	.90	4.59	1.75	.88	.36	.27	.22
IN.	.45	.75	.97	.48	.49	1.04	5.12	2.02	.98	.42	.31	.25

CAL YR 1975 TOTAL 297338 MEAN 815 MAX 6900 MIN 217 CFSM .94 IN 12.71
WTR YR 1976 TOTAL 310610 MEAN 849 MAX 5800 MIN 177 CFSM .98 IN 13.28

04059000 ESCANABA RIVER AT CORNELL, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-73, 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: February 1975 to current year.
WATER TEMPERATURES: February 1975 to current year.

INSTRUMENTATION.--Water-quality monitor since October 1975.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. Monthly samples are collected as a cross-section sample in the reach of stream from the County Road 519 bridge to a point 200 ft (61 m) downstream.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 360 micromhos Sept. 10, 1975; minimum daily, 115 micromhos Apr. 24, 25, 1975.
WATER TEMPERATURES: Maximum daily, 35.0°C July 31, 1975; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 274 micromhos Sept. 16; minimum, 122 micromhos Mar. 31.
WATER TEMPERATURES: Maximum, 31.0°C July 7, 8; minimum, 0.0° on many days during winter period.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT												
10...	1400	260	183	8.3	11.5	10.8	102	32	<1	33	99	7
NOV												
13...	1400	720	179	7.7	3.0	13.7	103	24	6	51	97	12
DEC												
05...	1015	1020	151	7.2	.5	15.2	110	56	15	14	71	9
FEB												
09...	1300	393	198	7.9	.0	13.1	92	1	1	1	100	0
MAR												
19...	1100	468	235	7.8	.0	13.6	95	3	1	<1	110	5
APR												
15...	1030	4290	95	7.7	5.0	12.4	99	11	3	2	50	4
MAY												
20...	1210	2420	105	8.2	13.0	10.4	100	39	12	12	58	5
JUN												
09...	1130	485	161	8.3	20.0	9.7	110	84	8	75	87	3
JUL												
09...	1030	337	192	8.3	19.5	9.7	100	>1000	6	91	94	0
AUG												
19...	1200	268	200	8.1	22.5	10.5	120	44	3	18	96	6
SEP												
17...	1300	215	218	8.0	15.0	10.3	100	80	3	11	100	0
29...	1215	203	197	8.3	10.5	10.5	100	73	2	24	100	0

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT												
10...	24	9.5	3.1	.1	1.1	112	0	92	.9	10	3.0	.2
NOV												
13...	23	9.6	2.5	.1	1.8	104	0	85	3.3	12	2.9	.1
DEC												
05...	17	6.9	2.5	.1	.9	76	0	62	7.7	14	3.3	.6
FEB												
09...	26	9.5	5.0	.2	1.3	142	0	116	2.9	11	3.1	.3
MAR												
19...	25	11	4.9	.2	1.2	128	0	105	3.2	10	3.5	.3
APR												
15...	12	4.9	1.7	.1	.8	56	0	46	1.8	10	2.3	.1
MAY												
20...	14	5.5	1.2	.1	.4	64	0	52	.6	8.9	1.3	.1
JUN												
09...	21	8.4	2.3	.1	.9	102	0	84	.8	9.4	3.1	.1
JUL												
09...	22	9.6	3.0	.1	1.0	122	0	100	1.0	10	1.1	.1
AUG												
19...	23	9.3	5.1	.2	1.0	110	0	90	1.4	8.2	3.6	.1
SEP												
17...	24	10	4.1	.2	1.1	130	0	107	2.1	6.3	3.9	0.2
29...	24	9.8	3.7	.2	1.0	122	0	100	1.0	7.5	2.9	.1

04059000 ESCANABA RIVER AT CORNELL, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT											
10...	7.7	108	114	75.9	.07	.38	1.7	.01	5	3.5	100
NOV											
13...	7.7	129	111	251	.17	.59	2.6	.01	1	1.9	100
DEC											
05...	8.4	104	91	286	.30	.72	3.2	.02	0	.00	100
FEB											
09...	9.9	156	136	166	.27	.57	2.5	.01	9	9.5	100
MAR											
19...	10	134	129	169	.28	.55	2.4	.02	7	8.8	100
APR											
15...	6.4	86	66	996	.17	.70	3.1	.02	5	58	100
MAY											
20...	4.4	84	67	549	.04	.52	2.3	.02	3	20	100
JUN											
09...	4.6	114	100	149	.05	.55	2.4	.05	14	18	100
JUL											
09...	6.6	121	114	110	.07	.47	2.1	.01	5	4.5	100
AUG											
19...	7.1	124	112	89.7	.05	.33	1.5	.02	5	3.6	100
SEP											
17...	6.9	122	120	70.8	.04	.22	.97	.09	1	.58	100
29...	7.5	123	117	67.4	.06	.24	1.1	.04	1	.55	100

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
OCT												
10...	1400	0	0	0	0	<10	3	0	0	8	2	600
FEB												
09...	1300	1	0	0	0	10	0	0	0	42	0	810
APR												
15...	1030	0	0	0	0	10	10	--	1	10	10	540
JUL												
09...	1030	1	1	0	0	10	10	--	1	0	0	410

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT												
10...	320	6	0	40	8	.4	.2	0	0	40	0	4.2
FEB												
09...	380	17	7	20	0	.2	.0	0	0	--	0	7.8
APR												
15...	280	--	5	30	10	<.5	<.5	0	0	--	30	13
JUL												
09...	200	1	1	60	0	<.5	<.5	0	0	10	10	6.9

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
PERIPHYTON

DATE	LENGTH OF EXPO-SURE (DAYS)	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M	UNCOR-RECTED PERI-PHYTON CHLORO-PHYLL A MG/SQ M	UNCOR-RECTED PERI-PHYTON CHLORO-PHYLL B MG/SQ M
NOV 13...	34	26.0	18.0	3.60	.000
MAR 19...	39	.400	.200	.000	.000
MAY 20...	35	.923	.692	.192	.000
AUG 19...	41	12.6	8.31	9.22	.528

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

OCT. 10, 1975
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

820 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			34	4
	...SCENEDESMACEAE				
D	....CRUCIGENIA			270	33
			TOTALS	310	37
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
D	....ACHNANTHES			210	25
	...CYMBELLACEAE				
	....CYMBELLA			34	4
	...DIATOMACEAE				
	....DIATOMA			69	8
	...FRAGILARIACEAE				
	....SYNEDRA			34	4
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			69	8
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			34	4
	...NITZSCHIACEAE				
	....NITZSCHIA			69	8
			TOTALS	520	61

04059000 ESCANABA RIVER AT CORNELL, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

NOV. 13, 1975
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,200 CELLS/ML

	ORGANISM NAME	COMMON NAME	CELLS/ML	PER CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
L	....SCENEDESMUS			0
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		630	53
L	....COCCONEIS			0
	...CYMBELLACEAE			
	....CYMBELLA		63	5
	...DIATOMACEAE			
	....DIATOMA		63	5
	...EUNOTIACEAE			
	....EUNOTIA		31	3
	...FRAGILARIACEAE			
	....SYNEDRA		63	5
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		94	8
	...NITZSCHIACEAE			
D	....NITZSCHIA		250	21
		TOTALS	1,200	100

DEC. 5, 1975
1015 HOURS

IDENTIFICATION OF PHYTOPLANKTON

340 CELLS/ML

	ORGANISM NAME	COMMON NAME	CELLS/ML	PER CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		140	40
	....COCCONEIS		17	5
	...CYMBELLACEAE			
L	....AMPHORA			0
	....CYMBELLA		17	5
	...DIATOMACEAE			
D	....DIATOMA		51	15
	...FRAGILARIACEAE			
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		17	5
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		68	20
	...NITZSCHIACEAE			
	....NITZSCHIA		34	10
		TOTALS	340	100
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...PERIDINIACEAE			
L	....PERIDINIUM			0

04059000 ESCANABA RIVER AT CORNELL, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

FEB. 9, 1976
1300 HOURS

IDENTIFICATION OF PHYTOPLANKTON

300 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		17	6
	...SCENEDESMACEAE			
	....SCENEDESMUS		35	12
		TOTALS	52	18
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		17	6
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		35	12
	....COCCONEIS		9	3
	...CYMBELLACEAE			
	....CYMBELLA		9	3
	...DIATOMACEAE			
D	....DIATOMA		61	21
	...FRAGILARIACEAE			
D	....FRAGILARIA		44	15
	....SYNEDRA		17	6
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		52	18
		TOTALS	240	84

MAR. 19, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

150 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		110	69
	...DIATOMACEAE			
D	....DIATOMA		35	23
	...FRAGILARIACEAE			
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NITZSCHIACEAE			
	....NITZSCHIA		12	8
		TOTALS	150	100

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

APR. 15, 1976
1030 HOURS

IDENTIFICATION OF PHYTOPLANKTON

430 CELLS/ML

	ORGANISM NAME	COMMON NAME		CELLS/ML	PER CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...SCENEDESMACEAE				
L	....SCENEDESMUS				0
	..VOLVOCALES				
	...CHLAMYDOMONADACEAE				
L	....CHLAMYDOMONAS				0
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
L	....MELOSIRA				0
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
D	....ACHNANTHES			110	25
	....COCCONEIS			13	3
	...CYMBELLACEAE				
	....CYMBELLA			27	6
	...DIATOMACEAE				
	....DIATOMA			40	9
	...EUNOTIACEAE				
	....EUNOTIA			13	3
	...FRAGILARIACEAE				
	....FRAGILARIA			13	3
L	....SYNEDRA				0
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			40	9
	...NAVICULACEAE	NAVICULOID			
D	....NAVICULA			94	22
	....PINNULARIA			13	3
L	....STAURONEIS				0
	...NITZSCHIACEAE				
	....NITZSCHIA			27	6
	...SURIRELLACEAE				
L	....SURIRELLA				0
	...TABELLARIACEAE				
	....TABELLARIA			27	6
			TOTALS	420	95
	EUGLENOPHYTA	EUGLENOIDS			
	.EUGLENOPHYCEAE				
	..EUGLENALES				
	...EUGLENACEAE				
	....EUGLENA			13	3
			TOTALS	13	3

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAY 20, 1976
1210 HOURS

IDENTIFICATION OF PHYTOPLANKTON

540 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...CHARACIACEAE				
	....SCHROEDERIA			33	6
			TOTALS	33	6
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			49	9
	....MELOSIRA			33	6
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			49	9
	...FRAGILARIACEAE				
D	....FRAGILARIA			82	15
	....SYNEDRA			33	6
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			16	3
	...NAVICULACEAE	NAVICULOID			
D	....NAVICULA			160	30
	...NITZSCHIACEAE				
	....NITZSCHIA			49	9
			TOTALS	470	87
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..CHROOCOCCALES	COCCOID			
	...CHROOCOCCACEAE				
	....ANACYSTIS			33	6
			TOTALS	33	6

JUNE 9, 1976
1130 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,100 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
D	....ANKISTRODESMUS			380	18
			TOTALS	380	18
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
D	....ACHNANTHES			1,400	68
	...DIATOMACEAE				
	....DIATOMA			150	7
	...FRAGILARIACEAE				
	....SYNEDRA			150	7
			TOTALS	1,700	82

04059000 ESCANABA RIVER AT CORNELL, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JULY 9, 1976
1030 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,500 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		41	3
	....SELENASTRUM		61	4
	...SCENEDESMACEAE			
D	....SCENEDESMUS		350	23
		TOTALS	450	30
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		220	15
	...CYMBELLACEAE			
	....CYMBELLA		41	3
	...DIATOMACEAE			
	....DIATOMA		81	5
	...FRAGILARIACEAE			
	....FRAGILARIA		41	3
	....SYNEDRA		41	3
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		41	3
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		370	25
	...NITZSCHIACEAE			
	....DENTICULA		20	1
	....NITZSCHIA		20	1
		TOTALS	880	59
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS		160	11
		TOTALS	160	11

AUG. 19, 1976
1200 HOURS

IDENTIFICATION OF PHYTOPLANKTON

110,000 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
L	....STEPHANODISCUS			0
		TOTALS	150	0
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
L	....ANABAENA			0
D	....APHANIZOMENON		110,000	100
		TOTALS	110,000	100
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...CERATIACEAE			
L	....CERATIUM			0

04059000 ESCANABA RIVER AT CORNELL, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

SEP. 17, 1976
1300 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,400 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...HYDRODICTYACEAE			
L	....PEDIASTRUM			0
	...SCENEDESMACEAE			
L	....SCENEDESMUS			0
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		27	2
		TOTALS	27	2
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		27	2
L	....MELOSIRA			0
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		300	22
	...CYMBELLACEAE			
	....CYMBELLA		54	4
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
	....SYNEDRA		27	2
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		54	4
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		82	6
	...NITZSCHIACEAE			
	....NITZSCHIA		82	6
	...SURIRELLACEAE			
L	....SURIRELLA			0
		TOTALS	630	46
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		740	53
		TOTALS	740	53

SEP. 29, 1976
1215 HOURS

IDENTIFICATION OF PHYTOPLANKTON

310 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		17	6
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		120	39
	...FRAGILARIACEAE			
D	....SYNEDRA		51	17
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		51	17
	...NITZSCHIACEAE			
D	....NITZSCHIA		68	22
		TOTALS	310	101

NOTE: D - DOMINANT-ORGANISM: GREATER OR EQUAL TO 15%
L - LESS THEN 1%: MAY NOT HAVE BEEN ACTUALLY COUNTED

04059000 ESCANABA RIVER AT CORNELL, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	192	190	191	241	184	203			
2	---	---	---	196	187	189	196	167	183			
3	---	---	---	196	191	194	204	161	177			
4	---	---	---	193	188	190	197	149	172			
5	---	---	---	191	186	188	173	155	162			
6	---	---	---	190	185	187	---	---	---			
7	---	---	---	206	187	197	---	---	---			
8	---	---	---	200	189	194	---	---	---			
9	---	---	---	195	182	187	---	---	---			
10	---	---	---	212	191	200	---	---	---			
11	---	---	---	208	191	197	---	---	---			
12	---	---	---	212	184	190	---	---	---			
13	---	---	---	182	174	179	---	---	---			
14	---	---	---	177	168	171	---	---	---			
15	234	230	232	170	160	165	---	---	---			
16	232	228	230	163	158	161	---	---	---			
17	234	223	228	161	156	159	---	---	---			
18	224	219	221	161	157	159	---	---	---			
19	222	219	221	162	156	158	---	---	---			
20	220	214	216	162	152	159	---	---	---			
21	219	215	217	174	154	158	---	---	---			
22	230	214	220	176	157	162	---	---	---			
23	240	211	227	224	165	181	---	---	---			
24	239	222	231	193	160	177	---	---	---			
25	228	221	225	186	161	171	---	---	---			
26	224	221	223	195	184	190	---	---	---			
27	222	219	220	182	173	177	---	---	---			
28	242	203	220	185	174	179	---	---	---			
29	209	201	205	217	173	185	---	---	---			
30	206	192	198	229	175	198	---	---	---			
31	193	191	192	---	---	---	---	---	---			
MONTH	---	---	---	229	152	180	---	---	---			

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	230	228	229	144	140	142	164	144	153
2	---	---	---	233	229	231	159	139	148	166	148	155
3	---	---	---	234	230	231	156	146	151	149	141	146
4	---	---	---	232	228	231	161	144	151	142	140	141
5	---	---	---	233	228	230	158	147	151	142	137	140
6	---	---	---	231	227	229	177	140	148	145	139	142
7	---	---	---	232	229	231	223	180	208	147	142	144
8	---	---	---	233	230	232	222	149	202	153	146	150
9	198	196	197	234	228	232	161	140	150	167	153	159
10	201	198	199	231	228	229	184	152	166	177	163	169
11	210	200	206	235	229	231	201	184	193	174	160	166
12	210	199	206	230	226	228	208	200	204	172	165	167
13	211	199	203	231	229	231	210	208	209	175	166	170
14	213	210	211	232	228	230	209	155	181	190	175	181
15	211	203	208	231	228	229	172	137	152	187	180	183
16	214	209	212	232	229	230	---	---	---	210	168	187
17	220	213	218	234	233	233	---	---	---	168	150	159
18	221	219	220	234	229	232	---	---	---	154	146	151
19	221	218	219	235	225	229	---	---	---	157	146	152
20	222	220	221	229	223	226	---	---	---	162	153	158
21	229	219	223	236	222	230	---	---	---	166	154	161
22	230	229	230	240	225	229	165	145	157	167	162	164
23	234	227	231	230	221	224	170	145	158	173	160	166
24	232	216	225	236	211	221	159	125	142	178	167	171
25	230	218	224	218	202	210	128	124	126	188	177	183
26	231	221	225	208	195	202	131	126	129	192	184	188
27	231	222	229	217	198	202	136	130	133	198	188	193
28	231	228	229	194	155	174	137	131	134	203	194	199
29	231	227	229	161	149	152	144	136	140	208	200	203
30	---	---	---	158	124	147	145	142	143	224	208	214
31	---	---	---	149	122	144	---	---	---	214	205	210
MONTH	---	---	---	240	122	217	223	124	159	224	137	169

04059000 ESCANABA RIVER AT CORNELL, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	206	200	203	216	206	210	206	198	202	215	203	207
2	204	199	202	209	202	205	205	198	201	211	204	208
3	206	199	203	214	193	208	207	197	203	205	197	202
4	210	199	205	216	206	210	202	190	197	272	198	210
5	212	208	211	214	201	208	205	195	200	204	200	203
6	214	210	212	210	202	206	211	203	206	208	201	204
7	219	211	216	211	200	204	215	209	212	210	204	207
8	230	217	223	209	192	201	216	208	212	213	205	209
9	236	230	234	208	187	195	214	205	209	214	206	211
10	---	---	---	201	190	195	212	199	205	217	208	212
11	---	---	---	204	191	197	210	199	205	215	204	209
12	---	---	---	202	193	197	212	202	207	209	201	205
13	---	---	---	202	193	198	231	210	218	208	200	204
14	---	---	---	205	195	200	216	209	212	210	196	204
15	---	---	---	204	192	198	214	208	211	215	206	211
16	186	182	184	201	188	194	213	205	210	274	212	218
17	186	178	182	197	187	192	218	209	213	221	211	216
18	193	181	185	195	189	192	220	205	214	242	207	213
19	204	186	196	196	187	191	225	200	213	212	197	205
20	200	189	194	197	190	193	214	204	209	206	198	202
21	203	196	199	198	192	195	214	206	211	205	195	201
22	203	197	199	203	193	198	213	205	209	211	203	205
23	203	198	200	206	196	200	209	202	205	214	205	209
24	212	199	204	203	194	198	215	207	211	207	200	204
25	205	197	201	201	189	195	219	206	213	203	198	200
26	222	204	209	205	193	199	222	207	214	199	193	197
27	210	201	204	206	196	201	225	212	219	199	192	196
28	211	200	204	202	187	195	220	207	213	197	192	194
29	224	198	210	201	192	197	220	204	210	199	197	198
30	223	212	217	203	180	195	212	204	208	249	198	202
31	---	---	---	203	197	200	217	197	207	---	---	---
MONTH	236	178	204	216	180	199	231	190	209	274	192	206

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	11.5	6.0	8.0	2.0	0.5	1.0			
2	---	---	---	10.5	4.5	7.0	1.0	0.0	0.5			
3	---	---	---	9.5	4.5	6.5	1.0	0.5	0.5			
4	---	---	---	10.0	4.0	6.5	1.0	0.5	0.5			
5	---	---	---	11.5	5.0	7.5	1.0	0.5	0.5			
6	---	---	---	10.0	5.5	7.5	---	---	---			
7	---	---	---	10.5	8.5	9.5	---	---	---			
8	---	---	---	12.0	7.5	9.5	---	---	---			
9	---	---	---	8.5	7.5	8.0	---	---	---			
10	---	---	---	9.5	6.5	8.5	---	---	---			
11	---	---	---	6.5	5.5	6.0	---	---	---			
12	---	---	---	6.5	4.0	5.5	---	---	---			
13	---	---	---	4.0	2.5	3.0	---	---	---			
14	---	---	---	4.5	1.5	2.0	---	---	---			
15	12.5	---	---	4.5	1.0	2.0	---	---	---			
16	11.5	7.5	9.5	4.5	0.5	2.0	---	---	---			
17	12.0	6.0	8.0	5.5	1.5	2.5	---	---	---			
18	12.5	5.5	8.0	4.5	1.5	3.0	---	---	---			
19	12.0	4.0	7.5	5.5	3.5	4.5	---	---	---			
20	10.5	4.5	7.0	4.5	3.0	4.0	---	---	---			
21	10.5	6.0	7.5	3.5	1.5	2.0	---	---	---			
22	10.5	7.0	8.5	3.0	0.5	2.0	---	---	---			
23	13.5	8.0	10.5	1.5	0.0	1.0	---	---	---			
24	13.0	10.0	11.5	1.5	0.0	0.5	---	---	---			
25	12.0	7.0	9.5	1.0	0.0	0.5	---	---	---			
26	10.5	5.5	7.5	0.5	0.0	0.5	---	---	---			
27	12.0	7.0	9.0	0.5	0.0	0.5	---	---	---			
28	10.0	7.0	9.0	1.5	0.5	0.5	---	---	---			
29	7.5	6.0	6.5	4.0	0.5	1.5	---	---	---			
30	6.5	4.5	5.5	2.0	0.5	1.0	---	---	---			
31	8.0	5.5	7.0	---	---	---	---	---	---			
MONTH	---	---	---	12.0	0.0	4.0	---	---	---			

04059000 ESCANABA RIVER AT CORNELL, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	0.0	0.0	0.0	0.0	0.0	0.0	8.5	6.0	7.0
2	---	---	---	0.0	0.0	0.0	0.5	0.0	0.0	6.5	5.0	6.0
3	---	---	---	0.0	0.0	0.0	0.5	0.0	0.0	5.5	4.0	4.5
4	---	---	---	0.0	0.0	0.0	0.5	0.0	0.0	8.0	3.0	5.5
5	---	---	---	0.0	0.0	0.0	0.5	0.0	0.0	7.0	4.5	6.0
6	---	---	---	0.0	0.0	0.0	0.5	0.0	0.0	8.5	4.0	6.0
7	---	---	---	0.0	0.0	0.0	0.5	0.0	0.0	8.5	5.5	6.5
8	---	---	---	0.0	0.0	0.0	1.0	0.0	0.0	10.0	5.0	7.5
9	0.0	0.0	2.0	0.0	0.0	0.0	1.5	0.0	0.5	13.5	7.0	10.0
10	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5	1.0	14.0	9.5	11.5
11	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.5	1.0	14.0	9.0	11.0
12	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.5	1.0	14.5	7.5	11.0
13	0.0	0.0	0.0	0.0	0.0	0.0	4.0	1.0	2.5	14.0	9.5	11.5
14	0.0	0.0	0.0	0.0	0.0	0.0	5.5	2.5	4.0	17.0	10.0	13.5
15	0.0	0.0	0.0	0.0	0.0	0.0	6.0	4.5	5.0	17.0	11.0	14.0
16	0.0	0.0	0.0	0.0	0.0	0.0	8.0	5.5	7.0	14.0	11.5	12.0
17	0.0	0.0	0.0	0.0	0.0	0.0	9.0	7.0	8.0	12.0	10.0	11.0
18	0.0	0.0	0.0	0.0	0.0	0.0	9.5	8.0	8.5	12.0	9.5	10.5
19	0.0	0.0	0.0	0.0	0.0	0.0	9.0	8.0	8.5	12.5	9.0	11.0
20	0.0	0.0	0.0	0.0	0.0	0.0	8.0	6.5	7.5	15.5	11.0	13.0
21	0.0	0.0	0.0	0.0	0.0	0.0	7.5	6.5	7.0	15.5	12.5	13.5
22	0.0	0.0	0.0	0.0	0.0	0.0	6.5	6.0	6.5	15.5	11.5	13.0
23	0.0	0.0	0.0	0.0	0.0	0.0	7.0	5.5	6.5	15.5	11.5	13.0
24	0.0	0.0	0.0	0.0	0.0	0.0	7.0	6.0	6.5	15.5	11.0	13.0
25	0.0	0.0	0.0	0.0	0.0	0.0	7.0	5.5	6.5	17.0	11.0	13.5
26	0.0	0.0	0.0	0.0	0.0	0.0	6.0	4.0	5.0	18.5	11.0	14.5
27	0.0	0.0	0.0	0.0	0.0	0.0	5.5	3.5	4.0	20.0	12.0	15.5
28	0.0	0.0	0.0	0.0	0.0	0.0	7.0	3.5	5.5	20.0	13.5	16.0
29	0.0	0.0	0.0	0.0	0.0	0.0	7.5	5.0	6.5	16.0	15.0	15.5
30	---	---	---	0.0	0.0	0.0	7.5	6.0	7.0	14.5	13.5	14.0
31	---	---	---	0.0	0.0	0.0	---	---	---	13.5	13.0	13.5
MONTH	---	---	---	0.0	0.0	0.0	9.5	0.0	4.0	20.0	3.0	11.0

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	16.5	12.0	14.0	25.0	15.5	19.5	26.0	15.0	19.5	19.5	12.5	15.0
2	17.0	12.0	14.5	23.0	15.5	19.0	27.0	13.5	20.0	20.5	8.5	14.0
3	18.5	13.5	16.0	28.5	17.0	21.5	28.0	16.0	21.5	22.5	13.0	17.0
4	20.0	15.0	17.5	29.5	16.0	22.5	21.0	18.0	19.5	18.5	13.0	15.5
5	22.5	15.5	18.5	30.5	17.0	23.0	21.0	16.5	18.5	23.0	10.5	16.0
6	23.5	16.5	19.5	30.5	18.5	24.0	25.0	13.5	19.0	23.5	12.0	17.0
7	24.5	17.0	21.0	31.0	20.5	25.0	28.0	13.5	20.0	26.5	13.5	19.5
8	24.0	19.0	21.0	31.0	18.5	24.0	29.0	14.5	21.0	26.0	16.0	20.5
9	---	18.5	19.0	22.0	19.0	21.0	29.0	17.5	22.5	20.5	14.5	17.0
10	---	---	---	28.5	19.0	23.5	24.0	18.0	20.5	21.0	11.5	16.0
11	---	---	---	27.5	18.0	23.0	27.5	18.5	22.5	24.0	11.5	17.5
12	---	---	---	25.5	15.5	20.0	30.0	19.5	23.5	23.5	13.0	17.5
13	---	---	---	28.0	15.5	21.0	22.5	17.5	20.0	24.0	14.5	18.5
14	---	---	---	30.0	17.0	23.0	24.5	14.5	19.0	18.5	13.0	16.0
15	---	---	---	27.0	19.0	22.5	25.5	14.0	19.0	15.5	12.0	13.5
16	20.5	---	19.5	22.5	17.0	20.0	27.0	12.0	19.5	23.0	12.5	16.5
17	23.0	17.5	19.0	26.0	15.5	20.5	27.0	14.0	20.0	22.0	11.0	16.0
18	20.0	17.0	18.5	28.0	17.0	22.5	24.0	15.5	19.5	22.0	10.5	16.0
19	24.0	15.0	19.0	27.0	18.5	22.5	29.5	18.0	23.0	18.0	13.0	15.0
20	25.5	15.5	20.0	27.0	20.0	23.0	28.5	19.5	23.5	18.0	10.5	14.0
21	26.5	15.5	20.5	28.0	16.5	22.0	28.5	18.0	22.5	14.5	10.0	12.0
22	27.5	16.5	21.5	28.0	16.5	22.0	28.0	19.5	22.5	16.0	8.0	11.5
23	26.5	18.0	21.5	29.5	19.5	23.5	27.0	16.5	21.5	15.0	7.0	10.5
24	23.0	18.5	20.5	30.0	18.0	23.0	29.0	16.5	22.0	16.5	6.0	10.5
25	25.5	19.0	21.5	26.0	16.5	21.0	26.0	16.5	21.0	16.5	6.5	11.0
26	27.5	17.0	22.0	27.0	18.5	22.0	26.5	19.0	22.5	15.5	6.5	11.0
27	28.5	17.5	22.5	30.5	18.0	23.0	30.0	19.5	24.0	14.5	8.5	11.5
28	27.5	17.5	22.0	23.0	17.5	20.0	26.0	16.5	20.5	16.0	5.5	10.5
29	21.5	17.0	19.0	28.5	16.5	22.0	23.0	13.0	17.5	18.0	7.5	12.0
30	24.5	16.5	20.0	27.0	18.5	22.0	23.5	11.0	17.0	18.0	6.5	12.0
31	---	---	---	25.5	16.5	20.0	17.5	14.5	16.0	---	---	---
MONTH	---	---	19.5	31.0	15.5	22.0	30.0	11.0	20.5	26.5	5.5	14.5

04059400 TENMILE CREEK AT PERRONVILLE, MI

LOCATION.--Lat 45°48'38", long 87°22'00", in NE¼ NE¼ sec.3, T.39 N., R.25 W., Menominee County, Hydrologic Unit 04030109, on left bank 10 ft (3 m) downstream from bridge on county road, 700 ft (213 m) upstream from County Road 569, and 1.0 mi (1.6 km) northwest of Perronville.

DRAINAGE AREA.--38.4 mi^2 (99.5 km^2).

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1969, 1970. April 1971 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 810 ft (247 m) from topographic map (nearest 10 ft). Prior to Sept. 29, 1971, non-recording gage at present site and datum.

REMARKS.--Records fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--5 years, 44.4 ft^3/s (1.257 m^3/s), 15.70 in/yr (399 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 810 ft^3/s (22.9 m^3/s) Apr. 24, 1975, gage height, 5.42 ft (1.652 m); minimum, 0.18 ft^3/s (0.005 m^3/s) Sept. 18, 1971, Aug. 11, 12, 1976; minimum gage height, 1.95 ft (0.594 m) Aug. 12, 1975, Aug. 11, 12, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--A discharge of 0.09 ft^3/s (0.003 m^3/s) was measured, Aug. 25, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 318 ft^3/s (9.01 m^3/s) Apr. 5, gage height,.4.09 ft (1.247 m); minimum, 0.18 ft^3/s (0.005 m^3/s) Aug. 11, 12, gage height, 1.95 ft (0.594 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	5.2	52	9.0	6.5	9.5	200	85	154	8.8	.42	1.2
2	8.8	4.8	38	9.0	6.5	9.5	225	81	142	7.3	.33	1.4
3	7.5	4.8	31	9.0	6.5	10	250	80	116	5.5	.26	1.5
4	7.5	4.3	27	9.0	6.5	10	275	74	86	4.2	.22	1.5
5	7.2	3.9	22	9.5	6.5	10	308	70	66	3.3	.39	1.3
6	6.4	3.9	20	9.5	6.5	10	277	78	50	2.6	.42	.98
7	5.1	3.9	17	9.5	6.5	10	278	75	38	2.2	.41	.95
8	4.8	4.0	15	9.5	6.5	11	264	66	31	2.1	.34	.89
9	4.8	4.6	14	9.5	6.5	11	260	59	26	1.5	.27	.86
10	4.8	10	13	9.5	6.5	11	268	51	23	1.5	.22	.83
11	4.8	15	12	9.0	6.5	11	229	44	36	1.5	.22	.67
12	5.1	17	12	9.0	6.5	11	202	37	44	1.5	7.7	.50
13	6.0	19	12	8.5	6.5	11	193	37	36	1.3	8.6	.54
14	5.3	18	25	8.0	7.0	11	189	43	31	1.2	6.2	.90
15	5.3	17	50	8.0	7.0	11	209	42	25	1.0	4.0	1.2
16	5.3	15	35	7.5	7.0	11	224	126	21	1.0	2.7	1.2
17	4.8	14	27	7.5	7.5	11	228	192	18	.92	1.6	1.3
18	4.8	13	24	7.0	8.0	11	250	184	17	.72	6.8	1.5
19	4.4	13	21	7.0	8.5	13	270	165	17	.55	41	1.3
20	4.1	15	19	7.0	9.0	15	252	141	14	.90	38	1.5
21	4.3	30	17	7.0	9.0	25	225	113	12	.96	26	1.3
22	4.3	35	16	7.0	9.5	35	258	89	9.8	.95	17	1.3
23	5.8	26	15	6.5	9.5	40	255	70	8.0	.80	12	1.3
24	8.8	21	14	6.5	9.5	44	221	60	7.4	.55	7.7	1.2
25	10	18	13	6.5	9.5	46	185	51	6.8	.45	5.2	1.1
26	10	15	12	6.5	9.5	52	155	44	6.0	.38	3.8	1.1
27	9.4	14	11	6.5	9.5	62	133	38	5.2	.38	3.0	1.1
28	8.4	13	11	6.5	9.5	72	116	33	6.1	.38	2.0	1.1
29	6.6	13	10	6.5	9.5	90	100	30	7.9	.38	1.3	1.0
30	5.8	46	9.5	6.5	---	120	89	67	9.9	.45	1.1	.95
31	5.3	---	9.0	6.5	---	170	---	134	---	.63	1.1	---
TOTAL	195.5	436.4	623.5	244.0	223.5	974.0	6588	2459	1070.1	55.90	200.30	33.47
MEAN	6.31	14.5	20.1	7.87	7.71	31.4	220	79.3	35.7	1.80	6.46	1.12
MAX	10	46	52	9.5	9.5	170	308	192	154	8.8	41	1.5
MIN	4.1	3.9	9.0	6.5	6.5	9.5	89	30	5.2	.38	.22	.50
CFSM	.16	.38	.52	.20	.20	.82	5.73	2.07	.93	.05	.17	.03
IN.	.19	.42	.60	.24	.22	.94	6.38	2.38	1.04	.05	.19	.03

CAL YR 1975 TOTAL 14587.44 MEAN 40.0 MAX 680 MIN .26 CFSM 1.04 IN 14.13
WTR YR 1976 TOTAL 13103.67 MEAN 35.8 MAX 308 MIN .22 CFSM .93 IN 12.69

04059500 FORD RIVER NEAR HYDE, MI

LOCATION.--Lat 45°45'20", long 87°12'05", in SW¼ sec.19, T.39 N., R.23 W., Delta County, Hydrologic Unit 04030109, on right bank 40 ft (12 m) downstream from bridge on County Road 533, 1.4 mi (2.3 km) downstream from Tenmile Creek, and 1.5 mi (2.4 km) north of Hyde.

DRAINAGE AREA.--450 mi^2 (1,166 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1954 to current year.

GAGE.--Water-stage recorder. Datum of gage is 677.9 ft (206.62 m) above mean sea level.

REMARKS.--Water-discharge records good except those for the winter period, which are fair.

AVERAGE DISCHARGE.--22 years, 377 ft^3/s (10.68 m^3/s), 11.38 in/yr (289 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,590 ft^3/s (215 m^3/s) May 7, 1960, gage height, 8.27 ft (2.521 m); minimum, 18 ft^3/s (0.510 m^3/s) Aug. 30, 1976, gage height, 1.33 ft (0.405 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,350 ft^3/s (94.9 m^3/s) Apr. 7, gage height, 5.95 ft (1.814 m); minimum, 18 ft^3/s (0.510 m^3/s) Aug. 30, gage height, 1.33 ft (0.405 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	150	142	498	140	92	120	1930	851	1180	102	33	25
2	138	135	450	140	90	120	2080	800	1110	104	37	23
3	130	130	400	145	90	125	2340	783	1020	98	40	23
4	120	122	375	145	90	125	2490	757	899	85	38	26
5	112	118	350	150	90	125	2680	755	729	76	42	27
6	108	112	330	155	90	125	2980	785	563	69	36	28
7	104	112	315	160	90	130	3040	748	444	65	35	27
8	100	115	300	155	90	130	2780	699	354	61	39	25
9	98	142	285	150	92	130	2540	646	298	59	40	24
10	96	187	270	145	92	130	2520	592	260	58	37	24
11	94	258	260	140	92	130	2290	529	262	58	35	22
12	96	335	250	135	92	130	2040	478	247	55	60	20
13	98	393	240	130	92	130	1890	442	222	54	71	20
14	96	404	280	125	94	130	1830	454	251	54	62	24
15	100	393	500	120	96	130	1940	456	297	52	63	25
16	100	358	450	115	98	130	2050	934	273	48	57	23
17	100	318	400	110	100	135	2130	1550	240	45	52	24
18	96	286	350	105	105	145	2490	1680	221	43	46	29
19	96	266	320	105	105	160	2680	1650	203	43	67	31
20	94	273	290	105	105	180	2590	1660	184	51	77	32
21	92	361	270	100	110	250	2460	1470	168	46	62	30
22	92	380	250	100	110	450	2590	1180	150	42	52	28
23	102	306	230	98	110	480	2460	921	135	45	42	28
24	118	274	215	96	110	520	2170	696	121	44	35	27
25	163	222	200	96	110	540	1960	566	110	41	30	27
26	172	215	190	96	110	580	1760	486	102	38	29	29
27	181	205	180	94	115	700	1520	429	96	35	27	29
28	190	210	170	94	115	850	1290	373	92	32	22	28
29	178	228	160	92	115	1000	1090	341	100	33	20	28
30	160	409	150	92	---	1200	936	534	104	33	19	29
31	150	---	145	92	---	1500	---	964	---	35	20	---
TOTAL	3724	7409	9073	3725	2890	10730	65546	25209	10435	1704	1325	785
MEAN	120	247	293	120	99.7	346	2185	813	348	55.0	42.7	26.2
MAX	190	409	500	160	115	1500	3040	1680	1180	104	77	32
MIN	92	112	145	92	90	120	936	341	92	32	19	20
CFSM	.27	.55	.65	.27	.22	.77	4.86	1.81	.77	.12	.09	.06
IN.	.31	.61	.75	.31	.24	.89	5.42	2.08	.86	.14	.11	.06

CAL YR 1975 TOTAL 147024 MEAN 403 MAX 4250 MIN 35 CFSM .90 IN 12.15
WTR YR 1976 TOTAL 142555 MEAN 389 MAX 3040 MIN 19 CFSM .86 IN 11.78

04059500 FORD RIVER NEAR HYDE, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1956 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: December 1974 to current year.
WATER TEMPERATURES: July 1956 to current year.

INSTRUMENTATION.--Temperature recorder July 1956 to September 1975. Water-quality monitor since October 1975.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. Monthly samples are collected as a cross-section sample in reach of stream 200 ft (61 m) upstream to 200 ft (61 m) downstream from gage.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 400 micromhos Jan. 22, 1975; minimum recorded, 131 micromhos May 22, 1976.
WATER TEMPERATURES: Maximum, 31.0°C July 31, 1975, minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 357 micromhos Feb. 4-7; minimum recorded, 131 micromhos May 22.
WATER TEMPERATURES: Maximum, 30.5°C July 14; minimum, 0.0°C on many days during November to April.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT												
13...	1415	102	310	8.3	12.5	10.5	100	36	6	8	180	0
NOV												
17...	0900	300	251	7.7	1.5	13.4	98	27	7	14	150	19
DEC												
04...	1030	374	260	7.8	.0	14.1	98	120	45	33	140	12
JAN												
08...	1100	156	336	7.8	.0	14.3	100	19	12	2	190	10
FEB												
05...	1315	89	350	7.7	.0	9.7	68	20	13	4	200	0
MAR												
18...	1045	143	320	7.8	.0	10.5	73	2	<1	1	200	3
APR												
14...	1030	1830	183	7.6	4.5	12.5	98	6	2	4	97	0
MAY												
12...	0910	485	189	8.3	9.5	9.2	81	55	11	2	120	0
JUN												
10...	1100	264	260	8.3	21.0	8.8	100	410	13	5	150	0
JUL												
08...	1125	59	320	8.3	24.5	8.6	100	123	17	45	190	1
AUG												
18...	1000	46	313	8.2	18.5	8.6	93	117	20	39	180	12
SEP												
16...	1230	24	322	8.2	16.0	10.1	100	47	9	33	180	0

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT												
13...	42	19	1.5	.0	.8	222	0	182	1.8	14	2.2	.2
NOV												
17...	34	15	1.2	.0	.6	160	0	131	5.1	18	3.4	.2
DEC												
04...	34	13	1.0	.0	.6	156	0	128	4.0	19	2.5	.2
JAN												
08...	44	20	1.5	.0	.7	220	0	180	5.6	17	1.8	.2
FEB												
05...	46	21	1.4	.0	.7	252	0	207	8.0	15	2.8	.3
MAR												
18...	46	20	1.3	.0	.7	240	0	197	6.1	14	2.3	.2
APR												
14...	23	9.6	.7	.0	1.1	120	0	98	4.8	11	1.9	.1
MAY												
12...	27	12	.7	.0	.4	148	0	121	1.2	9.0	1.9	.1
JUN												
10...	34	16	1.0	.0	.4	188	0	154	1.5	11	2.3	.1
JUL												
08...	45	19	1.2	.0	.9	230	0	189	1.8	10	--	.1
AUG												
18...	39	20	1.5	.0	.9	205	0	168	2.1	6.7	2.8	.1
SEP												
16...	36	21	1.2	.0	1.0	224	0	184	2.3	16	1.9	.1

04059500 FORD RIVER NEAR HYDE, MI--CONTINUED

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT											
13...	7.4	182	197	50.1	.01	.33	1.5	.00	0	.00	--
NOV											
17...	8.6	152	160	123	.21	.64	2.8	.01	2	1.6	--
DEC											
04...	8.2	154	155	156	.18	.48	2.1	.01	6	6.1	100
JAN											
08...	9.3	188	203	79.2	.12	.39	1.7	.02	3	1.3	100
FEB											
05...	10	216	221	51.9	.17	.47	2.1	.01	2	.48	100
MAR											
18...	9.6	222	212	85.7	.18	.54	2.4	.01	1	.39	100
APR											
14...	5.3	124	112	613	.10	.58	2.6	.02	26	128	100
MAY											
12...	2.9	143	127	187	.01	.64	2.8	.03	6	7.9	100
JUN											
10...	5.6	189	163	135	.12	.77	3.4	.03	4	2.9	100
JUL											
08...	5.8	188	196	29.9	.02	.40	1.8	.01	3	.48	100
AUG											
18...	5.1	201	177	25.0	.01	.29	1.3	.01	2	.25	100
SEP											
16...	5.2	197	193	12.8	.03	.28	1.2	.03	0	.00	100

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
OCT												
13...	1415	0	0	0	0	<10	0	0	0	5	0	220
JAN												
08...	1100	0	0	0	0	<10	0	0	0	8	0	170
APR												
14...	1030	0	0	--	1	10	<10	1	1	10	10	180
JUL												
08...	1125	--	1	0	0	<10	<10	0	0	0	0	60

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT												
13...	90	0	0	30	20	.1	.0	0	0	40	20	13
JAN												
08...	100	12	3	20	10	.2	.2	0	0	30	0	13
APR												
14...	80	5	5	20	0	<.5	<.5	0	0	--	30	13
JUL												
08...	0	3	3	30	20	1.3	.5	0	0	--	20	16

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
PERIPHYTON

DATE	LENGTH OF EXPOSURE (DAYS)	PERIPHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERIPHYTON BIOMASS ASH WEIGHT G/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL A MG/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL B MG/SQ M
NOV 17...	35	3.80	2.70	1.30	.000
FEB 05...	28	.000	.000	.000	.000
MAY 12...	28	.769	.462	1.84	.000
AUG 18...	41	14.6	5.85	12.4	.056

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

OCT. 13, 1975
1415 HOURS

IDENTIFICATION OF PHYTOPLANKTON

200 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
L	....ANKISTRODESMUS				0
	..VOLVOCALES				
	...CHLAMYDOMONADACEAE				
	....CHLAMYDOMONAS			10	5
			TOTALS	10	5
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			20	10
	....COCCONEIS			10	5
	...CYMBELLACEAE				
D	....CYMBELLA			61	30
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			10	5
	...NAVICULACEAE	NAVICULOID			
D	....NAVICULA			30	15
	...NITZSCHIACEAE				
D	....NITZSCHIA			61	30
			TOTALS	190	95

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

NOV. 17, 1975
0900 HOURS

IDENTIFICATION OF PHYTOPLANKTON

680 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		7	1
	...SCENEDESMACEAE			
L	....SCENEDESMUS		0	0
		TOTALS	7	1
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		170	26
	....COCCONEIS		7	1
	...CYMBELLACEAE			
	....CYMBELLA		14	2
	...FRAGILARIACEAE			
	....SYNEDRA		42	6
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		7	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		63	9
	....NEIDIUM		7	1
	....PINNULARIA		14	2
	...NITZSCHIACEAE			
	....NITZSCHIA		77	11
		TOTALS	410	59
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS		49	7
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		220	32
		TOTALS	270	39

DEC. 4, 1975
1030 HOURS

IDENTIFICATION OF PHYTOPLANKTON

460 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..ZYGNEMATALES			
	...DESMIDIACEAE	PLACODERM DESMIDS		
	....CLOSTERIUM		21	5
		TOTALS	21	5
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		63	14
	....COCCONEIS		21	5
	...CYMBELLACEAE			
	....CYMBELLA		21	5
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
	....SYNEDRA		63	14
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		21	5
	...NITZSCHIACEAE			
D	....NITZSCHIA		210	45
	...SURIRELLACEAE			
L	....SURIRELLA		0	0
		TOTALS	400	88
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS		42	9
		TOTALS	42	9

04059500 FORD RIVER NEAR HYDE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JAN. 8, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

59 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
L	....MELOSIRA			0
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		13	22
	...CYMBELLACEAE			
L	....CYMBELLA			0
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
L	....FRAGILARIA			0
D	....SYNEDRA		33	56
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		7	11
	...NITZSCHIACEAE			
L	....NITZSCHIA			0
		TOTALS	53	89
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		7	11
		TOTALS	7	11

FEB. 5, 1976
1315 HOURS

IDENTIFICATION OF PHYTOPLANKTON

43 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		9	20
	...CYMBELLACEAE			
	....AMPHORA		4	10
D	....CYMBELLA		9	20
	...DIATOMACEAE			
D	....DIATOMA		13	30
	...FRAGILARIACEAE			
D	....SYNEDRA		9	20
		TOTALS	43	100

04059500 FORD RIVER NEAR HYDE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAR. 18, 1976
1045 HOURS

IDENTIFICATION OF PHYTOPLANKTON

52 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		6	12
		TOTALS	6	12
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		6	12
	..PENNALES	PENNATE		
	...FRAGILARIACEAE			
	....SYNEDRA		6	12
	...GOMPHONEMATACEAE			
D	....GOMPHONEMA		13	25
	...NITZSCHIACEAE			
L	....NITZSCHIA			0
		TOTALS	26	49
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
D	....DINOBRYON		13	25
		TOTALS	13	25
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....AGMENELLUM		6	12
		TOTALS	6	12

APR. 14, 1976
1030 HOURS

IDENTIFICATION OF PHYTOPLANKTON

270 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		6	2
		TOTALS	6	2
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		6	2
	....MELOSIRA		19	7
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		13	5
	....COCCONEIS		19	7
	...CYMBELLACEAE			
	....CYMBELLA		13	5
	...FRAGILARIACEAE			
	....FRAGILARIA		26	10
	....SYNEDRA		26	10
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		26	10
	...MERIDIONACEAE			
	....MERIDION		6	2
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		45	17
	...NITZSCHIACEAE			
	....NITZSCHIA		13	5
		TOTALS	210	80
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
L	....ANABAENA			0
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		52	19
		TOTALS	52	19

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAY 12, 1976
0910 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,500 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		390	26
	...CYMBELLACEAE			
	....CYMBELLA		98	6
	...DIATOMACEAE			
	....DIATOMA		98	6
	...FRAGILARIACEAE			
	....FRAGILARIA		200	13
	....SYNEDRA		200	13
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		130	9
	...MERIDIONACEAE			
	....MERIDION		130	9
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		65	4
	...NITZSCHIACEAE			
D	....NITZSCHIA		230	15
		TOTALS	1,500	101

JUNE 10, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,300 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....SCENEDESMUS		110	8
		TOTALS	110	8
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		620	47
	...CYMBELLACEAE			
	....CYMBELLA		27	2
	...FRAGILARIACEAE			
D	....FRAGILARIA		210	16
	....SYNEDRA		54	4
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		110	8
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		54	4
	...NITZSCHIACEAE			
	....NITZSCHIA		110	8
		TOTALS	1,200	89
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...MALLOMONADACEAE			
	....MALLOMONAS		27	2
		TOTALS	27	2

04059500 FORD RIVER NEAR HYDE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JULY 8, 1976
1125 HOURS

IDENTIFICATION OF PHYTOPLANKTON

640 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
D	....ANKISTRODESMUS		150	23
	....KIRCHNERIELLA		60	9
		TOTALS	210	32
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		130	21
	....COCCONEIS		45	7
	...EUNOTIACEAE			
	....EUNOTIA		15	2
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		15	2
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		30	5
	...NITZSCHIACEAE			
D	....NITZSCHIA		180	28
		TOTALS	420	65
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOCHRYSIDACEAE			
	....CHROOMONAS		15	2
		TOTALS	15	2

AUG. 18, 1976
1000 HOURS

IDENTIFICATION OF PHYTOPLANKTON

110,000 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
L	....STEPHANODISCUS			0
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
L	....ANABAENA			0
D	....APHANIZOMENON		110,000	100
		TOTALS	110,000	100
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...CERATIACEAE			
L	....CERATIUM			0

04059500 FORD RIVER NEAR HYDE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

SEP. 16, 1976
1230 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,300 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		33	3
	..PENNALES	PENNATE		
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		33	3
	...NITZSCHIACEAE			
	....NITZSCHIA		11	1
		TOTALS	76	7
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
D	....CYLINDROSPERMUM		1,200	93
		TOTALS	1,200	93
	EUGLENOPHYTA	EUGLENOIDS		
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
	....TRACHELOMONAS		11	1
		TOTALS	11	1

NOTE: D - DOMINANT ORGANISM; GREATER OR EQUAL TO 15%
L - LESS THEN 1%; MAY NOT HAVE BEEN ACTUALLY COUNTED

04059500 FORD RIVER NEAR HYDE, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	245	235	242	287	283	285	266	263	265	308	294	301
2	251	242	246	289	284	286	267	266	267	299	293	297
3	255	246	251	290	286	288	270	268	269	306	299	302
4	262	249	256	291	288	290	269	215	245	326	307	322
5	265	257	261	295	291	293	---	---	---	332	327	329
6	273	259	265	295	289	293	---	---	---	329	327	328
7	273	261	269	295	293	295	---	---	---	328	327	327
8	281	267	274	299	294	298	---	---	---	328	326	327
9	284	274	279	298	283	294	---	---	---	329	329	329
10	285	281	282	283	278	280	---	---	---	330	329	330
11	286	282	284	277	266	273	---	---	---	332	330	331
12	290	283	286	266	262	263	---	---	---	337	333	334
13	299	289	293	262	258	260	---	---	---	339	334	337
14	308	303	306	258	254	256	---	---	---	345	339	342
15	322	312	317	255	231	244	---	---	---	351	346	349
16	320	305	312	231	222	226	---	---	---	351	348	349
17	317	312	314	228	221	224	---	---	---	354	351	353
18	317	313	316	224	222	223	---	---	---	353	351	352
19	317	313	315	229	222	225	272	---	---	352	347	350
20	344	312	314	254	228	239	271	217	246	352	348	351
21	345	344	345	255	227	244	266	230	258	352	350	351
22	346	345	345	255	224	248	287	266	277	353	351	353
23	344	339	341	257	227	246	293	286	290	355	353	354
24	340	338	339	257	251	256	298	291	287	355	353	354
25	339	315	328	261	257	260	301	298	299	353	350	352
26	316	302	309	269	262	265	305	300	302	351	348	349
27	305	287	295	274	267	271	306	303	304	353	351	352
28	289	285	287	271	265	268	329	307	326	356	352	354
29	286	284	286	266	233	253	326	258	292	352	352	352
30	285	282	284	261	222	238	324	303	313	353	350	352
31	285	282	284	---	---	---	315	305	309	352	349	351
MONTH	346	235	294	299	221	263	---	---	---	356	293	339

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	354	349	352	337	336	337	155	150	154	---	---	---
2	356	354	354	338	335	337	180	152	166	---	---	---
3	356	355	356	335	332	334	198	154	174	---	---	---
4	357	355	356	333	330	332	199	157	173	---	---	---
5	357	356	357	333	330	331	184	153	164	---	---	---
6	357	356	356	338	333	336	186	154	170	---	---	---
7	357	352	356	338	335	336	182	160	166	---	---	---
8	355	351	353	337	333	335	174	165	166	---	---	---
9	356	349	352	336	330	334	176	165	167	---	---	---
10	352	342	348	332	329	330	180	160	167	---	---	---
11	353	350	352	334	329	332	191	161	170	211	---	---
12	354	347	350	330	327	328	192	162	170	212	172	212
13	353	347	351	332	329	330	171	165	167	186	181	184
14	356	352	354	332	329	331	168	165	167	187	183	185
15	349	338	343	334	331	332	168	167	167	192	182	186
16	346	344	345	333	332	332	167	167	167	203	179	183
17	344	342	343	335	333	334	167	166	166	210	139	185
18	342	341	341	334	327	330	167	165	166	---	---	---
19	341	340	341	330	324	326	165	163	164	---	---	---
20	343	339	341	325	313	319	169	163	166	---	---	---
21	343	340	342	322	304	313	---	---	---	---	---	---
22	344	342	344	305	297	302	---	---	---	168	131	144
23	345	340	343	297	278	288	---	---	---	155	139	144
24	341	331	336	278	265	272	---	---	---	158	155	157
25	339	332	335	266	257	260	---	---	---	162	159	160
26	337	329	334	258	250	252	206	---	173	170	162	166
27	337	333	336	251	228	241	209	---	---	175	169	171
28	339	336	337	252	228	246	---	---	---	179	172	176
29	336	333	335	230	223	227	---	---	---	183	179	181
30	---	---	---	224	200	211	---	---	---	189	180	184
31	---	---	---	203	153	182	---	---	---	187	179	182
MONTH	357	329	346	338	153	304	---	---	---	---	---	---

04059500 FORD RIVER NEAR HYDE, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	183	175	---	314	310	313	339	327	333	336	326	331
2	---	184	450	316	310	314	341	331	335	333	325	329
3	---	---	---	321	310	317	344	337	340	332	326	329
4	---	---	---	324	310	320	344	333	340	335	329	333
5	---	---	---	325	312	320	338	325	332	340	330	336
6	---	---	---	328	316	323	335	322	329	342	334	338
7	---	---	---	328	321	324	329	323	327	343	335	340
8	---	---	---	328	323	327	337	327	332	348	338	344
9	---	---	---	335	326	330	335	324	331	345	334	341
10	260	248	257	338	330	334	337	324	331	342	331	337
11	270	246	260	340	328	332	335	321	328	339	331	336
12	274	272	273	335	328	331	330	276	303	340	331	337
13	277	276	277	339	330	334	286	263	275	342	333	339
14	271	280	280	339	330	335	317	287	302	342	321	331
15	288	280	282	340	330	336	317	310	313	331	318	325
16	283	216	268	342	330	336	318	313	315	323	315	320
17	265	258	263	343	328	336	320	312	316	326	313	320
18	270	263	266	343	330	337	319	308	313	331	316	324
19	276	266	271	343	334	339	333	318	326	330	318	324
20	284	273	278	342	326	333	325	298	313	333	323	328
21	289	281	284	332	321	327	299	290	293	335	324	330
22	291	285	288	336	327	332	305	294	298	333	323	328
23	297	288	291	342	333	338	310	303	307	332	325	330
24	297	290	293	343	332	338	319	309	316	336	330	333
25	301	294	296	344	331	338	328	314	322	342	336	340
26	304	297	301	344	335	339	330	315	324	346	341	343
27	309	303	306	340	330	336	334	318	328	347	342	345
28	313	300	308	344	332	338	332	322	328	348	342	345
29	313	297	304	342	329	336	333	324	329	347	345	346
30	310	300	303	342	334	338	330	322	326	350	346	348
31	---	---	---	342	327	335	337	323	331	---	---	---
MONTH	---	---	---	344	310	331	344	263	321	350	313	334

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	14.5	12.5	13.5	9.0	7.5	8.0	0.0	0.0	0.0	0.0	0.0	0.0
2	12.0	9.5	10.5	8.5	6.0	7.5	0.0	0.0	0.0	0.0	0.0	0.0
3	14.0	10.0	11.5	8.0	6.0	7.5	0.0	0.0	0.0	0.0	0.0	0.0
4	15.5	12.0	13.5	7.5	5.5	6.5	0.0	0.0	0.0	0.0	0.0	0.0
5	14.0	13.0	13.5	8.5	6.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0
6	15.0	12.0	13.0	8.5	7.5	8.0	0.0	0.0	0.0	0.0	0.0	0.0
7	15.0	11.0	12.5	11.0	8.5	10.0	0.0	0.0	0.0	0.0	0.0	0.0
8	14.5	12.0	13.0	11.5	10.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0
9	14.0	13.0	13.5	10.5	8.5	9.5	0.0	0.0	0.0	0.0	0.0	0.0
10	13.5	12.0	13.0	9.0	7.5	8.5	0.0	0.0	0.0	0.0	0.0	0.0
11	13.5	12.0	12.5	7.5	5.5	6.0	0.0	0.0	0.0	0.0	0.0	0.0
12	13.5	12.0	12.5	6.0	5.0	5.5	0.0	0.0	0.0	0.0	0.0	0.0
13	16.0	12.0	13.5	5.0	3.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0
14	15.5	14.0	14.5	3.0	1.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
15	14.5	12.0	13.0	2.5	0.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0
16	12.5	11.0	11.5	3.0	0.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0
17	11.0	9.0	10.0	3.5	1.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0
18	10.5	7.5	9.0	3.5	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
19	10.0	7.0	8.5	5.5	4.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0
20	8.0	5.5	7.0	5.5	4.5	5.0	0.0	0.0	0.0	0.0	0.0	0.0
21	8.0	6.0	7.0	4.0	1.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
22	9.5	7.5	8.5	1.5	0.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0
23	12.0	8.5	10.5	1.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
24	14.0	12.0	13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	13.5	10.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	9.5	7.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	10.0	8.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	10.0	8.5	10.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	8.5	5.5	6.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	5.5	4.5	5.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	7.5	5.0	6.0	---	---	---	0.0	0.0	0.0	0.0	0.0	0.0
MONTH	16.0	4.5	11.0	11.5	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0

04059500 FORD RIVER NEAR HYDE, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	6.5	7.5
2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	7.5	5.0	6.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	5.0	4.0	4.5
4	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.5	9.0	3.0	6.0
5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.5	8.0	4.5	6.5
6	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.5	8.5	3.5	5.5
7	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.5	1.0	9.0	5.0	7.0
8	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.5	2.0	10.5	4.0	7.5
9	0.0	0.0	0.0	0.0	0.0	0.0	4.5	1.0	2.5	13.5	8.0	10.5
10	0.0	0.0	0.0	0.0	0.0	0.0	3.5	2.0	3.0	14.0	10.0	12.0
11	0.0	0.0	0.0	0.0	0.0	0.0	4.0	1.0	2.5	14.5	9.5	12.0
12	0.0	0.0	0.0	0.0	0.0	0.0	5.0	1.0	3.0	15.0	9.5	12.5
13	0.0	0.0	0.0	0.0	0.0	0.0	6.5	3.0	5.0	14.0	10.5	13.0
14	0.0	0.0	0.0	0.0	0.0	0.0	8.5	5.0	6.5	17.5	12.0	14.5
15	0.0	0.0	0.0	0.0	0.0	0.0	8.5	7.0	8.0	17.0	13.5	15.5
16	0.0	0.0	0.0	0.0	0.0	0.0	11.0	7.5	9.0	17.0	12.5	14.0
17	0.0	0.0	0.0	0.0	0.0	0.0	11.0	9.5	10.5	13.5	11.0	12.0
18	0.0	0.0	0.0	0.0	0.0	0.0	12.0	10.5	11.0	13.0	9.5	11.0
19	0.0	0.0	0.0	0.0	0.0	0.0	11.5	10.0	10.5	13.5	9.5	11.0
20	0.0	0.0	0.0	0.0	0.0	0.0	10.5	8.5	9.5	16.0	11.5	13.5
21	0.0	0.0	0.0	0.0	0.0	0.0	8.5	7.5	8.0	17.0	13.5	15.0
22	0.0	0.0	0.0	0.0	0.0	0.0	7.5	6.5	7.0	17.0	13.0	15.0
23	0.0	0.0	0.0	0.0	0.0	0.0	8.0	5.0	6.5	16.5	12.5	14.5
24	0.0	0.0	0.0	0.0	0.0	0.0	7.5	6.0	6.5	16.5	12.0	14.5
25	0.0	0.0	0.0	0.0	0.0	0.0	8.5	5.0	7.0	16.5	12.0	14.5
26	0.0	0.0	0.0	0.0	0.0	0.0	6.0	4.5	5.0	18.0	13.0	15.5
27	0.0	0.0	0.0	0.0	0.0	0.0	6.0	4.0	5.0	20.0	14.5	17.0
28	0.0	0.0	0.0	0.0	0.0	0.0	8.5	4.0	6.0	19.0	16.0	17.5
29	0.0	0.0	0.0	0.0	0.0	0.0	8.0	5.0	6.5	18.5	15.5	16.5
30	---	---	---	0.0	0.0	0.0	8.5	6.5	7.5	15.5	14.0	14.5
31	---	---	---	0.0	0.0	0.0	---	---	---	14.0	13.0	13.5
MONTH	0.0	0.0	0.0	0.0	0.0	0.0	12.0	0.0	5.0	20.0	3.0	12.0

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	17.0	12.0	14.5	24.0	19.0	21.5	26.0	20.5	23.0	18.0	14.0	16.0
2	---	13.0	14.5	23.0	19.5	21.0	25.5	17.5	21.5	16.5	10.5	14.5
3	---	---	---	25.5	20.0	22.5	26.0	18.5	22.5	20.0	13.5	16.5
4	---	---	---	28.5	22.0	24.5	22.5	20.5	22.0	18.0	14.5	16.5
5	---	---	---	29.0	22.5	25.5	22.0	19.5	20.5	19.0	13.0	16.0
6	---	---	---	30.0	23.5	26.5	24.0	16.5	20.0	21.0	14.0	17.5
7	---	---	---	30.0	25.0	27.0	26.0	16.5	21.0	23.5	15.5	19.5
8	---	---	---	30.0	23.0	26.0	27.0	18.5	22.5	24.0	18.5	21.5
9	---	---	---	24.5	23.0	24.0	28.5	21.5	24.5	22.0	18.5	20.0
10	23.0	0.0	0.0	26.0	22.0	24.0	24.0	22.0	23.0	19.0	14.5	17.0
11	24.5	21.5	23.0	29.0	22.5	25.5	27.5	21.0	24.0	21.0	13.5	17.5
12	22.5	20.0	21.5	26.0	20.0	23.0	26.5	22.5	24.5	21.0	15.0	18.5
13	25.5	20.5	23.0	26.0	19.5	22.5	23.5	20.0	22.0	21.5	16.5	19.5
14	26.5	23.0	25.0	30.5	21.5	25.0	23.0	17.5	19.5	21.0	16.5	18.5
15	26.0	22.5	24.0	28.0	24.0	26.0	22.0	16.5	19.0	16.5	14.5	15.0
16	22.5	19.0	20.5	24.0	21.5	23.0	23.5	15.5	19.0	18.5	13.0	16.0
17	22.0	18.0	20.0	25.5	18.5	22.0	24.0	17.0	20.0	19.0	13.0	16.5
18	22.0	19.5	20.5	28.5	20.5	24.0	22.5	18.0	20.0	20.0	13.5	17.0
19	21.0	17.0	19.5	27.5	22.5	25.0	25.5	19.5	22.0	17.5	15.0	16.5
20	23.5	18.5	21.5	28.5	23.5	25.5	27.0	22.0	24.0	16.5	12.5	14.5
21	25.0	21.0	23.5	28.5	22.0	24.5	27.0	21.0	23.5	14.5	11.5	13.0
22	25.5	22.0	23.5	29.0	21.0	24.5	26.5	21.5	23.5	13.0	9.5	11.5
23	26.0	22.5	24.0	30.0	23.0	26.0	26.0	19.5	22.5	12.0	8.5	10.5
24	24.0	22.0	23.0	29.5	22.5	26.0	26.0	18.5	22.0	13.0	6.5	10.0
25	24.0	21.0	22.5	27.0	21.5	24.0	24.5	18.5	22.0	12.5	7.5	10.5
26	25.5	21.0	23.0	26.5	22.0	24.0	24.5	20.5	22.5	12.5	7.5	10.0
27	27.5	22.0	24.5	30.0	21.5	25.5	27.5	21.0	24.0	12.5	10.5	11.0
28	26.0	22.5	24.0	25.0	22.0	23.0	25.0	20.5	22.5	12.5	7.0	10.0
29	23.5	19.5	21.5	28.0	20.0	23.5	21.0	15.5	18.5	14.0	8.0	11.0
30	23.5	18.0	20.5	26.0	22.0	24.5	20.5	13.5	17.5	15.5	8.5	12.0
31	---	---	---	27.5	21.0	24.0	19.5	16.0	17.0	---	---	---
MONTH	---	---	---	30.5	18.5	24.5	28.5	13.5	21.5	24.0	6.5	15.0

04060500 IRON RIVER AT CASPIAN, MI

LOCATION.--Lat 46°03'31", long 88°37'38", in SE¼ SW¼ sec.1, T.42 N., R.35 W., Iron County, Hydrologic Unit 04030106, on right bank 10 ft (3 m) downstream from bridge on County Highway 424 in Caspian, and 5.0 mi (8.0 km) upstream from mouth.

DRAINAGE AREA.--92.1 mi^2 (238.5 km^2).

PERIOD OF RECORD.--March 1948 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,438.78 ft (438.540 m) above mean sea level. Prior to Sept. 25, 1969, nonrecording gage at site 10 ft (3 m) upstream at same datum.

REMARKS.--Records good except those for the winter period, which are fair. The average flow includes mine pumpage and sewage effluent. Pumpage rates have diminished over the years due to the closing of most mines. Remaining pumpage averages about 10 ft^3/s (0.3 m^3/s). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--28 years, 87.6 ft^3/s (2.481 m^3/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,430 ft^3/s (40.5 m^3/s) July 2, 1953, gage height, 10.20 ft (3.109 m); minimum, 25 ft^3/s (0.71 m^3/s) Mar. 29, 1969, gage height, 3.30 ft (1.006 m), result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 438 ft^3/s (12.4 m^3/s) Mar. 30, gage height, 7.54 ft (2.298 m); minimum, 47 ft^3/s (1.33 m^3/s) Aug. 27, 28, gage height, 3.88 ft (1.183 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64	60	114	77	72	70	324	130	100	75	66	58
2	61	59	109	77	72	70	278	142	89	71	63	54
3	61	59	95	78	72	70	312	158	86	70	61	54
4	60	58	91	80	70	72	303	146	83	68	63	52
5	58	58	90	80	70	72	327	138	79	66	79	51
6	58	58	89	79	70	72	366	124	77	66	73	51
7	57	58	87	78	70	72	406	112	75	68	65	52
8	57	65	81	76	70	72	408	105	74	66	60	51
9	58	71	80	76	70	75	392	101	75	65	59	51
10	58	147	78	74	70	72	410	96	73	69	60	51
11	58	141	76	74	70	74	408	92	90	71	62	51
12	58	132	72	72	70	85	340	89	78	68	61	49
13	60	123	77	72	70	74	302	89	101	65	60	50
14	59	101	115	72	70	76	296	93	88	64	63	52
15	58	93	105	70	70	82	320	93	81	64	60	53
16	59	87	96	70	68	67	318	117	79	66	57	52
17	59	85	90	70	68	83	294	129	77	65	56	53
18	59	84	84	70	68	84	295	109	85	63	55	69
19	59	85	78	70	68	81	311	101	91	60	69	60
20	58	88	76	70	68	108	271	98	79	74	65	52
21	58	91	73	70	68	114	251	92	73	68	55	53
22	57	90	72	70	68	104	304	96	72	64	51	53
23	69	86	72	70	68	101	304	98	71	63	49	53
24	83	84	72	70	68	116	255	95	72	62	50	52
25	96	80	72	70	68	140	210	92	74	61	50	52
26	78	78	71	70	68	172	178	92	72	62	53	53
27	70	78	72	70	68	207	160	85	68	62	48	54
28	66	77	72	70	68	190	146	82	68	61	49	55
29	62	82	74	71	68	219	135	82	77	60	65	54
30	60	123	76	72	---	337	131	108	83	70	52	53
31	61	---	77	72	---	407	---	111	---	80	58	---
TOTAL	1939	2581	2586	2260	2008	3638	8755	3295	2390	2057	1837	1598
MEAN	62.5	86.0	83.4	72.9	69.2	117	292	106	79.7	66.4	59.3	53.3
MAX	96	147	115	80	72	407	410	158	101	80	79	69
MIN	57	58	71	70	68	67	131	82	68	60	48	49

CAL YR 1975 TOTAL 34764 MEAN 95.2 MAX 792 MIN 51
WTR YR 1976 TOTAL 34944 MEAN 95.5 MAX 410 MIN 48

04061000 BRULE RIVER NEAR FLORENCE, WI

LOCATION.--Lat 45°57'31", long 88°15'57", in SE¼ SE¼ sec.11, T.41 N., R.32 W., Michigan meridian, Iron County, Hydrologic Unit 04030106, on left bank 40 ft (12 m) upstream from highway bridge, 1.0 mi (1.6 km) upstream from Paint River, 2.5 mi (4.0 km) north of Florence, and 5.0 mi (8.0 km) upstream from confluence with Michigamme River.

DRAINAGE AREA.--389 mi^2 (1,008 km^2).

PERIOD OF RECORD.--January 1914 to February 1916, June 1944 to current year.

REVISED RECORDS.--WSP 1387: 1914-16. WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,200.55 ft (365.928 m) above mean sea level (levels by Owen Ayres Associates). Prior to Aug. 29, 1944, nonrecording gage at bridge 40 ft (12 m) downstream at same datum.

REMARKS.--Records good except those for winter period, which are fair. Discharge includes some mine pumpage (see sta. 04060500). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--33 years (water years 1915, 1945-76), 361 ft^3/s (10.22 m^3/s), 12.60 in/yr (320 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,700 ft^3/s (133 m^3/s) July 2, 1953, gage height, 6.57 ft (2.003 m); maximum gage height, 8.27 ft (2.521 m) Dec. 26, 1969 (backwater from ice); minimum discharge, 118 ft^3/s (3.34 m^3/s) Dec. 2, 1963 (discharge measurement); minimum gage height, 1.79 ft (0.546 m) July 24, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,260 ft^3/s (35.7 m^3/s) Apr. 11, gage height, 3.65 ft (1.113 m); maximum gage height, 6.45 ft (1.966 m) Dec. 12 (backwater from ice); minimum discharge, 185 ft^3/s (5.24 m^3/s) Sept. 12, 13, gage height, 1.89 ft (0.576 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	256	254	450	300	280	320	957	504	504	300	247	230
2	253	261	440	300	280	310	837	545	433	277	234	220
3	248	252	430	300	280	310	880	636	388	267	225	217
4	246	244	410	300	280	310	888	595	362	259	225	209
5	244	241	380	290	280	300	910	580	346	250	302	211
6	243	242	370	290	280	300	1020	543	332	245	289	212
7	237	247	350	280	280	300	1130	493	327	249	271	212
8	233	260	330	280	280	290	1210	453	324	246	249	217
9	232	287	320	280	290	290	1220	429	326	242	234	209
10	234	533	310	280	290	290	1230	407	325	247	242	196
11	234	663	300	290	290	290	1240	395	356	264	245	191
12	235	610	290	290	280	290	1110	385	347	252	239	188
13	244	558	310	290	280	290	990	375	402	241	234	188
14	242	448	400	290	290	300	952	387	380	238	230	198
15	238	398	440	290	300	310	1020	381	337	234	227	207
16	234	367	400	290	310	320	1070	656	326	235	220	207
17	233	348	380	280	310	340	1050	754	318	234	213	205
18	229	338	350	280	310	350	1120	598	315	237	207	205
19	229	343	320	280	310	360	1170	495	345	233	211	222
20	227	358	310	280	300	370	1050	451	324	273	223	216
21	230	373	310	280	300	450	921	420	299	279	207	225
22	230	349	310	280	300	560	1030	405	285	265	201	218
23	253	351	310	270	300	650	1000	403	277	249	200	212
24	308	330	310	270	300	690	872	394	275	235	198	209
25	384	310	310	270	310	700	746	377	276	229	195	209
26	358	300	300	280	320	720	650	363	273	227	197	211
27	310	310	290	280	330	740	585	349	265	226	203	217
28	286	330	290	280	330	750	542	335	267	223	194	221
29	271	400	290	280	330	762	507	337	303	223	203	227
30	261	450	290	280	---	805	488	488	339	223	209	244
31	255	---	300	280	---	1030	---	562	---	267	205	---
TOTAL	7917	10755	10600	8810	8620	14097	28395	14495	9976	7669	6979	6353
MEAN	255	359	342	284	297	455	947	468	333	247	225	212
MAX	384	663	450	300	330	1030	1240	754	504	300	302	244
MIN	227	241	290	270	280	290	488	335	265	223	194	188
CFSM	.66	.92	.88	.73	.76	1.17	2.43	1.20	.86	.63	.58	.54
IN.	.76	1.03	1.01	.84	.82	1.35	2.72	1.39	.95	.73	.67	.61

CAL YR 1975 TOTAL 133031 MEAN 364 MAX 2280 MIN 193 CFSM .94 IN 12.72
WTR YR 1976 TOTAL 134666 MEAN 368 MAX 1240 MIN 188 CFSM .95 IN 12.88

04061500 PAINT RIVER AT CRYSTAL FALLS, MI

LOCATION.--Lat 46°06'21", long 88°20'05", in SE¼ sec.20, T.43 N., R.32 W., Iron County, Hydrologic Unit 04030106, on right bank 150 ft (46 m) downstream from municipal powerplant at Crystal Falls, and 14.5 mi (23.3 km) upstream from mouth.

DRAINAGE AREA.--597 mi^2 (1,546 km^2).

PERIOD OF RECORD.--August 1944 to current year.

REVISED RECORDS.--WSP 1174: 1947-48(m). WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,306.1 ft (398.1 m) above mean sea level (Wisconsin-Michigan Power Co. bench mark).

REMARKS.--Records good. Diurnal fluctuation caused by powerplant immediately upstream; since storage capacity is small, daily flows are not affected appreciably. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--32 years, 592 ft^3/s (16.77 m^3/s), 13.47 in/yr (342 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,900 ft^3/s (309 m^3/s) Apr. 25, 1960, gage height, 9.82 ft (2.993 m); minimum, 7.7 ft^3/s (0.22 m^3/s) Sept. 17, 1950, gage height, 0.89 ft (0.271 m); minimum daily, 81 ft^3/s (2.29 m^3/s) Nov. 1, 1947.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,860 ft^3/s (109 m^3/s) Apr. 17, gage height, 5.74 ft (1.750 m); minimum, 98 ft^3/s (2.78 m^3/s) Aug. 24, gage height, 1.67 ft (0.509 m); minimum daily, 142 ft^3/s (4.02 m^3/s) Aug. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	361	341	739	362	314	367	1820	877	538	330	203	153
2	348	333	677	361	322	342	1690	890	522	297	196	164
3	323	326	633	355	313	338	1860	962	487	281	186	163
4	314	320	618	354	315	359	1860	954	448	269	196	159
5	298	301	641	340	322	354	1970	938	402	257	217	162
6	288	303	598	343	321	346	2180	932	374	253	224	157
7	283	310	549	346	316	342	2530	853	348	242	220	155
8	275	327	519	348	314	348	2710	779	333	242	203	162
9	276	361	501	338	320	347	2750	710	348	238	192	168
10	269	526	469	339	322	348	2970	664	334	245	206	157
11	276	941	428	342	341	348	3100	607	330	249	214	156
12	288	983	409	340	344	338	2770	573	316	242	203	158
13	280	948	461	337	347	334	2530	544	395	242	203	152
14	303	828	568	342	351	324	2630	532	437	242	200	155
15	300	731	607	337	333	338	3240	522	413	220	192	159
16	294	685	567	327	323	340	3750	573	390	231	189	164
17	270	630	492	335	342	340	3820	675	373	231	189	162
18	269	590	462	327	347	335	3770	678	377	210	175	166
19	260	574	473	328	345	354	3720	622	408	203	175	163
20	261	610	469	330	345	445	3440	577	400	234	169	160
21	260	652	443	332	344	598	2830	533	374	269	169	167
22	255	565	431	330	348	695	2710	504	343	257	160	183
23	273	513	413	319	342	648	2710	475	325	242	160	181
24	338	519	405	309	331	671	2350	444	313	234	147	174
25	420	476	391	313	345	743	1970	417	309	228	147	167
26	455	459	389	319	363	854	1670	407	285	224	147	182
27	427	420	353	325	374	961	1410	386	285	203	150	179
28	393	466	368	324	373	944	1220	366	277	192	150	179
29	391	469	370	313	367	1050	1050	354	289	196	142	172
30	358	565	370	313	---	1360	939	419	334	210	144	173
31	347	---	371	305	---	1830	---	491	---	200	150	---
TOTAL	9753	16072	15184	10333	9784	17341	73969	19258	11107	7413	5618	4952
MEAN	315	536	490	333	337	559	2466	621	370	239	181	165
MAX	455	983	739	362	374	1830	3820	962	538	330	224	183
MIN	255	301	353	305	313	324	939	354	277	192	142	152
CFSM	.53	.90	.82	.56	.56	.94	4.13	1.04	.62	.40	.30	.28
IN.	.61	1.00	.95	.64	.61	1.08	4.61	1.20	.69	.46	.35	.31

CAL YR 1975 TOTAL 214458 MEAN 588 MAX 5090 MIN 156 CFSM .98 IN 13.36
WTR YR 1976 TOTAL 200784 MEAN 549 MAX 3820 MIN 142 CFSM .92 IN 12.51

04062000 PAINT RIVER NEAR ALPHA, MI

LOCATION.--Lat 46°00'40", long 88°15'30", in NW¼ NW¼ sec.25, T.42 N., R.32 W., Iron County, Hydrologic Unit 04030106, on right bank 0.6 mi (1.0 km) downstream from Lower Paint Dam, 5.5 mi (8.8 km) upstream from Brule River, and 6.0 mi (9.7 km) southeast of Alpha.

DRAINAGE AREA.--631 mi^2 (1,634 km^2).

PERIOD OF RECORD.--June 1952 to current year. Monthly discharge only for period October 1953 to September 1960, published in WSP 1727.

REVISED RECORDS.--WSP 1727: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 1,260 ft (384 m) from topographic map (nearest 10 ft).

REMARKS.--Records good except those for winter period, which are fair. Flow completely regulated by powerplant and Lower Paint Dam, 0.6 mi (1.0 km) above station. Records not adjusted for diversion to Michigamme River by Paint River diversion canal. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--24 years, 173 ft^3/s (4.899 m^3/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,050 ft^3/s (228 m^3/s) July 2, 1953, gage height, 10.50 ft (3.200 m); minimum daily, 62 ft^3/s (1.76 m^3/s) Mar. 22, 1963.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,900 ft^3/s (82.1 m^3/s) Apr. 18, gage height, 7.02 ft (2.140 m); minimum daily, 86 ft^3/s (2.44 m^3/s) May 5, 6; minimum gage height, 2.79 ft (0.850 m) May 5, 6, 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	90	95	94	90	90	96	96	92	93	95	90	90
2	92	94	94	90	90	96	96	93	92	95	90	90
3	91	92	94	90	90	96	98	435	92	95	92	93
4	90	92	94	90	90	96	100	470	92	93	93	97
5	90	92	94	90	90	96	100	86	92	93	93	97
6	89	92	94	90	90	96	110	86	92	94	92	97
7	88	92	94	90	90	96	312	91	92	94	92	97
8	88	92	94	90	90	96	523	92	92	95	93	97
9	88	93	94	90	90	96	551	92	92	94	94	96
10	88	95	94	90	90	96	622	92	93	93	94	95
11	88	95	92	90	90	96	762	91	95	93	94	95
12	88	94	92	90	90	96	828	90	94	93	93	95
13	90	94	92	90	90	96	907	90	96	95	92	95
14	90	94	92	90	90	96	908	90	95	93	92	95
15	90	94	92	90	92	96	1010	90	95	93	95	95
16	90	94	92	90	92	96	1590	99	95	93	95	95
17	90	95	92	90	92	96	1920	95	95	95	95	95
18	90	95	92	90	92	96	2470	93	95	95	95	95
19	90	95	92	90	94	96	2730	92	95	96	96	95
20	91	95	92	90	94	96	2660	91	95	97	96	95
21	91	94	92	90	94	96	2520	90	95	97	95	95
22	92	95	90	90	94	96	2430	90	95	97	95	95
23	93	94	90	90	94	96	2440	90	95	97	95	95
24	94	94	90	90	94	96	2350	90	95	95	95	95
25	97	94	90	90	96	96	1850	90	95	95	95	95
26	97	94	90	90	96	96	1380	90	95	95	95	95
27	96	94	90	90	96	96	1280	90	95	95	97	95
28	95	94	90	90	96	96	1160	90	95	94	97	95
29	95	94	90	90	96	96	475	91	95	92	97	95
30	95	94	90	90	---	96	93	94	95	92	94	95
31	95	---	90	90	---	96	---	94	---	90	91	---
TOTAL	2831	2815	2852	2790	2672	2976	34371	3549	2822	2923	2912	2849
MEAN	91.3	93.8	92.0	90.0	92.1	96.0	1146	114	94.1	94.3	93.9	95.0
MAX	97	95	94	90	96	96	2730	470	96	97	97	97
MIN	88	92	90	90	90	96	93	86	92	90	90	90

CAL YR 1975 TOTAL 68384 MEAN 187 MAX 3200 MIN 68
WTR YR 1976 TOTAL 66362 MEAN 181 MAX 2730 MIN 86

04062200 PESHEKEE RIVER NEAR CHAMPION, MI

LOCATION.--Lat 46°33'25", long 88°00'09", in NW¼ sec.13, T.48 N., R.30 W., Marquette County, Hydrologic Unit 04030107, on left bank 10 ft (3 m) downstream from bridge on County Road 607, 0.6 mi (1.0 km) downstream from West Branch, and 3.5 mi (5.6 km) northwest of Champion.

DRAINAGE AREA.--133 mi^2 (344 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,557.49 ft (474.723 m) above mean sea level. Prior to Aug. 15, 1961, nonrecording gage at same site and datum.

REMARKS.--Water-discharge records good except those for the winter period, which are fair.

AVERAGE DISCHARGE.--15 years, 213 ft^3/s (6.032 m^3/s), 21.75 in/yr (552 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,610 ft^3/s (102 m^3/s) May 8, 1965, gage height, 8.01 ft (2.441 m); minimum, 0.70 ft^3/s (0.020 m^3/s) Sept. 7, 8, 9, 10, 11, 1976, gage height, 1.10 ft (0.335 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 600 ft^3/s (17.0 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 1	1800	ice jam		4.19	1.277	Apr. 18	0600	*3,540	100	*7.92	2.414

Minimum discharge, 0.70 ft^3/s (0.020 m^3/s) Sept. 7, 8, 9, 10, 11, gage height, 1.10 ft (0.335 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	60	480	94	64	74	600	425	124	14	3.7	1.2
2	64	57	520	89	64	76	660	428	109	12	3.6	1.2
3	66	54	410	86	65	77	680	419	90	11	3.0	1.2
4	64	49	370	84	66	78	700	393	76	10	3.1	1.1
5	59	46	320	82	67	80	760	433	67	8.9	3.6	1.2
6	53	43	290	80	68	80	840	428	61	7.9	3.2	.94
7	49	42	250	78	69	81	940	380	52	7.8	2.9	.90
8	44	44	220	78	70	82	960	326	46	7.6	2.8	.80
9	41	44	200	78	71	82	1000	284	43	11	2.5	.81
10	38	95	190	76	72	82	957	254	39	12	2.4	.74
11	37	193	180	74	72	84	930	226	35	11	2.5	.71
12	40	259	170	72	72	84	886	198	32	10	2.6	.93
13	46	302	160	70	72	84	876	176	36	9.3	2.3	.93
14	49	292	220	68	72	88	1080	179	35	9.7	2.3	1.7
15	51	271	330	68	72	90	1830	162	35	10	2.3	2.1
16	54	230	350	68	72	94	2620	187	40	9.2	2.1	2.2
17	61	208	250	66	72	98	3280	232	40	8.7	2.0	2.2
18	63	208	220	65	71	100	3470	210	45	7.9	1.9	2.1
19	60	246	205	64	71	130	3230	178	53	6.5	1.9	2.3
20	56	385	190	64	71	180	2330	158	50	8.2	1.7	2.8
21	51	411	180	63	71	230	1640	138	44	8.7	1.4	3.9
22	48	350	170	62	71	230	1720	121	37	7.6	1.2	4.0
23	53	300	160	63	71	225	1790	108	31	6.7	1.1	3.4
24	73	260	150	63	72	240	1440	99	27	6.3	1.1	2.9
25	113	230	140	63	72	270	1050	91	24	6.1	.98	2.6
26	123	210	130	64	72	290	799	85	23	5.7	.97	2.5
27	106	190	120	64	72	310	636	77	21	5.2	1.3	2.4
28	92	180	112	64	73	350	523	70	19	4.6	1.6	2.4
29	79	200	108	64	73	415	447	65	18	4.4	1.4	2.4
30	71	350	100	64	---	480	410	73	17	4.1	1.3	2.3
31	65	---	98	64	---	560	---	116	---	4.0	1.2	---
TOTAL	1930	5809	6993	2202	2040	5424	39084	6719	1369	256.1	65.95	56.86
MEAN	62.3	194	226	71.0	70.3	175	1303	217	45.6	8.26	2.13	1.90
MAX	123	411	520	94	73	560	3470	433	124	14	3.7	4.0
MIN	37	42	98	62	64	74	410	65	17	4.0	.97	.71
CFSM	.47	1.46	1.70	.53	.53	1.32	9.80	1.63	.34	.06	.02	.01
IN.	.54	1.62	1.96	.62	.57	1.52	10.93	1.88	.38	.07	.02	.02

CAL YR 1975 TOTAL 81771.20 MEAN 224 MAX 2600 MIN 3.2 CFSM 1.68 IN 22.87
WTR YR 1976 TOTAL 71948.91 MEAN 197 MAX 3470 MIN .71 CFSM 1.48 IN 20.12

04062200 PESHEKEE RIVER NEAR CHAMPION, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: August 1961 to current year.

INSTRUMENTATION.--Temperature recorder since Aug. 29, 1961.

REMARKS.--Complete ice cover during winter period. Unpublished water temperatures for water year 1963 are available in the Escanaba suboffice.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 28.5°C July 1, 1966; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 26.5°C July 7, 23, Aug. 19, 20; minimum, 0.0°C on many days during winter period.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04062200 PESHEKEE RIVER NEAR CHAMPION, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	0.0	0.0	6.5	6.0	18.5	15.0	22.0	17.5	22.0	18.0	16.0	14.0
2	0.0	0.0	6.5	5.0	19.0	15.5	21.0	17.0	21.0	17.0	15.0	13.0
3	0.0	0.0	5.5	4.5	20.0	16.0	23.0	17.0	21.0	17.5	15.5	12.5
4	0.5	0.0	6.5	4.0	21.0	17.0	24.5	18.0	21.0	19.0	15.5	13.5
5	0.5	0.0	6.5	6.0	22.0	18.0	25.0	19.0	19.5	17.5	14.5	12.0
6	0.0	0.0	7.0	5.0	23.5	19.5	24.5	20.5	19.0	15.5	15.5	12.5
7	0.0	0.0	8.0	6.5	23.5	19.5	26.5	21.5	19.0	15.5	16.5	14.5
8	0.5	0.0	8.5	7.0	22.5	21.0	26.0	20.5	20.0	16.5	19.0	16.5
9	0.5	0.0	10.5	8.0	23.0	20.0	24.5	20.5	23.5	18.5	18.0	15.5
10	0.0	0.0	12.0	10.0	24.5	20.5	25.0	19.5	23.0	19.5	15.0	13.5
11	0.5	0.0	12.0	10.0	24.5	21.0	25.0	20.5	23.0	20.0	15.0	13.0
12	0.5	0.0	13.0	10.0	22.5	19.5	23.0	17.5	23.0	20.0	15.0	13.0
13	1.0	0.0	12.0	11.5	24.5	20.0	22.0	18.5	22.0	19.0	15.5	15.0
14	1.0	0.5	13.5	10.0	25.5	21.0	25.5	20.5	19.5	16.5	15.5	15.0
15	1.5	1.0	15.0	12.0	24.5	21.5	24.5	20.5	19.5	16.0	15.0	13.5
16	2.5	1.0	14.5	12.5	21.5	19.0	21.5	18.5	19.5	16.0	13.5	11.5
17	3.0	2.0	13.0	11.5	19.5	17.5	22.5	18.0	21.5	17.0	13.5	11.5
18	4.0	2.5	13.5	11.0	19.5	18.0	25.0	19.5	25.0	21.5	13.5	11.5
19	4.5	3.0	14.5	11.0	19.5	15.5	25.5	21.5	26.5	22.5	13.5	11.5
20	5.0	3.5	16.5	13.5	22.0	16.5	25.5	23.0	26.5	24.0	11.5	10.5
21	5.0	4.5	17.0	14.5	23.5	17.0	24.5	20.0	26.0	23.0	11.0	9.0
22	5.0	3.5	16.5	14.0	23.5	19.0	25.0	19.0	25.0	23.0	9.5	8.0
23	4.5	3.0	16.0	13.5	23.5	19.5	26.5	22.5	24.5	20.5	9.0	8.0
24	5.5	4.5	16.5	12.5	22.5	20.0	25.0	21.0	23.0	20.0	9.5	7.0
25	5.5	4.5	17.0	13.0	22.0	20.0	23.5	19.5	23.0	20.0	10.0	8.0
26	5.5	4.0	19.0	14.0	24.0	18.5	25.5	20.5	23.0	21.0	10.0	8.0
27	4.0	3.5	19.0	15.0	24.0	20.0	25.0	20.0	24.0	21.0	8.5	7.5
28	6.0	4.0	19.0	16.0	23.0	18.5	23.5	20.5	23.5	19.0	8.5	7.0
29	6.0	5.5	18.5	17.0	22.0	18.5	24.5	19.5	19.0	16.0	10.0	7.5
30	6.5	6.0	17.0	16.0	23.0	17.5	23.5	21.0	17.0	14.0	9.5	8.0
31	---	---	17.0	15.5	---	---	22.5	19.0	17.0	15.5	---	---
MONTH	6.5	0.0	19.0	4.0	25.5	15.0	26.5	17.0	26.5	14.0	19.0	7.0

04062230 MICHIGAMME RIVER NEAR MICHIGAMME, MI

LOCATION.--Lat 46°28'00", long 88°04'28", in SW¼ SW¼ sec.16, T.47 N., R.30 W., Marquette County, Hydrologic Unit 04030107, on right bank 20 ft (6 m) upstream from Northern Natural Gas Co. pipeline, 0.6 mi (1.0 km) upstream from Spruce River, 1.2 mi (1.9 km) downstream from Lake Michigamme, and 5.0 mi (8.0 km) southeast of Michigamme.

DRAINAGE AREA.--194 mi^2 (502 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,520 ft (463 m) from topographic map (nearest 10 ft).

REMARKS.--Water-discharge record good.

AVERAGE DISCHARGE.--8 years, 292 ft^3/s (8.269 m^3/s), 20.44 in/yr (519 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,180 ft^3/s (90.1 m^3/s) Apr. 19, 1976, gage height, 7.77 ft (2.368 m); minimum, 2.8 ft^3/s (0.08 m^3/s) Sept. 30, 1976, gage height, 1.56 ft (0.475 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,180 ft^3/s (90.1 m^3/s) Apr. 19, gage height, 7.77 ft (2.368 m); minimum, 2.8 ft^3/s (0.08 m^3/s) Sept. 30, gage height, 1.56 ft (0.475 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	129	99	367	217	130	116	379	1070	202	67	33	9.4
2	125	99	392	212	127	121	420	1000	195	64	31	8.2
3	121	99	419	211	125	121	466	931	187	62	30	7.3
4	120	98	438	208	125	121	514	849	178	60	28	6.8
5	117	97	444	200	124	124	567	806	169	58	29	6.8
6	114	96	446	198	122	125	632	761	160	55	28	6.6
7	109	96	438	194	121	126	692	720	149	55	27	6.2
8	108	98	428	189	122	126	760	665	142	53	27	6.2
9	104	97	416	184	120	125	822	619	142	53	26	6.5
10	102	106	403	180	120	125	906	573	135	53	25	6.2
11	102	109	390	178	120	125	966	523	131	52	25	5.8
12	99	131	374	174	118	133	998	481	120	49	25	5.4
13	97	158	359	171	116	139	1040	443	117	47	25	5.0
14	96	175	362	167	115	137	1090	421	113	47	24	5.2
15	95	193	363	163	120	133	1260	391	112	47	23	5.3
16	95	206	353	160	121	133	1600	389	110	46	22	5.0
17	94	216	347	157	119	134	2120	383	103	44	21	4.8
18	93	223	339	152	119	134	2640	367	102	42	20	4.7
19	93	235	329	150	120	134	3050	349	102	42	19	4.6
20	92	265	322	147	120	137	3110	337	98	44	19	4.6
21	90	301	311	145	118	146	2900	320	96	43	18	4.5
22	89	314	302	142	118	152	2670	299	93	42	17	4.4
23	92	332	290	140	117	162	2550	283	89	40	17	4.2
24	93	348	279	138	117	177	2410	272	85	40	16	3.8
25	94	353	270	138	116	193	2190	258	81	39	15	3.6
26	95	345	261	138	115	213	1920	246	80	38	14	3.4
27	99	340	252	134	114	237	1670	234	77	37	13	3.4
28	102	329	243	132	114	255	1470	220	74	37	12	3.3
29	102	322	236	133	115	282	1310	208	72	37	11	3.0
30	102	338	229	132	---	312	1180	203	71	35	10	2.9
31	99	---	223	130	---	341	---	205	---	35	9.6	---
TOTAL	3162	6218	10625	5114	3468	5039	44302	14826	3585	1463	659.6	157.1
MEAN	102	207	343	165	120	163	1477	478	120	47.2	21.3	5.24
MAX	129	353	446	217	130	341	3110	1070	202	67	33	9.4
MIN	89	96	223	130	114	116	379	203	71	35	9.6	2.9
CFSM	.53	1.07	1.77	.85	.62	.84	7.61	2.46	.62	24	.11	.03
IN.	.61	1.19	2.04	.98	.66	.97	8.49	2.84	.69	.28	.13	.03

CAL YR 1975 TOTAL 105426.0 MEAN 289 MAX 2470 MIN 36 CFSM 1.49 IN 20.22
WTR YR 1976 TOTAL 98618.7 MEAN 269 MAX 3110 MIN 2.9 CFSM 1.39 IN 18.91

04062230 MICHIGAMME RIVER NEAR MICHIGAMME, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970-76.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)
OCT								
21...	1530	89	44	7.5	18.5	10.5	35	0
NOV								
20...	0905	262	42	7.3	1.0	5.0	50	1
DEC								
15...	1430	357	43	7.5	-8.5	1.5	50	1
JAN								
22...	1400	146	50	7.8	-10.0	.5	70	1
FEB								
17...	1230	118	43	7.5	2.5	1.5	60	1
MAR								
30...	1515	324	45	7.7	7.0	1.5	60	1
APR								
21...	1045	2910	54	7.7	8.0	4.5	55	1
MAY								
18...	0900	387	33	7.2	9.0	9.5	50	1
JUN								
14...	1405	112	35	6.8	28.0	21.0	45	1
JUL								
14...	1500	48	50	7.5	25.0	24.5	32	1
AUG								
16...	1645	23	46	7.1	25.5	21.5	28	6
SEP								
10...	1030	7.0	48	6.6	15.0	14.5	25	3

DATE	HARDNESS (CA,MG) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL IRON (FE) (UG/L)	DISSOLVED IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT								
21...	27	7.7	1.9	.09	270	130	--	4
NOV								
20...	18	5.1	1.3	.14	230	120	20	20
DEC								
15...	25	7.4	1.7	.15	250	140	10	0
JAN								
22...	19	5.2	1.4	.16	290	210	--	10
FEB								
17...	18	4.7	1.4	.16	240	200	0	0
MAR								
30...	20	5.5	1.4	.20	370	200	10	0
APR								
21...	20	5.2	1.8	.21	340	180	110	100
MAY								
18...	17	4.5	1.5	.13	910	100	40	20
JUN								
14...	16	4.0	1.5	.13	160	90	20	10
JUL								
14...	19	4.7	1.7	.08	140	80	30	20
AUG								
16...	21	5.0	2.1	.07	110	70	10	10
SEP								
10...	23	5.3	2.4	.04	180	90	40	20

04062400 MICHIGAMME RIVER NEAR WITCH LAKE, MI

LOCATION.--Lat 46°14'48", long 88°00'45", in NW¼ NW¼ sec.1, T.44 N., R.30 W., Dickinson County, Hydrologic Unit 04030107, on left bank 20 ft (6 m) upstream from bridge on county highway, 0.4 mi (0.6 km) upstream from Witch Lake Outlet, and 2.0 mi (3.2 km) south of Witch Lake.

DRAINAGE AREA.--316 mi^2 (818 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,384.25 ft (421.919 m) above mean sea level.

REMARKS.--Water-discharge records good except those for the winter period, which are fair. Occasional regulation caused by dam 14 mi (23 km) above station. Some flow diverted and returned above station by iron ore processing plant.

AVERAGE DISCHARGE.--12 years, 437 ft^3/s (12.38 m^3/s), 18.78 in/yr (477 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,360 ft^3/s (123 m^3/s) May 11, 1965, gage height, 11.60 ft (3.536 m); minimum, 25 ft^3/s (0.71 m^3/s) Sept. 10, 11, 12, 13, 1976, gage height, 1.96 ft (0.597 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,030 ft^3/s (114 m^3/s) Apr. 21, gage height, 11.01 ft (3.356 m); minimum, 25 ft^3/s (0.71 m^3/s) Sept. 10, 11, 12, 13, gage height, 1.96 ft (0.597 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	150	152	520	270	180	190	670	1460	355	119	60	32
2	176	148	560	270	175	190	820	1350	332	116	58	30
3	170	137	580	260	170	190	784	1310	310	104	57	27
4	168	133	600	260	170	190	778	1220	292	99	54	27
5	139	131	610	250	170	190	865	1160	255	97	54	27
6	121	130	600	240	170	190	959	1140	214	96	51	27
7	118	131	590	240	170	190	1070	1080	186	86	50	27
8	122	136	580	230	170	190	1140	1010	184	79	47	27
9	151	141	560	230	170	190	1210	924	195	82	44	26
10	167	173	550	230	170	190	1280	860	208	93	46	26
11	150	234	540	220	170	200	1340	784	209	89	50	25
12	121	275	520	220	170	200	1360	696	201	84	50	25
13	84	311	500	210	170	205	1380	668	264	94	53	25
14	106	296	490	210	170	210	1450	612	244	98	48	28
15	158	287	490	200	175	215	1660	596	216	97	46	30
16	182	293	480	200	175	215	2040	660	203	85	44	28
17	121	305	460	190	175	205	2500	712	189	79	43	27
18	84	303	440	190	180	200	3000	732	166	79	44	27
19	82	322	430	190	185	210	3500	668	163	142	46	27
20	117	366	410	180	185	240	3900	584	157	108	46	27
21	153	418	390	180	185	280	4010	532	154	77	46	28
22	155	442	380	180	185	310	3930	460	160	70	46	30
23	156	446	370	185	185	325	3770	411	157	68	44	28
24	165	452	350	185	185	330	3520	400	150	61	43	28
25	184	450	340	185	185	340	3140	390	140	60	40	27
26	171	430	330	190	185	355	2730	346	122	60	40	27
27	159	420	320	190	190	375	2370	323	107	59	40	30
28	157	410	310	190	190	420	2050	308	113	57	37	28
29	157	402	300	185	190	470	1750	271	120	57	36	27
30	154	462	290	185	---	540	1560	289	125	59	32	27
31	152	---	280	185	---	610	---	342	---	62	32	---
TOTAL	4450	8736	14170	6530	5150	8355	60536	22298	5891	2616	1427	825
MEAN	144	291	457	211	178	270	2018	719	196	84.4	46.0	27.5
MAX	184	462	610	270	190	610	4010	1460	355	142	60	32
MIN	82	130	280	180	170	190	670	271	107	57	32	25
CFSM	.46	.92	1.45	.67	.56	.85	6.39	2.28	.62	.27	.15	.09
IN.	.52	1.03	1.67	.77	.61	.98	7.13	2.62	.69	.31	.17	.10

CAL YR 1975 TOTAL 149506 MEAN 410 MAX 3310 MIN 59 CFSM 1.30 IN 17.60
WTR YR 1976 TOTAL 140984 MEAN 385 MAX 4010 MIN 25 CFSM 1.22 IN 16.60

04062400 MICHIGAMME RIVER NEAR WITCH LAKE, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965-76.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)
OCT								
22...	1015	156	104	7.4	8.0	7.5	35	2
NOV								
20...	1030	355	79	7.2	.0	4.0	50	3
DEC								
15...	1600	487	76	7.4	-8.0	.0	50	1
JAN								
21...	1430	183	87	7.6	-6.0	.0	50	1
FEB								
17...	1415	175	104	7.1	3.0	.0	50	2
MAR								
30...	1200	541	84	7.4	3.5	1.0	50	3
APR								
28...	0930	2090	43	7.1	8.0	4.0	55	1
MAY								
18...	0950	752	58	7.5	13.0	10.5	40	1
JUN								
14...	1230	235	85	7.6	26.0	22.0	55	2
JUL								
15...	0915	96	142	7.5	24.0	21.0	20	1
AUG								
16...	1515	44	209	8.1	27.0	19.5	6	5
SEP								
10...	1315	23	240	7.9	18.5	16.5	6	4

DATE	HARDNESS (CA,MG) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL IRON (FE) (UG/L)	DISSOLVED IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT								
22...	51	12	5.0	.21	360	160	50	30
NOV								
20...	42	11	3.5	.29	460	160	60	60
DEC								
15...	38	10	3.1	.21	390	160	50	30
JAN								
21...	43	11	3.8	.20	430	240	50	30
FEB								
17...	55	15	4.3	.18	400	280	50	40
MAR								
30...	37	9.3	3.4	.37	650	210	80	40
APR								
28...	24	7.0	1.5	.17	280	160	40	40
MAY								
18...	40	11	3.1	.15	360	170	50	30
JUN								
14...	46	11	4.6	.18	440	250	70	40
JUL								
15...	63	14	6.8	.21	310	180	60	50
AUG								
16...	110	24	11	.14	180	60	70	60
SEP								
10...	130	27	14	.06	170	40	70	50

04062500 MICHIGAMME RIVER NEAR CRYSTAL FALLS, MI

LOCATION.--Lat 46°06'50", long 88°12'57", in NW¼ sec.20, T.43 N., R.31 W., Iron County, Hydrologic Unit 04030107, on right bank 400 ft (122 m) upstream from highway bridge, 5.0 mi (8.0 km) downstream from Michigamme Reservoir, 6.0 mi (9.7 km) east of Crystal Falls and 15 mi (24 km) upstream from confluence with Brule River.

DRAINAGE AREA.--656 mi^2 (1,699 km^2).

PERIOD OF RECORD.--August 1944 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 1,300 ft (396 m) from topographic map (nearest 10 ft).

REMARKS.--Records excellent. Flow regulated by powerplant and by Michigamme Reservoir, capacity, 119,950 acre-ft (148 hm^3) 5 mi (8 km) above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--32 years, 704 ft^3/s (19.94 m^3/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,260 ft^3/s (206 m^3/s) Apr. 28, 1960, gage height, 10.73 ft (3.271 m); minimum daily, 71 ft^3/s (2.01 m^3/s) Nov. 26, 1950.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,360 ft^3/s (152 m^3/s) Apr. 22, gage height, 9.33 ft (2.844 m); minimum, 98 ft^3/s (2.78 m^3/s) Mar. 5, gage height, 1.41 ft (0.430 m); minimum daily, 128 ft^3/s (3.62 m^3/s) Sept. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	152	159	716	1130	1090	581	202	1150	205	583	145	566
2	149	159	714	1090	1090	741	200	1160	473	464	289	565
3	150	437	706	1080	1080	582	204	1710	618	146	291	564
4	150	599	703	1080	1070	493	209	1840	612	149	293	294
5	151	599	703	1080	1060	359	521	1630	607	147	290	128
6	150	599	704	1090	1090	170	666	1630	604	411	292	147
7	423	599	702	1080	1100	175	682	1620	938	578	141	421
8	593	597	865	1080	1090	607	692	1610	1160	577	142	569
9	474	601	1170	1080	1100	771	700	1610	892	459	293	568
10	149	485	1170	1090	1100	571	715	1340	644	143	285	439
11	430	156	1170	1090	1090	590	704	1140	600	146	281	136
12	596	165	1160	1090	1080	341	702	898	599	409	283	138
13	594	162	1180	1080	1070	148	701	713	654	579	284	406
14	596	160	887	1080	1080	184	609	712	628	580	138	567
15	593	158	620	1080	1110	390	557	712	612	579	140	561
16	591	156	619	1070	1110	554	561	1030	605	464	289	559
17	457	440	614	1070	1090	587	560	1250	601	146	286	377
18	151	607	930	1060	1080	544	858	1240	602	147	281	150
19	155	608	1190	1060	1050	433	1820	1220	598	405	403	148
20	155	611	1190	1060	1050	164	3320	1200	597	578	579	413
21	156	612	1190	1070	1040	178	4070	1180	595	571	314	553
22	155	608	1180	1080	1040	334	4640	903	593	571	135	553
23	159	607	1180	1070	1040	167	5130	716	591	457	395	539
24	161	606	1180	1070	983	399	4610	711	591	151	570	423
25	163	603	1170	1060	880	836	3440	647	449	148	569	160
26	161	603	1180	1060	757	1010	2650	604	425	295	538	145
27	161	603	1190	1070	620	1000	2440	603	310	297	568	405
28	160	602	1190	1070	293	1040	2150	601	425	283	311	555
29	159	610	1180	1070	148	1060	1460	323	589	300	142	428
30	158	678	1180	1090	---	817	1140	192	586	296	398	245
31	159	---	1180	1100	---	202	---	207	---	146	568	---
TOTAL	8611	14189	30713	33430	28481	16028	46913	32102	18003	11205	9933	11722
MEAN	278	473	991	1078	982	517	1564	1036	600	361	320	391
MAX	596	678	1190	1130	1110	1060	5130	1840	1160	583	579	569
MIN	149	156	614	1060	148	148	200	192	205	143	135	128

CAL YR 1975 TOTAL 252702 MEAN 692 MAX 3810 MIN 133
WTR YR 1976 TOTAL 261330 MEAN 714 MAX 5130 MIN 128

04063000 MENOMINEE RIVER NEAR FLORENCE, WI

LOCATION.--Lat 45°57'04", long 88°11'13", in NE¼ sec.16, T.41 N., R.31 W., Michigan meridian, Iron County, Hydrologic Unit 04030108, on left bank 0.5 mi (0.8 km) downstream from confluence of Brule and Michigamme Rivers, 3.5 mi (5.6 km) northeast of Florence, and at mile 117 (188 km).

DRAINAGE AREA.--1,780 mi^2 (4,610 km^2).

PERIOD OF RECORD.--January 1914 to current year. Published as "at Twin Falls near Iron Mountain, MI" 1914-57. Records published for both sites July 1950 to September 1957.

REVISED RECORDS.--WSP 1707: 1953(M). WSP 1911: Drainage area of former site.

GAGE.--Water-stage recorder. Datum of gage is 1,119.23 (341.141 m) above mean sea level (levels by Owen Ayres Associates). Prior to July 1950, headwater and tailwater gages and generation data entered hourly in daily log sheets by company employees at the Twin Falls Powerplant of Wisconsin-Michigan Power Co., 10.4 mi (16.7 km) downstream.

REMARKS.--Records excellent. Prior to July 1950, discharge determined from powerplant records computed on basis of load-discharge rating of hydroelectric units and rating for tailwater gage during periods of spill. Rating developed by Geological Survey. Flow regulated by powerplants, Michigamme Reservoir, capacity, 119,950 acre-ft (148 hm^3), and Peavy Pond, capacity, 33,860 acre-ft (41.7 hm^3), on Michigamme River, and by many smaller reservoirs above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--62 years, 1,802 ft^3/s (51.03 m^3/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,500 ft^3/s (552 m^3/s) Apr. 26, 1960, gage height, 14.15 ft (4.313 m); minimum, 38 ft^3/s (1.08 m^3/s) Aug. 21, 1962, Sept. 26, 1975; minimum gage height, 1.18 ft (0.360 m) Aug. 21, 1962, Nov. 4, 1965; minimum daily discharge, 57 ft^3/s (1.61 m^3/s) Sept. 26, 1975.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,500 ft^3/s (297 m^3/s) Apr. 22, gage height, 9.83 ft (2.996 m); minimum, 67 ft^3/s (1.90 m^3/s) Oct. 20, gage height, 1.35 ft (0.411 m); minimum daily, 96 ft^3/s (2.72 m^3/s) Oct. 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1370	1430	1910	1910	1870	1740	2650	2760	1720	1150	782	860
2	1500	1550	1970	1960	1820	1920	2660	2970	2150	1100	857	800
3	1550	1480	1960	1940	1810	1950	2420	3900	1520	879	914	735
4	1680	1490	1920	1910	1910	1870	2270	3780	1550	777	911	726
5	1680	1360	1870	1820	1990	1790	3200	3210	1580	687	914	762
6	1530	1150	1930	1790	1880	1510	3760	3390	1440	1140	916	779
7	1310	1160	1890	2060	1850	1610	3940	3180	1690	1040	723	923
8	1260	1140	1900	1870	1690	1960	4180	3170	1850	1170	626	711
9	1480	945	2000	1890	1790	2070	4150	3170	1780	1200	964	769
10	1160	1240	2100	1920	1810	1960	4490	3120	1600	764	1000	914
11	1100	1590	2110	1740	1950	1860	4740	2730	1600	706	887	732
12	677	1860	1990	1920	2000	1960	4750	2590	1630	1120	901	738
13	1060	1950	1970	1840	1820	1690	4720	1850	1690	1050	991	962
14	1020	2130	2110	1890	1980	1590	4650	1550	1710	1090	733	805
15	1100	1980	1920	1840	1810	1610	4670	2020	1710	983	654	743
16	1200	2160	2030	1870	1880	1510	5430	3190	1710	936	882	778
17	1480	2130	2110	1930	1930	1400	5550	3860	1720	682	894	856
18	640	1880	2060	1940	2090	1720	6590	3260	1600	749	849	741
19	96	1930	1940	1890	2090	1850	7550	3110	1220	906	862	724
20	108	1950	2200	1910	2100	1920	8450	2740	1360	1090	871	768
21	238	2130	2250	1760	2050	2170	8900	2390	1560	1030	665	835
22	148	1640	2040	1830	2010	2150	9780	2220	1330	1350	749	945
23	212	1560	2200	1820	1970	2090	9970	2150	1530	962	913	700
24	500	1810	2090	1710	1900	2490	8200	1720	1500	618	919	1080
25	680	1520	1880	1740	2010	3080	6260	1340	1230	702	839	708
26	520	1450	2020	1870	1870	2550	4490	1380	1010	933	913	716
27	450	883	1870	1820	1810	3000	4790	1040	784	1030	810	864
28	400	1300	1830	1910	1490	2420	4690	1380	1250	1010	805	952
29	450	1400	1930	1810	1440	2630	3840	1020	1280	998	660	921
30	1000	1690	2080	1710	---	2460	2760	1550	1180	840	832	880
31	1390	---	1960	1880	---	2760	---	1840	---	746	900	---
TOTAL	28989	47888	62040	57700	54620	63290	154500	77580	45484	29438	26136	24427
MEAN	935	1596	2001	1861	1883	2042	5150	2503	1516	950	843	814
MAX	1680	2160	2250	2060	2100	3080	9970	3900	2150	1350	1000	1080
MIN	96	883	1830	1710	1440	1400	2270	1020	784	618	626	700

CAL YR 1975 TOTAL 669932 MEAN 1835 MAX 8130 MIN 57
WTR YR 1976 TOTAL 672092 MEAN 1836 MAX 9970 MIN 96

04065300 WEST BRANCH STURGEON RIVER NEAR RANDVILLE, MI

LOCATION.--Lat 46°00'45", long 87°58'41", in NE¼ sec.30, T.42 N., R.29 W., Dickinson County, Hydrologic Unit 04030108, on right bank 500 ft (152 m) downstream from county highway bridge, 3.0 mi (4.8 km) downstream from Tom Kings Creek, and 4.0 mi (6.4 km) northeast of Randville.

DRAINAGE AREA.--56.1 mi^2 (145.3 km^2).

PERIOD OF RECORD.--August 1958 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Sharp-crested weir since Aug. 6, 1976. Altitude of gage is 1,170 ft (357 m) from topographic map (nearest 10 ft).

REMARKS.--Records fair. Since December 1958, diversion above station for industrial use; figures of runoff adjusted thereafter. Small diversions for sprinkler irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--18 years, 43.7 ft^3/s (1.238 m^3/s), 10.58 in/yr (269 mm/yr), adjusted for industrial diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 570 ft^3/s (16.1 m^3/s) May 7, 1960, gage height, 6.40 ft (1.951 m); minimum, 1.5 ft^3/s (0.042 m^3/s) July 22, 1964, gage height, 1.35 ft (0.411 m); minimum daily, 3.4 ft^3/s (0.096 m^3/s) July 22, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 396 ft^3/s (11.2 m^3/s) May 17, gage height, 5.71 ft (1.740 m); minimum, 5.2 ft^3/s (0.15 m^3/s) Aug. 23, gage height, 3.39 ft (1.033 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	17	54	20	13	16	322	82	225	19	14	14
2	15	16	43	19	13	16	257	84	181	18	13	13
3	14	16	38	18	12	17	216	88	136	17	12	12
4	14	17	34	17	12	17	215	88	105	16	13	10
5	13	16	31	17	12	17	195	86	84	15	14	10
6	13	15	29	16	12	17	207	82	70	14	15	10
7	12	16	27	16	12	17	226	76	59	14	14	9.4
8	12	25	26	16	12	17	229	72	51	13	13	8.8
9	12	30	24	15	12	17	213	67	42	13	11	8.8
10	12	37	24	15	12	17	216	60	34	14	10	8.1
11	12	46	24	15	12	17	221	56	37	15	11	7.8
12	12	49	25	15	12	17	193	51	40	14	11	7.6
13	12	50	27	14	12	17	172	49	45	13	12	6.9
14	13	42	50	14	13	17	173	48	42	12	12	8.8
15	13	38	45	14	13	17	200	92	38	12	11	12
16	13	35	43	14	13	17	223	170	35	12	9.2	12
17	12	31	42	14	14	18	217	375	33	12	9.2	9.6
18	12	28	39	14	14	18	228	313	31	12	10	6.3
19	12	28	38	14	14	20	277	214	30	13	9.9	5.8
20	12	31	35	13	14	24	254	161	28	15	9.4	7.6
21	13	33	33	13	14	35	205	134	26	14	8.6	12
22	15	30	32	13	14	58	246	112	24	13	8.1	12
23	22	28	30	13	14	64	296	94	22	12	6.9	12
24	28	27	28	13	14	66	238	73	21	12	9.7	11
25	34	26	27	13	15	71	185	62	19	11	10	12
26	31	25	25	13	15	80	155	56	18	10	8.4	12
27	27	25	24	13	15	90	139	50	17	10	9.0	14
28	24	26	23	13	16	110	115	44	16	10	8.3	14
29	23	28	22	13	16	135	99	60	17	11	8.3	15
30	20	50	21	13	---	175	88	108	21	13	7.8	14
31	18	---	20	13	---	225	---	177	---	15	8.8	---
TOTAL	511	881	983	453	386	1459	6220	3284	1547	414	327.6	316.5
MEAN	16.5	29.4	31.7	14.6	13.3	47.1	207	106	51.6	13.4	10.6	10.6
MAX	34	50	54	20	16	225	322	375	225	19	15	15
MIN	12	15	20	13	12	16	88	44	16	10	6.9	5.8
+	5.7	5.8	5.9	5.8	5.8	5.8	5.7	5.2	5.6	3.7	4.1	3.2
MEAN‡	22.2	35.2	37.6	20.4	19.1	52.9	213	111	57.2	17.1	14.7	13.8
CFSM‡	.40	.63	.67	.36	.34	.94	3.80	1.98	1.02	.30	.26	.25
IN‡	.46	.70	.77	.42	.37	1.09	4.24	2.28	1.14	.35	.30	.27

CAL YR 1975 TOTAL 13184.0 MEAN 36.1 MAX 423 MIN 7.5 MEAN‡ 41.4 CFSM‡ .74 IN‡ 10.01
WTR YR 1976 TOTAL 16782.1 MEAN 45.9 MAX 375 MIN 5.8 MEAN‡ 51.0 CFSM‡ .91 IN‡ 12.39

+Average monthly diversion, equivalent in cubic feet per second, for industrial use; furnished by Hanna Mining Co.
‡Adjusted for diversion.

04065393 EAST BRANCH STURGEON RIVER BELOW SKUNK CREEK, NEAR FELCH, MI

LOCATION.--Lat 46°01'34", long 87°49'56", in NW¼ NE¼ sec.20, T.42 N., R.28 W., Dickinson County, Hydrologic Unit 04030108, on right bank 50 ft (15 m) downstream from Skunk Creek, and 2.2 mi (3.5 km) north of Felch.

DRAINAGE AREA.--61.8 mi^2 (160 km^2).

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1972, 1973. October 1973 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,069.53 ft (325.993 m) above mean sea level. Prior to December 20, 1973, nonrecording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are fair. Since June 1975, occasional regulation during low flows by Gene Lake Reservoir (useable capacity, 3,990 acre-ft or 4.92 hm^3) 3 mi (5 km) above station. Initial filling stored an additional 1,700 acre-ft (2.10 hm^3) during the year. Several observations of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 612 ft^3/s (17.3 m^3/s) Apr. 24, 1975, gage height, 4.26 ft (1.298 m); minimum, 3.4 ft (0.10 m^3/s) Sept. 7, 8, 9, 13, 1976, gage height, -0.11 ft (-0.034 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 455 ft^3/s (12.9 m^3/s) Apr. 1, gage height, 3.95 ft (1.204 m); minimum, 3.4 ft^3/s (0.10 m^3/s) Sept. 7, 8, 9, 13, gage height, -0.11 ft (-0.034 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	18	52	27	20	24	430	115	210	30	8.8	5.0
2	12	17	46	27	20	24	381	117	209	26	8.0	4.8
3	12	16	43	27	20	24	339	133	175	23	7.2	4.2
4	11	15	40	26	20	24	305	131	130	20	8.9	4.0
5	10	14	37	26	20	24	300	124	97	18	12	4.0
6	10	14	33	26	20	24	300	122	74	17	12	3.8
7	10	14	30	26	20	24	305	111	60	17	9.9	3.5
8	10	17	28	25	20	24	298	100	51	16	7.9	3.4
9	9.8	19	26	25	20	24	285	91	47	15	6.8	3.6
10	10	38	25	25	20	25	280	80	44	15	6.4	3.6
11	10	52	24	25	20	25	260	72	57	17	6.4	3.6
12	10	53	23	24	20	25	247	67	55	16	8.8	3.5
13	10	55	28	24	21	25	234	64	73	14	14	3.4
14	11	46	54	24	21	26	224	73	83	12	13	5.0
15	12	40	50	24	21	26	249	73	70	11	14	6.4
16	12	34	44	23	21	26	272	180	57	11	13	5.4
17	12	30	42	23	22	26	282	398	50	11	11	4.7
18	12	27	40	23	22	27	290	384	44	10	8.9	4.2
19	12	25	38	22	22	34	292	320	44	10	7.8	4.1
20	12	26	36	22	22	56	275	262	38	12	6.7	4.1
21	12	28	34	22	22	86	255	210	33	12	5.8	4.1
22	13	28	33	22	22	96	272	172	29	11	5.0	4.1
23	16	27	32	22	23	103	302	132	24	11	4.6	4.0
24	28	24	31	22	23	103	290	104	21	10	4.2	3.8
25	36	23	31	21	23	100	253	87	20	10	4.1	3.6
26	33	22	30	21	23	116	220	74	19	10	4.1	3.6
27	29	22	29	21	24	166	193	65	17	9.5	4.1	7.8
28	26	22	29	21	24	196	167	59	16	8.8	4.0	12
29	23	23	29	21	24	232	138	54	17	8.8	3.6	8.8
30	20	53	28	21	---	305	120	86	32	9.3	3.6	6.8
31	19	---	28	21	---	410	---	163	---	10	4.1	---
TOTAL	475.8	842	1073	729	620	2450	8058	4223	1896	431.4	238.7	142.9
MEAN	15.3	28.1	34.6	23.5	21.4	79.0	269	136	63.2	13.9	7.70	4.76
MAX	36	55	54	27	24	410	430	398	210	30	14	12
MIN	9.8	14	23	21	20	24	120	54	16	8.8	3.6	3.4
CFSM	.25	.45	.56	.38	.35	1.28	4.35	2.20	1.02	.22	.12	.08
IN.	.29	.51	.65	.44	.37	1.47	4.85	2.54	1.14	.26	.14	.09

CAL YR 1975 TOTAL 19343.0 MEAN 53.0 MAX 594 MIN 5.3 CFSM .86 IN 11.64 MEAN+ 58.5 CFSM+ 0.95 IN+ 12.85
WTR YR 1976 TOTAL 21179.8 MEAN 57.9 MAX 430 MIN 3.4 CFSM .94 IN 12.75 MEAN+ 60.2 CFSM+ 0.97 IN+ 13.26

+Adjusted for initial filling of Gene Lake Reservoir; storage began in June 1975, completed in December 1975. Elevations furnished by Michigan Department of Natural Resources.

04065500 STURGEON RIVER NEAR FOSTER CITY, MI

LOCATION.--Lat 45°54'30", long 87°45'15", in NW¼ sec.36, T.41 N., R.28 W., Dickinson County, Hydrologic Unit 04030108, on left bank 30 ft (9 m) downstream from bridge on County Highway 569, 1.8 mi (2.9 km) downstream from confluence of East and West Branches, and 4.0 mi (6.4 km) south of Foster City.

DRAINAGE AREA.--237 mi^2 (614 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1954 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 966.6 ft (294.620 m) above mean sea level.

REMARKS.--Water-discharge records good except those for the winter period, which are fair. Since December 1958, diversion above station for industrial use; figures of runoff adjusted thereafter. Since June 1975, occasional regulation during low flows by Gene Lake Reservoir in headwaters of East Branch (see sta 04065393). Inital filling stored an additional 1,700 acre-ft (2.10 hm^3) during year. Prior to April 8, 1976, about 6,000 acre-ft (7.40 hm^3) stored in temporary filling of Hardwood Reservoir on East Branch Sturgeon River, 9 mi (14 km) above station; released during period April to June, 1976. Small diversions for sprinkler irrigation.

AVERAGE DISCHARGE.--22 years, 187 ft^3/s (5.296 m^3/s), 10.72 in/yr (272 mm/yr), adjusted for industrial diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,570 ft^3/s (72.8 m^3/s) May 8, 1960, gage height, 10.35 ft (3.155 m); minimum, 15 ft^3/s (0.42 m^3/s) July 24, 1964; minimum gage height, 1.96 ft (0.597 m) Aug. 21, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,400 ft^3/s (39.6 m^3/s) Mar. 31, gage height, 8.32 ft (2.536 m); minimum, 20 ft^3/s (0.57 m^3/s) Sept. 13, 14, gage height, 2.23 ft (0.680 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	95	94	310	97	86	95	1370	438	624	111	62	32
2	87	88	285	95	85	95	1260	417	632	108	56	34
3	83	86	260	91	84	96	1170	428	598	95	52	37
4	79	95	250	90	84	95	1020	426	519	85	46	35
5	75	90	240	88	84	96	819	416	429	79	51	32
6	71	82	220	88	84	95	800	416	357	74	55	30
7	68	80	210	88	83	95	807	400	296	71	61	28
8	67	134	195	88	83	95	805	373	252	68	55	27
9	65	161	190	88	83	95	1110	344	235	66	50	25
10	67	206	180	90	83	96	1260	317	226	66	47	25
11	66	260	170	90	85	96	1160	292	283	67	45	23
12	68	281	165	90	86	96	1100	274	297	65	46	23
13	68	290	160	90	87	96	1000	260	314	64	46	21
14	70	276	170	90	88	96	904	272	339	60	49	24
15	70	249	200	90	89	96	962	278	293	57	51	27
16	69	216	200	90	90	94	1140	472	255	55	49	29
17	69	187	180	89	91	95	1140	980	238	51	47	32
18	67	166	175	89	93	96	1210	1050	218	49	46	30
19	66	158	165	89	93	100	1240	1100	206	49	48	27
20	66	167	155	89	93	125	1170	1010	186	55	44	26
21	72	193	145	88	93	215	1100	835	157	60	38	23
22	75	170	140	88	93	270	1090	671	134	62	34	23
23	82	165	135	87	92	280	1090	535	119	56	31	26
24	124	156	130	87	93	300	1060	438	108	49	29	25
25	152	151	120	88	94	315	985	369	101	46	27	24
26	166	140	120	88	93	350	846	320	96	46	29	25
27	160	140	115	89	94	400	717	283	91	44	30	24
28	149	140	110	89	94	480	610	257	86	41	27	23
29	126	153	105	88	95	600	536	245	88	41	24	26
30	111	204	100	88	---	800	476	303	105	43	24	32
31	101	---	100	87	---	1100	---	476	---	59	25	---
TOTAL	2754	4978	5400	2766	2575	7053	29957	14695	7882	1942	1324	818
MEAN	88.8	166	174	89.2	88.8	228	999	474	263	62.6	42.7	27.3
MAX	166	290	310	97	95	1100	1370	1100	632	111	62	37
MIN	65	80	100	87	83	94	476	245	86	41	24	21
+	5.7	5.8	5.9	5.8	5.8	5.8	5.7	5.2	5.6	3.7	4.1	3.2
MEAN‡	94.5	172	180	95.0	94.6	234	1005	479	269	66.3	46.8	30.5
CFSM‡	.40	.73	.76	.40	.40	.99	4.24	2.02	1.14	.28	.20	.13
IN‡	.46	.81	.88	.46	.43	1.14	4.73	2.33	1.27	.32	.23	.14

CAL YR 1975 TOTAL 74572 MEAN 204 MAX 1790 MIN 27 MEAN‡ 210 CFSM‡ .89 IN‡ 12.01
WTR YR 1976 TOTAL 82144 MEAN 224 MAX 1370 MIN 21 MEAN‡ 230 CFSM‡ .97 IN‡ 13.19

+Average monthly diversion, equivalent in cubic feet per second, for industrial use; furnished by Hanna Mining Co.
‡Adjusted for diversion.

04065500 STURGEON RIVER NEAR FOSTER CITY, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: July 1956 to current year.

INSTRUMENTATION.--Temperature recorder since July 26, 1956.

REMARKS.--Complete ice cover during winter period.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 30.0°C July 1, 1963; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 26.5°C July 7; minimum, 0.0°C on many days during December to April.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04065500 STURGEON RIVER NEAR FOSTER CITY, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	0.0	0.0	9.5	8.5	17.0	14.0	21.5	18.0	21.5	19.0	18.0	14.5
2	0.0	0.0	9.5	7.5	18.0	14.5	21.0	18.5	21.0	17.0	15.5	13.0
3	0.0	0.0	7.5	6.5	19.0	16.0	23.0	18.5	22.0	18.5	18.0	14.0
4	0.5	0.0	8.5	5.5	20.5	18.0	24.0	19.5	21.0	19.5	17.0	15.0
5	1.5	0.5	8.5	7.5	21.5	19.0	24.0	20.5	19.5	18.5	17.0	14.0
6	2.5	1.0	9.5	6.5	22.5	20.0	25.5	21.5	20.0	16.5	18.5	14.5
7	3.5	1.5	9.5	7.5	23.0	21.0	26.5	23.0	21.0	17.0	20.5	16.0
8	4.0	2.0	10.0	7.5	22.5	21.5	25.5	22.5	22.0	18.0	22.0	19.0
9	4.0	2.5	12.5	9.5	23.0	21.0	24.5	22.0	23.5	19.5	21.0	19.0
10	4.0	3.5	14.0	12.0	23.5	21.5	24.0	21.5	22.5	20.5	18.0	15.5
11	4.0	2.5	13.5	11.5	24.0	22.0	25.5	23.0	23.5	20.5	18.5	15.0
12	4.5	3.0	14.0	11.0	22.5	20.5	24.0	20.5	24.5	22.0	19.0	15.5
13	6.0	4.0	13.5	12.5	23.0	20.5	23.5	20.5	23.5	20.5	20.5	17.0
14	7.0	6.0	16.0	12.5	24.5	21.5	25.5	21.0	21.0	18.5	19.5	17.0
15	8.0	7.0	15.5	13.5	24.0	22.5	24.5	22.5	20.5	17.0	17.0	16.0
16	11.0	8.0	15.5	12.5	22.5	19.5	22.5	20.0	20.5	16.5	17.5	14.0
17	12.0	11.0	12.5	11.0	20.5	18.5	22.0	18.5	21.5	17.5	18.0	14.5
18	12.0	12.0	13.0	11.0	20.0	18.5	24.5	19.5	22.0	19.0	18.0	14.5
19	12.0	11.0	13.5	11.5	19.5	17.5	24.5	21.5	24.5	20.0	17.0	15.0
20	11.0	10.0	16.0	13.5	21.5	18.0	25.0	22.5	26.0	22.5	15.5	13.0
21	10.0	9.0	16.5	14.5	22.5	19.5	24.5	21.0	25.5	22.0	14.0	12.5
22	9.0	8.0	17.0	14.5	23.0	20.5	23.5	20.5	25.5	22.5	12.5	11.5
23	9.0	7.0	17.0	14.5	23.0	20.5	25.0	22.0	24.5	21.0	12.0	10.0
24	9.0	8.0	16.5	14.0	21.5	20.5	25.0	21.0	24.0	20.0	11.5	8.5
25	8.5	7.0	17.0	14.5	21.5	19.5	23.0	19.5	23.0	20.0	12.0	9.5
26	8.0	6.5	18.0	15.0	22.0	19.0	24.0	21.0	23.0	21.0	11.0	9.5
27	7.5	6.0	18.0	16.0	23.5	20.0	25.5	21.0	25.0	21.0	12.5	10.5
28	9.5	6.5	18.0	17.0	23.0	20.0	23.5	21.0	23.0	19.0	11.0	8.5
29	9.0	7.5	18.0	16.0	22.5	19.5	23.5	19.0	20.0	17.0	12.5	9.5
30	9.0	8.5	16.0	15.0	21.5	18.0	23.0	21.5	19.5	15.5	13.0	10.0
31	---	---	15.0	14.5	---	---	23.0	19.5	18.0	16.0	---	---
MONTH	12.0	0.0	18.0	5.5	24.5	14.0	26.5	18.0	26.0	15.5	22.0	8.5

04065600 PINE CREEK NEAR IRON MOUNTAIN, MI

LOCATION.--Lat 45°55'51", long 87°58'18", in SE¼ SE¼ sec.19, T.41 N., R.29 W., Dickinson County, Hydrologic Unit 04030108, on left bank 20 ft (6 m) upstream from bridge on County Road 866, 1.2 mi (1.9 km) downstream from Steel Creek, and 9.0 mi (14.5 km) northeast of Iron Mountain.

DRAINAGE AREA.--16.8 mi^2 (43.5 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Occasional low-flow measurements, water year 1971. October 1971 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,034 ft (315.16 m) above mean sea level, from topographic leveling (nearest 0.5 ft). Prior to Nov. 23, 1971, nonrecording gage 20 ft (6 m) downstream at same datum.

REMARKS.--Water-discharge records good except those for the winter period, which are fair. Flow includes an average of 5.2 ft^3/s (0.15 m^3/s) diverted from West Branch Sturgeon River Basin. Some regulation by mine tailings ponds in headwaters. Since August 1975, additional regulation by 2A Reservoir, useable capacity, 4,700 acre-ft (5.80 hm^3), 4.2 mi (6.8 km) upstream.

AVERAGE DISCHARGE.--5 years, 14.5 ft^3/s (0.411 m^3/s), 11.72 in/yr (298 mm/yr), adjusted for storage and diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 272 ft^3/s (7.70 m^3/s) May 16, 1976, gage height, 6.42 ft (1.957 m); minimum, 0.70 ft^3/s (0.020 m^3/s) Aug. 11, 12, 1975, gage height, 1.46 ft (0.445 m), during the period of initial filling of 2A Reservoir.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 272 ft^3/s (7.70 m^3/s) May 16, gage height, 6.42 ft (1.957 m); minimum, 1.5 ft^3/s (0.042 m^3/s) Aug. 30, 31, Sept. 12, 13; minimum gage height, 1.55 ft (0.472 m). Aug. 30, 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	6.7	15	4.8	3.6	5.0	175	31	69	11	3.3	2.8
2	9.0	5.6	13	4.6	3.6	5.0	156	32	55	10	3.0	2.3
3	8.4	5.1	11	4.6	3.6	5.0	142	38	41	9.5	2.7	2.1
4	8.1	4.9	9.0	4.4	3.6	5.0	100	33	34	8.9	2.4	2.0
5	7.2	4.5	8.0	4.4	3.6	5.0	91	31	30	8.6	4.7	1.9
6	6.7	4.5	7.0	4.4	3.6	5.0	93	31	27	8.3	4.3	1.7
7	6.5	5.0	6.2	4.2	3.6	5.2	93	29	25	8.2	3.4	1.7
8	6.5	8.9	5.8	4.2	3.6	5.6	85	26	22	7.6	2.7	1.7
9	6.7	8.6	5.6	4.2	3.6	6.0	80	25	21	7.2	2.4	1.7
10	6.5	20	5.6	4.2	3.6	7.4	79	24	20	7.1	2.5	1.7
11	6.6	16	5.6	4.0	3.6	9.0	76	22	25	7.1	2.6	1.6
12	7.3	15	5.6	4.0	3.8	11	66	21	27	6.2	2.6	1.5
13	8.0	15	6.0	4.0	3.8	13	59	20	26	5.2	2.9	1.5
14	8.7	12	22	4.0	4.0	15	62	27	23	5.0	2.8	2.1
15	11	9.9	19	4.0	4.2	18	71	31	20	4.9	2.5	2.8
16	9.6	9.5	15	4.0	4.4	20	70	161	20	4.9	2.4	2.6
17	9.3	8.5	13	4.0	4.6	22	66	156	18	4.9	2.4	2.4
18	7.4	7.9	12	3.8	4.6	24	71	96	18	4.3	2.2	2.2
19	4.5	8.0	11	3.8	4.8	26	69	70	18	3.9	2.3	2.1
20	3.6	9.2	10	3.8	4.8	28	59	56	16	5.9	2.4	2.3
21	3.3	12	9.0	3.8	5.0	30	57	45	15	5.7	2.3	2.5
22	2.8	10	8.4	3.8	5.0	34	98	39	14	4.6	2.1	2.6
23	7.8	8.4	7.6	3.8	5.0	40	107	34	14	4.0	1.9	2.2
24	12	7.5	7.4	3.8	5.0	46	76	32	13	3.8	1.9	2.0
25	18	6.7	6.8	3.8	5.0	54	58	29	13	3.3	1.8	1.9
26	13	6.3	6.2	3.8	5.0	70	48	27	12	3.1	1.8	1.9
27	11	6.1	6.0	3.6	5.0	90	41	25	11	2.8	1.9	2.2
28	9.1	6.1	5.6	3.6	5.0	110	37	23	11	2.6	1.8	2.3
29	7.8	7.4	5.4	3.6	5.0	131	38	22	12	2.9	1.6	2.2
30	7.1	23	5.2	3.6	---	160	33	41	13	3.3	1.5	2.2
31	7.1	---	5.0	3.6	---	196	---	58	---	4.7	1.7	---
TOTAL	250.6	278.3	278.0	124.2	123.6	1201.2	2356	1335	683	179.5	76.8	62.7
MEAN	8.08	9.28	8.97	4.01	4.26	38.7	78.5	43.1	22.8	5.79	2.48	2.09
MAX	18	23	22	4.8	5.0	196	175	161	69	11	4.7	2.8
MIN	2.8	4.5	5.0	3.6	3.6	5.0	33	20	11	2.6	1.5	1.5

CAL YR 1975 TOTAL 5775.31 MEAN 15.8 MAX 198 MIN .71 MEAN+ 12.0 CFSM+ .71 IN+ 9.70
WTR YR 1976 TOTAL 6948.90 MEAN 19.0 MAX 196 MIN 1.5 MEAN+ 16.1 CFSM+ .96 IN+ 13.05

+Adjusted for diversion and change in contents in 2-A Reservoir. Records of diversion furnished by Hanna Mining Co.

04065600 PINE CREEK NEAR IRON MOUNTAIN, MI--CONTINUED

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--November 1971 to current year.

INSTRUMENTATION.--Temperature recorder since Nov. 10, 1971.

REMARKS.--In addition to the temperature recorder record, two samples for field analysis were collected during the year. Complete ice cover during winter period.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 24.0°C July 8, 9, 1973, May 23, 24, 1975; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 22.5°C June 14, 15; minimum, 0.0°C on many days during December to April.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	CARBONATE (CO3) (MG/L)
NOV									
04...	1440	4.6	420	8.2	15.5	5.0	12.3	100	0
MAR									
22...	1500	34	500	7.0	4.0	.0	12.2	87	0

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04065600 PINE CREEK NEAR IRON MOUNTAIN, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 to SEPTEMBER 1976

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	0.0	0.0	6.5	6.5	17.0	15.0	17.5	16.5	20.0	18.0	13.0	12.0
2	0.0	0.0	6.5	6.5	17.5	14.5	17.5	16.5	18.0	16.5	12.0	9.0
3	0.0	0.0	6.5	6.0	19.0	16.0	18.0	16.0	18.5	17.0	13.5	10.5
4	1.0	0.0	7.0	5.5	20.0	17.5	18.5	17.5	18.5	18.0	13.5	11.5
5	1.0	1.0	7.5	7.0	20.5	18.5	19.5	18.0	18.0	18.0	12.5	10.0
6	1.5	1.0	7.5	6.5	21.0	18.5	20.0	19.5	18.0	16.0	13.5	11.0
7	2.0	1.5	7.5	7.0	21.5	19.5	20.5	20.0	17.0	15.0	15.5	12.5
8	2.5	2.0	9.0	7.0	21.5	21.0	20.5	19.5	18.0	16.5	16.5	14.5
9	3.5	2.5	11.5	9.0	21.0	20.5	20.0	19.5	19.0	18.0	16.5	14.5
10	3.5	3.0	12.0	11.0	22.0	20.5	20.0	19.5	19.0	19.0	14.5	11.0
11	3.0	3.0	12.0	10.0	22.0	20.5	20.5	20.0	20.0	19.0	13.5	10.5
12	4.0	3.0	11.0	9.0	21.5	18.5	20.0	18.5	21.0	20.0	13.5	11.0
13	5.0	4.0	11.0	11.0	21.5	19.0	20.0	19.0	21.0	20.0	14.5	13.5
14	6.0	5.0	15.0	10.5	22.5	20.0	20.0	20.0	20.0	17.5	14.5	14.0
15	6.5	6.0	15.0	13.0	22.5	20.5	22.0	21.0	17.5	16.0	14.0	12.5
16	9.5	6.5	15.0	13.0	20.5	17.5	21.0	19.0	16.5	15.0	12.5	10.5
17	10.0	9.5	13.0	12.0	18.5	16.5	19.0	17.5	17.0	15.5	12.0	10.0
18	10.0	10.0	13.0	11.5	18.5	17.5	20.0	18.0	19.0	17.0	12.0	10.0
19	10.0	9.5	14.5	12.0	17.5	15.5	21.5	20.0	21.5	19.0	12.0	11.0
20	9.5	8.5	17.0	14.0	19.0	16.0	22.0	21.5	22.0	21.0	11.5	10.0
21	8.5	8.5	17.0	15.0	20.0	17.5	22.0	19.0	22.0	20.0	10.0	10.0
22	8.5	7.5	16.0	14.0	20.0	18.5	20.0	19.0	22.0	21.0	10.0	9.0
23	7.5	7.5	15.0	14.0	19.5	18.5	22.0	20.0	21.5	18.0	9.0	8.5
24	7.5	7.5	15.0	13.0	19.5	18.5	22.0	20.0	20.0	18.5	8.5	8.0
25	7.5	7.0	15.5	13.5	18.5	18.5	21.0	20.0	18.5	17.0	9.0	8.5
26	7.0	6.5	17.0	14.0	19.0	17.0	21.5	20.0	19.0	18.5	8.5	8.5
27	6.5	6.0	17.0	15.5	19.5	18.5	21.5	20.0	20.5	18.5	9.0	8.5
28	7.0	6.0	17.0	16.0	19.5	17.5	21.0	20.0	20.5	17.5	9.0	8.5
29	7.0	6.5	17.0	16.0	18.5	17.5	20.0	19.0	18.0	14.0	10.5	8.5
30	6.5	6.5	16.0	15.0	17.5	16.5	20.0	20.0	15.0	12.0	10.5	9.0
31	---	---	15.0	15.0	---	---	20.0	20.0	14.0	12.5	---	---
MONTH	10.0	0.0	17.0	5.5	22.5	14.5	22.0	16.0	22.0	12.0	16.5	8.0

04066000 MENOMINEE RIVER NEAR PEMBINE, WI

LOCATION.--Lat 45°35'56", long 87°46'32", in sec.16, T.37 N., R.28 W., Michigan meridian, Menominee County, MI, Hydrologic Unit 04030108, on left bank 0.6 mi (1.0 km) upstream from Pemene Creek, 4.0 mi (6.4 km) west of Nathan, MI, 15 mi (24 km) southeast of Pembine, and at mile 65.8 (105.9 km).

DRAINAGE AREA.--3,240 mi^2 (8,390 km^2), approximately.

PERIOD OF RECORD.--October 1949 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORD.--WSP 1277: 1975.

GAGE.--Water-stage recorder. Altitude of gage is 770 ft (235 m), from river-profile map. Prior to Oct. 28, 1972, at site 0.5 mi (0.8 km) downstream at datum 15 ft (4.6 m) lower.

REMARKS.--Records good except those for the winter period, which are fair. Flow regulated by powerplants and by Michigamme Reservoir, capacity, 119,950 acre-ft (148 hm^3), and Peavy Pond, capacity, 33,860 acre-ft (41.7 hm^3), on the Michigamme River, and by many smaller reservoirs above station.

AVERAGE DISCHARGE.--27 years, 3,004 ft^3/s (85.07 m^3/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,900 ft^3/s (762 m^3/s) May 8, 1960, gage height, 13.90 ft (4.237 m); minimum, 694 ft^3/s (19.7 m^3/s) Sept. 3, 1969, gage height, 1.66 ft (0.506 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15,700 ft^3/s (445 m^3/s) Apr. 23, gage height, 14.75 ft (4.496 m); minimum daily, 912 ft^3/s (25.8 m^3/s) Oct. 21.

Rating table (gage height, in feet, and discharge, in cubic feet per second).
(Stage-discharge relation affected by ice Nov. 21, 22, Nov. 30 to Mar. 29.)

6.8	900	11.0	7,000
7.5	1,480	13.0	11,340
9.0	3,440	15.0	16,400

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	983	1790	2500	2500	2300	2400	7580	5000	5440	1930	1100	1000
2	1070	1990	2800	2400	2300	2300	6980	5000	4870	1810	1100	990
3	1910	2010	2900	2300	2300	2300	7000	5520	4020	1950	1400	990
4	1920	2050	2800	2800	2300	2300	7020	6920	3620	1480	1210	960
5	2070	1930	2800	3000	2400	2400	6940	5560	3380	1070	1380	966
6	2140	1920	2800	2700	2500	2500	8020	5560	3120	924	1370	960
7	2200	1530	2800	2400	2500	2600	8480	5440	2940	1530	1410	884
8	1580	1480	2600	2500	2400	2400	8570	5360	3000	1750	982	1030
9	1590	1420	2600	2400	2400	2400	8420	5060	2920	1510	1180	1100
10	1950	1570	2700	2400	2400	2400	8400	5040	2730	1230	1220	984
11	1490	2450	2700	2500	2400	2500	9320	4330	2970	1020	1300	984
12	1160	3080	2500	2600	2400	2600	9030	4060	3140	1070	1420	978
13	1380	3460	2500	2600	2500	2600	8730	3830	2980	1200	1300	978
14	1410	3210	2700	2500	2400	2500	8420	3020	3030	1380	1330	990
15	1360	3470	3100	2500	2400	2500	8290	3100	3100	1430	1140	984
16	1580	3210	3100	2400	2500	2400	8660	5300	2790	1440	1080	984
17	1420	3120	3100	2400	2500	2300	10000	10000	2790	1160	1090	1120
18	1910	2770	3400	2500	2500	2300	10500	9010	2700	990	996	990
19	1500	2550	3600	2500	2500	2300	12800	8000	2390	1140	996	990
20	930	2630	3100	2400	2500	2400	13600	6460	1970	1200	1100	990
21	912	1900	2900	2400	2600	2500	14000	5900	2250	1200	1070	984
22	966	2000	2800	2400	2700	3800	14800	5340	2310	1410	1050	984
23	972	2250	2800	2400	2800	3600	15500	4420	2150	1300	972	984
24	954	1920	2800	2400	2500	3400	14900	3540	2110	1200	1060	1010
25	918	1830	2800	2400	2500	4000	11800	3320	1840	1000	1120	1080
26	985	2090	2600	2400	2600	4900	8900	3040	1750	1000	1090	1110
27	1340	2280	2600	2400	2700	5000	7360	2800	1290	1100	1070	1040
28	1710	1580	2900	2400	2600	5000	7670	2670	1350	1000	1020	996
29	1610	1650	2800	2400	2500	5000	6780	2170	1600	1100	972	996
30	1630	2200	2700	2300	---	6240	5600	2580	1970	1300	1020	1220
31	1800	---	2600	2300	---	7180	---	4380	---	1300	1050	---
TOTAL	45350	67340	87400	76500	71900	99020	284070	151730	82520	40124	35598	30256
MEAN	1463	2245	2819	2468	2479	3194	9469	4895	2751	1294	1148	1009
MAX	2200	3470	3600	3000	2800	7180	15500	10000	5440	1950	1420	1220
MIN	912	1420	2500	2300	2300	2300	5600	2170	1290	924	972	884

CAL YR 1975 TOTAL 1059110 MEAN 2902 MAX 16400 MIN 912
WTR YR 1976 TOTAL 1071808 MEAN 2928 MAX 15500 MIN 884

04067000 MENOMINEE RIVER BELOW KOSS, MI

LOCATION.--Lat 45°21'16", long 87°38'55", in sec.9, T.34 N., R.27 W., Michigan meridian, Menominee County, Hydrologic Unit 04030108, on left bank at powerplant of Wisconsin Public Service Corp., 0.5 mi (0.8 km) upstream from Little Cedar River, 3.6 mi (5.8 km) southeast of Koss, and at mile 24.7 (39.7 km).

DRAINAGE AREA.--3,790 mi^2 (9,820 km^2), approximately.

PERIOD OF RECORD.--July 1907 to March 1909 (published as "at Koss"), July 1913 to current year.

GAGE.--Headwater and tailwater gages and generation data entered hourly in daily log sheet by company employees. Prior to June 1913, chain gage on railroad bridge 4 mi (6.4 km) upstream.

REMARKS.--Records fair. Daily discharge computed on basis of average daily load and load-discharge rating of combined hydroelectric units. Flow regulated by powerplants, and by Michigamme Reservoir, capacity, 119,950 acre-ft (148 hm^3), and Peavy Pond, capacity, 33,860 acre-ft (41.7 hm^3) on Michigamme River, and by many smaller reservoirs above station.

COOPERATION.--Records of daily discharge furnished by Wisconsin Public Service Corp. since 1913.

AVERAGE DISCHARGE.--64 years (water years 1907-08, 1913-76), 3,153 ft^3/s (89.29 m^3/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 33,000 ft^3/s (935 m^3/s) May 10, 1960; minimum daily, 162 ft^3/s (4.59 m^3/s) Sept. 15, 1931.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 15,800 ft^3/s (447 m^3/s) Apr. 24; minimum daily, 711 ft^3/s (20.1 m^3/s) Sept. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1160	1680	2740	2930	2280	2210	9600	5350	5440	1900	1500	1250
2	1200	2090	2890	2760	2320	2300	8980	5460	5440	2040	1160	1140
3	1070	2490	2770	2590	2160	2250	8330	4990	4180	1900	1440	1060
4	1620	2540	2400	2600	2300	2500	8930	7030	3570	1890	1100	1180
5	2020	1900	3520	2160	2350	2690	7800	7440	3790	1720	1450	960
6	2560	1900	3630	2210	2300	2700	9100	5310	3210	1200	1760	960
7	1900	1980	3080	2400	2350	2400	9770	5520	3120	1480	1590	1180
8	2080	1740	2660	2120	2300	2300	9890	5250	2750	1340	1610	1000
9	1440	1680	2720	2310	2300	2400	9890	5370	2750	1320	1180	960
10	1350	1900	2820	2560	2300	2500	9700	5090	2850	1660	1390	1200
11	1480	2040	2700	2400	2350	2690	9860	4780	2710	1340	1440	1170
12	1690	2390	2850	2500	2500	2690	9840	4420	2860	1180	1610	940
13	1540	3550	2950	2360	2400	2500	9890	4210	2880	1180	1490	950
14	1330	3500	3120	2440	2210	2560	9700	3480	3120	1240	1710	1100
15	1340	3560	4040	2400	2390	2380	9480	3150	2880	1460	1380	1100
16	1340	3360	4180	2300	2460	2300	9380	3970	2950	1490	1320	1060
17	1720	3000	4010	2400	2400	2210	9650	8190	2380	1940	1400	1180
18	1510	2880	3580	2360	2450	2240	9890	10900	2820	1380	1220	1380
19	1450	2690	3510	2320	2600	2420	11900	9580	2500	1060	1100	1010
20	1570	2640	3240	2300	2660	2290	13200	8570	2220	1200	1120	711
21	1460	2760	3390	2300	2690	3360	14800	6960	2140	1560	1120	1030
22	1300	2880	3020	2430	2780	3610	15300	4930	2270	1400	1250	1040
23	1420	3000	3000	2330	2440	3440	15400	5170	2350	1700	1200	931
24	1390	2370	2880	2380	2450	3750	15800	3470	1950	1870	1080	998
25	1340	2180	2770	2350	2710	4030	12600	3480	2200	1300	980	1010
26	1300	1730	2810	2200	2690	4480	12700	3120	1970	1100	1200	1030
27	1290	2080	2810	2340	2700	6090	10200	3000	1570	1200	1150	1310
28	1490	2020	2590	2400	2600	6230	8350	2930	1300	1200	1250	1010
29	1870	2100	2500	2300	2350	6290	7950	2640	1830	1100	1100	1060
30	1850	2690	2480	2210	---	7390	7650	2690	1800	1290	980	1180
31	1450	---	2810	2210	---	8820	---	4090	---	1480	1100	---
TOTAL	47530	73320	94470	73870	70790	106020	315530	160540	83800	45120	40380	32090
MEAN	1533	2444	3047	2383	2441	3420	10520	5179	2793	1455	1303	1070
MAX	2560	3560	4180	2930	2780	8820	15800	10900	5440	2040	1760	1380
MIN	1070	1680	2400	2120	2160	2210	7650	2640	1300	1060	980	711

CAL YR 1975 TOTAL 1158210 MEAN 3173 MAX 16500 MIN 1070
WTR YR 1976 TOTAL 1143460 MEAN 3124 MAX 15800 MIN 711

04096207 BAW BEESE LAKE OUTLET AT HILLSDALE, MI

LOCATION.--Lat 41°54'18", long 84°37'01", in NE¼ SE¼ sec.35, T.6 S., R.3 W., Hillsdale County, Hydrologic Unit 04050001, at bridge on Lakeview Road, 300 ft (91 m) downstream from Baw Beese Lake, 0.5 mi (0.8 km) southeast of Hillsdale.

DRAINAGE AREA.--5.10 mi^2 (13.21 km^2).

PERIOD OF RECORD.--Water years 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)
FEB 10...	1000	E.20	385	8.0	.5	5	1	190	35	47

DATE	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
FEB 10...	18	9.3	9	.3	1.8	191	0	157	20	17

DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
FEB 10...	.2	4.8	220	213	.06	.00	.00	60	40

E--ESTIMATED VALUE

04096207 BAW BEESE LAKE OUTLET AT HILLSDALE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)
NOV									
04...	1050	E.20	370	8.4	12.5	.00	.01	.01	--
21...	1000	E.10	365	8.0	7.5	.00	.01	.01	--
DEC									
05...	0950	14	360	8.2	4.5	.03	.01	.04	--
JAN									
20...	0940	E2.0	380	7.1	1.0	.04	.01	.05	--
FEB									
10...	1000	E.20	385	8.0	.5	--	--	--	.06
17...	1300	16	410	--	3.0	.09	.00	.09	--
MAR									
23...	1100	21	370	8.4	6.0	.12	.01	.13	--
JUN									
23...	1000	E.10	365	--	21.5	.00	.01	.01	--
AUG									
16...	0950	E.10	360	7.9	21.0	.01	.00	.01	--

DATE	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)
NOV								
04...	.04	.57	.61	.62	2.7	.02	.00	--
21...	.00	.47	.47	.48	2.1	.01	.01	--
DEC								
05...	.06	.33	.39	.43	1.9	.02	.01	--
JAN								
20...	.05	1.4	1.4	1.5	6.4	.01	.00	--
FEB								
10...	--	--	--	--	--	--	--	.00
17...	.04	.58	.62	.71	3.1	.01	.01	--
MAR								
23...	.07	.47	.54	.67	3.0	.02	.01	--
JUN								
23...	.04	.51	.55	.56	2.5	.03	.01	--
AUG								
16...	.04	.86	.90	.91	4.0	.02	.01	--

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR										
29...	1005	10	385	8.6	6.0	11.0	0	0	10	2

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUSPENDED SEDIMENT (MG/L)
APR										
29...	0	20	3	20	<.5	0	0	0	10	3

E--ESTIMATED VALUE

04096207 BAW BEESE LAKE OUTLET AT HILLSDALE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)
MAR 19...	0800	E12	360	7.5	4.5	11	.00	.0	.00	.0

DATE	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR 19...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHOXYCHLOR (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR 19...	.00	.00	.00	.00	.00	0	.00	.00	.00	.07

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
NOV 04...	1050	E.20	12.5	6	E.00
21...	1000	E.10	7.5	2	E.00
DEC 05...	0950	14	4.5	E1	E.04
JAN 20...	0940	E2.0	1.0	1	E.01
FEB 17...	1300	16	3.0	40	1.7
MAR 23...	1100	21	6.0	1	.06
APR 29...	1005	10	11.0	3	.08
JUN 23...	1000	E.10	21.5	4	E.00
AUG 16...	0950	E.10	21.0	3	E.00
SEP 28...	1145	E.10	15.5	6	E.00

E--ESTIMATED VALUE

04096214 KING LAKE OUTLET AT HILLSDALE, MI

LOCATION.--Lat 41°54'26", long 84°37'28", in NE¼ NW¼ sec.35, T.6 S., R.3 W., Hillsdale County, Hydrologic Unit 04050001, at bridge on Steamburg Road at Hillsdale, 0.3 mi (0.5 km) upstream from mouth.

DRAINAGE AREA.--4.19 mi^2 (10.85 km^2).

PERIOD OF RECORD.--Water years 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)
FEB 10...	1105	E2.5	554	8.1	2.5	20	1	300	42	84

DATE	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
FEB 10...	21	7.4	5	.2	1.8	310	0	254	28	13

DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO, PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
FEB 10...	.2	7.8	332	322	1.3	.01	.03	110	180

E--ESTIMATED VALUE

04096214 KING LAKE OUTLET AT HILLSDALE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	DISSOLVED NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	DISSOLVED NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)
NOV										
04...	1125	2.0	560	8.2	12.5	1.1	--	.01	--	1.1
21...	1025	3.3	540	8.2	5.5	.90	--	.00	--	.90
DEC										
05...	1050	5.5	500	8.0	4.0	1.1	--	.01	--	1.1
JAN										
20...	1020	2.7	560	7.3	.5	1.2	--	.01	--	1.2
FEB										
10...	1105	E2.5	554	8.1	2.5	--	--	--	--	--
MAR										
23...	1150	9.0	450	8.5	6.0	.83	--	.01	--	.84
JUN										
23...	1020	2.9	500	--	17.5	1.5	--	.05	--	1.5
SEP										
28...	1045	.53	620	7.7	10.5	2.6	2.6	.03	.06	2.6

DATE	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	DISSOLVED AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	DISSOLVED ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	DISSOLVED KJEL. NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	NITROGEN DISSOLVED AS N (MG/L)
NOV									
04...	--	.01	--	.84	--	.85	--	2.0	--
21...	--	.01	--	.90	--	.91	--	1.8	--
DEC									
05...	--	.02	--	1.5	--	1.5	--	2.6	--
JAN									
20...	--	.04	--	.08	--	.12	--	1.3	--
FEB									
10...	1.3	--	--	--	--	--	--	--	--
MAR									
23...	--	.04	--	.39	--	.43	--	1.3	--
JUN									
23...	--	.04	--	.81	--	.85	--	2.4	--
SEP									
28...	2.7	.04	.05	.36	.30	.40	.35	3.0	3.1

DATE	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	DISSOLVED PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	TOTAL ORTHO + HYDRO. PHOSPHORUS (P) (MG/L)	DIS. ORTHO + HYDRO. PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC PHOSPHORUS (P) (MG/L)	DISSOLVED ORGANIC PHOSPHORUS (P) (MG/L)
NOV									
04...	8.6	.04	--	.01	--	--	--	--	--
21...	8.0	.04	--	.01	--	--	--	--	--
DEC									
05...	12	.04	--	.01	--	--	--	--	--
JAN									
20...	5.8	.02	--	.01	--	--	--	--	--
FEB									
10...	--	--	--	--	.01	--	--	--	--
MAR									
23...	5.6	.03	--	.01	--	--	--	--	--
JUN									
23...	10	.06	--	.01	--	--	--	--	--
SEP									
28...	13	.07	.06	.02	.02	.03	.02	.02	.02

E--ESTIMATED VALUE

04096214 KING LAKE OUTLET AT HILLSDALE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR 29...	1105	6.4	495	8.3	7.5	9.0	2	0	10	2

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUSPENDED SEDIMENT (MG/L)
APR 29...	10	1200	3	90	<.5	1	0	0	30	6

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)
MAR 19...	0820	E10	440	10.5	5.0	13	.00	.0	.00	.0

DATE	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR 19...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHOXYCHLOR (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR 19...	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
NOV 04...	1125	2.0	12.5	7	.04
21...	1025	3.3	5.5	14	.12
DEC 05...	1050	5.5	4.0	3	.04
JAN 20...	1020	2.7	.5	7	.05
FEB 17...	1645	15	1.0	1	.04
27...	0850	11	4.0	5	.15
MAR 23...	1150	9.0	6.0	2	.05
APR 29...	1105	6.4	9.0	6	.10
JUN 23...	1020	2.9	17.5	16	.13
SEP 28...	1045	.53	10.5	42	.06

04096225 ST. JOSEPH RIVER AT HILLSDALE, MI

LOCATION.--Lat 41°55'45", long 84°38'22", in SW¼ SE¼ sec.22, T.6 S., R.3 W., Hillsdale County, Hydrologic Unit 04050001, at bridge on Fayette Street at Hillsdale.

DRAINAGE AREA.--12.4 mi^2 (32.1 km^2).

PERIOD OF RECORD.--Water years 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	DISSOLVED NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	DISSOLVED NITRITE (N) (MG/L)
NOV									
04...	0940	4.0	700	8.6	13.0	.56	--	.02	--
21...	0920	6.0	645	8.0	6.0	.35	--	.00	--
DEC									
05...	1215	23	460	8.1	5.0	.42	--	.01	--
JAN									
07...	1225	6.0	705	6.7	2.0	.87	--	.02	--
20...	1130	6.4	735	7.2	2.5	.79	--	.02	--
FEB									
17...	1410	60	375	--	2.5	1.2	--	.02	--
MAR									
04...	1800	91	410	--	5.0	.93	--	.00	--
23...	1300	33	455	8.2	7.5	.50	--	.01	--
JUN									
23...	0850	5.8	650	--	18.0	.82	--	.08	--
SEP									
28...	0935	3.4	640	7.6	11.5	.59	.59	.04	.05

DATE	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	DISSOLVED AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	DISSOLVED ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	DISSOLVED KJEL. NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)
NOV									
04...	.58	--	.12	--	.66	--	.78	--	1.4
21...	.35	--	.08	--	.42	--	.50	--	.85
DEC									
05...	.43	--	.27	--	.70	--	.97	--	1.4
JAN									
07...	.89	--	1.1	--	.70	--	1.8	--	2.7
20...	.81	--	1.3	--	.50	--	1.8	--	2.6
FEB									
17...	1.2	--	.16	--	.94	--	1.1	--	2.3
MAR									
04...	.93	--	.05	--	.50	--	.55	--	1.5
23...	.51	--	.07	--	.46	--	.53	--	1.0
JUN									
23...	.90	--	.13	--	.60	--	.73	--	1.6
SEP									
28...	.63	.64	.13	.12	.45	.41	.58	.53	1.2

DATE	NITROGEN DISSOLVED AS N (MG/L)	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	DISSOLVED PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHORUS (P) (MG/L)	TOTAL ORTHO + HYDRO. PHOSPHORUS (P) (MG/L)	DIS. ORTHO + HYDRO. PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC PHOSPHORUS (P) (MG/L)
NOV									
04...	--	6.0	.08	--	.04	--	--	--	--
21...	--	3.8	.01	--	.00	--	--	--	--
DEC									
05...	--	6.2	.09	--	.05	--	--	--	--
JAN									
07...	--	12	.26	--	.15	--	--	--	--
20...	--	12	.29	--	.19	--	--	--	--
FEB									
17...	--	10	.10	--	.05	--	--	--	--
MAR									
04...	--	6.6	.05	--	.01	--	--	--	--
23...	--	4.6	.03	--	.01	--	--	--	--
JUN									
23...	--	7.2	.06	--	.02	--	--	--	--
SEP									
28...	1.2	5.4	.08	.06	.04	.02	.04	.02	.00

04096225 ST. JOSEPH RIVER AT HILLSDALE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR 29...	1205	20	495	8.5	9.5	11.5	0	0	10	1

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUSPENDED SEDIMENT (MG/L)
APR 29...	10	870	4	70	<.5	3	0	0	10	5

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)
MAR 18...	1220	E40	445	4.0	4.0	8.7	.00	.0	.00	.0

DATE	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR 18...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHOXYCHLOR (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR 18...	.00	.00	.00	.00	.00	0	.00	.00	.00	.06

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
NOV					
04...	0940	4.0	13.0	E1	E.01
21...	0920	6.0	6.0	8	.13
DEC					
05...	1215	23	5.0	4	.25
JAN					
07...	1225	6.0	2.0	2	.03
20...	1130	6.4	2.5	3	.05
FEB					
17...	1410	60	2.5	48	7.8
27...	0945	37	6.0	7	.70
MAR					
04...	1800	91	5.0	31	7.6
23...	1300	33	7.5	2	.18
APR					
29...	1205	20	11.5	5	.27
JUN					
23...	0850	5.8	18.0	12	.19
SEP					
28...	0935	3.4	11.5	15	.14

E--ESTIMATED VALUE

04096250 BEEBE CREEK NEAR NORTH ADAMS, MI

LOCATION.--Lat 41°56'27", long 84°33'02", NW¼ NW¼ sec.21, T.6 S., R.2 W., Hillsdale County, Hydrologic Unit 04050001, at bridge on State Road, 2.5 mi (4.0 km) southwest of North Adams.

DRAINAGE AREA.--20.2 mi^2 (52.3 km^2).

PERIOD OF RECORD.--Water years 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	DISSOLVED NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	DISSOLVED NITRITE (N) (MG/L)
OCT 22...	1240	4.5	650	8.0	12.5	.26	--	.00	--
NOV 20...	1055	4.0	680	8.2	7.5	.43	--	.00	--
JAN 20...	1230	7.7	655	7.4	1.0	.51	--	.01	--
FEB 19...	1610	127	--	--	1.5	2.2	--	.03	--
MAR 04...	1320	241	335	--	3.5	1.7	--	.01	--
JUN 22...	1145	6.6	590	--	19.5	1.1	--	.08	--
SEP 23...	0955	1.3	575	7.7	12.0	.22	.22	.02	.02

DATE	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	DISSOLVED AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	DISSOLVED ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	DISSOLVED KJEL. NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)
OCT 22...	.26	--	.01	--	.73	--	.74	--	1.0
NOV 20...	.43	--	.06	--	.85	--	.91	--	1.3
JAN 20...	.52	--	.11	--	.50	--	.61	--	1.1
FEB 19...	2.2	--	.08	--	1.2	--	1.3	--	3.5
MAR 04...	1.7	--	.01	--	.69	--	.70	--	2.4
JUN 22...	1.2	--	.06	--	1.0	--	1.1	--	2.3
SEP 23...	.24	.24	.03	.03	.32	.22	.35	.25	.59

DATE	NITROGEN DISSOLVED AS N (MG/L)	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	TOTAL ORTHO + HYDRO. PHOSPHORUS (P) (MG/L)	DIS. ORTHO + HYDRO. PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC PHOSPHORUS (P) (MG/L)
OCT 22...	--	4.4	.03	.01	--	--	--	--
NOV 20...	--	5.9	.03	.01	--	--	--	--
JAN 20...	--	5.0	.02	.00	--	--	--	--
FEB 19...	--	16	.12	.05	--	--	--	--
MAR 04...	--	11	.06	.02	--	--	--	--
JUN 22...	--	10	.06	.01	--	--	--	--
SEP 23...	.49	2.6	.10	.01	.01	.03	.02	.06

04096250 BEEBE CREEK NEAR NORTH ADAMS, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR 28...	1330	31	520	8.3	9.5	10.5	1	0	10	2

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUSPENDED SEDIMENT (MG/L)
APR 28...	10	1100	3	90	<.5	6	0	0	30	9

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)
MAR 18...	1250	37	445	5.5	3.5	14	.00	.0	.00	.0

DATE	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR 18...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHOXYCHLOR (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR 18...	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
OCT 22...	1240	4.5	12.5	45	.55
NOV 20...	1055	4.0	7.5	9	.10
JAN 20...	1230	7.7	1.0	8	.17
FEB 17...	1510	207	.5	62	35
18...	1440	180	3.0	22	11
19...	1610	127	1.5	9	3.1
20...	1440	90	3.5	10	2.4
FEB 23...	1125	108	1.5	18	5.2
MAR 04...	1320	241	3.5	28	18
05...	1515	245	6.0	29	19
06...	1130	195	2.5	13	6.8
APR 28...	1330	31	10.5	9	.75
JUN 22...	1145	6.6	19.5	26	.46

04096255 BEEBE CREEK AT LAKE PLEASANT ROAD NEAR NORTH ADAMS, MI

LOCATION.--Lat 41°57'04", long 84°34'26", SW¼ NW¼ sec.17, T.6 S., R.2 W., Hillsdale County, Hydrologic Unit 04050001, at bridge on Lake Pleasant Road, 2.8 mi (4.5 km) southwest of North Adams.

DRAINAGE AREA.--24.6 mi (63.7 km²).

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	DISSOLVED NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	DISSOLVED NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)
OCT										
22...	1205	7.0	530	8.4	12.5	.06	--	.00	--	.06
NOV										
20...	1210	7.1	570	8.5	8.5	.09	--	.00	--	.09
JAN										
08...	1100	14	500	7.2	1.0	1.3	--	.01	--	1.3
FEB										
18...	1510	215	--	--	1.0	1.7	--	.02	--	1.7
MAR										
04...	1110	273	330	--	3.5	1.4	--	.01	--	1.4
JUN										
22...	1105	13	475	--	23.0	.01	--	.01	--	.02
AUG										
23...	0910	1.9	465	8.2	24.5	--	.06	--	.01	--
SEP										
23...	1110	1.1	500	7.8	17.0	--	.02	--	.04	--

DATE	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	DISSOLVED AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	DISSOLVED ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	DISSOLVED KJEL. NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	NITROGEN DISSOLVED AS N (MG/L)
OCT									
22...	--	.02	--	.78	--	.80	--	.86	--
NOV									
20...	--	.02	--	1.1	--	1.1	--	1.2	--
JAN									
08...	--	.12	--	.78	--	.90	--	2.2	--
FEB									
18...	--	.15	--	1.1	--	1.2	--	2.9	--
MAR									
04...	--	.06	--	.64	--	.70	--	2.1	--
JUN									
22...	--	.04	--	.81	--	.85	--	.87	--
AUG									
23...	.07	.04	.02	.96	.88	1.0	.90	--	1.0
SEP									
23...	.06	.11	.05	.77	.38	.88	.43	--	.49

DATE	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	DISSOLVED PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	TOTAL ORTHO + HYDRO. PHOSPHORUS (P) (MG/L)	DIS. ORTHO + HYDRO. PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC PHOSPHORUS (P) (MG/L)	DISSOLVED ORGANIC PHOSPHORUS (P) (MG/L)
OCT									
22...	3.8	.03	--	.01	--	--	--	--	--
NOV									
20...	5.3	.04	--	.01	--	--	--	--	--
JAN									
08...	9.7	.03	--	.01	--	--	--	--	--
FEB									
18...	13	.10	--	.06	--	--	--	--	--
MAR									
04...	9.3	.05	--	.02	--	--	--	--	--
JUN									
22...	3.9	.05	--	.01	--	--	--	--	--
AUG									
23...	--	.07	.04	.03	.03	--	--	--	.00
SEP									
23...	--	.08	.06	.01	.01	.03	.01	.04	.04

04096255 BEEBE CREEK AT LAKE PLEASANT ROAD NEAR NORTH ADAMS, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR 28...	1350	37	500	8.6	11.0	9.5	1	0	10	1

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUSPENDED SEDIMENT (MG/L)
APR 28...	0	300	3	40	<.5	2	0	0	20	3

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)
MAR 18...	1130	43	415	3.5	2.0	14	.00	.0	.00	.0

DATE	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR 18...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHOXYCHLOR (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR 18...	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
OCT 22...	1205	7.0	12.5	21	.40
NOV 20...	1210	7.1	8.5	31	.59
JAN 08...	1100	14	1.0	7	.26
FEB 17...	1610	231	1.0	20	12
17...	1650	231	1.0	26	16
18...	1510	215	1.0	9	5.2
20...	1330	119	2.0	10	3.2
23...	1105	125	2.0	16	5.4
26...	1310	76	3.5	9	1.8
MAR 04...	1110	273	3.5	12	8.8
05...	1455	280	5.0	24	18
06...	1055	230	3.0	10	6.2
APR 28...	1350	37	9.5	3	.30
JUN 22...	1105	13	23.0	12	.42
AUG 23...	0910	1.9	24.5	15	.08

04096267 BEEBE CREEK TRIBUTARY NEAR HILLSDALE, MI

LOCATION.--Lat 41°57'49", long 84°35'48", in SE¼ NE¼ sec.12, T.6 S., R.3 W., Hillsdale County, Hydrologic Unit 04050001, at bridge on Ball Road, 150 ft (46 m) upstream from mouth, 3.4 mi (5.5 km) northeast of Hillsdale.

DRAINAGE AREA.--10.8 mi^2 (28.0 km^2).

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)
OCT 22...	1105	3.8	670	8.1	9.5	.24	.00	.24
NOV 18...	1320	5.2	650	8.4	9.0	.39	.01	.40
JAN 08...	1020	6.2	600	7.1	.5	.68	.01	.69
APR 05...	1255	13	535	8.1	9.5	.57	.01	.58
MAY 19...	1035	8.6	585	8.1	9.5	.41	.06	.47
JUN 22...	1005	5.3	590	--	16.5	.73	.07	.80
AUG 16...	0910	1.8	605	7.9	12.5	.38	.01	.39

DATE	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)
OCT 22...	.00	.59	.59	.83	3.7	.04	.02
NOV 18...	.03	.57	.60	1.0	4.4	.04	.02
JAN 08...	.07	.43	.50	1.2	5.3	.04	.01
APR 05...	.15	.30	.45	1.0	4.6	.03	.01
MAY 19...	.04	.76	.80	1.3	5.6	.06	.03
JUN 22...	.03	.70	.73	1.5	6.8	.07	.01
AUG 16...	.02	.36	.38	.77	3.4	.04	.02

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR 28...	1055	16	530	8.6	8.5	7.0	1	0	20	1

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUSPENDED SEDIMENT (MG/L)
APR 28...	0	350	3	90	<.5	5	0	0	10	3

04096267 BEERE CREEK TRIBUTARY NEAR HILLSDALE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)
MAR 18...	1100	19	500	2.5	2.0	12	.00	.0	.00	.0

DATE	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR 18...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHOXYCHLOR (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR 18...	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
OCT 22...	1105	3.8	9.5	31	.32
NOV 18...	1320	5.2	9.0	12	.17
JAN 08...	1020	6.2	.5	8	.13
FEB 17...	1340	E82	.0	20	E4.4
APR 05...	1255	13	9.5	11	.39
APR 28...	1055	16	7.0	3	.13
MAY 19...	1035	8.6	9.5	10	.23
JUN 22...	1005	5.3	16.5	27	.39
AUG 16...	0910	1.8	12.5	66	.32

E--ESTIMATED VALUE

04096272 BEEBE CREEK NEAR HILLSDALE, MI

LOCATION.--Lat 41°57'15", long 84°38'20", in NW¼ NE¼ sec.15, T.6 S., R.3 W., Hillsdale County, Hydrologic Unit 04050001, on right bank 20 ft (6 m) upstream from bridge on Moore Road, 1.0 mi (1.6 km) upstream from mouth, and 1.2 mi (1.9 km) northwest of Hillsdale.

DRAINAGE AREA.--42.4 mi^2 (109.8 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1974 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,070 ft (326 m) from topographic map (nearest 10 ft).

REMARKS.--Water-discharge record good. Occasional regulation by Lake Belair about 5.0 mi (8.0 km) upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 462 ft^3/s (13.1 m^3/s) Mar. 5, 1976, gage height, 6.91 ft (2.106 m); minimum, 4.6 ft^3/s (0.13 m^3/s) Sept. 1, 2, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 462 ft^3/s (13.1 m^3/s) Mar. 5, gage height, 6.91 ft (2.106 m); minimum, 4.9 ft^3/s (0.14 m^3/s) Sept. 3, 4, 5, 6, 7, 8, 9; minimum gage height, 3.73 ft (1.137 m) Aug. 31, Sept. 1, 3, 4, 5, 6, 7, 8, 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	12	91	29	19	105	61	44	37	50	9.6	5.4
2	11	12	81	29	19	175	63	41	34	42	8.7	5.7
3	10	13	68	28	19	300	72	40	35	33	8.1	5.2
4	10	16	56	27	19	409	66	23	26	28	7.7	5.0
5	9.7	14	48	26	18	448	57	16	21	24	7.7	5.0
6	9.2	13	51	22	18	424	54	38	18	20	7.9	5.0
7	8.8	18	53	22	18	319	50	98	15	18	7.9	5.1
8	8.8	19	49	21	17	222	46	111	9.7	17	7.5	4.9
9	14	17	47	21	16	164	43	96	9.4	15	7.3	6.2
10	14	25	47	19	18	134	41	76	7.9	14	7.0	8.0
11	12	25	43	19	23	115	43	60	8.3	14	6.9	6.5
12	12	22	40	19	34	107	41	49	8.7	12	7.2	5.9
13	11	21	41	19	55	110	39	42	9.0	11	7.2	5.6
14	11	37	55	20	79	105	38	38	9.3	11	7.7	5.5
15	11	28	77	19	98	96	36	38	10	10	8.3	5.7
16	10	20	96	19	153	90	35	45	23	10	7.6	6.8
17	10	24	92	19	310	83	31	44	17	8.1	7.3	6.9
18	11	21	83	18	363	78	30	41	14	7.4	7.0	6.5
19	14	17	72	19	324	75	28	35	34	7.3	6.8	5.9
20	15	16	53	18	238	74	28	32	35	7.6	6.6	6.5
21	13	19	44	18	198	83	28	33	24	11	6.5	6.5
22	12	18	39	18	255	78	33	29	20	10	6.3	6.3
23	12	16	35	19	233	71	34	26	17	11	6.3	6.1
24	12	23	32	20	188	67	36	24	28	11	24	5.9
25	14	23	29	19	155	70	65	22	73	9.7	9.0	6.1
26	14	19	29	21	129	69	79	22	61	9.0	6.0	8.9
27	13	18	29	19	110	70	76	20	45	9.7	5.9	10
28	13	18	28	20	97	76	65	21	34	9.6	5.8	7.6
29	12	31	29	19	87	74	55	29	27	13	5.6	6.9
30	12	80	29	19	---	69	48	32	43	12	5.5	6.6
31	12	---	30	19	---	64	---	39	---	11	5.5	---
TOTAL	363.5	655	1596	644	3310	4424	1421	1304	753.3	476.4	238.4	188.2
MEAN	11.7	21.8	51.5	20.8	114	143	47.4	42.1	25.1	15.4	7.69	6.27
MAX	15	80	96	29	363	448	79	111	73	50	24	10
MIN	8.8	12	28	18	16	64	28	16	7.9	7.3	5.5	4.9
CFSM	.28	.51	1.21	.49	2.69	3.37	1.12	.99	.59	.36	.18	.15
IN.	.32	.57	1.40	.57	2.90	3.88	1.25	1.14	.66	.42	.21	.17

CAL YR 1975 TOTAL 14532.8 MEAN 39.8 MAX 268 MIN 7.4 CFSM .94 IN 12.75
WTR YR 1976 TOTAL 15373.8 MEAN 42.0 MAX 448 MIN 4.9 CFSM .99 IN 13.49

04096272 BEEBE CREEK NEAR HILLSDALE, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1974 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1974 to current year.

REMARKS.--Daily temperature record based on once daily measurements between 1400 and 1700 hours.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 101 mg/L Aug. 2, 1976; minimum daily mean, 1 mg/L on several days during 1975 and 1976.
SEDIMENT DISCHARGES: Maximum daily, 18 tons (16 tonnes) Feb. 17, 1976; minimum daily, 0.05 ton (0.05 tonne) Nov. 16, 1975.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 101 mg/L Aug. 2; minimum daily mean, 1 mg/L Nov. 16, Dec. 1, Feb. 28, Mar. 11.
SEDIMENT DISCHARGES: Maximum daily, 18 tons (16 tonnes) Feb. 17; minimum daily, 0.05 ton (0.05 tonne) Nov. 16.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	DISSOLVED NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	DISSOLVED NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)
OCT										
22...	0935	13	595	8.1	11.0	.39	--	.00	--	.39
28...	1510	12	700	8.0	11.0	.49	--	.01	--	.50
NOV										
18...	1230	20	590	8.4	9.0	.32	--	.01	--	.33
DEC										
03...	1325	66	540	8.1	2.0	1.1	--	.00	--	1.1
31...	1345	30	580	7.3	1.5	1.3	--	.01	--	1.3
FEB										
04...	1320	20	750	7.7	1.0	.87	--	.01	--	.88
17...	1015	314	420	--	1.0	1.5	--	.01	--	1.5
18...	0840	368	--	--	.5	1.6	--	.02	--	1.6
19...	1130	326	--	--	.5	1.6	--	.02	--	1.6
24...	1335	186	--	--	4.0	1.7	--	.02	--	1.7
MAR										
03...	1045	341	370	--	3.0	1.2	--	.01	--	1.2
23...	1400	71	480	8.5	6.0	1.2	--	.01	--	1.2
APR										
13...	1125	42	530	8.6	8.5	.56	--	.01	--	.57
MAY										
10...	1000	79	510	8.4	13.0	.43	--	.05	--	.48
JUN										
22...	0850	21	530	--	18.5	.50	--	.02	--	.52
AUG										
12...	1345	7.4	580	8.1	22.0	.71	--	.02	--	.73
SEP										
23...	0855	4.9	580	7.9	13.0	.70	.69	.01	.03	.71

DATE	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	DISSOLVED AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	DISSOLVED ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	DISSOLVED KJEL. NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	NITROGEN DISSOLVED AS N (MG/L)
OCT									
22...	--	.00	--	.55	--	.55	--	.94	--
28...	--	.01	--	.56	--	.57	--	1.1	--
NOV									
18...	--	.00	--	.64	--	.64	--	.97	--
DEC									
03...	--	.02	--	.39	--	.41	--	1.5	--
31...	--	.08	--	.56	--	.64	--	1.9	--
FEB									
04...	--	.11	--	.46	--	.57	--	1.5	--
17...	--	.12	--	.98	--	1.1	--	2.6	--
18...	--	.15	--	1.1	--	1.2	--	2.8	--
19...	--	.11	--	1.2	--	1.3	--	2.9	--
24...	--	.03	--	.62	--	.65	--	2.4	--
MAR									
03...	--	.03	--	.55	--	.58	--	1.8	--
23...	--	.03	--	.47	--	.50	--	1.7	--
APR									
13...	--	.01	--	.57	--	.58	--	1.2	--
MAY									
10...	--	.03	--	.80	--	.83	--	1.3	--
JUN									
22...	--	.04	--	.76	--	.80	--	1.3	--
AUG									
12...	--	.01	--	.57	--	.58	--	1.3	--
SEP									
23...	.72	.05	.01	.20	.22	.25	.23	.96	.95

04096272 BEEBE CREEK NEAR HILLSDALE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	DIS-SOL-VED-PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO + HYDRO. PHOS-PHORUS (P) (MG/L)	DIS. ORTHO + HYDRO. PHOS-PHORUS (P) (MG/L)	TOTAL ORGANIC PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORGANIC PHOS-PHORUS (P) (MG/L)
OCT									
22...	4.2	.03	--	.01	--	--	--	--	--
28...	4.7	.04	--	.00	--	--	--	.03	--
NOV									
18...	4.3	.03	--	.01	--	--	--	--	--
DEC									
03...	6.7	.06	--	.02	--	--	--	--	--
31...	8.6	.03	--	.00	--	--	--	--	--
FEB									
04...	6.4	.03	--	.01	--	--	--	--	--
17...	12	.08	--	.05	--	--	--	--	--
18...	12	.07	--	.05	--	--	--	--	--
19...	13	.07	--	.05	--	--	--	--	--
24...	10	.04	--	.03	--	--	--	--	--
MAR									
03...	7.9	.04	--	.02	--	--	--	--	--
23...	7.5	.03	--	.01	--	--	--	--	--
APR									
13...	5.1	.03	--	.01	--	--	--	--	--
MAY									
10...	5.8	.05	--	.01	--	--	--	--	--
JUN									
22...	5.8	.06	--	.01	--	--	--	--	--
AUG									
12...	5.8	.04	--	.02	--	--	--	--	--
SEP									
23...	4.3	.24	.12	.02	.01	.04	.02	.18	.09

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	AIR TEMPER-ATURE (DEG C)	TEMPER-ATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR										
28...	1005	69	505	8.3	5.5	8.0	2	0	10	2

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUS-PENDED SEDI-MENT (MG/L)
APR										
28...	0	270	3	70	<.5	1	0	0	10	1

04096272 BEEBE CREEK NEAR HILLSDALE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)
MAR 16...	1320	90	425	-.5	3.5	9.8	.00	.0	.00	.0

DATE	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR 16...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR 16...	.00	.00	.00	.00	0	.00	.00	.00	.00

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
ONCE-DAILY

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

04096272 BEEBE CREEK NEAR HILLSDALE, MI--CONTINUED

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	12	12	.39	12	24	.78	91	1	.25
2	11	13	.39	12	17	.55	81	3	.66
3	10	8	.22	13	16	.56	68	15	2.8
4	10	7	.19	16	10	.43	56	13	2.0
5	9.7	16	.42	14	13	.49	48	18	2.3
6	9.2	12	.30	13	11	.39	51	16	2.2
7	8.8	10	.24	18	8	.39	53	20	2.9
8	8.8	15	.36	19	7	.36	49	9	1.2
9	14	18	.68	17	7	.32	47	10	1.3
10	14	15	.57	25	13	.88	47	8	1.0
11	12	24	.78	25	3	.20	43	24	2.8
12	12	16	.52	22	3	.18	40	20	2.2
13	11	21	.62	21	6	.34	41	18	2.0
14	11	15	.45	37	7	.70	55	7	1.0
15	11	21	.62	28	5	.38	77	15	3.1
16	10	26	.70	20	1	.05	96	6	1.6
17	10	25	.68	24	4	.26	92	14	3.5
18	11	20	.59	21	7	.40	83	13	2.9
19	14	23	.87	17	4	.18	72	5	.97
20	15	45	1.8	16	4	.17	53	16	2.3
21	13	14	.49	19	3	.15	44	5	.59
22	12	32	1.0	18	3	.15	39	9	.95
23	12	20	.65	16	6	.26	35	6	.57
24	12	15	.49	23	3	.19	32	7	.60
25	14	20	.76	23	7	.43	29	7	.55
26	14	22	.83	19	21	1.1	29	12	.94
27	13	12	.42	18	5	.24	29	15	1.2
28	13	13	.46	18	11	.53	28	14	1.1
29	12	12	.39	31	18	1.5	29	19	1.5
30	12	13	.42	80	11	2.4	29	2	.16
31	12	8	.26	---	---	---	30	9	.73
TOTAL	363.5	---	17.56	655	---	14.96	1596	---	47.87

	JANUARY			FEBRUARY			MARCH		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	29	16	1.3	19	23	1.2	105	2	.57
2	29	7	.55	19	19	.97	175	2	.94
3	28	10	.76	19	35	1.8	300	3	2.4
4	27	6	.44	19	19	.97	409	3	3.3
5	26	9	.63	18	28	1.4	448	3	3.6
6	22	12	.71	18	16	.78	424	7	8.0
7	22	13	.77	18	30	1.5	319	3	2.6
8	21	15	.85	17	14	.64	222	4	2.4
9	21	11	.62	16	19	.82	164	3	1.3
10	19	8	.41	18	31	1.5	134	3	1.1
11	19	4	.21	23	10	.62	115	1	.31
12	19	11	.56	34	19	1.7	107	4	1.2
13	19	18	.92	55	13	1.9	110	5	1.5
14	20	27	1.5	79	13	2.8	105	4	1.1
15	19	19	.97	98	11	2.9	96	6	1.6
16	19	34	1.7	153	12	5.0	90	5	1.2
17	19	28	1.4	310	22	18	83	7	1.6
18	18	19	.92	363	13	13	78	7	1.5
19	19	25	1.3	324	12	10	75	6	1.2
20	18	11	.53	238	9	5.8	74	9	1.8
21	18	16	.78	198	10	5.3	83	6	1.3
22	18	23	1.1	255	11	7.6	78	13	2.7
23	19	27	1.4	233	2	1.3	71	23	4.4
24	20	26	1.4	188	3	1.5	67	13	2.4
25	19	24	1.2	155	5	2.1	70	9	1.7
26	21	20	1.1	129	6	2.1	69	14	2.6
27	19	27	1.4	110	6	1.8	70	12	2.3
28	20	43	2.3	97	1	.26	76	7	1.4
29	19	31	1.6	87	3	.70	74	8	1.6
30	19	15	.77	---	---	---	69	17	3.2
31	19	16	.82	---	---	---	64	8	1.4
TOTAL	644	---	30.92	3310	---	95.96	4424	---	64.22

04096272 BEEBE CREEK NEAR HILLSDALE, MI--CONTINUED

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	APRIL			MAY			JUNE		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	61	13	2.1	44	13	1.5	37	14	1.4
2	63	7	1.2	41	17	1.9	34	15	1.4
3	72	9	1.7	40	20	2.2	35	13	1.2
4	66	8	1.4	23	15	.93	26	16	1.1
5	57	7	1.1	16	23	.99	21	18	1.0
6	54	8	1.2	38	18	1.8	18	12	.58
7	50	5	.68	98	9	2.4	15	11	.45
8	46	7	.87	111	8	2.4	9.7	21	.55
9	43	9	1.0	96	10	2.6	9.4	20	.51
10	41	11	1.2	76	12	2.5	7.9	59	1.3
11	43	9	1.0	60	9	1.5	8.3	14	.31
12	41	5	.55	49	20	2.6	8.7	24	.56
13	39	6	.63	42	19	2.2	9.0	20	.49
14	38	11	1.1	38	28	2.9	9.3	34	.85
15	36	6	.58	38	35	3.6	10	14	.38
16	35	8	.76	45	20	2.4	23	12	.75
17	31	8	.67	44	29	3.4	17	15	.69
18	30	9	.73	41	42	4.6	14	17	.64
19	28	8	.60	35	30	2.8	34	21	1.9
20	28	8	.60	32	42	3.6	35	10	.94
21	28	6	.45	33	29	2.6	24	25	1.6
22	33	21	1.9	29	43	3.4	20	39	2.1
23	34	21	1.9	26	34	2.4	17	48	2.2
24	36	25	2.4	24	47	3.0	28	46	3.5
25	65	13	2.3	22	46	2.7	73	19	3.7
26	79	8	1.7	22	50	3.0	61	19	3.1
27	76	13	2.7	20	49	2.6	45	25	3.0
28	65	14	2.5	21	47	2.7	34	41	3.8
29	55	10	1.5	29	37	2.9	27	30	2.2
30	48	11	1.4	32	45	3.9	43	26	3.0
31	---	---	---	39	22	2.3	---	---	---
TOTAL	1421	---	38.42	1304	---	80.32	753.3	---	45.20

	JULY			AUGUST			SEPTEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	50	20	2.7	9.6	64	1.7	5.4	71	1.0
2	42	31	3.5	8.7	101	2.4	5.7	71	1.1
3	33	32	2.9	8.1	68	1.5	5.2	64	.90
4	28	37	2.8	7.7	52	1.1	5.0	76	1.0
5	24	39	2.5	7.7	56	1.2	5.0	61	.82
6	20	35	1.9	7.9	54	1.2	5.0	75	1.0
7	18	41	2.0	7.9	44	.94	5.1	63	.87
8	17	42	1.9	7.5	71	1.4	4.9	53	.70
9	15	42	1.7	7.3	77	1.5	6.2	85	1.4
10	14	28	1.1	7.0	57	1.1	8.0	65	1.4
11	14	50	1.9	6.9	51	.95	6.5	45	.79
12	12	56	1.8	7.2	60	1.2	5.9	72	1.1
13	11	45	1.3	7.2	49	.95	5.6	66	1.0
14	11	44	1.3	7.7	45	.94	5.5	60	.89
15	10	51	1.4	8.3	45	1.0	5.7	71	1.1
16	10	53	1.4	7.6	39	.80	6.8	64	1.2
17	8.1	58	1.3	7.3	60	1.2	6.9	73	1.4
18	7.4	65	1.3	7.0	57	1.1	6.5	49	.86
19	7.3	48	.95	6.8	63	1.2	5.9	50	.80
20	7.6	53	1.1	6.6	52	.93	6.5	69	1.2
21	11	51	1.5	6.5	66	1.2	6.5	80	1.4
22	10	48	1.3	6.3	69	1.2	6.3	59	1.0
23	11	31	.92	6.3	40	.68	6.1	52	.86
24	11	48	1.4	24	20	1.3	5.9	67	1.1
25	9.7	31	.81	9.0	12	.29	6.1	62	1.0
26	9.0	35	.85	6.0	37	.60	8.9	47	1.1
27	9.7	43	1.1	5.9	65	1.0	10	46	1.2
28	9.6	26	.67	5.8	75	1.2	7.6	42	.86
29	13	37	1.3	5.6	65	.98	6.9	54	1.0
30	12	35	1.1	5.5	69	1.0	6.6	40	.71
31	11	74	2.2	5.5	66	.98	---	---	---
TOTAL	476.4	---	49.90	238.4	---	34.74	188.2	---	30.76
YEAR	15373.8		550.83						

04096273 ST. JOSEPH RIVER NEAR HILLSDALE, MI

LOCATION.--Lat 41°57'23", long 84°39'31", in SW¼ SE¼ sec.9, T.6 S., R.3 W., Hillsdale County, Hydrologic Unit 04050001, at bridge on Moore Road, 0.9 mi (1.4 km) downstream from Beebe Creek, 2.7 mi (4.3 km) northwest of Hillsdale.

DRAINAGE AREA.--62.4 mi^2 (161.6 km^2).

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)
NOV								
06...	1050	25	680	8.5	13.0	.33	.01	.34
20...	1000	24	660	8.0	7.0	.83	.06	.89
JAN								
07...	1320	37	655	6.8	.5	1.2	.03	1.2
FEB								
19...	1155	376	--	--	1.5	1.6	.03	1.6
MAR								
04...	1600	575	420	--	4.0	1.2	.00	1.2
APR								
05...	1010	87	550	8.1	8.5	.69	.02	.71
MAY								
19...	0910	60	555	8.4	11.5	.56	.04	.60
AUG								
12...	1235	15	680	7.6	21.5	.96	.24	1.2

DATE	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)
NOV							
06...	.09	.38	.47	.81	3.6	.01	.01
20...	.47	.53	1.0	1.9	8.4	.30	.29
JAN							
07...	.33	.77	1.1	2.3	10	.19	.12
FEB							
19...	.12	.98	1.1	2.7	12	.09	.06
MAR							
04...	.00	.59	.59	1.8	7.9	.05	.02
APR							
05...	.07	.81	.88	1.6	7.0	.11	.07
MAY							
19...	.15	.85	1.0	1.6	7.1	.20	.01
AUG							
12...	.70	1.1	1.8	3.0	13	.49	.40

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR										
28...	0925	125	530	8.3	6.5	7.5	1	0	10	1

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUSPENDED SEDIMENT (MG/L)
APR										
28...	0	330	3	70	<.5	5	0	0	20	5

04096273 ST. JOSEPH RIVER NEAR HILLSDALE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)
MAR										
18...	1030	121	485	1.5	1.5	8.6	.00	.0	.00	.0

DATE	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR										
18...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHOXYCHLOR (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR										
18...	.00	.00	.00	.00	.00	0	.00	.00	.00	.01

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
NOV					
06...	1050	25	13.0	1	.07
20...	1000	24	7.0	E5	E.32
JAN					
07...	1320	37	.5	3	.30
FEB					
19...	1155	376	1.5	3	3.0
20...	0920	E400	1.0	1	E1.1
23...	1220	265	1.0	4	2.9
26...	1125	190	6.5	7	3.6
MAR					
04...	1600	575	4.0	E10	E15
05...	1750	660	5.0	12	21
06...	1245	660	4.0	10	18
APR					
05...	1010	87	8.5	6	1.4
28...	0925	125	7.5	5	1.7
MAY					
19...	0910	60	11.5	8	1.3
AUG					
12...	1235	15	21.5	8	.32

E--ESTIMATED VALUE

04096276 ST. JOSEPH RIVER AT JONESVILLE, MI

LOCATION.--Lat 41°58'58", long 84°39'52", in NE¼ NW¼ sec.4, T.6 S., R.3 W., Hillsdale County, Hydrologic Unit 04050001, at bridge on Chicago Street at Jonesville.

DRAINAGE AREA.--66.5 mi^2 (172.2 km^2).

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)
NOV								
06...	0920	29	675	8.6	13.5	.72	.07	.79
21...	0840	39	640	8.1	6.5	1.1	.06	1.2
JAN								
07...	0940	44	675	7.5	.5	1.5	.02	1.5
FEB								
18...	1620	404	420	--	2.0	1.4	.02	1.4
MAR								
04...	1655	516	420	--	4.5	1.2	.01	1.2
MAY								
19...	1125	74	570	8.1	13.5	.77	.09	.86
JUL								
14...	1300	26	660	--	25.0	1.1	.16	1.3
AUG								
12...	0945	18	700	7.8	21.0	1.1	.13	1.2

DATE	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)
NOV							
06...	.48	.62	1.1	1.9	8.4	.41	.37
21...	.45	.65	1.1	2.3	10	.25	.21
JAN							
07...	.38	.59	.97	2.5	11	.20	.13
FEB							
18...	.18	.82	1.0	2.4	11	.09	.06
MAR							
04...	.01	.54	.55	1.8	7.7	.05	.02
MAY							
19...	.20	.80	1.0	1.9	8.2	.19	.13
JUL							
14...	.15	1.1	1.2	2.5	11	.26	.09
AUG							
12...	.16	1.3	1.5	2.7	12	.31	.17

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR										
22...	1350	63	600	8.5	16.5	7.5	0	0	10	0

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUSPENDED SEDIMENT (MG/L)
APR										
22...	0	700	6	110	<.5	7	0	0	10	13

04096276 ST. JOSEPH RIVER AT JONESVILLE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)
MAR										
18...	0955	165	480	1.0	1.5	8.6	.00	.0	.00	.0

DATE	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR										
18...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHOXYCHLOR (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR										
18...	.00	.00	.00	.00	.00	0	.00	.00	.00	.01

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
NOV					
06...	0920	29	13.5	5	.39
21...	0840	39	6.5	6	.63
JAN					
07...	0940	44	.5	6	.72
FEB					
18...	1620	404	2.0	11	12
19...	1340	405	1.5	4	4.4
20...	0855	336	1.0	2	1.8
23...	1010	315	1.0	7	6.0
26...	1105	220	7.5	11	6.5
MAR					
04...	1655	516	4.5	2	2.8
05...	1715	620	5.5	17	28
MAR					
06...	1310	625	4.0	8	13
APR					
22...	1350	63	7.5	13	2.2
MAY					
19...	1125	74	13.5	2	.40
JUL					
14...	1300	26	25.0	24	1.7
AUG					
12...	0945	18	21.0	14	.68

04096288 ST. JOSEPH RIVER AT LITCHFIELD, MI

LOCATION.--Lat 42°02'37", long 84°45'52", in NW¼ NW¼ sec.15, T.5 S., R.4 W., Hillsdale County, Hydrologic Unit 04050001, at bridge on Litchfield Road at Litchfield.

DRAINAGE AREA.--81.0 mi^2 (209.8 km^2).

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	DISSOLVED NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	DISSOLVED NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)
OCT 15...	0910	33	645	8.0	15.5	1.3	--	.01	--	1.3
NOV 19...	0910	40	640	8.3	7.0	1.5	--	.03	--	1.5
JAN 06...	1135	66	660	7.3	.5	2.0	--	.02	--	2.0
APR 07...	0955	113	575	8.7	9.5	1.6	--	.03	--	1.6
MAY 11...	1205	157	520	8.3	16.5	.66	--	.05	--	.71
JUN 25...	1205	115	540	--	20.0	1.4	--	.01	--	1.4
AUG 10...	0855	20	680	8.1	18.5	1.9	--	.05	--	1.9
SEP 14...	0905	16	700	7.9	18.0	1.8	2.0	.08	.05	1.9

DATE	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	DISSOLVED AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	DISSOLVED ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	DISSOLVED KJEL. NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	NITROGEN DISSOLVED AS N (MG/L)
OCT 15...	--	.00	--	.53	--	.53	--	1.8	--
NOV 19...	--	.01	--	.72	--	.73	--	2.2	--
JAN 06...	--	.29	--	.54	--	.83	--	2.8	--
APR 07...	--	.17	--	.68	--	.85	--	2.5	--
MAY 11...	--	.02	--	.78	--	.80	--	1.5	--
JUN 25...	--	.01	--	.69	--	.70	--	2.1	--
AUG 10...	--	.05	--	.88	--	.93	--	2.8	--
SEP 14...	2.0	.04	.01	.49	.44	.53	.45	2.4	2.4

DATE	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	DISSOLVED PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	TOTAL ORTHO + HYDRO. PHOSPHORUS (P) (MG/L)	DIS. ORTHO + HYDRO. PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC PHOSPHORUS (P) (MG/L)	DISSOLVED ORGANIC PHOSPHORUS (P) (MG/L)
OCT 15...	8.1	.14	--	.12	--	--	--	--	--
NOV 19...	9.9	.16	--	.13	--	--	--	--	--
JAN 06...	13	.12	--	.11	--	--	--	--	--
APR 07...	11	.11	--	.06	--	--	--	--	--
MAY 11...	6.7	.12	--	.05	--	--	--	--	--
JUN 25...	9.3	.20	--	.09	--	--	--	--	--
AUG 10...	13	.15	--	.09	--	--	--	--	--
SEP 14...	11	.17	.12	.11	.09	.16	.10	.00	.00

04096288 ST. JOSEPH RIVER AT LITCHFIELD, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR 23...	0850	80	590	8.5	9.0	13.5	0	0	10	1

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)
APR 23...	0	590	3	110	<.5	5	0	0	10

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)
MAR 16...	0915	225	480	.0	3.5	5.4	.00	.0	.00	.0

DATE	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR 16...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR 16...	.00	.00	.00	.00	0	.00	.00	.00	.00

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
OCT 15...	0910	33	15.5	1	.09
NOV 19...	0910	40	7.0	7	.76
JAN 06...	1135	66	.5	9	1.6
APR 07...	0955	113	9.5	5	1.5
23...	0835	80	13.5	18	3.9
MAY 11...	1205	157	16.5	6	2.5
JUN 08...	0900	46	20.5	18	2.2
25...	1205	115	20.0	10	3.1
AUG 10...	0855	20	18.5	10	.54
SEP 14...	0905	16	18.0	13	.56

04096300 SAND CREEK NEAR JONESVILLE, MI

LOCATION.--Lat 41°55'21", long 84°41'55", in NW¼ SW¼ sec.18, T.6 S., R.3 W., Hillsdale County, Hydrologic Unit 04050001, at bridge on Sand Lake Road, 400 ft (122 m) downstream from North Sand Lake, 3.6 mi (5.8 km) southwest of Jonesville.

DRAINAGE AREA.--9.44 mi^2 (24.45 km^2).

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)
OCT								
15...	1220	8.8	420	8.4	16.5	.32	.00	.32
NOV								
06...	1230	8.8	425	8.5	15.0	1.0	.08	1.1
20...	0920	8.5	420	8.4	8.0	.55	.01	.56
JAN								
07...	1100	10	440	7.1	1.5	.49	.00	.49
MAR								
03...	1115	E35	700	--	4.0	.60	.01	.61
25...	1310	26	410	8.3	9.0	3.0	.05	3.0
MAY								
19...	1300	16	460	8.4	16.0	.39	.06	.45
JUN								
23...	1125	9.0	420	--	23.5	.31	.04	.35
AUG								
12...	1115	5.1	400	8.1	23.5	.21	.02	.23

DATE	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)
OCT							
15...	.00	.36	.36	.68	3.0	.00	.00
NOV							
06...	.45	.65	1.1	2.2	9.7	.31	.25
20...	.06	.83	.89	1.5	6.4	.04	.01
JAN							
07...	.09	.33	.42	.91	4.0	.02	.00
MAR							
03...	.09	.23	.32	.93	4.1	.01	.00
25...	.01	.38	.39	3.4	15	.02	.01
MAY							
19...	.06	.47	.53	.98	4.3	.02	.01
JUN							
23...	.04	.36	.40	.75	3.3	.02	.01
AUG							
12...	.01	.39	.40	.63	2.8	.02	.01

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR										
23...	1200	15	430	8.7	18.5	18.0	0	0	10	0

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUSPENDED SEDIMENT (MG/L)
APR										
23...	0	70	2	20	<.5	1	0	0	10	1

E--ESTIMATED VALUE

04096300 SAND CREEK NEAR JONESVILLE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)
MAR										
16...	1150	400	.5	4.0	7.6	.00	.0	.00	.0	.00

DATE	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR									
16...	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR									
16...	.00	.00	.00	.00	0	.00	.00	.00	.00

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
OCT					
15...	1220	8.8	16.5	2	.05
NOV					
06...	1230	8.8	15.0	4	.10
20...	0920	8.5	8.0	1	.02
JAN					
07...	1100	10	1.5	3	.08
MAR					
03...	1115	E35	4.0	1	E.09
25...	1310	26	9.0	3	.21
APR					
23...	1200	15	18.0	1	.04
MAY					
19...	1300	16	16.0	17	.73
JUN					
08...	1110	10	23.5	15	.40
23...	1125	9.0	23.5	22	.53
AUG					
12...	1115	5.1	23.5	11	.15

E--ESTIMATED VALUE

04096312 SAND CREEK AT LITCHFIELD, MI

LOCATION.--Lat 42°01'45", long 84°46'47", in NE¼ NW¼ sec.21, T.5 S., R.4 W., Hillsdale County, Hydrologic Unit 04050001, on right bank 20 ft (6 m) upstream from bridge on Herring Road, 1.0 mi (1.6 km) southwest of Litchfield, and 3.0 mi (4.8 km) upstream from mouth.

DRAINAGE AREA.--20.6 mi^2 (53.4 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1974 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,000 ft (305 m) from topographic map (nearest 10 ft).

REMARKS.--Water-discharge records good.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 131 ft^3/s (3.71 m^3/s) Mar. 3, 1976, gage height, 4.85 ft (1.478 m); minimum, 5.2 ft^3/s (0.15 m^3/s) Aug. 25, 1976, gage height, 0.96 ft (0.293 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 131 ft^3/s (3.71 m^3/s) Mar. 3, gage height, 4.85 ft (1.478 m); minimum, 5.2 ft^3/s (0.15 m^3/s) Aug. 25, gage height, 0.96 ft (0.293 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	18	34	26	21	64	51	36	29	35	12	7.5
2	20	18	30	26	21	91	52	36	28	30	12	7.1
3	19	19	28	26	21	119	50	35	27	27	12	7.2
4	19	19	27	24	21	107	49	34	26	26	11	7.2
5	18	19	26	24	20	121	47	33	25	24	11	7.3
6	18	18	31	24	20	97	46	62	25	23	11	7.4
7	18	20	29	24	20	87	45	86	24	21	12	6.8
8	18	20	27	23	20	81	43	56	23	21	12	7.2
9	22	20	28	25	20	78	42	49	22	19	11	7.5
10	21	21	27	24	21	76	41	46	22	19	10	8.8
11	20	21	26	24	24	73	42	43	21	18	9.8	8.8
12	19	20	26	23	28	76	40	41	20	16	10	8.2
13	19	20	31	23	41	85	39	38	20	16	10	7.5
14	19	19	36	23	37	72	38	37	19	15	9.7	7.9
15	19	19	48	23	38	68	37	38	18	15	10	7.7
16	18	18	37	23	54	66	36	40	22	15	9.3	8.2
17	18	18	33	21	79	62	35	39	20	14	9.0	7.9
18	19	17	31	22	58	60	34	37	20	14	8.4	8.1
19	21	17	28	23	58	60	33	35	33	13	7.9	7.9
20	21	18	30	22	51	59	32	34	27	13	7.7	8.1
21	20	20	28	22	72	72	33	33	25	16	8.0	8.1
22	20	19	26	21	76	60	33	32	25	14	7.9	7.9
23	19	17	27	21	62	57	32	31	23	16	7.6	7.8
24	19	17	26	21	57	55	36	31	27	14	7.1	7.4
25	21	17	26	21	55	55	58	30	36	13	7.3	7.6
26	21	17	26	22	52	53	50	29	29	13	7.9	8.9
27	20	17	26	21	49	59	44	28	27	14	7.5	11
28	20	17	26	21	47	60	41	28	26	13	7.5	9.7
29	19	28	25	21	46	55	39	28	25	16	7.7	9.5
30	18	48	27	21	---	53	37	29	40	14	7.0	9.1
31	18	---	27	21	---	51	---	31	---	13	7.2	---
TOTAL	601	596	903	706	1189	2232	1235	1185	754	550	288.5	241.3
MEAN	19.4	19.9	29.1	22.8	41.0	72.0	41.2	38.2	25.1	17.7	9.31	8.04
MAX	22	48	48	26	79	121	58	86	40	35	12	11
MIN	18	17	25	21	20	51	32	28	18	13	7.0	6.8
CFSM	.94	.97	1.41	1.11	1.99	3.50	2.00	1.85	1.22	.86	.45	.39
IN.	1.09	1.08	1.63	1.27	2.15	4.03	2.23	2.14	1.36	.99	.52	.44

CAL YR 1975	TOTAL	10039.0	MEAN 27.5	MAX 106	MIN 12	CFSM 1.33	IN 18.13		
WTR YR 1976	TOTAL	10480.8	MEAN 28.6	MAX 121	MIN 6.8	CFSM 1.39	IN 18.93		

04096312 SAND CREEK AT LITCHFIELD, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1974 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: August 1974 to current year.
SUSPENDED SEDIMENT DISCHARGE: August 1974 to current year.

REMARKS.--Daily temperature record based on once daily measurements between 0800 and 0900 hours.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum daily, 21.5°C June 23, 24, 1975; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 159 mg/L Feb. 21, 1976; minimum daily mean, 2 mg/L Jan. 20, Feb. 2, 1975.
SEDIMENT DISCHARGES: Maximum daily, 31 tons (28 tonnes) Feb. 21, 1976; minimum daily, 0.07 ton (0.06 tonne) Oct. 9, 1974.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum daily, 20.5°C July 11; minimum daily, 0.0°C on several days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 159 mg/L Feb. 21; minimum daily mean, 5 mg/L Oct. 16, Jan. 21.
SEDIMENT DISCHARGES: Maximum daily, 31 tons (28 tonnes) Feb. 21; minimum daily, 0.24 ton (0.22 tonne) Oct. 16.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	DISSOLVED NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	DISSOLVED NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)
OCT										
15...	1030	19	505	8.1	14.5	1.1	--	.00	--	1.1
28...	0945	19	525	7.7	9.5	.14	--	.01	--	.15
NOV										
04...	1430	19	500	8.4	13.0	.01	--	1.2	--	1.2
19...	1240	17	555	8.2	8.0	1.3	--	.00	--	1.3
DEC										
04...	1120	26	510	8.2	4.0	1.2	--	.00	--	1.2
31...	1050	26	505	6.6	3.0	1.4	--	.01	--	1.4
JAN										
23...	1130	18	465	7.2	.5	1.4	--	.03	--	1.4
FEB										
17...	1615	66	400	--	4.0	1.3	--	.01	--	1.3
18...	1140	56	--	--	4.5	1.4	--	.01	--	1.4
24...	1245	56	--	--	4.5	1.4	--	.01	--	1.4
MAR										
02...	1310	93	395	--	4.0	1.3	--	.01	--	1.3
03...	1210	124	630	--	5.0	1.1	--	.01	--	1.1
05...	1220	134	380	--	7.5	1.2	--	.01	--	1.2
APR										
07...	1100	45	500	8.3	8.5	1.4	--	.01	--	1.4
MAY										
18...	1025	38	515	8.3	11.0	1.2	--	.02	--	1.2
JUL										
14...	0950	15	530	--	18.5	1.3	--	.02	--	1.3
AUG										
10...	1105	12	525	8.2	17.0	1.3	--	.05	--	1.3
10...	1200	--	--	--	--	1.4	--	.08	--	1.5
SEP										
17...	1045	7.9	525	7.8	16.0	1.2	1.2	.04	.05	1.2

DATE	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	DISSOLVED AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	DISSOLVED ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	DISSOLVED KJEL. NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	NITROGEN DISSOLVED AS N (MG/L)
OCT									
15...	--	.00	--	.40	--	.40	--	1.5	--
28...	--	.00	--	.20	--	.20	--	.35	--
NOV									
04...	--	.02	--	.43	--	.45	--	1.7	--
19...	--	.02	--	.32	--	.34	--	1.6	--
DEC									
04...	--	.08	--	.40	--	.48	--	1.7	--
31...	--	.08	--	.21	--	.29	--	1.7	--
JAN									
23...	--	.08	--	.25	--	.33	--	1.7	--
FEB									
17...	--	.08	--	.74	--	.82	--	2.1	--
18...	--	.09	--	.63	--	.72	--	2.1	--
24...	--	.05	--	.40	--	.45	--	1.9	--
MAR									
02...	--	.07	--	.49	--	.56	--	1.9	--
03...	--	.06	--	.65	--	.71	--	1.8	--
05...	--	.03	--	.67	--	.70	--	1.9	--
APR									
07...	--	.01	--	.44	--	.45	--	1.9	--
MAY									
18...	--	.04	--	.51	--	.55	--	1.8	--
JUL									
14...	--	.05	--	.50	--	.55	--	1.9	--
AUG									
10...	--	.02	--	.41	--	.43	--	1.7	--
10...	--	.13	--	2.7	--	2.8	--	4.3	--
SEP									
17...	1.2	.05	.04	.28	.21	.33	.25	1.5	1.5

04096312 SAND CREEK AT LITCHFIELD, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	DIS-SOL-VED PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO + HYDRO. PHOS-PHORUS (P) (MG/L)	DIS. ORTHO + HYDRO. PHOS-PHORUS (P) (MG/L)	TOTAL ORGANIC PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORGANIC PHOS-PHORUS (P) (MG/L)
OCT									
15...	6.6	.01	--	.00	--	--	--	--	--
28...	1.6	.01	--	.00	--	--	--	--	--
NOV									
04...	7.3	.01	--	.00	--	--	--	--	--
19...	7.3	.01	--	.00	--	--	--	--	--
DEC									
04...	7.4	.03	--	.01	--	--	--	--	--
31...	7.5	.01	--	.00	--	--	--	--	--
JAN									
23...	7.7	.01	--	.00	--	--	--	--	--
FEB									
17...	9.4	.04	--	.01	--	--	--	--	--
18...	9.4	.02	--	.01	--	--	--	--	--
24...	8.2	.01	--	.01	--	--	--	--	--
MAR									
02...	8.2	.04	--	.01	--	--	--	--	--
03...	8.0	.07	--	.02	--	--	--	--	--
05...	8.4	.06	--	.01	--	--	--	--	--
APR									
07...	8.2	.03	--	.01	--	--	--	--	--
MAY									
18...	7.7	.03	--	.01	--	--	--	--	--
JUL									
14...	8.2	.03	--	.00	--	--	--	--	--
AUG									
10...	7.7	.02	--	.01	--	--	--	--	--
10...	19	.18	--	.01	--	--	--	--	--
SEP									
17...	6.8	.03	.03	.01	.01	.03	.02	.00	.00

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	AIR TEMPER-ATURE (DEG C)	TEMPER-ATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR										
23...	1040	32	500	8.5	15.5	12.5	0	0	10	0

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUS-PENDED SEDI-MENT (MG/L)
APR										
23...	0	460	3	70	<.5	3	0	0	10	7

04096312 SAND CREEK AT LITCHFIELD, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)
MAR 15...	1430	67	470	1.5	5.5	6.0	.00	.0	.00	.0

DATE	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR 15...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR 15...	.00	.00	.00	.00	0	.00	.00	.00	.00

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
ONCE-DAILY

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

04096312 SAND CREEK AT LITCHFIELD, MI--CONTINUED

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	20	16	.86	18	11	.53	34	18	1.7
2	20	15	.81	18	12	.58	30	15	1.2
3	19	12	.62	19	8	.41	28	15	1.1
4	19	19	.97	19	9	.46	27	18	1.3
5	18	18	.87	19	16	.82	26	19	1.3
6	18	17	.83	18	13	.63	31	20	1.7
7	18	19	.92	20	11	.59	29	16	1.3
8	18	11	.53	20	13	.70	27	16	1.2
9	22	16	.95	20	16	.86	28	9	.68
10	21	6	.34	21	19	1.1	27	10	.73
11	20	10	.54	21	15	.85	26	7	.49
12	19	9	.46	20	14	.76	26	7	.49
13	19	18	.92	20	9	.49	31	11	.92
14	19	9	.46	19	11	.56	36	14	1.4
15	19	13	.67	19	18	.92	48	20	2.6
16	18	5	.24	18	18	.87	37	15	1.5
17	18	21	1.0	18	13	.63	33	9	.80
18	19	8	.41	17	10	.46	31	12	1.0
19	21	13	.74	17	19	.87	28	10	.76
20	21	10	.57	18	12	.58	30	13	1.1
21	20	13	.70	20	17	.92	28	12	.91
22	20	6	.32	19	16	.82	26	4	.28
23	19	7	.36	17	12	.55	27	11	.80
24	19	9	.46	17	10	.46	26	12	.84
25	21	12	.68	17	14	.64	26	7	.49
26	21	9	.51	17	17	.78	26	6	.42
27	20	14	.76	17	14	.64	26	9	.63
28	20	8	.43	17	10	.46	26	11	.77
29	19	11	.56	28	13	.98	25	11	.74
30	18	15	.73	48	21	2.7	27	22	1.6
31	18	18	.87	---	---	---	27	35	2.6
TOTAL	601	---	20.09	596	---	22.62	903	---	33.35

	JANUARY			FEBRUARY			MARCH		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	26	18	1.3	21	14	.79	64	14	2.4
2	26	14	.98	21	14	.79	91	10	2.5
3	26	20	1.4	21	14	.79	119	52	17
4	24	26	1.7	21	9	.51	107	11	3.2
5	24	27	1.7	20	6	.32	121	42	14
6	24	20	1.3	20	8	.43	97	9	2.4
7	24	29	1.9	20	12	.65	87	9	2.1
8	23	25	1.6	20	18	.97	81	9	2.0
9	25	29	2.0	20	8	.43	78	10	2.1
10	24	17	1.1	21	14	.79	76	11	2.3
11	24	21	1.4	24	23	1.5	73	9	1.8
12	23	22	1.4	28	12	.91	76	22	4.5
13	23	34	2.1	41	27	3.0	85	9	2.1
14	23	19	1.2	37	14	1.4	72	11	2.1
15	23	22	1.4	38	19	1.9	68	12	2.2
16	23	16	.99	54	8	1.2	66	14	2.5
17	21	28	1.6	79	23	4.9	62	13	2.2
18	22	25	1.5	58	11	1.7	60	13	2.1
19	23	14	.87	58	12	1.9	60	15	2.4
20	22	14	.83	51	13	1.8	59	13	2.1
21	22	5	.30	72	159	31	72	12	2.3
22	21	11	.62	76	12	2.5	60	15	2.4
23	21	11	.62	62	6	1.0	57	13	2.0
24	21	14	.79	57	7	1.1	55	14	2.1
25	21	15	.85	55	7	1.0	55	19	2.8
26	22	9	.53	52	8	1.1	53	15	2.1
27	21	11	.62	49	12	1.6	59	17	2.7
28	21	19	1.1	47	14	1.8	60	22	3.6
29	21	20	1.1	46	22	2.7	55	16	2.4
30	21	9	.51	---	---	---	53	17	2.4
31	21	9	.51	---	---	---	51	18	2.5
TOTAL	706	---	35.82	1189	---	70.48	2232	---	101.3

04096312 SAND CREEK AT LITCHFIELD, MI--CONTINUED

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	APRIL			MAY			JUNE		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	51	13	1.8	36	31	3.0	29	51	4.0
2	52	15	2.1	36	35	3.4	28	51	3.9
3	50	20	2.7	35	32	3.0	27	49	3.6
4	49	13	1.7	34	19	1.7	26	58	4.1
5	47	28	3.6	33	34	3.0	25	53	3.6
6	46	20	2.5	62	42	7.0	25	62	4.2
7	45	21	2.6	86	14	3.3	24	73	4.7
8	43	23	2.7	56	26	3.9	23	84	5.2
9	42	18	2.0	49	40	5.3	22	68	4.0
10	41	26	2.9	46	45	5.6	22	86	5.1
11	42	20	2.3	43	46	5.3	21	78	4.4
12	40	23	2.5	41	50	5.5	20	70	3.8
13	39	20	2.1	38	33	3.4	20	75	4.1
14	38	16	1.6	37	43	4.3	19	71	3.6
15	37	30	3.0	38	46	4.7	18	72	3.5
16	36	63	6.1	40	55	5.9	22	58	3.4
17	35	78	7.4	39	39	4.1	20	94	5.1
18	34	26	2.4	37	39	3.9	20	72	3.9
19	33	26	2.3	35	34	3.2	33	69	6.1
20	32	37	3.2	34	53	4.9	27	84	6.1
21	33	47	4.2	33	56	5.0	25	54	3.6
22	33	31	2.8	32	45	3.9	25	71	4.8
23	32	29	2.5	31	50	4.2	23	59	3.7
24	36	24	2.3	31	45	3.8	27	62	4.5
25	58	20	3.1	30	48	3.9	36	24	2.3
26	50	15	2.0	29	50	3.9	29	74	5.8
27	44	26	3.1	28	50	3.8	27	64	4.7
28	41	50	5.5	28	50	3.8	26	62	4.4
29	39	25	2.6	28	50	3.8	25	68	4.6
30	37	24	2.4	29	49	3.8	40	42	4.5
31	---	---	---	31	49	4.1	---	---	---
TOTAL	1235	---	88.0	1185	---	128.4	754	---	129.3

	JULY			AUGUST			SEPTEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	35	64	6.0	12	43	1.4	7.5	57	1.2
2	30	53	4.3	12	56	1.8	7.1	39	.75
3	27	54	3.9	12	60	1.9	7.2	39	.76
4	26	59	4.1	11	54	1.6	7.2	61	1.2
5	24	59	3.8	11	91	2.7	7.3	115	2.3
6	23	57	3.5	11	55	1.6	7.4	36	.72
7	21	61	3.5	12	47	1.5	6.8	37	.68
8	21	53	3.0	12	54	1.7	7.2	38	.74
9	19	58	3.0	11	59	1.8	7.5	28	.57
10	19	77	4.0	10	56	1.5	8.8	25	.59
11	18	54	2.6	9.8	39	1.0	8.8	29	.69
12	16	46	2.0	10	70	1.9	8.2	56	1.2
13	16	44	1.9	10	55	1.5	7.5	25	.51
14	15	57	2.3	9.7	49	1.3	7.9	33	.70
15	15	44	1.8	10	49	1.3	7.7	25	.52
16	15	73	3.0	9.3	51	1.3	8.2	23	.51
17	14	75	2.8	9.0	59	1.4	7.9	15	.32
18	14	70	2.6	8.4	80	1.8	8.1	14	.31
19	13	75	2.6	7.9	101	2.2	7.9	19	.41
20	13	65	2.3	7.7	60	1.2	8.1	21	.46
21	16	65	2.8	8.0	54	1.2	8.1	20	.44
22	14	57	2.2	7.9	48	1.0	7.9	24	.51
23	16	60	2.6	7.6	50	1.0	7.8	16	.34
24	14	61	2.3	7.1	50	.96	7.4	19	.38
25	13	67	2.4	7.3	45	.89	7.6	22	.45
26	13	59	2.1	7.9	72	1.5	8.9	15	.36
27	14	47	1.8	7.5	39	.79	11	22	.65
28	13	54	1.9	7.5	45	.91	9.7	20	.52
29	16	49	2.1	7.7	56	1.2	9.5	18	.46
30	14	44	1.7	7.0	44	.83	9.1	12	.29
31	13	47	1.6	7.2	25	.49	---	---	---
TOTAL	550	---	86.5	288.5	---	43.17	241.3	---	19.54
YEAR	10480.8		778.57						

04096314 SAND CREEK NEAR LITCHFIELD, MI

LOCATION.--Lat 42°03'04", long 84°48'22", in SW¼ NW¼ sec.8, T.5 S., R.4 W., Hillsdale County, Hydrologic Unit 04050001, at bridge on Storms Road, 2.6 mi (4.2 km) west of Litchfield.

DRAINAGE AREA.--23.2 mi^2 (60.1 km^2).

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	DISSOLVED NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	DISSOLVED NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)
OCT 14...	1325	23	520	8.0	15.5	1.3	--	.00	--	1.3
NOV 19...	1020	20	530	8.3	7.0	1.4	--	.01	--	1.4
JAN 06...	1050	32	535	7.1	1.0	1.5	--	.01	--	1.5
MAY 18...	0920	45	515	8.3	11.0	1.4	--	.02	--	1.4
JUN 25...	1135	40	475	--	18.0	1.4	--	.01	--	1.4
AUG 10...	1005	9.8	570	8.1	16.0	1.7	--	.07	--	1.8
SEP 14...	1035	E8.0	545	7.7	16.0	1.4	1.5	.04	.02	1.4

DATE	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	DISSOLVED AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	DISSOLVED ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	DISSOLVED KJEL. NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	NITROGEN DISSOLVED AS N (MG/L)
OCT 14...	--	.01	--	.36	--	.37	--	1.7	--
NOV 19...	--	.01	--	.30	--	.31	--	1.7	--
JAN 06...	--	.05	--	.29	--	.34	--	1.8	--
MAY 18...	--	.04	--	.54	--	.58	--	2.0	--
JUN 25...	--	.01	--	.82	--	.83	--	2.2	--
AUG 10...	--	.01	--	.37	--	.38	--	2.2	--
SEP 14...	1.5	.02	.02	.26	.26	.28	.28	1.7	1.8

DATE	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	DISSOLVED PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	TOTAL ORTHO + HYDRO. PHOSPHORUS (P) (MG/L)	DIS. ORTHO + HYDRO. PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC PHOSPHORUS (P) (MG/L)	DISSOLVED ORGANIC PHOSPHORUS (P) (MG/L)
OCT 14...	7.4	.01	--	.00	--	--	--	--	--
NOV 19...	7.6	.02	--	.00	--	--	--	--	--
JAN 06...	8.1	.01	--	.01	--	--	--	--	--
MAY 18...	8.8	.03	--	.01	--	--	--	--	--
JUN 25...	9.9	.05	--	.02	--	--	--	--	--
AUG 10...	9.7	.02	--	.01	--	--	--	--	--
SEP 14...	7.4	.02	.03	.01	.01	.01	.02	.00	.00

E--ESTIMATED VALUE

04096314 SAND CREEK NEAR LITCHFIELD, MI

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR 23...	0930	38	510	8.4	11.0	12.0	0	0	10	1

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUSPENDED SEDIMENT (MG/L)
APR 23...	0	600	2	90	<.5	10	0	1	10	8

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)
MAR 19...	1030	60	495	12.5	8.0	9.0	.00	.0	.00

DATE	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)
MAR 19...	.0	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALATHION (UG/L)	TOTAL METHOXYCHLOR (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)
MAR 19...	.00	.00	.00	.00	.00	.00	.00	0	.00

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
OCT 14...	1325	23	15.5	6	.37
NOV 19...	1020	20	7.0	1	.05
JAN 06...	1050	32	1.0	8	.69
APR 23...	0930	38	12.0	8	.82
MAY 18...	0920	45	11.0	17	2.1
JUN 07...	1305	28	19.0	64	4.8
25...	1135	40	18.0	44	4.8
AUG 10...	1005	9.8	16.0	26	.69
SEP 14...	1035	E8.0	16.0	9	E.15

E--ESTIMATED VALUE

04096320 SOAP CREEK AT MCLAIN ROAD NEAR LITCHFIELD, MI

LOCATION.--Lat 42°00'32", long 84°47'15", in SW¼ NW¼ sec.28, T.5 S., R.4 W., Hillsdale County, Hydrologic Unit 04050001, at bridge on McLain Road, 3.0 mi (4.8 km) southwest of Litchfield.

DRAINAGE AREA.--4.66 mi^2 (12.07 km^2).

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)
OCT 15...	1140	1.0	600	8.3	14.0	1.4	.01	1.4
NOV 19...	1345	1.3	600	8.4	10.5	1.6	.01	1.6
JAN 06...	1220	3.8	605	7.0	2.5	1.9	.01	1.9
MAR 02...	1330	46	395	--	4.0	1.8	.01	1.8
03...	0840	60	335	--	4.0	1.7	.03	1.7
APR 07...	1210	5.3	600	8.4	12.0	1.8	.01	1.8
MAY 18...	1130	4.9	640	8.1	11.0	1.7	.03	1.7
JUL 14...	1100	.94	600	--	16.5	1.8	.02	1.8
AUG 10...	1225	E.40	580	8.2	18.5	1.3	.02	1.3

DATE	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)
OCT 15...	.00	.45	.45	1.9	8.2	.00	.00
NOV 19...	.00	.27	.27	1.9	8.3	.01	.00
JAN 06...	.00	.29	.29	2.2	9.7	.02	.06
MAR 02...	.05	.56	.61	2.4	11	.04	.01
03...	.08	1.3	1.4	3.1	14	.23	.07
APR 07...	.01	.39	.40	2.2	9.7	.02	.01
MAY 18...	.04	.39	.43	2.1	9.4	.02	.01
JUL 14...	.05	.15	.20	2.0	8.9	.03	.01
AUG 10...	.00	.43	.43	1.7	7.7	.02	.01

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR 23...	1120	3.0	600	8.6	14.5	12.5	0	0	10	11

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUSPENDED SEDIMENT (MG/L)
APR 23...	0	330	3	120	<.5	2	0	8	40	7

E--ESTIMATED VALUE

04096320 SOAP CREEK AT MCLAIN ROAD NEAR LITCHFIELD, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	AIR TEMPER-ATURE (DEG C)	TEMPER-ATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLY-CHLO-RINATED NAPH-THA-LENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR-DANE (UG/L)
MAR										
16...	1100	9.0	600	-.5	6.5	5.0	.00	.0	.00	.0

DATE	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTA-CHLOR (UG/L)	TOTAL HEPTA-CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR										
16...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALA-THION (UG/L)	TOTAL METHYL PARA-THION (UG/L)	TOTAL METHYL TRI-THION (UG/L)	TOTAL PARA-THION (UG/L)	TOTAL TOX-APHENE (UG/L)	TOTAL TRI-THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR									
16...	.00	.00	.00	.00	0	.00	.00	.00	.00

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	TEMPER-ATURE (DEG C)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)
OCT					
15...	1140	1.0	14.0	1	.00
NOV					
19...	1345	1.3	10.5	7	.03
JAN					
06...	1220	3.8	2.5	25	.26
FEB					
18...	1110	19	5.5	23	1.2
20...	1105	12	6.0	29	.94
MAR					
02...	1330	46	4.0	36	4.5
03...	0840	60	4.0	192	31
06...	1230	24	6.5	15	.97
APR					
07...	1210	5.3	12.0	6	.09
23...	1120	3.0	12.5	7	.06
MAY					
18...	1130	4.9	11.0	20	.26
JUN					
08...	1030	2.0	14.5	35	.19
JUL					
14...	1100	.94	16.5	46	.12
AUG					
10...	1225	E.40	18.5	48	E.05

E--ESTIMATED VALUE

04096325 SOAP CREEK NEAR LITCHFIELD, MI

LOCATION.--Lat 42°02'38", long 84°50'10", in SE¼ SW¼ sec.12, T.5 S., R.5 W., Branch County, Hydrologic Unit 04050001, on left bank 10 ft (3 m) downstream from bridge on Litchfield Road, 2.3 mi (3.7 km) upstream from mouth, and 3.5 mi (5.6 km) west of Litchfield.

DRAINAGE AREA.--10.9 mi^2 (28.2 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder. Dec. 1, 1974 to Jan. 1, 1975, nonrecording gage at same site and datum. Altitude of gage is 990 ft (302 m) from topographic map, (nearest 10 ft).

REMARKS.-Water-discharge records good.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 138 ft^3/s (3.91 m^3/s) Mar. 5, 1976, gage height, 4.10 ft (1.250 m); minimum daily discharge, 2.9 ft^3/s (0.082 m^3/s) Oct. 1-7, 11-15, 24-28, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 138 ft^3/s (3.91 m^3/s) Mar. 5, gage height, 4.10 ft (1.250 m); minimum, 3.2 ft^3/s (0.091 m^3/s) Sept. 23, 24, 28, 29, 30; minimum gage height, 0.73 ft (0.223 m) Sept. 23, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.6	7.0	24	15	10	36	23	19	15	16	5.5	3.5
2	9.3	7.0	18	15	9.5	74	24	19	15	14	5.3	3.5
3	9.1	7.2	16	15	9.3	108	22	18	14	12	5.1	3.5
4	8.8	7.2	15	14	9.3	97	22	17	13	12	5.0	3.5
5	8.6	7.2	14	13	9.3	118	21	17	13	11	4.9	3.4
6	8.4	7.0	18	13	9.0	102	20	43	12	10	4.9	3.4
7	8.1	7.4	18	13	8.0	93	19	66	12	10	4.6	3.4
8	8.1	7.7	16	12	8.4	84	19	45	12	10	4.6	3.4
9	8.8	7.4	16	12	8.1	71	18	36	12	9.5	4.4	3.7
10	8.8	7.9	15	12	9.1	59	18	31	11	9.4	4.3	3.6
11	8.4	7.9	15	12	15	50	18	28	11	9.2	4.2	3.6
12	8.1	7.9	14	12	18	46	17	26	11	8.9	4.2	3.5
13	8.1	7.7	17	12	33	55	17	25	11	8.5	4.1	3.5
14	7.9	7.4	25	11	30	46	17	23	10	8.2	4.1	3.5
15	7.7	7.2	36	11	31	40	17	23	10	8.0	4.0	3.5
16	7.7	7.0	30	11	46	36	16	23	10	7.9	4.0	3.7
17	7.4	7.0	25	11	73	33	16	24	10	7.6	3.9	3.5
18	7.4	6.8	22	11	54	30	15	22	9.8	7.3	3.9	3.5
19	7.7	6.8	20	10	54	29	15	21	13	7.1	3.8	3.4
20	7.9	7.2	19	10	52	28	15	20	12	7.2	3.8	3.4
21	7.7	7.9	18	10	71	34	15	19	11	7.4	3.8	3.3
22	7.4	7.7	18	10	73	29	16	18	10	6.8	3.7	3.3
23	7.2	7.2	17	10	58	27	15	18	9.9	6.9	3.7	3.3
24	7.2	7.2	17	10	50	25	17	17	11	6.5	3.6	3.3
25	7.4	7.0	16	10	45	24	36	17	15	6.5	3.7	3.3
26	7.7	6.8	17	10	39	23	31	16	12	6.1	3.7	3.7
27	7.4	7.0	16	10	33	26	26	16	11	6.3	3.6	3.6
28	7.4	6.6	15	10	29	29	23	16	11	6.0	3.6	3.3
29	7.2	13	15	10	26	27	21	15	11	6.2	3.6	3.2
30	7.0	32	15	10	---	25	20	16	16	5.9	3.6	3.2
31	7.0	---	16	9.8	---	24	---	16	---	5.7	3.5	---
TOTAL	246.3	248.3	573	354.8	920.0	1530	589	730	354.7	264.1	128.7	103.5
MEAN	7.95	8.28	18.5	11.4	31.7	49.4	19.6	23.5	11.8	8.52	4.15	3.45
MAX	9.6	32	36	15	73	118	36	66	16	16	5.5	3.7
MIN	7.0	6.6	14	9.8	8.0	23	15	15	9.8	5.7	3.5	3.2
CFSM	.73	.76	1.70	1.05	2.91	4.53	1.80	2.16	1.08	.78	.38	.32
IN.	.84	.85	1.95	1.21	3.14	5.22	2.01	2.49	1.21	.90	.44	.35

CAL YR 1975 TOTAL 5775.6 MEAN 15.8 MAX 77 MIN 4.1 CFSM 1.45 IN 19.71
WTR YR 1976 TOTAL 6042.6 MEAN 16.5 MAX 118 MIN 3.2 CFSM 1.51 IN 20.62

04096325 SOAP CREEK NEAR LITCHFIELD, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: December 1974 to current year.
SUSPENDED SEDIMENT DISCHARGE: December 1974 to current year.

REMARKS.--Daily temperature record based on once daily measurements between 1600 and 1700 hours.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: (Water year 1974) Maximum daily 20.0°C Aug. 25, 1975; minimum daily, 2.0°C Jan. 12-14, 1975.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 189 mg/L July 12, 1976; minimum daily mean, 3 mg/L Dec. 22, 27, 1974, Jan. 1, Sept. 2, 1975.
SEDIMENT DISCHARGES: Maximum daily, 14 tons (13 tonnes) Mar. 2, 1976; minimum daily, 0.03 ton (0.03 tonne) Jan. 1, 1975.

EXTREMES OUTSIDE PERIOD OF DAILY RECORD.--Water temperature of 23.0°C and 0.5°C were observed on July 14, 1976, and Feb. 13, 1975, respectively.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 189 mg/L July 12; minimum daily mean, 9 mg/L Oct. 6, Feb. 21.
SEDIMENT DISCHARGES: Maximum daily, 14 tons (13 tonnes) Mar. 2; minimum daily, 0.12 ton (0.11 tonne) Sept. 18.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	DISSOLVED NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	DISSOLVED NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)
OCT										
14...	1200	8.1	640	8.2	14.5	.50	--	.01	--	.51
28...	1115	7.4	690	7.5	10.5	.59	--	.01	--	.60
NOV										
19...	1125	6.6	660	8.1	8.0	.61	--	.00	--	.61
DEC										
04...	1010	15	640	8.0	5.0	1.2	--	.01	--	1.2
31...	0920	16	690	6.6	4.5	.99	--	.01	--	1.0
JAN										
23...	1040	10	850	7.1	2.0	.74	--	.01	--	.75
FEB										
05...	1145	9.4	580	7.9	2.5	.69	--	.01	--	.70
17...	1750	58	500	--	5.0	2.4	--	.01	--	2.4
18...	1110	53	--	--	5.5	2.1	--	.01	--	2.1
24...	1200	50	--	--	4.0	1.7	--	.01	--	1.7
MAR										
02...	1515	89	520	--	3.5	1.7	--	.01	--	1.7
03...	1345	116	365	--	6.0	2.0	--	.02	--	2.0
05...	1015	135	380	--	8.0	1.7	--	.01	--	1.7
MAY										
11...	1125	29	640	8.4	12.5	1.0	--	.09	--	1.1
JUN										
25...	1040	15	610	--	16.5	2.9	--	.01	--	2.9
AUG										
09...	1115	4.4	700	7.7	14.5	.25	--	.03	--	.28
SEP										
17...	0910	3.5	690	7.3	14.5	.32	.18	.02	.01	.34

DATE	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	DISSOLVED AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	DISSOLVED ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	DISSOLVED KJEL. NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	NITROGEN DISSOLVED AS N (MG/L)
OCT									
14...	--	.01	--	.37	--	.38	--	.89	--
28...	--	.00	--	.29	--	.29	--	.89	--
NOV									
19...	--	.01	--	.20	--	.21	--	.82	--
DEC									
04...	--	.06	--	.17	--	.23	--	1.4	--
31...	--	.07	--	.23	--	.30	--	1.3	--
JAN									
23...	--	.08	--	.26	--	.34	--	1.1	--
FEB									
05...	--	.05	--	.27	--	.32	--	1.0	--
17...	--	.08	--	.92	--	1.0	--	3.4	--
18...	--	.12	--	.67	--	.79	--	2.9	--
24...	--	.03	--	.54	--	.57	--	2.3	--
MAR									
02...	--	.09	--	1.0	--	1.1	--	2.8	--
03...	--	.06	--	.94	--	1.0	--	3.0	--
05...	--	.02	--	.85	--	.87	--	2.6	--
MAY									
11...	--	.07	--	.63	--	.70	--	1.8	--
JUN									
25...	--	.01	--	.47	--	.48	--	3.4	--
AUG									
09...	--	.01	--	.39	--	.40	--	.68	--
SEP									
17...	.19	.00	.04	.25	.24	.25	.28	.59	.47

04096325 SOAP CREEK NEAR LITCHFIELD, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	DIS-SOL-VED PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO + HYDRO. PHOS-PHORUS (P) (MG/L)	DIS. ORTHO + HYDRO. PHOS-PHORUS (P) (MG/L)	TOTAL ORGANIC PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORGANIC PHOS-PHORUS (P) (MG/L)
OCT									
14...	3.9	.01	--	.00	--	--	--	--	--
28...	3.9	.03	--	.00	--	--	--	.03	--
NOV									
19...	3.6	.02	--	.00	--	--	--	--	--
DEC									
04...	6.3	.03	--	.01	--	--	--	--	--
31...	5.8	.01	--	.01	--	--	--	--	--
JAN									
23...	4.8	.02	--	.01	--	--	--	--	--
FEB									
05...	4.5	.02	--	.01	--	--	--	--	--
17...	15	.07	--	.04	--	--	--	--	--
18...	13	.04	--	.02	--	--	--	--	--
24...	10	.01	--	.01	--	--	--	--	--
MAR									
02...	12	.13	--	.03	--	--	--	--	--
03...	13	.13	--	.05	--	--	--	--	--
05...	11	.10	--	.02	--	--	--	--	--
MAY									
11...	8.0	.04	--	.01	--	--	--	--	--
JUN									
25...	15	.03	--	.01	--	--	--	--	--
AUG									
09...	3.0	.02	--	.01	--	--	--	--	--
SEP									
17...	2.6	.02	.01	.01	.01	.01	.01	.00	.00

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	AIR TEMPER-ATURE (DEG C)	TEMPER-ATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR										
22...	1145	16	670	7.9	17.0	14.0	0	0	<10	1

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUS-PENDED SEDI-MENT (MG/L)
APR										
22...	0	1400	2	200	<.5	2	0	0	10	32

04096325 SOAP CREEK NEAR LITCHFIELD, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)
MAR 15...	1400	39	640	4.5	9.5	6.2	.00	.0	.00	.0

DATE	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR 15...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR 15...	.00	.00	.00	.00	0	.00	.00	.00	.00

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
ONCE-DAILY

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

04096325 SOAP CREEK NEAR LITCHFIELD, MI--CONTINUED

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	9.6	30	.78	7.0	55	1.0	24	21	1.4
2	9.3	51	1.3	7.0	58	1.1	18	21	1.0
3	9.1	18	.44	7.2	50	.97	16	26	1.1
4	8.8	15	.36	7.2	65	1.3	15	33	1.3
5	8.6	19	.44	7.2	66	1.3	14	53	2.0
6	8.4	9	.20	7.0	44	.83	18	24	1.2
7	8.1	11	.24	7.4	69	1.4	18	14	.68
8	8.1	38	.83	7.7	52	1.1	16	48	2.1
9	8.8	41	.97	7.4	43	.86	16	64	2.8
10	8.8	31	.74	7.9	55	1.2	15	48	1.9
11	8.4	20	.45	7.9	45	.96	15	34	1.4
12	8.1	59	1.3	7.9	50	1.1	14	48	1.8
13	8.1	37	.81	7.7	53	1.1	17	31	1.4
14	7.9	20	.43	7.4	75	1.5	25	15	1.0
15	7.7	18	.37	7.2	62	1.2	36	24	2.3
16	7.7	41	.85	7.0	46	.87	30	15	1.2
17	7.4	36	.72	7.0	46	.87	25	10	.68
18	7.4	21	.42	6.8	41	.75	22	20	1.2
19	7.7	32	.67	6.8	50	.92	20	18	.97
20	7.9	73	1.6	7.2	39	.76	19	21	1.1
21	7.7	33	.69	7.9	24	.51	18	31	1.5
22	7.4	24	.48	7.7	35	.73	18	29	1.4
23	7.2	20	.39	7.2	20	.39	17	15	.69
24	7.2	17	.33	7.2	55	1.1	17	21	.96
25	7.4	32	.64	7.0	47	.89	16	28	1.2
26	7.7	26	.54	6.8	34	.62	17	14	.64
27	7.4	20	.40	7.0	63	1.2	16	26	1.1
28	7.4	54	1.1	6.6	44	.78	15	17	.69
29	7.2	57	1.1	13	37	1.3	15	41	1.7
30	7.0	52	.98	32	26	2.2	15	21	.85
31	7.0	55	1.0	---	---	---	16	28	1.2
TOTAL	246.5	---	21.57	248.3	---	30.81	573	---	40.46

	JANUARY			FEBRUARY			MARCH		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	15	15	.61	10	32	.86	36	47	4.6
2	15	24	.97	9.5	40	1.0	74	70	14
3	15	19	.77	9.3	36	.90	108	33	9.6
4	14	14	.53	9.3	30	.75	97	40	10
5	13	30	1.1	9.3	19	.48	118	30	9.6
6	13	28	.98	9.0	31	.75	102	29	8.0
7	13	26	.91	8.0	17	.37	93	21	5.3
8	12	24	.78	8.4	15	.34	84	21	4.8
9	12	25	.81	8.1	34	.74	71	53	10
10	12	24	.78	9.1	21	.52	59	38	6.1
11	12	19	.62	15	12	.49	50	50	6.8
12	12	17	.55	18	17	.83	46	41	5.1
13	12	11	.36	33	36	3.2	55	48	7.1
14	11	48	1.4	30	20	1.6	46	55	6.8
15	11	44	1.3	31	21	1.8	40	44	4.8
16	11	29	.86	46	20	2.5	36	35	3.4
17	11	44	1.3	73	27	5.3	33	44	3.9
18	11	27	.80	54	12	1.7	30	39	3.2
19	10	29	.78	54	13	1.9	29	31	2.4
20	10	30	.81	52	12	1.7	28	53	4.0
21	10	14	.38	71	9	1.7	34	55	5.0
22	10	22	.59	73	10	2.0	29	55	4.3
23	10	24	.65	58	15	2.3	27	71	5.2
24	10	26	.70	50	17	2.3	25	87	5.9
25	10	27	.73	45	18	2.2	24	47	3.0
26	10	19	.51	39	19	2.0	23	52	3.2
27	10	24	.65	33	22	2.0	28	56	4.2
28	10	27	.73	29	34	2.7	29	79	6.2
29	10	26	.70	26	28	2.0	27	75	5.5
30	10	21	.57	---	---	---	25	72	4.9
31	9.8	18	.48	---	---	---	24	36	2.3
TOTAL	354.8	---	23.71	920.0	---	46.93	1530	---	179.2

04096325 SOAP CREEK NEAR LITCHFIELD, MI--CONTINUED

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	APRIL			MAY			JUNE		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	23	51	3.2	19	62	3.2	15	29	1.2
2	24	56	3.6	19	47	2.4	15	31	1.3
3	22	30	1.8	18	42	2.0	14	30	1.1
4	22	45	2.7	17	55	2.5	13	45	1.6
5	21	83	4.7	17	60	2.8	13	44	1.5
6	20	66	3.6	43	46	5.3	12	62	2.0
7	19	52	2.7	66	17	3.0	12	31	1.0
8	19	62	3.2	45	39	4.7	12	36	1.2
9	18	54	2.6	36	42	4.1	12	52	1.7
10	18	47	2.3	31	58	4.9	11	54	1.6
11	18	56	2.7	28	40	3.0	11	49	1.5
12	17	57	2.6	26	69	4.8	11	55	1.6
13	17	64	2.9	25	47	3.2	11	74	2.2
14	17	60	2.8	23	36	2.2	10	58	1.6
15	17	56	2.6	23	38	2.4	10	73	2.0
16	16	71	3.1	23	62	3.9	10	65	1.8
17	16	50	2.2	24	43	2.8	10	54	1.5
18	15	54	2.2	22	51	3.0	9.8	75	2.0
19	15	47	1.9	21	47	2.7	13	35	1.2
20	15	48	1.9	20	66	3.6	12	32	1.0
21	15	51	2.1	19	41	2.1	11	43	1.3
22	16	54	2.3	18	47	2.3	10	35	.94
23	15	45	1.8	18	32	1.6	9.9	20	.53
24	17	40	1.8	17	23	1.1	11	20	.59
25	36	32	3.1	17	40	1.8	15	20	.81
26	31	19	1.6	16	58	2.5	12	16	.52
27	26	22	1.5	16	26	1.1	11	18	.53
28	23	49	3.0	16	52	2.2	11	13	.39
29	21	55	3.1	15	43	1.7	11	22	.65
30	20	52	2.8	16	49	2.1	16	36	1.6
31	---	---	---	16	37	1.6	---	---	---
TOTAL	589	---	78.4	730	---	86.6	354.7	---	38.46

	JULY			AUGUST			SEPTEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	16	72	3.1	5.5	36	.53	3.5	52	.49
2	14	58	2.2	5.3	64	.92	3.5	54	.51
3	12	80	2.6	5.1	91	1.3	3.5	41	.39
4	12	62	2.0	5.0	58	.78	3.5	38	.36
5	11	80	2.4	4.9	51	.67	3.4	28	.26
6	10	49	1.3	4.9	110	1.5	3.4	44	.40
7	10	63	1.7	4.6	58	.72	3.4	38	.35
8	10	42	1.1	4.6	58	.72	3.4	39	.36
9	9.5	45	1.2	4.4	93	1.1	3.7	46	.46
10	9.4	48	1.2	4.3	52	.60	3.6	50	.49
11	9.2	51	1.3	4.2	19	.22	3.6	59	.57
12	8.9	189	4.5	4.2	55	.62	3.5	51	.48
13	8.5	40	.92	4.1	39	.43	3.5	68	.64
14	8.2	36	.80	4.1	86	.95	3.5	73	.69
15	8.0	43	.93	4.0	25	.27	3.5	37	.35
16	7.9	36	.77	4.0	24	.26	3.7	30	.30
17	7.6	57	1.2	3.9	33	.35	3.5	41	.39
18	7.3	83	1.6	3.9	33	.35	3.5	13	.12
19	7.1	62	1.2	3.8	45	.46	3.4	17	.16
20	7.2	62	1.2	3.8	55	.56	3.4	26	.24
21	7.4	50	1.0	3.8	60	.62	3.3	43	.38
22	6.8	91	1.7	3.7	59	.59	3.3	91	.81
23	6.9	70	1.3	3.7	61	.61	3.3	69	.61
24	6.5	58	1.0	3.6	59	.57	3.3	88	.78
25	6.5	45	.79	3.7	48	.48	3.3	71	.63
26	6.1	54	.89	3.7	36	.36	3.7	100	1.0
27	6.3	57	.97	3.6	31	.30	3.6	44	.43
28	6.0	53	.86	3.6	28	.27	3.3	46	.41
29	6.2	39	.65	3.6	34	.33	3.2	40	.35
30	5.9	55	.88	3.6	41	.40	3.2	32	.28
31	5.7	44	.68	3.5	37	.35	---	---	---
TOTAL	264.1	---	43.94	128.7	---	18.19	103.5	---	13.69
YEAR	6042.6		621.96						

04096326 SOAP CREEK AT ELY ROAD NEAR LITCHFIELD, MI

LOCATION.--Lat 42°04'07", long 84°50'04", in NW¼ NE¼ sec.1, T.5 S., R.5 W., Branch County, Hydrologic Unit 04050001, at bridge on Ely Road, 4.3 mi (6.9 km) west of Litchfield.

DRAINAGE AREA.--13.1 mi^2 (33.9 km^2).

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	DISSOLVED NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	DISSOLVED NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)
OCT												
14...	1120	12	600	8.2	15.5	.38	--	.01	--	.39	--	.03
NOV												
18...	1050	9.9	640	8.2	8.5	.31	--	.02	--	.33	--	.09
JAN												
06...	0935	16	620	7.1	1.5	.85	--	.01	--	.86	--	.04
FEB												
05...	1040	13	560	7.7	1.0	.73	--	.01	--	.74	--	.09
MAR												
02...	1440	150	450	--	3.5	.99	--	.01	--	1.0	--	.03
JUN												
25...	1015	17	590	--	20.5	.50	--	.03	--	.53	--	.01
AUG												
09...	1015	5.6	580	7.9	18.0	.05	--	.01	--	.06	--	.04
SEP												
13...	1045	4.6	590	7.8	17.5	.01	.01	.01	.01	.02	.02	.04

DATE	DISSOLVED AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	DISSOLVED ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	DISSOLVED KJEL. NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	NITROGEN DISSOLVED AS N (MG/L)	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	DISSOLVED PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)
OCT												
14...	--	.49	--	.52	--	.91	--	4.0	.01	--	.00	--
NOV												
18...	--	.45	--	.54	--	.87	--	3.9	.02	--	.00	--
JAN												
06...	--	.34	--	.38	--	1.2	--	5.5	.01	--	.01	--
FEB												
05...	--	.36	--	.45	--	1.2	--	5.3	.01	--	.00	--
MAR												
02...	--	.44	--	.47	--	1.5	--	6.5	.02	--	.01	--
JUN												
25...	--	.42	--	.43	--	.96	--	4.3	.03	--	.02	--
AUG												
09...	--	.41	--	.45	--	.51	--	2.3	.02	--	.01	--
SEP												
13...	.01	.36	.27	.40	.28	.42	.30	1.9	.03	.03	.03	.01

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR										
22...	1030	20	620	8.6	12.0	15.0	0	0	20	0

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUSPENDED SEDIMENT (MG/L)
APR										
22...	0	410	2	110	<.5	1	0	0	20	66

04096326 SOAP CREEK AT ELY ROAD NEAR LITCHFIELD, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)
MAR 15...	1315	525	1.0	4.5	7.0	.00	.0	.00	.0	.00

DATE	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR 15...	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR 15...	.00	.00	.00	.00	0	.00	.00	.00	.00

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
OCT 14...	1120	12	15.5	6	.19
NOV 18...	1050	9.9	8.5	11	.29
JAN 06...	0935	16	1.5	7	.31
FEB 05...	1040	13	1.0	18	.63
18...	1040	185	1.0	6	3.0
19...	1415	228	1.5	5	3.1
20...	1120	255	2.0	2	1.4
24...	1130	225	2.5	5	3.0
26...	0910	172	6.0	6	2.8
MAR 02...	1440	150	3.5	2	.81
03...	1425	240	6.0	7	4.5
05...	1145	411	7.0	6	6.7
APR 22...	1030	20	15.0	66	3.6
JUN 25...	1015	17	20.5	35	1.6
AUG 09...	1015	5.6	18.0	21	.32
SEP 13...	1045	4.6	17.5	6	.07

04096340 ST. JOSEPH RIVER AT CLARENDON, MI

LOCATION.--Lat 42°07'51", long 84°51'56", in SW¼ SW¼ sec.11, T.4 S., R.5 W., Calhoun County, Hydrologic Unit 04050001, on left bank 5 ft (2 m) upstream from bridge on 22 Mile Road at Clarendon, 0.4 mi (0.6 km) upstream from Andrus drain, and at mile 171 (275 km).

DRAINAGE AREA.--144 mi^2 (373 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1974 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 960 ft (293 m) from topographic map (nearest 10 ft).

REMARKS.--Water-discharge records good except those for the winter period which are fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 810 ft^3/s (22.9 m^3/s) Mar. 7, 1976, gage height, 7.64 ft (2.329 m); minimum, 28 ft^3/s (0.79 m^3/s) Sept. 1, 4, 5, 8, 9, 1976; minimum gage height, 3.81 ft (1.161 m) Sept. 4, 8, 9, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--A discharge of 19.3 ft^3/s (0.55 m^3/s) was measured, July 9, 1963.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 810 ft^3/s (22.9 m^3/s) Mar. 7, gage height, 7.64 ft (2.329 m); minimum, 28 ft^3/s (0.79 m^3/s) Sept. 1, 4, 5, 8, 9; minimum gage height, 3.81 ft (1.161 m) Sept. 4, 8, 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80	77	181	130	100	400	299	226	164	185	57	29
2	80	77	199	125	98	406	288	213	158	180	53	30
3	77	78	207	125	96	467	272	201	147	163	50	29
4	74	82	208	118	94	548	261	190	136	143	48	29
5	72	83	203	104	94	660	251	180	128	126	46	29
6	71	81	208	118	92	742	246	199	118	112	45	29
7	70	83	205	115	92	800	238	287	110	101	45	29
8	69	88	197	110	90	796	226	342	103	97	44	29
9	77	89	192	110	90	758	213	366	96	89	43	29
10	86	91	186	105	90	702	204	361	89	84	41	34
11	87	92	179	105	100	633	199	346	85	80	40	36
12	84	94	173	105	110	573	193	318	82	74	40	34
13	82	92	172	105	150	540	187	285	80	69	40	32
14	80	87	189	105	186	507	181	251	78	66	39	31
15	78	85	237	105	213	486	176	233	75	64	42	31
16	76	89	290	100	259	464	173	244	77	63	40	33
17	75	85	280	95	334	441	168	321	90	62	38	34
18	75	81	270	90	408	420	162	286	90	60	36	34
19	79	80	250	95	466	396	155	252	111	57	34	33
20	87	79	226	100	507	376	149	229	127	56	33	33
21	89	84	220	105	574	372	149	211	130	64	32	33
22	87	86	210	105	611	361	153	195	123	70	32	34
23	84	83	193	105	596	353	152	181	107	66	31	34
24	82	79	190	105	564	342	162	168	109	66	30	33
25	85	78	175	105	540	332	215	158	143	62	30	32
26	88	81	168	105	515	316	253	149	156	58	33	35
27	88	83	156	100	483	328	267	142	163	61	32	46
28	85	84	145	100	449	340	264	135	158	60	30	47
29	82	91	137	100	415	331	253	133	139	62	30	41
30	79	140	130	100	---	322	240	136	165	66	30	39
31	77	---	130	100	---	310	---	154	---	62	29	---
TOTAL	2485	2582	6106	3295	8416	14822	6349	7092	3537	2628	1193	1001
MEAN	80.2	86.1	197	106	290	478	212	229	118	84.8	38.5	33.4
MAX	89	140	290	130	611	800	299	366	165	185	57	47
MIN	69	77	130	90	90	310	149	133	75	56	29	29
CFSM	.56	.60	1.37	.74	2.01	3.32	1.47	1.59	.82	.59	.27	.23
IN.	.64	.67	1.58	.85	2.17	3.83	1.64	1.83	.91	.68	.31	.26

CAL YR 1975 TOTAL 54762 MEAN 150 MAX 417 MIN 46 CFSM 1.04 IN 14.15
WTR YR 1976 TOTAL 59506 MEAN 163 MAX 800 MIN 29 CFSM 1.13 IN 15.37

04096340 ST. JOSEPH RIVER AT CLARENDON, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: July 1974 to current year.
SUSPENDED SEDIMENT DISCHARGE: July 1974 to current year.

REMARKS.--Daily temperature record based on once daily measurements between 1700 and 1900 hours.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 130 mg/L July 23, 1976; minimum daily mean, 1 mg/L on many days during 1974-76.
SEDIMENT DISCHARGES: Maximum daily, 23 tons (21 tonnes) Mar. 3, July 23, 1976; minimum daily, 0.11 ton (0.10 tonne) Sept. 6, Oct. 23, 24, 1974.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 130 mg/L July 23; minimum daily mean, 1 mg/L on many days during October, November, March, and May.
SEDIMENT DISCHARGES: Maximum daily, 23 tons (21 tonnes) Mar. 3, July 23; minimum daily, 0.20 ton (0.18 tonne) Oct. 4.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)
FEB										
20...	1600	512	424	7.8	2.0	30	2	180	38	49

DATE	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
FEB										
20...	14	6.5	7	.2	2.5	173	0	142	31	16

DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
FEB										
20...	.2	6.7	244	217	337	1.2	.00	.00	60	80

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	DISSOLVED NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)
OCT								
14...	0940	79	590	8.1	14.5	.90	--	.00
28...	1250	81	710	8.0	10.5	.93	--	.01
NOV								
18...	0920	82	605	8.3	8.0	1.1	--	.01
DEC								
03...	0945	196	515	7.4	.5	.96	--	.00
29...	1100	95	590	7.0	.5	1.3	--	.01
JAN								
21...	1025	105	580	7.4	.5	1.6	--	.01
FEB								
05...	0935	120	495	7.9	.5	1.6	--	.01
18...	0940	398	--	--	.0	1.1	--	.01
19...	0850	462	--	--	.0	1.1	--	.01
20...	1600	512	424	7.8	2.0	--	--	--
24...	0930	566	--	--	2.0	1.3	--	.01
MAR								
05...	1455	677	740	--	3.5	.93	--	.00
25...	0930	327	505	8.4	10.0	.74	--	.01
APR								
13...	0955	187	550	8.6	8.5	.96	--	.03
MAY								
11...	0915	350	500	8.4	15.5	.39	--	.04
JUN								
25...	0915	141	515	--	19.0	1.3	--	.01
AUG								
09...	0925	42	600	8.1	17.0	1.2	--	.02
24...	0940	30	610	8.1	20.0	.90	.93	.02
SEP								
13...	0940	--	625	7.8	16.5	1.3	1.3	.02

04096340 ST. JOSEPH RIVER AT CLARENDON, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	DIS-SOLVED AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	DIS-SOLVED ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	DIS-SOLVED KJEL. NITRO-GEN (N) (MG/L)
OCT									
14...	--	.90	--	.00	--	.50	--	.50	--
28...	--	.94	--	.00	--	.42	--	.42	--
NOV									
18...	--	1.1	--	.00	--	.95	--	.95	--
DEC									
03...	--	.96	--	.03	--	.29	--	.32	--
29...	--	1.3	--	.11	--	.29	--	.40	--
JAN									
21...	--	1.6	--	.19	--	.02	--	.21	--
FEB									
05...	--	1.6	--	.21	--	.49	--	.70	--
18...	--	1.1	--	.03	--	.59	--	.62	--
19...	--	1.1	--	.03	--	.73	--	.76	--
20...	--	--	1.2	--	--	--	--	--	--
24...	--	1.3	--	.01	--	.61	--	.62	--
MAR									
05...	--	.93	--	.00	--	.52	--	.52	--
25...	--	.75	--	.02	--	.43	--	.45	--
APR									
13...	--	.99	--	.03	--	.50	--	.53	--
MAY									
11...	--	.43	--	.04	--	.51	--	.55	--
JUN									
25...	--	1.3	--	.01	--	.72	--	.73	--
AUG									
09...	--	1.2	--	.01	--	.42	--	.43	--
24...	.02	.92	.95	.05	.01	.65	.27	.70	.28
SEP									
13...	.02	1.3	1.3	.05	.03	.43	.35	.48	.38

DATE	TOTAL NITRO-GEN (N) (MG/L)	NITRO-GEN DIS-SOLVED AS N (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	DIS-SOL-VED-PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORGANIC PHOS-PHORUS (P) (MG/L)
OCT								
14...	1.4	--	6.2	.06	--	.04	--	--
28...	1.4	--	6.0	.07	--	.04	--	--
NOV								
18...	2.1	--	9.1	.06	--	.03	--	--
DEC								
03...	1.3	--	5.7	.09	--	.06	--	--
29...	1.7	--	7.5	.05	--	.04	--	--
JAN								
21...	1.8	--	8.0	.06	--	.06	--	--
FEB								
05...	2.3	--	10	.08	--	.07	--	--
18...	1.7	--	7.6	.04	--	.03	--	--
19...	1.9	--	8.2	.04	--	.04	--	--
20...	--	--	--	--	--	--	.00	--
24...	1.9	--	8.5	.01	--	.02	--	--
MAR								
05...	1.5	--	6.4	.03	--	.00	--	--
25...	1.2	--	5.3	.03	--	.01	--	--
APR								
13...	1.5	--	6.7	.05	--	.03	--	--
MAY								
11...	.98	--	4.3	.06	--	.03	--	--
JUN								
25...	2.0	--	9.0	.13	--	.04	--	--
AUG								
09...	1.6	--	7.2	.06	--	.03	--	--
24...	1.6	1.2	7.2	.08	.05	.05	.09	.00
SEP								
13...	1.8	1.7	7.9	.09	.06	.05	.04	--

04096340 ST. JOSEPH RIVER AT CLARENDON, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)
APR 22...	0915	153	555	8.7	11.5	14.5	0	0	10	1

DATE	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUSPENDED SEDIMENT (MG/L)
APR 22...	0	570	3	110	<.5	3	0	0	10	4

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL ORGANIC CARBON (C) (MG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)
MAR 15...	1230	485	460	1.0	3.5	8.0	.00	.0	.00	.0

DATE	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)
MAR 15...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR 15...	.00	.00	.00	.00	0	.00	.00	.00	.00

04096340 ST. JOSEPH RIVER AT CLARENDON, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.5	---	---	0.0	0.0	---	---	14.5	---	---	---	19.0
2	---	12.0	1.0	0.0	0.0	---	11.0	12.0	19.5	16.5	---	---
3	---	---	---	0.0	---	---	13.0	---	---	---	---	---
4	13.0	---	---	0.0	---	---	12.5	---	---	---	---	21.0
5	13.5	14.0	---	---	---	---	12.0	16.0	---	---	19.0	19.0
6	14.5	---	3.5	0.0	0.0	---	12.0	---	21.0	---	---	18.5
7	14.0	15.0	2.0	---	---	---	14.0	---	---	---	---	19.5
8	13.5	---	---	0.0	0.0	---	9.0	---	22.5	---	---	21.0
9	13.5	14.5	---	---	0.0	---	---	15.0	23.0	23.0	---	18.5
10	14.0	---	---	---	0.0	---	---	---	---	---	---	15.0
11	---	9.0	1.0	0.0	---	---	---	---	24.5	---	---	---
12	13.0	---	---	---	0.0	---	---	16.0	24.0	---	---	20.0
13	---	---	5.5	---	---	---	13.0	17.5	23.0	---	---	---
14	17.0	6.0	---	0.0	---	---	17.0	18.0	---	---	---	---
15	16.5	5.0	7.0	---	---	---	20.0	18.0	---	---	21.0	18.5
16	---	7.0	---	---	---	---	---	---	---	---	---	18.0
17	11.0	8.5	0.5	---	---	---	17.5	15.0	21.0	---	21.0	18.0
18	11.0	---	---	---	---	---	---	14.5	22.0	---	---	19.0
19	8.0	---	---	---	---	---	---	15.0	---	---	---	19.0
20	13.0	9.0	---	---	---	---	---	16.0	---	---	---	18.0
21	13.0	---	---	0.0	---	---	17.5	18.5	20.0	25.0	---	---
22	14.0	5.0	0.0	0.0	---	---	17.5	---	---	22.5	---	13.0
23	---	---	---	0.0	---	---	17.0	16.0	---	24.5	---	---
24	---	---	---	0.0	---	---	---	---	19.0	26.0	---	---
25	14.5	3.0	---	---	---	---	9.0	15.0	---	---	---	13.0
26	11.5	---	0.0	---	---	---	5.0	16.0	---	25.5	---	12.5
27	---	2.0	---	---	---	---	8.5	18.0	---	25.0	---	12.5
28	11.0	2.5	1.0	0.0	---	---	---	17.0	23.0	24.0	---	13.5
29	---	---	---	0.0	---	9.5	---	---	---	---	---	13.5
30	---	6.0	---	0.0	---	14.0	---	---	---	---	---	---
31	---	---	1.0	---	---	9.5	---	---	---	---	---	---

04096340 ST. JOSEPH RIVER AT CLARENDON, MI--CONTINUED

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	80	3	.65	77	1	.21	181	10	4.9
2	80	3	.65	77	5	1.0	199	10	5.4
3	77	4	.83	78	4	.84	207	9	5.0
4	74	1	.20	82	1	.22	208	9	5.1
5	72	3	.58	83	1	.22	203	9	4.9
6	71	4	.77	81	1	.22	208	8	4.5
7	70	3	.57	83	2	.45	205	7	3.9
8	69	2	.37	88	5	1.2	197	10	5.3
9	77	3	.62	89	4	.96	192	9	4.7
10	86	1	.23	91	1	.25	186	8	4.0
11	87	4	.94	92	1	.25	179	11	5.3
12	84	2	.45	94	1	.25	173	6	2.8
13	82	3	.66	92	1	.25	172	8	3.7
14	80	2	.43	87	1	.23	189	6	3.1
15	78	1	.21	85	1	.23	237	8	5.1
16	76	5	1.0	89	2	.48	290	9	7.0
17	75	2	.41	85	1	.23	280	5	3.8
18	75	11	2.2	81	1	.22	270	6	4.4
19	79	13	2.8	80	1	.22	250	5	3.4
20	87	7	1.6	79	1	.21	226	6	3.7
21	89	8	1.9	84	2	.45	220	7	4.2
22	87	6	1.4	86	1	.23	210	6	3.4
23	84	12	2.7	83	1	.22	193	7	3.6
24	82	16	3.5	79	3	.64	190	2	1.0
25	85	3	.69	78	4	.84	175	2	.94
26	88	5	1.2	81	3	.66	168	2	.91
27	88	9	2.1	83	7	1.6	156	2	.84
28	85	5	1.1	84	3	.68	145	2	.78
29	82	3	.66	91	4	.98	137	6	2.2
30	79	8	1.7	140	13	4.9	130	3	1.1
31	77	2	.42	---	---	---	130	2	.70
TOTAL	2485	---	33.54	2582	---	19.34	6106	---	109.67

	JANUARY			FEBRUARY			MARCH		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	130	4	1.4	100	26	7.0	400	4	4.3
2	125	2	.68	98	24	6.4	406	4	4.4
3	125	2	.68	96	25	6.5	467	18	23
4	118	4	1.3	94	30	7.6	548	3	4.4
5	104	4	1.1	94	35	8.9	660	3	5.3
6	118	3	.96	92	40	9.9	742	2	4.0
7	115	3	.93	92	35	8.7	800	2	4.3
8	110	3	.89	90	31	7.5	796	4	8.6
9	110	2	.59	90	37	9.0	758	2	4.1
10	105	2	.57	90	27	6.6	702	3	5.7
11	105	3	.85	100	31	8.4	633	3	5.1
12	105	2	.57	110	20	5.9	573	3	4.6
13	105	2	.57	150	12	4.9	540	3	4.4
14	105	2	.57	186	9	4.5	507	3	4.1
15	105	2	.57	213	7	4.0	486	3	3.9
16	100	2	.54	259	5	3.5	464	3	3.8
17	95	2	.51	334	5	4.5	441	3	3.6
18	90	2	.49	408	2	2.2	420	4	4.5
19	95	8	2.1	466	4	5.0	396	4	4.3
20	100	7	1.9	507	12	16	376	4	4.1
21	105	9	2.6	574	3	4.6	372	4	4.0
22	105	13	3.7	611	3	4.9	361	4	3.9
23	105	6	1.7	596	3	4.8	353	4	3.8
24	105	13	3.7	564	3	4.6	342	4	3.7
25	105	8	2.3	540	3	4.4	332	2	1.8
26	105	16	4.5	515	3	4.2	316	4	3.4
27	100	19	5.1	483	3	3.9	328	4	3.5
28	100	17	4.6	449	3	3.6	340	1	.92
29	100	17	4.6	415	4	4.5	331	1	.89
30	100	26	7.0	---	---	---	322	1	.87
31	100	26	7.0	---	---	---	310	1	.84
TOTAL	3295	---	64.57	8416	---	176.5	14822	---	138.12

04096340 ST. JOSEPH RIVER AT CLARENDON, MI--CONTINUED

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	APRIL			MAY			JUNE		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	299	2	1.6	226	20	12	164	22	9.7
2	288	4	3.1	213	11	6.3	158	27	12
3	272	4	2.9	201	10	5.4	147	31	12
4	261	6	4.2	190	8	4.1	136	38	14
5	251	5	3.4	180	26	13	128	34	12
6	246	6	4.0	199	10	5.4	118	31	9.9
7	238	6	3.9	287	2	1.5	110	21	6.2
8	226	4	2.4	342	1	.92	103	30	8.3
9	213	6	3.5	366	2	2.0	96	30	7.8
10	204	4	2.2	361	2	1.9	89	29	7.0
11	199	10	5.4	346	15	14	85	23	5.3
12	193	15	7.8	318	10	8.6	82	38	8.4
13	187	20	10	285	24	18	80	28	6.0
14	181	20	9.8	251	18	12	78	35	7.4
15	176	23	11	233	17	11	75	35	7.1
16	173	24	11	244	10	6.6	77	34	7.1
17	168	26	12	321	3	2.6	90	27	6.6
18	162	30	13	286	4	3.1	90	23	5.6
19	155	30	13	252	19	13	111	24	7.2
20	149	30	12	229	22	14	127	24	8.2
21	149	36	14	211	10	5.7	130	37	13
22	153	32	13	195	7	3.7	123	29	9.6
23	152	30	12	181	7	3.4	107	38	11
24	162	19	8.3	168	7	3.2	109	40	12
25	215	8	4.6	158	10	4.3	143	24	9.3
26	253	11	7.5	149	20	8.0	156	24	10
27	267	7	5.0	142	25	9.6	163	21	9.2
28	264	20	14	135	40	15	158	22	9.4
29	253	8	5.5	133	29	10	139	36	14
30	240	6	3.9	136	25	9.2	165	31	14
31	---	---	---	154	27	11	---	---	---
TOTAL	6349	---	224.0	7092	---	238.52	3537	---	279.3

	JULY			AUGUST			SEPTEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	185	23	11	57	40	6.2	29	10	.78
2	180	22	11	53	77	11	30	7	.57
3	163	28	12	50	75	10	29	14	1.1
4	143	34	13	48	73	9.5	29	14	1.1
5	126	36	12	46	86	11	29	12	.94
6	112	37	11	45	18	2.2	29	8	.63
7	101	32	8.7	45	16	1.9	29	7	.55
8	97	39	10	44	21	2.5	29	7	.55
9	89	36	8.7	43	16	1.9	29	12	.94
10	84	28	6.4	41	18	2.0	34	9	.83
11	80	25	5.4	40	14	1.5	36	17	1.7
12	74	25	5.0	40	16	1.7	34	10	.92
13	69	25	4.7	40	20	2.2	32	8	.69
14	66	25	4.5	39	20	2.1	31	7	.59
15	64	25	4.3	42	26	2.9	31	6	.50
16	63	25	4.3	40	17	1.8	33	10	.89
17	62	25	4.2	38	20	2.1	34	10	.92
18	60	25	4.1	36	12	1.2	34	9	.83
19	57	25	3.8	34	6	.55	33	12	1.1
20	56	25	3.8	33	7	.62	33	14	1.2
21	64	63	11	32	5	.43	33	6	.53
22	70	38	7.2	32	4	.35	34	7	.64
23	66	130	23	31	9	.75	34	8	.73
24	66	20	3.6	30	9	.73	33	9	.80
25	62	20	3.3	30	10	.81	32	7	.60
26	58	59	9.2	33	7	.62	35	7	.66
27	61	18	3.0	32	5	.43	46	18	2.2
28	60	11	1.8	30	9	.73	47	5	.63
29	62	8	1.3	30	9	.73	41	4	.44
30	66	15	2.7	30	11	.89	39	12	1.3
31	62	10	1.7	29	9	.70	---	---	---
TOTAL	2628	---	215.7	1193	---	82.04	1001	---	25.86
YEAR	59506.0		1607.16						

04096400 ST. JOSEPH RIVER NEAR BURLINGTON, MI

LOCATION.--Lat 42°06'10", long 85°02'25", in SW¼ SW¼ sec.20, T.4 S., R.6 W., Calhoun County, Hydrologic Unit 04050001, on right bank 10 ft (3 m) upstream from bridge on 13 Mile Rd., 2.0 mi (3.2 km) east of Burlington, 4.0 mi (6.4 km) downstream from Tekonsha Creek, and at mile 164 (264 km).

DRAINAGE AREA.--201 mi^2 (521 km^2).

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 920 ft (280 m) from topographic map (nearest 10 ft).

REMARKS.--Records good. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--14 years, 162 ft^3/s (4.588 m^3/s), 10.95 in/yr (278 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,030 ft^3/s (29.2 m^3/s), Mar. 6, 1976, gage height, 5.31 ft (1.618 m); maximum gage height, 5.51 ft (1.679 m) Feb. 5, 1968; minimum discharge, 8.0 ft^3/s (0.23 m^3/s) Aug. 9, 10, 11, 1964; minimum gage height, 1.54 ft (0.469 m) Sept. 1-9, 15, 16, 25, 1976.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,030 ft^3/s (29.2 m^3/s), Mar. 6, gage height, 5.31 ft (1.618 m); minimum, 34 ft^3/s (0.96 m^3/s) Sept. 16, 25, 26; minimum gage height, 1.54 ft (0.469 m) Sept. 1-9, 15, 16, 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	107	101	241	180	120	574	420	317	207	252	76	36
2	109	102	247	175	120	601	410	301	206	243	68	36
3	107	105	252	170	120	721	390	289	195	225	62	36
4	104	108	252	165	120	804	370	272	182	205	59	36
5	100	110	251	158	120	919	351	258	171	183	57	36
6	96	110	265	155	120	1020	336	310	163	165	56	36
7	94	115	277	150	120	996	325	541	153	150	55	36
8	93	119	266	150	120	994	311	573	144	140	54	36
9	100	120	261	145	120	982	295	518	136	134	52	36
10	108	125	251	145	119	948	283	505	128	126	52	39
11	112	122	245	140	130	884	277	488	121	117	48	42
12	112	123	238	140	140	819	267	459	116	108	48	42
13	109	123	239	140	180	787	259	418	110	99	49	39
14	105	119	286	135	240	733	254	374	107	92	49	37
15	102	114	381	135	310	678	247	340	103	87	51	36
16	100	114	430	135	387	642	242	323	104	84	52	37
17	99	115	391	130	474	605	234	382	106	81	49	39
18	99	110	352	130	521	569	227	429	116	77	46	39
19	104	107	313	130	553	543	220	385	141	72	45	39
20	111	109	307	130	568	519	212	335	151	71	43	40
21	114	116	283	130	622	501	211	303	156	88	42	39
22	114	116	275	125	797	482	219	276	156	90	41	39
23	111	114	289	125	833	463	214	257	145	89	41	39
24	108	110	253	125	793	448	230	242	154	84	40	37
25	110	108	252	125	751	435	334	227	192	80	39	37
26	111	107	230	125	716	418	425	215	191	72	40	41
27	113	113	219	125	679	448	399	204	190	76	42	52
28	111	113	214	125	637	502	378	195	190	75	40	57
29	107	128	193	126	592	489	360	193	182	78	38	54
30	104	198	194	125	---	465	337	192	221	82	37	49
31	101	---	185	120	---	438	---	200	---	82	37	---
TOTAL	3275	3494	8332	4314	11122	20427	9037	10321	4637	3607	1508	1197
MEAN	106	116	269	139	384	659	301	333	155	116	48.6	39.9
MAX	114	198	430	180	833	1020	425	573	221	252	76	57
MIN	93	101	185	120	119	418	211	192	103	71	37	36
CFSM	.53	.58	1.34	.69	1.91	3.28	1.50	1.66	.77	.58	.24	.20
IN.	.61	.65	1.54	.80	2.06	3.78	1.67	1.91	.86	.67	.28	.22

CAL YR 1975 TOTAL 73983 MEAN 203 MAX 480 MIN 67 CFSM 1.01 IN 13.69
WTR YR 1976 TOTAL 81271 MEAN 222 MAX 1020 MIN 36 CFSM 1.10 IN 15.04

04096515 HOG CREEK NEAR ALLEN, MI

LOCATION.--Lat 41°56'55", long 84°49'40", in NE¼ SE¼ sec.13, T.6 S., R.5 W., Branch County, Hydrologic Unit 04050001, on left bank 12 ft (4 m) downstream from bridge on U.S. Highway 12, 1.0 mi (1.6 km) downstream from Little Hog Creek, and 3.1 mi (5.0 km) west of Allen.

DRAINAGE AREA.--48.7 mi^2 (126.1 km^2).

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

GAGE.--Water-stage recorder. Altitude of gage is 1,010 ft (308 m) from topographic map. Prior to May 23, 1970, nonrecording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--7 years, 42.2 ft^3/s (1.195 m^3/s), 11.77 in/yr (299 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 304 ft^3/s (8.61 m^3/s) Mar. 5, 1976, gage height, 5.33 ft (1.625 m); maximum gage height, 5.73 ft (1.747 m) Feb. 20, 1971 (backwater from ice); minimum discharge, 1.2 ft^3/s (0.034 m^3/s) Aug. 20, 21, 1971, gage height, 1.35 ft (0.411 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 304 ft^3/s (8.61 m^3/s) Mar. 5, gage height, 5.33 ft (1.625 m); minimum, 3.5 ft^3/s (0.099 m^3/s) Sept. 1, 7; minimum gage height, 1.37 ft (0.418 m) Sept. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	17	114	37	36	136	79	62	43	75	14	4.0
2	18	18	116	37	31	179	79	60	37	69	12	4.3
3	17	21	106	36	34	240	77	59	32	56	11	4.3
4	17	24	92	35	34	278	75	56	28	45	11	4.3
5	16	22	81	37	33	297	72	49	24	39	9.9	4.1
6	16	21	80	36	33	301	68	72	22	34	9.9	4.1
7	15	24	81	34	34	275	64	122	20	31	9.6	3.7
8	15	27	78	35	38	238	59	135	18	29	9.1	3.8
9	22	25	75	35	37	210	55	123	17	26	8.5	4.5
10	25	28	71	35	39	185	51	108	16	23	8.3	6.7
11	22	30	68	35	44	168	53	92	15	21	7.8	5.4
12	20	27	64	36	50	155	51	80	15	18	7.8	4.7
13	19	26	64	36	60	148	48	70	14	16	7.8	4.3
14	18	24	75	36	79	141	46	63	13	14	7.6	4.1
15	17	22	99	36	105	131	44	60	12	13	7.4	3.8
16	17	22	115	37	152	122	43	65	18	13	7.4	4.1
17	16	21	120	33	202	114	41	85	20	12	7.1	4.9
18	16	20	114	36	236	106	39	94	17	11	6.9	4.7
19	19	19	105	36	226	101	36	84	32	10	6.4	4.3
20	22	21	89	36	200	98	34	72	51	10	6.2	4.3
21	21	30	82	36	190	102	35	66	56	14	5.8	4.4
22	19	28	66	36	208	100	37	57	49	15	5.8	4.1
23	18	25	71	36	209	95	39	50	41	16	5.6	4.0
24	18	22	60	36	192	88	46	45	44	17	5.2	3.8
25	23	23	54	36	175	86	84	42	71	15	5.2	3.8
26	25	22	47	36	160	84	103	39	86	13	5.6	5.4
27	22	22	43	36	145	88	99	36	87	13	5.6	8.9
28	20	24	41	34	133	94	87	33	76	13	5.4	6.1
29	19	40	40	36	122	92	77	33	65	19	4.9	5.3
30	18	92	38	34	---	88	68	36	70	18	4.5	5.0
31	17	---	38	33	---	83	---	43	---	15	4.1	---
TOTAL	586	787	2387	1103	3237	4623	1789	2091	1109	733	233.4	139.2
MEAN	18.9	26.2	77.0	35.6	112	149	59.6	67.5	37.0	23.6	7.53	4.64
MAX	25	92	120	37	236	301	103	135	87	75	14	8.9
MIN	15	17	38	33	31	83	34	33	12	10	4.1	3.7
CFSM	.39	.54	1.58	.73	2.30	3.06	1.22	1.39	.76	.48	.15	.10
IN.	.45	.60	1.82	.84	2.47	3.53	1.37	1.60	.85	.56	.18	.11

CAL YR 1975 TOTAL 19673.9 MEAN 53.9 MAX 198 MIN 9.9 CFSM 1.11 IN 15.03
WTR YR 1976 TOTAL 18817.6 MEAN 51.4 MAX 301 MIN 3.7 CFSM 1.06 IN 14.37

04096600 COLDWATER RIVER NEAR HODUNK, MI

LOCATION.--Lat 42°01'45", long 85°06'25", in NW¼ NE¼ sec.22, T.5 S., R.7 W., Branch County, Hydrologic Unit 04050001, on downstream side of bridge on Girard Rd., 2.5 mi (4.0 km) northwest of Hodunk, and 3.5 mi (5.6 km) upstream from mouth.

DRAINAGE AREA.--293 mi^2 (759 km^2).

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 900 ft (274 m) from topographic map (nearest 10 ft). Prior to July 26, 1963, non-recording gage and crest-stage gage at same site and datum.

REMARKS.--Records good. Diurnal fluctuation caused by mills above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--14 years, 233 ft^3/s (6.599 m^3/s), 10.80 in/yr (274 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,230 ft^3/s (63.2 m^3/s) Mar. 8, 9, 1974, gage height, 7.69 ft (2.344 m); minimum, 6.2 ft^3/s (0.18 m^3/s) Sept. 26, 1964; minimum gage height, 2.28 ft (0.695 m) Oct. 4-14, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,860 ft^3/s (52.7 m^3/s) Mar. 6, gage height, 8.18 ft (2.493 m); minimum, 27 ft^3/s (0.76 m^3/s) Sept. 7, 8, 9, gage height, 2.57 ft (0.783 m).

REVISIONS.--The maximum discharge for water year 1974 has been revised to 1,620 ft^3/s (45.9 m^3/s) Mar. 8, 9, 1974, gage height, 7.69 ft (2.344 m); revised daily discharges, in cubic feet per second, for the high-water period in March 1974, are given below. These figures supersede those published in the report for 1974.

Mar. 5	1150	Mar. 9	1570	Mar. 13	1130
6	1060	10	1420	14	1070
7	1130	11	1290	15	1000
8	1450	12	1200	16	940

Month	Total	Mean	Max	Min	Cfsm	In.
March 1974	26641	859	1570	500	2.93	3.38
Wtr Yr 1974	110597	303	1570	46	1.03	14.04
Cal Yr 1974	107550	295	1570	43	1.01	13.65

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	125	166	325	290	186	857	653	495	290	295	108	29
2	121	165	379	280	187	959	632	465	277	341	104	29
3	119	169	412	280	190	1250	620	438	255	306	94	30
4	117	171	388	270	185	1510	593	412	236	277	90	30
5	115	169	364	270	179	1640	572	384	220	252	88	29
6	110	166	358	260	177	1710	552	465	186	231	84	29
7	108	170	362	260	180	1610	530	734	139	214	81	28
8	107	173	358	260	167	1460	509	932	136	204	75	28
9	115	174	352	248	179	1330	492	881	134	194	71	29
10	124	174	340	250	170	1230	471	788	130	184	61	35
11	125	173	332	240	180	1140	460	701	130	171	32	37
12	123	169	325	240	200	1080	449	626	130	156	32	36
13	121	160	329	235	270	1050	436	566	125	144	30	32
14	118	151	375	231	370	1040	428	525	121	132	31	31
15	118	151	492	226	508	992	417	501	119	123	34	32
16	121	147	572	223	660	941	401	482	119	110	37	32
17	125	147	588	223	905	902	390	495	119	84	49	34
18	124	140	536	220	1120	869	368	519	121	82	43	34
19	137	136	489	220	1130	836	328	498	139	81	48	34
20	156	139	460	211	1080	812	260	471	154	81	43	34
21	168	143	440	203	1070	788	186	449	156	96	46	34
22	172	145	410	204	1140	788	212	417	156	98	37	32
23	175	146	379	205	1180	776	233	379	154	102	35	31
24	178	141	364	195	1100	749	277	355	171	102	34	30
25	181	137	341	195	1040	719	487	339	217	104	34	32
26	186	136	331	195	992	698	644	322	231	102	36	49
27	189	141	321	194	950	716	689	306	233	110	35	58
28	186	140	309	200	899	752	638	290	236	110	43	56
29	178	161	300	195	854	755	581	290	233	119	32	52
30	173	241	298	193	---	725	533	285	271	116	32	55
31	171	---	290	185	---	683	---	287	---	112	30	---
TOTAL	4386	4741	11919	7101	17448	31367	14041	15097	5338	4833	1629	1061
MEAN	141	158	384	229	602	1012	468	487	178	156	52.5	35.4
MAX	189	241	588	290	1180	1710	689	932	290	341	108	58
MIN	107	136	290	185	167	683	186	285	119	81	30	28
CFSM	.48	.54	1.31	.78	2.05	3.45	1.60	1.66	.61	.53	.18	.12
IN.	.56	.60	1.51	.90	2.22	3.98	1.78	1.92	.68	.61	.21	.13

CAL YR 1975 TOTAL 111176 MEAN 305 MAX 850 MIN 70 CFSM 1.04 IN 14.12
WTR YR 1976 TOTAL 118961 MEAN 325 MAX 1710 MIN 28 CFSM 1.11 IN 15.10

04096900 NOTTAWA CREEK NEAR ATHENS, MI

LOCATION.--Lat 42°03'20", long 85°18'30", in NW¼ sec.12, T.5 S., R.9 W., St. Joseph County, Hydrologic Unit 04050001, on right bank at downstream side of bridge on Shorts Road, 4.2 mi (6.8 km) southwest of Athens, and 5.0 mi (8.0 km) downstream from Pine Creek.

DRAINAGE AREA.--162 mi^2 (420 km^2).

PERIOD OF RECORD.--October 1966 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 850 ft (259 m) from topographic map (nearest 10 ft).

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--10 years, 148 ft^3/s (4.191 m^3/s), 12.41 in/yr (315 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 808 ft^3/s (22.9 m^3/s) Mar. 6, 1976, gage height, 4.46 ft (1.359 m); maximum gage height, 4.66 ft (1.420 m) Feb. 3, 1968; minimum discharge, 25 ft^3/s (0.71 m^3/s) Sept. 15, 16, 19, 1976; minimum gage height, 0.37 ft (0.113 m) Oct. 16, 18, 20, 21, Nov. 8, 1971.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 808 ft^3/s (22.9 m^3/s) Mar. 6, gage height, 4.46 ft (1.359 m); minimum, 25 ft^3/s (0.71 m^3/s) Sept. 15, 16, 19; minimum gage height, 0.56 ft (0.171 m) Sept. 23, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	91	87	229	120	120	302	353	337	190	135	80	44
2	89	88	241	120	120	328	333	294	183	142	77	43
3	87	93	229	120	120	428	318	270	180	137	74	42
4	85	98	207	120	120	539	301	258	173	127	71	40
5	84	102	180	120	120	687	282	243	165	117	70	38
6	82	102	190	120	120	794	263	270	153	106	70	35
7	80	100	213	120	120	791	244	381	142	98	68	33
8	79	103	221	120	120	708	226	478	131	92	67	34
9	80	104	216	120	120	599	211	486	121	86	65	35
10	82	108	200	120	120	517	198	452	114	82	63	39
11	81	106	186	125	120	458	194	406	110	79	59	36
12	80	106	171	125	120	417	188	357	106	75	58	35
13	83	103	167	120	130	404	183	309	104	71	58	33
14	81	98	200	120	170	397	176	274	102	72	59	28
15	80	96	282	120	250	389	170	249	101	70	61	26
16	79	94	338	120	299	372	165	239	105	69	60	26
17	79	92	362	120	355	347	161	251	105	68	57	26
18	78	90	334	120	367	317	153	308	104	67	55	27
19	81	88	300	120	420	293	146	350	112	66	51	26
20	87	90	312	120	423	275	142	345	109	67	50	30
21	90	98	292	120	436	287	144	322	105	86	49	31
22	91	105	150	120	510	307	158	292	102	95	47	29
23	89	106	140	120	538	308	159	261	99	99	46	28
24	86	101	130	120	514	296	175	236	102	96	47	29
25	90	99	130	120	475	281	274	216	115	91	46	30
26	92	94	130	120	434	259	401	201	116	84	48	40
27	94	99	130	120	390	273	485	187	111	83	48	47
28	93	96	130	120	351	340	495	178	106	81	48	48
29	90	109	130	120	312	398	452	173	105	83	47	47
30	87	175	130	120	---	396	391	177	124	83	46	46
31	86	---	130	120	---	382	---	193	---	83	45	---
TOTAL	2636	3030	6400	3730	7834	12889	7541	8993	3695	2790	1790	1051
MEAN	85.0	101	206	120	270	416	251	290	123	90.0	57.7	35.0
MAX	94	175	362	125	538	794	495	486	190	142	80	48
MIN	78	87	130	120	120	259	142	173	99	66	45	26
CFSM	.52	.62	1.27	.74	1.67	2.57	1.55	1.79	.76	.56	.36	.22
IN.	.61	.70	1.47	.85	1.80	2.96	1.73	2.07	.85	.64	.41	.24

CAL YR 1975 TOTAL 55616 MEAN 152 MAX 384 MIN 54 CFSM .94 IN 12.77
WTR YR 1976 TOTAL 62379 MEAN 170 MAX 794 MIN 26 CFSM 1.05 IN 14.32

04097170 PORTAGE RIVER NEAR VICKSBURG, MI

LOCATION.--Lat 42°06'53", long 85°29'08", in SW¼ sec.16, T.4 S., R.10 W., Kalamazoo County, Hydrologic Unit 04050001, on right bank 15 ft (5 m) upstream from bridge on W Avenue, 2.4 mi (3.9 km) east of Vicksburg.

DRAINAGE AREA.--68.2 mi^2 (176.6 km^2).

PERIOD OF RECORD.--March 1946 to September 1951, October 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 839.94 ft (256.014 m) above mean sea level. Mar. 13, 1946 to Sept. 30, 1951, non-recording gage at same site and datum.

REMARKS.--Records good. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--17 years, 62.4 ft^3/s (1.767 m^3/s), 12.43 in/yr (316 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 356 ft^3/s (10.1 m^3/s) Apr. 7, 1947, gage height, 5.66 ft (1.725 m); minimum, 10 ft^3/s (0.28 m^3/s) on many days during July and August, 1965; minimum gage height, 3.08 ft (0.939 m) July 17, Aug. 14, 1946, July 30, 31, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 274 ft^3/s (7.76 m^3/s) Mar. 5, gage height, 5.38 ft (1.640 m); minimum, 17 ft^3/s (0.48 m^3/s) Sept. 4, 5, 7, 8, 9; minimum gage height, 3.34 ft (1.018 m) Sept. 9, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	61	85	87	52	132	131	120	62	50	28	19
2	60	61	84	84	50	146	128	116	60	44	28	19
3	59	63	83	82	51	183	122	117	58	41	27	19
4	58	66	81	78	50	202	118	111	56	40	26	18
5	56	67	79	77	49	243	111	103	54	38	26	18
6	56	67	92	75	49	271	106	113	52	38	26	18
7	55	68	101	74	48	262	102	154	51	36	25	18
8	54	70	100	72	48	254	98	147	49	36	25	18
9	55	70	100	65	52	237	93	137	48	34	24	18
10	54	69	99	79	56	222	88	130	47	34	24	21
11	54	71	97	69	59	207	89	124	46	33	24	19
12	54	69	96	69	60	197	85	115	44	32	24	19
13	53	69	96	70	76	195	82	108	47	31	23	19
14	53	67	106	70	84	188	79	102	45	30	23	19
15	53	64	139	66	89	181	77	97	43	30	22	19
16	54	63	153	69	104	172	76	95	43	29	21	20
17	55	61	151	66	112	164	74	101	41	29	21	20
18	56	61	142	65	115	153	72	97	40	28	20	20
19	58	60	134	62	120	143	73	90	45	27	19	20
20	60	60	128	62	119	138	72	84	42	28	19	21
21	60	61	122	60	143	156	71	81	41	31	19	22
22	59	62	116	60	181	152	71	77	40	30	18	22
23	59	60	112	60	175	141	70	72	38	30	18	22
24	59	60	110	61	170	131	75	69	39	29	19	22
25	62	60	105	61	164	129	113	67	42	29	18	21
26	63	58	103	62	156	124	142	64	39	28	19	24
27	63	59	99	63	146	134	137	62	38	29	18	26
28	63	58	95	61	137	154	135	60	37	29	19	25
29	63	63	94	60	130	146	130	61	37	29	19	25
30	62	81	90	60	---	138	124	61	46	28	19	26
31	61	---	88	56	---	133	---	63	---	28	19	---
TOTAL	1792	1929	3280	2105	2845	5428	2944	2998	1370	1008	680	617
MEAN	57.8	64.3	106	67.9	98.1	175	98.1	96.7	45.7	32.5	21.9	20.6
MAX	63	81	153	87	181	271	142	154	62	50	28	26
MIN	53	58	79	56	48	124	70	60	37	27	18	18
CFSM	.85	.94	1.55	1.00	1.44	2.57	1.44	1.42	.67	.48	.32	.30
IN.	.98	1.05	1.79	1.15	1.55	2.96	1.61	1.64	.75	.55	.37	.34

CAL YR 1975 TOTAL 26695 MEAN 73.1 MAX 153 MIN 30 CFSM 1.07 IN 14.56
WTR YR 1976 TOTAL 26996 MEAN 73.8 MAX 271 MIN 18 CFSM 1.08 IN 14.72

04097500 ST. JOSEPH RIVER AT THREE RIVERS, MI

LOCATION.--Lat 41°56'25", long 85°38'00", in SW¼ SE¼ sec.18, T.6 S., R.11 W., St. Joseph County, Hydrologic Unit 04050001, on right bank in Scidmore Park at Three Rivers, 250 ft (76 m) downstream from Rocky River, and at mile 112 (180 km).

DRAINAGE AREA.--1,350 mi^2 (3,496 km^2).

PERIOD OF RECORD.--May 1953 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 781.34 ft (238.152 m) above mean sea level (levels by Michigan Department of Natural Resources).

REMARKS.--Records good. Flow regulated by powerplant above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--23 years, 1,097 ft^3/s (31.07 m^3/s), 11.04 in/yr (280 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,810 ft^3/s (165 m^3/s) Mar. 7, 1976, gage height, 9.08 ft (2.768 m); minimum daily, 78 ft^3/s (2.21 m^3/s) Sept. 12, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1918, 8,260 ft^3/s (234 m^3/s) Apr. 27, 1950, gage height, 10.6 ft (3.23 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,810 ft^3/s (165 m^3/s) Mar. 7, gage height, 9.08 ft (2.768 m); minimum, 278 ft^3/s (7.87 m^3/s) Sept. 4, 5, gage height, 2.34 ft (0.713 m); minimum daily, 278 ft^3/s (7.87 m^3/s) Sept. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	830	761	1400	1470	1020	3240	2930	2590	1740	1580	874	430
2	929	782	1520	1350	1080	3250	2770	2420	1670	1590	748	422
3	818	759	1620	1500	1160	3530	2670	2340	1580	1520	688	346
4	766	778	1590	1360	921	4090	2610	2050	1470	1450	682	282
5	771	922	1580	1170	877	4880	2500	1940	1390	1390	635	278
6	774	1030	1680	1110	960	5470	2410	2170	1240	1330	682	282
7	771	805	1770	1230	1080	5780	2300	2360	1210	1220	682	330
8	770	819	1800	1350	973	5740	2200	3000	1270	1050	625	370
9	675	939	1790	1140	947	5530	1970	3540	1270	1050	605	414
10	697	918	1740	913	938	5200	1950	3570	1100	991	585	466
11	759	925	1680	957	927	4850	1960	3440	991	958	575	452
12	745	884	1650	1270	1070	4530	1920	3260	946	796	580	426
13	692	929	1620	1320	1330	4320	1770	2980	1010	724	540	430
14	708	888	1660	1270	1590	4110	1730	2720	964	772	452	410
15	739	855	1890	1210	1790	3920	1730	2600	898	802	452	402
16	752	807	2270	1190	2150	3720	1730	2600	964	694	461	398
17	755	795	2540	1000	2660	3580	1680	2640	991	730	457	358
18	814	751	2610	1190	2960	3340	1580	2500	946	742	452	294
19	808	767	2420	1170	3230	3070	1580	2270	998	645	439	298
20	693	762	2260	901	3370	3040	1560	2260	998	635	410	390
21	664	825	2110	1050	3770	3050	1440	2280	1080	940	366	475
22	737	840	1780	1200	3990	3010	1390	2220	1040	1070	366	443
23	783	932	1740	1190	4310	2920	1470	2120	940	1150	382	366
24	834	839	1850	1090	4310	2800	1680	1970	1050	1120	434	346
25	886	804	1750	922	4140	2670	1800	1540	1270	1020	418	294
26	868	803	1710	898	3920	2650	2350	1580	1290	946	406	366
27	807	830	1610	1000	3670	2720	2780	1500	1250	940	418	640
28	769	948	1580	1080	3480	2800	3010	1590	1200	838	426	640
29	873	899	1440	1060	3250	3080	3070	1580	1170	886	398	590
30	912	1010	1380	1030	---	3110	2880	1520	1490	904	410	565
31	770	---	1560	998	---	3060	---	1530	---	898	439	---
TOTAL	24169	25606	55600	35589	65873	117060	63420	72680	35426	31381	16087	12203
MEAN	780	854	1794	1148	2271	3776	2114	2345	1181	1012	519	407
MAX	929	1030	2610	1500	4310	5780	3070	3570	1740	1590	874	640
MIN	664	751	1380	898	877	2650	1390	1500	898	635	366	278
CFSM	.58	.63	1.33	.85	1.68	2.80	1.57	1.74	.87	.75	.38	.30
IN.	.67	.71	1.53	.98	1.82	3.23	1.75	2.00	.98	.86	.44	.34

CAL YR 1975 TOTAL 514278 MEAN 1409 MAX 2760 MIN 493 CFSM 1.04 IN 14.17
WTR YR 1976 TOTAL 555094 MEAN 1517 MAX 5780 MIN 278 CFSM 1.12 IN 15.30

04097540 PRAIRIE RIVER NEAR NOTTAWA, MI

LOCATION.--Lat 41°53'18", long 85°24'34", in NW¼ SW¼ sec.6, T.7 S., R.9 W., St. Joseph County, Hydrologic Unit 04050001, on left bank 10 ft (3 m) upstream from bridge on State Highway 66, 3.0 mi (4.8 km) upstream from unnamed tributary, and 3.0 mi (4.8 km) southeast of Nottawa.

DRAINAGE AREA.--106 mi^2 (275 km^2).

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 850 ft (259 m) from topographic map (nearest 10 ft).

REMARKS.--Records good. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--14 years, 88.4 ft^3/s (2.503 m^3/s), 11.33 in/yr (288 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 523 ft^3/s (14.8 m^3/s), Mar. 6, 1976, gage height, 5.66 ft (1.725 m); minimum, 11 ft^3/s (0.31 m^3/s), Aug. 9, 10, Sept. 8, 9, 10, 1964; minimum gage height, 1.77 ft (0.539 m) Aug. 9, 10, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 523 ft^3/s (14.8 m^3/s) Mar. 6, gage height, 5.66 ft (1.725 m); minimum, 27 ft^3/s (0.76 m^3/s), Sept. 8, 9, gage height, 2.21 ft (0.674 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	74	66	142	110	84	239	201	169	104	119	78	33
2	75	67	163	110	84	283	192	159	104	118	75	33
3	73	68	167	110	84	367	183	152	100	110	71	32
4	71	69	159	105	84	431	178	145	97	100	66	31
5	68	68	147	105	84	496	173	137	93	94	62	30
6	68	68	145	103	84	520	167	164	89	86	60	29
7	66	69	142	102	82	506	162	227	85	82	59	29
8	66	70	139	105	82	477	157	269	81	78	58	28
9	66	71	139	100	82	424	151	282	78	75	57	29
10	67	72	134	100	82	369	145	268	76	72	55	34
11	68	71	128	100	82	328	143	238	74	68	52	36
12	68	71	124	98	84	303	140	209	77	62	50	36
13	68	69	122	98	90	294	136	187	85	56	49	34
14	67	67	127	96	125	285	133	173	82	54	49	32
15	66	65	149	96	170	275	130	165	78	52	49	35
16	66	63	162	94	201	259	128	166	76	51	48	35
17	65	62	176	94	247	245	125	164	74	50	47	34
18	65	61	178	92	285	231	121	159	75	49	46	33
19	67	60	165	92	308	219	117	151	80	47	44	32
20	69	61	154	92	313	212	115	143	80	49	43	32
21	71	64	150	90	323	207	114	136	80	101	41	32
22	72	67	140	90	325	203	115	129	79	119	40	32
23	71	67	134	88	318	204	115	123	76	133	38	31
24	70	65	126	88	308	199	122	118	80	127	37	30
25	72	65	121	88	290	193	155	114	92	114	35	30
26	72	64	120	88	269	187	183	111	99	101	35	33
27	72	66	119	88	247	203	211	107	103	94	35	41
28	71	66	115	86	228	217	217	104	99	85	36	43
29	70	77	115	86	212	221	203	106	101	85	36	41
30	69	113	115	86	---	219	183	105	111	80	35	39
31	67	---	110	86	---	209	---	105	---	80	34	---
TOTAL	2140	2052	4327	2966	5257	9025	4615	4985	2608	2591	1520	999
MEAN	69.0	68.4	140	95.7	181	291	154	161	86.9	83.6	49.0	33.3
MAX	75	113	178	110	325	520	217	282	111	133	78	43
MIN	65	60	110	86	82	187	114	104	74	47	34	28
CFSM	.65	.65	1.32	.90	1.71	2.75	1.45	1.52	.82	.79	.46	.31
IN.	.75	.72	1.52	1.04	1.84	3.17	1.62	1.75	.92	.91	.53	.35

CAL YR 1975 TOTAL 40186 MEAN 110 MAX 315 MIN 36 CFSM 1.04 IN 14.10
WTR YR 1976 TOTAL 43085 MEAN 118 MAX 520 MIN 28 CFSM 1.11 IN 15.12

04097970 LIME LAKE OUTLET AT PANAMA, IN

LOCATION.--Lat 41°42'46", long 85°07'10", in NW¼ NW¼ sec.35, T.38 N., R.12 E., Steuben County, on right bank 10 ft (3 m) downstream from dam for Lime Lake, 30 ft (9 m) upstream from bridge on Orland Road, and 0.7 mile (1.1 km) northwest of Panama.

DRAINAGE AREA.--17.5 mi^2 (45.3 km^2), of which 3.68 mi^2 (9.53 km^2) does not contribute directly to surface runoff.

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

GAGE.--Water-stage recorder. Datum of gage is 950.00 ft (289.560 m) above mean sea level.

REMARKS.--Records fair. Occasional regulation by control structure for Lime Lake.

AVERAGE DISCHARGE.--7 years, 7.19 ft^3/s (0.204 m^3/s), 5.58 in/yr (142 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 34 ft^3/s (0.96 m^3/s) Mar. 5, 1976, gage height, 4.59 ft (1.399 m); no flow at times during 1971 and 1972.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 34 ft^3/s (0.96 m^3/s) Mar. 5, gage height, 4.59 ft (1.399 m); minimum daily discharge, 0.05 ft^3/s (0.001 m^3/s) Sept. 3-9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	1.3	8.6	10	7.8	27	24	17	2.4	14	3.2	.10
2	3.3	1.6	8.3	10	7.5	28	24	17	2.0	15	2.6	.06
3	3.0	2.0	8.1	10	7.3	30	23	16	1.7	14	2.3	.05
4	2.6	2.1	8.1	10	7.1	31	23	15	1.5	13	2.1	.05
5	2.6	2.3	8.1	10	7.1	33	23	15	1.3	13	1.9	.05
6	2.3	2.5	9.1	10	7.3	32	22	17	1.2	13	1.9	.05
7	2.1	3.2	9.4	10	7.1	30	22	19	1.1	12	1.8	.05
8	2.1	3.0	9.1	10	6.8	30	21	18	1.0	11	1.6	.05
9	2.3	3.4	9.7	10	8.6	29	21	17	.94	11	1.5	.05
10	2.2	3.6	9.7	10	12	29	21	13	.99	6.6	1.5	.24
11	2.0	3.3	9.4	10	8.4	28	21	11	.87	4.2	1.5	.24
12	2.0	3.0	9.4	10	5.8	29	21	10	1.2	3.5	1.5	.22
13	2.0	2.8	10	10	7.5	28	21	9.6	1.2	2.9	1.6	.17
14	2.0	2.4	11	10	9.0	28	21	7.9	1.1	2.5	1.6	.14
15	1.8	2.5	13	10	11	27	20	4.2	1.2	2.4	1.4	.11
16	1.6	2.4	13	10	14	27	20	4.7	1.3	2.2	1.2	.09
17	1.5	2.4	12	9.6	17	26	20	4.3	1.2	1.8	1.1	.07
18	1.4	2.4	11	9.1	17	26	20	3.5	1.3	1.6	1.1	.07
19	1.8	2.5	10	8.9	19	26	19	3.1	1.6	1.4	1.2	.10
20	1.9	3.0	10	8.6	18	27	18	3.0	1.4	1.5	2.9	.22
21	1.8	3.2	10	8.6	20	26	17	2.9	1.3	4.0	3.2	.14
22	1.8	2.9	10	8.6	22	25	15	2.6	1.5	4.0	.98	.10
23	1.8	2.8	10	8.1	21	25	15	2.2	1.6	4.3	.86	.06
24	1.9	2.8	10	7.8	21	25	15	1.8	3.5	4.1	.73	.06
25	1.9	3.0	10	8.1	21	25	18	1.7	5.6	3.7	.67	.06
26	1.8	3.0	10	8.6	21	25	19	1.6	5.8	3.3	.72	.06
27	1.8	3.7	10	8.3	21	26	18	1.6	6.3	2.9	.74	.42
28	1.6	3.7	10	8.1	20	26	17	1.6	6.4	3.0	.57	.38
29	1.5	6.4	10	7.9	21	26	17	1.6	6.5	4.7	.40	.35
30	1.4	9.4	10	7.8	---	26	18	1.7	10	4.1	.31	.30
31	1.5	---	10	7.7	---	24	---	2.0	---	3.8	.32	---
TOTAL	63.2	92.6	307.0	285.8	393.3	850	594	246.6	75.00	188.5	45.00	4.11
MEAN	2.04	3.09	9.90	9.22	13.6	27.4	19.8	7.95	2.50	6.08	1.45	.14
MAX	3.9	9.4	13	10	22	33	24	19	10	15	3.2	.42
MIN	1.4	1.3	8.1	7.7	5.8	24	15	1.6	.87	1.4	.31	.05
CFSM	.12	.18	.57	.53	.78	1.57	1.13	.45	.14	.35	.08	.008
IN.	.13	.20	.65	.61	.84	1.81	1.26	.52	.16	.40	.10	.009

CAL YR 1975 TOTAL 3135.21 MEAN 8.59 MAX 23 MIN .34 CFSM .49 IN 6.66
WTR YR 1976 TOTAL 3145.11 MEAN 8.59 MAX 33 MIN .05 CFSM .49 IN 6.69

04099000 ST. JOSEPH RIVER AT MOTTVILLE, MI

LOCATION.--Lat 41°48'03", long 85°45'22", in SW¼ sec. 6, T.8 S., R.12 W., Michigan meridian, St. Joseph County, Hydrologic Unit 04050001, on right bank 500 ft (152 m) upstream from bridge on U.S. Highway 12 at Mottville, 0.4 mi (0.6 km) downstream from Michigan Power Co. hydroelectric plant, 4 mi (6 km) upstream from Pigeon River, and at mile 96 (154 km).

DRAINAGE AREA.--1,866 mi^2 (4,833 km^2).

PERIOD OF RECORD.--October 1923 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1387: 1930, 1932, 1938, 1940-42, 1945. WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 755.3 ft (230.22 m) above mean sea level (Michigan Power Co. benchmark). Prior to Oct. 1, 1951, at site 0.4 mi (0.6 km) upstream at datum 4.2 ft (1.28 m) higher.

REMARKS.--Records good. Flow regulated by powerplants above station. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--53 years, 1,538 ft^3/s (43.56 m^3/s), 11.19 in/yr (284 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,700 ft^3/s (303 m^3/s) Apr. 27, 1950, gage height, 6.56 ft (1.999 m), site and datum then in use; minimum daily, 39 ft^3/s (1.10 m^3/s) Oct. 19, 1963.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,320 ft^3/s (207 m^3/s) Mar. 8, gage height, 8.28 ft (2.524 m); minimum, 125 ft^3/s (3.54 m^3/s) Sept. 6, gage height, 1.06 ft (0.323 m); minimum daily, 304 ft^3/s (8.61 m^3/s) Sept. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	916	803	1860	2160	1540	4330	3780	3540	2250	2050	1240	671
2	1250	978	2070	2020	1680	4360	3780	3290	2300	2110	1210	690
3	1390	1380	2130	1800	1580	4490	3620	3060	2200	1960	1170	705
4	1210	1160	2150	1910	1350	4980	3560	2830	2220	2010	1080	557
5	1010	1190	2190	1990	1410	5780	3440	2640	1890	2130	1100	528
6	1080	1370	2200	1650	1410	6550	3240	2880	1730	1690	1270	304
7	1100	1580	2350	1590	1460	6990	3160	3210	1630	1710	772	652
8	1140	1030	2440	1940	1370	7150	3070	3500	1680	1660	880	650
9	1070	1090	2510	1990	1750	6980	2720	4300	1690	1660	1290	644
10	1470	1580	2320	1940	1470	6730	2640	4580	1630	1180	1060	669
11	641	1490	2310	1480	1390	6400	2700	4440	1650	1250	1020	406
12	1370	1420	2310	1230	1300	6110	2640	4230	1420	1620	968	570
13	1020	1280	2130	1560	1900	5850	2560	3980	1050	973	1120	760
14	1160	1570	2260	1690	2030	5530	2480	3660	1580	1040	824	721
15	1200	1210	2530	1810	1890	5060	2370	3540	1380	1130	624	680
16	1160	999	2700	1760	2530	5020	2300	3590	1250	1170	840	762
17	1170	1440	3060	1720	3230	4840	2340	3660	1420	585	860	792
18	740	1180	3280	1310	3530	4530	2260	3480	1460	865	772	490
19	1180	1200	3090	1770	3840	4250	2190	3200	1530	1310	813	485
20	1350	1100	2900	1660	4180	4070	2200	2930	1120	896	1240	738
21	1140	1420	2850	1290	4520	4110	2260	3030	1580	1210	1000	715
22	1060	970	2630	1360	5020	3990	2100	2930	1570	1250	516	756
23	1070	993	2410	1730	5160	3930	1770	2900	1410	1770	600	767
24	1280	1510	2410	1720	5280	3680	1980	2620	1350	1240	637	744
25	898	1310	2410	1520	5190	3680	2570	2540	1710	1440	648	477
26	1210	1300	2350	1350	5010	3540	2700	1900	1610	1500	688	487
27	1440	861	2280	1340	4810	3670	3270	2100	1730	1380	848	956
28	1420	1490	2140	1590	4610	3750	3660	2160	1790	1390	586	847
29	1100	1080	1980	1350	4440	3860	3750	2170	1730	1280	575	877
30	1290	1430	1930	1470	---	4240	3740	2170	1830	1460	823	1140
31	1550	---	2120	1580	---	4110	---	2170	---	1250	632	---
TOTAL	36085	37414	74300	51280	84880	152560	84850	97230	49390	44169	27706	20240
MEAN	1164	1247	2397	1654	2927	4921	2828	3136	1646	1425	894	675
MAX	1550	1580	3280	2160	5280	7150	3780	4580	2300	2130	1290	1140
MIN	641	803	1860	1230	1300	3540	1770	1900	1050	585	516	304
CFSM	.62	.67	1.28	.89	1.57	2.64	1.52	1.68	.88	.76	.48	.36
IN.	.72	.75	1.48	1.02	1.69	3.04	1.69	1.94	.98	.88	.55	.40

CAL YR 1975 TOTAL 708915 MEAN 1942 MAX 3550 MIN 589 CFSM 1.04 IN 14.13
WTR YR 1976 TOTAL 760104 MEAN 2077 MAX 7150 MIN 304 CFSM 1.11 IN 15.15

04099750 PIGEON RIVER NEAR SCOTT, IN

LOCATION.--Lat 41°44'56", long 85°34'35", in SE¼ NW¼ sec.14, T.38 N., R.8 E., Lagrange County, on right bank 20 ft (6 m) downstream from bridge on County Road 750 North, 1,200 ft (366 m) downstream from Page ditch, 0.7 mile (1.1 km) south of Indiana-Michigan state line, and 1.2 miles (1.9 km) northwest of Scott.

DRAINAGE AREA.--361 mi^2 (935 km^2), of which 53.9 mi^2 (139.6 km^2) does not contribute directly to surface runoff.

PERIOD OF RECORD.--June 1968 to current year.

REVISED RECORDS.--WSP 2111: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 815.00 ft (248.412 m) above mean sea level.

REMARKS.--Records good.

AVERAGE DISCHARGE.--8 years, 340 ft^3/s (9.63 m^3/s), 12.79 in/yr (325 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,780 ft^3/s (50.4 m^3/s) Mar. 5, 1976, gage height, 7.07 ft (2.155 m); minimum daily, 42 ft^3/s (1.19 m^3/s) Oct. 21, 1971.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,780 ft^3/s (50.4 m^3/s) Mar. 5, gage height, 7.07 ft (2.155 m); minimum daily, 118 ft^3/s (3.34 m^3/s) Sept. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	192	160	493	340	222	1200	595	406	363	419	477	132
2	186	160	450	338	222	1300	580	411	358	403	444	118
3	182	170	394	338	218	1450	561	401	320	364	417	135
4	177	167	387	333	212	1500	543	385	295	346	392	135
5	174	170	399	330	210	1650	528	369	278	330	365	132
6	169	170	432	320	210	1600	511	425	263	328	359	130
7	167	177	461	310	205	1540	493	591	253	324	361	126
8	168	190	466	300	205	1440	475	644	246	300	339	123
9	172	187	459	295	202	1380	460	540	237	282	313	132
10	174	187	457	285	202	1330	421	476	227	266	293	182
11	139	187	448	280	220	1290	434	445	221	255	278	180
12	120	190	429	270	255	1260	430	422	210	239	270	155
13	154	185	421	265	350	1230	416	404	207	252	255	139
14	159	182	429	260	500	1180	406	391	202	228	255	135
15	158	177	485	250	700	1110	398	406	201	212	252	135
16	155	175	537	245	930	1040	390	501	227	190	238	137
17	152	177	538	238	1110	985	381	515	222	181	225	139
18	152	172	478	232	1200	939	373	464	215	185	216	139
19	165	172	427	227	1260	889	370	427	237	179	209	135
20	180	175	465	222	1300	840	354	403	243	178	202	139
21	177	193	478	218	1330	813	354	384	230	315	197	143
22	170	201	486	215	1320	792	361	367	225	454	194	146
23	167	186	468	215	1310	721	351	351	240	448	191	139
24	162	178	458	215	1300	666	353	339	262	431	183	135
25	167	177	422	215	1260	638	440	326	356	431	216	132
26	172	176	397	218	1200	577	514	313	389	416	196	160
27	172	184	387	220	1130	651	500	301	324	408	192	202
28	167	185	375	222	1100	688	446	292	306	403	179	190
29	150	243	375	222	1000	679	423	276	309	454	170	172
30	160	406	350	222	---	646	411	278	368	543	160	162
31	160	---	340	222	---	614	---	302	---	528	152	---
TOTAL	5119	5659	13591	8082	20883	32638	13272	12555	8034	10292	8190	4359
MEAN	165	189	438	261	720	1053	442	405	268	332	264	145
MAX	192	406	538	340	1330	1650	595	644	389	543	477	202
MIN	120	160	340	215	202	577	351	276	201	178	152	118
CFSM	.46	.52	1.21	.72	1.99	2.92	1.22	1.12	.74	.92	.73	.40
IN.	.53	.58	1.40	.83	2.15	3.36	1.37	1.29	.83	1.06	.84	.45

CAL YR 1975 TOTAL 132894 MEAN 364 MAX 763 MIN 120 CFSM 1.01 IN 13.69
WTR YR 1976 TOTAL 142674 MEAN 390 MAX 1650 MIN 118 CFSM 1.08 IN 14.70

04100222 NORTH BRANCH ELKHART RIVER AT COSPERVILLE, IN

LOCATION.--Lat 41°28'54", long 85°28'32", in NE¼ NW¼ sec.22, T.35 N., R.9 E., Noble County, on right bank at downstream side of bridge on County Road 900 North, 1,300 ft (396 m) downstream from Boyd ditch, 1.7 miles (2.7 km) upstream from Hustin ditch, and 3.1 miles (5.0 km) downstream from Waldron Lake.

DRAINAGE AREA.--142 mi^2 (368 km^2).

PERIOD OF RECORD.--October 1971 to current year. October 1950 to September 1971 at site 3.1 miles (5.0 km) upstream, published as North Branch Elkhart River near Cosperville. Records may not be equivalent.

GAGE.--Water-stage recorder. Datum of gage is 880.12 ft (268.261 m) above mean sea level (levels by State of Indiana, Department of Natural Resources).

REMARKS.--Records good. Flow regulated at times by dam at Waldron Lake.

AVERAGE DISCHARGE.--5 years, 132 ft^3/s (3.738 m^3/s), 12.62 in/yr (321 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 587 ft^3/s (16.6 m^3/s) Mar. 6, 1976, gage height, 7.25 ft (2.210 m); minimum daily, 2.4 ft^3/s (0.068 m^3/s) Nov. 21, 1971.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 587 ft^3/s (16.6 m^3/s) Mar. 6, gage height, 7.25 ft (2.210 m); minimum daily, 14 ft^3/s (0.40 m^3/s) Oct. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	30	167	84	53	433	238	123	95	133	202	33
2	18	37	163	81	53	468	232	118	91	127	195	31
3	16	59	150	79	52	502	226	109	85	113	185	27
4	16	59	132	76	52	531	218	102	77	98	172	23
5	15	55	115	74	52	568	207	94	68	88	160	20
6	14	51	116	73	51	585	196	111	61	85	163	18
7	15	55	116	72	51	583	185	155	56	81	171	18
8	15	58	110	70	50	573	173	158	53	78	168	20
9	17	57	107	69	51	558	161	149	50	74	159	32
10	17	55	102	67	58	539	150	138	45	67	150	45
11	16	64	98	65	105	521	146	125	41	62	139	42
12	17	56	96	63	152	498	135	116	40	60	128	39
13	16	49	96	60	193	477	124	109	37	54	117	35
14	16	44	99	59	218	456	117	104	34	49	109	32
15	16	41	141	58	229	436	112	118	32	48	102	34
16	15	40	168	57	262	414	108	155	53	48	93	32
17	17	39	168	56	345	393	103	158	54	44	85	31
18	19	38	158	55	383	373	97	154	47	40	78	29
19	25	36	155	54	399	354	91	145	73	37	72	28
20	27	40	142	53	405	335	89	136	72	35	66	35
21	28	49	132	52	425	320	86	128	61	66	63	35
22	30	48	129	51	448	303	83	119	54	105	58	33
23	37	45	108	51	454	287	85	111	49	131	55	28
24	40	43	101	51	451	273	89	106	72	143	53	27
25	45	43	97	51	444	268	126	100	151	141	50	25
26	48	43	96	53	434	259	150	95	161	134	49	35
27	43	49	95	56	419	259	149	90	153	124	49	47
28	39	47	92	55	404	265	144	87	142	118	49	44
29	38	74	91	54	390	261	136	86	132	182	44	39
30	35	147	89	54	---	251	128	86	135	199	39	36
31	33	---	87	53	---	245	---	93	---	203	35	---
TOTAL	762	1551	3716	1906	7083	12588	4284	3678	2274	2967	3258	953
MEAN	24.6	51.7	120	61.5	244	406	143	119	75.8	95.7	105	31.8
MAX	48	147	168	84	454	585	238	158	161	203	202	47
MIN	14	30	87	51	50	245	83	86	32	35	35	18
CFSM	.17	.36	.85	.43	1.72	2.86	1.01	.84	.53	.67	.74	.22
IN.	.20	.41	.97	.50	1.86	3.30	1.12	.96	.60	.78	.85	.25

CAL YR 1975 TOTAL 40873 MEAN 112 MAX 321 MIN 14 CFSM .79 IN 10.71
WTR YR 1976 TOTAL 45020 MEAN 123 MAX 585 MIN 14 CFSM .87 IN 11.79

04100500 ELKHART RIVER AT GOSHEN, IN

LOCATION.--Lat 41°35'36", long 85°50'55", in NE¼ NE¼ sec.8, T.36 N., R.6 E., Elkhart County, on right bank 20 ft (6 m) downstream from River Avenue bridge at Goshen, 0.4 mile (0.6 km) upstream from Rock Run, and at mile 16.1 (25.9 km).

DRAINAGE AREA.--594 mi^2 (1,538 km^2).

PERIOD OF RECORD.--April 1931 to current year.

REVISED RECORDS.--WSP 1337: 1939(M). WSP 1557: 1954. WSP 2111: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 769.43 ft (234.522 m) above mean sea level. Prior to Nov. 20, 1931, nonrecording gage at same site and datum.

REMARKS.--Records good.

AVERAGE DISCHARGE.--45 years, 503 ft^3/s (14.2 m^3/s), 11.50 in/yr (292 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,440 ft^3/s (154 m^3/s) Apr. 4, 1950, gage height, 10.15 ft (3.094 m); maximum gage height, 10.33 ft (3.149 m) July 10, 1951; minimum daily discharge, 7.0 ft^3/s (0.20 m^3/s) Aug. 11, 1964, result of extreme regulation.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,280 ft^3/s (92.9 m^3/s) Mar. 5, gage height, 7.83 ft (2.387 m); minimum daily, 135 ft^3/s (3.82 m^3/s) Oct. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	171	172	967	442	233	2010	816	483	457	727	1570	240
2	168	179	836	432	230	2260	784	471	426	588	1160	234
3	161	216	639	400	230	2470	751	462	393	502	889	227
4	156	235	557	348	230	2670	723	447	368	446	752	219
5	153	228	522	291	232	3040	694	429	348	408	669	211
6	149	218	531	359	232	2980	668	509	331	404	722	206
7	146	233	584	350	232	2470	643	810	314	365	848	203
8	151	231	561	340	233	2150	613	877	304	350	804	197
9	156	228	522	340	234	1930	592	676	290	328	672	213
10	160	230	498	340	235	1800	569	584	282	305	594	273
11	145	230	475	336	463	1690	548	539	266	288	548	244
12	135	229	459	336	778	1610	524	497	252	271	519	222
13	144	229	461	335	1060	1570	505	468	241	250	504	216
14	143	217	506	326	1330	1460	489	452	230	232	516	212
15	145	209	731	300	1170	1360	482	452	233	230	492	209
16	142	202	1120	290	1320	1270	465	486	275	227	457	211
17	142	196	939	280	2310	1200	438	520	271	208	424	211
18	142	194	709	270	2700	1120	417	498	270	197	395	213
19	150	192	501	265	2210	1060	405	476	299	188	377	208
20	167	199	531	260	1910	1010	395	461	319	186	358	223
21	165	206	564	255	1870	980	398	447	296	330	343	237
22	162	210	502	255	2250	925	395	431	278	367	329	223
23	159	212	522	253	2200	865	379	417	313	395	315	212
24	160	213	487	250	1890	823	401	404	381	427	302	205
25	177	219	471	251	1730	789	520	400	566	359	290	203
26	185	220	462	256	1620	773	682	396	716	329	292	266
27	184	230	444	251	1530	999	621	386	607	307	303	297
28	182	226	428	250	1430	1320	556	375	551	357	294	271
29	180	325	392	245	1360	1180	520	384	549	1790	273	257
30	176	646	437	240	---	965	498	395	760	2650	259	242
31	174	---	451	232	---	862	---	443	---	1940	247	---
TOTAL	4930	6974	17809	9378	33452	47611	16491	15075	11186	15951	16517	6805
MEAN	159	232	574	303	1154	1536	550	486	373	515	533	227
MAX	185	646	1120	442	2700	3040	816	877	760	2650	1570	297
MIN	135	172	392	232	230	773	379	375	230	186	247	197
CFSM	.27	.39	.97	.51	1.94	2.59	.93	.82	.63	.87	.90	.38
IN.	.31	.44	1.12	.59	2.09	2.98	1.03	.94	.70	1.00	1.03	.43

CAL YR 1975 TOTAL 192609 MEAN 528 MAX 1860 MIN 135 CFSM .89 IN 12.06
WTR YR 1976 TOTAL 202179 MEAN 552 MAX 3040 MIN 135 CFSM .93 IN 12.66

04101000 ST. JOSEPH RIVER AT ELKHART, IN

LOCATION.--Lat 41°41'30", long 85°58'30", in SW¼ NE¼ sec.5, T.37 N., R.5 E., Elkhart County, on left bank 200 ft (61 m) downstream from mouth of Elkhart River, 200 ft (61 m) upstream from Main Street bridge in Elkhart, 2,000 ft (610 m) downstream from Christiana Creek, and 0.5 mile (0.8 km) downstream from Elkhart Hydroelectric Plant.

DRAINAGE AREA.--3,370 mi^2 (8,728 km^2).

PERIOD OF RECORD.--August 1947 to current year. Gage heights at site 0.8 mile (1.3 km) downstream at different datum from September 1924 to March 1926 are available in the district office.

REVISED RECORDS.--WSP 2111: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 700.00 ft (213.360 m) above mean sea level.

REMARKS.--Records good. The flow is regulated by Elkhart Hydroelectric Plant.

AVERAGE DISCHARGE.--29 years, 3,091 ft^3/s (87.5 m^3/s), 12.46 in/yr (316 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,400 ft^3/s (521 m^3/s) Apr. 5, 1950, gage height, 27.82 ft (8,480 m); minimum daily, 336 ft^3/s (9.52 m^3/s) Aug. 5, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 13,700 ft^3/s (388 m^3/s) Mar. 6, gage height, 25.50 ft (7.772 m); minimum daily, 1,000 ft^3/s (28.3 m^3/s) Oct. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1570	1680	4180	3630	2600	8480	6450	5480	4040	4270	4190	1530
2	1930	1370	3990	3640	2430	9720	6670	5180	4010	4090	3680	1490
3	2110	1740	3950	3160	2720	10200	5570	4960	3810	3730	3110	1510
4	1940	1500	3750	2940	2320	10800	5880	4670	3640	3640	2950	1350
5	2190	1540	3650	2820	2550	12200	5740	4270	3430	3860	2720	1290
6	2290	1570	3800	2760	2490	13300	5510	4950	3250	3320	2920	1080
7	1840	1720	4050	3240	2390	12900	5330	6130	3090	3460	3090	1240
8	1890	1420	4190	2750	2290	12500	5190	6220	2970	2720	2490	1360
9	1870	1230	4140	2700	2480	12000	4870	6580	2970	2940	2740	1450
10	1460	2250	3900	2990	2670	11500	4610	6900	2940	2500	2560	1510
11	1000	1750	3930	3100	2860	11000	4620	6670	2760	2420	2400	1250
12	1570	1820	3790	2620	3470	10500	4540	6340	2790	2730	2290	1330
13	2000	1620	3660	2790	3990	10200	4460	5920	2180	2100	2260	1500
14	1640	1690	3900	3080	4990	9660	4290	5580	2620	2100	2300	1500
15	1670	1530	4570	2960	4460	8980	4160	5370	2640	2100	1890	1320
16	1580	1190	5110	3140	5480	8690	3980	5610	2600	2250	2050	1510
17	1520	1750	5240	2820	7210	8350	4010	5700	2420	1620	2000	1520
18	1450	1640	5320	2570	8230	7900	3880	5580	2630	1650	1880	1270
19	1540	1900	4570	2500	7970	7440	3740	5200	3130	2120	1870	1230
20	1560	1870	4700	2980	7910	7090	3720	4790	2390	1880	2090	1470
21	1360	2130	4570	2490	8370	7010	3800	4760	2960	2690	2180	1460
22	1320	2100	4390	2330	9420	6830	3610	4600	2820	2960	1560	1480
23	1280	1610	4420	2600	9570	6680	3600	4740	2640	3190	1570	1480
24	1470	2430	4070	2860	9390	6400	3080	4190	2590	3190	1530	1430
25	1420	2110	4010	2740	9130	6220	4800	4060	3700	2900	1600	1160
26	1540	2080	3950	2490	8790	6000	5040	3670	3610	2990	1620	1330
27	1640	1900	3750	2370	8440	6480	5440	3700	3540	2670	1670	1850
28	1840	2110	3660	2430	8100	7210	5760	3140	3560	2780	1650	1720
29	1550	2400	3280	2600	7840	6930	5670	3670	3590	3660	1460	1760
30	1700	3050	3380	2470	---	6970	5680	3700	4040	4990	1700	1840
31	1920	---	3570	2590	---	6810	---	3750	---	4890	1490	---
TOTAL	51660	54700	127440	87160	160560	276950	143700	156080	93360	92410	69510	43220
MEAN	1666	1823	4111	2812	5537	8934	4790	5035	3112	2981	2242	1441
MAX	2290	3050	5320	3640	9570	13300	6670	6900	4040	4990	4190	1850
MIN	1000	1190	3280	2330	2290	6000	3080	3140	2180	1620	1460	1080
CFSM	.49	.54	1.22	.83	1.64	2.65	1.42	1.49	.92	.88	.67	.43
IN.	.57	.60	1.41	.96	1.77	3.06	1.59	1.72	1.03	1.02	.77	.48

CAL YR 1975 TOTAL 1250270 MEAN 3425 MAX 6510 MIN 1000 CFSM 1.02 IN 13.80
WTR YR 1976 TOTAL 1356750 MEAN 3707 MAX 13300 MIN 1000 CFSM 1.10 IN 14.98

04101500 ST. JOSEPH RIVER AT NILES, MI

LOCATION.--Lat 41°49'45", long 86°15'35", in SW¼ sec. 26, T.7 S., R.17 W., Berrien County, Hydrologic Unit 04050001, on right bank 100 ft (30 m) upstream from Main Street Bridge at Niles 0.6 mi (1.0 km) downstream from dam at French Paper Co., 1 mi (2 km) upstream from Dowagiac River, at mile 44 (71 km).

DRAINAGE AREA.--3,666 mi^2 (9,495 km^2).

PERIOD OF RECORD.--October 1930 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1387: 1931, 1933-36, 1940-43, 1945-46(M), 1949(M). WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 633.02 ft (192.944 m) above mean sea level. Prior to Oct. 1, 1968, at datum 2.00 ft (0.610 m) higher. Oct. 1, 1930 to Feb. 11, 1931, nonrecording gage on Main Street Bridge, and Feb. 12 to June 30, 1931, nonrecording gage 50 ft (15 m) upstream from present site (gage heights referred to mean sea level). Since Apr. 13, 1970, auxiliary water-stage recorder 1.1 mi (1.8 km) downstream from base gage at same datum. Oct. 1, 1943 to Apr. 12, 1970, auxiliary gage was headwater gage at hydroelectric plant at Buchanan Dam, 8 mi (13 km) downstream from base gage at different datum.

REMARKS.--Records good. Flow regulated by powerplants above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--46 years, 3,160 ft^3/s (89.49 m^3/s), 11.71 in/yr (297 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,200 ft^3/s (572 m^3/s) Apr. 5, 1950, gage height, 15.10 ft (4.602 m), present datum; minimum daily, 420 ft^3/s (11.9 m^3/s) Aug. 30, 1931.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 14,700 ft^3/s (416 m^3/s) Mar. 6, gage height, 12.53 ft (3.819 m); minimum daily, 1,210 ft^3/s (34.3 m^3/s) Sept. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1890	2360	4120	3520	2790	9090	6740	5770	4000	4280	4350	1670
2	1900	1910	4230	3570	2600	10800	6720	5310	4100	4230	3990	1710
3	2160	1740	3410	3330	2800	11400	5940	5000	4000	3880	3540	1670
4	2650	2390	3670	3130	2490	12200	6010	5150	3800	3670	2990	1660
5	2230	2170	3620	2970	2600	13000	5730	4480	3500	3790	2950	1600
6	2480	2190	3940	3080	2770	14400	5730	5120	3200	3220	3280	1540
7	2100	2360	3990	3180	2400	13700	5350	7150	3000	3340	3660	1210
8	2020	2600	3940	2870	2550	12800	5360	7120	3000	3520	3190	1370
9	2140	2080	4170	2570	2550	12200	5070	6530	3000	2920	2610	1620
10	2080	2000	4050	2700	3160	11800	4760	6630	2970	3080	2890	1750
11	2020	2630	3940	2700	2930	11200	4770	6850	2840	2460	2650	1820
12	1540	2720	3820	2820	3690	10900	4540	6300	3120	3120	2700	1330
13	1950	2170	3770	2770	4560	10800	4610	6200	2520	2410	2450	1470
14	1910	2400	3670	3070	5330	10200	4640	5600	2500	2130	3260	1830
15	1960	2540	4650	2930	4790	9350	4080	5820	2700	2430	2120	1510
16	2020	2150	5470	3320	5430	8790	4220	5800	2720	2560	2440	1420
17	2050	2180	5160	3140	8100	8780	4060	5700	2530	2290	2050	1550
18	2010	2790	4970	2840	9310	8320	4000	5600	2730	1600	2330	1480
19	1710	1670	4920	2270	8440	7440	4020	5400	3570	2350	2020	1340
20	2070	1910	4380	3130	8430	7700	3870	5300	2770	2300	2100	1420
21	2170	2060	4430	2670	8910	7160	4270	5300	2570	3480	2560	1650
22	2050	2320	3900	2580	10200	6910	3640	5200	3360	3040	2110	1590
23	2230	1960	4500	2660	10400	6400	3870	5000	3630	3560	1820	1600
24	1540	2280	3690	2930	9910	6480	3670	4700	3050	3910	1630	1660
25	2470	2370	3880	2950	9400	5970	5780	4300	4330	3010	1870	1570
26	1850	2230	3780	2780	9200	6280	5220	3500	4130	3100	1740	1550
27	2150	2430	3700	2580	8650	6550	5630	3800	3670	3150	2240	1730
28	2230	1940	3490	2570	8250	7870	5810	3900	2800	2670	2050	1970
29	2210	2980	3240	2900	7970	7560	6160	3900	3270	4060	1640	2010
30	2070	3250	3500	2610	---	7140	5400	3900	4720	4330	1770	1900
31	2270	---	3580	2930	---	7020	---	3900	---	5620	1830	---
TOTAL	64130	68780	125580	90070	170610	290210	149670	164230	98100	99510	78830	48200
MEAN	2069	2293	4051	2905	5883	9362	4989	5298	3270	3210	2543	1607
MAX	2650	3250	5470	3570	10400	14400	6740	7150	4720	5620	4350	2010
MIN	1540	1670	3240	2270	2400	5970	3640	3500	2500	1600	1630	1210
CFSM	.56	.63	1.11	.79	1.60	2.55	1.36	1.45	.89	.88	.69	.44
IN.	.65	.70	1.27	.91	1.73	2.94	1.52	1.67	1.00	1.01	.80	.49

CAL YR 1975 TOTAL 1309960 MEAN 3588 MAX 7140 MIN 1540 CFSM .98 IN 13.29
WTR YR 1976 TOTAL 1447920 MEAN 3956 MAX 14400 MIN 1210 CFSM 1.08 IN 14.69

04101800 DOWAGIAC RIVER AT SUMNERVILLE, MI

LOCATION.--Lat 41°54'57", long 86°12'47", in SE¼ sec.30, T.6 S., R.16 W., Cass County, Hydrologic Unit 04050001, on right bank 30 ft (9 m) upstream from bridge on Indian Lake Road, 0.3 mi (0.5 km) west of Sumnerville.

DRAINAGE AREA.--255 mi^2 (660 km^2).

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

GAGE.--Water-stage recorder. Datum of gage is 692.62 ft (211.111 m) above mean sea level.

REMARKS.--Records good. Flow regulated by millpond and lake-level control dam above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--16 years, 273 ft^3/s (7.731 m^3/s), 14.54 in/yr (369 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,280 ft^3/s (36.2 m^3/s) June 26, 1968, gage height, 8.78 ft (2.676 m); minimum, 86 ft^3/s (2.44 m^3/s) Sept. 10, 1964; minimum gage height, 2.57 ft (0.783 m) Aug. 8, 9, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 893 ft^3/s (25.3 m^3/s) Apr. 26, gage height, 7.09 ft (2.161 m); minimum, 130 ft^3/s (3.68 m^3/s) Sept. 8, 9, gage height, 3.06 ft (0.933 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	204	211	422	307	249	462	386	410	369	425	296	144
2	204	221	364	302	224	586	392	405	337	370	259	147
3	200	239	330	302	230	635	370	450	312	325	238	144
4	197	267	307	280	255	648	369	413	293	297	219	141
5	192	264	294	277	242	813	371	383	276	277	214	140
6	186	255	409	279	241	782	351	453	263	260	221	139
7	184	280	442	277	233	631	335	679	257	242	228	136
8	186	302	378	269	229	539	322	590	251	236	210	134
9	188	282	357	249	229	493	313	487	239	227	200	142
10	184	272	339	260	261	463	306	436	232	217	196	176
11	182	264	323	268	369	439	314	401	230	207	193	163
12	184	254	312	264	393	450	310	373	228	199	190	157
13	185	256	325	266	480	552	300	355	220	193	185	154
14	184	258	412	271	473	519	297	344	216	188	188	150
15	182	247	622	267	450	485	293	351	214	184	187	149
16	183	241	600	268	545	451	289	472	229	180	175	148
17	186	236	488	252	537	416	282	450	222	174	168	149
18	186	232	410	258	515	401	276	410	223	168	164	147
19	195	229	373	246	519	394	306	379	283	163	164	145
20	211	238	360	257	446	390	296	355	267	167	163	149
21	214	291	342	251	630	411	303	336	254	385	158	151
22	213	297	318	261	798	396	327	319	253	386	155	150
23	212	280	315	257	673	380	315	305	290	342	152	152
24	203	265	305	256	548	370	323	296	318	333	151	148
25	239	257	298	253	484	359	691	283	382	302	151	148
26	249	248	296	256	442	351	879	277	341	277	156	180
27	240	250	292	252	412	432	734	273	300	262	152	219
28	231	250	286	241	390	495	569	268	276	247	149	195
29	218	283	273	255	377	443	485	330	268	249	148	184
30	212	440	301	251	---	416	435	396	420	243	147	181
31	209	---	315	248	---	387	---	411	---	316	145	---
TOTAL	6243	7909	11208	8200	11874	14989	11539	12090	8263	8041	5722	4662
MEAN	201	264	362	265	409	484	385	390	275	259	185	155
MAX	249	440	622	307	798	813	879	679	420	425	296	219
MIN	182	211	273	241	224	351	276	268	214	163	145	134
CFSM	.79	1.04	1.42	1.04	1.60	1.90	1.51	1.53	1.08	1.02	.73	.61
IN.	.91	1.15	1.64	1.20	1.73	2.19	1.68	1.76	1.21	1.17	.83	.68

CAL YR 1975 TOTAL 115115 MEAN 315 MAX 727 MIN 157 CFSM 1.24 IN 16.79
WTR YR 1976 TOTAL 110740 MEAN 303 MAX 879 MIN 134 CFSM 1.19 IN 16.15

04102500 PAW PAW RIVER AT RIVERSIDE, MI

LOCATION.--Lat 42°11'10", long 86°22'06", in SW¼ SE¼ sec.23, T.3 S., R.18 W., Berrien County, Hydrologic Unit 04050001, on left bank 40 ft (12 m) upstream from bridge on Coloma Road, 0.8 mi (1.3 km) east of Riverside.

DRAINAGE AREA.--390 mi^2 (1,010 km^2).

PERIOD OF RECORD.--October 1951 to current year.

REVISED RECORDS.--WSP 1337: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 588.80 ft (179.466 m) above mean sea level. May 10, 1966, to July 11, 1967, nonrecording gage at same site and datum.

REMARKS.--Records good. Diurnal fluctuation, principally during low flow, caused by paper mill above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--25 years, 428 ft^3/s (12.12 m^3/s), 14.90 in/yr (378 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,140 ft^3/s (60.6 m^3/s) Feb. 6, 1968, gage height, 9.32 ft (2.841 m); maximum gage height, 9.49 ft (2.893 m) Apr. 23, 1975; minimum discharge, 99 ft^3/s (2.80 m^3/s) July 5, 1964, gage height, 2.66 ft (0.811 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,500 ft^3/s (42.5 m^3/s) Feb. 22, gage height, 8.87 ft (2.704 m); minimum, 250 ft^3/s (7.08 m^3/s) Sept. 8, gage height, 4.07 ft (1.241 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	383	353	552	540	446	897	642	1120	897	468	509	264
2	384	357	562	536	430	915	656	1030	876	465	480	262
3	385	368	548	538	407	1010	662	951	932	459	447	260
4	385	390	552	536	470	1020	654	875	964	457	411	260
5	380	393	566	526	440	1100	636	812	947	448	382	257
6	373	395	628	514	440	1260	614	795	869	416	364	255
7	365	408	727	520	440	1280	591	828	768	388	353	253
8	359	432	746	510	430	1310	569	857	679	374	340	251
9	356	439	721	500	430	1260	546	815	602	365	331	255
10	354	442	712	500	444	1180	524	796	544	355	324	274
11	349	445	721	500	515	1070	515	792	488	348	318	281
12	345	445	738	500	599	978	503	790	454	338	317	285
13	343	448	742	500	682	919	488	770	444	328	315	282
14	343	450	770	500	755	876	479	726	429	321	314	279
15	344	445	895	500	757	842	471	683	405	334	312	272
16	337	430	950	500	815	812	474	669	389	315	309	268
17	328	421	878	490	908	785	474	679	371	308	304	266
18	324	420	858	480	974	769	473	670	364	304	297	266
19	325	421	915	480	1040	753	473	649	389	299	291	267
20	332	420	935	480	1050	751	474	628	391	320	287	266
21	336	439	915	490	1160	768	478	612	386	578	284	267
22	337	450	850	490	1440	734	484	598	386	735	281	265
23	335	450	782	490	1300	702	482	575	396	580	279	266
24	335	445	718	480	1210	676	484	540	416	532	275	265
25	353	445	685	480	1230	655	619	509	436	485	272	265
26	363	440	649	480	1220	635	913	483	438	442	272	274
27	366	436	616	470	1130	635	957	462	424	410	272	282
28	363	436	592	470	1020	643	884	449	414	433	272	289
29	360	446	566	470	936	651	994	486	412	456	272	294
30	359	494	554	460	---	637	1130	574	450	460	270	293
31	354	---	546	460	---	631	---	746	---	500	265	---
TOTAL	10955	12803	22189	15390	23118	27154	18343	21969	16360	13021	10019	8083
MEAN	353	427	716	496	797	876	611	709	545	420	323	269
MAX	385	494	950	540	1440	1310	1130	1120	964	735	509	294
MIN	324	353	546	460	407	631	471	449	364	299	265	251
CFSM	.91	1.09	1.84	1.27	2.04	2.25	1.57	1.82	1.40	1.08	.83	.69
IN.	1.04	1.22	2.12	1.47	2.21	2.59	1.75	2.10	1.56	1.24	.96	.77

CAL YR 1975 TOTAL 212100 MEAN 581 MAX 2030 MIN 300 CFSM 1.49 IN 20.23
WTR YR 1976 TOTAL 199404 MEAN 545 MAX 1440 MIN 251 CFSM 1.40 IN 19.02

04102700 BLACK RIVER NEAR BANGOR, MI

LOCATION.--Lat 42°21'15", long 86°11'15", in NW¼ sec.28, T.1 S., R.16 W., Van Buren County, Hydrologic Unit 04050002, on left bank 50 ft (15 m) upstream from bridge on 66th Street, 4.9 mi (7.9 km) northwest of Bangor.

DRAINAGE AREA.--83.6 mi^2 (216.5 km^2).

PERIOD OF RECORD.--June 1966 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 610 ft (186 m) from topographic map (nearest 10 ft).

REMARKS.--Records good. Occasional regulation caused by mills above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--10 years, 104 ft^3/s (2.945 m^3/s), 16.89 in/yr (429 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,320 ft^3/s (37.4 m^3/s) Apr. 19, 1975, gage height, 13.16 ft (4.011 m); minimum, 20 ft^3/s (0.57 m^3/s) Sept. 28, 1966, gage height, 1.83 ft (0.558 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 400 ft^3/s (11.3 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 16	0300	500	14.2	8.53	2.600	Mar. 6	0100	619	17.5	9.19	2.801
Feb. 14	0300	463	13.1	7.91	2.411	Apr. 26	1700	599	17.0	9.04	2.755
Feb. 22	0900	*694	19.7	*9.77	2.978	June 1	0500	583	16.5	8.91	2.716

Minimum discharge, 25 ft^3/s (0.71 m^3/s) Sept. 29, gage height, 1.88 ft (0.573 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	50	211	97	78	170	119	167	559	64	70	30
2	46	55	173	97	78	269	118	136	434	70	58	30
3	45	61	143	95	77	412	111	145	334	60	50	30
4	43	76	122	93	77	453	104	138	255	52	46	30
5	42	77	105	91	76	540	100	119	171	47	43	30
6	41	71	161	90	76	568	95	131	116	44	42	30
7	41	71	235	90	76	412	89	246	95	42	39	30
8	41	76	200	89	75	321	83	233	83	41	39	30
9	41	76	170	88	75	265	79	182	73	39	37	46
10	41	74	148	87	85	224	75	142	67	38	37	49
11	41	72	132	86	152	192	85	118	65	38	34	32
12	40	67	116	86	254	173	90	103	61	36	37	32
13	40	66	131	85	394	185	83	92	53	36	28	33
14	41	71	238	85	435	182	77	85	51	37	44	32
15	41	71	413	84	366	176	73	85	50	36	37	32
16	42	67	467	84	396	162	128	180	49	33	34	32
17	42	63	342	83	396	145	147	260	50	33	34	33
18	42	60	270	83	383	131	123	230	41	35	33	32
19	43	57	237	83	426	125	101	190	57	52	32	32
20	47	58	217	82	366	131	88	150	52	37	32	33
21	48	87	167	82	425	205	85	125	48	50	32	33
22	47	98	137	82	667	185	88	100	45	40	31	33
23	46	88	119	82	551	163	87	85	49	30	31	39
24	45	75	105	81	414	149	85	76	62	37	31	36
25	55	69	97	81	336	133	253	70	68	37	30	34
26	62	64	93	80	285	117	566	67	50	37	30	41
27	60	62	91	80	239	125	523	63	51	237	30	47
28	56	63	87	79	198	192	371	61	45	144	31	38
29	53	74	82	74	170	177	281	98	46	104	32	29
30	51	170	81	84	---	153	217	198	47	79	30	35
31	49	---	90	79	---	133	---	443	---	74	30	---
TOTAL	1417	2191	5380	2642	7527	6968	4524	4518	3227	1739	1144	1023
MEAN	45.7	73.0	174	85.2	263	225	151	146	108	56.1	36.9	34.1
MAX	62	170	467	97	667	568	566	443	559	237	70	49
MIN	40	50	81	74	75	117	73	61	41	30	28	29
CFSM	.55	.87	2.08	1.02	3.15	2.69	1.81	1.75	1.29	.67	.44	.41
IN.	.63	.97	2.39	1.18	3.39	3.10	2.01	2.01	1.44	.77	.51	.46

CAL YR 1975 TOTAL 49798 MEAN 136 MAX 1190 MIN 36 CFSM 1.63 IN 22.16
WTR YR 1976 TOTAL 42400 MEAN 116 MAX 667 MIN 28 CFSM 1.39 IN 18.87

04102850 SOUTH BRANCH KALAMAZOO RIVER NEAR ALBION, MI

LOCATION.--Lat 42°12'11", long 84°47'39", in SE¼ SE¼ sec.17, T.3 S., R.4 W., Calhoun County, Hydrologic Unit 04050003, on right bank at downstream side of bridge on F Drive South, 3.6 mi (5.8 km) southwest of Albion.

DRAINAGE AREA.--146 mi^2 (378 km^2).

PERIOD OF RECORD.--October 1971 to September 30, 1976 (discontinued).

GAGE.--Water-stage recorder. Altitude of gage is 950 ft (290 m) from topographic map.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, Nov. 29 to Jan. 5, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--5 years, 130 ft^3/s (3.682 m^3/s), 12.09 in/yr (307 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 500 ft^3/s (14.2 m^3/s) Mar. 6, 1976, gage height, 4.37 ft (1.332 m); maximum gage height, 4.61 ft (1.405 m) Feb. 6, 1964 (backwater from ice); minimum daily discharge, 36 ft^3/s (1.02 m^3/s) Aug. 16, 1972; minimum gage height, 1.60 ft (0.488 m) Dec. 2, 1971, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 500 ft^3/s (14.2 m^3/s) Mar. 6, gage height, 4.37 ft (1.332 m); minimum, 57 ft^3/s (1.61 m^3/s) Sept. 25, 26; minimum gage height, 2.07 ft (0.631 m) Feb. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	115	98	145	115	96	229	223	175	162	210	110	73
2	117	99	165	110	94	264	222	171	157	210	103	75
3	113	103	180	105	93	365	217	168	147	194	96	73
4	115	105	180	105	92	433	213	159	140	178	92	75
5	110	105	185	92	90	481	206	152	131	160	89	71
6	108	103	180	110	90	493	199	195	125	150	87	71
7	105	103	180	105	90	462	194	313	122	141	87	70
8	103	106	175	105	91	411	192	339	120	138	85	70
9	108	106	170	105	91	365	185	332	117	133	82	71
10	113	105	165	105	98	332	182	295	115	127	80	82
11	112	108	155	105	120	309	183	262	113	125	78	83
12	110	106	155	105	148	300	178	225	113	124	78	80
13	106	105	150	105	175	313	176	203	110	120	78	75
14	105	101	165	105	206	316	171	187	108	118	83	75
15	99	98	195	100	218	313	164	183	106	115	90	68
16	98	94	220	97	258	297	162	187	108	113	92	70
17	94	92	225	94	318	280	159	208	106	112	89	70
18	96	92	215	94	346	265	153	197	108	108	85	70
19	101	93	200	100	346	253	152	185	145	105	78	70
20	110	92	190	105	320	248	148	175	159	105	78	71
21	110	96	175	105	320	246	150	169	155	131	77	68
22	108	100	165	105	362	246	153	166	148	129	75	63
23	103	96	155	100	350	250	150	160	134	125	73	63
24	101	92	150	100	327	243	162	157	140	120	73	59
25	103	92	145	100	300	236	229	152	175	115	73	61
26	108	93	135	99	278	227	265	150	178	108	77	68
27	108	94	130	98	258	241	262	148	169	113	73	78
28	103	94	125	98	241	253	243	147	153	117	73	80
29	101	105	125	98	227	250	213	145	147	118	73	73
30	101	120	120	97	---	236	188	152	192	117	75	70
31	98	---	115	96	---	227	---	162	---	112	73	---
TOTAL	3282	2996	5135	3163	6043	9384	5694	6019	4103	4091	2555	2146
MEAN	106	99.9	166	102	208	303	190	194	137	132	82.4	71.5
MAX	117	120	225	115	362	493	265	339	192	210	110	83
MIN	94	92	115	92	90	227	148	145	106	105	73	59
CFSM	.73	.68	1.14	.70	1.42	2.08	1.30	1.33	.94	.90	.56	.49
IN.	.84	.76	1.31	.81	1.54	2.39	1.45	1.53	1.05	1.04	.65	.55

CAL YR 1975 TOTAL 52605 MEAN 144 MAX 370 MIN 64 CFSM .99 IN 13.40
WTR YR 1976 TOTAL 54611 MEAN 149 MAX 493 MIN 59 CFSM 1.02 IN 13.91

04103500 KALAMAZOO RIVER AT MARSHALL, MI

LOCATION.--Lat 42°15'55", long 84°57'55", on line between sec.25 and 26, T.2 S., R.6 W., Calhoun County, Hydrologic Unit 04050003, on left bank at upstream side of bridge on U.S. Highway 27 at Marshall.

DRAINAGE AREA.--449 mi^2 (1,163 km^2).

PERIOD OF RECORD.--October 1948 to current year. Monthly discharge only for October 1948, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 877.09 ft (267.337 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to Nov. 11, 1948, nonrecording gage at same site and datum.

REMARKS.--Records good. Diurnal fluctuation caused by powerplant above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--28 years, 314 ft^3/s (8.89 m^3/s), 950 in/yr (241 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,130 ft^3/s (60.3 m^3/s) Mar. 29, 1950, gage height, 8.20 ft (2.499 m); minimum, 12 ft^3/s (0.34 m^3/s) Aug. 2, 1967; minimum gage height, 3.00 ft (0.914 m) May 16, 1963; minimum daily discharge, 31 ft^3/s (0.88 m^3/s) Aug. 16, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,510 ft^3/s (42.8 m^3/s) Mar. 5, gage height, 7.03 ft (2.143 m); minimum, 41 ft^3/s (1.16 m^3/s) July 20; minimum gage height, 3.43 ft (1.045 m) Sept. 5, 8, 9; minimum daily discharge, 61 ft^3/s (1.73 m^3/s) Sept. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	217	275	513	277	279	638	688	654	451	700	197	219
2	360	274	521	428	313	707	675	606	386	696	307	169
3	256	293	521	325	277	926	650	588	476	658	219	177
4	274	264	501	319	303	1130	620	563	334	602	255	278
5	225	316	424	295	313	1370	594	535	384	547	325	178
6	279	294	352	344	304	1440	570	572	396	457	233	146
7	255	297	516	388	264	1390	546	912	386	409	168	293
8	282	276	520	375	265	1280	522	1040	307	380	279	189
9	224	292	464	243	363	1140	504	1030	373	347	276	252
10	292	303	421	225	340	1010	492	998	340	361	205	61
11	263	338	448	336	391	914	487	910	317	213	221	178
12	269	331	444	388	395	848	481	784	302	407	264	217
13	267	280	337	296	445	862	475	685	256	307	256	213
14	299	285	498	285	495	850	468	611	376	239	209	215
15	254	287	676	375	523	839	465	572	306	296	219	210
16	200	227	740	321	651	794	487	592	261	294	300	355
17	317	309	719	238	790	748	496	732	376	303	212	206
18	267	290	638	286	871	687	421	752	306	165	201	201
19	238	302	462	373	932	654	446	681	303	336	281	251
20	254	262	547	270	890	652	483	616	417	301	267	279
21	288	278	469	273	919	704	478	587	387	287	166	189
22	287	258	460	284	988	679	391	550	394	324	202	197
23	281	276	393	334	946	665	432	531	378	307	347	241
24	278	330	417	302	897	654	458	517	405	275	152	229
25	309	306	333	303	844	640	747	369	480	274	207	195
26	265	261	418	358	781	612	932	500	484	202	231	351
27	304	150	310	287	723	679	911	480	456	393	205	316
28	309	385	349	276	673	810	890	336	374	290	184	205
29	239	328	336	309	624	777	838	388	416	275	288	276
30	233	482	423	355	---	748	749	492	543	312	150	273
31	307	---	386	270	---	739	---	491	---	288	235	---
TOTAL	8392	8849	14556	9738	16794	26586	17396	19674	11370	11245	7261	6759
MEAN	271	295	470	314	579	858	580	635	379	363	234	225
MAX	360	482	740	428	988	1440	932	1040	543	700	347	355
MIN	200	150	310	225	264	612	391	336	256	165	150	61
CFSM	.60	.66	1.05	.70	1.29	1.91	1.29	1.41	.84	.81	.52	.50
IN.	.70	.73	1.21	.81	1.39	2.20	1.44	1.63	.94	.93	.60	.56

CAL YR 1975 TOTAL 147145 MEAN 403 MAX 937 MIN 63 CFSM .90 IN 12.19
WTR YR 1976 TOTAL 158625 MEAN 433 MAX 1440 MIN 61 CFSM .96 IN 13.14

04105000 BATTLE CREEK AT BATTLE CREEK, MI

LOCATION.--Lat 42°19'55", long 85°09'15", in NW¼ sec.5, T.2 S., R.7 W., Calhoun County, Hydrologic Unit 04050003, on right bank 350 ft (107 m) upstream from Emmett Street Bridge at Battle Creek, and 3.0 mi (4.8 km) upstream from mouth.

DRAINAGE AREA.--241 mi^2 (624 km^2).

PERIOD OF RECORD.--October 1930 to September 1931, October 1932 to July 1933, January 1934 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1387: 1931, 1944. WSP 1507: 1956.

GAGE.--Water-stage recorder. Datum of gage is 823.24 ft (250.924 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to May 14, 1951, nonrecording gage, at same site datum.

REMARKS.--Records good. Occasional slight regulation prior to November 1943. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--43 years (1930-31, 1934-76), 199 ft^3/s (5.636 m^3/s), 11.21 in/yr (285 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,640 ft^3/s (103 m^3/s) Apr. 7, 1947, gage height, 4.48 ft (1.366 m), from floodmark; minimum, 22 ft^3/s (0.62 m^3/s) Aug. 14, 1934; minimum gage height, about -0.5 ft (-.152 m) in July 1936 and on Aug. 31, 1939, due to opening of gates at dam forming control.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,560 ft^3/s (44.2 m^3/s) Mar. 7, gage height, 2.66 ft (0.811 m); minimum, 52 ft^3/s (1.47 m^3/s) Aug. 31, Sept. 1, 5, 14, 15, gage height, 0.59 ft (0.180 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	108	99	223	238	151	592	450	640	233	204	85	55
2	106	102	248	237	150	562	440	550	237	240	91	62
3	104	112	282	228	158	621	430	492	237	287	85	80
4	101	121	298	175	152	879	400	451	228	330	80	68
5	99	127	287	179	150	1290	380	414	204	334	78	55
6	96	135	302	190	151	1470	357	411	181	304	77	59
7	94	137	325	197	150	1540	337	448	155	256	76	67
8	93	141	358	187	148	1350	319	518	134	204	73	69
9	94	143	394	177	144	1090	299	690	123	165	71	62
10	94	147	405	166	146	907	281	717	115	141	68	64
11	94	146	388	160	167	773	272	621	111	124	66	67
12	94	140	363	159	195	677	252	528	108	112	64	65
13	94	132	340	159	251	621	241	457	104	106	63	67
14	91	127	348	156	290	586	233	410	101	100	65	60
15	91	123	411	159	409	584	227	376	98	95	67	55
16	90	120	618	161	632	559	247	344	101	91	68	69
17	90	117	925	161	869	511	274	316	106	87	65	73
18	92	111	871	159	1060	465	306	316	107	83	62	85
19	95	104	693	154	1150	419	325	333	122	83	60	85
20	98	106	619	149	1130	394	310	344	122	79	59	69
21	103	122	510	150	1120	384	294	338	114	115	58	60
22	105	130	421	150	1170	372	281	311	106	112	56	65
23	104	133	403	150	1360	373	273	289	100	103	56	87
24	103	128	347	150	1340	371	284	268	108	96	55	94
25	119	125	327	150	1120	355	364	258	130	89	55	93
26	116	121	301	150	947	360	499	242	136	82	57	115
27	114	118	283	150	825	380	823	233	130	86	56	130
28	111	122	253	152	720	420	1020	218	119	81	56	138
29	108	135	205	150	639	450	915	204	117	72	57	133
30	105	182	237	150	---	460	761	194	159	66	57	123
31	102	---	237	150	---	460	---	208	---	76	54	---
TOTAL	3108	3806	12222	5203	16894	20275	11894	12139	4146	4403	2040	2374
MEAN	100	127	394	168	583	654	396	392	138	142	65.8	79.1
MAX	119	182	925	238	1360	1540	1020	717	237	334	91	138
MIN	90	99	205	149	144	355	227	194	98	66	54	55
CFSM	.41	.53	1.63	.70	2.42	2.71	1.64	1.63	.57	.59	.27	.33
IN.	.48	.59	1.89	.80	2.61	3.13	1.84	1.87	.64	.68	.31	.37

CAL YR 1975 TOTAL 108337 MEAN 297 MAX 3470 MIN 69 CFSM 1.23 IN 16.72
WTR YR 1976 TOTAL 98504 MEAN 269 MAX 1540 MIN 54 CFSM 1.12 IN 15.20

04105500 KALAMAZOO RIVER NEAR BATTLE CREEK, MI

LOCATION.--Lat 42°19'26", long 85°11'51", in SW¼ sec.1, T.2 S., R.8 W., Calhoun County, Hydrologic Unit 04050003, on left bank 20 ft (6 m) upstream from bridge on Kendall Street in Battle Creek.

DRAINAGE AREA.--824 mi^2 (2,134 km^2).

PERIOD OF RECORD.--July 1937 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 924: 1938-39. WSP 1387: 1938, 1945-46, 1948.

GAGE.--Water-stage recorder. Altitude of gage is 815 ft (248 m) from topographic map (nearest 5 ft). Prior to Oct. 1, 1957, water-stage recorder at site 4.7 mi (7.6 km) downstream at different datum. Oct. 1, 1957, to June 15, 1959, nonrecording gage at bridge 1,800 ft (549 m) upstream at different datum. June 16, 1959, to Oct. 13, 1960, nonrecording gage at present site and datum.

REMARKS.--Records good. Diurnal fluctuation, below 1,500 ft^3/s (42.5 m^3/s), caused by powerplants above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--39 years, 653 ft^3/s (18.49 m^3/s), 10.76 in/yr (273 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,290 ft^3/s (206 m^3/s) Apr. 7, 1947, gage height, 9.13 ft (2,783 m), site and datum then in use; minimum, 50 ft^3/s (1.42 m^3/s) Sept. 22, 1939, site then in use; minimum daily, 86 ft^3/s (2.44 m^3/s) Aug. 5, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,460 ft^3/s (98.0 m^3/s) Mar. 6, gage height, 6.32 ft (1.296 m); minimum, 228 ft^3/s (6.46 m^3/s) Sept. 11, gage height, 3.05 ft (0.930 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	530	562	1050	874	578	1620	1480	1740	1080	1140	493	371
2	413	562	1050	690	690	1670	1430	1600	919	1170	458	352
3	522	584	1060	856	650	1980	1340	1530	983	1170	471	330
4	478	564	1060	618	586	2330	1270	1450	919	1180	448	326
5	406	583	1020	626	602	3040	1230	1360	775	1130	477	385
6	385	567	1120	715	610	3410	1210	1450	856	1030	497	316
7	455	601	1120	784	594	3440	1170	1810	707	862	374	308
8	406	624	1200	724	562	3160	1110	2040	724	808	420	410
9	448	562	1200	650	570	2720	1070	2120	634	722	418	361
10	455	584	1140	562	732	2360	1030	2160	674	649	442	380
11	485	597	1120	586	793	2090	1030	2030	618	649	396	236
12	448	617	1150	698	856	1920	881	1760	515	494	401	335
13	413	552	1150	707	1000	1860	976	1550	538	610	429	353
14	536	548	1200	642	1100	1790	969	1400	594	494	419	361
15	550	442	1550	626	1250	1740	959	1310	570	501	388	373
16	495	577	1740	715	1610	1680	1100	1340	507	508	456	422
17	413	413	1960	642	1990	1580	1060	1540	530	515	407	471
18	545	472	1910	682	2360	1480	1060	1570	610	536	384	334
19	478	519	1580	690	2530	1380	974	1450	634	421	384	413
20	471	555	1480	658	2520	1350	1090	1360	618	515	418	388
21	474	563	1380	562	2600	1440	1100	1300	666	689	395	436
22	493	531	1150	586	2740	1400	1080	1220	658	633	345	369
23	493	615	1080	578	2840	1320	926	1150	626	587	498	390
24	485	538	1010	618	2810	1310	1140	1110	698	617	357	405
25	572	607	964	594	2540	1300	1580	993	829	517	337	378
26	593	557	874	602	2280	1260	1980	955	820	443	379	486
27	491	495	883	618	2030	1330	2180	1000	793	557	367	621
28	586	500	793	594	1810	1540	2330	892	666	531	326	481
29	555	731	784	578	1660	1510	2220	802	715	508	349	471
30	436	941	811	618	---	1530	1960	983	983	541	396	476
31	512	---	838	610	---	1540	---	1080	---	455	295	---
TOTAL	15022	17163	36427	20303	43493	58080	38935	44055	21459	21182	12624	11738
MEAN	485	572	1175	655	1500	1874	1298	1421	715	683	407	391
MAX	593	941	1960	874	2840	3440	2330	2160	1080	1180	498	621
MIN	385	413	784	562	562	1260	881	802	507	421	295	236
CFSM	.59	.69	1.43	.79	1.82	2.27	1.58	1.72	.87	.83	.49	.47
IN.	.68	.77	1.64	.92	1.96	2.62	1.76	1.99	.97	.96	.57	.53

CAL YR 1975 TOTAL 308757 MEAN 846 MAX 4590 MIN 227 CFSM 1.03 IN 13.94
WTR YR 1976 TOTAL 340481 MEAN 930 MAX 3440 MIN 236 CFSM 1.13 IN 15.37

04105700 AUGUSTA CREEK NEAR AUGUSTA, MI

LOCATION.--Lat 42°21'12", long 85°21'14", in SW¼ sec.27, T.1 S., R.9 W., Kalamazoo County, Hydrologic Unit 04050003, on left bank 15 ft (5 m) downstream from bridge on EF Road, and 1.3 mi (2.1 km) north of Augusta.

DRAINAGE AREA.--38.9 mi^2 (100.8 km^2).

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 815 ft (248 m) from topographic map. Prior to June 15, 1965, nonrecording gage at same site and datum.

REMARKS.--Records good. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--12 years, 42.6 ft^3/s (1.206 m^3/s), 14.87 in/yr (378 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 308 ft^3/s (8.72 m^3/s) Apr. 19, 1975, gage height, 3.06 ft (0.933 m); minimum, 9.5 ft^3/s (0.27 m^3/s) Dec. 30, 1970, result of freezeup; minimum gage height, 0.65 ft (0.198 m) Jan. 19, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 121 ft^3/s (3.43 m^3/s) Feb. 22, gage height, 2.22 ft (0.677 m); minimum, 22 ft^3/s (0.62 m^3/s) Sept. 7; minimum gage height, 0.88 ft (0.268 m) Sept. 7, 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	44	71	52	45	66	57	58	52	56	35	24
2	41	47	65	51	44	76	58	59	48	52	34	24
3	40	51	59	50	45	93	57	63	46	45	33	24
4	39	54	55	44	44	98	56	61	46	40	31	24
5	39	53	55	49	43	112	55	56	44	38	30	23
6	38	50	82	47	43	112	54	65	42	36	30	23
7	39	55	81	47	42	98	53	82	37	34	30	23
8	38	57	71	43	43	84	51	78	35	33	29	23
9	36	55	64	46	42	76	49	68	32	32	28	26
10	37	56	60	46	47	72	49	60	31	31	28	30
11	38	53	57	46	54	70	50	57	34	31	28	29
12	38	50	56	46	53	70	49	54	33	30	28	28
13	37	49	59	47	62	79	48	51	32	29	27	27
14	37	47	76	47	64	79	47	49	31	28	29	27
15	37	46	96	47	67	74	47	50	31	27	29	27
16	38	46	98	47	81	69	61	53	35	27	28	28
17	37	46	86	43	87	64	59	56	33	27	27	28
18	38	45	69	50	86	61	53	56	31	27	26	27
19	42	45	62	45	86	61	58	50	35	27	25	27
20	45	46	60	45	80	61	55	48	33	28	25	29
21	45	52	56	45	94	63	55	48	34	58	24	30
22	43	51	51	45	116	61	54	46	35	71	24	30
23	43	49	56	43	106	59	53	44	34	49	24	30
24	42	47	52	46	92	57	57	43	38	41	24	29
25	48	47	51	46	82	56	86	43	41	38	24	29
26	49	46	51	46	75	54	96	43	40	35	25	36
27	46	47	50	46	70	65	93	42	38	38	24	41
28	45	48	50	42	66	71	81	42	36	36	26	37
29	44	55	46	46	65	68	69	47	37	37	26	35
30	44	74	53	45	---	64	62	51	50	37	25	34
31	43	---	54	43	---	59	---	54	---	36	24	---
TOTAL	1268	1511	1952	1431	1924	2252	1772	1677	1124	1154	850	852
MEAN	40.9	50.4	63.0	46.2	66.3	72.6	59.1	54.1	37.5	37.2	27.4	28.4
MAX	49	74	98	52	116	112	96	82	52	71	35	41
MIN	36	44	46	42	42	54	47	42	31	27	24	23
CFSM	1.05	1.30	1.62	1.19	1.70	1.87	1.52	1.39	.96	.96	.70	.73
IN.	1.21	1.44	1.87	1.37	1.84	2.15	1.69	1.60	1.07	1.10	.81	.81

CAL YR 1975 TOTAL 21318 MEAN 58.4 MAX 254 MIN 29 CFSM 1.50 IN 20.39
WTR YR 1976 TOTAL 17767 MEAN 48.5 MAX 116 MIN 23 CFSM 1.25 IN 16.99

04106000 KALAMAZOO RIVER AT COMSTOCK, MI

LOCATION.--Lat 42°17'05", long 85°30'50", in NE¼ sec.19, T.2 S., R.10 W., Kalamazoo County, Hydrologic Unit 04050003, on left bank at downstream side of bridge on River Street in Comstock, 0.2 mi (0.3 km) downstream from Comstock Creek.

DRAINAGE AREA.--1,010 mi^2 (2,620 km^2), approximately.

PERIOD OF RECORD.--April to August 1931, October 1932 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 824: 1933-36. WSP 1387: 1933, 1934(M), 1935, 1936(M), 1938(M), 1940(M), 1941.

GAGE.--Water-stage recorder. Datum of gage is 759.12 ft (231.380 m) above mean sea level. Prior to November 1945, nonrecording gage at same site and datum.

REMARKS.--Records good. Flow regulated by powerplants above station. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--44 years, (1932-76), 847 ft^3/s (23.99 m^3/s), 11.39 in/yr (289 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,910 ft^3/s (196 m^3/s) Apr. 8, 1947, gage height, 7.94 ft (2.420 m); minimum, 119 ft^3/s (3.37 m^3/s) May 29, 1958, gage height, 0.09 ft (0.027 m); minimum daily, 185 ft^3/s (5.24 m^3/s) Aug. 7, 1934.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,930 ft^3/s (111 m^3/s) Mar. 8, gage height, 5.37 ft (1.637 m); minimum, 256 ft^3/s (7.25 m^3/s) Aug. 24, gage height, 0.91 ft (0.277 m); minimum daily, 382 ft^3/s (10.8 m^3/s) Aug. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	746	685	1300	1150	868	2000	1820	2390	1460	1500	697	427
2	740	756	1340	1150	625	1960	1810	2180	1400	1470	688	445
3	763	822	1340	1080	598	2200	1750	2030	1320	1440	670	454
4	730	851	1320	1000	787	2380	1680	1880	1270	1420	661	445
5	742	808	1320	742	886	2680	1620	1740	1200	1380	679	445
6	731	833	1470	670	868	3220	1510	1760	1030	1380	562	472
7	733	929	1530	931	850	3740	1450	1890	1100	1230	634	427
8	729	946	1460	1020	823	3890	1440	2080	895	1100	535	472
9	723	927	1490	832	787	3750	1370	2280	814	958	553	508
10	645	899	1480	733	841	3400	1210	2370	877	904	580	526
11	700	914	1440	868	1030	2950	1230	2390	1090	769	643	454
12	753	879	1410	931	1080	2630	1330	2350	895	742	697	436
13	781	880	1380	1120	1220	2330	1170	2190	742	697	472	490
14	704	817	1420	1070	1370	2140	1180	1850	814	742	499	481
15	771	785	1630	1040	1450	2170	1170	1770	751	697	553	436
16	787	774	1860	976	1610	2100	1220	1680	751	607	535	508
17	714	870	1930	841	2050	1980	1320	1700	904	607	508	535
18	634	761	2140	661	2290	1830	1310	1770	859	616	616	472
19	745	760	1980	715	2420	1820	1350	1840	958	634	625	481
20	792	783	1980	859	2670	1760	1290	1770	967	544	535	481
21	789	870	1890	1030	2960	1720	1330	1640	940	796	463	517
22	737	890	1630	895	3090	1750	1380	1540	1010	1040	490	553
23	758	817	1570	769	3190	1720	1350	1440	895	1060	526	454
24	756	837	1460	832	3230	1620	1280	1430	877	850	481	427
25	778	810	1310	913	3200	1630	1600	1290	976	733	499	508
26	823	841	1230	886	2990	1590	2050	1260	1240	697	472	598
27	846	822	1160	886	2650	1610	2330	1260	1160	769	481	778
28	811	753	1160	850	2390	1710	2470	1250	1060	805	472	742
29	791	798	1080	859	2170	1840	2620	1210	922	859	382	589
30	776	1110	1110	859	---	1820	2590	1180	1040	697	436	598
31	695	---	1160	859	---	1830	---	1330	---	715	571	---
TOTAL	23223	25227	45980	28027	50993	69770	47230	54740	30217	28458	17215	15159
MEAN	749	841	1483	904	1758	2251	1574	1766	1007	918	555	505
MAX	846	1110	2140	1150	3230	3890	2620	2390	1460	1500	697	778
MIN	634	685	1080	661	598	1590	1170	1180	742	544	382	427
CFSM	.74	.83	1.47	.90	1.74	2.23	1.56	1.75	1.00	.91	.55	.50
IN.	.86	.93	1.69	1.03	1.88	2.57	1.74	2.02	1.11	1.05	.63	.56

CAL YR 1975 TOTAL 428178 MEAN 1173 MAX 4960 MIN 382 CFSM 1.16 IN 15.77
WTR YR 1976 TOTAL 436239 MEAN 1192 MAX 3890 MIN 382 CFSM 1.18 IN 16.07

04106300 PORTAGE CREEK NEAR KALAMAZOO, MI

LOCATION.--Lat 42°14'46", long 85°34'33", in SE¼ sec.34, T.2 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050003, on left bank 25 ft (8 m) upstream from bridge on Lovers Lane, and 3.0 mi (4.8 km) south of Kalamazoo.

DRAINAGE AREA.--22.4 mi^2 (58.0 km^2).

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 814.88 ft (248.375 m) above mean sea level.

REMARKS.--Records good except those for period of no gage-height record, Oct. 10 to Nov. 10, which are fair. Flow includes water which is pumped from ground water sources by industry and discharged into stream two miles above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--12 years, 40.9 ft^3/s (1.158 m^3/s), 24.80 in/yr (630 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 206 ft^3/s (5.83 m^3/s) Apr. 18, 1975, gage height, 3.81 ft (1.161 m); minimum, 8.0 ft^3/s (0.23 m^3/s) Jan. 19, 1965, gage height, 0.88 ft (0.268 m), result of bridge construction upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 85 ft^3/s (2.41 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	0100	107	3.03	2.91	0.887	Mar. 5	0700	105	2.97	3.24	0.988
Feb. 21	1200	111	3.14	3.29	1.003	Apr. 25	1600	*163	4.62	*3.46	1.055

Minimum discharge, 28 ft^3/s (0.79 m^3/s) Sept. 24, 25, minimum gage height, 1.69 ft (0.515 m) Sept. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	40	49	41	36	53	46	48	50	46	33	35
2	37	40	46	41	37	64	48	56	47	39	34	34
3	37	44	45	42	36	67	46	54	45	34	32	36
4	35	44	45	40	37	61	45	51	43	33	34	32
5	35	42	46	41	36	80	45	51	40	32	36	31
6	37	43	69	41	37	58	47	72	38	36	37	32
7	36	54	50	44	36	49	46	73	40	43	35	33
8	36	49	49	43	35	48	44	55	41	40	34	33
9	36	47	48	43	37	48	44	49	41	34	36	36
10	36	45	48	40	42	47	43	49	44	31	35	39
11	35	44	45	41	43	46	45	47	42	31	37	33
12	35	48	47	43	44	52	44	46	37	32	37	32
13	36	46	51	44	50	49	45	46	35	32	38	33
14	36	45	64	44	45	46	46	47	37	32	39	33
15	36	43	82	42	50	46	46	46	42	33	35	34
16	36	42	57	45	57	48	51	56	43	32	38	33
17	34	46	49	40	52	46	45	61	40	31	41	34
18	34	45	47	39	51	45	43	48	41	31	41	32
19	38	44	45	41	47	47	49	47	42	33	40	31
20	39	50	43	43	45	49	46	49	34	38	41	34
21	38	46	41	41	81	45	53	47	36	48	38	33
22	38	42	42	42	64	44	51	43	37	40	37	32
23	39	40	41	42	53	44	48	42	36	37	39	32
24	39	41	43	40	50	46	60	43	45	34	39	32
25	48	41	41	39	48	45	124	43	41	31	41	30
26	41	41	41	42	45	46	86	44	35	34	41	37
27	38	41	40	41	44	55	63	43	32	45	37	36
28	39	40	40	41	42	48	55	43	34	35	32	33
29	37	50	41	41	42	46	52	45	35	35	30	32
30	36	58	45	41	---	47	51	53	49	33	34	32
31	36	---	44	36	---	44	---	54	---	37	34	---
TOTAL	1151	1341	1484	1284	1322	1559	1557	1551	1202	1102	1135	999
MEAN	37.1	44.7	47.9	41.4	45.6	50.3	51.9	50.0	40.1	35.5	36.6	33.3
MAX	48	58	82	45	81	80	124	73	50	48	41	39
MIN	34	40	40	36	35	44	43	42	32	31	30	30

CAL YR 1975 TOTAL 15872 MEAN 43.5 MAX 138 MIN 32
WTR YR 1976 TOTAL 15687 MEAN 42.9 MAX 124 MIN 30

04106320 WEST FORK PORTAGE CREEK NEAR OSHTEMO, MI

LOCATION.--Lat 42°14'07", long 85°38'54", in SE¼ sec.1, T.3 S., R.12 W., Kalamazoo County, Hydrologic Unit 04050003, on right bank at upstream side of bridge on 12th Street, 2.1 mi (3.4 km) southeast of Oshtemo.

DRAINAGE AREA.--13.0 mi^2 (33.7 km^2).

PERIOD OF RECORD.--May 1972 to current year.

GAGE.--Water-stage recorder. Datum of gage is 868.86 ft (264.829 m) above mean sea level (Kalamazoo County Road Commission bench mark).

REMARKS.--Records good except those for periods of no gage-height record, Aug. 28 to Sept. 30, which are fair. Several observations of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26 ft^3/s (0.74 m^3/s) Aug. 31, 1975, gage height, 2.15 ft (0.655 m); minimum, 4.6 ft^3/s (0.13 m^3/s) July 20, 21, 1974, gage height, 1.25 ft (0.381 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17 ft^3/s (0.48 m^3/s) Apr. 26, gage height, 1.76 ft (0.536 m); minimum not determined; minimum daily, 5.7 ft^3/s (0.16 m^3/s) Sept. 7, 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	9.8	13	9.8	8.5	8.7	8.7	10	11	9.1	8.5	6.3
2	11	11	13	9.8	8.5	10	8.9	10	10	9.1	8.1	6.3
3	10	11	12	9.5	8.5	12	8.5	11	9.5	8.7	7.6	6.2
4	10	11	12	9.1	8.5	12	8.3	11	8.5	8.3	7.4	6.1
5	10	11	12	9.3	8.5	13	8.5	10	8.1	8.1	7.4	6.1
6	10	11	15	9.9	8.5	12	8.3	11	7.8	7.8	7.2	6.0
7	10	11	15	10	8.5	11	8.3	13	7.6	7.6	7.1	5.7
8	10	11	13	9.9	8.3	11	8.1	12	7.4	7.4	6.9	5.7
9	10	11	13	9.6	8.3	10	8.1	11	7.2	7.2	6.7	5.9
10	10	11	13	9.8	8.5	9.6	8.1	10	7.1	7.2	6.7	6.9
11	10	11	12	9.9	9.3	9.5	8.3	9.5	6.9	7.1	6.9	7.1
12	10	11	12	9.8	9.1	10	8.3	9.3	6.7	6.7	6.9	6.9
13	10	11	12	10	9.6	11	8.3	8.9	6.7	6.4	6.7	6.8
14	10	11	13	10	9.6	11	8.3	8.7	6.4	6.2	6.9	6.7
15	9.8	11	16	9.9	9.8	10	8.5	8.9	6.5	6.7	7.1	6.7
16	9.5	10	15	10	11	10	9.3	9.6	7.1	6.4	6.9	6.7
17	9.3	10	13	9.7	11	9.6	9.3	11	6.7	6.4	6.7	6.7
18	9.3	10	12	9.4	11	9.5	8.9	10	6.9	6.2	6.7	6.7
19	9.6	10	11	9.3	11	9.5	9.3	9.8	7.6	6.0	6.7	6.7
20	9.8	11	11	9.4	10	9.5	9.3	9.8	7.2	6.4	6.5	6.8
21	9.5	12	10	9.2	12	9.3	9.6	9.8	7.2	7.4	6.7	6.9
22	9.1	12	10	9.2	13	9.3	10	9.5	7.4	7.8	6.7	6.9
23	8.9	11	9.8	9.1	12	9.1	10	9.3	6.9	7.8	6.5	6.9
24	8.5	11	9.6	9.1	11	8.9	10	8.9	7.8	7.4	6.5	6.8
25	9.5	11	9.5	8.9	10	8.7	14	8.9	8.1	6.9	6.7	6.7
26	9.5	11	9.5	9.1	9.5	8.7	16	8.7	8.0	6.9	6.5	7.0
27	9.5	11	9.6	8.9	9.1	9.6	15	8.5	7.8	8.7	6.5	7.7
28	9.5	11	9.5	8.9	8.5	10	13	8.7	7.2	8.9	6.7	7.8
29	9.5	12	9.5	8.7	8.3	9.6	11	9.3	7.2	9.1	6.6	7.8
30	9.5	14	10	8.7	---	9.6	11	9.8	8.1	8.7	6.4	7.8
31	9.5	---	10	8.5	---	9.1	---	11	---	8.9	6.3	---
TOTAL	301.8	330.8	365.0	292.4	279.4	310.8	291.2	306.9	228.6	233.5	213.7	201.3
MEAN	9.74	11.0	11.8	9.43	9.63	10.0	9.71	9.90	7.62	7.53	6.89	6.71
MAX	11	14	16	10	13	13	16	13	11	9.1	8.5	7.8
MIN	8.5	9.8	9.5	8.5	8.3	8.7	8.1	8.5	6.4	6.0	6.3	5.7
CFSM	.75	.85	.91	.73	.74	.77	.75	.76	.59	.58	.53	.52
IN.	.86	.95	1.04	.84	.80	.89	.83	.88	.65	.67	.61	.58

CAL YR 1975 TOTAL 3840.3 MEAN 10.5 MAX 25 MIN 7.3 CFSM .81 IN 10.99
WTR YR 1976 TOTAL 3355.4 MEAN 9.17 MAX 16 MIN 5.7 CFSM .71 IN 9.60

04106400 WEST FORK PORTAGE CREEK AT KALAMAZOO, MI

LOCATION.--Lat 42°14'40", long 85°36'50", in NE¼ sec.5, T.3 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050003, on right bank 30 ft (9 m) upstream from culvert on Oakland Drive, 2.5 mi (4.0 km) upstream from mouth, and 3.7 mi (6.0 km) southwest of main business district of Kalamazoo.

DRAINAGE AREA.--18.7 mi^2 (48.4 km^2).

PERIOD OF RECORD.--September 1959 to current year.

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 858.09 ft (261.546 m) above mean sea level (levels by Michigan Department of Natural Resources).

REMARKS.--Records good. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--17 years, 10.1 ft^3/s (0.286 m^3/s), 7.33 in/yr (186 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 41 ft^3/s (1.16 m^3/s) Apr. 19, 1975, gage height, 3.32 ft (1.012 m); minimum, 1.0 ft^3/s (0.028 m^3/s) Aug. 9, 1964; minimum gage height, 0.88 ft (0.268 m) July 30, 1963, caused by construction.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 26 ft^3/s (0.74 m^3/s) Apr. 25, gage height, 2.97 ft (0.905 m); minimum, 3.4 ft^3/s (0.096 m^3/s) Feb. 9, gage height, 2.27 ft (0.692 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	12	17	14	11	12	13	15	17	14	13	8.9
2	15	13	16	14	12	13	13	14	17	14	12	8.9
3	15	13	15	13	12	14	13	14	16	13	12	8.7
4	15	15	15	12	12	14	12	14	15	13	11	8.6
5	14	15	14	12	12	19	12	14	14	13	11	8.6
6	14	15	17	13	12	20	12	16	13	13	11	8.6
7	14	15	17	13	11	18	12	19	12	12	10	8.1
8	13	15	17	13	11	16	11	18	12	12	9.9	8.0
9	13	15	17	13	7.8	15	11	17	12	12	9.7	8.4
10	13	15	17	13	14	14	11	16	11	11	9.6	10
11	13	14	16	13	12	13	11	16	10	11	9.6	10
12	13	14	16	13	12	13	11	15	10	10	9.7	9.7
13	13	14	15	14	13	14	11	14	9.9	9.7	9.8	9.5
14	13	13	16	13	14	14	12	14	9.5	9.7	10	9.5
15	13	13	19	13	13	14	12	14	9.6	9.5	10	9.5
16	13	13	19	13	14	14	14	16	11	9.3	9.9	9.5
17	12	13	18	13	17	13	13	17	10	9.0	9.6	9.5
18	12	13	16	12	16	14	12	16	10	8.9	9.4	9.5
19	12	13	15	12	15	14	13	16	11	8.7	9.1	9.5
20	13	14	14	12	13	13	13	16	11	9.0	9.0	9.6
21	13	15	13	12	17	14	13	15	11	12	9.0	9.8
22	13	15	13	12	20	13	14	15	11	12	9.0	9.8
23	12	15	13	12	19	12	13	14	11	12	8.9	9.8
24	12	14	14	11	17	13	14	14	11	11	8.7	9.7
25	12	14	14	11	15	13	23	14	12	11	8.8	9.5
26	13	14	14	11	14	12	25	14	12	11	9.2	10
27	13	14	13	12	13	13	24	14	12	13	9.4	11
28	12	14	13	11	12	14	23	13	11	14	9.5	11
29	12	14	12	12	12	14	19	14	12	14	9.3	11
30	12	16	15	11	---	14	17	15	13	13	9.1	11
31	12	---	14	11	---	14	---	17	---	13	8.8	---
TOTAL	404	422	474	384	392.8	437	427	470	357.0	357.8	305.0	285.2
MEAN	13.0	14.1	15.3	12.4	13.5	14.1	14.2	15.2	11.9	11.5	9.84	9.51
MAX	15	16	19	14	20	20	25	19	17	14	13	11
MIN	12	12	12	11	7.8	12	11	13	9.5	8.7	8.7	8.0
CFSM	.70	.75	.82	.66	.72	.75	.76	.81	.64	.61	.53	.51
IN.	.80	.84	.94	.76	.78	.87	.85	.93	.71	.71	.61	.57

CAL YR 1975 TOTAL 5301.1 MEAN 14.5 MAX 37 MIN 8.6 CFSM .78 IN 10.54
WTR YR 1976 TOTAL 4715.8 MEAN 12.9 MAX 25 MIN 7.8 CFSM .69 IN 9.38

04106500 PORTAGE CREEK AT KALAMAZOO, MI

LOCATION.--Lat 42°16'27", long 85°34'35", in NW¼ NE¼ sec.27, T.2 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050003, on left bank 50 ft (15 m) upstream from bridge on Reed Avenue in Kalamazoo, and 1.5 miles (2.4 km) upstream from mouth.

DRAINAGE AREA.--46.8 mi^2 (121.2 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1947 to September 1958, June 1975 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 761.50 ft (232.105 m) above mean sea level (levels by Michigan Department of Natural Resources). Dec. 15, 1947, to Dec. 7, 1955, nonrecording gage at same site and datum.

REMARKS.--Water-discharge records good. Some regulation by millponds upstream from station. Flow includes water which is pumped from ground water sources by industry and discharged into stream five miles above station.

AVERAGE DISCHARGE.--12 years (1947-58, 1976), 56.7 ft^3/s (1.606 m^3/s), 16.45 in/yr (418 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 580 ft^3/s (16.4 m^3/s) sometime in July 1954 from rating curve extended above 165 ft^3/s (4.67 m^3/s) by logarithmic plotting, gage height, 5.25 ft (1.600 m) caused by momentary gate opening of millpond; minimum, 2.0 ft^3/s (0.057 m^3/s) May 8, 1956, gage height, 1.50 ft (0.457 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 204 ft^3/s (5.78 m^3/s) Apr. 25, gage height, 3.94 ft (1.201 m); minimum, 31 ft^3/s (0.88 m^3/s) July 7, Aug. 30; minimum gage height, 2.23 ft (0.680 m) Aug. 30; minimum daily discharge, 37 ft^3/s (1.05 m^3/s) Aug. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	50	52	73	63	50	77	62	67	65	65	47	43
2	49	53	67	63	49	94	63	81	62	53	44	42
3	48	58	64	60	48	97	62	72	59	48	39	42
4	48	58	64	54	49	82	64	68	57	47	41	40
5	46	54	68	57	49	127	62	66	54	45	46	40
6	47	56	113	58	49	84	61	98	50	44	46	38
7	47	72	78	60	47	73	62	105	54	42	44	44
8	47	63	71	59	49	68	59	75	55	44	45	56
9	47	60	73	59	48	65	58	69	55	44	45	45
10	47	61	71	56	58	65	57	64	60	40	44	41
11	46	58	68	59	62	62	65	61	57	40	45	41
12	47	61	69	59	60	69	59	58	51	39	45	42
13	47	61	77	60	69	71	58	58	49	38	46	41
14	47	60	98	60	64	65	57	58	52	39	52	41
15	47	58	128	60	68	63	65	60	57	41	45	44
16	46	57	88	61	83	63	73	76	58	43	44	43
17	44	58	77	57	76	61	61	82	56	40	47	43
18	44	59	69	56	74	61	62	62	57	39	47	41
19	50	59	68	56	68	65	70	58	60	38	47	40
20	51	67	66	57	63	66	62	65	46	51	48	49
21	49	66	60	55	135	68	73	60	46	79	46	60
22	49	58	60	55	100	63	70	58	47	50	45	48
23	50	57	60	56	74	66	63	57	46	48	47	45
24	50	56	62	54	69	70	85	56	62	44	46	46
25	63	57	62	56	67	64	176	56	57	41	47	44
26	51	57	63	56	64	60	147	56	47	42	50	42
27	49	59	61	55	60	75	93	56	45	76	47	48
28	51	59	60	55	57	78	79	56	44	47	41	88
29	49	73	56	55	59	72	72	62	48	48	37	50
30	47	88	66	55	---	69	69	76	69	43	38	48
31	48	---	65	50	---	66	---	77	---	52	41	---
TOTAL	1503	1815	2225	1776	1868	2229	2169	2073	1625	1450	1392	1375
MEAN	48.5	60.5	71.8	57.3	64.4	71.9	72.3	66.9	54.2	46.8	44.9	45.8
MAX	63	88	128	63	135	127	176	105	69	79	52	88
MIN	44	52	56	50	47	60	57	56	44	38	37	38

WTR YR 1976 TOTAL 21500 MEAN 58.7 MAX 176 MIN 37

04106500 PORTAGE CREEK AT KALAMAZOO, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: August 1975 to September 1976.

INSTRUMENTATION.--Digital temperature recorder since August 1975.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1							---	---	---	20.5	18.5	19.5
2							---	---	---	21.5	19.5	20.5
3							---	---	---	21.5	20.0	20.5
4							---	---	---	20.5	19.5	20.5
5							---	---	---	20.5	18.0	19.0
6							22.5	19.0	21.5	18.5	17.0	17.5
7							23.0	19.5	21.0	18.5	17.5	18.0
8							23.5	18.0	21.5	18.5	17.0	18.0
9							24.0	20.0	22.5	18.0	16.5	17.0
10							24.5	19.5	22.5	18.5	16.0	17.5
11							24.5	21.5	22.5	18.5	18.0	18.5
12							---	---	---	18.5	16.0	17.0
13							---	---	---	---	---	---
14							---	---	---	---	---	---
15							---	---	---	---	---	---
16							---	---	---	---	---	---
17							---	---	---	---	---	---
18							---	---	---	---	---	---
19							---	---	---	---	---	---
20							---	---	---	---	---	---
21							---	---	---	---	---	---
22							21.5	19.5	21.0	---	---	---
23							23.0	18.5	21.0	---	---	---
24							24.0	21.0	22.5	---	---	---
25							24.0	22.0	23.0	---	---	---
26							24.0	22.0	23.0	---	---	---
27							23.0	21.5	22.0	---	---	---
28							22.5	20.0	21.5	---	---	---
29							22.5	21.5	22.0	---	---	---
30							21.5	19.5	20.5	---	---	---
31							19.5	18.5	19.0	---	---	---

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
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										5.5	5.0	5.0
28										5.0	3.5	4.5
29										5.0	4.0	4.5
30										5.5	5.0	5.0
31										5.5	5.0	5.5

04106500 PORTAGE CREEK AT KALAMAZOO, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	5.0	2.5	4.0	10.5	7.0	8.5	12.0	10.5	11.5	18.0	14.5	16.0
2	3.0	1.5	2.0	7.0	6.5	6.5	15.0	9.5	12.0	17.5	12.0	14.0
3	3.5	3.0	3.5	8.0	6.5	7.0	16.5	12.5	14.5	11.5	10.5	11.0
4	5.0	3.5	4.5	8.0	7.0	7.5	15.5	12.0	14.0	16.5	10.5	13.0
5	5.5	5.0	5.0	8.5	7.5	8.0	15.0	11.0	13.0	18.5	14.0	16.5
6	5.5	5.0	5.0	7.5	6.0	7.0	17.0	13.5	15.0	18.0	11.5	14.5
7	5.0	3.0	4.5	7.0	6.0	6.5	16.0	13.0	15.0	14.5	10.5	12.0
8	3.0	2.5	3.0	8.0	5.5	6.5	15.0	12.0	13.5	16.0	12.0	14.0
9	3.5	3.0	3.0	10.0	8.0	9.0	16.0	11.5	13.5	19.0	13.5	16.0
10	6.5	3.5	5.0	10.5	8.5	10.0	15.5	13.0	14.5	---	---	---
11	6.5	5.5	6.0	9.0	7.5	8.5	15.0	12.5	14.0	---	---	---
12	7.0	5.0	6.0	8.5	8.0	8.5	15.5	10.5	13.0	---	---	---
13	7.5	6.5	7.0	8.5	6.0	7.5	16.5	12.0	14.5	---	---	---
14	6.5	5.5	6.0	7.5	5.5	6.5	19.5	15.0	24.0	---	---	---
15	8.0	5.5	6.5	8.5	7.0	8.0	21.5	18.5	20.0	---	---	---
16	8.0	5.5	7.0	9.0	7.5	8.5	22.5	19.0	20.5	---	---	---
17	6.0	5.5	5.5	8.0	6.0	7.0	22.0	19.0	20.5	---	---	---
18	6.5	5.5	6.0	10.5	7.5	8.5	21.0	18.5	20.0	---	---	---
19	6.0	5.5	5.5	15.0	10.5	12.5	22.0	18.5	20.0	---	---	---
20	7.5	5.5	6.5	15.0	14.0	15.0	20.0	17.0	18.0	---	---	---
21	8.0	4.0	6.0	14.0	8.0	11.0	19.0	15.5	17.5	---	---	---
22	4.0	3.0	3.5	9.0	6.0	7.5	19.5	16.5	18.0	---	---	---
23	4.5	3.0	3.5	12.5	9.0	10.5	19.0	16.0	18.0	---	---	---
24	8.0	4.5	6.0	14.5	11.5	13.0	18.5	14.5	16.5	---	---	---
25	11.0	8.0	9.0	15.5	12.5	14.5	14.0	8.0	11.0	---	---	---
26	12.5	11.0	11.5	18.0	14.0	15.5	10.5	8.0	9.0	---	---	---
27	12.0	10.5	11.5	17.0	11.0	14.5	12.5	9.0	11.0	---	---	---
28	12.0	11.0	11.5	13.5	9.5	11.5	15.5	10.5	13.0	---	---	---
29	11.0	10.5	10.5	13.0	12.0	12.5	17.5	13.0	15.0	---	---	---
30	---	---	---	17.0	13.0	14.5	16.5	14.0	15.5	---	---	---
31	---	---	---	14.0	11.5	12.5	---	---	---	---	---	---

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	22.0	16.5	19.0	21.5	19.0	20.5	21.5	19.0	20.5
2	---	---	---	22.5	18.5	20.5	21.0	18.5	20.0	20.0	17.5	19.0
3	---	---	---	22.0	18.5	20.5	22.0	18.5	20.0	22.0	18.0	20.0
4	---	---	---	22.5	19.0	21.0	21.5	19.0	20.5	21.0	19.5	20.5
5	---	---	---	23.0	19.0	21.0	21.5	19.5	20.5	20.0	17.0	18.5
6	---	---	---	24.5	19.5	22.0	21.5	19.5	20.0	19.0	16.0	18.0
7	---	---	---	23.5	20.5	22.5	21.0	18.0	19.5	20.5	17.0	19.0
8	---	---	---	24.5	20.0	22.5	21.5	18.5	20.0	22.0	19.0	20.5
9	---	---	---	23.5	21.0	22.5	22.5	19.0	21.0	22.0	18.5	20.5
10	---	---	---	25.0	21.5	23.0	23.0	20.0	21.5	18.5	15.5	17.0
11	---	---	---	25.5	22.5	24.0	23.0	20.5	22.0	19.5	16.5	18.0
12	---	---	---	---	---	---	24.0	21.0	23.0	21.0	18.5	19.5
13	---	---	---	---	---	---	24.0	21.5	23.0	21.5	18.5	20.0
14	25.0	24.0	9.0	---	---	---	23.5	20.5	21.5	21.0	19.0	20.0
15	24.5	22.5	23.5	---	---	---	21.0	18.0	19.5	21.0	19.5	20.5
16	22.5	20.0	21.0	---	---	---	21.0	17.5	19.5	20.0	19.0	19.0
17	23.0	18.5	20.5	---	---	---	22.5	18.5	20.5	20.0	18.5	19.5
18	23.0	20.0	21.5	---	---	---	23.0	19.0	21.0	20.0	18.0	19.0
19	22.0	19.5	21.0	---	---	---	24.0	20.5	22.0	18.5	16.5	18.0
20	21.5	18.5	20.5	---	---	---	24.0	20.5	22.5	19.0	18.0	18.5
21	21.0	19.0	20.0	---	---	---	24.5	21.0	23.0	18.0	16.0	16.5
22	22.0	19.0	20.0	---	---	---	24.0	21.5	23.0	16.0	14.5	15.0
23	22.5	19.0	21.0	---	---	---	24.0	22.0	23.0	17.5	15.5	16.5
24	21.5	19.0	20.0	---	---	---	23.5	20.5	22.5	16.0	14.0	15.5
25	22.5	18.5	20.0	---	---	---	23.0	21.0	22.0	15.5	13.5	14.5
26	22.5	19.0	21.0	---	---	---	24.0	21.0	22.5	13.5	13.5	13.5
27	23.0	19.5	21.5	25.5	22.5	24.0	24.5	22.0	23.5	15.5	13.0	14.5
28	24.0	21.0	22.5	24.5	22.0	23.0	24.5	22.5	23.5	15.5	14.0	15.0
29	23.0	20.5	21.5	22.5	21.5	22.0	23.0	20.0	21.0	16.0	14.0	15.0
30	20.0	18.0	19.0	24.0	20.0	22.0	20.0	17.5	19.0	17.0	15.0	16.0
31	---	---	---	23.5	21.0	22.0	21.5	18.5	20.0	---	---	---

04108500 KALAMAZOO RIVER NEAR FENNVILLE, MI

LOCATION.--Lat 42°35'36", long 85°59'03", in NE¼ sec.5, T.2 N., R.14 W., Allegan County, Hydrologic Unit 04050003, on left bank 40 ft (12 m) upstream from bridge on State Highway 89, 2.1 mi (3.4 km) downstream from Swan Creek, 4.0 mi (6.4 km) downstream from Calkins Dam, and 6.1 mi (9.8 km) east of Fennville.

DRAINAGE AREA.--1,600 mi^2 (4,144 km^2), approximately.

PERIOD OF RECORD.--April 1929 to September 1936, October 1937 to current year. Monthly discharge only for some periods, published in WSP 1307. Published as "near Allegan" April 1929 to September 1932; as "at Calkins Bridge, near Allegan" October 1932 to September 1936, October 1937 to September 1938; as "at Calkins Dam, near Allegan" October 1938 to September 1950.

REVISED RECORDS.--WSP 1387: 1929(M), 1930, 1933, 1934-36(M), 1938(M), 1939-40, 1942.

GAGE.--Water-stage recorder. Datum of gage is 586.51 ft (178.768 m) above mean sea level (levels by Michigan Department of Natural Resources). April 1929 to September 1936 at bridge and October 1937 to September 1950 in powerplant, 4.0 mi (6.4 km) upstream at mean sea level datum (levels by city of Allegan).

REMARKS.--Records good except those for the period Aug. 14-20, which are poor. Flow regulated at low and medium stages by powerplants upstream from station and since June 1936, by Calkins Dam and powerplant, 4.0 mi (6.4 km) upstream from station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--46 years, 1,386 ft^3/s (39.25 m^3/s), 11.76 in/yr (299 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,500 ft^3/s (496 m^3/s) Apr. 11, 1947, gage height, 606.76 ft (184.940 m), site and datum then in use; minimum daily, 50 ft^3/s (1.42 m^3/s) Aug. 19, 1976, caused by shutting off flow at Calkins Dam.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,370 ft^3/s (152 m^3/s) Feb. 23, gage height, 12.34 ft (3.761 m); minimum daily, 50 ft^3/s (1.42 m^3/s) Aug. 19, caused by shutting off flow at Calkins Dam.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1370	1360	1800	1850	1810	3210	2680	3390	2220	1910	1120	771
2	1300	1480	1880	1820	1930	3640	2680	3220	2390	1900	1120	778
3	1120	1130	1990	1820	1500	3700	2590	3170	2260	1900	1260	775
4	371	1300	2260	1820	1500	4010	2500	2520	2070	1890	1270	782
5	415	1760	2230	1820	1530	4300	2540	2630	2020	1890	1300	803
6	727	1460	2170	1800	1460	4290	2430	2800	1920	1880	2060	810
7	884	1310	2170	1760	1360	5050	2410	3180	1520	1860	4120	778
8	883	1740	2190	1230	1340	4980	2400	3120	1220	1520	2280	1090
9	1300	1740	2180	1380	1670	4900	2350	3270	1570	1420	1200	852
10	1520	1250	2170	1540	1940	4830	2260	2890	1880	1630	1020	644
11	1200	1140	2210	1520	1880	4360	2260	2870	1280	1160	1010	750
12	1200	1280	2300	1500	1880	3840	2110	2870	1170	1150	810	806
13	1200	1620	2310	1500	2080	4100	1900	2800	1160	1150	430	852
14	1010	1760	2540	1800	2370	4250	1890	3110	1530	1150	214	838
15	853	1280	3860	2130	2490	3130	1890	2710	1640	1140	75	841
16	1070	1200	3980	1830	2800	2960	1910	2630	1180	1140	65	841
17	1550	1330	2900	1500	3340	2980	1970	2660	1170	1140	60	838
18	1550	1450	3440	1490	2800	3000	2030	2440	1170	1140	55	841
19	1100	1460	3970	1500	3510	2820	2140	2350	1380	713	50	855
20	1150	1470	2490	1370	3960	2630	2250	2410	1860	1110	456	859
21	1190	1480	2920	1340	4010	2880	2110	2420	1860	1120	657	859
22	1190	1470	2590	1670	4720	2790	1980	2410	1510	1500	1070	862
23	1200	1470	2780	2160	5330	2660	2170	2400	1080	1830	1080	862
24	1230	1470	2490	1660	4790	2760	2200	2350	1140	1520	1080	1180
25	1290	1210	2330	1520	3930	2470	2110	2060	1440	1140	754	1060
26	1280	1140	2260	1520	4590	2440	2850	2050	1860	1470	747	1050
27	1510	1350	2060	1530	4380	2450	4000	2020	1520	1320	764	1100
28	1800	1750	1870	1540	3510	2540	3300	1920	1120	1290	754	1090
29	1320	1760	1850	1450	3600	2830	2950	1950	1550	1320	761	1060
30	1160	1780	1850	1320	---	2540	3450	2020	1970	1300	757	1070
31	1120	---	1850	1340	---	2650	---	2080	---	1200	761	---
TOTAL	36063	43400	75890	50030	82010	105990	72310	80720	47660	43803	29160	26597
MEAN	1163	1447	2448	1614	2828	3419	2410	2604	1589	1413	941	887
MAX	1800	1780	3980	2160	5330	5050	4000	3390	2390	1910	4120	1180
MIN	371	1130	1800	1230	1340	2440	1890	1920	1080	713	50	644
CFSM	.73	.90	1.53	1.01	1.77	2.14	1.51	1.63	.99	.88	.59	.55
IN.	.84	1.01	1.76	1.16	1.91	2.46	1.68	1.88	1.11	1.02	.68	.62

CAL YR 1975 TOTAL 729556 MEAN 1999 MAX 7110 MIN 362 CFSM 1.25 IN 16.96
WTR YR 1976 TOTAL 693633 MEAN 1895 MAX 5330 MIN 50 CFSM 1.18 IN 16.13

04108600 RABBIT RIVER NEAR HOPKINS, MI

LOCATION.--Lat 42°38'32", long 85°43'19", in SE¼ sec.16, T.3 N., R.12 W., Allegan County, Hydrologic Unit 04050003, on left bank at downstream side of bridge on 18th Street, 2.5 mi (4.0 km) northeast of Hopkins.

DRAINAGE AREA.--71.4 mi^2 (184.9 km^2).

PERIOD OF RECORD.--October 1965 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 700 ft (213 m) from topographic map (nearest 10 ft).

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, Mar. 19 to Apr. 19, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--11 years, 57.2 ft^3/s (1.620 m^3/s), 10.88 in/yr (276 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,000 ft^3/s (28.3 m^3/s) Dec. 15, 1975, gage height, 8.62 ft (2.627 m); maximum gage height, 8.66 ft (2.640 m) Dec. 31, 1972; minimum discharge not determined; minimum daily, 9.2 ft^3/s (0.26 m^3/s) Aug. 27, 28, 1970, Sept. 18, 1971; minimum gage height, 1.93 ft (0.588 m) Sept. 20, 26, 27, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 300 ft^3/s (8.50 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	0400	*1,000	28.3	*8.62	2.627	Feb. 21	2400	412	11.7	7.49	2.283
Feb. 13	2300	340	9.63	7.15	2.179	Mar. 5	1100	625	17.7	7.95	2.423
Feb. 16	0100	355	10.1	7.24	2.207	May 7	0400	491	13.9	7.68	2.341

Minimum discharge, 14 ft^3/s (0.40 m^3/s) Sept. 8, 9; minimum gage height, 2.17 ft (0.661 m) Sept. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	26	104	56	46	85	60	74	74	69	30	16
2	27	30	80	55	46	165	58	71	63	60	27	16
3	25	35	64	54	46	353	56	81	56	49	26	15
4	24	40	54	46	46	365	54	76	52	44	25	15
5	23	36	52	54	46	518	52	69	49	40	25	15
6	23	32	92	61	46	393	51	233	46	37	27	15
7	23	31	89	54	46	249	49	451	44	36	26	15
8	23	35	68	48	46	149	47	319	42	35	24	14
9	23	33	58	48	46	120	45	157	41	34	24	15
10	23	31	54	48	53	107	45	102	38	33	23	22
11	23	30	51	48	76	100	54	89	37	32	22	20
12	23	28	49	48	110	110	48	77	36	31	22	18
13	23	29	66	48	285	142	48	71	42	30	22	17
14	23	28	211	48	299	127	45	71	39	29	22	17
15	23	27	918	48	266	112	70	79	36	28	22	17
16	23	26	538	48	342	103	190	74	42	27	21	17
17	22	25	326	47	291	91	125	68	40	26	20	17
18	22	25	176	47	241	87	88	63	39	25	20	17
19	23	25	126	47	204	86	79	65	44	24	19	16
20	25	26	108	47	187	98	70	58	42	25	19	17
21	25	35	92	47	257	150	68	55	39	29	18	18
22	24	37	84	47	368	110	76	54	38	27	18	18
23	23	33	78	47	253	88	69	53	36	26	17	18
24	23	31	72	47	161	75	68	52	38	26	17	17
25	31	30	69	47	136	66	156	54	44	24	17	16
26	37	30	66	47	121	63	253	54	40	23	17	18
27	33	34	64	46	106	130	195	52	36	27	17	22
28	31	32	62	46	96	130	119	50	40	26	17	20
29	29	38	60	46	87	95	94	59	43	29	18	19
30	28	106	58	46	---	74	80	65	46	29	17	18
31	27	---	57	45	---	67	---	79	---	30	17	---
TOTAL	782	1007	4046	1512	4413	4608	2512	2975	1302	1010	656	515
MEAN	25.2	33.6	131	48.8	152	149	83.7	96.0	43.4	32.6	21.2	17.2
MAX	37	106	918	61	368	518	253	451	74	69	30	22
MIN	22	25	49	46	46	63	45	50	36	23	17	14
CFSM	.35	.47	1.83	.68	2.13	2.09	1.17	1.34	.61	.46	.30	.24
IN.	.41	.52	2.11	.79	2.30	2.40	1.31	1.55	.68	.53	.34	.27

CAL YR 1975 TOTAL 25895 MEAN 70.9 MAX 918 MIN 17 CFSM .99 IN 13.49
WTR YR 1976 TOTAL 25338 MEAN 69.2 MAX 918 MIN 14 CFSM .97 IN 13.20

04108690 KALAMAZOO RIVER AT SAUGATUCK, MI
(National stream-quality accounting network and pesticide station)

LOCATION.--Lat 42°38'50", long 86°11'53", in NE¼ sec.16, T.3 N., R.16 W., Allegan County, Hydrologic Unit 04050003, at bridge on Old US-31 between Saugatuck and Douglas, 7.9 mi (12.7 km) downstream from Rabbit River, 17.6 mi (28.3 km) downstream from gaging station near Fennville and 2.9 mi (4.7 km) upstream from mouth.

DRAINAGE AREA.--2,020 mi^2 (5,230 km^2), approximately.

PERIOD OF RECORD.--Water years 1974 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: February 1974 to current year.
WATER TEMPERATURES: May 1975 to current year.

INSTRUMENTATION.--Water quality monitor since Nov. 1, 1975.

REMARKS.--Water quality monitor located 30 ft (9 m) from the right abutment of the bridge. Monthly samples are collected as a cross-section sample at the upstream side of the bridge. Once daily temperatures are reported to the nearest 1.0°C. Water discharge measurements are made at times of monthly sampling.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: (Water years 1974 and 1975) Maximum daily, 590 micromhos on several days during 1974 and 1975; minimum daily, 321 micromhos Apr. 22, 1975.

EXTREMES OUTSIDE PERIOD OF DAILY RECORD.--Specific conductance values of 642 and 308 micromhos were recorded on July 29, 30, 1976 and Dec. 15, 1975, respectively.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT												
06...	1500	980	627	8.4	14.0	13.4	137	200	72	13	270	44
NOV												
03...	1330	1640	616	7.9	11.5	13.5	125	300	230	59	270	35
DEC												
08...	1330	2170	576	8.0	1.0	11.8	85	480	100	170	260	43
JAN												
05...	1530	--	538	7.9	.5	12.2	86	410	30	42	250	55
FEB												
09...	1500	1540	603	8.2	.5	11.2	79	2600	>1200	40	260	24
MAR												
08...	1330	7000	399	7.8	3.0	12.0	90	320	>6000	270	170	22
APR												
05...	1400	3000	508	7.9	12.0	11.4	108	10	<1	10	230	23
MAY												
10...	1400	5380	432	8.2	17.0	12.1	127	70	40	18	200	23
JUN												
08...	1400	2050	536	8.2	22.5	9.0	105	190	56	200	240	20
JUL												
12...	1430	1470	550	8.2	25.0	8.0	98	210	72	40	240	17
AUG												
02...	1400	1650	572	8.1	23.0	9.8	115	420	75	200	260	40
SEP												
07...	1300	650	589	8.2	21.0	6.5	74	1100	80	86	250	66

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT												
06...	70	22	20	.5	2.0	--	--	290	--	42	33	.5
NOV												
03...	71	22	20	.5	2.2	286	0	235	5.8	45	32	.3
DEC												
08...	70	20	17	.5	2.2	264	0	217	4.2	47	29	.2
JAN												
05...	69	20	18	.5	2.0	244	0	254	6.2	46	31	.1
FEB												
09...	68	21	20	.5	1.8	288	0	236	2.9	46	33	.2
MAR												
08...	44	14	10	.3	2.3	180	0	148	4.6	35	17	.2
APR												
05...	66	17	15	.4	1.8	252	0	207	5.1	44	25	.2
MAY												
10...	51	17	11	.3	2.3	216	0	177	2.2	31	17	.1
JUN												
08...	64	19	16	.5	1.7	268	0	220	2.7	38	26	.2
JUL												
12...	60	22	18	.5	1.7	272	0	223	2.7	40	29	.2
AUG												
02...	71	20	21	.6	1.8	268	0	220	3.4	41	35	.2
SEP												
07...	61	23	28	.8	2.0	224	0	184	2.3	48	41	.2

04108690 KALAMAZOO RIVER AT SAUGATUCK, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT											
06...	6.4	342	--	905	.28	1.2	5.4	.10	15	40	100
NOV											
03...	7.0	327	340	1450	.71	1.6	7.0	.10	7	31	100
DEC											
08...	8.4	325	324	1900	1.0	1.8	8.0	.07	11	64	100
JAN											
05...	9.3	316	316	--	1.0	1.7	7.5	.08	--	--	--
FEB											
09...	9.7	358	342	1490	.96	1.8	8.1	.08	4	17	100
MAR											
08...	6.2	245	217	--	1.1	1.9	8.5	.12	27	E490	100
APR											
05...	4.0	320	297	2590	.83	1.6	6.9	.07	11	89	100
MAY											
10...	3.3	256	239	3720	.67	1.4	6.3	.08	13	189	100
JUN											
08...	5.0	313	302	1730	.84	1.5	6.8	.11	9	50	100
JUL											
12...	5.4	334	310	1330	.61	1.4	6.4	.11	9	36	100
AUG											
02...	6.0	327	328	1460	.50	1.5	6.4	.14	19	85	100
SEP											
07...	1.3	351	315	616	.34	1.3	5.9	.14	27	47	100

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
OCT												
06...	1500	2	1	0	0	<10	0	0	0	9	2	500
JAN												
05...	1530	1	1	1	1	<10	0	0	0	11	2	470
APR												
05...	1400	0	0	--	1	10	<10	1	1	0	0	550
JUL												
12...	1430	3	2	3	1	<10	<10	0	0	0	0	510

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT												
06...	20	10	0	120	10	.1	.1	0	0	50	0	14
JAN												
05...	30	20	0	50	20	.1	.1	0	0	30	10	8.4
APR												
05...	100	7	7	70	40	<.5	<.5	0	0	10	10	9.4
JUL												
12...	10	36	8	80	10	<.5	<.5	--	4	10	10	--

04108690 KALAMAZOO RIVER AT SAUGATUCK, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL CHLORDANE (UG/L)	CHLORDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MATERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDT (UG/L)	DDT IN BOTTOM MATERIAL (UG/KG)
NOV 03...	1330	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY 10...	1400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 02...	1400	ND	--	ND	--	ND	--	ND	--	ND	--

DATE	TOTAL DIAZINON (UG/L)	DIAZINON IN BOTTOM MATERIAL (UG/KG)	TOTAL DIELDRIN (UG/L)	DIELDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ETHION (UG/L)	ETHION IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR (UG/L)	HEPTACHLOR IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR EPOXIDE (UG/L)
NOV 03...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY 10...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 02...	ND	--	ND	--	ND	--	ND	--	ND	--	ND

DATE	HEPTACHLOR EPOXIDE IN BOTTOM MATERIAL (UG/KG)	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL MALATHION (UG/L)	MALATHION IN BOTTOM MATERIAL (UG/KG)	TOTAL METHOXYCHLOR (UG/L)	TOTAL METHYL PARATHION (UG/L)	METHYL PARATHION IN BOTTOM MATERIAL (UG/KG)	TOTAL METHYL TRITHION (UG/L)	METHYL TRITHION IN BOTTOM MATERIAL (UG/KG)	TOTAL PARATHION (UG/L)
NOV 03...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY 10...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 02...	--	ND	--	ND	--	ND	ND	--	ND	--	ND

DATE	PARATHION IN BOTTOM MATERIAL (UG/KG)	TOTAL TOXAPHENE (UG/L)	TOXAPHENE IN BOTTOM MATERIAL (UG/KG)	TOTAL TRITHION (UG/L)	TRITHION IN BOTTOM MATERIAL (UG/KG)	TOTAL 2,4-D (UG/L)	2,4-D IN BOTTOM MATERIAL (UG/KG)	TOTAL 2,4,5-T (UG/L)	2,4,5-T IN BOTTOM MATERIAL (UG/KG)	TOTAL SILVEX (UG/L)	SILVEX IN BOTTOM MATERIAL (UG/KG)
NOV 03...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY 10...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 02...	--	ND	--	ND	--	ND	--	ND	--	ND	--

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

PERIPHYTON

DATE	LENGTH OF EXPOSURE (DAYS)	PERIPHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERIPHYTON BIOMASS ASH WEIGHT G/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL A MG/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL B MG/SQ M	BIOMASS CHLOROPHYLL RATIO PERIPHYTON (UNITS)
NOV 03...	28	7.40	5.20	47.0	1.40	47
MAY 10...	35	32.8	14.0	84.1	.000	220
AUG 02...	21	22.2	11.2	69.3	9.85	159

ND--NOT DETECTED

04108690 KALAMAZOO RIVER AT SAUGATUCK, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

OCT. 6, 1975
1500 HOURS

IDENTIFICATION OF PHYTOPLANKTON

33,000 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			380	1
	...SCENEDESMACEAE				
	....SCENEDESMUS			1,500	5
	..VOLVOCALES				
	...CHLAMYDOMONADACEAE				
	....CHLAMYDOMONAS			380	1
			TOTALS	2,300	7
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
D	....CYCLOTELLA			18,000	53
D	....MELOSIRA			11,000	33
	..PENNALES	PENNATE			
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			380	1
	...NITZSCHIACEAE				
	....NITZSCHIA			380	1
			TOTALS	29,000	88
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..CHROOCOCCALES	COCCOID			
	...CHROOCOCCACEAE				
L	....ANACYSTIS				0
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOMONODACEAE				
	....CRYPTOMONAS			380	1
			TOTALS	380	1
	.EUGLENOPHYCEAE				
	..EUGLENALES				
	...EUGLENACEAE				
	....EUGLENA			760	2
	....PHACUS			380	1
			TOTALS	1,100	3

NOV. 3, 1975
1330 HOURS

IDENTIFICATION OF PHYTOPLANKTON

19,000 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		700	4
	...SCENEDESMACEAE			
D	....SCENEDESMUS		3,700	19
		TOTALS	4,400	23
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		7,200	37
D	....MELOSIRA		5,300	27
	..PENNALES	PENNATE		
	...FRAGILARIACEAE			
	....ASTERIONELLA		230	1
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		230	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		460	2
	...NITZSCHIACEAE			
	....NITZSCHIA		700	4
	...SURIRELLACEAE			
	....SURIRELLA		230	1
		TOTALS	14,000	73
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....OCHROMONAS		460	2
		TOTALS	460	2
	EUGLENOPHYTA	EUGLENOIDS		
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
	....EUGLENA		230	1
		TOTALS	230	1
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...PERIDINIACEAE			
L	....PERIDINIUM			0

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DEC. 8, 1975
1330 HOURS

IDENTIFICATION OF PHYTOPLANKTON

3,300 CELLS/ML

	ORGANISM NAME	COMMON NAME	CELLS/ML	PER CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
L	....SCENEDESMUS			0
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		550	17
D	....MELOSIRA		490	15
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		120	4
L	....COCCONEIS			0
L	....RHOICOSPHENIA			0
	...CYMBELLACEAE			
	....AMPHORA		61	2
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
	....FRAGILARIA		61	2
L	....SYNEDRA			0
	...MERIDIONACEAE			
L	....MERIDION			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		180	6
	...NITZSCHIACEAE			
	....NITZSCHIA		61	2
		TOTALS	1,500	48
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		1,700	53
		TOTALS	1,700	53
	EUGLENOPHYTA	EUGLENOIDS		
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
L	....EUGLENA			0

04108690 KALAMAZOO RIVER AT SAUGATUCK, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JAN. 5, 1976
1530 HOURS

IDENTIFICATION OF PHYTOPLANKTON

4,600 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...HYDRODICTYACEAE			
L	....PEDIASTRUM			0
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		110	2
	....MELOSIRA		180	4
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....ACHNANTHES			0
L	....COCCONEIS			0
	...CYMBELLACEAE			
L	....CYMBELLA			0
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
	....FRAGILARIA		460	10
	....SYNEDRA		53	1
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		110	2
	...NITZSCHIACEAE			
	....NITZSCHIA		53	1
		TOTALS	1,000	20
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		3,600	78
		TOTALS	3,600	78
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
L	....CRYPTOMONAS			0
		TOTALS	18	0
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
L	....EUGLENA			0

04108690 KALAMAZOO RIVER AT SAUGATUCK, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

FEB. 9, 1976
1500 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,200 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		30	3
		TOTALS	30	3
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		91	8
	....MELOSIRA		30	3
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		30	3
	....COCCONEIS		30	3
	...CYMBELLACEAE			
L	....CYMBELLA			0
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		91	8
	...NITZSCHIACEAE			
L	....NITZSCHIA		0	0
		TOTALS	270	25
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
L	....DINOBRYON			0
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
L	....APHANIZOMENON			0
	...OSCILLATORIACEAE			
L	....ARTHROSPIRA			0
D	....OSCILLATORIA		880	74
		TOTALS	880	74

04108690 KALAMAZOO RIVER AT SAUGATUCK, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAR. 8, 1976
1330 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,900 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			21	1
	...SCENEDESMACEAE				
	....SCENEDESMUS			42	1
			TOTALS	62	2
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			42	1
	....MELOSIRA			270	9
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....COCCONEIS			21	1
	...FRAGILARIACEAE				
L	....SYNEDRA				0
	...MERIDIONACEAE				
	....MERIDION			21	1
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			230	8
	...NITZSCHIACEAE				
	....NITZSCHIA			21	1
			TOTALS	600	21
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..OSCILLATORIALES	FILAMENTOUS			
	...OSCILLATORIACEAE				
D	....OSCILLATORIA			2,200	77
			TOTALS	2,200	77
	EUGLENOPHYTA	EUGLENOIDS			
	.EUGLENOPHYCEAE				
	..EUGLENALES				
	...EUGLENACEAE				
L	....EUGLENA				0

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

APR. 5, 1976
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

11,000 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...SCENEDESMACEAE				
	....SCENEDESMUS			480	5
			TOTALS	480	5
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
D	....CYCLOTELLA			4,700	45
D	....MELOSIRA			2,500	24
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			120	1
	...DIATOMACEAE				
	....DIATOMA			120	1
	...FRAGILARIACEAE				
	....ASTERIONELLA			360	3
	...NAVICULACEAE	NAVICULOID			
D	....NAVICULA			1,700	16
	...NITZSCHIACEAE				
	....NITZSCHIA			240	2
			TOTALS	9,800	92
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOMONODACEAE				
	....CRYPTOMONAS			240	2
			TOTALS	240	2

MAY 10, 1976
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

8,900 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
D	....CYCLOTELLA			5,400	60
	....MELOSIRA			210	2
	..PENNALES	PENNATE			
	...FRAGILARIACEAE				
	....ASTERIONELLA			830	9
	...NITZSCHIACEAE				
	....NITZSCHIA			410	5
			TOTALS	6,800	76
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..CHROOCOCCALES	COCCOID			
	...CHROOCOCCACEAE				
D	....ANACYSTIS			2,100	23
			TOTALS	2,100	23

04108690 KALAMAZOO RIVER AT SAUGATUCK, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JUNE 8, 1976
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

53,000 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			1,600	3
	....DICTYOSPHAERIUM			3,800	7
	....KIRCHNERIELLA			270	1
	....TETRAEDRON			270	1
	...SCENEDESMACEAE				
	....CRUCIGENIA			2,200	4
	....SCENEDESMUS			1,100	2
	....TETRASTRUM			1,100	2
	..VOLVOCALES				
	...CHLAMYDOMONADACEAE				
	....CARTERIA			820	2
	....CHLAMYDOMONAS			270	1
			TOTALS	11,000	23
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
D	....CYCLOTELLA			36,000	68
	....MELOSIRA			1,100	2
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			270	1
	...FRAGILARIACEAE				
	....SYNEDRA			270	1
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			820	2
	...NITZSCHIACEAE				
	....NITZSCHIA			820	2
			TOTALS	40,000	76
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..CHROOCOCCALES	COCCOID			
	...CHROOCOCCACEAE				
	....ANACYSTIS			2,200	4
			TOTALS	2,200	4
	EUGLENOPHYTA	EUGLENOIDS			
	.EUGLENOPHYCEAE				
	..EUGLENALES				
	...EUGLENACEAE				
	....TRACHELOMONAS			270	1

04108690 KALAMAZOO RIVER AT SAUGATUCK, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JULY 12, 1976
1430 HOURS

IDENTIFICATION OF PHYTOPLANKTON

40,000 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...MICRACTINIACEAE				
	....MICRACTINIUM			4,100	10
	...OOCYSTACEAE				
	....ANKISTRODESMUS			1,700	4
	...SCENEDESMACEAE				
	....ACTINASTRUM			3,200	8
	....SCENEDESMUS			3,500	9
	..VOLVOCALES				
	...CHLAMYDOMONADACEAE				
	....CARTERIA			580	1
			TOTALS	13,000	32
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
D	....CYCLOTELLA			17,000	43
D	....MELOSIRA			7,300	18
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			290	1
	....COCCONEIS			290	1
	...FRAGILARIACEAE				
	....FRAGILARIA			290	1
L	....SYNEDRA				0
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			290	1
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			870	2
			TOTALS	27,000	67
	.XANTHOPHYCEAE	YELLOW-GREEN ALGAE			
	..HETEROCOCCALES				
	...CHLOROTHECIACEAE				
	....OPHIOCYTIUM			580	1
			TOTALS	580	1

04108690 KALAMAZOO RIVER AT SAUGATUCK, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

AUG. 2, 1976
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

43,000 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...COELASTRACEAE			
L	....COELASTRUM			0
	...HYDRODICTYACEAE			
	....PEDIASTRUM		3,100	7
	...MICRACTINIACEAE			
	....MICRACTINIUM		490	1
	...OOCYSTACEAE			
	....ANKISTRODESMUS		820	2
L	....CHODATELLA			0
L	....DICTYOSPHAERIUM			0
	....KIRCHNERIELLA		4,300	10
L	....OOCYSTIS			0
	....TETRAEDRON		330	1
L	....TREUBARIA			0
	....WESTELLA		2,000	5
	...SCENEDESMACEAE			
L	....ACTINASTRUM			0
	....CRUCIGENIA		1,300	3
D	....SCENEDESMUS		8,300	19
	....TETRASTRUM		2,000	5
		TOTALS	23,000	53
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		13,000	30
	....MELOSIRA		2,800	6
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....COCCONEIS			0
L	....RHOICOSPHENIA			0
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
L	....FRAGILARIA			0
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
L	....FRUSTULIA			0
L	....NAVICULA			0
	...NITZSCHIACEAE			
L	....NITZSCHIA			0
		TOTALS	16,000	36
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...MALLOMONADACEAE			
L	....MALLOMONAS			0
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS		3,300	8
		TOTALS	3,300	8
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		490	1
		TOTALS	490	1
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...GLENODINIACEAE			
L	....GLENODINIUM			0

04108690 KALAMAZOO RIVER AT SAUGATUCK, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

SEP. 7, 1976
1300 HOURS

IDENTIFICATION OF PHYTOPLANKTON

29,000 CELLS/ML

	ORGANISM NAME	COMMON NAME	CELLS/ML	PER CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...CHARACIACEAE			
L	....SCHROEDERIA			0
	...COELASTRACEAE			
	....COELASTRUM		1,900	6
	...HYDRODICTYACEAE			
	....PEDIASTRUM		1,600	5
	...MICRACTINIACEAE			
L	....GOLENKINIA			0
	...OOCYSTACEAE			
	....ANKISTRODESMUS		830	3
	....FRANCEIA		210	1
	....KIRCHNERIELLA		730	2
L	....SELENASTRUM			0
	....TETRAEDRON		210	1
	...SCENEDESMACEAE			
	....CRUCIGENIA		2,500	9
D	....SCENEDESMUS		5,100	17
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		210	1
	...PHACOTACEAE			
L	....PHACOTUS			0
	..ZYGNEMATALES			
	...DESMIDIACEAE	PLACODERM DESMIDS		
	....STAURASTRUM		310	1
		TOTALS	14,000	46
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		4,300	15
D	....MELOSIRA		6,100	21
	..PENNALES	PENNATE		
	...CYMBELLACEAE			
L	....EPITHEMIA			0
	...FRAGILARIACEAE			
L	....FRAGILARIA			0
L	....SYNEDRA			0
	...NAVICULACEAE	NAVICULOID		
L	....AMPHIPRORA			0
L	....NAVICULA			0
L	....PINNULARIA			0
	...NITZSCHIACEAE			
L	....NITZSCHIA			0
	...SURIRELLACEAE			
L	....SURIRELLA			0
		TOTALS	11,000	36
	.XANTHOPHYCEAE	YELLOW-GREEN ALGAE		
	..HETEROCOCCALES			
	...CHLOROTHECIACEAE			
L	....OPHIOCYTIUM			0
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....AGMENELLUM		830	3
	....ANACYSTIS		3,500	12
		TOTALS	4,400	15
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		210	1
		TOTALS	210	1
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
L	....TRACHELOMONAS			0

NOTE: D - DOMINANT ORGANISM; GREATER OR EQUAL TO 15%
L - LESS THEN 1%; MAY NOT HAVE BEEN ACTUALLY COUNTED

04108690 KALAMAZOO RIVER AT SAUGATUCK, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER	NOVEMBER			DECEMBER			JANUARY		
DAY	ONCE DAILY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	596	600	487	557	520	470	503	---	---	---
2	597	578	572	575	510	462	479	---	---	---
3	596	577	569	574	507	470	494	---	---	---
4	596	573	566	569	506	452	490	---	---	---
5	585	587	565	575	532	485	502	---	---	---
6	576	597	578	588	557	506	533	547	521	535
7	561	601	574	583	561	530	550	567	523	556
8	600	589	578	582	556	476	523	569	534	545
9	564	593	581	589	563	476	508	564	544	557
10	566	587	550	569	560	495	530	562	547	555
11	553	589	581	583	549	476	526	587	540	557
12	604	584	576	581	549	474	497	614	545	583
13	549	583	578	580	548	428	484	576	546	557
14	608	592	579	587	489	312	361	592	558	570
15	618	595	578	592	323	308	316	578	560	566
16	601	606	589	596	351	318	331	609	578	592
17	604	604	593	597	462	342	440	589	564	576
18	568	600	595	598	428	401	415	587	555	573
19	609	604	594	598	400	383	395	587	561	574
20	611	604	575	592	379	343	364	605	568	583
21	616	589	431	476	---	---	---	606	570	578
22	595	483	435	456	---	---	---	587	571	577
23	594	515	459	494	---	---	---	582	573	575
24	613	536	512	523	---	---	---	594	579	585
25	601	566	525	547	---	---	---	596	576	583
26	593	552	519	542	---	---	---	593	577	583
27	573	543	531	534	---	---	---	596	579	584
28	605	551	535	545	---	---	---	603	580	589
29	618	560	413	491	---	---	---	612	57:	592
30	604	492	364	405	---	---	---	638	554	586
31	564	---	---	---	---	---	---	597	571	586
MONTH		606	364	556	---	---	---	638	521	573

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	619	541	581	---	---	---				---	---	---
2	600	588	592	---	---	---				---	---	---
3	611	589	599	---	---	---				---	---	---
4	600	591	594	---	---	---				---	---	---
5	608	593	597	---	---	---				---	---	---
6	602	594	596	---	---	---				---	---	---
7	613	596	601	---	---	---				---	---	---
8	627	597	608	---	---	---				---	---	---
9	614	599	604	457	440	449				---	---	---
10	---	---	---	467	454	459				---	---	---
11	---	---	---	471	456	466				445	388	426
12	---	---	---	---	---	---				464	445	455
13	---	---	---	---	---	---				474	459	466
14	---	---	---	---	---	---				487	470	478
15	---	---	---	---	---	---				491	368	469
16	---	---	---	---	---	---				446	339	379
17	---	---	---	---	---	---				474	447	457
18	---	---	---	---	---	---				493	473	483
19	---	---	---	---	---	---				498	475	488
20	---	---	---	---	---	---				501	487	495
21	---	---	---	---	---	---				503	483	498
22	---	---	---	---	---	---				513	492	502
23	---	---	---	---	---	---				517	502	511
24	---	---	---	---	---	---				522	502	514
25	---	---	---	---	---	---				521	509	515
26	---	---	---	---	---	---				527	515	522
27	---	---	---	---	---	---				531	515	523
28	---	---	---	---	---	---				531	519	524
29	---	---	---	---	---	---				522	395	440
30	---	---	---	---	---	---				403	370	382
31	---	---	---	---	---	---				438	377	405
MONTH	---	---	---	---	---	---				---	---	---

04108690 KALAMAZOO RIVER AT SAUGATUCK, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	447	399	431	520	433	480	629	597	614	512	500	507
2	499	442	470	549	521	534	596	538	578	576	509	543
3	509	480	494	559	539	549	587	487	558	604	544	572
4	510	489	502	560	539	552	590	541	571	598	543	571
5	528	504	522	556	536	550	585	525	563	592	557	566
6	524	516	519	551	538	545	573	509	559	611	589	604
7	526	510	518	559	538	554	558	486	540	---	---	---
8	522	508	518	561	557	560	556	518	548	---	---	---
9	524	516	520	558	545	553	566	481	546	---	---	---
10	528	514	521	550	537	544	567	522	560	---	---	---
11	543	521	532	548	534	543	563	507	557	---	---	---
12	550	531	543	552	544	547	564	518	549	---	---	---
13	548	534	542	544	530	541	550	486	517	---	---	---
14	550	539	544	542	528	534	523	485	510	---	---	---
15	553	447	539	532	490	517	515	506	510	---	---	---
16	560	537	552	541	505	520	540	509	522	---	---	---
17	561	549	557	543	505	526	569	545	556	---	---	---
18	559	403	520	549	517	537	584	568	578	---	---	---
19	556	427	523	551	509	540	591	553	576	---	---	---
20	560	551	555	549	495	540	559	474	525	---	---	---
21	573	556	563	556	516	542	511	464	494	---	---	---
22	576	387	532	561	528	548	514	484	503	---	---	---
23	521	416	439	554	503	544	519	510	514	---	---	---
24	434	394	420	602	502	555	517	504	511	---	---	---
25	537	408	459	630	573	613	506	497	502	---	---	---
26	575	506	558	626	567	602	500	487	493	---	---	---
27	581	569	577	610	573	598	489	483	487	---	---	---
28	572	487	544	603	558	587	489	409	461	---	---	---
29	574	532	563	642	580	609	467	454	460	---	---	---
30	544	406	437	642	574	617	484	468	479	---	---	---
31	---	---	---	627	490	562	499	481	493	---	---	---
MONTH	581	387	517	642	433	553	629	409	530	---	---	---

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER	NOVEMBER			DECEMBER			JANUARY		
DAY	ONCE DAILY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	6.0	11.0	9.5	10.0	3.0	0.5	1.0	---	---	---
2	10.0	12.0	10.5	11.0	1.0	0.5	0.5	---	---	---
3	10.0	13.5	12.0	13.0	1.0	0.5	0.5	---	---	---
4	14.0	14.5	13.5	14.0	2.0	0.5	1.0	---	---	---
5	15.0	14.5	13.5	14.0	8.5	1.5	4.5	---	---	---
6	14.0	15.5	13.5	14.5	6.5	4.0	5.5	0.5	0.5	0.5
7	16.0	16.5	15.0	16.0	3.0	1.0	2.0	0.5	0.5	0.5
8	14.0	16.0	15.5	16.0	2.0	1.0	1.5	0.5	0.5	0.5
9	15.0	16.0	14.5	15.5	2.5	1.0	1.5	0.5	0.5	0.5
10	15.0	16.0	11.5	13.5	2.5	1.0	2.0	0.5	0.5	0.5
11	15.0	11.5	9.5	10.5	3.0	0.5	1.5	0.5	0.5	0.5
12	14.0	10.5	9.0	10.0	1.5	0.5	1.0	0.5	0.5	0.5
13	15.0	8.5	6.0	7.5	6.5	1.0	3.0	0.5	0.5	0.5
14	17.0	6.5	5.0	6.0	7.0	4.0	6.0	0.5	0.5	0.5
15	18.0	7.0	3.5	6.0	6.5	3.5	4.5	0.5	0.5	0.5
16	15.0	9.0	6.0	7.5	3.0	1.0	1.5	0.5	0.5	0.5
17	14.0	10.5	8.0	9.0	1.0	0.5	0.5	0.5	0.5	0.5
18	10.0	11.5	9.5	10.5	0.5	0.5	0.5	0.5	0.5	0.5
19	12.0	10.0	8.5	9.5	0.5	0.5	0.5	0.5	0.5	0.5
20	10.0	9.5	8.0	8.5	0.5	0.0	0.0	0.5	0.5	0.5
21	12.0	8.0	3.5	5.5	---	---	---	0.5	0.5	0.5
22	15.0	5.5	3.5	5.0	---	---	---	0.5	0.5	0.5
23	15.0	5.5	3.0	4.5	---	---	---	0.5	0.5	0.5
24	15.0	4.5	3.5	4.0	---	---	---	0.5	0.5	0.5
25	15.0	3.5	2.0	3.0	---	---	---	0.5	0.5	0.5
26	10.0	2.5	1.5	2.0	---	---	---	0.5	0.5	0.5
27	10.0	2.0	1.0	1.5	---	---	---	0.5	0.5	0.5
28	10.0	2.0	1.0	1.0	---	---	---	0.5	0.5	0.5
29	10.0	3.5	1.0	2.0	---	---	---	0.5	0.5	0.5
30	10.0	6.5	3.5	5.5	---	---	---	0.5	0.5	0.5
31	9.0	---	---	---	---	---	---	0.5	0.5	0.5
MONTH		16.5	1.0	8.5	---	---	---	0.5	0.5	0.5

STREAMS TRIBUTARY TO LAKE MICHIGAN

04108690 KALAMAZOO RIVER AT SAUGATUCK, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	0.5	0.5	0.5	---	---	---				---	---	---
2	0.5	0.5	0.5	---	---	---				---	---	---
3	0.5	0.5	0.5	---	---	---				---	---	---
4	0.5	0.5	0.5	---	---	---				---	---	---
5	0.5	0.5	0.5	---	---	---				---	---	---
6	0.5	0.5	0.5	---	---	---				---	---	---
7	0.5	0.5	0.5	---	---	---				---	---	---
8	0.5	0.5	0.5	---	---	---				---	---	---
9	0.5	0.5	0.5	6.5	2.0	4.0				---	---	---
10	---	---	---	6.0	4.0	5.0				---	---	---
11	---	---	---	6.5	2.0	4.5				16.0	14.0	15.0
12	---	---	---	---	---	---				17.0	12.0	14.5
13	---	---	---	---	---	---				16.5	13.0	15.0
14	---	---	---	---	---	---				18.0	15.0	16.0
15	---	---	---	---	---	---				18.0	16.0	17.0
16	---	---	---	---	---	---				18.0	13.5	16.0
17	---	---	---	---	---	---				18.0	15.5	16.5
18	---	---	---	---	---	---				16.5	12.0	14.5
19	---	---	---	---	---	---				17.0	13.0	15.5
20	---	---	---	---	---	---				17.5	15.5	16.5
21	---	---	---	---	---	---				18.5	16.5	17.5
22	---	---	---	---	---	---				19.0	16.0	17.5
23	---	---	---	---	---	---				18.0	15.5	17.0
24	---	---	---	---	---	---				18.0	16.0	17.0
25	---	---	---	---	---	---				18.5	16.0	17.5
26	---	---	---	---	---	---				18.5	17.0	17.5
27	---	---	---	---	---	---				19.0	17.5	18.5
28	---	---	---	---	---	---				20.0	18.0	19.0
29	---	---	---	---	---	---				18.0	16.0	16.5
30	---	---	---	---	---	---				16.5	15.0	15.5
31	---	---	---	---	---	---				19.0	16.5	17.0
MONTH	---	---	---	---	---	---				---	---	---

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	19.5	18.0	19.0	21.5	18.0	19.5	24.0	22.5	23.5	22.0	20.5	21.5
2	20.5	18.0	19.0	23.0	20.0	21.5	23.0	22.0	22.5	20.5	19.0	19.5
3	21.0	19.0	20.0	23.0	21.5	22.5	23.5	21.5	22.5	21.5	19.0	20.0
4	21.5	19.5	20.5	23.5	21.5	23.0	23.5	21.5	22.5	22.0	20.0	21.5
5	22.5	21.0	21.5	24.5	22.0	23.5	23.0	22.0	22.5	21.5	20.5	21.0
6	23.0	21.5	22.5	25.0	23.0	24.0	23.0	22.0	22.5	21.0	19.0	20.0
7	24.0	22.5	23.5	24.5	23.5	24.0	22.5	20.0	21.5	21.0	19.5	20.0
8	24.5	22.5	23.0	25.0	23.0	24.0	22.5	19.0	21.0	---	---	---
9	25.5	23.0	24.0	25.0	23.0	24.0	23.0	20.0	21.5	---	---	---
10	25.0	23.5	24.5	25.5	23.0	24.5	23.0	21.0	22.0	---	---	---
11	25.5	23.0	24.0	27.0	24.5	25.5	24.0	22.0	23.0	---	---	---
12	26.5	24.0	25.0	26.0	23.5	24.5	25.0	23.0	24.0	---	---	---
13	26.5	24.5	25.5	23.5	22.5	23.0	25.0	24.0	24.5	---	---	---
14	26.5	24.5	25.5	26.0	23.0	24.0	24.5	24.0	24.5	---	---	---
15	26.0	24.5	25.0	26.0	24.0	25.0	24.0	22.5	23.0	---	---	---
16	24.0	22.5	23.0	25.5	24.0	24.5	23.0	21.5	22.5	---	---	---
17	24.0	21.5	23.0	25.0	23.0	24.0	23.5	21.5	22.5	---	---	---
18	24.0	22.0	23.0	25.0	23.0	24.0	24.0	21.5	22.5	---	---	---
19	24.0	22.5	23.0	24.5	23.5	24.0	24.0	22.0	23.0	---	---	---
20	24.0	22.0	23.5	24.0	23.0	23.5	25.0	22.5	23.5	---	---	---
21	23.5	22.5	23.0	25.0	23.0	24.0	25.0	22.5	23.5	---	---	---
22	23.0	18.5	21.5	24.5	23.5	24.0	25.0	22.5	24.0	---	---	---
23	23.0	18.5	20.0	26.0	24.0	25.0	25.0	23.5	24.0	---	---	---
24	21.0	18.0	19.0	26.5	24.5	25.5	24.0	22.5	23.5	---	---	---
25	23.0	18.5	21.0	26.0	24.0	25.0	24.0	23.0	23.5	---	---	---
26	23.5	22.5	23.0	26.0	24.5	25.5	25.0	23.0	24.0	---	---	---
27	25.0	23.0	24.0	26.5	24.5	25.5	24.5	23.5	24.0	---	---	---
28	24.5	23.0	24.0	26.5	24.5	25.0	25.0	23.0	24.0	---	---	---
29	24.0	22.5	23.5	24.5	23.5	24.0	23.5	21.5	22.5	---	---	---
30	22.5	18.0	19.5	25.5	23.0	24.0	21.5	20.5	21.0	---	---	---
31	---	---	---	25.0	22.5	24.0	22.5	20.0	21.0	---	---	---
MONTH	26.5	18.0	22.5	27.0	18.0	24.0	25.0	19.0	23.0	---	---	---

04108800 BLACK RIVER NEAR ZEELAND, MI

LOCATION.--Lat 42°46'40", long 86°01'06", in NW¼ sec.31, T.5 N., R.14 W., Ottawa County, Hydrologic Unit 04050002, on left bank 20 ft (6 m) upstream from bridge on State Road, 0.2 mi (0.3 km) downstream from South Branch, and 2.5 mi (4.0 km) south of Zeeland.

DRAINAGE AREA.--65.8 mi^2 (170.4 km^2).

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

GAGE.--Water-stage recorder. Altitude of gage is 590 ft (180 m) from topographic map.

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--16 years, 61.4 ft^3/s (1.739 m^3/s), 12.67 in/yr (322 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,710 ft^3/s (105 m^3/s) Dec. 30, 1972, gage height, 13.20 ft (4.023 m); minimum, 0.9 ft^3/s (0.025 m^3/s) Aug. 24, 1962; minimum gage height, 1.79 ft (0.546 m) Sept. 30, Oct. 3, 1969.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 900 ft^3/s (25.5 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Nov. 30	1800	928	26.3	9.71	2.960	Mar. 3	1200	1,680	47.6	11.09	3.380
Dec. 15	0700	*2,730	77.3	*12.26	3.737	Mar. 5	1000	1,990	56.4	11.47	3.496
Feb. 14	0200	1,510	42.8	10.87	3.313	May 6	2400	1,870	53.0	11.32	3.450

Minimum discharge, 1.7 ft^3/s (0.048 m^3/s) Sept. 8, gage height, 1.93 ft (0.588 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.5	13	412	46	41	42	27	35	49	89	5.1	2.7
2	6.4	28	92	50	45	208	25	52	32	31	4.3	2.8
3	6.6	85	62	58	49	1330	24	88	24	18	4.1	2.7
4	5.9	57	47	66	45	922	22	49	20	13	4.0	2.5
5	5.6	42	59	76	41	1590	20	44	17	11	4.3	2.5
6	5.5	28	166	59	38	551	19	1350	16	9.6	4.5	2.3
7	5.5	27	96	52	37	108	18	1250	15	8.8	3.7	2.2
8	5.7	37	41	46	36	69	16	250	13	8.4	3.4	2.0
9	5.8	27	35	42	37	60	16	82	12	8.1	3.3	3.0
10	5.5	31	35	39	45	61	16	57	11	7.3	3.2	4.7
11	5.2	31	37	38	160	52	21	59	9.8	6.8	3.1	3.7
12	5.1	21	37	40	400	145	18	46	9.0	5.9	3.2	2.8
13	4.7	18	356	41	900	191	17	37	8.6	5.9	3.7	2.5
14	4.9	16	1410	41	1170	87	16	33	8.0	5.9	3.6	2.5
15	4.7	16	2200	41	598	93	62	33	7.5	6.1	3.4	2.4
16	4.7	15	803	44	621	68	607	319	9.1	5.8	3.3	2.6
17	4.6	13	154	44	288	42	130	263	8.9	5.1	3.2	2.6
18	4.7	13	80	39	361	39	45	68	8.8	5.4	3.2	2.5
19	5.2	12	69	35	284	47	35	42	11	5.3	3.0	2.5
20	5.7	16	62	33	110	130	29	44	9.8	5.2	3.1	2.7
21	6.7	121	56	35	363	319	32	37	9.4	5.1	2.7	3.1
22	5.6	77	53	38	703	60	53	28	9.5	5.2	2.7	2.7
23	5.3	39	52	40	168	42	30	24	9.2	5.2	2.6	2.7
24	5.2	27	49	43	180	36	33	22	11	7.4	2.4	2.6
25	25	23	46	40	305	30	624	21	12	5.9	2.4	2.6
26	15	24	44	40	122	27	583	20	9.5	5.2	2.5	3.0
27	10	40	43	40	76	83	164	19	8.1	5.3	2.6	3.2
28	8.8	22	42	40	60	80	77	19	9.7	5.8	3.0	3.1
29	7.4	99	41	40	48	41	52	74	11	7.2	2.9	2.7
30	6.5	822	41	40	---	36	40	174	50	5.5	2.8	2.5
31	6.2	---	42	40	---	30	---	106	---	6.1	2.7	---
TOTAL	209.6	1840	6762	1366	7331	6619	2871	4745	438.9	325.5	102.0	82.4
MEAN	6.76	61.3	218	44.1	253	214	95.7	153	14.6	10.5	3.29	2.75
MAX	25	822	2200	76	1170	1590	624	1350	50	89	5.1	4.7
MIN	4.6	12	35	33	36	27	16	19	7.5	5.1	2.4	2.0
CFSM	.10	.93	3.31	.67	3.84	3.25	1.45	2.33	.22	.16	.05	.04
IN.	.12	1.04	3.82	.77	4.14	3.74	1.62	2.68	.25	.18	.06	.05

CAL YR 1975 TOTAL 31553.1 MEAN 86.4 MAX 2200 MIN 2.8 CFSM 1.31 IN 17.84
WTR YR 1976 TOTAL 32692.4 MEAN 89.3 MAX 2200 MIN 2.0 CFSM 1.36 IN 18.48

04109000 GRAND RIVER AT JACKSON, MI

LOCATION.--Lat 42°17'05", long 84°24'30", in sec.22, T.2 S., R.1 W., Jackson County, Hydrologic Unit 04050004, on left bank of sewage-treatment plant, 1 mi (2 km) north of Jackson, 2.2 mi (3.5 km) upstream from Portage River, and at mile 216 (348 km).

DRAINAGE AREA.--174 mi^2 (451 km^2).

PERIOD OF RECORD.--April 1935 to current year.

REVISED RECORDS.--WSP 974: 1937(M). WSP 1387: 1936. WSP 1727: 1950(M).

GAGE.--Water-stage recorder. Datum of gage is 900.00 ft (274.320 m) above mean sea level (Fargo Engineering Co. bench mark). Prior to Sept. 24, 1935, nonrecording gage at same site and datum.

REMARKS.--Records good. Slight regulation by mills above station. Flow includes about 17 ft^3/s (0.48 m^3/s) as sewage effluent from the city of Jackson, which originates from ground water sources. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--41 years, 120 ft^3/s (3.398 m^3/s), 9.37 in/yr (238 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,070 ft^3/s (30.3 m^3/s) June 25, 1937, gage height, 13.50 ft (4.115 m); maximum gage height, 15.44 ft (4.706 m) June 25, 1968; minimum discharge, 9.2 ft^3/s (0.26 m^3/s) Aug. 22, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 761 ft^3/s (21.6 m^3/s) Mar. 5, gage height, 13.51 ft (4.118 m); minimum, 27 ft^3/s (0.76 m^3/s) Sept. 5, gage height, 8.29 ft (2.527 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75	127	207	160	80	438	336	264	169	286	57	41
2	73	111	209	163	70	587	337	250	169	294	53	40
3	71	78	214	161	70	652	294	253	166	249	52	40
4	63	75	219	149	83	656	265	250	162	222	51	34
5	57	75	249	156	89	700	259	241	127	205	51	29
6	79	76	271	154	93	672	261	373	113	205	52	31
7	131	97	227	105	142	669	285	397	112	202	44	37
8	133	137	230	91	144	676	282	412	83	190	38	39
9	145	138	234	90	154	673	235	420	77	177	46	79
10	137	169	223	86	201	669	216	426	76	145	46	51
11	73	105	224	83	176	649	210	429	70	90	46	39
12	56	95	223	93	176	649	199	418	61	87	48	33
13	70	95	230	107	200	621	141	402	58	77	49	39
14	72	103	243	158	211	590	144	387	63	76	43	38
15	72	148	313	159	222	560	186	373	67	72	39	42
16	68	145	295	157	281	532	229	361	147	68	51	41
17	66	150	290	145	337	478	195	381	127	57	108	44
18	87	149	245	138	419	430	180	349	83	50	96	37
19	173	140	220	134	443	402	180	318	199	58	50	31
20	178	101	225	89	457	384	177	265	147	70	49	59
21	132	96	208	88	558	375	177	237	98	129	42	47
22	79	94	195	89	563	367	175	217	83	132	38	41
23	79	139	205	88	563	358	169	198	84	112	45	43
24	79	148	181	96	560	351	210	192	136	63	44	40
25	87	105	174	146	544	372	303	141	127	55	43	36
26	68	91	158	156	532	381	292	126	113	61	44	87
27	80	135	109	153	496	370	319	119	105	71	43	77
28	140	140	99	150	448	310	328	166	129	68	37	119
29	140	189	84	150	417	292	327	165	204	72	32	121
30	137	212	129	147	---	330	285	163	288	73	39	68
31	134	---	162	88	---	342	---	163	---	123	41	---
TOTAL	3034	3663	6495	3929	8729	15535	7196	8856	3643	3839	1517	1503
MEAN	97.9	122	210	127	301	501	240	286	121	124	48.9	50.1
MAX	178	212	313	163	563	700	337	429	288	294	108	121
MIN	56	75	84	83	70	292	141	119	58	50	32	29
CFSM	.56	.70	1.21	.73	1.73	2.88	1.38	1.64	.70	.71	.28	.29
IN.	.65	.78	1.39	.84	1.87	3.32	1.54	1.89	.78	.82	.32	.32

CAL YR 1975 TOTAL 57452 MEAN 157 MAX 433 MIN 34 CFSM .90 IN 12.28
WTR YR 1976 TOTAL 67939 MEAN 186 MAX 700 MIN 29 CFSM 1.07 IN 14.52

04111000 GRAND RIVER NEAR EATON RAPIDS, MI

LOCATION.--Lat 42°32'05", long 84°37'25", in NE¼ sec.26, T.2 N., R.3 W., Eaton County, Hydrologic Unit 04050004, on right bank 400 ft (122 m) upstream from bridge on Petrieville Highway, 2 mi (3 km) northeast of Eaton Rapids, 2.5 mi (4.0 km) downstream from Spring Brook, 25 mi (40 km) upstream from Red Cedar River at mile 178 (286 km).

DRAINAGE AREA.--661 mi^2 (1,712 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1950 to current year. Gage-height record for flood seasons collected in this vicinity 1905-28 are contained in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 1707: 1951(M).

GAGE.--Water-stage recorder. Datum of gage is 852.68 ft (259.897 m) above mean sea level (levels by Michigan Department of Natural Resources).

REMARKS.--Water-discharge record good except those for the winter period, which are fair. Diurnal fluctuation caused by powerplant at Smithville and mills at Eaton Rapids.

AVERAGE DISCHARGE.--26 years, 463 ft^3/s (13.11 m^3/s), 9.51 in/yr (242 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,500 ft^3/s (99.1 m^3/s) Feb. 21, 1971; maximum gage height, 8.19 ft (2.496 m) June 28, 1968; minimum discharge, 14 ft^3/s (0.40 m^3/s) Dec. 20, 1962, Oct. 14, 1966; minimum gage height, 0.67 ft (0.204 m) Dec. 20, 1962; minimum daily discharge, 21 ft^3/s (0.59 m^3/s) Oct. 12, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 4, 1950, reached a stage of 8.15 ft (2.484 m), discharge, 3,860 ft^3/s (109 m^3/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,970 ft^3/s (84.1 m^3/s) Mar. 5, 6, gage height, 7.57 ft (2.307 m); minimum, 23 ft^3/s (0.65 m^3/s) Sept. 10, gage height, 0.81 ft (0.247 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	336	303	681	548	430	1590	1240	1150	591	787	220	165
2	328	344	702	545	420	1690	1220	1060	565	783	242	100
3	285	381	746	564	400	2160	1190	1050	556	851	226	122
4	298	330	762	543	360	2540	1140	1010	499	877	198	52
5	249	345	749	481	370	2880	1080	959	503	843	188	49
6	268	348	831	505	410	2930	1040	1020	437	760	162	106
7	219	337	893	437	360	2760	965	1480	463	700	190	151
8	237	341	888	450	380	2450	931	1680	407	648	110	138
9	272	347	970	445	390	2180	888	1740	363	612	172	84
10	298	383	775	440	430	2040	864	1580	348	556	180	93
11	308	405	758	430	500	1960	839	1390	307	525	153	166
12	301	401	781	420	640	1920	807	1240	288	459	148	148
13	301	443	776	415	944	1960	787	1150	270	412	145	101
14	267	429	990	405	1100	1940	728	1110	249	353	125	120
15	318	352	1360	410	1190	1870	705	1050	247	293	148	130
16	231	344	1480	420	1510	1770	847	1050	248	274	160	123
17	178	356	1470	420	1800	1670	767	1080	247	216	185	137
18	215	358	1300	410	1940	1550	786	1110	260	223	210	135
19	258	350	1080	400	2070	1480	777	1080	333	254	249	78
20	283	367	1000	390	1970	1430	750	1020	327	218	215	139
21	315	421	1040	410	2090	1540	725	953	372	163	119	135
22	344	393	905	410	2320	1570	736	878	366	228	106	140
23	334	371	859	410	2300	1480	716	827	330	312	162	138
24	328	366	787	400	2180	1350	731	765	332	270	177	136
25	260	362	757	400	2020	1280	1070	735	334	245	139	133
26	294	371	747	400	1900	1240	1460	696	358	243	141	130
27	326	374	671	405	1810	1340	1700	660	441	218	137	189
28	299	376	680	410	1720	1630	1640	632	352	216	60	197
29	307	389	670	415	1620	1590	1420	558	351	217	77	230
30	296	581	493	440	---	1450	1230	558	586	227	130	220
31	274	---	596	440	---	1310	---	551	---	213	133	---
TOTAL	8827	11268	27197	13618	35574	56550	29779	31822	11330	13196	5007	3985
MEAN	285	376	877	439	1227	1824	993	1027	378	426	162	133
MAX	344	581	1480	564	2320	2930	1700	1740	591	877	249	230
MIN	178	303	493	390	360	1240	705	551	247	163	60	49
CFSM	.43	.57	1.33	.66	1.86	2.76	1.50	1.55	.57	.64	.25	.20
IN.	.50	.63	1.53	.77	2.00	3.18	1.68	1.79	.64	.74	.28	.22

CAL YR 1975 TOTAL 225918 MEAN 619 MAX 3090 MIN 81 CFSM .94 IN 12.71
WTR YR 1976 TOTAL 248153 MEAN 678 MAX 2930 MIN 49 CFSM 1.03 IN 13.97

04111000 GRAND RIVER NEAR EATON RAPIDS, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1963 to September 1974, October 1975 to September 1976.

INSTRUMENTATION.--Temperature recorder since October 1963.

REMARKS.--No record for Feb. 12-25 due to malfunction of the recorder. Clock stopped July 19 to Aug. 19; recorded range in temperature, 19.0°C to 25.0°C.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 35.0°C Aug. 2, 1964; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 26.0°C Aug. 28; minimum, 0.0°C on many days during winter period.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	15.5	14.5	10.5	10.5	5.5	4.0	0.0	0.0	0.0	0.0	7.0	7.0
2	14.5	12.5	10.5	10.5	4.0	3.5	0.0	0.0	0.0	0.0	7.0	6.0
3	13.0	11.5	11.0	10.5	3.0	2.0	0.0	0.0	0.0	0.0	6.0	5.5
4	14.0	12.0	14.0	11.5	2.0	2.0	0.0	0.0	0.0	0.0	5.5	5.5
5	15.0	12.5	14.5	13.5	2.5	2.0	0.0	0.0	0.0	0.0	6.0	5.5
6	15.5	13.0	15.5	14.5	4.0	2.5	0.0	0.0	0.0	0.0	6.0	5.5
7	15.5	12.5	15.5	15.0	4.0	4.0	0.0	0.0	0.0	0.0	5.5	5.0
8	15.0	14.0	16.5	16.0	4.0	3.0	0.0	0.0	0.0	0.0	5.0	4.0
9	14.5	14.0	16.5	16.0	3.0	2.5	0.0	0.0	0.0	0.0	5.0	4.0
10	15.0	14.0	16.5	14.0	2.0	1.5	0.0	0.0	0.0	0.0	5.0	5.0
11	15.0	13.5	14.5	14.0	1.5	1.5	0.0	0.0	0.0	0.0	5.0	4.5
12	14.0	12.5	14.0	13.0	1.5	1.5	0.0	0.0	---	---	5.0	5.0
13	16.0	13.5	13.0	11.5	2.0	1.5	0.0	0.0	---	---	5.0	5.0
14	16.5	15.0	11.5	10.5	4.5	1.5	0.0	0.0	---	---	5.0	4.5
15	16.5	16.0	11.0	9.0	5.5	4.5	0.0	0.0	---	---	5.0	4.5
16	16.0	12.5	10.5	9.0	5.5	4.5	0.0	0.0	---	---	5.0	5.0
17	14.0	12.5	11.0	10.0	4.5	2.0	0.0	0.0	---	---	5.0	4.0
18	12.5	11.5	11.0	10.5	2.0	1.0	0.0	0.0	---	---	4.0	3.5
19	11.5	11.5	11.0	10.5	0.5	0.5	0.0	0.0	---	---	6.5	3.5
20	11.5	11.0	11.0	11.0	0.5	0.0	0.0	0.0	---	---	7.5	6.5
21	11.5	11.0	10.5	10.0	0.0	0.0	0.0	0.0	---	---	7.5	7.5
22	12.0	11.0	10.0	8.5	0.0	0.0	0.0	0.0	---	---	7.5	7.0
23	13.0	12.0	8.5	8.0	0.0	0.0	0.0	0.0	---	---	7.0	6.5
24	15.0	13.0	7.5	7.0	0.0	0.0	0.0	0.0	---	---	7.0	6.5
25	15.0	14.0	7.0	6.0	0.0	0.0	0.0	0.0	---	---	8.0	7.0
26	14.0	12.0	5.0	4.0	0.0	0.0	0.0	0.0	6.5	5.0	9.0	7.5
27	13.0	12.0	4.5	3.5	0.0	0.0	0.0	0.0	7.0	6.5	9.0	9.0
28	13.0	12.5	4.0	4.0	0.0	0.0	0.0	0.0	7.0	7.0	9.0	9.0
29	12.5	11.5	4.0	3.5	0.0	0.0	0.0	0.0	7.0	7.0	9.0	9.0
30	11.5	11.0	6.0	4.0	0.0	0.0	0.0	0.0	---	---	9.0	9.0
31	11.0	10.0	---	---	0.0	0.0	0.0	0.0	---	---	9.0	9.0
MONTH	16.5	10.0	16.5	3.5	5.5	0.0	0.0	0.0	---	---	9.0	3.5

04111000 GRAND RIVER NEAR EATON RAPIDS, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04111379 RED CEDAR RIVER NEAR WILLIAMSTON, MI

LOCATION.--Lat 42°40'59", long 84°13'09", in NE¼ sec.4, T.3 N., R.2 E., Ingham County, Hydrologic Unit 04050004, on right bank, 20 ft (6 m) upstream from bridge on State Highway 52, 1.5 mi (2.4 km) upstream from Squaw Creek, and 3.5 mi (5.6 km) east of Williamston.

DRAINAGE AREA.--163 mi^2 (422 km^2).

PERIOD OF RECORD.--July 1975 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 870 ft (265 m) from topographic map (nearest 10 ft).

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 1975, reached a gage height of 10.41 ft (3.173 m) Apr. 19, and a discharge of 2,640 ft^3/s (74.8 m^3/s) Apr. 20.

EXTREMES FOR CURRENT PERIOD.--July to September 1975: Maximum discharge during period, 308 ft^3/s (8.72 m^3/s) Sept. 6, gage height, 5.60 ft (1.707 m); minimum, 19 ft^3/s (0.54 m^3/s) Aug. 19, 20, 21, gage height, 2.34 ft (0.713 m).
Water year 1976: Maximum discharge, 990 ft^3/s (28.0 m^3/s) Mar. 5, 6, gage height, 7.60 ft (2.316 m); minimum, 10 ft^3/s (0.28 m^3/s) Sept. 9, gage height, 2.13 ft (0.649 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1										---	20	259
2										---	21	261
3										---	22	245
4										---	23	269
5										---	24	264
6										---	24	298
7										---	23	294
8										---	23	270
9										---	22	244
10										32	22	208
11										31	21	166
12										29	21	135
13										31	22	106
14										33	22	82
15										32	22	67
16										31	22	59
17										28	22	55
18										26	21	52
19							†2,590			28	20	52
20							†2,640			28	19	55
21							†2,430			27	27	60
22										25	58	62
23										23	68	60
24										26	65	56
25										25	73	52
26										26	62	52
27									†144	24	55	52
28										23	47	50
29										21	44	47
30										21	49	46
31										20	134	---
TOTAL										---	1118	3978
MEAN										---	36.1	133
MAX										---	134	298
MIN										---	19	46
CFSM										---	.22	.82
IN.										---	.26	.91

†Result of discharge measurement.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	54	236	114	74	392	375	295	89	254	25	15
2	45	57	236	113	72	430	358	258	90	258	22	15
3	43	65	227	112	71	603	336	230	86	202	19	15
4	42	71	209	83	71	742	311	207	76	161	19	15
5	41	73	188	72	71	898	286	182	66	126	20	14
6	39	69	237	98	70	958	263	189	59	90	20	14
7	37	69	297	108	69	834	237	330	53	67	19	14
8	38	78	283	79	67	718	214	375	48	58	19	13
9	39	81	274	75	65	609	189	394	45	50	18	12
10	41	85	256	76	66	525	169	377	43	46	17	16
11	41	95	237	77	88	468	157	344	42	43	18	18
12	41	93	215	77	120	433	148	305	41	38	17	18
13	40	87	204	76	220	440	139	266	41	33	18	16
14	38	78	294	76	370	423	129	223	38	31	20	15
15	38	71	435	74	468	408	121	183	33	28	22	18
16	38	67	486	73	692	388	164	158	37	28	21	21
17	39	63	465	74	828	363	192	161	34	29	18	20
18	39	60	470	72	832	338	183	178	33	29	17	19
19	44	58	419	68	872	318	158	178	46	27	16	19
20	50	57	339	69	792	304	133	162	52	25	16	19
21	55	63	286	70	820	318	115	133	49	31	16	18
22	56	66	254	71	954	324	106	104	43	29	17	18
23	55	64	197	71	842	334	99	91	41	25	16	19
24	53	61	148	71	718	336	100	81	39	23	15	18
25	57	61	126	70	645	334	209	73	43	23	14	18
26	60	61	118	70	573	322	363	71	47	21	16	22
27	60	62	114	71	509	346	388	67	45	19	17	29
28	57	66	110	73	455	437	390	64	40	20	16	27
29	56	73	107	73	417	433	365	64	37	37	16	23
30	54	156	111	73	---	426	332	67	112	30	16	22
31	52	---	113	75	---	401	---	76	---	27	16	---
TOTAL	1434	2164	7691	2454	11911	14603	6729	5886	1548	1908	556	540
MEAN	46.3	72.1	248	79.2	411	471	224	190	51.6	61.5	17.9	18.0
MAX	60	156	486	114	954	958	390	394	112	258	25	29
MIN	37	54	107	68	65	304	99	64	33	19	14	12
CFSM	.28	.44	1.52	.49	2.52	2.89	1.37	1.17	.32	.38	.11	.11
IN.	.33	.49	1.76	.56	2.72	3.33	1.54	1.34	.35	.44	.13	.12

WTR YR 1976 TOTAL 57424 MEAN 157 MAX 958 MIN 12 CFSM .96 IN 13.11

04111500 DEER CREEK NEAR DANSVILLE, MI

LOCATION.--Lat 42°36'30", long 84°19'15", in E½ sec.33, T.3 N., R.1 E., Ingham County, Hydrologic Unit 04050004, on right bank 15 ft (5 m) upstream from bridge on Clark Road, 3.5 mi (5.6 km) north of Dansville, and 7.2 mi (11.6 km) upstream from mouth.

DRAINAGE AREA.--16.3 mi^2 (42.2 km^2).

PERIOD OF RECORD.--May 1954 to current year.

REVISED RECORDS.--WSP 1727: 1954(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 889.08 ft (270.992 m) above mean sea level (levels by Michigan Department of Natural Resources).

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--22 years, 10.7 ft^3/s (0.303 m^3/s), 8.91 in/yr (226 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 962 ft^3/s (27.2 m^3/s) Apr. 19, 1975, gage height, 12.18 ft (3.712 m), from flood mark, rating curve extended above 610 ft^3/s (17.3 m^3/s); minimum, 0.06 ft^3/s (0.002 m^3/s) Jan. 10, 1970, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft^3/s (2.83 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	0800	180	5.10	5.50	1.676	Mar. 5	1500	*252	7.14	*6.47	1.972
Feb. 16	0100	198	5.61	5.74	1.750	Mar. 28	0100	110	3.12	4.43	1.350
Feb. 17	0600	179	5.07	5.47	1.667	Apr. 25	2200	137	3.88	4.91	1.497
Feb. 21	2100	*252	7.14	*6.47	1.972	May 7	0600	151	4.28	5.11	1.558
Mar. 3	1700	197	5.58	5.73	1.747	June 30	2400	128	3.62	4.74	1.445

Minimum discharge, 0.15 ft^3/s (0.004 m^3/s) Sept. 4, 5, gage height, 2.63 ft (0.802 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	2.7	30	9.8	5.5	25	22	17	7.2	103	.99	.26
2	2.8	3.0	20	9.7	5.4	83	25	16	6.1	39	.95	.30
3	2.5	3.6	15	9.5	5.2	186	23	16	5.1	21	.89	.25
4	2.5	4.4	12	9.2	5.1	135	19	14	4.4	16	.81	.20
5	2.2	4.1	12	8.8	5.0	194	17	13	4.0	11	.86	.17
6	2.1	4.6	53	8.2	4.9	111	16	38	3.8	8.7	.88	.18
7	1.9	5.2	36	7.8	4.8	51	14	124	3.5	7.2	.81	.21
8	2.0	5.2	23	7.3	4.6	35	13	51	3.3	6.1	.76	.24
9	2.4	4.9	19	6.7	4.3	30	11	30	3.1	5.0	.71	.32
10	2.7	5.5	17	6.4	4.5	28	11	23	2.9	4.5	.64	.52
11	2.4	5.6	16	6.3	8.0	27	11	20	2.7	4.0	.57	.37
12	2.4	5.0	15	6.2	16	27	10	17	2.5	3.2	.56	.28
13	2.2	4.3	35	6.1	30	43	9.5	14	2.4	2.8	.58	.24
14	2.1	4.0	119	6.0	50	31	9.0	12	2.3	2.5	.72	.25
15	2.0	3.8	158	6.0	90	27	8.7	12	2.2	2.3	.62	.52
16	2.0	3.6	79	6.0	155	24	19	14	3.3	2.1	.53	.71
17	2.0	3.6	39	6.0	151	19	15	17	2.7	2.0	.45	.62
18	2.0	3.6	25	6.0	120	17	12	15	2.5	1.7	.43	.55
19	2.7	3.4	19	6.0	100	18	9.8	12	12	1.6	.38	.46
20	3.4	3.6	15	5.9	52	17	8.8	10	7.4	1.8	.35	.54
21	3.1	5.3	13	5.8	145	21	9.6	8.7	4.9	2.1	.35	.52
22	2.8	4.8	12	5.8	164	17	10	7.6	4.1	1.7	.33	.52
23	2.6	4.2	12	5.7	66	16	8.9	7.5	3.6	1.6	.29	.50
24	2.6	4.0	11	5.7	42	15	12	7.2	3.7	1.3	.26	.42
25	3.2	4.3	11	5.6	40	17	87	7.0	5.4	1.2	.25	.46
26	3.6	4.1	10	5.6	35	16	97	6.4	4.2	1.1	.27	.89
27	3.3	4.5	10	5.6	30	40	47	6.1	3.3	1.1	.30	1.5
28	3.0	5.0	10	5.6	26	82	32	5.8	3.6	1.1	.26	.96
29	2.9	8.7	10	5.7	24	39	25	5.9	3.8	1.4	.22	.64
30	2.6	45	10	5.8	---	32	20	6.3	69	1.4	.22	.58
31	2.6	---	9.9	5.7	---	25	---	7.1	---	1.2	.26	---
TOTAL	79.5	173.6	875.9	206.5	1393.3	1448	632.3	560.6	189.0	260.7	16.50	14.18
MEAN	2.56	5.79	28.3	6.66	48.0	46.7	21.1	18.1	6.30	8.41	.53	.47
MAX	3.6	45	158	9.8	164	194	97	124	69	103	.99	1.5
MIN	1.9	2.7	9.9	5.6	4.3	15	8.7	5.8	2.2	1.1	.22	.17
CFSM	.16	.36	1.74	.41	2.94	2.87	1.29	1.11	.39	.52	.03	.03
IN.	.18	.40	2.00	.47	3.18	3.30	1.44	1.28	.43	.59	.04	.03

CAL YR 1975 TOTAL 5961.42 MEAN 16.3 MAX 720 MIN .51 CFSM 1.00 IN 13.60
WTR YR 1976 TOTAL 5850.08 MEAN 16.0 MAX 194 MIN .17 CFSM .98 IN 13.35

04112000 SLOAN CREEK NEAR WILLIAMSTON, MI

LOCATION.--Lat 42°40'33", long 84°21'50", in SE¼ NE¼ sec.1, T.3 N., R.1 W., Ingham County, Hydrologic Unit 04050004, on left bank 30 ft (9 m) downstream from bridge on Meridian Road, 2.1 mi (3.4 km) upstream from mouth, and 4.2 mi (6.8 km) west of Williamston.

DRAINAGE AREA.--9.34 mi^2 (24.19 km^2).

PERIOD OF RECORD.--June 1954 to current year.

GAGE.--Water-stage recorder and concrete control with V-notch sharp-crested weir. Datum of gage is 862.12 ft (262.774 m) above mean sea level (levels by Michigan Department of Natural Resources).

REMARKS.--Records good except those for period of no gage-height record, Aug. 16 to Sept. 22, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--22 years, 5.81 ft^3/s (0.165 m^3/s), 8.45 in/yr (215 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,290 ft^3/s (36.5 m^3/s) Apr. 18, 1975, gage height, 9.99 ft (3.045 m), from rating curve extended above 660 ft^3/s (18.7 m^3/s) on basis of computation of peak flow through culvert and over-road embankment; minimum, 0.01 ft^3/s (<0.001 m^3/s) Sept. 11, 1954, Jan. 18, 1957, gage height, 1.10 ft (0.335 m), caused by unusual regulation; minimum natural discharge, 0.02 ft^3/s (0.001 m^3/s) July 27, 1965, gage height, 1.18 ft (0.360 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 120 ft^3/s (3.40 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	0300	158	4.47	4.15	1.265
Feb. 21	--	130	3.68	unknown	
Mar. 3	0500	148	4.19	4.05	1.234
Mar. 5	0700	*279	7.90	*4.93	1.503
Apr. 25	1900	122	3.46	3.81	1.161

Minimum daily discharge, 0.07 ft^3/s (0.002 m^3/s) Sept. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	.86	19	3.8	2.2	9.8	10	8.0	2.5	26	.59	.11
2	1.2	.91	10	3.8	2.0	77	12	7.2	2.2	9.9	.42	.13
3	1.1	1.7	7.1	3.8	1.9	114	10	6.8	1.8	5.3	.42	.10
4	1.1	1.7	5.9	3.5	2.0	59	8.6	5.8	1.6	4.1	.69	.08
5	.98	1.5	5.6	3.1	1.9	139	7.4	5.1	1.4	3.1	1.3	.07
6	.94	1.4	57	3.0	1.9	47	6.9	29	1.2	2.3	1.3	.08
7	.87	1.6	31	3.1	1.8	30	6.1	62	1.1	1.9	1.3	.09
8	.87	1.6	16	2.7	1.6	22	6.1	27	1.1	1.5	1.0	.10
9	.96	1.5	11	2.4	1.6	17	5.5	15	1.0	1.3	.36	.12
10	.96	1.7	9.1	2.3	2.0	14	4.7	11	.95	1.1	.26	.16
11	.90	1.6	7.9	2.4	4.2	13	4.7	8.5	.92	.99	.35	.13
12	.87	1.5	7.2	2.4	8.0	19	4.2	7.3	.86	.93	.30	.10
13	.84	1.5	25	2.5	15	31	4.1	5.6	.80	.87	.31	.08
14	.81	1.6	64	2.2	26	19	3.9	4.9	.75	.75	.36	.09
15	.81	1.9	103	2.1	47	14	4.3	5.2	.70	.68	.37	.13
16	.78	1.8	40	2.5	75	12	28	5.9	.84	.61	.32	.23
17	.81	1.3	24	2.4	74	9.0	12	6.7	.74	.55	.28	.20
18	.81	1.1	15	2.2	60	7.1	7.4	6.0	.72	.51	.25	.18
19	.93	1.0	8.2	2.1	50	7.1	5.6	4.5	.97	.46	.22	.15
20	.99	1.1	6.5	2.3	26	20	4.9	3.6	.76	.51	.20	.17
21	.90	1.5	5.4	2.2	72	45	4.7	3.1	.71	1.0	.18	.18
22	.87	1.3	4.9	2.2	78	18	5.2	2.8	.69	.67	.17	.17
23	.84	1.2	4.6	2.3	33	12	4.9	2.7	.64	.53	.16	.14
24	.81	1.2	4.1	2.2	26	8.8	6.7	2.6	.79	.46	.15	.13
25	.90	1.2	4.0	2.1	24	7.8	86	2.5	.97	.40	.14	.15
26	.87	1.1	4.0	2.2	20	7.2	59	2.4	.68	.37	.13	.28
27	.84	1.3	3.7	2.0	15	56	33	2.3	.78	.35	.12	.36
28	.84	1.4	3.4	1.9	12	49	22	2.2	.54	1.3	.10	.26
29	.81	4.0	3.3	2.3	10	27	14	2.3	.56	2.7	.08	.20
30	.78	34	3.6	2.2	---	20	10	2.5	13	1.2	.09	.18
31	.78	---	3.9	2.1	---	13	---	2.6	---	.79	.10	---
TOTAL	28.07	77.07	517.4	78.3	694.1	943.8	401.9	263.1	42.27	73.13	12.02	4.55
MEAN	.91	2.57	16.7	2.53	23.9	30.4	13.4	8.49	1.41	2.36	.39	.15
MAX	1.3	34	103	3.8	78	139	86	62	13	26	1.3	.36
MIN	.78	.86	3.3	1.9	1.6	7.1	3.9	2.2	.54	.35	.08	.07
CFSM	.10	.28	1.79	.27	2.56	3.25	1.43	.91	.15	.25	.04	.02
IN.	.11	.31	2.06	.31	2.76	3.76	1.60	1.05	.17	.29	.05	.02

CAL YR 1975 TOTAL 4025.58 MEAN 11.0 MAX 536 MIN .22 CFSM 1.18 IN 16.03
WTR YR 1976 TOTAL 3135.71 MEAN 8.57 MAX 139 MIN .07 CFSM .92 IN 12.49

04112500 RED CEDAR RIVER AT EAST LANSING, MI

LOCATION.--Lat 42°43'40", long 84°28'40", in SW¼ sec.18, T.4 N., R.1 W., Ingham County, Hydrologic Unit 04050004, in left downstream bridge abutment of Farm Lane Bridge on Michigan State University Campus in East Lansing, 4.0 mi (6.4 km) upstream from Sycamore Creek, and 5.6 mi (9.0 km) upstream from mouth.

DRAINAGE AREA.--355 mi^2 (919 km^2).

PERIOD OF RECORD.--August 1902 to December 1903, March 1931 to current year. Monthly discharge only for some periods, published in WSP 1307. Published as Red Cedar River at Agricultural College, August 1902 to December 1903 and as Cedar River at East Lansing, March 1931 to September 1965. Gage height records collected in this vicinity 1911-19, and for flood seasons only 1920-28, are contained in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 1307: 1936(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 824.39 ft (251.274 m) above mean sea level. August 1902 to December 1903 nonrecording gage at site 0.8 mi (1.3 km) downstream at different datum. March 1931 to November 1940 water-stage recorder at site 250 ft (76 m) upstream at present datum.

REMARKS.--Records good. Occasional regulation at low flow by mill at Williamston, 16 mi (26 km) above station. Several observations of water temperature were made during the year. National Weather Service gage-height telemark at station.

AVERAGE DISCHARGE.--46 years, 209 ft^3/s (5.919 m^3/s), 7.99 in/yr (203 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,940 ft^3/s (168 m^3/s) Apr. 20, 1975, gage height, 11.95 ft (3.642 m); minimum, 3 ft^3/s (0.08 m^3/s) July 31, 1931.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 24, 1904, reached a stage of 13.4 ft (4.08 m), discharge, 8,000 ft^3/s (277 m^3/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,250 ft^3/s (63.7 m^3/s) Mar. 6, gage height, 7.46 ft (2.274 m); minimum, 21 ft^3/s (0.59 m^3/s) Sept. 6, 7, 8, 9, gage height, 3.12 ft (0.951 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	102	89	471	244	160	695	630	575	160	550	67	24
2	97	97	453	240	156	760	590	500	166	595	62	24
3	92	132	387	236	149	1250	565	466	160	480	55	24
4	89	142	343	184	152	1760	505	415	149	339	49	24
5	84	138	323	152	152	2020	458	367	129	258	49	23
6	79	135	510	198	149	2230	435	480	111	222	49	23
7	77	135	670	226	149	2000	395	870	102	188	49	21
8	74	135	620	174	146	1580	355	1010	92	163	47	21
9	77	142	505	156	138	1230	323	920	84	142	42	23
10	79	149	444	163	142	1010	299	775	74	120	40	28
11	79	156	407	163	184	885	287	655	72	105	38	26
12	77	163	375	163	261	795	275	550	72	95	36	26
13	77	163	387	163	423	835	261	466	67	82	36	26
14	72	149	640	163	620	870	254	403	65	77	36	26
15	69	142	1050	156	800	815	250	359	67	72	38	26
16	69	129	1290	156	1250	740	399	327	69	65	42	28
17	67	120	1160	160	1720	675	435	319	67	62	40	34
18	69	117	890	152	1920	585	395	315	62	60	34	34
19	77	111	665	149	1890	530	347	323	72	57	32	34
20	87	114	495	149	1780	500	311	303	87	57	31	34
21	87	123	453	152	1640	565	287	275	97	62	29	34
22	89	126	347	152	2010	585	283	254	87	62	28	32
23	87	126	351	152	2040	520	275	219	77	62	26	31
24	84	120	307	152	1620	490	264	191	82	57	26	31
25	84	120	272	152	1290	471	540	180	87	53	24	31
26	89	120	250	152	1130	453	990	166	87	47	23	36
27	95	123	250	152	990	490	1050	160	84	47	24	51
28	95	129	240	156	870	820	945	152	82	77	26	49
29	89	160	219	156	765	950	800	149	79	184	26	47
30	87	323	226	156	---	835	675	149	264	135	26	42
31	87	---	240	160	---	715	---	160	---	92	24	---
TOTAL	2566	4128	15240	5239	24696	28659	13878	12453	2953	4667	1154	913
MEAN	82.8	138	492	169	852	924	463	402	98.4	151	37.2	30.4
MAX	102	323	1290	244	2040	2230	1050	1010	264	595	67	51
MIN	67	89	219	149	138	453	250	149	62	47	23	21
CFSM	.23	.39	1.39	.48	2.40	2.60	1.30	1.13	.28	.43	.10	.09
IN.	.27	.43	1.60	.55	2.59	3.00	1.45	1.30	.31	.49	.12	.10

CAL YR 1975 TOTAL 127413 MEAN 349 MAX 5720 MIN 34 CFSM .98 IN 13.35
WTR YR 1976 TOTAL 116546 MEAN 318 MAX 2230 MIN 21 CFSM .90 IN 12.21

04112850 SYCAMORE CREEK NEAR HOLT, MI

LOCATION.--Lat 42°38'25", long 84°28'58", in SW¼ SW¼ sec.18, T.3 N., R.1 W., Ingham County, Hydrologic Unit 04050004, on left bank 15 ft (5 m) downstream from bridge on Holt Road, and 1.5 mi (2.4 km) east of Holt.

DRAINAGE AREA.--80.6 mi^2 (208.8 km^2).

PERIOD OF RECORD.--April 1975 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 850 ft (259 m) from topographic map (nearest 10 ft).

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,110 ft^3/s (59.8 m^3/s) Apr. 19, 1975, gage height, 10.00 ft (3.048 m); minimum, 6.0 ft^3/s (0.17 m^3/s) Sept. 12, 13, 1976; minimum gage height, 1.80 ft (0.549 m) Sept. 5, 6, 7, 8, 9, 12, 13, 1976.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 596 ft^3/s (16.9 m^3/s) Mar. 5, gage height, 7.39 ft (2.252 m); minimum, 6.0 ft^3/s (0.17 m^3/s) Sept. 12, 13; minimum gage height, 1.80 ft (0.549 m) Sept. 5, 6, 7, 8, 9, 12, 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	17	146	52	29	137	134	115	61	245	14	7.7
2	19	18	118	51	28	218	130	100	85	261	13	7.6
3	19	22	83	50	27	424	124	105	58	183	13	7.4
4	17	27	63	48	27	475	112	96	43	99	12	7.3
5	18	26	58	46	26	556	97	86	34	66	12	6.6
6	16	24	116	44	25	514	91	108	31	50	13	6.3
7	17	24	194	42	25	362	85	306	29	37	12	6.3
8	16	27	158	39	24	290	78	318	27	33	12	6.3
9	17	25	109	36	24	250	71	242	25	30	11	6.7
10	19	24	89	34	27	219	68	173	23	27	11	9.8
11	19	27	79	33	45	195	69	121	22	25	11	7.9
12	19	25	74	33	75	168	65	100	21	22	10	6.7
13	18	23	82	32	120	210	61	86	19	20	10	6.1
14	18	22	193	32	190	204	59	77	19	19	12	6.5
15	18	21	376	31	312	180	57	73	18	19	12	7.7
16	17	21	360	31	385	145	96	78	20	18	11	8.9
17	16	20	285	31	409	115	121	93	20	17	11	8.8
18	17	20	190	31	382	100	93	108	17	16	10	8.5
19	19	19	140	31	368	96	74	89	26	15	9.7	7.6
20	24	19	108	31	310	110	65	125	36	16	9.2	8.3
21	24	28	86	31	346	160	64	61	24	30	8.9	8.3
22	21	26	76	31	502	140	80	54	21	19	8.5	7.9
23	20	23	66	31	391	120	71	49	20	16	8.2	7.8
24	19	21	62	30	304	105	74	46	19	16	8.2	7.6
25	20	22	58	30	269	95	215	46	30	14	8.6	7.6
26	23	23	55	29	239	95	358	42	21	14	8.3	9.6
27	20	23	54	29	214	180	324	40	19	13	8.6	16
28	19	26	53	29	181	380	258	37	17	14	8.5	11
29	18	30	53	30	147	280	200	36	18	16	7.9	10
30	17	91	52	30	---	200	147	38	78	16	7.4	9.4
31	17	---	52	30	---	170	---	46	---	15	7.7	---
TOTAL	581	764	3688	1088	5451	6893	3541	3094	901	1401	319.7	244.2
MEAN	18.7	25.5	119	35.1	188	222	118	99.8	30.0	45.2	10.3	8.14
MAX	24	91	376	52	502	556	358	318	85	261	14	16
MIN	16	17	52	29	24	95	57	36	17	13	7.4	6.1
CFSM	.23	.32	1.48	.44	2.33	2.75	1.46	1.24	.37	.56	.13	.10
IN.	.27	.35	1.70	.50	2.52	3.18	1.63	1.43	.42	.65	.15	.11

WTR YR 1976 TOTAL 27965.9 MEAN 76.4 MAX 556 MIN 6.1 CFSM .95 IN 12.91

04112904 MUD LAKE DRAIN AT LANSING, MI

LOCATION.--Lat 42°40'09", long 84°32'05", in SE¼ SW¼ sec.3, T.3 N., R.2 W., Ingham County, Hydrologic Unit 04050004, on right bank 5 ft (2 m) downstream from culvert on Miller Road in Lansing.

DRAINAGE AREA.--4.28 mi^2 (11.09 km^2).

PERIOD OF RECORD.--January 1975 to September 1976 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 852.15 ft (259.735 m) above mean sea level.

REMARKS.--Records poor. Several observations of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 485 ft^3/s (13.7 m^3/s) Apr. 18, 1975, gage height, 7.03 ft (2.143 m); no flow part of each day July 2-6, 9-21, 1975; no flow Sept. 1-6, 11-18, 1976.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 151 ft^3/s (4.28 m^3/s) June 30, gage height, 3.72 ft (1.134 m); no flow Sept. 1-6, 11-18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.21	2.1	1.4	.30	.52	11	6.5	2.7	3.3	7.6	.11	0
2	.16	.37	.74	.40	.52	23	5.1	4.7	1.7	2.7	.10	0
3	.16	5.7	.90	.50	.52	31	4.1	3.1	1.4	2.1	.09	0
4	.12	.34	.34	.60	.52	23	3.8	2.4	1.3	1.8	.09	0
5	.10	.34	2.8	.60	.50	44	2.9	1.7	.92	1.1	1.6	0
6	.10	.24	19	.60	.50	21	3.0	23	.89	.79	.62	0
7	.10	2.9	3.4	.60	.50	16	2.4	13	.88	.80	.14	.10
8	.06	.34	2.3	.60	.50	12	1.9	8.3	.77	.48	.10	.01
9	1.9	.25	2.6	.58	.50	9.5	1.5	6.0	.71	.35	.08	2.2
10	.23	4.3	1.7	.58	.50	9.0	1.3	4.5	.64	.25	.07	.02
11	.16	.31	1.7	.58	.50	6.8	2.2	4.0	.55	.22	.07	0
12	.16	.24	2.2	.58	.52	16	1.0	3.0	.28	.13	.08	0
13	.16	.32	8.8	.58	1.5	14	.84	2.4	.37	.11	.25	0
14	.11	.29	19	.56	5.0	10	.57	1.9	.67	.10	.50	0
15	.10	.24	15	.56	11	8.1	11	3.1	2.2	.09	.11	0
16	.10	.24	8.0	.56	14	6.8	15	7.9	.72	.08	.04	0
17	.10	.18	2.5	.55	13	7.2	3.9	3.6	.15	.08	.03	0
18	.54	.16	1.8	.54	16	4.8	2.8	2.4	2.1	.13	.03	0
19	1.7	.16	1.5	.54	13	4.4	2.2	1.8	5.5	.10	.02	.10
20	.29	4.6	1.3	.54	9.8	7.2	1.9	1.6	.18	16	.02	.70
21	.21	.44	1.1	.54	39	6.3	5.0	1.3	.17	2.8	.02	.01
22	.16	.24	1.0	.53	19	5.1	3.3	.95	.31	.11	.02	.01
23	.16	.24	.88	.53	17	4.7	2.2	.94	.22	.19	.02	.10
24	.24	.23	.70	.53	11	4.3	9.5	1.0	6.0	.19	.18	.02
25	1.8	.34	.66	.53	9.2	3.8	31	.88	.54	.16	.28	.01
26	.26	.32	.60	.53	8.9	3.5	15	.94	.15	.15	.15	9.3
27	.24	.50	.52	.53	7.3	17	11	.78	.11	.42	.02	.22
28	.24	.41	.50	.53	6.0	8.4	7.7	.90	.12	5.8	.57	.02
29	.19	11	.50	.52	5.6	6.6	5.3	1.4	6.0	.59	.02	.01
30	.16	6.8	.40	.52	---	5.5	3.8	2.1	57	.16	.01	.01
31	.16	---	.39	.52	---	4.7	---	2.8	---	.14	.01	---
TOTAL	10.38	44.14	104.23	16.76	212.40	354.7	167.71	115.09	95.85	45.73	5.45	12.84
MEAN	.33	1.47	3.36	.54	7.32	11.4	5.59	3.71	3.20	1.48	.18	.43
MAX	1.9	11	19	.60	39	44	31	23	57	16	1.6	9.3
MIN	.06	.16	.34	.30	.50	3.5	.57	.78	.11	.08	.01	0
CFSM	.08	.35	.79	.13	1.72	2.68	1.32	.87	.75	.35	.04	.10
IN.	.09	.39	.91	.15	1.86	3.10	1.47	1.01	.84	.40	.05	.11

CAL YR 1975 TOTAL 1141.73 MEAN 3.13 MAX 105 MIN .01 CFSM .74 IN 9.99
WTR YR 1976 TOTAL 1185.28 MEAN 3.24 MAX 57 MIN 0 CFSM .76 IN 10.37

04113000 GRAND RIVER AT LANSING, MI

LOCATION.--Lat 42°45'02", long 84°33'19", in NW¼ sec.9, T.4 N., R.2 W., Ingham County, Hydrologic Unit 04050004, on right bank 30 ft (9 m) upstream from bridge on North Grand River Avenue in Lansing, 2.0 mi (3.2 km) downstream from Red Cedar River, and at mile 152 (245 km).

DRAINAGE AREA.--1,230 mi^2 (3,180 km^2), approximately.

PERIOD OF RECORD.--March 1901 to September 1906, October 1934 to current year. Monthly discharge only for some periods, published in WSP 1307. Published as "at North Lansing" 1901-6. Gage-height records collected in this vicinity 1907-10 (flood seasons only), 1911-19, 1920-28 (flood seasons only), and since 1931 are contained in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 1174: 1949. WSP 1387: 1901, 1903-4, 1935, 1937, 1942.

GAGE.--Water-stage recorder. Datum of gage is 805.53 ft (245.526 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to August 1906, nonrecording gage at same site at different datum. November 1934 to June 1949 water-stage recorder at site 1.8 mi (2.9 km) downstream at datum 2.42 ft (0.738 m) lower.

REMARKS.--Records good. Large diurnal fluctuation at medium and low flows caused by powerplants above station. Several observations of water temperature were made during the year. National Weather Service gage-height telemark at station.

AVERAGE DISCHARGE.--47 years, 837 ft^3/s (23.70 m^3/s), 9.24 in/yr (235 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,500 ft^3/s (694 m^3/s) Mar. 26, 1904, gage height, 18.60 ft (5.669 m), datum then in use, from rating curve extended above 15,000 ft^3/s (425 m^3/s) by logarithmic plotting; minimum, 2.8 ft^3/s (0.079 m^3/s) Sept. 9, 1963, gage height, 0.85 ft (0.259 m); minimum daily, 20 ft^3/s (0.57 m^3/s) Aug. 25, 1941.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1901, that of Mar. 26, 1904.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,840 ft^3/s (194 m^3/s) Mar. 5, gage height, 11.54 ft (3.517 m); minimum, 60 ft^3/s (1.70 m^3/s) Sept. 11, gage height, 1.63 ft (0.497 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	552	535	1370	1030	721	2630	2290	2070	1030	1850	372	167
2	462	501	1380	970	675	3010	2150	1920	922	1840	333	246
3	476	668	1310	960	657	4140	2050	1790	902	1640	357	167
4	440	659	1270	920	572	5290	1990	1720	809	1510	336	167
5	444	526	1280	870	585	6400	1810	1550	755	1360	264	113
6	352	577	1780	830	663	6760	1730	1900	675	1100	327	77
7	363	633	1920	800	570	6250	1600	2740	669	1050	258	137
8	375	553	1860	770	619	5250	1500	3180	603	1020	308	189
9	458	581	1710	750	624	4280	1470	3170	591	835	160	236
10	418	610	1770	730	688	3640	1360	2940	497	799	326	133
11	514	695	1150	710	776	3350	1350	2470	476	717	254	142
12	410	638	1440	700	996	3200	1280	2130	422	685	267	213
13	448	662	1420	680	1420	3360	1230	1930	443	543	228	186
14	495	712	2040	670	1820	3310	1200	1740	377	575	275	144
15	399	640	3040	643	2230	3130	1150	1670	414	455	181	195
16	383	522	3490	714	3260	2890	1650	1590	378	413	216	180
17	388	560	3350	676	4310	2650	1590	1580	385	409	290	184
18	270	541	2820	700	4970	2410	1380	1650	390	294	208	232
19	481	557	1910	660	4980	2270	1260	1600	503	380	258	196
20	413	596	1830	606	4680	2220	1290	1530	495	441	225	190
21	515	629	1610	697	4940	2350	1290	1430	508	437	305	191
22	484	679	1310	682	5640	2590	1330	1320	582	310	116	183
23	506	573	1480	677	5590	2370	1180	1180	520	456	225	167
24	514	581	1420	665	4830	2230	1240	1130	516	420	207	220
25	543	597	1220	637	4130	2030	2200	1020	533	372	251	152
26	414	556	1230	633	3730	1990	3180	1030	521	372	213	336
27	497	625	1180	658	3370	2190	3390	951	515	293	173	207
28	510	604	1040	677	3070	2870	3300	911	639	622	159	309
29	469	748	1030	657	2840	3170	2880	866	449	596	198	278
30	424	1060	926	701	---	2940	2420	818	1600	449	159	322
31	442	---	1060	704	---	2430	---	884	---	395	160	---
TOTAL	13859	18618	51646	22777	73956	103600	53740	52410	18119	22638	7609	5859
MEAN	447	621	1666	735	2550	3342	1791	1691	604	730	245	195
MAX	552	1060	3490	1030	5640	6760	3390	3180	1600	1850	372	336
MIN	270	501	926	606	570	1990	1150	818	377	293	116	77
CFSM	.36	.50	1.35	.60	2.07	2.72	1.46	1.37	.49	.59	.20	.16
IN.	.42	.56	1.56	.69	2.24	3.13	1.63	1.59	.55	.68	.23	.18

CAL YR 1975 TOTAL 441038 MEAN 1208 MAX 11000 MIN 180 CFSM .98 IN 13.34
WTR YR 1976 TOTAL 444831 MEAN 1215 MAX 6760 MIN 77 CFSM .99 IN 13.45

04113097 CARRIER CREEK NEAR LANSING, MI

LOCATION.--Lat 42°45'20", long 84°39'10", in SE¼ SW¼ sec.3, T.4 N., R.3 W., Eaton County, Hydrologic Unit 04050004, on left bank 15 ft (5 m) downstream from bridge on Willow Highway, 0.4 mi (0.6 km) upstream from mouth, and 2.6 mi (4.2 km) west of Lansing.

DRAINAGE AREA.--12.1 mi^2 (31.3 km^2).

PERIOD OF RECORD.--January 1975 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 805 ft (245 m) from topographic map (nearest 5 ft).

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 532 ft^3/s (15.1 m^3/s) Apr. 19, 1975, gage height, 6.76 ft (2.060 m); minimum, 0.13 ft^3/s (0.004 m^3/s) Aug. 18, 21, 29, 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 80 ft^3/s (2.27 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	0300	110	3.12	3.70	1.128	Mar. 3	1800	89	2.52	3.21	0.978
Feb. 15	2300	114	3.23	3.57	1.088	Mar. 5	0900	154	4.36	4.07	1.241
Feb. 18	1900	117	3.31	3.61	1.100	May 7	0200	104	2.95	3.43	1.045
Feb. 21	1800	*187	5.30	*4.44	1.353	June 30	2000	91	2.58	3.24	0.988

Minimum discharge, 0.13 ft^3/s (0.004 m^3/s) Aug. 18, 21, 29; minimum gage height, 0.62 ft (0.189 m) Sept. 6, 8, 13, 14, 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	2.0	18	5.6	3.2	21	11	12	6.5	41	.91	.15
2	.93	1.5	13	5.6	3.1	45	11	14	2.9	13	.73	.19
3	.86	14	9.3	5.4	3.0	77	8.4	14	2.2	7.1	.58	.17
4	.83	4.5	7.7	5.2	3.0	67	7.5	10	1.9	5.0	.45	.15
5	.74	3.0	7.3	5.0	2.9	116	6.5	8.4	2.5	3.7	1.2	.15
6	.72	2.5	38	4.7	2.8	62	6.3	45	2.4	2.8	.49	.15
7	.78	4.7	23	4.5	2.7	39	5.6	79	2.0	2.1	.41	.17
8	.75	3.3	16	4.2	2.6	27	4.9	36	1.8	1.9	.37	.17
9	1.5	2.7	13	4.0	2.5	22	4.6	24	1.2	1.5	.34	2.1
10	.85	3.9	11	3.8	2.8	22	4.4	15	1.5	1.3	.28	.85
11	.74	2.7	9.1	3.7	6.0	19	5.4	12	1.6	1.0	.28	.31
12	.68	2.3	8.6	3.6	13	26	4.1	9.5	1.4	.85	.25	.22
13	.68	2.4	23	3.5	35	36	3.6	7.7	1.2	.73	.28	.22
14	.73	2.0	50	3.5	41	25	3.7	6.9	1.2	.68	.34	.22
15	.70	1.9	87	3.5	63	22	4.1	7.1	1.4	.63	.34	.31
16	.71	1.8	44	3.5	84	19	24	8.0	3.0	.53	.28	.37
17	.72	1.7	20	3.5	79	15	13	6.9	1.4	.49	.25	.34
18	.82	1.6	14	3.4	84	13	7.5	6.3	1.6	.45	.19	.31
19	2.4	1.5	11	3.4	74	13	5.6	5.4	3.4	.41	.19	.34
20	1.8	3.4	9.0	3.3	43	13	4.8	4.9	1.2	3.5	.19	1.0
21	1.2	4.0	8.0	3.3	115	14	4.4	4.4	1.0	12	.19	.34
22	.95	2.3	7.2	3.3	105	10	4.4	3.5	1.2	1.6	.19	.31
23	.84	1.9	6.6	3.3	57	9.8	4.6	4.0	1.0	.91	.25	.49
24	.75	1.8	6.4	3.3	45	8.6	6.5	3.4	3.4	.73	.25	.31
25	3.0	2.3	6.2	3.3	37	7.5	64	2.9	1.9	.58	.28	.28
26	1.3	2.0	6.0	3.2	32	6.7	61	2.7	1.7	.53	.85	3.3
27	1.0	2.1	5.8	3.2	27	24	48	2.9	1.4	1.2	.79	1.4
28	1.0	3.0	5.8	3.2	23	25	31	2.4	1.1	4.1	.28	.37
29	.91	13	5.6	3.2	22	16	20	3.0	1.0	9.0	.17	.31
30	1.0	36	5.6	3.2	---	13	15	3.3	48	2.0	.15	.28
31	.91	---	5.6	3.2	---	9.8	---	3.5	---	1.2	.15	---
TOTAL	31.90	131.8	500.8	118.6	1013.6	843.4	404.9	368.1	104.0	122.52	11.90	15.28
MEAN	1.03	4.39	16.2	3.83	35.0	27.2	13.5	11.9	3.47	3.95	.38	.51
MAX	3.0	36	87	5.6	115	116	64	79	48	41	1.2	3.3
MIN	.68	1.5	5.6	3.2	2.5	6.7	3.6	2.4	1.0	.41	.15	.15
CFSM	.09	.36	1.34	.32	2.89	2.25	1.12	.98	.29	.33	.03	.04
IN.	.10	.41	1.54	.36	3.12	2.59	1.24	1.13	.32	.38	.04	.05

CAL YR 1975 TOTAL 4049.14 MEAN 11.1 MAX 345 MIN .18 CFSM .92 IN 12.45
WTR YR 1976 TOTAL 3666.80 MEAN 10.0 MAX 116 MIN .15 CFSM .83 IN 11.27

04114000 GRAND RIVER AT PORTLAND, MI

LOCATION.--Lat 42°51'20", long 84°54'45", in NW¼ sec.4, T.5 N., R.5 W., Ionia County, Hydrologic Unit 04050004, on left bank at downstream side of bridge on Kent Street, 1.0 mi (1.6 km) south of Portland, 1.9 mi (3.1 km) upstream from Looking Glass River, and at mile 115 (185 km).

DRAINAGE AREA.--1,385 mi^2 (3,587 km^2).

PERIOD OF RECORD.--August 1952 to current year. Gage-height records for flood seasons collected in this vicinity 1907-28 are contained in reports of U.S. Weather Bureau.

GAGE.--Water-stage recorder. Datum of gage is 705.00 ft (214.884 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to July 6, 1953, nonrecording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are fair. Slight diurnal fluctuation caused by powerplants above station. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--24 years, 926 ft^3/s (26.22 m^3/s), 9.08 in/yr (231 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,400 ft^3/s (351 m^3/s) Apr. 21, 1975, gage height, 12.98 ft (3.956 m); minimum, 38 ft^3/s (1.08 m^3/s) Oct. 10, 1963; minimum daily, 58 ft^3/s (1.64 m^3/s) Oct. 9, 1963.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,960 ft^3/s (225 m^3/s) Mar. 5, gage height, 11.19 ft (3.411 m); minimum, 82 ft^3/s (2.32 m^3/s) Aug. 28, gage height, 4.01 ft (1.222 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	590	490	1420	1100	740	3100	2660	2590	1190	2430	423	201
2	595	565	1580	1070	730	3370	2470	2290	1180	2170	391	201
3	505	702	1500	987	680	4790	2340	2180	1010	1920	360	266
4	505	732	1380	920	610	6010	2220	1990	973	1770	382	213
5	470	702	1370	880	630	7570	2090	1880	854	1540	378	177
6	470	590	1750	830	680	7750	1940	2120	810	1370	304	210
7	396	630	2300	800	620	7390	1840	3390	726	1090	373	126
8	405	732	2180	780	640	6410	1700	3750	726	1040	255	118
9	418	624	2060	760	660	5330	1610	3780	666	959	356	255
10	505	648	1890	750	720	4500	1510	3590	648	889	207	288
11	460	684	1770	730	840	4030	1500	3170	560	792	320	238
12	530	720	1330	720	1100	3750	1390	2650	535	720	324	177
13	441	678	1570	720	1600	4080	1320	2280	475	696	255	255
14	480	696	2190	680	2180	3960	1300	2040	490	565	262	220
15	515	726	4260	720	2500	3750	1260	1890	436	585	328	213
16	436	654	4300	730	3820	3460	1690	1830	485	485	198	252
17	418	550	4270	720	4800	3190	1960	1770	436	445	273	231
18	418	590	3750	720	5520	2900	1650	1750	441	432	280	245
19	344	570	2790	680	5840	2660	1570	1770	500	328	234	262
20	525	590	2270	650	5460	2560	1370	1710	545	441	356	227
21	465	684	2000	720	5370	2700	1420	1610	530	780	259	262
22	545	660	1950	730	6720	2850	1560	1490	545	530	340	248
23	540	702	1430	700	6360	2820	1380	1340	612	364	210	248
24	530	595	1560	690	5750	2650	1310	1260	570	485	195	231
25	555	630	1460	680	5220	2400	2320	1180	612	455	248	262
26	575	636	1290	670	4560	2250	3800	1090	565	396	336	231
27	445	612	1270	690	4080	2310	4120	1080	550	405	262	418
28	525	666	1220	690	3680	2910	4060	1020	550	356	165	296
29	535	666	1080	700	3360	3430	3630	980	660	744	241	360
30	500	1170	1060	730	---	3450	3030	959	840	565	198	336
31	460	---	987	740	---	2990	---	952	---	485	207	---
TOTAL	15101	19894	61237	23687	85470	121320	62020	61381	19720	26232	8920	7267
MEAN	487	663	1975	764	2947	3914	2067	1980	657	846	288	242
MAX	595	1170	4300	1100	6720	7750	4120	3780	1190	2430	423	418
MIN	344	490	987	650	610	2250	1260	952	436	328	165	118
CFSM	.35	.48	1.43	.55	2.13	2.83	1.49	1.43	.47	.61	.21	.17
IN.	.41	.53	1.64	.64	2.30	3.26	1.67	1.65	.53	.70	.24	.20

CAL YR 1975 TOTAL 510184 MEAN 1398 MAX 12200 MIN 196 CFSM 1.01 IN 13.70
WTR YR 1976 TOTAL 512249 MEAN 1400 MAX 7750 MIN 118 CFSM 1.01 IN 13.76

04114500 LOOKING GLASS RIVER NEAR EAGLE, MI

LOCATION.--Lat 42°49'45", long 84°46'40", in sec.10, T.5 N., R.4 W., Clinton County, Hydrologic Unit 04050004, on right bank at upstream side of highway bridge, 1.5 mi (2.4 km) northeast of Eagle and 10 mi (16 km) upstream from mouth.

DRAINAGE AREA.--281 mi^2 (728 km^2).

PERIOD OF RECORD.--August 1944 to current year.

REVISED RECORDS.--WSP 1387: 1946-47.

GAGE.--Water-stage recorder. Datum of gage is 747.09 ft (227.713 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to June 2, 1962, nonrecording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are fair. Small intermittent diversion at times into Lake Geneva when discharge is above 50 ft^3/s (1.42 m^3/s). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--32 years, 177 ft^3/s (5.013 m^3/s), 8.55 in/yr (217 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,860 ft^3/s (81.0 m^3/s) Apr. 5, 1947, gage height, 7.70 ft (2.347 m), from graph based on gage readings, from rating curve extended above 1,900 ft^3/s (53.8 m^3/s) by logarithmic plotting; maximum gage height, 9.9 ft (3.02 m) Mar. 7, 1956 (backwater from ice), from high-water mark; minimum discharge, 10 ft^3/s (0.28 m^3/s) July 28, 1965, gage height, 1.01 ft (0.308 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,190 ft^3/s (62.0 m^3/s) Mar. 5, gage height, 6.77 ft (2.063 m); minimum, 34 ft^3/s (0.96 m^3/s) Sept. 8, 9, gage height, 1.41 ft (0.430 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	165	109	328	220	175	1300	459	590	182	363	68	42
2	151	111	298	210	170	1370	478	618	166	305	66	41
3	139	153	289	200	165	1660	489	652	157	274	62	40
4	130	167	295	190	165	1690	487	637	150	267	58	38
5	123	172	312	190	165	2010	477	603	141	269	58	37
6	116	177	445	180	160	1610	466	732	131	269	57	36
7	110	210	448	180	160	1390	450	1020	121	264	56	37
8	105	235	425	175	155	1270	431	833	112	248	57	35
9	104	228	406	175	150	1230	411	706	102	225	60	37
10	103	230	402	175	150	1220	392	622	94	192	58	40
11	101	223	408	175	200	1210	377	587	88	158	55	39
12	100	223	418	175	250	1210	355	569	83	125	52	38
13	100	217	453	175	300	1340	335	556	79	101	50	38
14	99	209	633	170	370	1190	318	541	75	86	57	38
15	97	200	1230	170	440	1080	304	522	73	77	53	37
16	96	192	854	170	700	987	362	508	71	72	51	38
17	94	183	709	170	678	900	334	480	69	66	49	39
18	94	174	640	165	753	833	313	442	69	63	48	39
19	99	164	580	160	836	790	308	404	74	59	46	40
20	105	158	520	160	799	747	302	374	72	77	44	41
21	105	169	480	160	991	746	315	349	71	200	43	40
22	107	162	440	160	1390	666	343	325	71	96	41	39
23	110	156	400	160	1320	611	333	302	70	93	41	40
24	113	155	370	160	1400	567	326	281	72	79	40	39
25	120	157	350	160	1540	530	580	259	77	68	39	39
26	119	154	320	165	1570	501	650	237	73	63	52	43
27	117	157	300	165	1530	524	613	217	72	60	57	49
28	115	156	280	165	1460	552	569	198	71	58	47	47
29	112	180	260	170	1380	512	554	187	70	60	45	47
30	111	371	250	170	---	482	566	187	193	66	44	46
31	109	---	240	170	---	458	---	187	---	67	44	---
TOTAL	3469	5552	13783	5390	19522	31186	12697	14725	2949	4470	1598	1199
MEAN	112	185	445	174	673	1006	423	475	98.3	144	51.5	40.0
MAX	165	371	1230	220	1570	2010	650	1020	193	363	68	49
MIN	94	109	240	160	150	458	302	187	69	58	39	35
CFSM	.40	.66	1.58	.62	2.40	3.58	1.51	1.69	.35	.51	.18	.14
IN.	.46	.73	1.82	.71	2.58	4.13	1.68	1.95	.39	.59	.21	.16

CAL YR 1975 TOTAL 111868 MEAN 306 MAX 1380 MIN 43 CFSM 1.09 IN 14.81
WTR YR 1976 TOTAL 116540 MEAN 318 MAX 2010 MIN 35 CFSM 1.13 IN 15.43

04115000 MAPLE RIVER AT MAPLE RAPIDS, MI

LOCATION.--Lat 43°06'35", long 84°41'35", in sec.5, T.8 N., R.3 W., Clinton County, Hydrologic Unit 04050005, on right bank at downstream side of bridge on Maple Road at Maple Rapids, 50 ft (15 m) upstream from Pine Creek, and 0.8 mi (1.3 km) upstream from Hayworth Creek. Records include flow of Pine Creek.

DRAINAGE AREA.--434 mi^2 (1,124 km^2).

PERIOD OF RECORD.--August 1944 to current year.

REVISED RECORDS.--WSP 1707: 1956.

GAGE.--Water-stage recorder. Datum of gage is 642.58 ft (195.858 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to Oct. 4, 1968, nonrecording gage at same site and datum.

REMARKS.--Records good except those for period of no gage-height record, June 3 to July 12, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--32 years, 258 ft^3/s (7.307 m^3/s), 8.07 in/yr (205 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 6,500 ft^3/s (184 m^3/s) Mar. 20, 1948; maximum gage height, 11.22 ft (3.420 m) Mar. 20, 1948, from floodmark (backwater from ice); minimum discharge, 4.4 ft^3/s (0.12 m^3/s) Aug. 13, 1965, gage height, 1.62 ft (0.494 m).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1904 reached a stage of 13.8 ft (4.21 m), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,400 ft^3/s (153 m^3/s) Mar. 5, gage height, 10.17 ft (3.100 m); minimum, 20 ft^3/s (0.57 m^3/s) Sept. 8, 9, 24; minimum gage height, 3.11 ft (0.948 m) Sept. 8, 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	261	121	328	400	165	1530	605	1440	279	560	83	31
2	248	122	430	380	160	1410	596	1310	266	600	77	30
3	232	125	498	360	160	1790	584	1180	254	590	70	28
4	221	128	540	340	160	2740	553	1060	250	570	65	27
5	208	129	556	330	160	4290	510	921	230	550	62	26
6	197	131	584	320	160	4740	495	1370	220	530	60	24
7	187	135	622	310	155	3780	475	2070	200	500	55	22
8	178	142	635	300	155	3020	450	1980	180	470	51	21
9	169	149	639	290	155	2540	429	1930	170	450	49	22
10	159	146	626	280	155	2140	407	1790	160	420	46	23
11	151	163	609	270	155	1800	395	1660	145	400	44	24
12	146	174	580	260	160	1540	373	1490	140	370	42	26
13	138	177	548	250	165	1440	356	1310	130	351	43	27
14	135	176	639	240	200	1350	342	1130	125	326	51	26
15	129	172	1350	230	254	1300	333	976	120	302	61	25
16	125	171	1530	230	459	1190	385	860	120	275	60	24
17	123	165	1600	220	905	1140	427	759	115	249	56	23
18	120	165	1610	220	1350	1040	452	669	115	225	53	22
19	116	166	1610	210	1980	900	480	600	115	206	49	22
20	113	167	1470	205	2200	830	495	553	110	192	45	22
21	111	167	1230	200	2580	830	485	516	110	181	42	22
22	111	165	1050	195	2560	840	477	477	110	167	39	22
23	110	163	876	190	2330	784	470	443	110	155	37	22
24	110	161	763	185	1940	725	462	413	110	145	35	21
25	111	160	661	180	1890	690	742	381	110	133	31	22
26	113	156	596	180	2070	638	1470	356	110	121	29	22
27	112	156	536	175	2020	605	1640	336	110	112	28	24
28	111	154	498	170	1910	627	1720	318	110	105	29	25
29	110	157	470	170	1720	627	1670	303	120	99	32	24
30	115	210	440	170	---	611	1560	294	250	93	33	25
31	123	---	420	165	---	605	---	288	---	89	32	---
TOTAL	4593	4673	24544	7625	28433	48092	19838	29183	4694	9536	1489	724
MEAN	148	156	792	246	980	1551	661	941	156	308	48.0	24.1
MAX	261	210	1610	400	2580	4740	1720	2070	279	600	83	31
MIN	110	121	328	165	155	605	333	288	110	89	28	21
CFSM	.34	.36	1.82	.57	2.26	3.57	1.52	2.17	.36	.71	.11	.06
IN.	.39	.40	2.10	.65	2.44	4.12	1.70	2.50	.40	.82	.13	.06

CAL YR 1975 TOTAL 165218 MEAN 453 MAX 2510 MIN 26 CFSM 1.04 IN 14.16
WTR YR 1976 TOTAL 183424 MEAN 501 MAX 4740 MIN 21 CFSM 1.15 IN 15.72

04116000 GRAND RIVER AT IONIA, MI

LOCATION.--Lat 42°58'20", long 85°04'13", in NW¼ sec.30, T.7 N., R.6 W., Ionia County, Hydrologic Unit 04050006, on left bank 15 ft (5 m) downstream from bridge on State Highway 66 at Ionia, 2.7 mi (4.3 km) downstream from Prairie Creek, and at mile 87 (140 km).

DRAINAGE AREA.--2,840 mi^2 (7,360 km^2), approximately.

PERIOD OF RECORD.--March to June 1931, July and September 1931 (fragmentary), July 1951 to current year. Gage-height records for flood seasons collected in this vicinity 1907-28 are contained in reports of U.S. Weather Bureau.

GAGE.--Water-stage recorder. Datum of gage is 615.38 ft (187.568 m) above mean sea level. Mar. 19 to Sept. 24, 1931, nonrecording gage at site 1.5 mi (2.4 km) upstream at different datum.

REMARKS.--Records good except for the winter period, which are fair. Diurnal fluctuation below about 5,000 ft^3/s (142 m^3/s) caused by powerplants above station. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--25 years (1951-76), 1,916 ft^3/s (54.26 m^3/s), 9.16 in/yr (233 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,500 ft^3/s (609 m^3/s) Apr. 1, 1960, gage height, 23.43 ft (7.141 m); minimum, 40 ft^3/s (1.13 m^3/s) May 13, 1968, gage height, 5.61 ft (1.710 m); minimum daily, 115 ft^3/s (3.26 m^3/s) Aug. 27, 1953.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 20,700 ft^3/s (586 m^3/s) Mar. 6, gage height, 23.19 ft (7.068 m); minimum, 216 ft^3/s (6.12 m^3/s) Sept. 8, gage height, 6.85 ft (2.088 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1530	1050	3530	2540	1750	8380	5130	6920	2430	3660	828	502
2	1460	1110	3510	2490	1700	7910	4760	6020	2510	3850	898	460
3	1370	1330	3350	2420	1620	8700	4520	5580	2340	3820	788	455
4	1450	1670	3080	2190	1460	12000	4330	5240	2030	3460	614	488
5	1330	1540	2930	1970	1450	16400	4170	4860	1960	3160	686	361
6	1430	1420	3160	1810	1600	20200	4010	5340	1780	2920	749	356
7	1810	1430	4150	1820	1450	19700	3690	7730	1710	2710	690	387
8	1720	1630	4190	1810	1500	17200	3580	9770	1480	2310	568	370
9	1520	1620	3590	1800	1540	14300	3410	9930	1550	2240	552	456
10	1150	1540	2290	1800	1650	11900	3180	9050	1380	2310	575	509
11	1090	1550	3290	1780	1890	10200	3100	8010	1320	2050	530	560
12	1080	1560	3090	1720	2300	9120	3020	7040	1270	1720	564	469
13	1090	1530	3160	1700	2940	8670	2780	6190	1160	1530	588	388
14	1050	1480	4100	1670	4190	8780	2800	5460	1090	1480	586	501
15	1050	1510	6800	1650	4910	8500	2730	4940	1100	1430	593	462
16	1030	1450	7220	1720	6520	7960	4480	4660	1190	1310	636	447
17	966	1360	7220	1700	8310	7380	5050	4410	1160	948	589	466
18	945	1270	7380	1700	9330	6790	4570	4080	1010	979	535	417
19	979	1300	7520	1590	10800	6270	3920	3930	1130	1090	566	377
20	961	1260	6610	1530	11600	5860	3300	3710	1150	902	591	526
21	1080	1370	5640	1680	11400	5900	3320	3500	1130	1360	592	499
22	1060	1470	5250	1700	11500	5830	3320	3240	1110	1780	523	505
23	1080	1400	4270	1650	12200	5900	3380	3020	1100	1150	519	510
24	1090	1380	4010	1600	12000	5820	3090	2770	1230	853	505	486
25	1150	1340	3810	1590	11300	5350	4340	2580	1220	864	420	478
26	1240	1340	3440	1600	11300	5020	6840	2510	1260	1050	530	419
27	1140	1370	3190	1620	11100	4700	8420	2320	1110	791	798	505
28	1110	1350	2970	1640	10300	5090	9020	2350	1060	816	675	825
29	1130	1430	2740	1640	9320	5490	8520	2100	1100	1010	345	587
30	1100	2550	2700	1700	---	5770	7770	2220	1510	1330	455	458
31	1100	---	2510	1730	---	5580	---	2260	---	902	392	---
TOTAL	37291	43610	130700	55560	178930	276670	134550	151740	42580	55785	18480	14229
MEAN	1203	1454	4216	1792	6170	8925	4485	4895	1419	1800	596	474
MAX	1810	2550	7520	2540	12200	20200	9020	9930	2510	3850	898	825
MIN	945	1050	2290	1530	1450	4700	2730	2100	1010	791	345	356
CFSM	.42	.51	1.48	.63	2.17	3.14	1.58	1.72	.50	.63	.21	.17
IN.	.49	.57	1.71	.73	2.34	3.62	1.76	1.99	.56	.73	.24	.19

CAL YR 1975 TOTAL 1080256 MEAN 2960 MAX 16400 MIN 473 CFSM 1.04 IN 14.15
WTR YR 1976 TOTAL 1140125 MEAN 3115 MAX 20200 MIN 345 CFSM 1.10 IN 14.93

04116500 FLAT RIVER AT SMYRNA, MI

LOCATION.--Lat 43°03'10", long 85°15'50", in NW¼ sec.28, T.8 N., R.8 W., Ionia County, Hydrologic Unit 04050006, on right bank at downstream side of highway bridge, 600 ft (183 m) downstream from dam and inactive powerplant, and 0.5 mi (0.8 km) south of Smyrna.

DRAINAGE AREA.--528 mi^2 (1,368 km^2).

PERIOD OF RECORD.--October 1950 to current year. Monthly discharge only for some periods, published in WSP 1727.

GAGE.--Water-stage recorder. Datum of gage is 729.53 ft (222.361 m) above mean sea level (levels by Michigan Department of Natural Resources).

REMARKS.--Records good except those for the winter period, which are fair. Diurnal fluctuation caused by powerplants above station prior to September 1956; occasional diurnal fluctuation since. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--26 years, 439 ft^3/s (12.43 m^3/s), 11.29 in/yr (287 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,100 ft^3/s (87.8 m^3/s) Apr. 22, 1967, gage height, 7.27 ft (2.216 m), caused by momentary release of water from storage above station; maximum gage height, 8.26 ft (2.518 m) Feb. 6, 1974 (backwater from ice); minimum discharge, 7.4 ft^3/s (0.21 m^3/s) Sept. 9, 1953; minimum daily, 70 ft^3/s (1.98 m^3/s) Sept. 6, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,680 ft^3/s (75.9 m^3/s) Mar. 7, gage height, 7.19 ft (2.192 m); maximum gage height, 8.10 ft (2.469 m) Dec. 20 (backwater from ice); minimum discharge, 67 ft^3/s (1.90 m^3/s) Aug. 30, gage height, 2.87 ft (0.875 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	505	480	796	620	490	1230	1190	1170	968	650	345	236
2	490	490	856	600	490	1280	1140	1080	928	680	329	239
3	470	555	845	580	490	1460	1070	1050	895	710	315	241
4	455	585	845	500	480	1760	1030	1000	829	710	300	237
5	440	605	823	475	480	2270	992	998	774	685	308	227
6	430	610	829	515	480	2430	962	1410	735	655	304	223
7	400	635	785	575	480	2580	933	1540	690	605	296	222
8	390	640	757	510	470	2570	895	1590	640	570	285	222
9	370	625	720	560	470	2510	862	1540	595	504	277	242
10	360	620	690	550	460	2250	823	1420	550	463	271	276
11	350	600	660	550	475	2060	807	1330	515	424	263	283
12	350	575	635	550	510	1940	785	1200	485	391	264	270
13	350	560	645	540	605	1910	768	1090	460	367	269	257
14	340	530	790	540	640	1900	735	1010	445	345	298	250
15	340	510	992	540	665	1940	741	944	385	330	359	248
16	340	500	1090	540	812	1890	812	956	407	320	353	249
17	340	480	1160	530	917	1770	823	1000	398	310	326	252
18	350	465	986	530	1080	1630	840	1020	403	300	281	250
19	360	450	1000	530	1230	1490	873	1050	435	293	280	247
20	390	455	940	520	1330	1470	834	1030	440	301	277	255
21	410	500	900	520	1400	1580	818	980	435	363	263	259
22	421	515	860	520	1380	1610	796	922	425	359	261	259
23	412	520	820	520	1290	1670	774	862	416	342	328	261
24	407	510	800	510	1380	1660	779	812	440	326	254	258
25	490	520	770	510	1320	1580	1070	768	455	311	244	256
26	515	520	740	510	1280	1470	1190	730	445	302	243	261
27	540	510	720	500	1280	1410	1370	700	430	294	244	286
28	535	515	700	500	1280	1350	1440	665	421	291	242	288
29	520	530	670	500	1270	1320	1400	645	412	334	238	279
30	500	715	650	500	---	1280	1300	675	520	378	232	270
31	480	---	630	490	---	1240	---	746	---	374	230	---
TOTAL	13050	16325	25104	16435	24934	54510	28852	31933	16376	13287	8779	7603
MEAN	421	544	810	530	860	1758	962	1030	546	429	283	253
MAX	540	715	1160	620	1400	2580	1440	1590	968	710	359	288
MIN	340	450	630	475	460	1230	735	645	385	291	230	222
CFSM	.80	1.03	1.53	1.00	1.63	3.33	1.82	1.95	1.03	.81	.54	.48
IN.	.92	1.15	1.77	1.16	1.76	3.84	2.03	2.25	1.15	.94	.62	.54

CAL YR 1975 TOTAL 225027 MEAN 617 MAX 2050 MIN 198 CFSM 1.17 IN 15.85
WTR YR 1976 TOTAL 257188 MEAN 703 MAX 2580 MIN 222 CFSM 1.33 IN 18.12

04117500 THORNAPPLE RIVER NEAR HASTINGS, MI

LOCATION.--Lat 42°36'57", long 85°14'11", in SE¼ sec.27, T.3 N., R.8 W., Barry County, Hydrologic Unit 04050007, on downstream side of highway bridge, 0.6 mi (1.0 km) downstream from Cedar Creek, 2.0 mi (3.2 km) downstream from Thornapple Lake, and 3.2 mi (5.1 km) southeast of Hastings.

DRAINAGE AREA.--385 mi^2 (997 km^2).

PERIOD OF RECORD.--October 1944 to current year.

GAGE.--Water-stage recorder. Datum of gage is 786.71 ft (239.789 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to Oct. 1, 1965, nonrecording gage at same site and datum.

REMARKS.--Records good. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--32 years, 312 ft^3/s (8.836 m^3/s), 11.01 in/yr (280 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,810 ft^3/s (193 m^3/s) Apr. 7, 1947, gage height, 10.20 ft (3.109 m), from graph based on gage readings; minimum, 33 ft^3/s (0.93 m^3/s) Aug. 10, 1964, gage height, 2.71 ft (0.826 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,540 ft^3/s (71.9 m^3/s) Mar. 7, gage height, 7.27 ft (2.216 m); minimum, 77 ft^3/s (2.18 m^3/s) Sept. 7, 8, 9, gage height, 2.85 ft (0.869 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	141	141	375	301	205	919	589	956	342	314	135	87
2	141	150	443	301	200	844	551	832	344	407	129	85
3	138	167	447	297	191	901	510	725	344	450	120	83
4	136	185	420	265	191	1200	468	639	325	446	114	82
5	133	198	379	238	191	1750	432	567	283	402	114	80
6	131	198	384	224	191	2350	407	567	245	329	121	80
7	131	198	434	242	194	2510	385	698	219	260	119	78
8	128	214	495	231	188	2280	362	882	202	220	113	77
9	126	228	519	217	185	1900	340	994	190	193	110	82
10	126	214	500	217	189	1530	322	992	180	174	106	92
11	126	214	461	217	221	1250	318	938	173	166	103	91
12	124	204	420	217	277	1040	311	840	164	154	101	90
13	119	198	393	217	376	967	298	715	151	145	101	87
14	119	191	480	217	509	959	288	585	143	141	101	85
15	117	182	816	217	699	954	289	495	136	136	103	85
16	119	179	1180	198	1010	903	396	446	134	127	102	85
17	119	173	1350	191	1350	825	499	441	135	119	102	85
18	114	167	1280	191	1600	740	555	443	132	115	98	84
19	119	167	1120	194	1800	658	566	433	142	114	95	85
20	128	161	1010	198	1850	605	521	402	152	113	92	88
21	136	176	873	198	1840	617	460	372	149	127	92	92
22	141	188	704	198	2110	629	430	338	144	144	90	93
23	141	191	594	194	2320	612	420	309	139	137	90	92
24	141	185	495	198	2300	559	432	284	143	131	88	90
25	144	185	429	198	2070	515	529	277	159	122	86	89
26	155	179	384	198	1770	476	752	270	166	112	87	97
27	155	179	357	198	1490	469	974	259	158	111	86	117
28	150	179	335	201	1250	530	1100	247	158	113	90	121
29	150	185	301	201	1050	592	1130	249	162	122	93	117
30	150	257	297	198	---	618	1070	266	204	130	90	113
31	144	---	301	207	---	617	---	307	---	135	87	---
TOTAL	4142	5633	17976	6779	27817	31319	15704	16768	5718	5909	3158	2712
MEAN	134	188	580	219	959	1010	523	541	191	191	102	90.4
MAX	155	257	1350	301	2320	2510	1130	994	344	450	135	121
MIN	114	141	297	191	185	469	288	247	132	111	86	77
CFSM	.35	.49	1.51	.57	2.49	2.62	1.36	1.41	.50	.50	.26	.23
IN.	.40	.54	1.74	.66	2.69	3.03	1.52	1.62	.55	.57	.31	.26

CAL YR 1975 TOTAL 165209 MEAN 453 MAX 4970 MIN 96 CFSM 1.18 IN 15.96
WTR YR 1976 TOTAL 143635 MEAN 392 MAX 2510 MIN 77 CFSM 1.02 IN 13.88

04118000 THORNAPPLE RIVER NEAR CALEDONIA, MI

LOCATION.--Lat 42°48'40", long 85°29'00", in NW¼ sec.22, T.5 N., R.10 W., Kent County, Hydrologic Unit 04050007, on right bank 200 ft (61 m) downstream from LaBarge powerplant, 2.3 mi (3.7 km) northeast of Caledonia, and 3.3 mi (5.3 km) downstream from Coldwater River.

DRAINAGE AREA.--773 mi^2 (2,002 km^2).

PERIOD OF RECORD.--October 1930 to September 1938, October 1951 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 824: 1931-36. WSP 1307: 1931-37.

GAGE.--Water-stage recorder. Datum of gage is 676.31 ft (206.139 m) above mean sea level, unadjusted (Consumers Power Co. bench mark). Oct. 1, 1930 to Sept. 30, 1938, nonrecording gage at same site and mean sea level datum (unadjusted).

REMARKS.--Records good. Prior to Dec. 1, 1958, large diurnal fluctuation at low and medium flow caused by powerplant above station; occasional fluctuation since. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--33 years, 570 ft^3/s (16.14 m^3/s), 10.01 in/yr (254 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,290 ft^3/s (178 m^3/s) May 10, 1956, gage height, 10.79 ft (3.289 m); maximum gage height, 10.96 ft (3.341 m) Apr. 22, 1975; minimum discharge, 1.0 ft^3/s (0.028 m^3/s) May 28, 1968, gage height, 1.40 ft (0.427 m), result of regulation during bridge construction.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 7, 1947, reached a stage of 14.4 ft (4.39 m) from information by powerplant operator.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,520 ft^3/s (128 m^3/s) Mar. 8, gage height, 9.25 ft (2.819 m); minimum, 169 ft^3/s (4.79 m^3/s) Sept. 4, gage height, 2.84 ft (0.866 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	390	407	858	688	480	1920	1140	1830	841	718	342	234
2	383	473	884	695	480	1850	1120	1670	813	762	346	226
3	384	489	881	682	470	2080	1070	1540	772	782	336	256
4	379	571	837	615	470	2730	1010	1360	740	782	312	238
5	375	553	792	604	470	3890	953	1220	700	752	311	234
6	369	504	877	687	470	4390	858	1570	658	694	326	234
7	331	525	961	580	460	4470	855	2090	617	605	319	260
8	341	566	955	549	460	4410	821	2170	518	558	310	219
9	345	525	956	550	480	4100	788	2080	490	495	306	229
10	390	529	942	540	520	3580	756	2020	485	445	302	296
11	359	516	905	530	580	2890	755	1930	479	379	302	287
12	353	495	856	520	643	2210	736	1780	432	404	259	272
13	352	485	847	520	931	2070	711	1580	433	391	280	233
14	356	459	1130	510	1210	1990	697	1350	437	386	283	281
15	362	425	2670	500	1470	1910	702	1180	410	368	291	245
16	359	415	3250	500	1960	1810	1280	1120	465	331	265	224
17	342	389	3180	501	2340	1670	1460	1230	431	335	277	266
18	358	401	2830	500	2840	1530	1430	1150	406	332	274	251
19	381	396	2330	500	3360	1390	1300	1050	485	318	311	260
20	423	396	1960	500	3430	1280	1190	981	468	315	229	257
21	395	394	1790	500	3450	1280	1100	923	437	353	259	258
22	400	407	1540	500	3670	1270	1050	870	423	353	266	285
23	401	418	1380	500	3770	1240	985	792	414	356	232	259
24	387	424	1150	500	3860	1200	980	747	427	361	283	259
25	467	424	1040	500	3900	1130	1390	708	464	327	212	262
26	483	390	950	500	3700	1060	1840	723	459	317	290	292
27	441	370	853	490	3310	1060	1940	694	439	324	220	318
28	438	390	783	490	2510	1120	1970	669	433	320	277	314
29	428	434	754	490	2050	1150	1960	668	433	323	252	319
30	402	706	728	490	---	1190	1940	722	492	331	288	293
31	376	---	675	480	---	1170	---	864	---	340	262	---
TOTAL	11950	13876	40544	16711	53744	65040	34787	39281	15501	13857	8822	7861
MEAN	385	463	1308	539	1853	2098	1160	1267	517	447	285	262
MAX	483	706	3250	695	3900	4470	1970	2170	841	782	346	319
MIN	331	370	675	480	460	1060	697	668	406	315	212	219
CFSM	.50	.60	1.69	.70	2.40	2.71	1.50	1.64	.67	.58	.37	.34
IN.	.58	.67	1.95	.80	2.59	3.13	1.67	1.89	.75	.67	.42	.38

CAL YR 1975 TOTAL 337091 MEAN 924 MAX 5820 MIN 280 CFSM 1.20 IN 16.22
WTR YR 1976 TOTAL 321974 MEAN 880 MAX 4470 MIN 212 CFSM 1.14 IN 15.49

04118500 ROGUE RIVER NEAR ROCKFORD, MI

LOCATION.--Lat 43°05'00", long 85°35'30", in NE¼ sec.15, T.8 N., R.11 W., Kent County, Hydrologic Unit 04050006, on left bank at downstream side of highway bridge, 2.2 mi (3.5 km) upstream from mouth, and 3.0 mi (4.8 km) southwest of Rockford.

DRAINAGE AREA.--234 mi^2 (606 km^2).

PERIOD OF RECORD.--February 1952 to current year.

GAGE.--Water-stage recorder. Datum of gage is 625.2 ft (190.56 m) above mean sea level (levels by Blass Survey Co.). Prior to August 30, 1952, nonrecording gage at same site and datum.

REMARKS.--Records good. Some diurnal fluctuation caused by mills above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--24 years, 229 ft^3/s (6.485 m^3/s), 13.29 in/yr (338 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,540 ft^3/s (100 m^3/s) Mar. 6, 1976, gage height, 9.29 ft (2.832 m); minimum, 28 ft^3/s (0.79 m^3/s) Jan. 22, 1967, gage height, 3.41 ft (1.039 m); minimum daily, 49 ft^3/s (1.39 m^3/s) Aug. 27, 1955.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,540 ft^3/s (100 m^3/s) Mar. 6, gage height, 9.29 ft (2.832 m); minimum, 80 ft^3/s (2.27 m^3/s) Sept. 21, gage height, 3.78 ft (1.152 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	214	221	454	311	269	574	473	473	473	289	163	113
2	209	227	522	313	270	723	473	448	476	258	154	115
3	207	286	513	315	270	1000	454	467	435	264	147	116
4	205	291	471	291	265	1560	434	445	372	268	141	113
5	201	299	406	280	260	2460	414	457	329	247	147	110
6	197	297	402	312	260	3290	398	744	300	217	144	108
7	194	308	376	284	260	2260	380	857	275	195	142	104
8	190	320	356	310	260	1350	362	1020	255	181	139	101
9	190	303	344	311	260	1040	351	775	240	172	135	114
10	190	299	331	304	255	864	343	604	228	169	128	133
11	188	287	314	285	253	777	343	512	215	166	126	130
12	191	276	296	282	252	783	329	453	209	159	126	125
13	192	267	328	279	316	938	322	418	203	153	125	115
14	190	253	477	274	336	1260	317	391	194	148	172	110
15	192	241	805	270	444	1160	317	381	190	143	187	109
16	192	231	1120	270	696	893	338	393	196	139	171	110
17	192	220	1020	260	951	702	332	440	189	137	157	113
18	191	210	666	260	1100	650	346	423	198	133	145	113
19	178	205	576	260	1220	590	415	419	238	130	137	112
20	174	217	445	260	1200	575	394	421	215	139	130	113
21	171	259	400	267	1010	611	377	387	211	158	128	109
22	176	259	401	264	830	609	388	352	211	155	123	121
23	176	267	365	260	768	573	369	331	202	160	118	121
24	175	265	357	260	761	529	388	316	215	155	114	119
25	273	262	332	260	715	485	713	302	222	144	112	119
26	258	237	328	256	759	447	1010	293	211	135	110	124
27	258	235	325	262	807	481	1240	289	206	133	111	132
28	259	227	306	273	737	514	924	284	201	139	116	131
29	251	260	315	273	652	530	679	334	196	168	117	130
30	230	405	308	268	---	541	548	382	279	165	116	124
31	211	---	306	270	---	503	---	429	---	170	115	---
TOTAL	6315	7934	13965	8644	16436	29272	14171	14240	7584	5389	4196	3507
MEAN	204	264	450	279	567	944	472	459	253	174	135	117
MAX	273	405	1120	315	1220	3290	1240	1020	476	289	187	133
MIN	171	205	296	256	252	447	317	284	189	130	110	101
CFSM	.87	1.13	1.92	1.19	2.42	4.03	2.02	1.96	1.08	.74	.58	.50
IN.	1.00	1.26	2.22	1.37	2.61	4.65	2.25	2.26	1.21	.86	.67	.56

CAL YR 1975 TOTAL 116936 MEAN 320 MAX 2010 MIN 94 CFSM 1.37 IN 18.59
WTR YR 1976 TOTAL 131653 MEAN 360 MAX 3290 MIN 101 CFSM 1.54 IN 20.93

04119000 GRAND RIVER AT GRAND RAPIDS, MI

LOCATION.--Lat 42°57'52", long 85°40'35", in NE¼ sec.25, T.7 N., R.12 W., Kent County, Hydrologic Unit 04050006, on right bank 500 ft (152 m) upstream from bridge on Fulton Street, 1.7 mi (2.7 km) upstream from Plaster Creek, and at mile 41 (66 km).

DRAINAGE AREA.--4,900 mi^2 (12,700 km^2), approximately.

PERIOD OF RECORD.--March 1901 to December 1905, January 1906 to August 1918 (gage heights only), October 1930 to current year. Monthly discharge only for some periods, published in WSP 1307. Gage-height records collected in this vicinity since 1907 are contained in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 924: 1938(M). WSP 1387: 1901-5, 1940.

GAGE.--Water-stage recorder. Datum of gage is 585.70 ft (178.521 m) above mean sea level (levels by City of Grand Rapids). March 1901 to August 1918, nonrecording gage at Fulton Street Bridge 500 ft (152 m) downstream and Oct. 1, 1930, to Oct. 26, 1953, water-stage recorder at sewage pumping station 1 mi (1.6 km) downstream at datum 2.99 ft (0.911 m) higher.

REMARKS.--Records good. Moderate diurnal fluctuation at low and medium flow caused by powerplants above station. Several observations of water temperature were made during the year. National Weather Service gage-height telemark at station.

AVERAGE DISCHARGE.--50 years, 3,577 ft^3/s (101.3 m^3/s), 9.91 in/yr (252 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 54,000 ft^3/s (1,530 m^3/s) Mar. 28, 1904, gage height, 19.5 ft (5.94 m), from graph based on gage readings, site then in use; minimum daily, 381 ft^3/s (10.8 m^3/s) Aug. 9, 17, 1936.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1901, 54,000 ft^3/s (1,530 m^3/s) Mar. 28, 1904.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 28,300 ft^3/s (801 m^3/s) Mar. 8, gage height, 19.29 ft (5.880 m); minimum, 1,060 ft^3/s (30.0 m^3/s) Aug. 31, gage height, 2.86 ft (0.872 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3130	2810	5870	5150	3090	16000	9100	13400	4920	3740	2220	1200
2	3120	2940	6450	5160	3040	15300	9000	12400	5100	5270	2110	1140
3	3010	3260	6510	5140	2900	15600	8600	11100	5080	5630	2020	1200
4	2920	3590	6320	4880	2600	16300	8000	9300	4780	5630	2000	1280
5	2900	4090	6010	4290	2580	18800	7500	8900	4340	5430	1940	1230
6	2810	3400	6090	3480	2820	22500	7100	10600	4140	5170	1880	1120
7	2830	3680	6360	3350	2600	26200	6800	11800	3890	4910	1940	1140
8	3100	3720	6900	3250	2600	28100	6500	12700	3520	4520	1850	1160
9	3080	3770	6950	3230	2750	26600	6300	13800	3230	4050	1650	1340
10	2850	3720	6250	3200	3050	23800	6200	14900	2990	3900	1590	1500
11	2440	3240	5360	3190	3500	20800	6100	15000	2690	3790	1590	1530
12	2280	3470	5820	3130	4000	18700	5700	14100	2390	3420	1530	1530
13	2220	3590	5950	3000	4840	17300	5830	12700	2310	3060	1530	1450
14	2250	3490	7430	2990	5790	16200	5520	11300	2250	2810	1620	1310
15	2250	3370	10000	2990	6960	15400	5490	9970	2110	2730	1680	1420
16	2220	3340	12000	3100	9050	14800	6730	9080	2340	2670	1680	1410
17	2200	3330	13800	3100	11800	14000	8070	8410	2360	2440	1620	1350
18	2140	3160	15300	3000	13200	13000	8330	7940	2570	2200	1560	1340
19	2200	3070	15500	2800	15100	12100	8100	7380	2310	2050	1480	1320
20	2250	3140	14300	2750	16300	11300	7370	7010	2280	2050	1480	1260
21	2340	3320	12100	3000	17500	10800	6780	6630	2170	2310	1250	1350
22	2380	3300	10300	3000	18200	10300	6650	6250	2170	2730	1450	1400
23	2380	3380	9220	2980	18200	9970	6500	5850	2200	2960	1420	1420
24	2430	3370	7950	2900	18300	9900	6420	5430	2340	2470	1230	1380
25	2890	3350	7360	2830	18600	9820	7680	5090	2620	2110	1250	1360
26	2910	3290	6830	2850	18500	9410	9430	4840	2500	2080	1250	1460
27	2920	3320	6420	2900	18200	9100	10800	4650	2250	2110	1340	1440
28	2800	3310	5980	2940	17700	8810	12100	4410	2080	1970	1560	1500
29	2770	3460	5720	3000	17000	8770	13600	4610	2050	2140	1650	1850
30	2790	4660	5500	3090	---	8800	13700	4570	2620	2470	1170	1630
31	2700	---	5360	3100	---	9000	---	4750	---	2640	1140	---
TOTAL	81510	102940	251910	103770	280770	467480	236000	278870	88600	101460	49680	41020
MEAN	2629	3431	8126	3347	9682	15080	7867	8996	2953	3273	1603	1367
MAX	3130	4660	15500	5160	18600	28100	13700	15000	5100	5630	2220	1850
MIN	2140	2810	5360	2750	2580	8770	5490	4410	2050	1970	1140	1120
CFSM	.54	.70	1.66	.68	1.98	3.08	1.61	1.84	.60	.67	.33	.28
IN.	.62	.78	1.91	.79	2.13	3.55	1.79	2.12	.67	.77	.38	.31

CAL YR 1975 TOTAL 2028130 MEAN 5557 MAX 23300 MIN 1280 CFSM 1.13 IN 15.40
WTR YR 1976 TOTAL 2084010 MEAN 5694 MAX 28100 MIN 1120 CFSM 1.16 IN 15.82

04119300 GRAND RIVER AT EASTMANVILLE, MI

LOCATION.--Lat 43°00'53", long 85°57'21", in NE¼ NW¼ sec.10, T.7 N., R.14 W., Ottawa County, Hydrologic Unit 04050006, on left bank at downstream side of bridge on 68th Avenue at Eastmanville, 1.1 mi (1.8 km) downstream from Deer Creek, and at mile 19.3 (31.1 km).

DRAINAGE AREA.--5,230 mi^2 (13,550 km^2), approximately.

PERIOD OF RECORD.--March to September 1976.

GAGE.--Water-stage recorder. Datum of gage is 573.09 ft (174.678 m) above mean sea level.

REMARKS.--Records good except those for periods of indefinite stage-discharge relation, June 7 to July 1 and July 9 to Sept. 30, which are fair. Some regulation at low flow by powerplants upstream. Several observations of water temperature were made during the year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period March to September, 29,600 ft^3/s (838 m^3/s) Mar. 9, gage height, 17.73 ft (5.404 m); minimum daily, 1,200 ft^3/s (34.0 m^3/s) Sept. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						18100	9420	14200	5550	3990	2370	1280
2						17200	9310	13800	5530	4830	2250	1220
3						18100	8820	12900	5510	5640	2160	1280
4						18900	8430	11100	5260	5730	2130	1370
5						22900	7920	9590	4930	5640	2070	1310
6						25100	7350	10900	4700	5360	2010	1200
7						27600	7170	12900	4150	5090	2070	1220
8						29200	6830	13500	3760	5010	1970	1240
9						29600	6410	13900	3450	4320	1760	1430
10						28100	6170	14900	3190	4160	1700	1600
11						25400	6150	15800	2870	4050	1700	1630
12						22600	5820	15600	2550	3650	1630	1630
13						21100	5450	14500	2470	3270	1630	1550
14						19000	5490	13100	2400	3000	1730	1400
15						17300	5230	11500	2250	2910	1790	1520
16						16200	6190	10200	2500	2850	1790	1500
17						15400	7590	9550	2520	2600	1730	1440
18						14200	8230	9100	2740	2350	1670	1430
19						13400	8350	8300	2470	2190	1580	1410
20						12300	7630	7680	2430	2190	1580	1340
21						12000	6940	7330	2320	2470	1330	1440
22						11100	6720	6880	2320	2910	1550	1490
23						10400	6240	6560	2350	3160	1520	1520
24						10100	6240	6230	2500	2640	1310	1470
25						10000	7590	5840	2800	2250	1330	1450
26						9730	9940	5540	2670	2220	1330	1560
27						9630	10900	5290	2400	2250	1430	1540
28						9240	11900	5050	2220	2100	1670	1600
29						8900	13000	5340	2190	2280	1760	1970
30						9180	13900	5460	2800	2640	1250	1740
31						9390	---	5570	---	2820	1220	---
TOTAL						521370	237330	308110	95800	106570	53020	43780
MEAN						16820	7911	9939	3193	3438	1710	1459
MAX						29600	13900	15800	5550	5730	2370	1970
MIN						8900	5230	5050	2190	2100	1220	1200
CFSM						3.22	1.51	1.90	.61	.66	.33	.28
IN.						3.71	1.69	2.19	.68	.76	.38	.31

04121300 CLAM RIVER AT VOGEL CENTER, MI

LOCATION.--Lat 44°12'02", long 85°03'10", in SW¼ NW¼ sec.21, T.21 N., R.6 W., Missaukee County, Hydrologic Unit 04060102, on left bank 10 ft (3 m) downstream from bridge on county road, 0.5 mi (0.8 km) north of Vogel Center, and 3.5 mi (5.6 km) southeast of Falmouth.

DRAINAGE AREA.--243 mi^2 (629 km^2).

PERIOD OF RECORD.--June 1966 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,130 ft (344 m) from topographic map.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, Mar. 24 to Apr. 26, which are fair. Some regulation at low flow by dams above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--10 years, 133 ft^3/s (3.767 m^3/s), 7.43 in/yr (189 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,150 ft^3/s (32.6 m^3/s) Apr. 13, 1971, gage height, 6.33 ft (1.929 m); minimum, 29 ft^3/s (0.82 m^3/s) Nov. 3, 1969, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 350 ft^3/s (9.91 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 1	2200	356	10.1	4.17	1.271	Mar. 31	unknown	*960	27.2	unknown	
Mar. 8	1800	376	10.6	4.23	1.289	Apr. 25	unknown	540	15.3	unknown	
Mar. 22	0300	563	15.9	4.91	1.497						

Minimum discharge, 62 ft^3/s (1.76 m^3/s) Sept. 30, gage height, 2.56 ft (0.780 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	180	128	338	130	120	255	880	272	241	123	85	74
2	180	127	328	130	115	198	790	269	240	127	82	76
3	180	126	263	130	115	204	680	289	213	113	79	74
4	174	127	214	125	110	233	600	294	188	102	77	72
5	171	126	202	120	115	293	530	279	180	95	81	70
6	166	123	224	120	115	334	490	285	174	90	81	69
7	164	138	210	115	120	357	450	287	169	88	81	67
8	161	191	204	115	120	361	420	271	162	86	79	67
9	158	210	183	115	120	338	390	256	156	85	75	69
10	156	201	179	115	120	309	360	248	149	85	73	78
11	154	184	173	115	125	283	340	241	142	84	72	81
12	153	177	169	115	130	259	320	239	139	81	75	75
13	152	167	170	115	135	258	310	237	134	80	77	70
14	149	155	204	115	140	259	300	229	123	80	78	67
15	148	146	260	110	150	246	310	222	120	81	79	67
16	145	142	250	110	160	237	320	242	126	79	76	67
17	145	138	204	110	170	219	310	295	132	78	73	67
18	144	135	156	115	180	221	290	325	127	78	72	67
19	140	132	152	120	190	219	260	297	121	79	70	66
20	139	132	150	125	200	297	240	258	114	82	69	66
21	137	156	150	120	210	462	235	237	109	85	68	67
22	135	177	150	120	205	548	245	223	104	85	68	69
23	133	170	145	125	200	500	250	214	97	85	66	69
24	131	156	145	130	197	480	300	208	97	84	65	67
25	148	145	140	130	215	470	510	202	98	83	66	65
26	158	126	140	125	230	460	450	197	95	82	71	66
27	159	141	140	120	250	560	392	194	92	79	70	66
28	148	142	135	120	259	670	331	187	92	80	69	66
29	135	154	135	120	258	770	299	179	93	89	69	65
30	130	238	130	120	---	850	281	202	106	92	67	64
31	130	---	130	120	---	910	---	225	---	92	67	---
TOTAL	4703	4610	5773	3715	4774	12060	11883	7603	4133	2732	2280	2073
MEAN	152	154	186	120	165	389	396	245	138	88.1	73.5	69.1
MAX	180	238	338	130	259	910	880	325	241	127	85	81
MIN	130	123	130	110	110	198	235	179	92	78	65	64
CFSM	.63	.63	.77	.49	.68	1.60	1.63	1.01	.57	.36	.30	.28
IN.	.72	.71	.88	.57	.73	1.85	1.82	1.16	.63	.42	.35	.32

CAL YR 1975 TOTAL 52479 MEAN 144 MAX 397 MIN 58 CFSM .59 IN 8.03
WTR YR 1976 TOTAL 66339 MEAN 181 MAX 910 MIN 64 CFSM .74 IN 10.16

04121500 MUSKEGON RIVER AT EVART, MI

LOCATION.--Lat 43°53'57", long 85°15'19", in NW¼ NE¼ sec.3, T.17 N., R.8 W., Osceola County, Hydrologic Unit 04060102, on right bank 500 ft (152 m) downstream from bridge on U.S. Highway 10 in Evart, 0.4 mi (0.6 km) upstream from Twin Creek, and at mile 123.9 (199.4 km).

DRAINAGE AREA.--1,450 mi^2 (3,760 km^2) approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1930 to September 1931, October 1933 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1437: 1934, 1947(M).

GAGE.--Water-stage recorder. Datum of gage is 977.72 ft (298.009 m) above mean sea level. Prior to Nov. 7, 1956, nonrecording gages at sites 400 ft (122 m) and 500 ft (152 m) upstream at present datum.

REMARKS.--Water-discharge records good except those for the winter period, which are fair. Some regulation during low flow from dams above station.

AVERAGE DISCHARGE.--44 years, 998 ft^3/s (28.26 m^3/s), 9.35 in/yr (237 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,790 ft^3/s (221 m^3/s) Mar. 29, 1976; maximum gage height, 14.42 ft (4.395 m) Apr. 9, 1959; minimum observed, 164 ft^3/s (4.64 m^3/s) Dec. 20, 1947, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,790 ft^3/s (221 m^3/s) Mar. 29, gage height, 14.07 ft (4.289 m); minimum, 384 ft^3/s (10.9 m^3/s) Aug. 25, 26, gage height, 6.62 ft (2.018 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1070	942	1810	1120	930	2820	6560	2790	2140	1210	538	450
2	1050	942	1860	1110	940	2620	6040	2640	2230	1180	526	430
3	1030	963	1810	1090	950	2410	5480	2770	2150	1080	505	425
4	1010	994	1680	1050	960	2840	4970	2740	1890	976	495	420
5	1000	986	1590	1020	970	3240	4530	2650	1680	888	495	406
6	978	978	1710	1010	960	3730	4100	2880	1550	808	505	402
7	963	1020	1630	1000	970	4000	3760	2990	1450	744	500	398
8	935	1190	1590	840	980	4050	3450	2990	1360	736	485	398
9	935	1240	1580	615	980	3880	3190	2770	1270	706	470	398
10	928	1270	1470	650	1010	3640	2990	2570	1190	678	460	416
11	928	1290	1440	800	1020	3260	2890	2450	1130	657	455	430
12	914	1250	1360	880	1030	3100	2730	2330	1070	629	460	420
13	921	1220	1320	1000	1040	3290	2590	2200	1020	594	455	411
14	907	1190	1590	1030	1100	3220	2460	2100	1000	580	450	406
15	921	1170	1950	1020	1170	3010	2390	2000	984	562	450	398
16	914	1150	1910	1000	1440	2830	2400	2080	1040	550	445	398
17	907	1120	1850	980	1510	2540	2320	2580	1040	538	435	402
18	886	1090	1550	980	1640	2440	2230	2580	1000	526	430	398
19	879	1050	1380	970	1850	2430	2160	2480	1080	505	420	393
20	865	1030	1300	970	1980	3360	2050	2330	1050	510	411	398
21	865	1150	1220	960	2070	4360	2020	2180	984	515	406	393
22	858	1170	1100	960	2110	4490	2150	2080	920	515	398	393
23	851	1150	1150	980	2020	4840	2140	1980	872	505	393	393
24	851	1130	1190	1000	1800	4880	2260	1920	848	505	384	393
25	986	1110	1200	960	1980	5100	3250	1810	840	500	384	388
26	1060	1030	1200	860	2330	5410	3480	1730	808	495	388	393
27	1030	1030	1180	880	2740	6150	3570	1670	776	495	450	398
28	1030	1040	1160	900	2800	7160	3500	1600	760	495	490	398
29	1020	1080	1150	900	2800	7710	3320	1640	768	526	435	398
30	978	1570	1150	900	---	7610	3020	1770	904	532	411	393
31	949	---	1140	900	---	7140	---	1910	---	532	411	---
TOTAL	29419	33545	45220	29335	44080	127560	98000	71210	35804	20272	13940	12137
MEAN	949	1118	1459	946	1520	4115	3267	2297	1193	654	450	405
MAX	1070	1570	1950	1120	2800	7710	6560	2990	2230	1210	538	450
MIN	851	942	1100	615	930	2410	2020	1600	760	495	384	388
CFSM	.65	.77	1.01	.65	1.05	2.84	2.25	1.58	.82	.45	.31	.28
IN.	.75	.86	1.16	.75	1.13	3.27	2.51	1.83	.92	.52	.36	.31

CAL YR 1975 TOTAL 460879 MEAN 1263 MAX 4810 MIN 485 CFSM .87 IN 11.82
WTR YR 1976 TOTAL 560522 MEAN 1531 MAX 7710 MIN 384 CFSM 1.06 IN 14.38

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: November 1956 to current year.

INSTRUMENTATION.--Temperature recorder since November 1956.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 28.0°C July 1, 1963; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 25.0°C July 24; minimum, 0.0°C on many days during winter period.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	13.5	13.0	8.0	7.5	2.0	1.5	0.0	0.0	0.0	0.0	0.5	0.5
2	13.0	11.5	8.5	8.0	1.5	0.5	0.0	0.0	0.0	0.0	0.5	0.5
3	11.5	10.5	9.5	8.5	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.5
4	12.0	10.5	10.0	9.5	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.0
5	12.0	11.0	10.0	10.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
6	12.0	11.0	10.5	10.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
7	12.0	11.0	11.0	10.5	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
8	12.0	11.0	11.0	10.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
9	11.5	11.0	11.0	11.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
10	11.5	11.5	11.0	9.0	1.0	1.0	0.0	0.0	0.5	0.0	0.0	0.0
11	11.5	11.0	9.0	8.5	1.0	1.0	0.0	0.0	0.5	0.5	0.5	0.0
12	11.0	10.0	8.5	7.0	1.0	1.0	0.0	0.0	0.5	0.5	0.5	0.0
13	13.5	11.0	7.0	5.5	1.0	1.0	0.0	0.0	0.5	0.5	0.0	0.0
14	14.5	13.5	5.5	5.0	3.5	1.0	0.0	0.0	0.5	0.5	0.0	0.0
15	15.0	14.5	5.0	4.5	3.5	3.5	0.0	0.0	0.5	0.5	0.5	0.0
16	14.5	13.5	4.5	4.5	3.5	2.0	0.0	0.0	0.5	0.5	0.5	0.5
17	13.5	11.5	5.0	4.5	2.0	1.5	0.0	0.0	0.5	0.5	1.0	0.5
18	11.5	10.5	5.5	5.0	1.5	1.5	0.0	0.0	0.5	0.5	0.5	0.5
19	10.5	10.5	5.5	5.0	1.5	1.5	0.0	0.0	0.5	0.5	2.0	0.5
20	10.5	10.0	5.5	5.5	1.5	1.0	0.0	0.0	0.5	0.5	2.0	2.0
21	10.5	10.5	5.5	5.0	1.0	1.0	0.0	0.0	0.5	0.5	2.0	2.0
22	11.0	10.5	5.0	4.0	0.5	0.5	0.0	0.0	0.5	0.5	2.0	2.0
23	13.0	11.0	4.0	3.5	0.5	0.5	0.0	0.0	0.5	0.5	2.0	2.0
24	13.5	12.0	3.5	3.0	0.5	0.5	0.0	0.0	0.5	0.5	3.5	2.0
25	13.5	12.0	3.0	1.5	0.5	0.5	0.0	0.0	0.5	0.5	4.0	3.5
26	12.0	10.5	1.5	1.0	0.5	0.5	0.0	0.0	0.5	0.5	4.5	4.0
27	10.5	9.5	1.0	0.5	0.5	0.5	0.0	0.0	0.5	0.5	4.5	4.0
28	9.5	9.0	1.0	0.5	0.5	0.0	0.0	0.0	0.5	0.5	4.5	4.0
29	9.0	8.5	1.0	1.0	0.0	0.0	0.0	0.0	0.5	0.5	4.0	4.0
30	8.5	8.0	2.0	1.0	0.0	0.0	0.0	0.0	---	---	5.0	4.0
31	8.0	7.5	---	---	0.0	0.0	0.0	0.0	---	---	5.0	5.0
MONTH	15.0	7.5	11.0	0.5	3.5	0.0	0.0	0.0	0.5	0.0	5.0	0.0

04121500 MUSKEGON RIVER AT EVART, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04121900 LITTLE MUSKEGON RIVER NEAR MORLEY, MI

LOCATION.--Lat 43°30'09", long 85°20'33", in SW¼ SW¼ sec.24, T.13 N., R.9 W., Mecosta County, Hydrologic Unit 04060102, on right bank at upstream side of highway bridge on 130th Avenue, 0.5 mi (0.8 km) downstream from Rustford Dam, and 5.2 mi (8.4 km) east of Morley.

DRAINAGE AREA.--138 mi^2 (357 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1966 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 920 ft (280 m) from topographic map.

REMARKS.--Water-discharge records good except those for the winter period and those for periods of no gage-height record, Oct. 1 to Nov. 4, and June 5 to July 7, which are fair. Some regulation from dams above station.

AVERAGE DISCHARGE.--10 years, 131 ft^3/s (3.710 m^3/s), 12.89 in/yr (327 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,010 ft^3/s (28.6 m^3/s) Aug. 31, 1975, gage height, 5.92 ft (1.804 m); minimum, 31 ft^3/s (0.88 m^3/s) June 3, 1972, gage height, 1.59 ft (0.485 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 400 ft^3/s (11.3 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	0800	416	11.8	3.57	1.088	Apr. 26	0700	*765	21.7	*5.00	1.524
Mar. 7	--	620	17.6	ice jam		May 6	1100	479	13.6	3.82	1.164
Mar. 13	0700	545	15.4	4.12	1.256	May 17	1400	423	12.0	3.54	1.079
Mar. 21	1400	720	20.4	4.82	1.469	June 1	1300	417	11.8	3.51	1.070
Mar. 28	0200	548	15.5	4.13	1.259	July 2	unknown	433	12.3	3.59	1.094

Minimum discharge, 65 ft^3/s (1.84 m^3/s) Sept. 8, gage height, 1.75 ft (0.533 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	125	115	281	145	125	330	369	283	399	190	87	75
2	125	150	257	147	125	290	351	277	367	225	85	75
3	120	175	195	145	130	310	323	345	289	220	83	73
4	120	195	175	140	130	331	303	343	233	210	83	71
5	115	167	171	140	130	470	311	313	215	195	85	69
6	110	147	193	140	130	520	311	402	195	185	87	67
7	110	165	175	140	135	490	293	439	190	175	83	67
8	110	181	157	135	140	420	273	387	185	161	71	65
9	105	171	145	130	140	390	255	327	175	149	69	73
10	105	163	143	125	135	370	247	279	165	143	67	93
11	105	153	141	125	125	357	253	263	160	135	71	83
12	105	143	137	135	110	391	231	247	150	119	81	77
13	105	133	154	130	125	528	223	233	140	111	85	75
14	105	128	327	130	140	501	215	229	135	107	83	71
15	110	124	399	125	160	439	221	225	125	105	91	71
16	110	120	355	125	180	387	255	275	125	103	85	73
17	115	116	286	125	200	345	233	385	130	101	79	75
18	115	116	215	125	215	327	211	393	125	93	75	75
19	110	112	175	125	235	364	201	333	120	87	75	71
20	110	122	155	125	255	565	193	267	110	91	73	73
21	105	171	160	125	270	712	197	227	108	101	71	73
22	105	155	160	125	280	622	219	221	105	93	71	73
23	100	133	160	120	270	511	215	219	105	89	69	75
24	100	124	155	120	260	457	294	217	105	89	67	73
25	110	120	151	120	285	453	676	211	105	87	67	73
26	120	105	151	120	333	457	495	205	105	85	71	75
27	125	111	149	120	355	485	581	197	105	83	79	77
28	120	114	147	120	337	530	433	189	108	85	75	77
29	110	136	143	120	345	467	353	219	108	97	73	77
30	105	296	145	120	---	395	305	263	140	95	69	77
31	100	---	145	120	---	379	---	366	---	91	69	---
TOTAL	3435	4361	5902	3987	5800	13593	9040	8779	4827	3900	2379	2222
MEAN	111	145	190	129	200	438	301	283	161	126	76.7	74.1
MAX	125	296	399	147	355	712	676	439	399	225	91	93
MIN	100	105	137	120	110	290	193	189	105	83	67	65
CFSM	.80	1.05	1.38	.93	1.45	3.17	2.18	2.05	1.17	.91	.56	.54
IN.	.93	1.18	1.59	1.07	1.56	3.66	2.44	2.37	1.30	1.05	.64	.60

CAL YR 1975 TOTAL 55581 MEAN 152 MAX 852 MIN 64 CFSM 1.10 IN 14.98
WTR YR 1976 TOTAL 68225 MEAN 186 MAX 712 MIN 65 CFSM 1.35 IN 18.39

04121900 LITTLE MUSKEGON RIVER NEAR MORLEY, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: November 1966 to current year.

INSTRUMENTATION.--Temperature recorder since November 1966.

REMARKS.--Interruptions in the record were due to malfunctions of the recorder.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 28.0°C Aug. 23, 1968, June 28, 1971; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 25.0°C July 27; minimum, 0.0°C on many days during January and March.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1			---	---	3.0	1.0	2.5	2.0	1.0	0.5	3.0	0.5
2			---	---	1.5	1.0	2.0	1.5	1.0	1.0	0.5	0.5
3			---	---	1.5	1.0	2.0	1.0	1.0	1.0	0.5	0.5
4			13.0	11.5	2.5	1.5	1.0	1.0	1.0	0.5	0.5	0.5
5			13.0	12.0	5.0	2.5	1.0	0.5	0.5	0.5	0.5	0.5
6			13.5	12.0	5.0	3.0	0.5	0.0	0.5	0.5	1.0	0.5
7			13.5	13.5	3.0	1.5	0.0	0.0	0.5	0.5	1.5	0.5
8			14.0	13.0	2.5	1.0	0.0	0.0	0.5	0.5	1.0	0.5
9			13.0	12.5	3.0	2.5	0.0	0.0	0.5	0.5	2.5	0.5
10			12.5	10.0	3.0	2.5	0.0	0.0	0.5	0.5	3.0	1.5
11			10.0	8.5	3.0	2.5	0.0	0.0	2.5	0.5	3.0	0.5
12			8.5	7.5	3.0	2.5	0.0	0.0	3.0	1.5	2.0	1.5
13			7.5	6.0	3.5	3.0	0.0	0.0	3.5	2.5	1.5	0.0
14			6.0	5.0	7.0	3.5	0.0	0.0	2.5	1.0	1.0	0.0
15			6.0	4.0	7.0	4.0	0.5	0.0	3.0	2.0	2.0	0.0
16			7.0	5.0	4.0	2.0	0.0	0.0	2.5	2.0	2.0	0.0
17			8.0	6.0	2.0	1.5	0.5	0.0	2.0	1.5	1.5	0.0
18			9.5	8.0	1.5	1.5	0.5	0.5	2.0	1.5	1.0	0.0
19			9.5	7.5	1.5	1.5	0.5	0.0	1.5	1.5	5.5	1.5
20			8.0	7.0	1.5	1.5	0.0	0.0	3.0	1.5	4.0	3.0
21			7.5	6.5	1.5	1.0	0.0	0.0	3.0	1.0	4.0	0.5
22			6.5	5.0	1.0	1.0	0.0	0.0	2.0	1.0	1.5	0.0
23			5.0	3.5	1.0	1.0	0.0	0.0	1.5	1.0	2.5	0.0
24			4.0	3.5	1.0	1.0	0.0	0.0	3.0	0.5	5.5	2.0
25			3.5	2.5	1.0	1.0	0.0	0.0	4.0	1.5	5.5	3.5
26			2.5	1.0	1.5	1.0	0.0	0.0	4.0	2.5	6.5	4.0
27			2.5	1.0	2.0	1.5	0.5	0.0	3.0	2.0	6.0	3.0
28			3.0	2.5	2.0	1.5	0.5	0.5	3.0	1.5	3.5	1.0
29			3.0	3.0	2.0	1.5	0.5	0.5	3.5	2.5	3.5	2.5
30			4.5	3.0	1.5	1.0	0.5	0.5	---	---	6.0	3.5
31			---	---	2.5	1.5	0.5	0.5	---	---	5.5	2.5
MONTH			14.0	1.0	7.0	1.0	2.5	0.0	4.0	0.5	6.5	0.0

04121900 LITTLE MUSKEGON RIVER NEAR MORLEY, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	2.5	1.5	13.0	8.5	20.0	17.0	---	---	21.5	17.0	20.0	17.0
2	5.0	1.0	12.0	7.5	20.0	16.5	---	---	21.5	16.5	18.5	13.5
3	5.5	2.5	7.5	6.0	20.0	16.5	---	---	22.5	17.0	20.0	14.5
4	6.0	3.0	10.5	5.5	21.5	17.0	---	---	21.0	17.0	20.5	16.5
5	5.5	3.0	13.0	9.0	---	---	---	---	20.5	18.5	19.5	15.0
6	7.0	4.0	11.5	8.0	---	---	---	---	21.0	17.0	19.0	14.0
7	7.0	4.5	8.5	6.5	---	---	22.0	19.0	21.0	16.0	20.5	15.0
8	6.5	3.5	11.5	6.5	---	---	22.5	18.5	22.5	16.0	21.5	16.5
9	6.5	3.0	15.0	10.0	---	---	21.0	18.5	23.5	17.0	19.0	15.5
10	5.5	4.0	16.5	12.5	---	---	22.5	19.5	19.5	17.5	16.5	13.5
11	6.0	3.0	16.0	13.0	---	---	24.5	20.5	23.0	17.5	19.0	14.0
12	6.0	2.0	15.0	11.0	---	---	22.5	18.5	22.5	20.0	19.5	14.5
13	7.5	3.0	15.0	11.5	---	---	21.5	16.5	23.0	19.5	19.5	15.0
14	10.5	6.0	18.0	14.5	---	---	24.0	17.5	21.5	17.5	19.5	15.5
15	12.5	10.0	17.5	15.0	---	---	24.0	20.5	19.5	15.0	18.0	15.5
16	15.0	11.0	16.5	14.5	---	---	22.5	20.5	20.0	14.5	15.5	15.0
17	15.5	13.0	16.0	13.5	---	---	21.0	17.5	21.0	15.0	18.5	14.5
18	16.0	13.0	15.5	12.0	---	---	22.5	17.0	21.5	15.5	18.5	14.0
19	15.5	13.0	15.5	12.0	---	---	20.5	17.5	22.0	17.5	18.0	15.0
20	14.0	11.5	19.0	14.0	---	---	21.0	19.0	23.0	18.0	18.0	15.5
21	12.5	10.0	19.0	15.5	---	---	22.5	18.0	23.0	18.0	15.5	13.0
22	12.5	10.5	18.0	14.5	---	---	23.5	18.5	23.5	18.5	14.0	10.5
23	12.0	8.5	16.5	14.0	---	---	24.5	20.5	23.5	18.5	14.5	11.5
24	12.0	6.5	15.0	13.5	---	---	24.5	20.0	23.0	17.5	12.5	9.0
25	6.5	3.5	15.0	13.5	---	---	24.0	19.5	21.5	18.5	13.0	9.5
26	3.5	2.5	16.5	13.5	---	---	24.5	19.5	22.0	18.5	11.5	10.5
27	5.5	2.5	18.5	14.5	---	---	25.0	21.0	23.5	19.0	12.5	11.0
28	9.5	4.5	18.0	16.0	---	---	22.0	18.5	23.5	20.0	12.5	9.0
29	11.5	7.5	17.5	16.0	---	---	21.0	18.0	20.5	16.5	13.5	9.5
30	11.0	9.0	17.0	15.5	---	---	23.5	18.5	17.5	14.0	14.5	10.5
31	---	---	17.5	16.0	---	---	22.0	20.0	20.5	14.5	---	---
MONTH	16.0	1.0	19.0	5.5	---	---	25.0	16.5	23.5	14.0	21.5	9.0

04122000 MUSKEGON RIVER AT NEWAYGO, MI

LOCATION.--Lat 43°25'20", long 85°48'04", in NE¼ NE¼ sec.24, T.12 N., R.13 W., Newaygo County, Hydrologic Unit 04060102, on left bank near nonoperative powerplant at Newaygo, 600 ft (183 m) downstream from Penoyer Creek and at mile 39.1 (62.9 km).

DRAINAGE AREA.--2,350 mi^2 (6,090 km^2), approximately.

PERIOD OF RECORD.--July to December 1908, July 1909 to July 1915, January 1916 to December 1919, October 1930 to current year. Monthly discharge only for some periods, published in WSP 1307. Records for June 1901 to December 1906, published in WSP 129, 170, and 206, have been found to be unreliable and should not be used.

REVISED RECORDS.--WSP 974: 1933, 1935, 1937-38. WSP 1307: 1940(M). See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 625.83 ft (190.753 m) above mean sea level. October 1930 to January 1939, nonrecording gage, and Jan. 31, 1939, to Sept. 30, 1963, water-stage recorder at present site at datum 40.0 ft (12.192 m) lower.

REMARKS.--Records good except those for the winter period, which are fair. Flow regulated by powerplants above station, the largest of which are at Croton Dam, Hardy Dam (since 1931), and Rogers Dam. Since Dec. 27, 1965, powerplant at Newaygo nonoperative, and in January 1969, dam at Newaygo was removed. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--54 years (1909-14, 1916-19, 1930-76), 1,966 ft^3/s (55.68 m^3/s), 11.36 in/yr (289 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 14,950 ft^3/s (423 m^3/s) Mar. 25, 1913; minimum, 52 ft^3/s (1.47 m^3/s) Oct. 2, 1965, gage height, 5.31 ft (1.618 m), result of regulation during pipeline repair; minimum daily, 330 ft^3/s (9.35 m^3/s) Feb. 15, 1914.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,800 ft^3/s (306 m^3/s) Mar. 30, gage height, 13.37 ft (4.075 m); minimum, 354 ft^3/s (10.0 m^3/s) Sept. 1, gage height, 6.03 ft (1.838 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1850	2000	4590	2550	2270	5480	9900	5750	4910	3720	1180	951
2	1080	2240	3640	2560	2450	5700	9100	5690	4530	2950	1660	1040
3	1420	2850	3470	2560	2500	5690	7830	5570	4340	2720	1430	1050
4	1810	2950	3620	2250	2440	5730	6740	5370	3980	2850	1440	1050
5	1820	2680	3660	2070	2250	5890	5950	5020	3490	2290	1290	1160
6	1830	2350	3510	2290	2260	5910	5950	5280	3050	1700	1460	1310
7	2020	2340	3290	2290	2280	5810	5930	5410	2680	1430	1160	1320
8	1250	2690	3080	2290	2260	5800	5880	5380	2580	1660	990	1310
9	2030	2680	3080	2280	2370	5820	5840	5350	2010	2000	1110	1330
10	2260	2910	3080	2280	2870	5810	5790	4510	2200	2130	1250	1320
11	2060	3130	3070	2150	3410	5790	5700	4400	2790	1690	1250	1200
12	1630	2880	3060	2070	3150	5910	5660	4340	2630	1640	1620	1060
13	1630	2640	2930	2290	2510	6020	5270	3060	2150	1890	1290	1060
14	2090	2620	3350	2400	2680	6050	4680	3830	2190	1650	1290	1060
15	2290	2320	4540	2570	3180	6000	4420	3850	2410	1240	1280	1060
16	2080	1960	3560	2530	3690	5970	4990	3700	2400	1360	1280	1080
17	1890	2280	3000	2330	3760	5940	4000	4690	2200	1320	1240	1080
18	1890	2620	2560	1950	3890	5940	3990	5260	2110	1500	1020	1080
19	1900	2620	2310	2030	4380	5940	4000	4460	2180	1460	1030	1080
20	1910	2320	2630	2270	4370	5980	3870	3840	2180	1010	1030	1080
21	1910	1970	2480	2380	4510	6100	3390	3690	2170	1010	1030	1200
22	1920	1870	2090	2720	4710	6180	3030	3300	2370	1160	1030	1330
23	1930	2020	2540	2980	4520	6160	3020	2850	2370	1320	1150	1350
24	1940	2860	2800	2810	4080	6140	3860	2580	2380	1430	1280	1240
25	2170	2850	2560	2510	4090	6160	5870	2370	2520	1310	1170	1100
26	2360	2290	2560	2510	4590	6150	6070	2380	2310	1310	1040	1110
27	2440	1950	2560	2510	5180	6940	6070	2750	1600	1310	1040	1110
28	2660	2140	2560	2390	5350	9360	6030	2910	1330	1250	1170	1110
29	2310	2870	2540	2260	5350	9950	5980	2720	1440	1340	1290	1100
30	1980	4000	2570	2260	---	10700	5920	3290	2290	1500	1190	1110
31	1990	---	2560	2260	---	10200	---	4530	---	1250	1040	---
TOTAL	60350	75900	93850	73600	101350	201220	164730	128130	77790	52400	37730	34441
MEAN	1947	2530	3027	2374	3495	6491	5491	4133	2593	1690	1217	1148
MAX	2660	4000	4590	2980	5350	10700	9900	5750	4910	3720	1660	1350
MIN	1080	1870	2090	1950	2250	5480	3020	2370	1330	1010	990	951
CFSM	.83	1.08	1.29	1.01	1.49	2.76	2.34	1.76	1.10	.72	.52	.49
IN.	.96	1.20	1.49	1.17	1.60	3.19	2.61	2.03	1.23	.83	.60	.55

CAL YR 1975 TOTAL 944290 MEAN 2587 MAX 9670 MIN 1050 CFSM 1.10 IN 14.95
WTR YR 1976 TOTAL 1101491 MEAN 3010 MAX 10700 MIN 951 CFSM 1.28 IN 17.44

04122030 MUSKEGON RIVER NEAR BRIDGETON, MI
(National stream-quality accounting network station)

LOCATION.--Lat 43°19'05", long 86°02'11", in SW¼ NW¼ sec.30, T.11 N., R.14 W., Newago County, Hydrologic Unit 04060102, at bridge on Maple Island Road, 5 mi (8 km) southwest of Bridgeton, 13 mi (21 km) upstream from Muskegon Lake, and 20 mi (32 km) downstream from gaging station at Newago.

DRAINAGE AREA.--2,420 mi² (6,270 km²), approximately.

PERIOD OF RECORD.--Water years 1974 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: November 1974 to September 1976.
WATER TEMPERATURES: November 1974 to September 1976.

INSTRUMENTATION.--Water quality monitor since Nov. 12, 1975.

REMARKS.--Interruptions in the daily record were due to malfunctions of the instrument. Monthly samples are collected as a cross section sample at the bridge. Water discharge measurements are made at times of monthly sampling.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 415 micromhos Sept. 30, 1976; minimum, 108 micromhos Apr. 16, 1976.
WATER TEMPERATURES: Maximum, 25.5°C July 15, 1976; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 415 micromhos Sept. 30; minimum, 108 micromhos Apr. 16.
WATER TEMPERATURES: Maximum, 25.5°C July 15; minimum, 0.0°C on many days during winter period.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT												
07...	1200	1840	--	8.2	12.5	4.6	46	2300	340	51	150	19
NOV												
04...	1230	2740	368	7.9	11.0	10.0	92	140	42	110	160	12
DEC												
09...	1230	3100	352	8.2	3.0	12.6	95	42	31	27	160	12
JAN												
06...	1300	2340	340	7.9	.0	12.2	85	160	60	31	160	17
FEB												
10...	1230	2550	355	7.9	2.0	13.2	97	96	>240	4	160	12
MAR												
09...	1100	5620	321	8.2	1.5	12.9	94	31	>240	23	130	7
APR												
06...	1230	6010	206	7.9	7.0	11.4	96	5	3	2	98	6
MAY												
11...	1300	4310	255	8.0	12.5	10.2	97	26	9	5	120	8
JUN												
09...	1400	2170	286	8.4	22.0	8.8	102	660	130	25	140	0
JUL												
13...	1130	1900	--	8.2	22.0	8.3	96	290	62	130	160	11
AUG												
03...	1130	1330	335	8.2	21.5	8.9	100	160	82	73	160	11
SEP												
08...	1300	1280	362	8.4	22.0	3.6	42	210	43	23	170	22

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT												
07...	42	12	7.8	.3	1.5	160	0	131	1.6	16	15	.3
NOV												
04...	43	13	9.0	.3	1.4	180	0	148	3.6	17	17	.3
DEC												
09...	44	13	8.6	.3	1.4	180	0	148	1.8	16	16	.2
JAN												
06...	43	13	8.2	.3	1.3	174	0	143	3.5	15	15	.1
FEB												
10...	42	13	8.4	.3	1.1	180	0	148	3.6	17	16	.1
MAR												
09...	34	11	7.0	.3	1.4	150	0	123	1.5	14	13	.2
APR												
06...	27	7.5	4.4	.2	1.2	112	0	92	2.3	11	9.7	.1
MAY												
11...	32	10	5.2	.2	1.1	136	0	112	2.2	10	9.4	.1
JUN												
09...	39	11	7.0	.3	1.1	160	10	148	2.3	14	12	.1
JUL												
13...	42	13	9.0	.3	1.2	182	0	149	1.8	17	17	.1
AUG												
03...	43	13	8.5	.3	.9	182	0	149	1.8	21	16	.1
SEP												
08...	45	15	10	.3	.9	180	0	148	1.1	18	19	.1

04122030 MUSKEGON RIVER NEAR BRIDGETON, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT											
07...	7.8	184	181	914	.23	.74	3.3	.04	18	89	100
NOV											
04...	7.0	185	196	1370	.26	.79	3.5	.04	28	207	100
DEC											
09...	7.0	206	195	1730	.35	.74	3.3	.02	49	410	100
JAN											
06...	7.4	196	189	1240	.37	.74	3.3	.03	69	436	100
FEB											
10...	7.6	214	194	1470	.45	1.2	5.1	.03	18	124	100
MAR											
09...	6.8	187	161	2840	.49	--	--	.04	20	303	100
APR											
06...	4.9	133	121	2160	.29	.72	3.2	.04	57	925	100
MAY											
11...	3.7	138	138	1610	.21	.64	2.8	.04	45	524	100
JUN											
09...	3.7	178	177	1040	.13	.51	2.3	.04	14	82	100
JUL											
13...	4.4	208	193	1070	.17	.62	2.7	.03	37	190	100
AUG											
03...	3.9	200	196	718	.09	.57	2.5	.04	20	72	100
SEP											
08...	4.7	228	201	788	.01	.26	1.2	.05	11	38	100

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
OCT												
07...	1200	1	1	1	0	<10	0	0	0	2	0	310
JAN												
06...	1300	1	1	0	0	<10	1	0	0	10	1	170
APR												
06...	1230	0	0	0	1	<10	<10	1	1	0	0	360
JUL												
13...	1130	1	1	1	0	10	10	1	0	0	0	120

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT												
07...	60	18	0	40	3	.1	.1	0	0	50	0	13
JAN												
06...	60	6	0	20	10	.0	.0	0	0	20	10	8.4
APR												
06...	50	8	8	20	10	<.5	<.5	0	0	--	40	18
JUL												
13...	10	6	2	20	0	<.5	<.5	1	0	10	0	--

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
PERIPHYTON

DATE	LENGTH OF EXPOSURE (DAYS)	PERIPHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERIPHYTON BIOMASS ASH WEIGHT G/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL A MG/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL B MG/SQ M	BIOMASS CHLOROPHYLL RATIO PERIPHYTON (UNITS)
NOV						
04...	28	19.0	13.0	33.0	.200	0
FEB						
10...	28	.000	.000	.000	.000	0
JUL						
13...	34	98.2	67.3	19.7	1.80	1600
SEP						
08...	29	12.8	10.4	2.50	.000	950

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

OCT. 7, 1975
1200 HOURS

IDENTIFICATION OF PHYTOPLANKTON

390 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		15	4
	...SCENEDESMACEAE			
L	....SCENEDESMUS			0
	..VOLVOCALES			
	...PHACOTACEAE			
L	....PHACOTUS			0
		TOTALS	15	4
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		45	12
D	....MELOSIRA		140	35
L	....STEPHANODISCUS			0
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		30	8
	....COCCONEIS		15	4
	...CYMBELLACEAE			
L	....AMPHORA			0
	....CYMBELLA		15	4
	...DIATOMACEAE			
	....DIATOMA		15	4
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
L	....FRAGILARIA			0
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		15	4
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		45	12
	...NITZSCHIACEAE			
D	....NITZSCHIA		61	15
		TOTALS	380	98
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
L	....DINOBRYON			0

04122030 MUSKEGON RIVER NEAR BRIDGETON, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

NOV. 4, 1975
1230 HOURS

IDENTIFICATION OF PHYTOPLANKTON

3,100 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			39	1
	...SCENEDESMACEAE				
D	....SCENEDESMUS			470	15
			TOTALS	510	16
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			230	8
D	....MELOSIRA			510	16
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....COCCONEIS			39	1
	...CYMBELLACEAE				
	....AMPHORA			78	3
	....CYMBELLA			120	4
	...DIATOMACEAE				
	....DIATOMA			160	5
	...FRAGILARIACEAE				
	....ASTERIONELLA			190	6
	....FRAGILARIA			39	1
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			120	4
	...NAVICULACEAE	NAVICULOID			
D	....NAVICULA			740	24
	...NITZSCHIACEAE				
	....NITZSCHIA			230	8
			TOTALS	2,500	80
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOMONODACEAE				
	....CRYPTOMONAS			120	4
			TOTALS	120	4

DEC. 9, 1975
1230 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,400 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		10	1
	...SCENEDESMACEAE			
	....SCENEDESMUS		39	3
	..TETRASPORALES			
	...COCCOMYXACEAE			
	....ELAKATOTHRIX		19	1
		TOTALS	68	5
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		68	5
	....MELOSIRA		160	12
	....STEPHANODISCUS		19	1
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		10	1
	....COCCONEIS		19	1
	...CYMBELLACEAE			
	....AMPHORA		10	1
	....CYMBELLA		10	1
	...DIATOMACEAE			
	....DIATOMA		29	2
	...FRAGILARIACEAE			
	....ASTERIONELLA		29	2
	....FRAGILARIA		10	1
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		19	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		77	5
	...NITZSCHIACEAE			
	....NITZSCHIA		10	1
		TOTALS	470	34
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
L	....DINOBRYON			0
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS			
D	.....A.INSERTA		870	61
		TOTALS	870	61
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		10	1
		TOTALS	10	1

04122030 MUSKEGON RIVER NEAR BRIDGETON, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JAN. 6, 1976
1300 HOURS

IDENTIFICATION OF PHYTOPLANKTON

760 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....SCENEDESMUS		84	11
		TOTALS	84	11
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		42	6
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		42	6
	....COCCONEIS		21	3
L	....RHOICOSPHENIA			0
	...CYMBELLACEAE			
	....CYMBELLA		21	3
	...DIATOMACEAE			
	....DIATOMA		21	3
	...FRAGILARIACEAE			
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		21	3
	...MERIDIONACEAE			
L	....MERIDION			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		63	8
	...NITZSCHIACEAE			
	....NITZSCHIA		63	8
		TOTALS	290	40
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
L	....DINOBRYON			0
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		380	50
		TOTALS	380	50

FEB. 10, 1976
1230 HOURS

IDENTIFICATION OF PHYTOPLANKTON

570 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
L	....CYCLOTELLA			0
L	....MELOSIRA			0
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		22	4
L	....COCCONEIS			0
	...CYMBELLACEAE			
L	....AMPHORA			0
	....CYMBELLA		44	8
	...DIATOMACEAE			
	....DIATOMA		44	8
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
	....FRAGILARIA		22	4
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
D	....GOMPHONEMA		130	23
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		110	19
	...NITZSCHIACEAE			
D	....NITZSCHIA		200	35
		TOTALS	570	101

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAR. 9, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,300 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			15	1
	....SELENASTRUM			15	1
			TOTALS	30	2
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			60	5
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			15	1
	....COCCONEIS			30	2
	....RHOICOSPHENIA			15	1
	...CYMBELLACEAE				
	....CYMBELLA			45	4
	...DIATOMACEAE				
	....DIATOMA			30	2
	...FRAGILARIACEAE				
	....FRAGILARIA			30	2
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			89	7
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			160	13
	...NITZSCHIACEAE				
	....NITZSCHIA			30	2
			TOTALS	510	39
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..OSCILLATORIALES	FILAMENTOUS			
	...NOSTOCACEAE				
	....APHANIZOMENON			60	5
	...OSCILLATORIACEAE				
D	....OSCILLATORIA			640	51
			TOTALS	700	56
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOMONODACEAE				
	....CRYPTOMONAS			15	1
			TOTALS	15	1

APR. 6, 1976
1230 HOURS

IDENTIFICATION OF PHYTOPLANKTON

400 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		14	4
L	....TETRAEDRON			0
		TOTALS	14	4
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		140	36
	....MELOSIRA		29	7
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		14	4
L	....COCCONEIS			0
	...CYMBELLACEAE			
	....AMPHORA		14	4
	....CYMBELLA		29	7
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
	....ASTERIONELLA		14	4
L	....FRAGILARIA			0
	....SYNEDRA		29	7
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		14	4
	...MERIDIONACEAE			
	....MERIDION		14	4
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		57	14
	...NITZSCHIACEAE			
	....NITZSCHIA		29	7
		TOTALS	390	98

04122030 MUSKEGON RIVER NEAR BRIDGETON, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAY 11, 1976
1300 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,200 CELLS/ML

	ORGANISM NAME	COMMON NAME		CELLS/ML	PER CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			98	4
			TOTALS	98	4
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
D	....CYCLOTELLA			340	16
	....MELOSIRA			220	10
	....STEPHANODISCUS			98	4
	...RHIZOSOLENIACEAE				
	....RHIZOSOLENIA			25	1
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....COCCONEIS			25	1
	...CYMBELLACEAE				
	....CYMBELLA			25	1
	...DIATOMACEAE				
	....DIATOMA			25	1
	...FRAGILARIACEAE				
	....ASTERIONELLA			320	14
D	....FRAGILARIA			780	36
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			25	1
	...NAVICULACEAE	NAVICULOID			
	....GYROSIGMA			25	1
	....NAVICULA			49	2
	...NITZSCHIACEAE				
	....NITZSCHIA			120	6
			TOTALS	2,100	94
	EUGLENOPHYTA	EUGLENOIDS			
	.EUGLENOPHYCEAE				
	..EUGLENALES				
	...EUGLENACEAE				
	....TRACHELOMONAS			25	1
			TOTALS	25	1

04122030 MUSKEGON RIVER NEAR BRIDGETON, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JUNE 9, 1976
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,400 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			63	3
	....KIRCHNERIELLA			42	2
	....OOCYSTIS			42	2
			TOTALS	150	7
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			150	6
	....MELOSIRA			21	1
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			100	4
	....COCCONEIS			21	1
	...CYMBELLACEAE				
	....AMPHORA			21	1
	....CYMBELLA			84	4
	...DIATOMACEAE				
	....DIATOMA			130	5
	...FRAGILARIACEAE				
	....FRAGILARIA			63	3
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			42	2
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			130	5
	...NITZSCHIACEAE				
	....NITZSCHIA			42	2
			TOTALS	800	34
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...OCHROMONADACEAE				
	....DINOBRYON			210	9
	....OCHROMONAS			84	4
			TOTALS	290	13
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..OSCILLATORIALES	FILAMENTOUS			
	...OSCILLATORIACEAE				
D	....OSCILLATORIA			420	18
			TOTALS	420	18
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOMONODACEAE				
D	....CRYPTOMONAS			730	31
			TOTALS	730	31

04122030 MUSKEGON RIVER NEAR BRIDGETON, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JULY 13, 1976
1130 HOURS

IDENTIFICATION OF PHYTOPLANKTON

12,000 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		66	1
	....KIRCHNERIELLA		66	1
	...SCENEDESMACEAE			
	....SCENEDESMUS		260	2
		TOTALS	400	4
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		66	1
D	....MELOSIRA		1,800	15
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....RHOICOSPHENIA		130	1
	...CYMBELLACEAE			
	....CYMBELLA		130	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		200	2
	...NITZSCHIACEAE			
	....NITZSCHIA		200	2
		TOTALS	2,600	22
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....DINOBRYON		66	1
	....OCHROMONAS		66	1
		TOTALS	130	2
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....ANACYSTIS		7,600	62
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
	....ANABAENA		1,500	12
		TOTALS	9,100	74

AUG. 3, 1976
1130 HOURS

IDENTIFICATION OF PHYTOPLANKTON

18,000 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....OOCYSTIS		180	1
	...SCENEDESMACEAE			
	....SCENEDESMUS		200	1
	..VOLVOCALES			
	...PHACOTACEAE			
	....PHACOTUS		130	1
	..ZYGNEMATALES			
	...DESMIDIACEAE	PLACODERM DESMIDS		
L	....STAURASTRUM			0
		TOTALS	550	3
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
L	....CYCLOTELLA			0
	....MELOSIRA		130	1
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....COCCONEIS		150	1
	...CYMBELLACEAE			
L	....CYMBELLA			0
	...DIATOMACEAE			
	....DIATOMA		100	1
	...FRAGILARIACEAE			
	....ASTERIONELLA		180	1
	....FRAGILARIA		1,300	7
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		180	1
	...NITZSCHIACEAE			
	....NITZSCHIA		130	1
	...TABELLARIACEAE			
L	....TABELLARIA			0
		TOTALS	2,300	13
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
L	....DINOBRYON			0
	...SYNURACEAE			
	....SYNURA		1,300	7
		TOTALS	1,300	7
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....AGMENELLUM		400	2
D	....ANACYSTIS		7,300	40
	....GOMPHOSPHAERIA		1,500	8
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
D	....ANABAENA		3,300	18
	....APHANIZOMENON		800	4
	...OSCILLATORIACEAE			
	....OSCILLATORIA		230	1
		TOTALS	13,000	73
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		380	2
		TOTALS	380	2

04122030 MUSKEGON RIVER NEAR BRIDGETON, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

SEP. 8, 1976
1300 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,900 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....SCENEDESMUS		51	2
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		150	5
		TOTALS	200	7
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....MELOSIRA		230	8
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....COCCONEIS		150	5
	....RHOICOSPHENIA		25	1
	...CYMBELLACEAE			
	....CYMBELLA		25	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		310	11
	...NITZSCHIACEAE			
	....NITZSCHIA		76	3
		TOTALS	820	29
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS			
D	.....A.INSERTA		1,400	49
	....ANACYSTIS		200	7
		TOTALS	1,600	56
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		250	9
		TOTALS	250	9

NOTE: D - DOMINANT ORGANISM; GREATER OR EQUAL TO 15%
L - LESS THEN 1%; MAY NOT HAVE BEEN ACTUALLY COUNTED

04122030 MUSKEGON RIVER NEAR BRIDGETON, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DAY	OCTOBER ONCE DAILY	NOVEMBER ONCE DAILY	NOVEMBER MAX	NOVEMBER MIN	NOVEMBER MEAN	DECEMBER MAX	DECEMBER MIN	DECEMBER MEAN	JANUARY MAX	JANUARY MIN	JANUARY MEAN
1	324	373	---	---	---	380	346	363	354	324	340
2	347	361	---	---	---	383	279	347	361	330	344
3	338	349	---	---	---	383	327	358	363	335	347
4	358	348	---	---	---	362	267	316	362	335	346
5	350	354	---	---	---	308	265	281	365	342	353
6	337	352	---	---	---	374	296	328	352	330	342
7	329	348	---	---	---	379	332	359	357	331	343
8	342	367	---	---	---	379	344	359	359	334	346
9	---	---	---	---	---	369	346	359	359	334	345
10	334	357	---	---	---	354	296	327	353	323	339
11	345	382	---	---	---	348	307	325	341	307	329
12	---	---	405	372	387	353	322	338	359	335	346
13	---	---	409	376	391	357	166	194	359	333	345
14	---	---	410	376	394	240	156	193	366	335	351
15	358	---	414	377	393	326	181	264	367	334	347
16	351	---	409	388	402	340	259	299	360	327	343
17	---	---	404	392	399	356	340	347	365	318	340
18	---	---	403	390	397	344	341	342	350	312	330
19	356	---	397	380	390	342	325	336	361	343	352
20	359	---	394	284	340	332	266	312	358	334	344
21	352	---	307	283	296	343	283	329	357	335	347
22	344	---	341	309	319	341	277	308	369	332	351
23	363	---	390	325	357	349	290	318	372	329	344
24	---	---	395	335	367	350	321	338	368	326	344
25	354	---	395	358	381	343	302	324	357	329	339
26	358	---	397	369	381	347	323	333	357	324	339
27	364	---	377	296	333	354	323	340	362	332	345
28	371	---	369	322	336	359	330	344	365	329	342
29	351	---	369	252	292	359	335	347	361	332	345
30	354	---	371	240	286	358	317	336	365	332	349
31	362	---	---	---	---	353	324	338	367	334	350
MONTH			---	---	---	383	156	323	372	307	344

DAY	FEBRUARY MAX	FEBRUARY MIN	FEBRUARY MEAN	MARCH MAX	MARCH MIN	MARCH MEAN	APRIL MAX	APRIL MIN	APRIL MEAN	MAY MAX	MAY MIN	MAY MEAN
1	363	330	344				---	---	---	241	230	235
2	350	323	337				---	---	---	245	241	243
3	354	325	339				---	---	---	251	246	249
4	364	336	346				---	---	---	261	251	255
5	360	337	347				---	---	---	262	209	245
6	367	342	355				---	---	---	235	210	219
7	370	343	356				210	204	207	251	221	233
8	367	338	352				210	205	207	278	228	251
9	374	347	359				209	202	205	267	237	254
10	371	342	358				205	199	202	262	253	257
11	368	335	347				205	198	202	269	251	255
12	367	338	349				205	201	203	286	248	258
13	365	344	355				206	198	203	301	264	275
14	376	349	362				211	204	208	308	271	282
15	---	---	---				243	116	178	290	181	234
16	---	---	---				171	108	132	224	175	192
17	---	---	---				228	169	191	256	215	227
18	---	---	---				236	196	214	261	231	242
19	---	---	---				239	206	218	288	261	270
20	---	---	---				241	214	226	289	273	279
21	---	---	---				224	178	201	294	269	280
22	---	---	---				245	193	212	296	269	280
23	---	---	---				250	210	185	293	266	281
24	---	---	---				213	148	163	296	251	283
25	---	---	---				181	152	---	295	255	281
26	---	---	---				219	181	201	303	280	294
27	---	---	---				213	189	199	307	285	298
28	---	---	---				212	181	195	303	269	287
29	---	---	---				241	194	214	249	181	204
30	---	---	---				234	218	226	227	182	198
31	---	---	---				---	---	---	250	196	218
MONTH	---	---	---				250	108	---	308	175	254

04122030 MUSKEGON RIVER NEAR BRIDGETON, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	265	220	239	312	273	292	---	---	---	363	301	346
2	306	262	277	314	295	303	---	---	---	362	339	353
3	310	288	296	313	294	301	---	---	---	368	347	358
4	307	280	288	319	290	304	352	336	346	386	353	366
5	298	283	290	326	289	304	351	294	341	386	349	358
6	305	285	293	306	287	297	354	301	334	356	348	353
7	317	285	299	312	289	305	340	316	331	375	352	360
8	316	302	308	317	294	305	346	336	341	380	351	367
9	332	309	317	309	292	300	351	311	342	378	329	350
10	330	308	319	307	285	295	352	337	346	351	329	342
11	332	297	312	317	284	301	355	333	346	370	338	356
12	327	297	306	313	286	304	353	240	308	380	355	372
13	320	288	301	319	283	300	342	292	324	389	358	378
14	329	295	310	312	285	298	340	223	312	390	360	375
15	326	279	303	314	298	306	333	310	326	390	345	374
16	329	279	299	324	309	316	345	331	337	386	356	375
17	328	303	312	317	291	305	353	334	344	384	361	379
18	334	302	317	322	298	311	355	338	350	384	359	376
19	321	292	310	320	299	311	360	346	351	392	329	380
20	337	297	313	327	276	315	360	349	354	402	361	395
21	343	298	320	---	---	---	357	343	351	402	362	329
22	337	296	314	---	---	---	362	351	358	402	336	386
23	330	288	308	---	---	---	363	351	355	399	347	371
24	326	204	242	---	---	---	366	342	353	404	369	389
25	276	226	240	---	---	---	366	352	358	407	367	395
26	326	264	286	---	---	---	367	335	360	401	366	389
27	333	292	315	---	---	---	373	334	361	406	380	397
28	348	313	335	---	---	---	372	317	360	406	367	394
29	349	314	332	---	---	---	366	340	354	409	375	395
30	336	296	320	---	---	---	361	340	351	415	363	400
31	---	---	---	---	---	---	364	349	359	---	---	---
MONTH	349	204	301	---	---	---	373	223	345	415	301	372

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER	NOVEMBER	NOVEMBER			DECEMBER			JANUARY		
DAY	ONCE DAILY	ONCE DAILY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	13.5	10.5	---	---	---	4.0	3.5	4.0	1.5	1.0	1.0
2	12.0	11.0	---	---	---	4.0	3.5	3.5	1.0	1.0	1.0
3	12.0	11.0	---	---	---	3.5	3.0	3.0	1.0	0.0	0.5
4	13.0	11.0	---	---	---	3.5	2.5	3.0	0.0	0.0	0.0
5	13.0	12.0	---	---	---	4.5	3.0	3.5	0.0	0.0	0.0
6	13.0	12.5	---	---	---	4.5	3.0	4.0	0.5	0.0	0.0
7	13.0	13.0	---	---	---	3.0	2.5	3.0	0.5	0.0	0.5
8	13.0	12.0	---	---	---	3.5	2.5	3.0	0.0	0.0	0.0
9	---	---	---	---	---	3.0	2.5	3.0	0.0	0.0	0.0
10	14.0	11.5	---	---	---	2.5	2.0	2.5	0.0	0.0	0.0
11	12.0	11.0	---	---	---	3.0	2.0	2.5	0.0	0.0	0.0
12	---	---	11.5	10.0	10.5	3.0	2.5	2.5	0.5	0.0	0.5
13	---	---	9.5	8.5	9.0	2.5	1.5	2.0	1.0	0.5	1.0
14	---	---	8.5	8.0	8.5	4.0	2.5	3.5	1.0	0.0	0.5
15	14.5	---	8.5	7.5	8.0	4.0	3.0	3.5	0.0	0.0	0.0
16	13.0	---	8.5	7.5	8.0	3.0	2.5	2.5	0.5	0.0	0.0
17	---	---	9.0	8.0	8.5	3.0	1.5	2.5	0.0	0.0	0.0
18	---	---	9.0	8.5	9.0	1.5	0.0	0.5	0.0	0.0	0.0
19	11.5	---	9.0	8.5	8.5	0.0	0.0	0.0	0.0	0.0	0.0
20	11.0	---	8.5	8.0	8.5	0.0	0.0	0.0	0.0	0.0	0.0
21	12.0	---	8.0	6.5	7.5	0.0	0.0	0.0	0.0	0.0	0.0
22	12.0	---	6.5	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
23	12.5	---	6.0	5.5	5.5	0.5	0.0	0.0	0.0	0.0	0.0
24	---	---	6.0	5.5	5.5	0.5	0.0	0.0	0.0	0.0	0.0
25	12.0	---	5.5	5.0	5.5	0.5	0.0	0.0	0.5	0.0	0.0
26	10.5	---	5.0	4.0	4.5	0.5	0.5	0.5	0.5	0.0	0.5
27	11.0	---	4.0	3.5	4.0	1.0	0.5	0.5	0.5	0.5	0.5
28	11.5	---	4.5	4.0	4.5	0.5	0.5	0.5	0.5	0.0	0.0
29	11.0	---	4.0	3.5	4.0	0.5	0.5	0.5	1.0	0.5	1.0
30	9.5	---	5.5	3.5	4.5	0.5	0.0	0.5	1.0	0.5	0.5
31	9.5	---	---	---	---	1.5	0.5	1.0	1.0	0.5	0.5
MONTH			---	---	---	4.5	0.0	2.0	1.5	0.0	0.5

STREAMS TRIBUTARY TO LAKE MICHIGAN

04122030 MUSKEGON RIVER NEAR BRIDGETON, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	1.0	0.0	0.5				---	---	---	12.5	10.5	11.5
2	0.5	0.0	0.5				---	---	---	12.5	10.5	11.0
3	0.5	0.0	0.5				---	---	---	10.5	10.0	10.0
4	0.5	0.0	0.5				---	---	---	11.0	9.0	10.0
5	0.5	0.0	0.5				---	---	---	11.5	10.0	11.0
6	0.5	0.0	0.0				---	---	---	11.5	10.0	10.5
7	0.5	0.0	0.5				8.0	6.5	7.5	10.5	9.0	10.0
8	0.5	0.5	0.5				8.0	6.0	7.5	11.0	9.0	10.5
9	1.0	1.0	0.5				8.0	6.5	7.5	12.5	10.5	11.5
10	2.5	1.0	1.5				8.0	7.0	7.5	13.0	11.0	12.0
11	2.0	1.5	2.0				8.0	6.5	7.5	13.5	11.5	12.5
12	2.5	1.5	2.0				8.0	6.0	7.0	14.0	12.0	13.0
13	3.0	2.0	2.5				8.5	6.5	7.5	13.5	12.0	13.0
14	1.5	1.0	1.5				10.5	7.5	8.5	15.5	13.0	14.5
15	---	---	---				10.5	9.5	10.0	15.5	12.5	13.5
16	---	---	---				12.0	9.0	10.5	15.0	13.0	14.0
17	---	---	---				13.0	10.5	12.0	15.0	13.0	13.5
18	---	---	---				13.5	11.0	12.5	14.5	13.0	14.0
19	---	---	---				13.5	11.0	12.5	15.0	13.0	14.0
20	---	---	---				13.0	12.0	12.5	16.5	14.5	15.5
21	---	---	---				13.0	10.5	12.0	16.5	15.0	16.0
22	---	---	---				13.0	11.5	12.0	16.5	15.0	16.0
23	---	---	---				12.5	10.5	12.0	16.5	15.0	16.0
24	---	---	---				13.0	10.0	11.5	16.5	15.0	16.0
25	---	---	---				10.0	8.5	9.0	16.5	15.0	15.5
26	---	---	---				9.0	8.5	8.5	17.0	15.0	16.0
27	---	---	---				9.0	8.0	8.5	17.5	16.5	17.0
28	---	---	---				10.5	8.0	9.0	17.5	16.5	16.5
29	---	---	---				11.0	9.5	10.5	16.5	15.0	15.5
30	---	---	---				11.5	10.5	11.0	16.5	15.0	15.5
31	---	---	---				---	---	---	17.0	15.5	16.5
MONTH	---	---	---				13.5	6.0	10.0	17.5	9.0	13.5

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	18.5	16.0	17.0	21.5	19.5	20.5	---	---	---	22.5	20.0	21.0
2	18.5	17.0	18.0	21.0	19.5	20.5	---	---	---	20.5	17.5	19.5
3	19.0	17.5	18.5	21.5	20.5	21.0	---	---	---	22.0	19.0	20.0
4	19.5	18.0	19.0	22.0	20.5	21.5	21.5	19.5	21.0	22.5	20.0	21.0
5	20.0	18.5	19.5	23.0	21.0	22.0	21.5	20.0	20.5	21.5	19.0	20.0
6	20.0	19.0	19.5	23.5	22.0	23.0	21.5	18.5	20.5	21.0	18.5	20.0
7	21.0	20.0	20.0	23.5	22.0	23.0	22.0	18.5	20.5	21.5	19.5	20.5
8	21.0	20.0	20.5	24.0	21.0	22.5	23.0	19.0	21.0	22.5	19.5	21.0
9	22.5	21.0	21.5	22.5	22.0	22.5	23.5	18.5	21.5	21.0	17.0	20.0
10	22.0	21.0	21.5	23.0	22.0	22.5	22.0	19.5	21.0	19.5	18.0	18.5
11	23.0	20.5	21.5	24.0	22.5	23.5	23.5	19.5	22.0	20.5	15.5	18.5
12	23.0	21.0	22.0	24.0	22.5	23.5	23.5	21.0	22.5	21.5	18.5	20.0
13	24.5	22.5	23.5	22.5	21.5	22.0	23.5	20.5	22.5	21.5	17.5	19.5
14	23.5	23.0	23.5	24.0	22.0	23.0	22.5	19.0	21.5	21.0	17.5	20.0
15	23.5	21.5	22.5	25.5	23.5	24.5	22.0	18.5	20.5	20.0	18.0	19.0
16	22.0	19.5	20.5	24.0	22.5	23.5	22.5	18.5	20.5	19.0	17.0	18.0
17	22.5	19.5	21.0	23.5	21.0	22.5	23.0	19.0	21.0	20.0	17.0	19.0
18	22.5	21.0	22.0	24.0	21.0	22.5	23.5	19.5	21.5	20.5	17.5	19.0
19	22.0	20.0	21.0	23.0	21.5	22.5	23.5	20.5	22.0	20.0	17.5	19.0
20	22.5	21.0	22.0	23.0	21.5	22.0	24.0	21.0	22.5	20.0	18.0	19.0
21	22.5	21.0	21.5	---	---	---	24.0	21.5	22.5	18.0	16.0	17.0
22	22.5	21.5	22.0	---	---	---	24.5	21.5	23.0	16.5	12.5	16.0
23	22.5	21.0	22.0	---	---	---	25.0	22.5	23.5	16.5	14.5	16.0
24	22.0	19.0	20.5	---	---	---	24.5	22.0	23.0	16.0	13.5	15.0
25	22.5	19.5	20.5	---	---	---	24.0	22.5	23.0	16.0	11.5	14.5
26	22.0	20.5	21.5	---	---	---	24.0	21.5	23.0	15.5	13.5	14.5
27	23.5	22.0	23.0	---	---	---	25.0	21.0	23.0	17.0	13.5	15.5
28	24.5	23.0	23.5	---	---	---	24.5	22.0	23.5	15.5	13.5	14.5
29	22.5	20.5	21.5	---	---	---	22.5	20.0	21.5	16.0	13.0	14.5
30	20.5	19.5	20.0	---	---	---	20.5	18.5	19.5	17.0	13.5	15.5
31	---	---	---	---	---	---	22.5	19.0	20.5	---	---	---
MONTH	24.5	16.0	21.0	---	---	---	25.0	18.5	21.5	22.5	11.5	18.0

04122100 BEAR CREEK NEAR MUSKEGON, MI

LOCATION.--Lat 43°17'19", long 86°13'22", in SW¼ NW¼ sec.4, T.10 N., R.16 W., Muskegon County, Hydrologic Unit 04060102, on left bank at upstream side of bridge on North Getty Street, 1.5 mi (2.4 km) upstream from Little Bear Creek, and 3.9 mi (6.3 km) northeast of Muskegon.

DRAINAGE AREA.--14.8 mi^2 (38.3 km^2).

PERIOD OF RECORD.--October 1965 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 610 ft (186 m) from topographic map.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, Apr. 13 to May 24, which are fair. Some regulation during low flow, from dams and irrigation above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--11 years, 16.1 ft^3/s (0.456 m^3/s), 14.77 in/yr (375 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,200 ft^3/s (34.0 m^3/s), Mar. 5, 1976, gage height, 11.00 ft (3.353 m); minimum, 1.0 ft^3/s (0.028 m^3/s) Aug. 5, 17, 22, 1971.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft^3/s (2.83 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Nov. 30	1500	127	3.60	7.08	2.158	Mar. 13	0800	146	4.13	7.29	2.222
Dec. 15	0700	193	5.47	7.76	2.365	Apr. 25	unknown	130	3.68	unknown	
Feb. 16	0500	182	5.15	7.66	2.335	May 30	1100	120	3.40	6.99	2.131
Mar. 5	1100	*1,200	34.0	*11.00	3.353						

Minimum discharge, 2.2 ft^3/s (0.062 m^3/s) Sept. 9, 19, 30; minimum gage height, 3.59 ft (1.094 m) Sept. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.8	14	64	19	17	38	30	37	34	14	8.5	7.4
2	8.3	19	34	19	17	101	27	34	24	11	5.3	4.6
3	7.8	34	29	19	17	183	24	34	20	11	4.7	5.1
4	7.9	43	27	19	18	187	23	44	18	10	4.6	6.2
5	7.4	28	30	19	18	720	22	52	19	9.1	6.0	5.6
6	7.2	22	40	18	18	211	21	72	19	10	5.1	5.9
7	7.0	35	27	18	18	113	20	72	17	11	4.6	3.6
8	7.6	43	22	18	18	65	19	60	17	10	4.4	3.2
9	7.7	27	21	18	19	52	18	48	13	10	3.8	4.0
10	7.9	28	21	18	20	49	18	38	13	11	3.7	5.8
11	8.2	26	24	18	22	40	18	30	15	9.8	3.7	4.4
12	8.2	21	22	18	22	52	17	26	15	8.5	9.5	3.9
13	8.5	20	24	18	39	118	18	25	14	8.5	7.0	3.4
14	8.6	18	81	17	50	75	17	24	14	9.8	7.0	3.1
15	12	17	159	17	59	60	18	26	14	9.4	6.9	3.4
16	11	16	75	17	138	51	19	43	15	8.9	5.5	3.8
17	11	15	38	17	134	41	18	61	14	5.5	4.4	3.7
18	11	15	35	17	119	38	17	65	13	4.9	4.0	3.3
19	11	14	34	17	116	39	16	52	12	7.3	3.8	3.1
20	11	17	28	17	59	40	15	44	12	9.4	3.7	3.5
21	10	34	26	17	58	58	16	35	12	10	3.7	3.3
22	10	30	24	17	51	41	17	30	13	7.6	4.0	3.8
23	10	22	22	16	45	35	18	23	12	8.0	4.2	4.2
24	11	19	21	16	39	32	26	20	15	10	3.1	3.7
25	26	18	20	16	76	28	100	19	15	8.2	3.0	3.6
26	20	16	20	16	60	27	79	19	13	7.4	5.1	3.8
27	16	17	20	16	43	54	95	14	11	8.7	5.9	3.6
28	14	17	19	16	34	60	75	14	11	14	8.6	3.1
29	13	22	19	16	42	41	55	46	12	11	6.6	3.0
30	12	98	19	16	---	40	45	107	13	11	6.1	2.8
31	12	---	19	16	---	37	---	56	---	12	6.1	---
TOTAL	332.1	765	1064	536	1386	2726	921	1270	459	297.0	162.6	121.9
MEAN	10.7	25.5	34.3	17.3	47.8	87.9	30.7	41.0	15.3	9.58	5.25	4.06
MAX	26	98	159	19	138	720	100	107	34	14	9.5	7.4
MIN	7.0	14	19	16	17	27	15	14	11	4.9	3.0	2.8
CFSM	.72	1.72	2.32	1.17	3.23	5.94	2.07	2.77	1.03	.65	.35	.27
IN.	.83	1.92	2.67	1.35	3.48	6.85	2.31	3.19	1.15	.75	.41	.31

CAL YR 1975 TOTAL 7035.8 MEAN 19.3 MAX 258 MIN 3.2 CFSM 1.30 IN 17.68
WTR YR 1976 TOTAL 10040.6 MEAN 27.4 MAX 720 MIN 2.8 CFSM 1.85 IN 25.24

04122200 WHITE RIVER NEAR WHITEHALL, MI

LOCATION.--Lat 43°27'51", long 86°13'57", in SE¼ NW¼ sec.4, T.12 N., R.16 W., Muskegon County, Hydrologic Unit 04060101, on right bank 30 ft (9 m) downstream from bridge on Fruitvale Road, 6.3 mi (10.1 km) downstream from North Branch, and 6.9 mi (11.1 km) northeast of Whitehall.

DRAINAGE AREA.--380 mi^2 (980 km^2), approximately.

PERIOD OF RECORD.--August 1957 to current year.

GAGE.--Water-stage recorder. Datum of gage is 594.1 ft (181.1 m) above mean sea level, unadjusted. Nov. 18, 1957, to Oct. 22, 1958, nonrecording gage at same site and datum.

REMARKS.--Record good except those for the winter period, which are fair. Some regulation during low flows from dams above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--19 years, 422 ft^3/s (11.95 m^3/s), 15.08 in/yr (383 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,400 ft^3/s (153 m^3/s) Sept. 1, 1975, gage height, 7.46 ft (2.274 m); minimum, 163 ft^3/s (4.62 m^3/s) Aug. 18, 19, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,750 ft^3/s (135 m^3/s) Mar. 5, gage height, 7.20 ft (2.195 m); minimum, 295 ft^3/s (8.35 m^3/s) Aug. 10, minimum gage height, 2.12 ft (0.646 m) Sept. 8, 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	454	435	924	540	520	980	997	894	1230	450	332	344
2	457	470	975	530	510	1030	916	838	1030	469	320	354
3	448	535	862	520	500	1100	871	815	878	463	310	350
4	436	626	812	520	500	1300	830	830	813	454	304	346
5	426	669	778	510	498	3000	799	822	758	433	309	340
6	418	640	740	510	499	4180	779	860	688	402	317	338
7	412	619	770	505	500	2880	765	1060	623	383	314	338
8	409	637	734	500	510	2370	749	957	576	372	307	336
9	405	698	680	499	520	1700	726	902	543	365	300	336
10	403	664	642	500	530	1480	715	847	517	362	296	366
11	401	648	614	505	540	1320	709	794	497	361	298	376
12	400	652	595	510	560	1210	704	758	484	350	400	366
13	401	613	597	510	590	1510	692	726	472	340	430	358
14	404	580	646	500	630	1750	677	698	460	334	442	354
15	430	549	973	499	680	1430	684	685	454	330	422	354
16	447	523	1140	499	780	1290	721	689	460	320	385	360
17	460	503	993	500	830	1140	802	689	465	317	358	365
18	448	490	900	505	850	1010	767	679	461	315	342	360
19	425	479	800	505	860	958	719	660	485	310	330	351
20	415	484	709	510	830	1010	695	651	498	322	326	350
21	409	523	670	510	820	1160	672	646	484	350	320	350
22	403	627	620	510	810	1200	655	629	456	348	317	357
23	404	687	600	505	800	1210	663	601	433	334	314	358
24	405	644	580	505	740	1150	726	578	430	328	312	347
25	453	603	570	500	690	1020	1650	563	466	322	309	342
26	524	549	560	498	740	939	2530	554	434	312	312	343
27	569	521	540	498	830	945	1780	545	409	306	317	345
28	522	512	530	499	900	1260	1530	535	417	306	334	343
29	483	530	520	500	940	1230	1200	585	409	324	354	339
30	453	617	520	500	---	1090	998	746	423	332	344	337
31	432	---	530	500	---	1070	---	1140	---	336	340	---
TOTAL	13556	17327	22115	15702	19507	44922	27721	22976	16753	11050	10415	10503
MEAN	437	578	713	507	673	1449	924	741	558	356	336	350
MAX	569	698	1140	540	940	4180	2530	1140	1230	469	442	376
MIN	400	435	520	498	498	939	655	535	409	306	296	336
CFSM	1.15	1.52	1.88	1.33	1.77	3.81	2.43	1.95	1.47	.94	.88	.92
IN.	1.33	1.70	2.16	1.54	1.91	4.40	2.71	2.25	1.64	1.08	1.02	1.03

CAL YR 1975 TOTAL 206644 MEAN 566 MAX 4650 MIN 259 CFSM 1.49 IN 20.23
WTR YR 1976 TOTAL 232547 MEAN 635 MAX 4180 MIN 296 CFSM 1.67 IN 22.77

04122500 PERE MARQUETTE RIVER AT SCOTTVILLE, MI

LOCATION.--Lat 43°56'42", long 86°16'43", in NW¼ NW¼ sec.19, T.18 N., R.16 W., Mason County, Hydrologic Unit 04060101, on right bank 20 ft (6 m) upstream from highway bridge at south edge of Scottville, 1.4 mi (2.3 km) upstream from India Creek and 5.6 mi (9.0 km) downstream from Big South Branch.

DRAINAGE AREA.--709 mi^2 (1,836 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1939 to current year. Prior to October 1942, published as "at Custer".

REVISED RECORDS.--WSP 1437: 1941(M), 1943(M), 1949(M), 1950.

GAGE.--Water-stage recorder. Datum of gage is 597.66 ft (182.167 m) above mean sea level. Prior to June 12, 1943, nonrecording gage at bridge 4.5 mi (7.2 km) upstream at different datum.

REMARKS.--Water-discharge records good except those for the winter period, which are fair. Some regulation above station during low flow.

AVERAGE DISCHARGE.--37 years, 652 ft^3/s (18.46 m^3/s), 12.49 in/yr (317 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,970 ft^3/s (84.1 m^3/s) July 1, 1969, gage height, 6.26 ft (1.908 m); minimum, 209 ft^3/s (5.92 m^3/s) Dec. 11, 1962, (discharge measurement); minimum daily, 310 ft^3/s (8.78 m^3/s) Aug. 9, 10, 1941.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,940 ft^3/s (83.3 m^3/s) Mar. 7, gage height, 6.18 ft (1.884 m); minimum daily, 498 ft^3/s (14.1 m^3/s) Aug. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	735	722	1230	730	720	1380	1650	1380	1330	735	588	550
2	734	719	1340	730	710	1260	1560	1290	1360	764	570	570
3	725	740	1410	740	700	1220	1480	1220	1370	774	552	570
4	707	781	1320	740	740	1240	1410	1170	1260	743	537	560
5	691	829	1200	740	740	1500	1350	1170	1150	720	574	550
6	677	862	1150	740	730	2280	1300	1180	1080	702	584	540
7	668	879	1170	730	730	2770	1250	1210	1020	682	584	540
8	662	919	1170	720	730	2820	1210	1250	962	664	564	550
9	659	971	1120	710	730	2450	1180	1260	903	654	546	560
10	662	1040	1050	720	740	2090	1140	1160	847	644	538	580
11	654	1060	992	740	750	1820	1120	1090	806	636	549	600
12	654	1070	947	750	760	1750	1110	1050	779	626	577	600
13	652	1050	925	750	780	1750	1120	1020	759	612	626	590
14	658	994	963	740	820	1780	1090	981	750	602	626	580
15	732	941	1020	730	860	1820	1070	950	745	594	605	570
16	726	898	1120	710	940	1730	1100	933	755	588	574	580
17	700	860	1220	700	1100	1580	1120	946	747	577	558	590
18	692	828	1330	690	1200	1480	1130	983	740	570	543	580
19	681	801	1200	710	1240	1400	1120	1040	735	564	531	570
20	671	793	1050	730	1200	1430	1070	1070	735	567	519	560
21	670	826	980	720	1180	1580	1030	1010	745	574	513	560
22	665	876	920	720	1130	1820	1000	923	735	574	510	580
23	663	934	870	720	1100	1960	994	874	722	564	504	590
24	660	944	830	720	1040	1800	1060	838	724	552	498	570
25	738	905	800	720	1060	1640	1170	822	728	543	505	560
26	789	861	790	720	1190	1630	1410	804	732	537	510	550
27	842	836	780	720	1360	1730	1840	795	725	531	520	560
28	844	810	760	720	1390	1800	1860	789	709	546	540	560
29	801	877	760	730	1390	1890	1640	824	699	588	560	560
30	760	1070	750	740	---	1970	1490	955	710	605	570	550
31	736	---	740	730	---	1780	---	1330	---	608	540	---
TOTAL	21908	26696	31907	22510	27760	55150	38074	32317	26062	19240	17115	17030
MEAN	707	890	1029	726	957	1779	1269	1042	869	621	552	568
MAX	844	1070	1410	750	1390	2820	1860	1380	1370	774	626	600
MIN	652	719	740	690	700	1220	994	789	699	531	498	540
CFSM	1.00	1.26	1.45	1.02	1.35	2.51	1.79	1.47	1.23	.88	.78	.80
IN.	1.15	1.40	1.67	1.18	1.46	2.89	2.00	1.70	1.37	1.01	.90	.89

CAL YR 1975 TOTAL 310265 MEAN 850 MAX 2810 MIN 384 CFSM 1.20 IN 16.28
WTR YR 1976 TOTAL 335769 MEAN 917 MAX 2820 MIN 498 CFSM 1.29 IN 17.62

04122500 PERE MARQUETTE RIVER AT SCOTTVILLE, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: May 1968 to current year.

INSTRUMENTATION.--Temperature recorder since May 1968.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 24.5°C June 29, 30, 1971; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 21.5°C June 13-15; minimum, 0.0°C on many days during winter period.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	13.0	12.5	9.0	8.0	4.0	1.5	1.0	0.5	0.0	0.0	3.0	1.5
2	12.5	11.0	9.5	9.0	1.5	1.0	1.0	1.0	0.0	0.0	1.5	1.0
3	11.0	10.0	10.5	9.5	1.0	0.5	1.0	0.5	0.0	0.0	1.5	1.5
4	11.5	11.5	11.0	10.5	0.5	0.5	0.5	0.5	0.0	0.0	1.5	1.5
5	12.0	11.0	11.0	11.0	2.5	0.5	0.5	0.5	0.0	0.0	1.5	1.5
6	12.0	11.5	12.0	11.0	2.5	2.0	0.5	0.0	0.0	0.0	1.5	1.5
7	12.0	10.5	12.0	12.0	2.0	0.5	0.0	0.0	0.0	0.0	1.5	1.5
8	11.5	11.0	12.0	12.0	0.5	0.5	0.0	0.0	0.0	0.0	1.5	1.5
9	12.0	11.5	12.0	11.5	0.5	0.5	0.0	0.0	0.0	0.0	1.5	1.5
10	12.5	11.5	11.5	10.0	0.5	0.5	0.0	0.0	0.0	0.0	2.0	1.5
11	11.5	11.0	10.0	9.0	1.0	0.5	0.0	0.0	0.0	0.0	2.0	1.5
12	11.0	10.0	9.0	8.0	1.0	1.0	0.0	0.0	0.0	0.0	2.0	2.0
13	13.0	11.0	8.0	6.0	2.0	1.0	0.0	0.0	0.0	0.0	2.0	2.0
14	13.5	13.0	6.0	5.5	5.0	2.0	0.0	0.0	0.0	0.0	2.0	2.0
15	14.0	13.5	5.5	4.5	5.0	3.5	0.0	0.0	0.5	0.0	2.5	2.0
16	14.0	12.5	5.0	4.5	3.5	2.0	0.0	0.0	0.5	0.5	2.5	2.0
17	12.5	10.5	6.0	5.0	2.0	0.5	0.0	0.0	0.5	0.5	2.0	1.5
18	10.5	9.5	7.0	6.0	0.5	0.5	0.0	0.0	1.0	0.5	3.0	2.0
19	9.5	9.5	7.0	7.0	0.5	0.5	0.0	0.0	1.0	1.0	6.5	3.0
20	10.0	9.5	7.0	7.0	0.5	0.0	0.0	0.0	1.0	1.0	8.0	6.5
21	10.5	10.0	7.0	6.0	0.0	0.0	0.0	0.0	1.0	1.0	9.0	6.0
22	10.5	10.0	6.0	5.5	0.0	0.0	0.0	0.0	1.0	1.0	6.0	4.5
23	12.0	10.5	5.5	5.0	0.0	0.0	0.0	0.0	1.0	1.0	5.0	4.5
24	13.0	12.0	5.0	4.0	0.0	0.0	0.0	0.0	1.5	1.0	7.0	5.0
25	13.0	12.0	4.0	3.0	0.0	0.0	0.0	0.0	2.0	1.5	8.0	7.0
26	12.0	10.0	3.0	1.5	0.0	0.0	0.0	0.0	3.0	2.0	10.0	8.0
27	10.0	9.0	1.5	0.5	0.5	0.0	0.0	0.0	3.0	2.5	10.0	8.5
28	9.5	9.5	1.5	1.0	0.5	0.5	0.0	0.0	3.0	2.5	8.5	8.0
29	9.5	9.5	2.5	1.5	0.5	0.5	0.0	0.0	3.0	3.0	8.5	8.5
30	9.0	9.0	4.5	2.5	0.5	0.5	0.0	0.0	---	---	9.5	7.5
31	8.0	7.5	---	---	0.5	0.5	0.0	0.0	---	---	9.5	8.5
MONTH	14.0	7.5	12.0	0.5	5.0	0.0	1.0	0.0	3.0	0.0	10.0	1.0

04122500 PERE MARQUETTE RIVER AT SCOTTVILLE, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04123500 MANISTEE RIVER NEAR GRAYLING, MI

LOCATION.--Lat 44°41'35", long 84°50'50", in SW¼ NW¼ sec.31, T.27 N., R.4 W., Crawford County, Hydrologic Unit 04060103, at partial-record streamflow station on right bank 25 ft (8 m) upstream from bridge on State Highway 72, 3.3 mi (5.3 km) downstream from Goose Creek, and 6.8 mi (10.9 km) northwest of Grayling.

DRAINAGE AREA.--159 mi^2 (412 km^2).

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: May 1957 to current year.

INSTRUMENTATION.--Temperature recorder since May 1957.

REMARKS..--Interruptions in the record were due to malfunctions of the recorder.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 24.0°C July 1, 1963, July 22, 23, 1972, July 3, 4, 1975; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum recorded, 21.5°C June 14; minimum 0.0°C on many days during December and January.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04123500 MANISTEE RIVER NEAR GRAYLING, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04124000 MANISTEE RIVER NEAR SHERMAN, MI

LOCATION.--Lat 44°26'11", long 85°41'55", in NE¼ NE¼ sec.36, T.24 N., R.12 W., Wexford County, Hydrologic Unit 04060103, on downstream side of bridge near right pier on State Highway 37, 250 ft (76 m) upstream from Wheeler Creek, 0.9 mi (1.4 km) north of Sherman, and at mile 60.8 (97.8 km).

DRAINAGE AREA.--900 mi^2 (2331 km^2).

PERIOD OF RECORD.--July 1903 to May 1916, October 1930 to September 1931, October 1933 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1004: 1936(m). WSP 1307: 1911, 1913-14(M), 1934(M), 1936(M), 1937, 1939-40(M). WSP 1437: 1911, 1913(M), 1937.

GAGE.--Nonrecording gage. Altitude of gage is 804 ft (245 m) from river-profile map. Prior to Apr. 13, 1934, at various datums.

REMARKS.--Records good except those for the winter period and those for period of indefinite stage-discharge relation, July 24 to Sept. 8, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--56 years (1903-15, 1930-31, 1933-76), 1,059 ft^3/s (29.99 m^3/s), 15.98 in/yr (406 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,570 ft^3/s (101 m^3/s) Mar. 25, 1913, gage height, 7.1 ft (2.16 m), from graph based on gage readings, datum then in use; minimum daily, 540 ft^3/s (15.3 m^3/s) Feb. 21-23, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,430 ft^3/s (97.1 m^3/s) Mar. 29, gage height, 15.72 ft (4.791 m); minimum daily, 796 ft^3/s (22.5 m^3/s) Aug. 31, Sept. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1000	958	1410	994	946	1280	2930	1450	1700	1060	943	796
2	1010	958	1390	988	919	1220	2640	1430	1680	1040	925	856
3	1000	961	1360	991	904	1240	2430	1420	1540	1040	904	865
4	991	961	1350	994	907	1270	2220	1500	1420	1040	889	841
5	976	958	1380	1000	955	1470	2080	1620	1330	1020	895	841
6	964	961	1380	979	1000	1600	1940	1720	1250	994	904	841
7	949	991	1340	991	1090	1510	1880	1660	1200	988	892	826
8	946	1120	1200	1050	1080	1430	1760	1570	1180	982	868	814
9	931	1160	1150	990	1070	1380	1690	1450	1170	973	856	826
10	931	1180	1140	1100	1080	1300	1680	1410	1140	973	856	829
11	931	1200	1110	1080	1100	1260	1630	1380	1120	958	841	820
12	931	1180	1050	1050	1120	1260	1580	1380	1090	952	892	820
13	931	1150	1030	1030	1100	1330	1520	1340	1070	946	934	820
14	934	1120	1140	1010	1100	1300	1460	1310	1060	943	943	820
15	964	1100	1320	1000	1160	1280	1480	1320	1100	943	910	840
16	1020	1040	1200	980	1240	1260	1540	1640	1190	940	874	840
17	1010	1010	1310	960	1260	1210	1490	1780	1180	928	856	850
18	985	1000	1460	980	1270	1170	1440	1900	1160	925	862	850
19	961	1010	1320	1020	1340	1200	1410	1800	1180	925	859	850
20	955	1010	1240	1020	1310	1600	1380	1710	1210	919	838	820
21	949	1050	1200	1020	1290	2090	1380	1560	1170	928	835	830
22	946	1100	1180	1010	1230	2120	1440	1440	1130	934	823	870
23	943	1110	1140	1000	1180	1950	1520	1360	1100	919	808	870
24	940	1080	1120	1000	1180	2030	1620	1330	1090	907	811	870
25	964	1070	1110	1020	1200	2280	2020	1280	1050	901	811	840
26	1000	1010	1090	1020	1290	2520	2000	1280	1040	886	814	830
27	1030	985	1060	1010	1350	2910	1780	1280	1030	871	829	830
28	1100	985	1040	1000	1340	3250	1600	1300	1020	856	832	830
29	1070	1050	1030	980	1300	3360	1500	1380	1020	955	820	830
30	1010	1360	1010	960	---	3250	1480	1500	1020	973	805	830
31	973	---	994	950	---	3050	---	1620	---	961	796	---
TOTAL	30245	31828	37254	31177	33311	55380	52520	46120	35640	29580	26725	25095
MEAN	976	1061	1202	1006	1149	1786	1751	1488	1188	954	862	837
MAX	1100	1360	1460	1100	1350	3360	2930	1900	1700	1060	943	870
MIN	931	958	994	950	904	1170	1380	1280	1020	856	796	796
CFSM	1.08	1.18	1.34	1.12	1.28	1.98	1.95	1.65	1.32	1.06	.96	.93
IN.	1.25	1.32	1.54	1.29	1.38	2.29	2.17	1.91	1.47	1.22	1.10	1.04

CAL YR 1975 TOTAL 408828 MEAN 1120 MAX 2320 MIN 808 CFSM 1.24 IN 16.90
WTR YR 1976 TOTAL 434875 MEAN 1188 MAX 3360 MIN 796 CFSM 1.32 IN 17.97

04125500 PINE RIVER NEAR HOXEYVILLE, MI

LOCATION.--Lat 44°12'11", long 85°47'58", in SW¼ NW¼ sec.20, T.21 N., R.12 W., Wexford County, Hydrologic Unit 04060103, on right bank 500 ft (152 m) upstream from bridge on State Highway 37, 4.2 mi (6.8 km) northwest of Hoxeyville, 8.0 mi (12.9 km) east of Wellston, and 8.0 mi (12.9 km) upstream from mouth.

DRAINAGE AREA.--251 mi^2 (650 km^2).

PERIOD OF RECORD.--July 1952 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 775 ft (236 m) by barometer.

REMARKS.--Records good. Some regulation during low flows from dams above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--24 years, 287 ft^3/s (8.128 m^3/s), 15.53 in/yr (394 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,440 ft^3/s (69.1 m^3/s) Aug. 6, 1956, gage height, 6.82 ft (2.079 m), from rating curve extended above 1,100 ft^3/s (31.2 m^3/s); minimum, 161 ft^3/s (4.56 m^3/s) Feb. 2, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 650 ft^3/s (18.4 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 1	1100	782	22.1	4.30	1.311	Mar. 28	2100	*1,440	40.8	*5.81	1.771
Mar. 6	1000	889	25.2	4.59	1.399	Apr. 26	1000	796	22.5	4.34	1.323
Mar. 21	2100	976	27.6	4.81	1.466	May 16	2100	932	26.4	4.70	1.433

Minimum discharge, 238 ft^3/s (6.74 m^3/s) Aug. 24, 25, gage height, 2.38 ft (0.725 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	300	282	756	301	288	481	730	408	590	342	268	263
2	304	282	603	302	266	441	634	420	578	342	261	265
3	296	289	466	304	280	412	566	444	434	313	257	256
4	286	301	408	302	293	408	514	456	378	298	254	251
5	280	302	390	292	284	649	478	424	357	287	269	247
6	278	291	435	294	276	847	454	475	338	278	283	247
7	273	315	426	299	280	700	434	492	323	275	270	244
8	270	397	365	270	284	577	415	433	314	271	260	242
9	270	431	344	282	280	531	397	400	308	268	255	247
10	270	411	333	294	284	509	392	380	306	268	252	260
11	270	420	326	294	297	456	423	377	300	268	253	258
12	274	383	319	291	303	445	423	373	294	264	263	249
13	271	352	318	290	311	491	395	360	289	261	265	244
14	271	333	404	290	316	486	382	351	286	260	260	244
15	292	320	498	276	335	441	382	346	292	260	256	244
16	303	310	457	286	429	410	434	462	297	259	254	247
17	297	306	379	267	446	379	436	672	294	258	249	249
18	284	302	335	273	430	371	395	723	288	256	249	249
19	278	296	318	296	466	387	382	525	298	256	247	244
20	275	305	327	291	445	361	363	427	300	269	244	247
21	275	352	314	286	424	916	361	390	285	276	244	249
22	275	366	308	285	401	789	420	368	279	277	244	251
23	273	337	314	281	365	647	400	354	276	266	242	249
24	275	319	310	276	364	673	437	351	288	259	240	244
25	340	312	308	291	397	768	669	346	302	255	240	244
26	390	296	308	287	444	855	778	335	294	255	242	244
27	347	293	307	284	508	1120	647	328	281	254	256	247
28	315	298	303	282	503	1300	502	329	281	257	258	247
29	298	363	298	286	479	1080	438	350	291	273	247	247
30	288	615	301	288	---	814	411	418	310	285	244	244
31	282	---	301	285	---	764	---	472	---	274	244	---
TOTAL	9000	10179	11579	8925	10478	19508	14092	12989	9751	8484	7870	7463
MEAN	290	339	374	288	361	629	470	419	325	274	254	249
MAX	390	615	756	304	508	1300	778	723	590	342	283	265
MIN	270	282	298	267	266	361	361	328	276	254	240	242
CFSM	1.16	1.35	1.49	1.15	1.44	2.51	1.87	1.67	1.29	1.09	1.01	.99
IN.	1.33	1.51	1.72	1.32	1.55	2.89	2.09	1.93	1.45	1.26	1.17	1.11

CAL YR 1975 TOTAL 123160 MEAN 337 MAX 1730 MIN 229 CFSM 1.34 IN 18.25
WTR YR 1976 TOTAL 130318 MEAN 356 MAX 1300 MIN 240 CFSM 1.42 IN 19.31

04126000 MANISTEE RIVER NEAR MANISTEE, MI

LOCATION.--Lat 44°16'14", long 86°11'56", in NW¼ NW¼ sec.36, T.22 N., R.16 W., Manistee County, Hydrologic Unit 04060103, on right bank 6.4 mi (10.3 km) northeast of Manistee, 7.8 mi (12.6 km) upstream from Manistee Lake, and at mile 10.8 (17.4 km).

DRAINAGE AREA.--1,780 mi^2 (4,610 km^2), approximately.

PERIOD OF RECORD.--October 1951 to current year. Monthly discharge only for October, November, 1951, published in WSP 1727.

GAGE.--Water-stage recorder. Altitude of gage is 585 ft (178 m) from river-profile map.

REMARKS.--Records good except those for the winter period, which are fair. Flow regulated at all stages by Tippy hydroelectric power-plant 21 mi (34 km) above station. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--25 years, 2,000 ft^3/s (56.64 m^3/s), 15.26 in/yr (388 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,120 ft^3/s (202 m^3/s) Mar. 30, 1976, gage height, 8.37 ft (2.551 m); maximum gage height, 9.15 ft (2.789 m) Feb. 12, 1955 (backwater from ice); minimum daily discharge, 992 ft^3/s (28.1 m^3/s) Oct. 10, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,120 ft^3/s (202 m^3/s) Mar. 30, gage height, 8.37 ft (2.551 m); minimum, 1,060 ft^3/s (30.0 m^3/s) Sept. 20, gage height, 4.31 ft (1.314 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1850	1760	3160	2110	1800	2870	5150	2810	2960	2220	1670	1760
2	1910	1540	3550	1960	1600	2960	4460	2750	3110	1930	1500	1780
3	2280	1620	3520	1780	1900	3120	3850	2890	3270	1880	1700	1640
4	1940	1780	3170	1850	1900	3010	3880	3200	3370	2010	1740	1640
5	1620	1960	2610	2100	1800	2910	3760	3130	3180	1640	1650	1500
6	1660	1700	2460	1900	1700	3430	3550	3300	2080	1720	2170	1400
7	1980	2340	2170	1700	2000	4120	3370	3520	2130	1920	1740	1420
8	1890	1880	2390	2000	2100	3850	3250	3340	2430	1870	1510	1640
9	1840	2170	2600	2200	1700	3330	3200	3200	2510	1990	1560	1610
10	1850	2180	2610	1600	2200	3020	3180	3010	2180	1710	1760	1660
11	1590	2490	2170	1300	2000	2850	2990	2990	1910	1660	1680	1840
12	1550	2560	2250	1200	2400	2940	3010	2810	1970	1780	2100	1400
13	1630	2640	2100	1800	2300	2850	3010	2890	2070	1760	2040	1360
14	1990	2520	2170	2300	2150	2530	3020	2910	1690	1710	2040	1660
15	1840	1940	2460	2200	2000	2940	3070	2890	2130	1690	1520	1710
16	2190	1730	2590	2100	2400	2770	3080	2540	1990	1740	1520	1770
17	2000	1890	2810	1900	2650	2510	3080	2810	2260	1760	1840	1570
18	1980	2230	2500	1600	2900	2550	3070	3390	2390	1400	1590	1530
19	1390	2020	2000	1400	2700	2590	2990	3760	2000	1480	1690	1380
20	1760	1850	1600	1800	2600	3080	3050	3760	1780	1710	1800	1440
21	1860	2110	1700	1900	2800	3300	3020	3460	1900	1780	1600	1760
22	1720	2550	1850	2300	2640	4120	3080	3120	2020	1960	1480	1550
23	1910	1720	2100	2000	2520	4980	2930	2780	2010	1700	1540	1520
24	1880	1860	2290	2500	2510	4700	2850	2610	1970	1640	1480	1710
25	1940	1940	2330	1700	2510	3700	3160	2440	2190	1570	1600	1550
26	1850	2090	2100	1300	2730	3820	3460	2460	2030	1580	1700	1420
27	2020	1850	1850	2000	2930	4300	3790	2530	1710	1820	1600	1420
28	2380	1910	1650	2200	3030	5020	3880	2780	1850	1710	1680	1640
29	2020	2100	1600	2200	3010	6280	3670	2400	1980	1880	1460	1620
30	1920	2470	2130	2600	---	6700	3230	2760	2010	1870	1480	1640
31	1880	---	2040	2200	---	5850	---	2790	---	1820	1620	---
TOTAL	58120	61400	72530	59700	67480	113000	101090	92030	67080	54910	52060	47540
MEAN	1875	2047	2340	1926	2327	3645	3370	2969	2236	1771	1679	1585
MAX	2380	2640	3550	2600	3030	6700	5150	3760	3370	2220	2170	1840
MIN	1390	1540	1600	1200	1600	2510	2850	2400	1690	1400	1460	1360
CFSM	1.05	1.15	1.31	1.08	1.31	2.05	1.89	1.67	1.26	.99	.94	.89
IN.	1.21	1.28	1.52	1.25	1.41	2.36	2.11	1.92	1.40	1.15	1.09	.99

CAL YR 1975 TOTAL 802210 MEAN 2198 MAX 5500 MIN 1320 CFSM 1.23 IN 16.77
WTR YR 1976 TOTAL 846940 MEAN 2314 MAX 6700 MIN 1200 CFSM 1.30 IN 17.70

04126200 LITTLE MANISTEE RIVER NEAR FREESOIL, MI

WATER-QUALITY RECORDS

LOCATION.--Lat 44°11'00", long 86°10'00", in NE¼ NE¼ sec.31, T.21 N. R.15 W., Manistee County, Hydrologic Unit 04060103, at partial-record streamflow station, on right bank 25 ft (8 m) upstream from Sixmile Bridge, 5.8 mi (9.3 km) north of Freesoil, 7.4 mi (11.9 km) upstream from mouth, and 9.0 mi (14.5 km) southeast of Manistee.

DRAINAGE AREA.--200 mi^2 (518 km^2).

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1956 to current year.

INSTRUMENTATION.--Temperature recorder since October 1956.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 22.5°C June 28, 29, 1971, July 22, 1972; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 20.0°C June 13, 14; minimum, 0.5°C on many days during January and February.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	12.5	11.0	9.0	7.5	4.0	2.0	3.0	2.5	1.0	0.5	3.5	2.0
2	11.0	9.5	9.5	8.5	2.0	1.0	3.0	2.5	0.5	0.5	2.0	1.5
3	10.5	8.5	10.0	9.5	1.0	1.0	2.5	1.0	0.5	0.5	2.5	1.5
4	11.0	9.5	11.0	10.0	2.0	1.0	1.0	0.5	0.5	0.5	2.5	2.5
5	11.5	10.0	10.5	10.0	4.0	2.0	0.5	0.5	0.5	0.5	2.5	2.5
6	11.5	10.5	11.0	10.5	4.0	2.5	1.0	0.5	0.5	0.5	2.5	1.5
7	11.0	9.5	11.0	11.0	2.5	2.0	1.0	0.5	0.5	0.5	1.5	1.0
8	11.0	9.5	11.0	11.0	2.0	2.0	0.5	0.5	0.5	0.5	1.5	1.0
9	12.0	10.5	11.0	10.5	2.5	2.0	0.5	0.5	1.5	0.5	2.5	1.5
10	11.5	11.0	11.0	9.0	2.5	2.5	0.5	0.5	3.0	1.5	3.0	2.0
11	11.0	10.0	9.0	7.5	3.0	2.5	0.5	0.5	3.0	3.0	4.0	2.5
12	10.0	8.5	8.0	7.0	3.0	2.5	0.5	0.5	3.5	3.0	3.5	3.0
13	12.5	10.0	7.0	6.0	4.5	2.5	1.5	0.5	4.0	3.0	3.0	2.5
14	13.5	12.0	6.0	5.0	6.5	4.5	1.5	1.0	3.0	2.0	3.0	2.5
15	13.0	12.0	5.0	4.5	6.5	4.0	1.0	0.5	3.5	2.5	3.0	1.5
16	12.0	10.0	5.5	4.5	4.0	2.5	0.5	0.5	4.0	3.0	3.0	2.5
17	10.0	8.5	6.5	5.5	2.5	1.0	0.5	0.5	3.0	2.5	3.0	1.5
18	9.0	7.5	8.0	6.5	1.0	1.0	0.5	0.5	2.5	2.5	4.0	2.5
19	8.5	8.5	8.0	7.0	1.0	1.0	0.5	0.5	3.0	2.5	7.0	4.0
20	9.5	8.5	7.5	7.0	1.0	1.0	0.5	0.5	3.5	3.0	6.5	5.0
21	10.0	9.0	7.0	6.0	1.0	1.0	0.5	0.5	3.5	2.5	5.0	2.0
22	10.0	9.0	6.0	5.5	1.0	1.0	0.5	0.5	2.5	2.0	2.5	1.0
23	12.0	10.0	5.5	5.0	2.0	1.0	0.5	0.5	2.0	1.5	4.0	1.0
24	12.5	11.5	5.0	4.0	2.0	2.0	0.5	0.5	3.5	2.0	6.5	4.0
25	12.5	10.0	4.0	2.5	2.5	2.0	0.5	0.5	4.5	3.0	7.5	5.5
26	10.0	8.0	2.5	2.0	2.5	2.5	0.5	0.5	5.0	4.0	9.0	7.5
27	9.0	8.0	2.5	1.5	3.0	2.0	0.5	0.5	5.0	4.5	9.0	6.0
28	9.0	8.5	3.5	2.5	2.0	2.0	0.5	0.5	4.5	3.5	7.5	5.0
29	8.5	7.5	4.0	3.5	2.0	2.0	0.5	0.5	4.0	3.5	7.0	6.0
30	7.5	7.0	5.5	4.0	2.5	2.0	1.0	0.5	---	---	9.0	7.0
31	7.5	7.0	---	---	2.5	2.0	1.0	1.0	---	---	8.0	7.0
MONTH	13.5	7.0	11.0	1.5	6.5	1.0	3.0	0.5	5.0	0.5	9.0	1.0

04126200 LITTLE MANISTEE RIVER NEAR FREESOIL, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04126520 MANISTEE RIVER AT MANISTEE, MI
(National stream-quality accounting network and pesticide station)

LOCATION.--Lat 44°14'54", long 86°19'25", in NW¼ NW¼ sec.12, T.21 N., R.17 W., Manistee County, Hydrologic Unit 04060103, at upstream side of bridge on Washington Street (revised), in Manistee, and 1.0 mi (1.6 km) upstream from mouth.

DRAINAGE AREA.--2,000 mi^2 (5,180 km^2), approximately.

PERIOD OF RECORD.--Water years 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: November 1974 to current year.
WATER TEMPERATURES: November 1974 to current year.

REMARKS.--Daily record based on samples collected at mid-stream from bridge on U.S. Highway 31, 1,400 ft (427 m) upstream from station. Daily samples collected at 1445 hours from Oct. 1 to Jan. 10, Apr. 5 to Sept. 30, and between 0900 and 1000 hours from Jan. 11 to Apr. 4. Water discharge measurements are made at times of monthly sampling.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 1,680 micromhos Nov. 18, 1974; minimum daily, 236 micromhos, Apr. 6, 1976.
WATER TEMPERATURES: Maximum daily, 24.5°C Aug. 1-3, 1975; minimum daily, 0.0°C Feb. 2-5, 1976.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 1,280 micromhos Oct. 11; minimum daily, 236 micromhos Apr. 6.
WATER TEMPERATURES: Maximum daily, 23.5°C July 11; minimum daily, 0.0°C Feb. 2-5.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT												
08...	1300	2340	650	7.6	12.5	--	--	290	62	30	--	--
NOV												
05...	1300	2700	536	8.0	10.5	9.8	89	100	48	18	240	76
DEC												
10...	1230	2870	574	7.9	1.5	12.3	90	19	--	35	210	62
JAN												
07...	1400	2540	550	7.9	.0	12.8	89	390	120	37	230	74
FEB												
10...	1200	3660	440	7.8	1.0	9.5	68	720	70	43	200	41
MAR												
10...	1200	4090	368	7.9	1.5	11.6	83	220	350	47	150	20
APR												
07...	1200	3780	295	7.6	7.0	11.0	92	280	200	32	130	18
MAY												
12...	1230	2770	310	8.1	12.0	10.0	94	170	78	3	150	9
JUN												
10...	1100	2420	318	8.2	21.0	8.9	101	91	48	28	180	29
JUL												
14...	1145	3340	376	8.3	22.0	7.5	87	--	--	28	180	21
AUG												
04...	1230	2030	429	8.1	20.5	8.6	96	260	50	55	190	32
SEP												
09...	1000	2180	376	8.0	19.0	4.6	50	1600	140	69	190	57

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT												
08...	--	--	--	--	--	190	0	156	7.6	--	--	--
NOV												
05...	72	14	13	.4	1.6	200	0	164	3.2	12	53	.0
DEC												
10...	63	13	24	.7	2.0	180	0	148	3.6	15	77	.2
JAN												
07...	72	13	16	.5	2.0	190	0	156	3.8	12	76	.2
FEB												
10...	59	13	14	.4	1.4	194	0	159	4.9	14	50	.2
MAR												
10...	44	10	8.3	.3	1.2	158	0	130	3.2	12	29	.3
APR												
07...	38	8.1	7.1	.3	1.1	136	0	112	5.5	11	22	.1
MAY												
12...	43	11	11	.4	1.2	172	0	141	2.2	9.2	30	.1
JUN												
10...	52	11	11	.4	1.2	184	0	151	1.9	13	32	.1
JUL												
14...	52	12	15	.5	1.4	194	0	159	1.6	13	40	.1
AUG												
04...	53	13	15	.5	1.1	192	0	157	2.4	16	38	.1
SEP												
09...	52	14	15	.5	1.1	162	0	133	2.6	12	38	.1

04126520 MANISTEE RIVER AT MANISTEE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT											
08...	--	--	--	--	.15	.49	2.2	.03	9	57	100
NOV											
05...	7.8	258	272	1880	.18	.57	2.5	.02	1	7.3	100
DEC											
10...	8.3	302	291	2340	.22	.63	2.8	.01	6	46	100
JAN											
07...	8.9	312	294	2140	.30	.55	2.4	.03	60	411	100
FEB											
10...	8.9	277	256	2740	.36	.50	2.2	.03	3	30	100
MAR											
10...	7.6	202	190	2230	.30	.50	2.2	.04	12	133	100
APR											
07...	5.0	178	159	1820	.17	.52	2.3	.03	12	122	100
MAY											
12...	5.2	229	195	1710	.13	.46	2.0	.03	4	30	100
JUN											
10...	5.7	235	217	1540	.15	.60	2.7	.04	5	33	100
JUL											
14...	7.2	250	236	2250	.10	.80	3.5	.03	6	54	100
AUG											
04...	6.2	240	237	1320	.09	.34	1.5	.04	12	66	100
SEP											
09...	6.8	259	219	1520	.11	.29	1.3	.05	4	24	100

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
OCT												
08...	1300	1	1	0	0	<10	0	0	0	8	0	340
JAN												
07...	1400	1	0	2	2	<10	0	0	0	10	0	220
APR												
07...	1200	0	0	0	0	10	<10	0	0	0	0	410
JUL												
14...	1145	0	0	1	1	10	<10	1	0	0	0	280

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT												
08...	40	18	7	40	0	.0	.0	0	0	30	0	9.8
JAN												
07...	40	20	9	20	10	.0	.0	0	0	30	10	7.2
APR												
07...	40	3	0	20	10	<.5	<.5	0	0	--	20	6.5
JUL												
14...	50	6	4	30	10	<.5	<.5	0	0	10	0	--

04126520 MANISTEE RIVER AT MANISTEE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL CHLORDANE (UG/L)	CHLORDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MATERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDT (UG/L)	DDT IN BOTTOM MATERIAL (UG/KG)
NOV 05...	1300	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY 12...	1230	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 04...	1230	ND	--	ND	--	ND	--	ND	--	ND	--

DATE	TOTAL DIAZINON (UG/L)	DIAZINON IN BOTTOM MATERIAL (UG/KG)	TOTAL DIELDRIN (UG/L)	DIELDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ETHION (UG/L)	ETHION IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR (UG/L)	HEPTACHLOR IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR EPOXIDE (UG/L)
NOV 05...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY 12...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 04...	ND	--	ND	--	ND	--	ND	--	ND	--	ND

DATE	HEPTACHLOR EPOXIDE IN BOTTOM MATERIAL (UG/KG)	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL MALATHION (UG/L)	MALATHION IN BOTTOM MATERIAL (UG/KG)	TOTAL METHOXYCHLOR (UG/L)	TOTAL METHYL PARATHION (UG/L)	METHYL PAPATHION IN BOTTOM MATERIAL (UG/KG)	TOTAL METHYL TRITHION (UG/L)	METHYL TRITHION IN BOTTOM MATERIAL (UG/KG)	TOTAL PARATHION (UG/L)
NOV 05...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY 12...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 04...	--	ND	--	ND	--	ND	ND	--	ND	--	ND

DATE	PARATHION IN BOTTOM MATERIAL (UG/KG)	TOTAL TOXAPHENE (UG/L)	TOXAPHENE IN BOTTOM MATERIAL (UG/KG)	TOTAL TRITHION (UG/L)	TRITHION IN BOTTOM MATERIAL (UG/KG)	TOTAL 2,4-D (UG/L)	2,4-D IN BOTTOM MATERIAL (UG/KG)	TOTAL 2,4,5-T (UG/L)	2,4,5-T IN BOTTOM MATERIAL (UG/KG)	TOTAL SILVEX (UG/L)	SILVEX IN BOTTOM MATERIAL (UG/KG)
NOV 05...	ND	ND	ND	ND	ND	--	--	--	--	--	--

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

PERIPHYTON

DATE	LENGTH OF EXPOSURE (DAYS)	PERIPHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERIPHYTON BIOMASS ASH WEIGHT G/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL A MG/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL B MG/SQ M	BIOMASS CHLOROPHYLL RATIO PERIPHYTON (UNITS)
NOV 05...	28	2.20	.400	3.50	.500	530
FEB 10...	34	.500	.400	.100	.000	1400
MAY 12...	35	55.1	37.7	59.6	.000	290
AUG 04...	21	13.4	10.3	21.2	5.59	150

ND--NOT DETECTED

OCT. 8, 1975
1300 HOURS

IDENTIFICATION OF PHYTOPLANKTON

4,600 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....SCENEDESMUS		360	8
	..VOLVOCALES			
	...VOLVOCACEAE			
L	....PANDORINA			0
		TOTALS	360	8
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		810	18
D	....MELOSIRA		2,400	53
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....COCCONEIS		90	2
	...CYMBELLACEAE			
	....CYMBELLA		180	4
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		90	2
	...NAVICULACEAE	NAVICULOID		
L	....NAVICULA			0
	...NITZSCHIACEAE			
	....NITZSCHIA		180	4
		TOTALS	3,800	83
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS		360	8
		TOTALS	360	8
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		90	2
		TOTALS	90	2

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

NOV. 5, 1975
1300 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,200 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
L	....ANKISTRODESMUS			0
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		870	39
	....MELOSIRA		240	11
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		140	6
	....COCCONEIS		140	6
	...CYMBELLACEAE			
	....CYMBELLA		69	3
	...FRAGILARIACEAE			
	....SYNEDRA		35	2
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		100	5
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		240	11
	...NITZSCHIACEAE			
	....NITZSCHIA		69	3
		TOTALS	1,900	86
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....DINOBRYON		35	2
	....OCHROMONAS		280	12
		TOTALS	310	14

DEC. 10, 1975
1230 HOURS

IDENTIFICATION OF PHYTOPLANKTON

180 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		30	17
L	....MELOSIRA			0
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....COCCONEIS		15	8
	...CYMBELLACEAE			
	....CYMBELLA		15	8
	...DIATOMACEAE			
L	....DIATOMA			0
	...EUNOTIACEAE			
D	....EUNOTIA		30	17
	...FRAGILARIACEAE			
D	....FRAGILARIA		30	17
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		15	8
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		37	21
L	....NEIDIUM			0
	...NITZSCHIACEAE			
	....NITZSCHIA		7	4
		TOTALS	180	100

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JAN. 7, 1976
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

9 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....COCCONEIS			0
	...GOMPHONEMATACEAE			
D	....GOMPHONEMA		5	50
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		5	50
	...NITZSCHIACEAE			
L	....NITZSCHIA			0
		TOTALS	9	100

FEB. 10, 1976
1200 HOURS

IDENTIFICATION OF PHYTOPLANKTON

76 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		6	8
		TOTALS	6	8
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		6	8
	....COCCONEIS		6	8
	...CYMBELLACEAE			
	....CYMBELLA		6	8
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
	....FRAGILARIA		6	8
	...GOMPHONEMATACEAE			
D	....GOMPHONEMA		12	15
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		23	31
	...NITZSCHIACEAE			
D	....NITZSCHIA		12	15
		TOTALS	70	93

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAR. 10, 1976
1200 HOURS

IDENTIFICATION OF PHYTOPLANKTON

220 CELLS/ML

	ORGANISM NAME	COMMON NAME	CELLS/ML	PER CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
D	....ACHNANTHES		40	18
	....COCCONEIS		10	5
	...CYMBELLACEAE			
	....AMPHORA		10	5
	....CYMBELLA		10	5
	...DIATOMACEAE			
	....DIATOMA		30	14
	...GOMPHONEMATACEAE			
D	....GOMPHONEMA		89	41
	...MERIDIONACEAE			
L	....MERIDION			0
	...NAVICULACEAE	NAVICULOID		
L	....GYROSIGMA			0
L	....NAVICULA			0
	...NITZSCHIACEAE			
	....NITZSCHIA		20	9
	...SURIRELLACEAE			
	....SURIRELLA		10	5
		TOTALS	220	102

APR. 7, 1976
1200 HOURS

IDENTIFICATION OF PHYTOPLANKTON

620 CELLS/ML

	ORGANISM NAME	COMMON NAME	CELLS/ML	PER CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		69	11
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		69	11
	....COCCONEIS		23	4
	...CYMBELLACEAE			
	....CYMBELLA		23	4
	...DIATOMACEAE			
	....DIATOMA		23	4
	...GOMPHONEMATACEAE			
D	....GOMPHONEMA		190	30
	...MERIDIONACEAE			
L	....MERIDION			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		69	11
	...NITZSCHIACEAE			
D	....NITZSCHIA		160	26
		TOTALS	620	101
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
L	....OCHROMONAS			0

04126520 MANISTEE RIVER AT MANISTEE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAY 12, 1976
1230 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,400 CELLS/ML

	ORGANISM NAME	COMMON NAME		CELLS/ML	PER CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...MICRACTINIACEAE				
D	....MICRACTINIUM			240	17
	...OOCYSTACEAE				
	....ANKISTRODESMUS			61	4
	....DICTYOSPHAERIUM			140	10
	....KIRCHNERIELLA			100	7
	....TETRAEDRON			20	1
	...SCENEDESMACEAE				
	....SCENEDESMUS			81	6
	..VOLVOCALES				
	...CHLAMYDOMONADACEAE				
	....CHLAMYDOMONAS			20	1
			TOTALS	670	46
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
D	....CYCLOTELLA			260	19
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....COCCONEIS			40	3
	...CYMBELLACEAE				
L	....CYMBELLA				0
	...DIATOMACEAE				
	....DIATOMA			40	3
	...FRAGILARIACEAE				
L	....ASTERIONELLA				0
L	....FRAGILARIA				0
	....SYNEDRA			81	6
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			100	7
	....STAURONEIS			20	1
	...NITZSCHIACEAE				
	....NITZSCHIA			200	14
			TOTALS	750	53

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JUNE 10, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

4,000 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		120	3
	....KIRCHNERIELLA		60	1
	...SCENEDESMACEAE			
	....SCENEDESMUS		60	1
		TOTALS	240	5
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		60	1
D	....MELOSIRA		1,600	39
	...RHIZOSOLENIACEAE			
L	....RHIZOSOLENIA			0
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		90	2
	...CYMBELLACEAE			
	....CYMBELLA		60	1
	...DIATOMACEAE			
	....DIATOMA		30	1
	...FRAGILARIACEAE			
	....FRAGILARIA		390	10
	....SYNEDRA		30	1
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		60	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		210	5
	...NITZSCHIACEAE			
	....NITZSCHIA		300	7
	...SURIRELLACEAE			
	....SURIRELLA		30	1
	...TABELLARIACEAE			
L	....TABELLARIA			0
		TOTALS	2,800	69
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....DINOBRYON		480	12
	....OCHROMONAS		30	1
		TOTALS	510	13
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS		480	12
		TOTALS	480	12

JULY 14, 1976
1145 HOURS

IDENTIFICATION OF PHYTOPLANKTON

3,800 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...CHARACIACEAE				
L	....SCHROEDERIA				0
	...MICRACTINIACEAE				
L	....MICRACTINIUM				0
	...OOCYSTACEAE				
	....ANKISTRODESMUS			77	2
	....KIRCHNERIELLA			61	2
L	....OOCYSTIS				0
	...SCENEDESMACEAE				
	....SCENEDESMUS			120	3
	..VOLVOCALES				
	...CHLAMYDOMONADACEAE				
L	....CHLAMYDOMONAS				0
	...VOLVOCACEAE				
	....EUDORINA			250	6
			TOTALS	540	13
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			170	4
	....MELOSIRA			450	12
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			92	2
	....COCCONEIS			61	2
	...CYMBELLACEAE				
	....CYMBELLA			31	1
	...FRAGILARIACEAE				
L	....SYNEDRA				0
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			31	1
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			140	4
	....PINNULARIA			31	1
	...NITZSCHIACEAE				
	....NITZSCHIA			150	4
			TOTALS	1,200	31
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...MALLOMONADACEAE				
L	....MALLOMONAS				0
	...OCHROMONADACEAE				
L	....DINOBRYON				0
	....OCHROMONAS			46	1
			TOTALS	77	1
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..CHROOCOCCALES	COCCOID			
	...CHROOCOCCACEAE				
	....ANACYSTIS			92	2
	..OSCILLATORIALES	FILAMENTOUS			
	...NOSTOCACEAE				
	....ANABAENA			320	9
D	....APHANIZOMENON			1,600	42
			TOTALS	2,000	53

04126520 MANISTEE RIVER AT MANISTEE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

AUG. 4, 1976
1230 HOURS

IDENTIFICATION OF PHYTOPLANKTON

4,200 CELLS/ML

	ORGANISM NAME	COMMON NAME	CELLS/ML	PER CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		270	6
	....SELENASTRUM		110	3
	...SCENEDESMACEAE			
	....SCENEDESMUS		210	5
		TOTALS	590	14
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		53	1
D	....MELOSIRA		1,600	38
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		160	4
	....COCCONEIS		53	1
	...CYMBELLACEAE			
	....CYMBELLA		53	1
	...FRAGILARIACEAE			
L	....FRAGILARIA			0
	....SYNEDRA		27	1
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		53	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		130	3
	...NITZSCHIACEAE			
	....NITZSCHIA		160	4
	...TABELLARIACEAE			
L	....TABELLARIA			0
		TOTALS	2,300	54
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....DINOBRYON		110	3
	....OCHROMONAS		53	1
		TOTALS	160	4
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
L	....ANACYSTIS			0
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
D	....APHANIZOMENON		1,000	24
	...OSCILLATORIACEAE			
	....OSCILLATORIA		53	1
		TOTALS	1,100	25
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOCHRYSIDACEAE			
	....CHROOMONAS		110	3
		TOTALS	110	3

04126520 MANISTEE RIVER AT MANISTEE, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

SEP. 9, 1976
1000 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,800 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...CHARACIACEAE			
	....SCHROEDERIA		26	1
	...OOCYSTACEAE			
	....ANKISTRODESMUS		100	4
	...SCENEDESMACEAE			
	....SCENEDESMUS		160	6
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		26	1
		TOTALS	310	12
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		78	3
	....MELOSIRA		160	6
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		26	1
	....COCCONEIS		26	1
	...CYMBELLACEAE			
L	....AMPHORA			0
	....CYMBELLA		26	1
	...FRAGILARIACEAE			
	....ASTERIONELLA		100	4
	....FRAGILARIA		26	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		160	6
	...NITZSCHIACEAE			
	....NITZSCHIA		78	3
		TOTALS	680	26
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
D	....APHANIZOMENON		1,300	45
		TOTALS	1,300	45
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOCHRYSIDACEAE			
	....CHROOMONAS		340	12
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		210	7
		TOTALS	550	19

NOTE: D - DOMINANT ORGANISM; GREATER OR EQUAL TO 15%
L - LESS THEN 1%; MAY NOT HAVE BEEN ACTUALLY COUNTED

04126520 MANISTEE RIVER AT MANISTEE, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	463	683	435	422	356	439	498	346	302	473	697	458
2	513	530	684	339	395	326	288	448	352	386	617	383
3	698	589	438	---	385	317	250	472	324	397	441	398
4	554	385	461	382	507	612	270	304	302	342	403	529
5	357	566	393	495	478	404	271	339	324	515	531	424
6	423	371	422	625	570	405	236	360	333	347	467	374
7	381	380	694	---	406	463	285	498	625	647	406	395
8	556	701	350	359	476	367	281	314	341	396	546	423
9	654	688	359	---	442	294	279	306	315	355	529	436
10	650	508	520	382	408	305	277	428	327	396	416	522
11	1280	368	554	570	414	340	289	555	391	349	385	385
12	654	413	378	866	681	557	342	353	351	439	443	376
13	534	452	384	578	366	435	313	415	332	423	351	402
14	401	414	404	437	395	349	247	372	411	432	560	421
15	546	407	373	464	585	340	246	437	329	364	394	443
16	565	378	493	554	418	530	258	328	362	359	382	460
17	728	436	396	484	413	409	312	386	363	386	403	838
18	851	379	500	754	405	384	275	525	370	356	372	389
19	452	379	445	419	448	332	374	350	358	383	600	489
20	584	366	398	391	342	362	296	313	351	415	448	434
21	487	464	485	582	353	370	344	354	404	386	358	376
22	520	429	537	420	368	409	308	343	343	372	412	385
23	493	445	390	504	527	284	312	430	347	394	406	449
24	606	749	331	475	401	283	557	345	486	378	368	376
25	670	852	324	471	492	328	348	334	379	375	464	440
26	523	435	349	435	368	294	297	503	388	678	446	377
27	510	425	435	399	340	293	317	327	398	400	441	422
28	893	565	345	569	487	279	332	428	350	379	404	545
29	444	374	372	415	342	248	349	333	387	372	439	404
30	561	438	331	752	---	275	305	507	397	354	423	472
31	599	---	347	473	---	282	---	332	---	435	452	---
MAX	1280	852	694	866	681	612	557	555	625	678	697	838
MIN	357	366	324	339	340	248	236	304	302	342	351	374

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
ONCE-DAILY

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

04127000 BOARDMAN RIVER NEAR MAYFIELD, MI

LOCATION.--Lat 44°38'18", long 85°31'10", in SE¼ NE¼ sec.21, T.26 N., R.10 W., Grand Traverse County, Hydrologic Unit 04060105, on right bank 25 ft (8 m) downstream from Brown's Bridge, 300 ft (91 m) downstream from East Creek, 0.9 mi (1.4 km) downstream from Brown's Bridge Dam, 1.0 mi (1.6 km) northeast of Mayfield, and 9.6 mi (15.4 km) southeast of Traverse City.

DRAINAGE AREA.--223 mi^2 (578 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1952 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 760 ft (230 m) by barometer.

REMARKS.--Water-discharge records good. Flow regulated by hydroelectric powerplant 0.9 mi (1.4 km) above station.

AVERAGE DISCHARGE.--24 years, 194 ft^3/s (5.494 m^3/s), 11.81 in/yr (300 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,220 ft^3/s (34.6 m^3/s) Sept. 14, 1961, gage height, 6.90 ft (2.103 m); minimum, 30 ft^3/s (0.85 m^3/s) Jan. 15, 1965, gage height, 2.53 ft (0.771 m); minimum daily, 47 ft^3/s (1.33 m^3/s) Nov. 2, 3, 1963.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 968 ft^3/s (27.4 m^3/s) Mar. 27, gage height, 6.37 ft (1.942 m); minimum, 86 ft^3/s (2.44 m^3/s) Jan. 11, gage height, 2.96 ft (0.902 m); minimum daily, 119 ft^3/s (3.37 m^3/s) Aug. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	214	195	229	202	179	231	595	268	353	218	176	155
2	244	197	218	201	178	233	575	271	343	214	174	150
3	204	196	222	201	184	240	539	303	329	207	173	152
4	181	194	227	201	184	238	493	315	303	205	171	154
5	178	193	317	193	183	308	430	316	275	204	176	153
6	177	191	332	190	182	319	393	339	248	199	172	152
7	176	190	281	189	182	307	390	325	217	194	170	152
8	176	183	224	188	182	280	346	328	201	195	169	152
9	176	170	197	190	186	260	298	318	206	184	162	154
10	177	262	198	188	192	256	314	300	208	180	157	155
11	178	269	198	174	195	251	314	287	215	180	157	156
12	176	259	211	190	194	257	314	286	220	179	174	154
13	175	215	230	188	197	273	314	284	220	178	265	154
14	175	235	300	190	195	261	314	275	220	178	247	154
15	190	236	285	187	206	242	314	261	237	179	220	156
16	183	231	252	191	221	224	304	277	260	181	178	156
17	192	226	246	191	212	222	300	355	210	178	153	156
18	196	222	242	190	247	224	302	389	210	177	157	156
19	198	220	219	191	279	251	300	395	212	179	143	155
20	197	219	204	192	253	376	300	342	210	187	119	156
21	196	204	201	192	234	420	288	306	210	186	128	157
22	195	182	207	187	233	335	309	308	212	182	136	158
23	193	184	215	181	225	364	313	304	209	185	143	158
24	191	185	214	175	222	431	331	292	210	191	144	158
25	239	189	214	174	239	550	376	269	211	189	144	157
26	213	189	214	176	266	608	362	257	208	188	144	157
27	205	191	213	176	252	829	356	255	208	185	144	150
28	201	192	212	178	230	799	295	227	207	186	147	140
29	202	217	209	179	228	685	276	216	208	188	144	146
30	200	272	204	179	---	635	289	300	212	181	146	154
31	198	---	202	179	---	632	---	327	---	181	148	---
TOTAL	5996	6308	7137	5803	6160	11541	10644	9295	6992	5838	5081	4617
MEAN	193	210	230	187	212	372	355	300	233	188	164	154
MAX	244	272	332	202	279	829	595	395	353	218	265	158
MIN	175	170	197	174	178	222	276	216	201	177	119	140
CFSM	.87	.94	1.03	.84	.95	1.67	1.59	1.35	1.04	.84	.74	.69
IN.	1.00	1.05	1.19	.97	1.03	1.93	1.78	1.55	1.17	.97	.85	.77

CAL YR 1975 TOTAL 76205 MEAN 209 MAX 592 MIN 117 CFSM .94 IN 12.71
WTR YR 1976 TOTAL 85412 MEAN 233 MAX 829 MIN 119 CFSM 1.04 IN 14.25

04127000 BOARDMAN RIVER NEAR MAYFIELD, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: June 1961 to current year.

INSTRUMENTATION.--Temperature recorder since June 1961.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 23°C July 2, 1963; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 19.5°C June 11-15, July 12; minimum, 1.5°C Dec. 19-28.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04127000 BOARDMAN RIVER NEAR MAYFIELD, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04127800 JORDAN RIVER NEAR EAST JORDAN, MI

LOCATION.--Lat 45°06'09", long 85°05'53", in NW¼ NW¼ sec.7, T.31 N., R.6 W., Antrim County, Hydrologic Unit 04060105, on right bank 600 ft (183 m) downstream from Webster Bridge, 4.2 mi (6.8 km) south of East Jordan and 4.5 mi (7.2 km) upstream from mouth.

DRAINAGE AREA.--67.6 mi^2 (175 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1960-65. October 1966 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 610 ft (186 m) from topographic map. Nov. 19, 1959, to Sept. 30, 1966, nonrecording gage at present site and at site 600 ft (183 m) upstream at same datum.

REMARKS.--Water-discharge records good except those for the winter period, which are fair. Some regulation during low flows from fish hatchery above station.

AVERAGE DISCHARGE.--10 years, 186 ft^3/s (5.268 m^3/s), 37.37 in/yr (949 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,360 ft^3/s (38.5 m^3/s) July 19, 1975, gage height, 6.51 ft (1.984 m); minimum, 109 ft^3/s (3.09 m^3/s) Mar. 1, 8, 1967, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 400 ft^3/s (11.3 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Mar. 20	2200	*685	19.4	*5.33	1.625	Apr. 22	0200	402	11.4	4.58	1.396
Mar. 25	0100	514	14.6	4.96	1.512	May 31	1600	450	12.7	4.77	1.454
Mar. 27	1500	680	19.3	5.32	1.622						

Minimum discharge, 124 ft^3/s (3.51 m^3/s) Feb. 2, gage height, 2.89 ft (0.881 m), result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	197	182	223	184	184	198	281	196	256	194	161	197
2	196	182	204	184	136	192	283	198	200	172	160	168
3	181	182	200	186	190	190	254	205	187	168	158	167
4	176	181	199	186	190	190	233	218	183	164	158	168
5	173	179	221	184	186	268	222	233	179	163	172	164
6	172	180	271	184	184	230	220	274	177	161	167	164
7	171	231	198	185	183	208	215	221	176	171	160	162
8	171	282	191	180	185	200	209	213	175	171	160	160
9	169	210	192	180	183	197	208	207	175	163	160	173
10	170	242	192	185	190	194	214	207	173	166	158	179
11	175	227	188	188	190	191	222	220	173	164	162	164
12	172	200	184	185	188	210	206	205	170	161	209	160
13	173	201	187	185	186	260	206	199	169	160	209	160
14	172	194	267	184	188	216	206	200	170	160	180	162
15	200	191	225	183	205	203	209	196	176	159	173	172
16	181	189	191	183	210	197	209	222	193	163	172	167
17	174	188	192	164	217	191	200	258	177	160	168	164
18	173	187	195	175	237	192	198	216	175	159	166	161
19	173	186	200	180	251	219	197	198	197	157	166	161
20	175	198	190	182	218	421	194	193	175	187	166	166
21	175	263	186	185	214	423	256	189	170	172	164	176
22	175	207	189	182	204	252	306	186	169	162	164	174
23	175	196	187	180	197	256	226	186	167	160	162	168
24	175	192	185	180	200	364	228	187	171	161	162	164
25	272	185	186	185	215	407	209	186	174	158	163	162
26	203	177	186	184	216	363	204	185	168	158	164	162
27	188	184	185	182	216	578	206	183	166	158	166	162
28	186	187	184	183	208	344	208	181	166	160	168	162
29	183	223	183	184	204	278	204	191	175	166	162	161
30	182	292	184	183	---	329	200	238	184	161	166	161
31	182	---	185	182	---	296	---	323	---	166	168	---
TOTAL	5640	6118	6150	5657	5775	8257	6633	6514	5366	5105	5194	4991
MEAN	182	204	198	182	199	266	221	210	179	165	168	166
MAX	272	292	271	188	251	578	306	323	256	194	209	197
MIN	169	177	183	164	136	190	194	181	166	157	158	160
CFSM	2.69	3.02	2.93	2.69	2.94	3.93	3.27	3.11	2.65	2.44	2.49	2.46
IN.	3.10	3.37	3.38	3.11	3.18	4.54	3.65	3.58	2.95	2.81	2.86	2.75

CAL YR 1975 TOTAL 70787 MEAN 194 MAX 825 MIN 152 CFSM 2.87 IN 38.95
WTR YR 1976 TOTAL 71400 MEAN 195 MAX 578 MIN 136 CFSM 2.88 IN 39.29

04127800 JORDAN RIVER NEAR EAST JORDAN, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1966 to current year.

INSTRUMENTATION.--Temperature recorder since October 1966.

REMARKS.--Interruptions in the record were due to malfunctions of the recorder.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 20.0°C July 11, 1976; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 20.0°C July 11; minimum recorded, 0.0°C Dec. 18-22.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04127800 JORDAN RIVER NEAR EAST JORDAN, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04127918 PINE RIVER NEAR RUDYARD, MI

LOCATION.--Lat 46°11'09", long 84°35'52", in NW¼ NE¼ sec.30, T.44 N., R.2 W., Chippewa County, Hydrologic Unit 04070002, on right bank 15 ft (5 m) upstream from county highway bridge, 3.2 mi (5.1 km) south of Rudyard.

DRAINAGE AREA.--184 mi^2 (477 km^2).

PERIOD OF RECORD.--April 1972 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 600 ft (183 m) from topographic map (nearest 10 ft). Prior to Aug. 4, 1972, non-recording gage at same site and datum.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, Dec. 19 to Feb. 10, which are fair. Several observations of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,190 ft^3/s (119 m^3/s) June 18, 1975, gage height, 17.62 ft (5.371 m); minimum, 57 ft^3/s (1.61 m^3/s) Aug. 25-28, 1976, gage height, 1.87 ft (0.570 m).

EXTREMES OUTSIDE PERIOD OF RECORD.--A discharge of 50.3 ft^3/s (1.42 m^3/s) was measured Aug. 6, 1963.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,200 ft^3/s (34.0 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Mar. 30	2200	ice jam		*16.81	5.124	Apr. 17	2200	1,370	38.8	7.50	2.286
Apr. 3	0200	*3,150	89.2	14.17	4.319						

Minimum discharge, 57 ft^3/s (1.61 m^3/s) Aug. 25-28, gage height, 1.87 ft (0.570 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	101	93	370	140	94	100	2100	218	120	118	77	66
2	96	91	330	135	92	100	2440	211	117	95	74	67
3	98	89	270	135	92	100	2920	204	104	84	73	66
4	96	86	250	135	90	105	2740	194	99	79	74	67
5	93	84	270	130	90	105	2400	191	94	75	76	69
6	90	83	300	130	90	105	2020	236	91	72	81	66
7	89	84	260	125	88	110	1890	231	89	74	76	64
8	88	139	240	125	88	110	1610	212	92	76	74	64
9	89	143	210	120	86	110	1380	197	87	76	72	63
10	90	216	190	120	86	115	1300	187	82	132	70	72
11	92	247	170	120	86	115	1120	184	83	137	68	69
12	92	242	150	115	86	115	881	175	83	105	71	63
13	91	255	140	115	86	115	860	164	79	89	74	59
14	93	226	480	115	86	110	900	218	90	86	74	61
15	93	201	540	110	88	110	1010	248	111	90	70	69
16	96	191	400	110	88	110	1100	266	107	83	66	69
17	96	176	330	110	90	110	1180	335	98	77	65	64
18	94	165	280	105	90	110	1230	304	90	75	64	62
19	92	185	230	105	92	150	964	243	85	73	64	59
20	92	189	215	105	94	180	682	211	82	81	65	58
21	92	355	200	100	96	200	748	188	80	98	64	60
22	92	298	190	100	98	210	1010	171	78	83	64	63
23	93	224	180	100	98	220	824	158	77	83	62	73
24	106	192	170	100	98	280	568	148	76	80	61	72
25	121	170	160	100	100	350	412	141	76	75	59	68
26	134	150	155	98	100	500	331	135	76	74	57	66
27	117	140	145	96	100	800	276	132	77	72	57	66
28	110	130	145	96	100	740	251	127	79	70	62	65
29	106	150	140	94	100	1000	236	118	94	72	67	65
30	100	420	140	94	---	1500	227	115	130	72	63	65
31	94	---	140	94	---	1900	---	116	---	75	62	---
TOTAL	3026	5414	7390	3477	2672	9985	35610	5978	2726	2631	2106	1960
MEAN	97.6	180	238	112	92.1	322	1187	193	90.9	84.9	67.9	65.3
MAX	134	420	540	140	100	1900	2920	335	130	137	81	73
MIN	88	83	140	94	86	100	227	115	76	70	57	58
CFSM	.53	.98	1.29	.61	.50	1.75	6.45	1.05	.49	.46	.37	.35
IN.	.61	1.09	1.49	.70	.54	2.02	7.20	1.21	.55	.53	.43	.40

CAL YR 1975 TOTAL 92983 MEAN 255 MAX 3240 MIN 64 CFSM 1.39 IN 18.80
WTR YR 1976 TOTAL 82975 MEAN 227 MAX 2920 MIN 57 CFSM 1.23 IN 16.78

04128000 STURGEON RIVER NEAR WOLVERINE, MI

LOCATION.--Lat 45°17'56", long 84°36'40", in SE¼ NE¼ sec.36, T.34 N., R.3 W., Cheboygan County, Hydrologic Unit 04070004, on left bank 1.8 mi (2.9 km) north of Wolverine, 2.8 mi (4.5 km) downstream from West Branch, and 9 mi (14 km) upstream from mouth.

DRAINAGE AREA.--170 mi^2 (440 km^2), approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1942 to current year.

REVISED RECORDS.--WSP 1307: 1944(M), 1948(M). WSP 1727: 1951(M).

GAGE.--Water-stage recorder. Altitude of gage is 740 ft (226 m), from topographic map. Prior to June 15, 1942, nonrecording gage at site 1.0 mi (1.6 km) upstream, and June 16, 1942, to Sept. 30, 1958, at site 0.7 mi (1.1 km) upstream at different datums.

REMARKS.--Water-discharge records good except those for the winter period, which are fair. Prior to July 1975 intermittent regulation at low flows from ponds 2.4 mi (3.9 km) above station.

AVERAGE DISCHARGE.--34 years, 217 ft^3/s (6.145 m^3/s), 17.33 in/yr (440 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,290 ft^3/s (36.5 m^3/s) Sept. 29, 1972, gage height, 3.72 ft (1.134 m); minimum, 94 ft^3/s (2.66 m^3/s) Jan. 19, 1971, result of freezeup; minimum daily, 113 ft^3/s (3.20 m^3/s) Aug. 6, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 815 ft^3/s (23.1 m^3/s) Mar. 27, gage height, 3.11 ft (0.948 m); minimum, 132 ft^3/s (3.74 m^3/s) Feb. 2, result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	248	218	280	214	200	224	555	265	595	293	183	211
2	237	218	260	214	167	220	515	279	372	237	178	194
3	224	218	250	218	225	218	480	348	272	218	176	189
4	218	218	240	218	230	218	412	293	248	211	173	189
5	218	211	270	218	230	276	368	296	240	205	181	186
6	211	211	310	218	230	276	368	360	237	199	186	183
7	211	230	260	218	225	248	352	296	230	199	181	181
8	211	340	250	218	220	235	328	268	224	208	176	178
9	211	279	240	220	224	230	316	258	221	194	173	194
10	211	272	237	220	230	224	320	251	214	199	173	218
11	214	285	230	220	258	227	328	276	221	199	173	194
12	214	260	221	230	234	244	300	265	221	191	373	186
13	218	245	227	221	237	293	296	254	214	183	444	178
14	214	240	312	218	227	258	300	254	221	237	279	183
15	240	240	324	220	230	244	324	248	214	218	237	194
16	265	238	254	218	296	237	336	282	240	205	214	194
17	230	236	240	210	262	227	304	425	221	196	202	189
18	221	234	244	215	248	224	290	398	211	191	199	186
19	218	232	250	220	248	237	279	300	276	189	196	186
20	221	250	245	225	237	390	265	268	234	218	191	191
21	218	320	240	225	237	500	300	251	218	221	189	199
22	214	270	230	220	234	372	380	248	214	199	186	202
23	214	240	225	220	214	340	316	248	208	194	183	199
24	214	235	230	215	251	461	282	248	205	191	178	194
25	300	230	230	220	240	580	268	244	208	186	178	191
26	282	225	228	220	248	550	265	237	199	186	183	189
27	240	230	220	225	244	745	262	237	199	186	194	194
28	230	240	214	230	230	708	262	234	199	181	183	194
29	224	260	211	230	227	545	254	234	214	186	178	191
30	218	350	211	221	---	580	254	293	244	181	178	191
31	218	---	214	220	---	635	---	474	---	183	183	---
TOTAL	7027	7475	7597	6819	6783	10966	9879	8832	7234	6284	6301	5748
MEAN	227	249	245	220	234	354	329	285	241	203	203	192
MAX	300	350	324	230	296	745	555	474	595	293	444	218
MIN	211	211	211	210	167	218	254	234	199	181	173	178
CFSM	1.34	1.46	1.44	1.29	1.38	2.08	1.94	1.68	1.42	1.19	1.19	1.13
IN.	1.54	1.64	1.66	1.49	1.48	2.40	2.16	1.93	1.58	1.38	1.38	1.26

CAL YR 1975 TOTAL 91705 MEAN 251 MAX 790 MIN 173 CFSM 1.48 IN 20.07
WTR YR 1976 TOTAL 90945 MEAN 248 MAX 745 MIN 167 CFSM 1.46 IN 19.90

04128000 STURGEON RIVER NEAR WOLVERINE, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1958 to current year.

INSTRUMENTATION.--Temperature recorder since October 1958.

REMARKS.--Interruptions in the record were due to malfunctions of the recorder.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 24.0°C June 30, 1964; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 20.5°C June 14, 15; minimum recorded, 0.0°C Jan. 29 to Feb. 4.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04128000 STURGEON RIVER NEAR WOLVERINE, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04128500 INDIAN RIVER AT INDIAN RIVER, MI

LOCATION.--Lat 45°24'38", long 84°37'12", in NE¼ SW¼ sec.24, T.35 N., R.3 W., Cheboygan County, Hydrologic Unit 04070004, on left bank in Indian River, 500 ft (152 m) downstream from Burt Lake, and 2.3 mi (3.7 km) upstream from Millett Lake.

DRAINAGE AREA.--583 mi^2 (1,510 km^2).

PERIOD OF RECORD.--April 1942 to current year.

REVISED RECORDS.--WSP 1437: 1942(M), 1945(M), 1947.

GAGE.--Water-stage recorder. Datum of gage is 590.21 ft (179.896 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to Nov. 12, 1942, nonrecording gage at site 100 ft (30 m) downstream. Auxiliary water-stage recorder 14.3 mi (23.0 km) downstream from base gage, near Cheboygan, datum of gage is 591.21 ft (180.201 m) above mean sea level.

REMARKS.--Records fair. Flow regulated by dam at Cheboygan. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--34 years, 568 ft^3/s (16.09 m^3/s), 13.23 in/yr (336 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 1,220 ft^3/s (34.6 m^3/s) May 7, 1972; maximum daily gage height, 5.58 ft (1.701 m) May 13, 14, 1960; minimum daily discharge, 212 ft^3/s (6.00 m^3/s) Sept. 2, 1970; minimum daily gage height, 3.34 ft (1.018 m) Oct. 21, 1957.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1,170 ft^3/s (33.1 m^3/s) Apr. 25; minimum daily discharge, 324 ft^3/s (9.18 m^3/s) Sept. 3; minimum daily gage height, 3.70 ft (1.128 m) Feb. 7, 9, 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	650	571	649	660	612	634	954	1050	731	614	459	407
2	636	582	667	660	621	645	977	1050	741	587	445	387
3	612	588	673	660	605	645	978	1030	750	576	448	324
4	637	589	650	660	615	645	983	984	759	572	443	382
5	621	596	650	660	604	664	1000	984	763	561	452	380
6	661	597	688	674	595	659	996	990	753	552	450	360
7	645	607	654	679	585	665	1010	938	746	552	442	359
8	647	615	654	685	591	659	1060	905	753	554	437	351
9	648	626	679	685	581	653	1080	882	751	545	429	363
10	636	603	673	678	576	653	1100	860	735	540	416	347
11	643	629	668	678	583	668	1110	869	746	545	411	380
12	640	614	681	672	588	691	1120	819	754	550	432	365
13	647	664	670	671	592	692	1130	817	754	550	442	360
14	647	631	668	671	582	700	1130	810	762	537	446	360
15	637	616	691	666	594	695	1130	800	750	525	437	375
16	645	628	668	660	599	690	1130	785	774	524	423	365
17	629	623	685	660	595	680	1130	835	766	506	406	358
18	624	624	698	655	605	670	1130	835	727	493	391	358
19	609	624	680	650	615	665	1130	825	746	488	390	368
20	581	635	680	645	615	680	1130	810	729	476	385	375
21	576	645	685	640	625	695	1130	800	717	497	385	375
22	577	634	690	640	630	700	1130	790	684	477	382	380
23	572	623	690	640	625	715	1130	775	665	472	380	375
24	562	640	685	640	625	726	1150	760	647	483	380	385
25	555	636	680	638	630	755	1170	750	629	469	378	370
26	567	614	675	638	634	748	1150	735	618	458	379	358
27	567	632	675	628	645	827	1130	714	614	469	366	355
28	583	616	670	622	629	859	1100	675	593	470	395	362
29	594	605	665	617	629	871	1080	662	593	456	410	370
30	580	559	665	617	---	889	1060	653	620	450	393	365
31	564	---	660	612	---	915	---	697	---	462	402	---
TOTAL	18992	18466	20866	20261	17625	22053	32638	25889	21370	16010	12834	11019
MEAN	613	616	673	654	608	711	1088	835	712	516	414	367
MAX	661	664	698	685	645	915	1170	1050	774	614	459	407
MIN	555	559	649	612	576	634	954	653	593	450	366	324
CFSM	1.05	1.06	1.15	1.12	1.04	1.22	1.87	1.43	1.22	.89	.71	.63
IN.	1.21	1.18	1.33	1.29	1.12	1.41	2.08	1.65	1.36	1.02	.82	.70

CAL YR 1975 TOTAL 248434 MEAN 681 MAX 1090 MIN 432 CFSM 1.17 IN 15.85
WTR YR 1976 TOTAL 238023 MEAN 650 MAX 1170 MIN 324 CFSM 1.11 IN 15.19

04129000 PIGEON RIVER NEAR VANDERBILT, MI

LOCATION.--Lat 45°10'15", long 84°26'18", in SE¼ SW¼ sec.9, T.32 N., R.1 W., Otsego County, Hydrologic Unit 04070004, on right bank at Pigeon River Headquarters, 11.1 mi (17.9 km) east of Vanderbilt, and 26 mi (41.8 km) upstream from Mullett Lake.

DRAINAGE AREA.--63 mi^2 (160 km^2), approximately.

PERIOD OF RECORD.--September 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 886.24 ft (270.126 m) above mean sea level.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, Dec. 15 to Jan. 28, which are poor. Prior to May 16, 1957, and since Apr. 22, 1958, occasional regulation by Lansing Club Dam 3.5 mi (5.6 km) above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--26 years, 77.9 ft^3/s (2.206 m^3/s), 16.79 in/yr (426 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,500 ft^3/s (42.5 m^3/s) May 15, 1957, gage height, 6.80 ft (2.073 m), from floodmark, from rating curve extended above 500 ft^3/s (14.2 m^3/s), result of failure of Lansing Club Dam; minimum, 13 ft^3/s (0.37 m^3/s) Jan. 8, 1957.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 442 ft^3/s (12.5 m^3/s) May 31, gage height, 5.06 ft (1.542 m); minimum, 29 ft^3/s (0.82 m^3/s) Oct. 4, gage height, 1.68 ft (0.512 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	91	78	149	76	78	88	202	95	274	167	63	73
2	88	74	104	75	73	76	178	96	126	99	63	72
3	90	73	98	74	77	81	166	121	102	85	60	66
4	69	72	85	75	79	96	142	125	85	80	62	65
5	81	71	91	76	80	128	135	101	86	69	66	66
6	76	72	115	75	80	112	137	143	82	72	68	63
7	69	77	94	75	80	100	131	117	74	68	63	58
8	75	134	82	75	80	94	119	104	81	81	64	58
9	75	100	83	76	81	88	114	92	71	67	63	64
10	79	95	79	76	83	83	124	90	79	75	57	81
11	77	104	83	77	89	80	126	113	72	69	63	65
12	77	90	72	78	95	79	113	93	75	65	88	67
13	73	86	78	79	83	112	117	95	78	68	99	62
14	75	79	123	79	81	85	109	93	69	77	79	62
15	139	83	120	78	81	88	136	84	75	76	74	61
16	138	79	96	77	105	86	139	97	87	71	71	65
17	103	79	86	75	92	84	120	258	82	69	65	63
18	86	78	80	74	87	80	115	210	84	65	68	63
19	86	76	88	76	87	91	107	124	93	62	63	62
20	82	75	85	77	83	147	93	105	86	78	63	61
21	84	104	83	77	84	211	109	91	77	72	64	65
22	76	87	81	76	84	156	140	86	70	70	63	65
23	79	86	79	75	85	120	114	84	73	71	60	67
24	74	78	80	76	83	152	103	86	63	69	58	64
25	112	84	80	78	94	215	97	89	73	62	64	63
26	99	75	80	79	83	201	93	81	62	65	64	64
27	93	67	76	80	94	311	92	83	71	72	68	66
28	75	83	74	82	85	300	92	82	65	60	64	66
29	74	88	73	81	83	189	92	76	84	67	61	65
30	79	174	74	80	---	207	84	112	112	69	64	62
31	65	---	75	79	---	261	---	255	---	57	62	---
TOTAL	2639	2601	2746	2386	2449	4201	3639	3481	2611	2297	2054	1944
MEAN	85.1	86.7	88.6	77.0	84.4	136	121	112	87.0	74.1	66.3	64.8
MAX	139	174	149	82	105	311	202	258	274	167	99	81
MIN	65	67	72	74	73	76	84	76	62	57	57	58
CFSM	1.35	1.38	1.41	1.22	1.34	2.16	1.92	1.78	1.38	1.18	1.05	1.03
IN.	1.56	1.54	1.62	1.41	1.45	2.48	2.15	2.06	1.54	1.36	1.21	1.15

CAL YR 1975 TOTAL 32508 MEAN 89.1 MAX 306 MIN 53 CFSM 1.41 IN 19.19
WTR YR 1976 TOTAL 33048 MEAN 90.3 MAX 311 MIN 57 CFSM 1.43 IN 19.51

04129500 PIGEON RIVER AT AFTON, MI

LOCATION.--Lat 45°22'26", long 84°30'54", in NW¼ NE¼ sec.2, T.34 N., R.2 W., Cheboygan County, Hydrologic Unit 04070004, on downstream side of bridge on State Highway 68, 0.9 mi (1.4 km) west of Afton, 2.2 mi (3.5 km) downstream from Wilkes Creek, and 7 mi (11 km) upstream from Mullett Lake.

DRAINAGE AREA.--159 mi^2 (412 km^2).

PERIOD OF RECORD.--April 1942 to current year.

REVISED RECORDS.--WSP 1437: 1945-46, 1950.

GAGE.--Nonrecording gage. Altitude of gage 675 ft (206 m), by barometer. Prior to Oct. 1, 1961, at various sites upstream at present datum.

REMARKS.--Records poor. Prior to May 16, 1957, and since Apr. 22, 1958, occasional regulation by Lansing Club Dam 22 mi (35 km) above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--34 years, 141 ft^3/s (3.993 m^3/s), 12.04 in/yr (306 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,170 ft^3/s (33.1 m^3/s) Apr. 17, 1960, gage height, 6.80 ft (2.073 m), from high-water mark; maximum gage height, about 10.5 ft (3.20 m) Mar. 31, 1943, from floodmarks (backwater from ice); minimum discharge, 49 ft^3/s (1.39 m^3/s) Aug. 8, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 835 ft^3/s (23.6 m^3/s) probably on Mar. 27; minimum daily, 87 ft^3/s (2.46 m^3/s) Sept. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	137	126	276	135	138	140	615	172	570	196	103	101
2	146	129	259	135	138	101	513	181	513	216	101	101
3	142	129	194	134	140	135	477	214	316	177	103	101
4	129	129	160	132	140	179	410	248	238	149	97	101
5	122	126	180	130	140	189	340	240	196	118	103	97
6	126	129	196	130	142	214	316	251	179	114	107	97
7	126	140	191	130	144	212	300	270	160	116	103	89
8	120	174	165	130	145	190	288	240	149	114	97	87
9	122	214	150	130	145	180	265	208	153	118	97	91
10	120	196	142	130	148	170	246	194	146	116	99	114
11	122	181	140	132	160	164	251	196	156	114	95	114
12	122	174	151	134	180	160	248	206	144	105	102	95
13	133	162	144	134	170	190	235	194	144	93	140	95
14	126	156	189	132	165	200	230	196	142	131	165	93
15	131	144	211	130	170	180	243	191	129	186	150	95
16	177	143	175	130	185	170	265	196	149	156	130	93
17	184	142	150	128	195	170	262	265	149	129	118	95
18	158	140	152	125	190	170	243	394	142	116	103	95
19	137	137	155	125	185	200	219	333	160	105	105	91
20	130	137	150	125	175	300	201	254	181	114	95	89
21	128	151	150	128	170	450	208	208	153	129	89	99
22	126	174	148	130	170	580	246	194	140	116	93	103
23	125	150	145	130	165	460	256	179	124	116	100	99
24	124	140	142	130	165	320	246	169	126	114	100	101
25	170	130	140	130	170	400	216	166	124	112	96	101
26	167	124	140	132	180	450	184	164	122	103	93	99
27	160	129	138	135	180	720	179	162	109	103	95	97
28	151	137	136	138	175	710	179	167	107	114	91	99
29	140	151	135	138	160	540	174	162	114	97	89	99
30	135	221	134	138	---	470	174	179	149	103	89	97
31	137	---	132	138	---	656	---	366	---	112	93	---
TOTAL	4273	4515	5070	4078	4730	9370	8229	6759	5384	3902	3241	2928
MEAN	138	151	164	132	163	302	274	218	179	126	105	97.6
MAX	184	221	276	138	195	720	615	394	570	216	165	114
MIN	120	124	132	125	138	101	174	162	107	93	89	87
CFSM	.87	.95	1.03	.83	1.03	1.90	1.72	1.37	1.13	.79	.66	.61
IN.	1.00	1.06	1.19	.95	1.11	2.19	1.93	1.58	1.26	.91	.76	.69

CAL YR 1975 TOTAL 62552 MEAN 171 MAX 908 MIN 89 CFSM 1.08 IN 14.63
WTR YR 1976 TOTAL 62479 MEAN 171 MAX 720 MIN 87 CFSM 1.08 IN 14.62

04130000 CHEBOYGAN RIVER NEAR CHEBOYGAN, MI

LOCATION.--Lat 45°34'38", long 84°29'15", in SW¼ sec.19, T.37 N., R.1 W., Cheboygan County, Hydrologic Unit 04070004, on right bank 300 ft (91 m) downstream from Mullett Lake, 2.4 mi (3.9 km) upstream from Black River, and 4.8 mi (7.7 km) south of Cheboygan.

DRAINAGE AREA.--865 mi^2 (2,240 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1942 to current year. Monthly discharge only for October 1942, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 591.21 ft (180.201 m) above mean sea level. Auxiliary water-stage recorder 5.1 mi (8.2 km) downstream from base gage, in Cheboygan, datum of gage is 590.00 ft (179.832 m) above mean sea level. Prior to Aug. 30, 1967, nonrecording auxiliary gage in Cheboygan, 5.2 mi (8.4 km) downstream at present datum.

REMARKS.--Water-discharge record fair. Flow regulated by dam in Cheboygan; prior to Dec. 31, 1965, flow affected by variable backwater from powerplant in Cheboygan 5.2 mi (8.4 km) below station and by Alverno powerplant.

AVERAGE DISCHARGE.--34 years, 816 ft^3/s (23.11 m^3/s), 12.81 in/yr (325 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 1,640 ft^3/s (46.4 m^3/s) May 8, 1959; maximum daily gage height, 3.27 ft (0.997 m) May 13, 14, 1960; minimum daily discharge, 90 ft^3/s (2.55 m^3/s) Mar. 29, 30, 1958; minimum daily gage height, 1.05 ft (0.320 m) Apr. 13, 14, 15, 1975.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1,630 ft^3/s (46.2 m^3/s) Apr. 26; maximum daily gage height, 2.89 ft (0.881 m) Apr. 7, 8; minimum daily discharge, 483 ft^3/s (13.7 m^3/s) Aug. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	726	865	981	945	820	1090	1390	1400	910	772	644	552
2	741	878	999	940	800	1130	1370	1370	1160	744	651	526
3	758	869	1020	935	820	1090	1360	1250	1320	753	676	510
4	849	881	999	930	825	1070	1380	1240	1340	730	675	556
5	845	915	981	920	830	1030	1370	1190	1330	718	687	558
6	847	924	972	915	830	1030	1380	1090	1340	707	662	534
7	860	924	924	920	830	1030	1410	834	1320	707	557	531
8	869	916	971	910	830	1040	1420	792	1320	707	570	501
9	869	920	1090	905	835	1020	1420	829	1330	710	536	543
10	873	882	1040	905	840	1080	1450	834	1340	705	499	568
11	882	851	986	905	860	1280	1480	903	1340	700	510	550
12	882	873	1100	900	870	1300	1480	903	1340	705	498	530
13	878	959	1030	900	880	1320	1490	915	1340	700	504	502
14	882	942	994	895	900	1330	1510	980	1360	673	511	520
15	873	911	1020	895	910	1340	1520	1020	1370	626	510	540
16	855	928	1010	890	920	1320	1530	1030	1390	644	493	530
17	791	923	1030	885	961	1280	1530	1020	1290	648	483	520
18	804	936	1100	880	1040	1250	1550	1070	1100	641	495	525
19	783	927	1040	875	1020	1300	1570	1090	1080	630	540	515
20	763	935	1020	870	1080	1320	1580	1070	1050	616	580	520
21	763	932	995	870	1090	1350	1580	1100	932	615	530	525
22	775	927	985	870	1090	1400	1590	1120	721	573	540	535
23	784	923	985	870	1080	1250	1590	1130	722	588	540	526
24	760	944	1000	865	1080	1120	1620	1150	731	590	520	535
25	732	934	1010	860	1080	1410	1620	1140	732	573	560	510
26	738	881	1000	860	1080	1610	1630	1050	727	570	585	495
27	746	1030	985	855	1100	1530	1570	905	727	587	574	490
28	762	1030	975	850	1090	1500	1430	729	727	605	588	494
29	786	1030	960	850	1080	1470	1430	745	743	608	632	495
30	777	963	955	845	---	1410	1410	752	767	605	647	500
31	778	---	950	835	---	1400	---	736	---	640	644	---
TOTAL	25031	27753	31107	27550	27471	39100	44660	31387	32899	20390	17641	15736
MEAN	807	925	1003	889	947	1261	1489	1012	1097	658	569	525
MAX	882	1030	1100	945	1100	1610	1630	1400	1390	772	687	568
MIN	726	851	924	835	800	1020	1360	729	721	570	483	490
CFSM	.93	1.07	1.16	1.03	1.09	1.46	1.72	1.17	1.27	.76	.66	.61
IN.	1.08	1.19	1.34	1.18	1.18	1.68	1.92	1.35	1.41	.88	.76	.68

CAL YR 1975 TOTAL 341376 MEAN 935 MAX 1330 MIN 554 CFSM 1.08 IN 14.68
WTR YR 1976 TOTAL 340725 MEAN 931 MAX 1630 MIN 483 CFSM 1.08 IN 14.65

04130500 BLACK RIVER NEAR TOWER, MI

LOCATION.--Lat 45°23'33", long 84°20'00", in SE¼ NE¼ sec.29, T.35 N., R.1 E., Cheboygan County, Hydrologic Unit 04070005, on right bank 400 ft (122 m) downstream from Kleber Dam, 1,000 ft (305 m) upstream from Milligan Creek, 3.0 mi (4.8 km) northwest of Tower, and 10.8 mi (17.4 km) upstream from Black Lake.

DRAINAGE AREA.--313 mi^2 (811 km^2).

PERIOD OF RECORD.--October 1942 to current year. Monthly discharge only for October 1942, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 658.00 ft (200.558 m) above mean sea level (Stanley Engineering Co. bench mark). Prior to Aug. 1, 1949, at site 1 mi (1.6 km) upstream at different datum.

REMARKS.--Records good. Flow regulated by hydroelectric powerplant 400 ft (122 m) above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--34 years, 269 ft^3/s (7.618 m^3/s), 11.67 in/yr (296 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,340 ft^3/s (66.3 m^3/s) Apr. 17, 1960, gage height, 7.13 ft (2.173 m); minimum, 0.60 ft^3/s (0.017 m^3/s) Mar. 11, 1950; minimum daily, 4.0 ft^3/s (0.11 m^3/s) Nov. 27, 1949.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,560 ft^3/s (44.2 m^3/s) Mar. 27, gage height, 5.82 ft (1.774 m); minimum, 26 ft^3/s (0.74 m^3/s) Apr. 30, gage height, 1.40 ft (0.427 m); minimum daily, 132 ft^3/s (3.74 m^3/s) Dec. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	251	245	422	200	230	422	1390	391	610	302	153	182
2	253	245	467	281	205	222	1340	360	1040	472	231	245
3	257	245	492	258	162	155	1260	439	1030	469	185	167
4	347	244	490	170	183	240	1090	499	804	286	197	175
5	215	245	292	194	233	250	936	452	648	327	189	198
6	226	245	494	230	233	400	785	454	511	208	194	210
7	253	243	263	230	233	350	752	501	483	207	136	200
8	194	245	364	228	233	310	725	501	407	236	142	180
9	253	387	494	169	235	320	631	500	356	284	169	190
10	278	390	202	197	235	450	585	495	348	243	153	195
11	215	327	265	271	236	350	598	351	265	222	184	200
12	271	328	251	275	257	360	608	413	420	222	208	190
13	272	373	280	228	267	290	521	411	324	220	238	188
14	273	246	472	202	285	270	496	346	298	220	272	200
15	240	238	421	228	298	340	496	326	299	388	261	210
16	304	293	422	200	251	300	498	467	367	393	240	180
17	273	264	315	225	238	320	513	417	258	222	240	200
18	410	292	173	225	408	270	545	485	410	166	157	200
19	289	285	155	224	380	300	515	660	234	218	170	205
20	272	293	132	225	235	370	498	739	407	303	178	200
21	260	301	210	225	343	470	498	722	285	223	181	205
22	253	421	238	225	411	680	498	528	304	223	186	210
23	250	282	339	228	240	765	309	338	295	225	181	160
24	246	284	383	228	238	970	494	360	253	227	213	170
25	299	360	354	199	238	1170	493	297	230	221	184	190
26	290	240	235	201	358	1050	324	334	269	200	178	190
27	355	240	173	228	422	1500	424	329	257	221	155	190
28	259	355	235	228	278	1350	282	315	229	178	213	198
29	254	264	287	230	355	1410	328	325	230	165	164	196
30	267	422	295	230	---	1430	310	288	292	201	160	196
31	245	---	285	230	---	1320	---	418	---	195	176	---
TOTAL	8324	8842	9900	6912	7920	18404	18742	13461	12163	7887	5888	5820
MEAN	269	295	319	223	273	594	625	434	405	254	190	194
MAX	410	422	494	281	422	1500	1390	739	1040	472	272	245
MIN	194	238	132	169	162	155	282	288	229	165	136	160
CFSM	.86	.94	1.02	.71	.87	1.90	2.00	1.39	1.29	.81	.61	.62
IN.	.99	1.05	1.18	.82	.94	2.19	2.23	1.60	1.45	.94	.70	.69

CAL YR 1975 TOTAL 120780 MEAN 331 MAX 1340 MIN 132 CFSM 1.06 IN 14.35
WTR YR 1976 TOTAL 124263 MEAN 340 MAX 1500 MIN 132 CFSM 1.09 IN 14.77

04131500 RAINY RIVER NEAR OCQUEOC, MI

LOCATION.--Lat 45°24'30", long 84°10'45", in NE¼ NW¼ sec.22, T.35 N., R.2 E., Presque Isle County, Hydrologic Unit 04070005, on upstream side of highway bridge, 4.4 mi (7.1 km) west of Ocqueoc, and 5 mi (8 km) upstream from Black Lake.

DRAINAGE AREA.--85 mi^2 (220 km^2), approximately.

PERIOD OF RECORD.--October 1952 to current year.

GAGE.--Nonrecording gage. Datum of gage is 674.85 ft (205.694 m) above mean sea level, unadjusted.

REMARKS.--Records good except those for the winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--24 years, 42.2 ft^3/s (1.195 m^3/s), 6.74 in/yr (171 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 946 ft^3/s (26.8 m^3/s) Apr. 18, 1960, gage height, 6.33 ft (1.929 m), from floodmark; minimum, 0.4 ft^3/s (0.011 m^3/s) Sept. 7, 1955.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 748 ft^3/s (21.2 m^3/s) Mar. 27, gage height, 5.96 ft (1.817 m); minimum, 0.96 ft^3/s (0.027 m^3/s) Aug. 11; minimum gage height, 1.35 ft (0.411 m) Aug. 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	16	100	14	12	29	660	55	45	19	2.9	1.9
2	27	17	90	14	12	29	550	56	42	18	2.6	1.9
3	26	16	80	14	12	30	468	70	37	17	1.9	1.7
4	23	16	72	14	12	32	388	70	32	14	1.5	2.1
5	22	15	62	13	12	33	322	65	28	12	1.3	2.1
6	20	15	56	13	12	33	270	74	22	9.1	1.7	1.7
7	18	20	50	13	12	35	232	76	20	8.6	1.9	1.3
8	17	32	46	13	13	36	208	73	17	7.9	1.9	1.3
9	16	33	40	13	13	36	172	66	15	7.5	1.5	1.7
10	15	36	35	13	14	35	151	62	13	7.2	1.3	4.3
11	15	37	31	13	15	35	140	66	13	7.2	1.2	2.4
12	15	35	29	13	16	33	127	64	12	6.2	3.7	1.9
13	18	34	27	13	18	33	114	61	11	4.8	9.1	1.7
14	18	33	26	13	20	33	111	59	11	7.9	8.2	1.5
15	29	33	25	13	21	34	112	56	9.9	6.5	6.5	1.5
16	29	33	24	12	23	35	113	50	9.9	7.2	5.1	1.7
17	26	33	23	12	25	36	108	83	10	13	4.3	1.7
18	24	32	22	12	27	37	103	94	9.9	12	3.7	1.3
19	23	31	21	12	28	41	94	90	13	11	3.2	1.2
20	22	33	20	12	28	45	85	86	11	13	2.9	1.5
21	21	56	20	12	29	54	89	82	9.9	14	2.4	1.9
22	19	64	20	12	29	76	99	80	8.6	12	2.1	1.7
23	18	58	19	12	29	150	98	78	7.5	12	1.7	1.7
24	18	55	19	12	29	210	87	73	6.8	9.5	1.3	1.9
25	24	54	18	12	29	455	79	64	5.5	6.5	1.3	1.5
26	23	53	17	12	29	550	73	58	5.5	5.5	1.3	1.5
27	21	49	17	12	29	715	66	52	6.2	5.5	1.9	2.1
28	19	42	16	12	29	727	63	46	5.1	6.2	1.7	1.9
29	18	48	16	12	29	648	56	43	5.5	5.8	1.3	1.9
30	17	93	15	12	---	622	56	43	11	4.8	1.3	1.7
31	17	---	15	12	---	635	---	47	---	4.0	1.3	---
TOTAL	646	1122	1071	391	606	5532	5294	2042	453.3	294.9	84.0	54.2
MEAN	20.8	37.4	34.5	12.6	20.9	178	176	65.9	15.1	9.51	2.71	1.81
MAX	29	93	100	14	29	727	660	94	45	19	9.1	4.3
MIN	15	15	15	12	12	29	56	43	5.1	4.0	1.2	1.2
CFSM	.24	.44	.41	.15	.25	2.09	2.07	.78	.18	.11	.03	.02
IN.	.28	.49	.47	.17	.27	2.42	2.32	.89	.20	.13	.04	.02

CAL YR 1975 TOTAL 18584.1 MEAN 50.9 MAX 622 MIN 5.5 CFSM .60 IN 8.13
WTR YR 1976 TOTAL 17590.4 MEAN 48.1 MAX 727 MIN 1.2 CFSM .57 IN 7.70

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI
(National stream-quality accounting network station)

LOCATION.--Lat 45°38'02", long 84°28'52", in NW¼ NE¼ sec.6, T.37 N., R.1 W., Cheboygan County, Hydrologic Unit 04070004, at upstream side of bridge on Lincoln Avenue in Cheboygan, 1.75 mi (2.82 km) upstream from mouth.

DRAINAGE AREA.--1,500 mi^2 (3,900 km^2), approximately.

PERIOD OF RECORD.--Water years 1975-76.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1974 to current year.
WATER TEMPERATURES: October 1974 to current year.

REMARKS.--Flow regulated by dam 1,000 ft (305 m) downstream.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (Water year 1976): Maximum daily, 424 micromhos Jan. 21, 1976; minimum daily, 255 micromhos July 11, 17, Aug. 9, 1976.
WATER TEMPERATURES (Water year 1976): Maximum daily, 25.5°C Aug. 26, 1976; minimum daily, 0.0°C Feb. 1, 2, 5, 8, 15, 27, 1976.

EXTREMES OUTSIDE PERIOD OF DAILY RECORD.--Specific conductance values of 900 micromhos and 140 micromhos were observed on Apr. 24, 25, 1975 and Mar. 8, 1975, respectively. A water temperature of 26.5°C was observed on July 5-7, 1975.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 424 micromhos Jan. 21; minimum daily, 255 micromhos July 11, 17, Aug. 9.
WATER TEMPERATURES: Maximum daily, 25.5°C Aug. 26; minimum daily, 0.0°C Feb. 1, 2, 5, 8, 15, 27.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT												
01...	1430	1180	278	8.3	14.5	10.0	100	79	18	21	160	0
30...	0950	1160	270	8.1	8.5	11.0	96	730	400	290	170	6
NOV												
12...	1000	1460	293	8.0	9.5	10.4	95	130	74	41	160	0
DEC												
11...	1045	2070	308	7.6	1.0	13.3	96	800	400	>200	170	0
JAN												
15...	1400	1270	323	8.2	.5	13.4	95	89	20	6	170	0
FEB												
11...	1315	1280	334	7.9	.5	13.6	96	310	110	190	170	0
MAR												
10...	1600	2050	319	7.9	.5	13.8	98	16	14	5	180	4
APR												
08...	1430	3700	233	8.2	3.5	13.0	100	36	22	28	150	11
MAY												
06...	1045	1650	273	8.3	7.5	11.4	97	191	156	50	160	14
JUN												
03...	0930	1930	290	8.2	17.0	9.7	100	240	14	16	160	4
29...	1430	850	271	8.1	22.0	8.3	97	936	160	37	150	0
AUG												
06...	1115	800	290	8.4	20.0	8.2	91	225	56	30	160	7
SEP												
03...	0915	320	282	8.4	18.5	8.5	92	2000	28	27	160	12

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT												
01...	44	12	3.1	.1	.8	204	0	167	1.6	9.7	3.2	.2
30...	47	13	3.3	.1	.9	200	0	164	2.5	12	3.7	.2
NOV												
12...	42	14	2.9	.1	.9	208	0	171	3.3	11	3.8	.1
DEC												
11...	45	13	3.0	.1	.7	210	0	172	8.4	11	6.9	.4
JAN												
15...	46	13	3.3	.1	.9	224	0	184	2.3	11	4.0	2.0
FEB												
11...	46	13	3.6	.1	.8	214	0	176	4.3	11	4.1	.2
MAR												
10...	47	14	3.4	.1	.8	214	0	176	4.3	12	4.0	.3
APR												
08...	40	11	2.2	.1	.9	170	0	139	1.7	11	3.6	.1
MAY												
06...	44	12	2.9	.1	.9	178	0	146	1.4	11	4.0	.2
JUN												
03...	44	12	2.7	.1	.7	190	0	156	1.9	11	3.1	.2
29...	39	13	2.8	.1	.8	188	0	154	2.4	7.3	3.2	.2
AUG												
06...	41	13	3.0	.1	.7	176	5	153	1.2	12	5.4	.1
SEP												
03...	39	14	2.9	.1	.7	162	9	148	1.1	12	4.2	.1

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT											
01...	7.6	183	181	583	.01	.26	1.2	.02	4	13	100
30...	7.9	173	187	542	.01	.30	1.3	.01	2	6.3	100
NOV											
12...	7.8	161	185	635	.05	.29	1.3	.06	5	20	100
DEC											
11...	7.7	198	191	1110	.06	.26	1.2	.01	6	34	100
JAN											
15...	7.9	184	198	631	.08	.28	1.2	.01	4	14	100
FEB											
11...	8.0	196	192	677	.09	.33	1.5	.00	2	6.9	100
MAR											
10...	8.4	184	195	1020	.09	.09	.40	.01	2	11	100
APR											
08...	6.6	172	159	1720	.12	.37	1.6	.01	5	50	100
MAY											
06...	6.9	178	170	793	.09	.37	1.6	.01	3	13	100
JUN											
03...	6.6	164	174	855	.07	.37	1.6	.01	7	36	100
29...	6.1	167	165	383	.01	.29	1.3	.03	6	14	100
AUG											
06...	6.1	171	173	369	.01	.31	1.4	.02	2	4.3	100
SEP											
03...	6.0	171	168	148	.01	.31	1.4	.02	3	2.6	100

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
OCT												
01...	1430	0	0	1	0	<10	0	0	0	6	2	120
JAN												
15...	1400	0	0	2	0	<10	0	0	0	12	2	110
APR												
08...	1430	0	0	0	0	10	0	2	2	10	0	90
JUN												
29...	1430	0	0	1	1	10	10	1	0	0	0	60

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT												
01...	20	24	0	30	0	.1	.0	0	0	50	0	11
JAN												
15...	0	17	4	0	0	.0	.0	0	0	20	0	5.4
APR												
08...	50	5	2	10	0	<.5	<.5	0	0	10	10	6.8
JUN												
29...	30	7	3	6	1	<.5	<.5	0	0	10	10	6.9

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	TOTAL ALDRIN (UG/L)	TOTAL CHLOR-DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTA-CHLOR (UG/L)	TOTAL HEPTA-CHLOR EPOXIDE (UG/L)
NOV 12...	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
JAN 15...	1400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY 06...	1045	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 06...	1115	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

DATE	TOTAL LINDANE (UG/L)	TOTAL MALA-THION (UG/L)	TOTAL METH-OXY-CHLOR (UG/L)	TOTAL METHYL PARA-THION (UG/L)	TOTAL METHYL TRI-THION (UG/L)	TOTAL PARA-THION (UG/L)	TOTAL TOX-APHENE (UG/L)	TOTAL TRI-THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 12...	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
JAN 15...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY 06...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 06...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

PERIPHYTON

DATE	LENGTH OF EXPO-SURE (DAYS)	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M	UNCOR-RECTED PERI-PHYTON CHLORO-PHYLL A MG/SQ M	UNCOR-RECTED PERI-PHYTON CHLORO-PHYLL B MG/SQ M
FEB 11...	27	2.20	1.20	2.20	.000
MAY 06...	28	12.0	10.4	4.78	.000
AUG 06...	37	10.7	4.77	2.17	.074

ND--NOT DETECTED

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

OCT. 1, 1975
1430 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,700 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....OOCYSTIS		130	5
	...SCENEDESMACEAE			
L	....SCENEDESMUS			0
	..VOLVOCALES			
	...VOLVOCACEAE			
D	....PANDORINA		530	20
		TOTALS	670	25
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		730	27
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....COCCONEIS		33	1
	...FRAGILARIACEAE			
	....ASTERIONELLA		230	9
D	....FRAGILARIA		400	15
	....SYNEDRA		33	1
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		67	2
	...NITZSCHIACEAE			
	....NITZSCHIA		130	5
	...TABELLARIACEAE			
	....TABELLARIA		33	1
		TOTALS	1,700	61
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....OCHROMONAS		33	1
		TOTALS	33	1
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS		270	10
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
	....OSCILLATORIA		33	1
		TOTALS	300	11

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

OCT. 30, 1975
0950 HOURS

IDENTIFICATION OF PHYTOPLANKTON

550 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....SCENEDESMUS		48	9
		TOTALS	48	9
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		340	61
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....COCCONEIS			0
	...CYMBELLACEAE			
	....CYMBELLA		24	4
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
	...NAVICULACEAE	NAVICULOID		
L	....NAVICULA			0
	...NITZSCHIACEAE			
	....NITZSCHIA		24	4
		TOTALS	390	69
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...MALLOMONADACEAE			
	....MALLOMONAS		24	4
	...OCHROMONADACEAE			
	....DINOBRYON		24	4
	....OCHROMONAS		24	4
		TOTALS	72	12
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		24	4
		TOTALS	24	4
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...PERIDINIACEAE			
	....PERIDINIUM		24	4
		TOTALS	24	4

NOV. 12, 1975
1000 HOURS

IDENTIFICATION OF PHYTOPLANKTON

640 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
L	....CRUCIGENIA			0
	....SCENEDESMUS		47	7
		TOTALS	47	7
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		350	56
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....COCCONEIS		71	11
	...FRAGILARIACEAE			
	....ASTERIONELLA		71	11
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		24	4
	...NITZSCHIACEAE			
	....NITZSCHIA		71	11
		TOTALS	590	93

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

IDENTIFICATION OF PHYTOPLANKTON

DEC. 11, 1975
1045 HOURS

480 CELLS/ML

	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
L	....OOCYSTIS			0
	..TETRASPORALES			
	...COCCOMYXACEAE			
L	....ELAKATOTHRIX			0
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		440	91
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....ACHNANTHES			0
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
L	....FRAGILARIA			0
L	....SYNEDRA			0
	...NAVICULACEAE	NAVICULOID		
L	....AMPHIPRORA			0
L	....NAVICULA			0
	...SURIRELLACEAE			
L	....CYMATOPLEURA			0
		TOTALS	440	91
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...MALLOMONADACEAE			
L	....MALLOMONAS			0
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		44	9
		TOTALS	44	9

JAN. 15, 1976
1400 HOURS

1,900 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....CRUCIGENIA		52	3
	..TETRASPORALES			
	...COCCOMYXACEAE			
L	....ELAKATOTHRIX			0
		TOTALS	52	3
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		470	25
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		17	1
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
	....FRAGILARIA		260	14
	....SYNEDRA		17	1
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		17	1
	...NITZSCHIACEAE			
	....NITZSCHIA		52	3
		TOTALS	840	45
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....AGMENELLUM		70	4
D	....ANACYSTIS		930	49
		TOTALS	1,000	53

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

FEB. 11, 1976
1315 HOURS

IDENTIFICATION OF PHYTOPLANKTON

340 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		29	8
		TOTALS	29	8
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		240	71
L	....MELOSIRA			0
	..PENNALES	PENNATE		
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		14	4
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		14	4
	...NITZSCHIACEAE			
	....NITZSCHIA		14	4
	...SURIRELLACEAE			
L	....CYMATOPLEURA			0
		TOTALS	290	83
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....COCCOCHLORIS		29	8
		TOTALS	29	8
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...GLENODINIACEAE			
L	....GLENODINIUM			0

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAR. 10, 1976
1600 HOURS

IDENTIFICATION OF PHYTOPLANKTON
320 CELLS/ML

	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			21	6
	...SCENEDESMACEAE				
	....SCENEDESMUS			41	13
			TOTALS	62	19
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			41	13
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			21	6
	...CYMBELLACEAE				
L	....CYMBELLA				0
	...FRAGILARIACEAE				
D	....ASTERIONELLA			52	16
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			10	3
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			10	3
	...NITZSCHIACEAE				
D	....NITZSCHIA			93	29
			TOTALS	230	70
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...OCHROMONADACEAE				
	....OCHROMONAS			21	6
			TOTALS	21	6
	PYRRHOPHYTA	FIRE ALGAE			
	.DINOPHYCEAE	DINOFLAGELLATES			
	..PERIDINIALES				
	...PERIDINIACEAE				
	....PERIDINIUM			10	3
			TOTALS	10	3

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

APR. 8, 1976
1430 HOURS

IDENTIFICATION OF PHYTOPLANKTON

340 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....SCENEDESMUS		18	5
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		27	8
		TOTALS	44	13
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		49	14
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		18	5
	...CYMBELLACEAE			
	....CYMBELLA		9	3
	...FRAGILARIACEAE			
D	....ASTERIONELLA		58	17
	....FRAGILARIA		4	1
	....SYNEDRA		4	1
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		13	4
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		22	7
		TOTALS	180	52
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
D	....DINOBRYON		110	32
		TOTALS	110	32
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		9	3
		TOTALS	9	3
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...GLENODINIACEAE			
L	....GLENODINIUM			0

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAY 6, 1976
1045 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,500 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....TETRAEDRON			32	1
	...SCENEDESMACEAE				
	....SCENEDESMUS			97	4
			TOTALS	130	5
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			290	11
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			97	4
	....COCCONEIS			32	1
	...CYMBELLACEAE				
	....AMPHORA			16	1
	....CYMBELLA			48	2
	...FRAGILARIACEAE				
	....FRAGILARIA			81	3
	....SYNEDRA			16	1
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			65	3
	...NITZSCHIACEAE				
	....NITZSCHIA			310	12
	...SURIRELLACEAE				
	....SURIRELLA			32	1
			TOTALS	980	39
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...MALLOMONADACEAE				
	....MALLOMONAS			32	1
	...OCHROMONADACEAE				
	....DINOBRYON			350	14
			TOTALS	390	15
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..CHROOCOCCALES	COCCOID			
	...CHROOCOCCACEAE				
L	....AGMENELLUM				0
	..OSCILLATORIALES	FILAMENTOUS			
	...NOSTOCACEAE				
L	....APHANIZOMENON				0
	...OSCILLATORIACEAE				
D	....OSCILLATORIA			1,000	41
			TOTALS	1,000	41

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JUNE 3, 1976
0930 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,200 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..VOLVOCALES				
	...CHLAMYDOMONADACEAE				
	....CHLAMYDOMONAS			13	1
			TOTALS	13	1
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			67	3
	....MELOSIRA			130	6
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			54	2
	...CYMBELLACEAE				
	....CYMBELLA			13	1
	...FRAGILARIACEAE				
L	....ASTERIONELLA				0
	....FRAGILARIA			67	3
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			13	1
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			81	4
	...NITZSCHIACEAE				
	....NITZSCHIA			150	7
			TOTALS	580	27
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...OCHROMONADACEAE				
D	....DINOBRYON			400	18
	....OCHROMONAS			13	1
			TOTALS	420	19
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..OSCILLATORIALES	FILAMENTOUS			
	...OSCILLATORIACEAE				
D	....OSCILLATORIA			1,200	54
			TOTALS	1,200	54
	EUGLENOPHYTA	EUGLENOIDS			
	.EUGLENOPHYCEAE				
	..EUGLENALES				
	...EUGLENACEAE				
	....TRACHELOMONAS			13	1
			TOTALS	13	1

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

IDENTIFICATION OF PHYTOPLANKTON

JUNE 29, 1976
1430 HOURS

2,200 CELLS/ML

	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		67	3
		TOTALS	67	3
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		1,600	73
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		67	3
	...NITZSCHIACEAE			
	....NITZSCHIA		67	3
		TOTALS	1,700	79
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...MALLOMONADACEAE			
	....MALLOMONAS		67	3
		TOTALS	67	3
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOCHRYSIDACEAE			
	....CHROOMONAS		130	6
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		200	9
		TOTALS	340	15

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

AUG. 6, 1976
1115 HOURS

IDENTIFICATION OF PHYTOPLANKTON

4,900 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....CRUCIGENIA		300	6
		TOTALS	300	6
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		2,400	50
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		25	1
	...CYMBELLACEAE			
	....CYMBELLA		25	1
	...FRAGILARIACEAE			
	....SYNEDRA		25	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		25	1
		TOTALS	2,500	54
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....AGMENELLUM		400	8
D	....ANACYSTIS		1,500	31
		TOTALS	1,900	39
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		100	2
		TOTALS	100	2
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...PERIDINIACEAE			
	....PERIDINIUM		25	1
		TOTALS	25	1

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

SEP. 3, 1976
0915 HOURS

IDENTIFICATION OF PHYTOPLANKTON

7,100 CELLS/ML

	ORGANISM NAME	COMMON NAME		CELLS/ML	PER CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....DICTYOSPHAERIUM			470	7
	....TETRAEDRON			39	1
	..VOLVOCALES				
	...VOLVOCACEAE				
D	....GONIUM			1,200	17
			TOTALS	1,800	25
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			560	8
	....MELOSIRA			680	10
	....STEPHANODISCUS			58	1
	..PENNALES	PENNATE			
	...NITZSCHIACEAE				
	....NITZSCHIA			58	1
			TOTALS	1,400	20
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..CHROOCOCCALES	COCCOID			
	...CHROOCOCCACEAE				
	....ANACYSTIS			410	6
	..OSCILLATORIALES	FILAMENTOUS			
	...OSCILLATORIACEAE				
D	....OSCILLATORIA			3,500	49
			TOTALS	3,900	55
	EUGLENOPHYTA	EUGLENOIDS			
	.EUGLENOPHYCEAE				
	..EUGLENALES				
	...EUGLENACEAE				
	....TRACHELOMONAS			120	2
			TOTALS	120	2

NOTE: D - DOMINANT ORGANISM; GREATER OR EQUAL TO 15%
L - LESS THEN 1%; MAY NOT HAVE BEEN ACTUALLY COUNTED

04132052 CHEBOYGAN RIVER AT CHEBOYGAN, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	309	318	315	315	359	320	291	275	275	285	270	260
2	310	318	317	321	358	326	292	275	275	300	275	265
3	310	322	314	330	371	329	292	275	275	280	270	260
4	308	318	316	308	364	293	276	280	275	280	260	265
5	310	321	314	331	338	297	278	290	270	275	260	260
6	314	321	319	326	346	296	278	280	275	275	265	260
7	311	320	314	325	412	296	278	275	275	270	260	260
8	308	318	---	332	386	300	278	280	270	268	260	260
9	311	321	322	330	324	294	281	265	275	275	255	270
10	309	310	---	314	294	292	281	280	270	265	265	260
11	310	310	306	330	308	334	280	280	270	255	265	270
12	311	314	304	315	319	331	279	280	275	260	265	270
13	320	318	306	329	320	334	282	280	275	260	265	265
14	320	319	304	329	322	334	282	275	270	260	265	270
15	313	315	306	329	326	337	281	285	280	260	265	270
16	317	323	326	---	318	290	283	280	265	260	265	265
17	318	320	301	352	320	291	280	290	265	255	260	270
18	311	320	321	348	318	287	281	280	260	260	260	265
19	321	318	328	378	320	291	283	275	265	260	260	270
20	313	315	276	375	325	288	308	280	275	260	260	275
21	324	316	304	424	312	286	310	280	275	260	260	293
22	324	324	326	387	298	286	310	280	275	260	260	288
23	322	321	321	365	324	290	310	275	280	270	270	288
24	327	319	279	393	319	285	304	270	275	270	265	293
25	326	322	290	371	304	285	315	275	270	265	270	290
26	342	324	311	364	310	289	311	280	280	265	260	290
27	322	323	324	344	291	287	311	270	265	265	270	291
28	331	326	---	414	326	391	280	280	---	265	260	293
29	324	324	343	386	329	287	270	280	290	270	260	297
30	323	318	334	374	---	291	270	275	285	265	265	293
31	318	---	334	378	---	291	---	---	---	---	272	---
MAX	342	326	343	424	412	391	315	290	290	300	275	297
MIN	308	310	276	308	291	285	270	265	260	255	255	260

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
ONCE-DAILY

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

04133500 THUNDER BAY RIVER NEAR BOLTON, MI

LOCATION.--Lat 45°07'40", long 83°38'30", in NE¼ sec.36, T.32 N., R.6 E., Alpena County, Hydrologic Unit 04070006, on left bank 0.5 mi (0.8 km) upstream from Orchard Hill Bridge, 4 mi (6 km) upstream from North Branch, 5 mi (8 km) southwest of Bolton, and 11 mi (18 km) northwest of Alpena.

DRAINAGE AREA.--588 mi^2 (1,520 km^2).

PERIOD OF RECORD.--March 1945 to current year.

REVISED RECORDS.--WSP 1437: 1946. WSP 1727: 1947(M).

GAGE.--Water-stage recorder. Datum of gage is 671.96 ft (204.813 m) above mean sea level, unadjusted. Prior to Aug. 12, 1945, non-recording gage at site 500 ft (152 m) downstream at different datum.

REMARKS.--Records good except those for the winter period, which are poor. Regulation by Fletcher Pond on the Upper South Branch Thunder Bay River (usable capacity, 40,170 acre-ft or 49.5 hm^3). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--31 years, 472 ft^3/s (13.37 m^3/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,290 ft^3/s (121 m^3/s) Mar. 26, 1976, gage height, 10.29 ft (3.136 m); maximum gage height, 10.49 ft (3.197 m) Mar. 25, 1976 (backwater from ice); minimum, 92 ft^3/s (2.61 m^3/s) Sept. 28, 29, 1955.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,290 ft^3/s (121 m^3/s) Mar. 26, gage height, 10.29 ft (3.136 m); maximum gage height, 10.49 ft (3.197 m) Mar. 25 (backwater from ice); minimum, 155 ft^3/s (4.39 m^3/s) Aug. 27, gage height, 2.83 ft (0.863 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	468	489	982	470	490	560	2420	502	684	562	355	250
2	474	475	1100	470	490	560	2300	480	914	708	355	242
3	477	456	961	470	500	560	2040	540	974	760	351	261
4	465	471	857	470	500	570	1720	599	895	627	347	267
5	447	477	788	480	500	600	1400	622	771	565	343	244
6	438	467	740	480	500	640	1170	669	677	513	344	242
7	426	466	710	480	500	700	1000	706	611	481	346	240
8	417	462	677	480	500	720	915	694	588	472	342	248
9	411	485	619	480	500	710	826	631	530	456	336	252
10	441	493	595	480	520	710	766	583	496	446	335	282
11	453	490	560	490	540	700	722	561	516	461	333	282
12	453	471	540	490	540	680	685	687	523	442	358	310
13	459	466	525	490	530	660	625	706	476	387	362	318
14	459	460	594	490	530	660	609	684	506	409	375	290
15	464	456	675	490	540	670	607	633	486	464	358	282
16	470	452	678	480	550	680	625	621	533	499	346	278
17	492	447	560	480	550	680	651	765	697	467	332	248
18	500	444	470	480	550	710	626	940	776	439	322	246
19	503	442	450	490	550	740	589	1080	651	412	315	275
20	501	444	500	490	550	790	550	956	668	407	368	260
21	500	477	500	490	550	1000	525	844	687	406	383	280
22	494	547	490	480	550	1200	565	762	570	402	301	290
23	489	561	500	480	560	1700	585	698	531	404	290	280
24	487	533	500	480	560	2300	605	647	528	397	188	280
25	502	504	490	480	560	3500	585	615	500	391	228	270
26	523	487	480	490	560	4190	522	620	483	384	238	270
27	543	465	480	500	560	3870	505	589	482	376	208	270
28	535	461	470	500	560	3800	502	574	465	368	230	270
29	519	521	470	500	560	3580	494	561	463	361	237	270
30	497	722	470	500	---	2780	479	545	499	366	238	270
31	496	---	470	490	---	2440	---	572	---	365	239	---
TOTAL	14803	14591	18901	15020	15450	43660	26213	20686	18180	14197	9703	8067
MEAN	478	486	610	485	533	1408	874	667	606	458	313	269
MAX	543	722	1100	500	560	4190	2420	1080	974	760	383	318
MIN	411	442	450	470	490	560	479	480	463	361	188	240

CAL YR 1975 TOTAL 189159 MEAN 518 MAX 2360 MIN 200
WTR YR 1976 TOTAL 219471 MEAN 600 MAX 4190 MIN 188

04134000 NORTH BRANCH THUNDER BAY RIVER NEAR BOLTON, MI

LOCATION.--Lat 45°08'55", long 83°36'35", in SE¼ sec.29, T.32 N., R.7 E., Alpena County, Hydrologic Unit 04070006, on left bank 1.5 mi (2.4 km) upstream from mouth, 2.5 mi (4.0 km) south of Bolton, and 9 mi (14 km) northwest of Alpena.

DRAINAGE AREA.--184 mi^2 (477 km^2).

PERIOD OF RECORD.--March 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 675.52 ft (205.898 m) above mean sea level, unadjusted. Prior to Aug. 16, 1945, non-recording gage at site 0.5 mi (0.8 km) upstream at different datum.

REMARKS.--Records good except those for the winter period, which are poor. Occasional regulation during low flows from dams above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--31 years, 119 ft^3/s (3.370 m^3/s), 8.78 in/yr (223 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,950 ft^3/s (83.5 m^3/s) Mar. 28, 1976, gage height, 7.46 ft (2.274 m); maximum gage height, 7.98 ft (2.432 m) Mar. 31, 1950 (backwater from ice); minimum discharge, 0.40 ft^3/s (0.011 m^3/s) Oct. 14, 1955.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,950 ft^3/s (83.5 m^3/s) Mar. 28, gage height, 7.46 ft (2.274 m), only peak above base of 500 ft^3/s (14.2 m^3/s); minimum, 5.2 ft^3/s (0.15 m^3/s) Sept. 8; minimum gage height, 2.54 ft (0.774 m) Aug. 29, 30, 31, Sept. 7, 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	104	62	254	62	58	115	1850	96	73	43	14	6.5
2	94	60	343	60	58	115	1720	99	73	63	13	6.6
3	88	58	400	59	58	115	1450	108	75	79	11	6.3
4	84	57	360	58	58	120	1160	115	81	78	11	6.7
5	78	54	275	58	58	120	925	122	84	68	10	7.0
6	71	52	244	58	58	125	754	159	81	56	10	6.6
7	66	52	220	57	59	135	628	175	73	47	10	5.8
8	61	60	190	57	59	140	526	198	65	42	10	5.6
9	58	91	170	57	60	140	447	198	57	39	9.8	8.8
10	55	116	155	57	62	140	388	177	51	41	9.3	12
11	52	126	140	57	62	135	345	161	45	39	9.0	11
12	48	122	130	56	66	130	305	147	41	35	13	9.9
13	67	115	120	56	70	130	276	138	39	30	22	11
14	74	111	110	56	74	130	252	135	38	29	29	9.4
15	75	103	110	56	80	135	233	125	40	28	29	9.3
16	84	93	105	56	88	135	226	121	48	29	26	8.5
17	104	86	100	56	94	140	219	165	46	30	21	8.6
18	122	84	98	55	100	145	218	218	46	30	18	8.3
19	123	81	94	55	105	150	211	288	48	31	16	7.9
20	110	80	90	55	110	165	194	331	44	30	14	7.6
21	95	96	88	54	110	190	176	292	44	28	13	7.2
22	84	119	86	54	110	250	172	234	42	26	11	6.9
23	78	153	84	54	110	360	161	180	38	26	10	6.5
24	74	180	81	54	110	540	152	143	35	24	10	6.6
25	73	183	78	55	110	840	145	120	31	21	9.9	7.0
26	78	161	74	56	110	1800	137	105	28	20	8.8	6.7
27	78	132	72	57	110	2730	122	94	27	19	7.9	6.5
28	82	121	70	57	110	2690	106	86	26	17	7.4	6.2
29	79	119	68	58	110	2500	102	78	26	16	6.5	5.7
30	72	205	66	58	---	2180	98	74	28	16	6.5	5.6
31	67	---	64	58	---	1840	---	72	---	15	6.1	---
TOTAL	2478	3132	4539	1756	2427	18580	13698	4754	1473	1095	402.2	228.3
MEAN	79.9	104	146	56.6	83.7	599	457	153	49.1	35.3	13.0	7.61
MAX	123	205	400	62	110	2730	1850	331	84	79	29	12
MIN	48	52	64	54	58	115	98	72	26	15	6.1	5.6
CFSM	.43	.57	.79	.31	.45	3.26	2.48	.83	.27	.19	.07	.04
IN.	.50	.63	.92	.36	.49	3.76	2.77	.96	.30	.22	.08	.05

CAL YR 1975 TOTAL 53788.0 MEAN 147 MAX 2170 MIN 16 CFSM .80 IN 10.87
WTR YR 1976 TOTAL 54562.5 MEAN 149 MAX 2730 MIN 5.6 CFSM .81 IN 11.03

04135500 AU SABLE RIVER AT GRAYLING, MI

LOCATION.--Lat 44°39'35", long 84°42'45", in SE¼ SE¼ sec.7, T.26 N., R.3 W., Crawford County, Hydrologic Unit 04070007, on right bank 65 ft (20 m) upstream from bridge on Interstate Highway 75 (Business Loop) in Grayling, 0.7 mi (1.1 km) upstream from East Branch, and 114 mi (183 km) upstream from mouth.

DRAINAGE AREA.--110 mi^2 (285 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1942 to current year. Monthly discharge only for some periods, published in WSP 1307. Prior to October 1954, published as Middle Branch Au Sable River at Grayling.

GAGE.--Water-stage recorder above steel-crested dam. Datum of gage is 1,123.49 ft (342.440 m) above mean sea level.

REMARKS.--Water-discharge records good except those for the winter period, which are fair. Prior to Dec. 31, 1952, diurnal fluctuation caused by powerplant 2.5 mi (4.0 km) above station.

AVERAGE DISCHARGE.--34 years, 75.2 ft^3/s (2.130 m^3/s), 9.28 in/yr (236 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 274 ft^3/s (7.76 m^3/s) June 2, 1943, gage height, 3.00 ft (0.914 m); minimum, 28 ft^3/s (0.79 m^3/s) Apr. 21, 1946, gage height, 0.80 ft (0.244 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 228 ft^3/s (6.46 m^3/s) Mar. 28, gage height, 2.66 ft (0.811 m); minimum, 54 ft^3/s (1.53 m^3/s) Aug. 30, 31, gage height, 1.17 ft (0.357 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78	70	110	77	70	83	211	101	125	83	62	63
2	80	72	102	77	67	73	193	102	118	80	60	63
3	77	72	96	77	67	73	176	114	108	75	59	61
4	74	72	93	75	66	89	168	119	101	71	59	59
5	76	72	90	70	66	103	160	115	96	69	61	58
6	88	71	92	73	66	110	152	121	90	68	62	57
7	95	73	86	76	66	108	149	120	86	68	61	57
8	102	82	86	72	67	97	144	113	83	68	60	56
9	96	86	86	70	68	92	137	106	83	69	59	57
10	89	86	84	73	72	94	133	103	82	68	59	60
11	86	82	82	75	76	89	132	103	78	68	59	61
12	84	80	80	75	76	88	128	103	78	66	64	60
13	81	79	81	75	78	92	125	101	77	65	72	58
14	78	78	92	75	77	92	121	97	75	64	71	57
15	82	76	106	72	80	87	120	96	78	64	68	56
16	83	76	101	71	85	86	122	102	91	65	65	58
17	83	74	92	68	89	81	120	114	94	64	62	58
18	80	73	77	67	91	82	116	133	89	63	61	58
19	76	72	71	71	95	89	112	130	90	62	60	57
20	76	74	82	71	94	103	110	114	85	63	58	56
21	76	78	86	73	90	130	112	106	82	64	57	58
22	76	79	83	72	86	132	119	101	78	64	58	60
23	74	78	84	70	75	127	124	98	78	63	56	61
24	73	76	82	70	78	131	118	96	78	62	55	60
25	82	72	81	71	88	152	115	94	78	61	55	59
26	86	71	81	71	88	172	113	94	74	60	55	58
27	83	77	80	72	88	207	108	92	72	59	56	58
28	78	77	78	73	85	226	106	95	71	59	56	59
29	75	90	78	73	85	218	102	98	72	63	55	58
30	73	113	78	74	---	214	101	114	75	62	54	58
31	73	---	78	71	---	217	---	121	---	62	55	---
TOTAL	2513	2331	2678	2250	2279	3737	3947	3316	2565	2042	1854	1759
MEAN	81.1	77.7	86.4	72.6	78.6	121	132	107	85.5	65.9	59.8	58.6
MAX	102	113	110	77	95	226	211	133	125	83	72	63
MIN	73	70	71	67	66	73	101	92	71	59	54	56
CFSM	.74	.71	.79	.66	.71	1.10	1.20	.97	.78	.60	.54	.53
IN.	.85	.79	.91	.76	.77	1.26	1.33	1.12	.87	.69	.63	.59

CAL YR 1975 TOTAL 30528 MEAN 83.6 MAX 194 MIN 57 CFSM .76 IN 10.32
WTR YR 1976 TOTAL 31271 MEAN 85.4 MAX 226 MIN 54 CFSM .78 IN 10.58

04135500 AU SABLE RIVER AT GRAYLING, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: March 1953 to current year.

INSTRUMENTATION.--Temperature recorder since March 1953.

REMARKS.--Interruptions in the record were due to malfunctions of the recorder.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 28.0°C July 1, 2, 1963; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 25.0°C July 15, minimum recorded, 0.5°C on many days during winter period.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	13.0	12.5	---	---	---	---	0.5	0.5	0.5	0.5	2.5	1.5
2	12.5	10.5	---	---	---	---	0.5	0.5	0.5	0.5	1.5	1.0
3	11.0	9.0	---	---	---	---	0.5	0.5	0.5	0.5	1.0	1.0
4	12.5	10.0	---	---	---	---	0.5	0.5	0.5	0.5	1.0	1.0
5	12.5	11.0	---	---	---	---	0.5	0.5	0.5	0.5	1.0	1.0
6	12.5	11.5	---	---	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0
7	10.5	10.5	11.5	11.0	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0
8	10.5	10.5	11.5	11.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0
9	11.0	11.0	11.5	11.0	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0
10	11.0	11.0	11.0	8.0	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0
11	11.0	10.5	8.0	7.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0
12	10.5	9.5	---	---	0.5	0.5	0.5	0.5	0.5	0.5	---	---
13	13.0	10.0	---	---	1.0	0.5	0.5	0.5	0.5	0.5	---	---
14	14.5	13.0	---	---	4.0	1.0	0.5	0.5	0.5	0.5	---	---
15	14.5	13.0	---	---	3.5	2.5	0.5	0.5	0.5	0.5	1.5	1.0
16	13.0	11.5	---	---	2.5	1.5	0.5	0.5	0.5	0.5	1.5	1.5
17	11.5	10.0	---	---	1.5	0.5	0.5	0.5	0.5	0.5	1.5	1.5
18	10.0	8.5	---	---	0.5	0.5	0.5	0.5	0.5	0.5	1.5	1.5
19	8.5	8.5	---	---	0.5	0.5	0.5	0.5	0.5	0.5	4.0	1.5
20	9.0	8.5	---	---	0.5	0.5	0.5	0.5	0.5	0.5	6.0	4.0
21	9.0	9.0	---	---	0.5	0.5	0.5	0.5	0.5	0.5	6.0	4.0
22	9.0	9.0	---	---	0.5	0.5	0.5	0.5	0.5	0.5	4.0	3.5
23	12.5	9.0	---	---	0.5	0.5	0.5	0.5	0.5	0.5	5.0	3.5
24	13.0	11.5	---	---	0.5	0.5	0.5	0.5	0.5	0.5	6.5	4.5
25	13.0	11.0	---	---	0.5	0.5	0.5	0.5	1.5	0.5	6.5	5.5
26	11.0	9.0	---	---	0.5	0.5	0.5	0.5	2.5	1.5	6.5	6.0
27	9.0	8.5	---	---	0.5	0.5	0.5	0.5	2.5	2.5	5.0	5.5
28	8.5	8.5	---	---	0.5	0.5	0.5	0.5	2.5	2.0	5.0	4.0
29	8.5	8.5	---	---	0.5	0.5	0.5	0.5	2.5	2.0	5.5	4.5
30	---	---	---	---	0.5	0.5	0.5	0.5	---	---	5.5	5.0
31	---	---	---	---	0.5	0.5	0.5	0.5	---	---	5.5	5.5
MONTH	14.5	8.5	---	---	4.0	0.5	0.5	0.5	2.5	0.5	6.5	1.0

04135500 AU SABLE RIVER AT GRAYLING, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04135600 EAST BRANCH AU SABLE RIVER AT GRAYLING, MI

LOCATION.--Lat 44°40'08", long 84°42'20", in NW¼ NW¼ sec.8, T.26 N., R.3 W., Crawford County, Hydrologic Unit 04070007, on right bank, at south boundary of Michigan Department of Natural Resources field office in Grayling (revised) and 0.4 mi (0.6 km) upstream from mouth.

DRAINAGE AREA.--76.0 mi^2 (196.8 km^2).

PERIOD OF RECORD.--April 1958 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,110 ft (338 m) from topographic map. Prior to Sept. 30, 1958, nonrecording gage at site 10 ft (3 m) downstream at present datum.

REMARKS.--Records good except those for the winter period, which are fair. Occasional regulation by Michigan Department of Natural Resources field office above gage. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--18 years, 45.3 ft^3/s (1.283 m^3/s), 8.09 in/yr (205 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 207 ft^3/s (5.86 m^3/s) Mar. 28, 1976, gage height, 5.24 ft (1.597 m); minimum, 7.0 ft^3/s (0.20 m^3/s) Mar. 27, 1965, result of freezeup; minimum daily, 16 ft^3/s (0.45 m^3/s) Aug. 20, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 207 ft^3/s (5.86 m^3/s) Mar. 28, gage height, 5.24 ft (1.597 m); minimum, 26 ft^3/s (0.74 m^3/s) Feb. 23, result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	50	42	62	42	35	47	181	66	71	57	37	36
2	49	42	56	41	35	35	160	69	66	53	36	35
3	47	41	52	41	34	49	145	78	62	50	35	34
4	46	41	50	40	34	52	134	75	59	47	35	34
5	45	41	51	38	34	61	124	75	56	46	37	34
6	44	40	54	37	34	62	118	79	54	44	37	33
7	43	41	47	36	35	58	112	75	53	44	35	32
8	43	44	51	36	35	53	107	71	52	45	34	31
9	43	43	48	37	36	52	101	68	51	44	33	32
10	44	44	47	39	38	53	98	67	50	44	33	35
11	44	44	47	41	41	48	96	68	49	43	33	34
12	43	43	45	42	42	51	92	67	49	42	37	32
13	43	43	45	42	43	53	88	64	49	42	38	31
14	43	42	55	42	38	52	87	63	48	41	37	31
15	46	42	57	38	45	49	86	62	51	40	36	32
16	47	41	52	40	49	48	85	67	62	42	34	32
17	45	41	49	40	48	46	82	75	58	41	34	33
18	44	40	37	40	50	48	80	76	55	40	33	32
19	44	39	37	40	51	53	78	71	58	39	32	31
20	44	40	49	40	49	67	76	67	55	41	31	31
21	43	43	47	40	48	81	78	64	52	41	31	32
22	43	42	47	40	47	77	82	62	50	40	30	34
23	42	41	46	39	39	74	78	61	49	39	30	34
24	41	41	44	38	42	82	76	60	49	39	29	33
25	49	40	44	38	45	99	73	60	49	38	29	33
26	48	35	44	38	49	120	71	59	47	37	30	33
27	46	43	43	39	49	170	71	58	46	37	31	33
28	44	42	43	39	48	195	69	57	46	37	31	33
29	43	45	41	39	48	189	68	59	47	39	30	32
30	42	62	43	38	---	188	66	71	51	38	30	33
31	42	---	42	36	---	192	---	70	---	37	30	---
TOTAL	1380	1268	1475	1216	1221	2504	2862	2084	1594	1307	1028	985
MEAN	44.5	42.3	47.6	39.2	42.1	80.8	95.4	67.2	53.1	42.2	33.2	32.8
MAX	50	62	62	42	51	195	181	79	71	57	38	36
MIN	41	35	37	36	34	35	66	57	46	37	29	31
CFSM	.59	.56	.63	.52	.55	1.06	1.26	.88	.70	.56	.44	.43
IN.	.68	.62	.72	.60	.60	1.23	1.40	1.02	.78	.64	.50	.48

CAL YR 1975 TOTAL 18509 MEAN 50.7 MAX 138 MIN 29 CFSM .67 IN 9.06
WTR YR 1976 TOTAL 18924 MEAN 51.7 MAX 195 MIN 29 CFSM .68 IN 9.26

04135700 SOUTH BRANCH AU SABLE RIVER NEAR LUZERNE, MI

LOCATION.--Lat 44°36'53", long 84°27'20", in SE¼ SE¼ sec.29, T.26 N., R.1 W., Crawford County, Hydrologic Unit 04070007, on right bank 10 ft (3 m) upstream from Smith Bridge, 400 ft (122 m) downstream from bridge on State Highway 72, 4.6 mi (7.4 km) upstream from mouth, and 9.1 mi (14.6 km) west of Luzerne.

DRAINAGE AREA.--401 mi^2 (1,039 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1951-66. October 1966 to current year.

REVISED RECORDS.--WSP 2111: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 1,070 ft (326 m) from topographic map. Apr. 19, 1951, to Nov. 14, 1966, nonrecording gage at same site and datum.

REMARKS.--Water-discharge records good except those for the winter period, which are poor. Occasional regulation by dams above station.

AVERAGE DISCHARGE.--10 years, 234 ft^3/s (6.627 m^3/s), 7.92 in/yr (201 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,120 ft^3/s (31.7 m^3/s) Mar. 28, 1976, gage height, 7.30 ft (2.225 m); minimum daily, 105 ft^3/s (2.97 m^3/s) Oct. 7-9, Nov. 3, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,120 ft^3/s (31.7 m^3/s) Mar. 28, gage height, 7.30 ft (2.225 m); minimum, 110 ft^3/s (3.12 m^3/s) Aug. 24, 25, 26, 27, 30, 31, gage height, 4.23 ft (1.289 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	272	222	304	246	195	290	1040	381	268	258	138	135
2	267	216	300	248	190	280	992	378	254	261	136	137
3	271	212	284	248	188	270	924	411	227	258	134	131
4	273	210	257	230	188	259	830	414	206	234	134	124
5	264	207	250	230	188	306	774	424	194	196	146	121
6	252	203	272	235	190	328	718	438	186	179	150	122
7	242	213	255	229	190	342	676	423	179	167	143	120
8	238	239	260	220	190	347	637	412	174	165	136	114
9	236	240	266	220	195	366	609	396	172	167	138	120
10	236	243	275	220	198	369	581	375	167	162	129	129
11	230	222	281	220	203	348	556	375	165	160	126	133
12	229	206	284	221	203	359	536	363	162	153	134	123
13	228	195	291	218	207	367	514	348	158	146	138	128
14	226	187	317	219	208	362	494	342	155	146	136	125
15	228	193	338	213	220	357	486	330	167	143	131	117
16	228	190	323	228	234	351	476	345	210	143	135	118
17	224	185	305	212	237	339	458	369	218	138	127	118
18	229	181	280	212	246	339	444	366	201	141	123	116
19	227	178	265	218	256	330	430	348	206	138	123	114
20	223	180	265	215	256	390	411	333	208	143	120	113
21	215	193	265	208	261	486	402	320	201	143	119	116
22	215	200	265	203	259	490	405	305	179	143	118	120
23	210	197	264	200	245	560	396	295	170	141	115	121
24	225	190	259	200	269	606	396	285	170	138	113	118
25	247	185	256	200	262	718	424	280	172	136	118	116
26	241	172	254	202	272	822	441	275	167	134	113	116
27	233	180	253	200	287	1000	444	268	162	131	119	118
28	230	190	251	202	296	1100	427	263	158	131	119	119
29	229	210	249	204	300	1110	405	239	179	136	115	120
30	222	278	249	200	---	1090	387	246	208	138	111	119
31	223	---	246	200	---	1070	---	251	---	141	112	---
TOTAL	7313	6117	8483	6721	6633	15751	16713	10598	5643	5010	3949	3641
MEAN	236	204	274	217	229	508	557	342	188	162	127	121
MAX	273	278	338	248	300	1110	1040	438	268	261	150	137
MIN	210	172	246	200	188	259	387	239	155	131	111	113
CFSM	.59	.51	.68	.54	.57	1.27	1.39	.85	.47	.40	.32	.30
IN.	.68	.57	.79	.62	.62	1.46	1.55	.98	.52	.46	.37	.34

CAL YR 1975 TOTAL 90415 MEAN 248 MAX 609 MIN 118 CFSM .62 IN 8.39
WTR YR 1976 TOTAL 96572 MEAN 264 MAX 1110 MIN 111 CFSM .66 IN 8.96

04135700 SOUTH BRANCH AU SABLE RIVER NEAR LUZERNE, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: November 1966 to current year.

INSTRUMENTATION.--Temperature recorder since November 1966.

REMARKS.--Interruptions in the record were due to malfunctions of the recorder.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 24.0°C July 16, 1968; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 21.0°C June 11; minimum, 0.5°C on many days during December and January.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	12.5	11.5	8.0	6.5	3.5	2.0	1.5	1.5	1.0	1.0	2.5	1.0
2	11.5	10.0	8.5	7.5	2.0	2.0	1.5	1.0	1.5	1.0	1.0	1.0
3	11.0	9.5	9.5	8.5	2.0	1.5	1.5	1.0	1.0	1.0	1.5	1.0
4	11.5	10.0	9.0	8.5	2.0	1.5	1.0	0.5	1.0	1.0	1.5	1.0
5	11.5	10.0	9.0	8.0	3.0	2.0	1.0	0.5	1.0	1.0	1.5	1.0
6	12.0	11.0	9.5	8.5	3.0	2.0	1.0	0.5	1.0	1.0	2.0	1.0
7	12.0	10.0	9.5	9.5	2.0	1.5	1.0	0.5	1.0	1.0	2.0	1.0
8	11.5	10.0	10.5	9.5	1.5	1.5	0.5	0.5	1.5	1.0	1.5	1.0
9	11.0	10.0	10.0	9.0	1.5	1.5	0.5	0.5	1.5	1.0	2.0	1.0
10	11.0	10.5	9.5	9.5	1.5	1.5	0.5	0.5	2.0	1.5	2.0	1.5
11	11.0	10.0	8.5	7.5	1.5	1.0	0.5	0.5	2.0	2.0	2.0	1.0
12	10.5	9.5	7.5	7.0	1.5	1.0	1.0	0.5	2.0	1.5	2.0	1.0
13	12.0	10.0	7.0	6.0	2.0	1.0	1.0	1.0	2.5	2.0	2.0	1.0
14	13.0	11.5	6.0	5.0	3.0	2.0	1.0	1.0	2.0	1.0	2.0	1.0
15	13.0	12.5	5.0	4.5	3.0	1.0	0.5	0.5	2.5	1.5	2.0	1.0
16	12.5	11.0	5.5	4.5	1.0	0.5	0.5	0.5	2.5	2.0	2.0	1.0
17	11.0	9.5	6.0	5.0	1.0	0.5	0.5	0.5	2.0	1.5	1.5	1.0
18	9.5	9.0	7.5	6.0	0.5	0.5	0.5	0.5	2.0	2.0	2.0	1.0
19	9.5	9.0	7.0	6.0	0.5	0.5	0.5	0.5	2.5	2.0	3.5	2.0
20	10.0	9.0	6.5	5.5	0.5	0.5	0.5	0.5	2.5	2.0	4.0	3.0
21	10.0	9.0	6.5	5.5	0.5	0.5	0.5	0.5	2.5	1.5	3.0	2.0
22	9.5	8.5	5.5	5.0	1.0	0.5	0.5	0.5	2.0	1.5	2.0	1.5
23	11.0	9.0	5.0	4.5	1.0	1.0	0.5	0.5	1.5	1.0	2.5	1.5
24	11.0	10.0	4.5	4.0	1.0	1.0	0.5	0.5	2.0	1.0	3.0	2.0
25	11.0	10.0	4.0	3.0	1.5	1.0	0.5	0.5	3.0	1.5	3.0	1.5
26	10.0	8.0	2.5	2.0	1.5	1.5	1.0	0.5	3.0	2.0	3.0	2.5
27	8.5	8.0	3.0	3.0	1.5	1.5	1.0	0.5	3.0	2.0	3.5	3.0
28	8.5	8.0	3.5	3.0	1.5	1.5	1.5	1.0	2.5	2.0	3.5	3.0
29	8.5	7.5	3.0	3.0	1.5	1.0	1.5	1.0	2.5	2.0	4.0	3.5
30	7.5	6.0	4.0	3.0	1.0	1.0	1.5	1.0	---	---	5.0	4.0
31	6.5	6.0	---	---	1.5	1.0	1.5	1.0	---	---	6.0	4.5
MONTH	13.0	6.0	10.5	2.0	3.5	0.5	1.5	0.5	3.0	1.0	6.0	1.0

04135700 SOUTH BRANCH AU SABLE RIVER NEAR LUZERNE, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04136500 AU SABLE RIVER AT MIO, MI

LOCATION.--Lat 44°39'36", long 84°07'52", in NW¼ sec.7, T.26 N., R.3 E., Oscoda County, Hydrologic Unit 04070007, on right bank 150 ft (46 m) upstream from bridge on State Highway 33 in Mio, 500 ft (152 m) downstream from Mio hydroelectric plant, 9.5 mi (15.3 km) downstream from Big Creek, and 73.0 mi (117.5 km) upstream from mouth.

DRAINAGE AREA.--1,100 mi^2 (2,850 km^2), approximately.

PERIOD OF RECORD.--July 1952 to current year.

GAGE.--Water-stage recorder. Datum of gage is 929.60 ft (283.342 m) above mean sea level.

REMARKS.--Records good. Flow regulated at all stages by hydroelectric plant 500 ft (152 m) above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--24 years, 994 ft^3/s (28.15 m^3/s), 12.27 in/yr (312 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,170 ft^3/s (118 m^3/s) Mar. 28, 1976, gage height, 6.14 ft (1.871 m); minimum, 18 ft^3/s (0.51 m^3/s) Sept. 18, 19, 20, 21, 28, 1962, gage height, 0.10 ft (0.030 m); minimum daily, 277 ft^3/s (7.84 m^3/s) Sept. 24, 1969.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,170 ft^3/s (118 m^3/s) Mar. 28, gage height, 6.14 ft (1.871 m); minimum, 27 ft^3/s (0.76 m^3/s) Sept. 17, gage height, 0.27 ft (0.082 m); minimum daily, 461 ft^3/s (13.1 m^3/s) Sept. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1140	1020	1390	980	956	1140	3700	1480	1310	1290	810	830
2	1110	1030	1340	1000	812	1080	3400	1450	1310	1250	785	870
3	1110	1010	1230	1030	806	1050	2950	1500	1190	1160	765	818
4	1080	992	1150	1020	986	1270	2600	1600	1120	1060	775	802
5	1080	962	1170	908	974	1420	2400	1550	1070	992	818	771
6	1050	968	1140	974	944	1370	2250	1680	1030	932	802	758
7	1050	1020	1160	1050	884	1340	2000	1620	1040	920	798	774
8	1050	1060	1100	890	962	1260	1900	1470	1010	949	809	782
9	1020	1160	1090	775	1000	1270	1800	1370	987	952	782	772
10	1060	1160	1090	800	968	1280	1700	1340	991	959	760	836
11	1060	1050	1090	1030	1030	1180	1600	1390	1000	921	760	836
12	1010	1020	1090	1070	1020	1220	1650	1360	962	872	830	822
13	1000	1030	1090	1080	1030	1260	1500	1290	962	850	924	799
14	1040	998	1180	1050	1010	1260	1400	1270	961	852	863	776
15	1030	950	1300	902	1030	1250	1450	1260	938	850	818	777
16	1050	974	1270	878	1050	1230	1500	1270	1340	849	800	794
17	1060	974	1170	866	1120	1190	1450	1490	1360	850	753	461
18	1020	962	998	780	1120	1180	1400	1590	1150	838	755	800
19	1010	968	872	926	1140	1240	1450	1490	1270	832	765	800
20	1000	968	1100	1080	1130	1320	1450	1330	1210	844	765	779
21	1000	1010	1040	1050	1100	2100	1470	1270	1080	855	765	776
22	1000	1050	1030	974	1110	1960	1500	1250	1050	844	763	782
23	992	1010	1230	908	1010	1840	1480	1230	1020	720	748	791
24	986	932	1110	926	1160	2110	1450	1200	986	719	735	795
25	1060	974	1040	980	1180	2520	1450	1180	986	803	735	788
26	1160	944	1060	962	1040	2680	1450	1170	998	800	767	787
27	1120	938	1050	980	1180	3310	1470	1150	962	812	780	787
28	1050	968	992	950	1150	4110	1490	1130	944	807	757	787
29	1030	1030	1010	962	1150	3500	1500	1130	968	806	739	787
30	1000	1520	1050	974	---	3490	1500	1220	1130	830	745	787
31	968	---	1050	902	---	3770	---	1410	---	821	740	---
TOTAL	32396	30652	34682	29657	30052	56200	54310	42140	32335	27839	24211	23524
MEAN	1045	1022	1119	957	1036	1813	1810	1359	1078	898	781	784
MAX	1160	1520	1390	1080	1180	4110	3700	1680	1360	1290	924	870
MIN	968	932	872	775	806	1050	1400	1130	938	719	735	461
CFSM	.95	.93	1.02	.87	.94	1.65	1.65	1.24	.98	.82	.71	.71
IN.	1.10	1.04	1.17	1.00	1.02	1.90	1.84	1.43	1.09	.94	.82	.80

CAL YR 1975 TOTAL 424899 MEAN 1164 MAX 2980 MIN 729 CFSM 1.06 IN 14.37
WTR YR 1976 TOTAL 417998 MEAN 1142 MAX 4110 MIN 461 CFSM 1.04 IN 14.14

04138500 AU GRES RIVER NEAR NATIONAL CITY, MI

LOCATION.--Lat 44°10'26", long 83°44'36", in NE¼ NE¼ sec.31, T.21 N., R.6 E., Iosco County, Hydrologic Unit 04080101, on left bank 15 ft (5 m) upstream from highway bridge on Allen Road, 1.7 mi (2.7 km) upstream from Elm Creek, 4.4 mi (7.1 km) southwest of National City, 12.8 mi (20.6 km) southwest of Tawas City, and 13 mi (21 km) upstream from mouth.

DRAINAGE AREA.--169 mi^2 (438 km^2).

PERIOD OF RECORD.--October 1950 to current year. Monthly discharge only October, November, 1950, published in WSP 1727.

REVISED RECORDS.--WSP 1911: 1959-60.

GAGE.--Water-stage recorder. Altitude of gage is 710 ft (216 m) by barometer. Prior to Oct. 1, 1951, nonrecording gage at site 1.5 mi (2.4 km) upstream at different datum. Oct. 1, 1951 to July 24, 1969, water-stage recorder at site 50 ft (15 m) downstream at present datum.

REMARKS.--Records good except those for the winter period, which are poor. Some regulation at low flows. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--26 years, 98.6 ft^3/s (2.792 m^3/s), 7.92 in/yr (201 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft^3/s (77.0 m^3/s) Mar. 21, 1976; maximum gage height, 10.64 ft (3.243 m) Mar. 6, 1974 (backwater from ice); minimum discharge, 5.9 ft^3/s (0.17 m^3/s) Nov. 3, 1966, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,720 ft^3/s (77.0 m^3/s) Mar. 21, gage height, 8.64 ft (2.633 m); minimum, 14 ft^3/s (0.40 m^3/s) Aug. 22, gage height, 0.77 ft (0.235 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	36	164	57	68	150	457	95	73	736	25	20
2	47	39	110	57	68	135	411	89	60	309	25	22
3	42	39	90	58	67	130	363	200	51	164	24	22
4	41	37	80	59	67	140	328	189	48	115	21	18
5	44	32	70	59	68	300	297	177	43	81	22	17
6	41	30	68	59	68	660	310	419	42	64	24	18
7	35	35	66	59	69	450	296	320	37	74	21	17
8	32	64	65	60	70	310	275	257	36	279	20	16
9	32	68	66	60	71	220	263	205	35	147	20	17
10	31	69	67	61	72	160	247	160	35	95	19	24
11	31	71	69	61	73	135	233	150	33	72	19	21
12	32	60	74	60	74	150	213	145	30	55	20	19
13	32	64	83	60	76	190	203	123	29	45	29	18
14	31	53	251	60	78	140	196	101	27	41	21	17
15	31	49	350	61	80	130	172	110	27	58	25	17
16	26	46	246	62	85	120	156	183	32	59	21	18
17	25	44	150	64	96	115	149	233	30	56	19	20
18	24	47	100	65	110	140	136	186	28	50	16	20
19	23	41	75	65	130	190	129	149	41	39	16	19
20	45	33	68	66	170	1150	116	127	36	33	16	19
21	45	55	65	67	190	2420	110	91	29	35	18	21
22	44	57	63	67	165	1100	160	73	27	31	18	20
23	42	53	62	67	135	799	118	66	26	28	16	20
24	42	46	61	67	125	805	120	62	24	28	15	20
25	55	46	60	68	130	1010	342	58	29	26	15	20
26	54	47	60	68	170	783	252	62	28	26	15	20
27	42	50	60	68	240	780	196	63	24	24	18	21
28	60	55	60	68	200	773	156	57	24	24	17	22
29	40	64	59	68	170	574	131	57	50	36	16	21
30	48	207	58	68	---	620	112	86	167	31	16	21
31	40	---	58	68	---	571	---	82	---	27	16	---
TOTAL	1205	1637	2978	1957	3185	15350	6647	4375	1201	2888	603	585
MEAN	38.9	54.6	96.1	63.1	110	495	222	141	40.0	93.2	19.5	19.5
MAX	60	207	350	68	240	2420	457	419	167	736	29	24
MIN	23	30	58	57	67	115	110	57	24	24	15	16
CFSM	.23	.32	.57	.37	.65	2.93	1.31	.83	.24	.55	.12	.12
IN.	.27	.36	.66	.43	.70	3.38	1.46	.96	.26	.64	.13	.13

CAL YR 1975 TOTAL 31105 MEAN 85.2 MAX 854 MIN 16 CFSM .50 IN 6.85
WTR YR 1976 TOTAL 42611 MEAN 116 MAX 2420 MIN 15 CFSM .69 IN 9.38

04140500 RIFLE RIVER AT SELKIRK, MI

LOCATION.--Lat 44°18'48", long 84°04'10", in SE¼ NE¼ sec.9, T.22 N., R.3 E., Ogemaw County, Hydrologic Unit 04080101, on left bank at upstream side of bridge on State Road at Selkirk, 1.0 mi (1.6 km) downstream from Klacking Creek.

DRAINAGE AREA.--117 mi^2 (303 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1950 to current year.

REVISED RECORDS.--WSP 2111: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 828.47 ft (252.518 m) above mean sea level.

REMARKS.--Water-discharge records good except those for the winter period, and those for period of no gage-height record, Jan. 24 to Feb. 25, which are poor. Some regulation from dams above station.

AVERAGE DISCHARGE.--26 years, 144 ft^3/s (4.078 m^3/s), 16.71 in/yr (424 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,760 ft^3/s (78.2 m^3/s) May 20, 1959, gage height, 6.76 ft (2.060 m); minimum, 55 ft^3/s (1.56 m^3/s) Aug. 19, 1958.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft^3/s (14.2 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Mar. 21	--	720	20.4	ice jam		Mar. 31	1800	802	22.7	3.57	1.088
Mar. 25	1900	*1,120	31.7	*4.10	1.250						

Minimum discharge, 58 ft^3/s (1.64 m^3/s) Aug. 29, gage height, 1.53 ft (0.466 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	103	103	204	108	124	210	610	160	170	354	80	85
2	101	103	153	108	124	193	420	164	147	252	82	80
3	101	103	135	110	124	195	336	246	132	170	78	71
4	99	101	132	110	124	200	287	225	125	137	76	69
5	99	99	136	110	124	300	252	200	117	120	85	67
6	99	97	161	112	125	400	230	249	115	105	85	67
7	97	106	142	112	128	370	216	225	113	115	80	65
8	99	131	131	112	130	310	198	200	105	150	78	62
9	99	126	128	112	130	270	187	185	103	120	76	67
10	99	126	128	115	132	246	182	164	103	110	76	82
11	99	118	123	115	135	219	180	172	103	108	76	73
12	99	115	118	115	138	211	170	164	98	96	80	69
13	101	115	123	118	140	241	170	154	96	92	80	67
14	101	110	184	118	140	227	170	152	108	96	82	62
15	99	108	231	118	145	203	175	147	101	134	85	65
16	99	110	160	118	155	190	180	172	117	134	80	69
17	101	110	145	115	160	177	172	198	105	115	73	69
18	97	106	135	115	165	167	167	180	103	108	73	67
19	99	106	130	118	170	177	162	162	115	98	80	65
20	97	103	130	120	175	374	152	152	108	96	80	67
21	101	150	125	120	175	620	157	144	103	96	78	67
22	97	144	120	120	170	540	193	140	103	92	76	67
23	95	128	115	120	170	460	180	137	101	89	73	67
24	99	123	110	120	175	605	172	134	101	87	71	65
25	128	118	110	120	180	1020	260	132	108	85	69	67
26	133	113	108	122	216	928	244	132	98	82	71	67
27	115	113	108	122	252	952	200	127	94	82	73	69
28	108	115	108	124	244	976	185	125	98	80	69	71
29	108	126	108	124	230	615	170	130	147	87	60	71
30	103	213	106	124	---	505	162	172	264	85	60	69
31	101	---	108	124	---	732	---	170	---	82	58	---
TOTAL	3176	3539	4155	3619	4600	12833	6539	5214	3501	3657	2343	2068
MEAN	102	118	134	117	159	414	218	168	117	118	75.6	68.9
MAX	133	213	231	124	252	1020	610	249	264	354	85	85
MIN	95	97	106	108	124	167	152	125	94	80	58	62
CFSM	.87	1.01	1.15	1.00	1.36	3.54	1.86	1.44	1.00	1.01	.65	.59
IN.	1.01	1.13	1.32	1.15	1.46	4.08	2.08	1.66	1.11	1.16	.74	.66

CAL YR 1975 TOTAL 51076 MEAN 140 MAX 772 MIN 74 CFSM 1.20 IN 16.24
WTR YR 1976 TOTAL 55244 MEAN 151 MAX 1020 MIN 58 CFSM 1.29 IN 17.56

04140500 RIFLE RIVER AT SELKIRK, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1950 to current year.

INSTRUMENTATION.--Temperature recorder since October 1950.

REMARKS.--Interruptions in the record were due to malfunctions of the recorder.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: (Water years 1951-75) Maximum, 26.0°C Aug. 1, 1955; minimum, 0.0°C on many days during winter periods.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER		NOVEMBER		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	13.5	12.0	8.0	6.0	---	---	19.5	16.5		
2	12.0	10.0	9.5	8.0	---	---	18.0	15.0		
3	11.0	9.0	10.0	9.5	---	---	19.0	15.5		
4	12.0	10.0	10.5	10.0	---	---	18.5	16.5		
5	12.0	10.5	10.0	8.5	---	---	18.0	17.0		
6	13.0	11.5	10.0	9.5	---	---	17.5	14.5		
7	12.0	10.0	10.5	10.0	---	---	17.5	14.5		
8	11.0	10.5	11.0	10.0	---	---	18.0	15.0		
9	12.0	11.0	11.0	9.5	---	---	19.0	16.0		
10	12.0	12.0	10.0	9.0	21.0	18.5	18.5	16.5		
11	12.0	11.0	9.0	7.0	23.0	20.5	19.0	16.5		
12	11.0	10.0	7.0	7.0	22.0	18.5	19.5	18.5		
13	13.0	11.0	7.0	5.5	19.5	17.0	20.0	18.0		
14	14.0	14.0	5.5	3.0	21.0	17.5	19.5	16.5		
15	14.5	12.5	---	---	20.5	17.0	17.0	14.5		
16	13.0	11.0	---	---	20.5	19.0	17.0	13.5		
17	11.0	9.5	---	---	19.0	16.5	17.0	14.0		
18	10.0	9.0	---	---	19.0	16.0	18.5	15.5		
19	9.5	9.5	---	---	19.0	17.0	19.0	17.0		
20	10.5	9.5	---	---	19.0	18.0	20.0	17.5		
21	10.5	10.0	---	---	20.5	17.5	20.5	18.0		
22	10.5	10.0	---	---	20.5	17.5	21.0	18.5		
23	12.0	10.0	---	---	21.5	18.5	21.0	18.5		
24	11.5	11.0	---	---	21.0	19.0	19.0	17.0		
25	11.5	11.0	---	---	20.0	17.5	19.0	17.0		
26	11.0	8.0	---	---	20.5	17.5	18.5	17.5		
27	8.0	7.0	---	---	21.5	18.5	19.5	17.5		
28	8.0	8.0	---	---	21.5	18.5	20.0	18.5		
29	8.0	7.0	---	---	19.5	17.5	18.5	16.0		
30	7.0	5.5	---	---	20.5	18.0	---	---		
31	6.0	5.5	---	---	20.5	19.0	---	---		
MONTH	14.5	5.5	---	---	---	---	21.0	13.5		

04141000 SOUTH BRANCH SHEPARDS CREEK NEAR SELKIRK, MI

LOCATION.--Lat 44°18'28", long 84°05'13", in SE¼ SE¼ sec.8, T.22 N., R.3 E., Ogemaw County, Hydrologic Unit 04080101, on right bank 200 ft (61 m) upstream from mouth, 600 ft (183 m) west of bridge on Bedtelyon Road, and 1.1 mi (1.8 km) southwest of Selkirk.

DRAINAGE AREA.--1.15 mi^2 (2.98 km^2).

PERIOD OF RECORD.--October 1951 to current year.

REVISED RECORDS.--WSP 1557: 1952(M), 1954(M), 1955(P). WSP 2111: Drainage area.

GAGE.--Water-stage recorder and V notch sharp-crested weir. Altitude of gage is 845 ft (258 m) by barometer.

REMARKS.--Records fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--25 years, 0.55 ft^3/s (0.0156 m^3/s), 6.49 in/yr (165 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 181 ft^3/s (5.13 m^3/s) Apr. 3, 1956, from rating curve extended above 40 ft^3/s (1.13 m^3/s); maximum gage height, 4.42 ft (1.347 m) Apr. 3, 1956, May 28, 1973, no flow at times each year, except 1956, and 1967-76.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 20 ft^3/s (0.57 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Mar. 5	1100	21	0.59	2.86	0.872	Mar. 24	1730	20	0.57	2.85	0.869
Mar. 20	1800	*99	2.80	*3.99	1.216						

Minimum discharge, 0.02 ft^3/s (0.001 m^3/s) Aug. 22, 23, 24, 25; minimum gage height, 1.13 ft (0.344 m) Aug. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.13	.11	.53	.12	.12	3.2	1.5	.24	.28	1.5	.04	.28
2	.13	.11	.29	.12	.12	1.3	1.2	.40	.15	.40	.04	.19
3	.12	.12	.22	.12	.12	.91	.87	.91	.12	.24	.03	.18
4	.11	.11	.19	.12	.12	1.2	.64	.50	.10	.16	.03	.09
5	.11	.11	.23	.12	.12	15	.53	.62	.09	.09	.05	.08
6	.10	.11	.87	.12	.12	10	.42	1.3	.09	.09	.05	.07
7	.10	.16	.31	.12	.12	4.7	.37	.64	.08	.32	.04	.06
8	.10	.29	.22	.12	.12	2.0	.33	.45	.06	.31	.03	.06
9	.10	.20	.20	.12	.12	1.3	.31	.35	.06	.14	.03	.09
10	.10	.20	.19	.12	.15	1.1	.31	.26	.07	.17	.03	.10
11	.10	.18	.19	.12	.24	.83	.31	.29	.06	.09	.03	.08
12	.10	.16	.15	.12	.22	.83	.26	.26	.06	.06	.04	.06
13	.10	.16	.28	.12	.24	1.8	.26	.22	.05	.05	.04	.06
14	.10	.14	3.5	.12	.23	1.7	.24	.22	.04	.17	.04	.06
15	.10	.12	2.5	.12	.28	1.0	.29	.19	.09	.20	.05	.06
16	.10	.13	.64	.12	.83	.83	.26	.39	.12	.11	.04	.07
17	.10	.13	.33	.12	.69	.61	.24	.64	.09	.08	.03	.06
18	.10	.13	.15	.14	1.2	.50	.22	.38	.08	.06	.03	.04
19	.09	.13	.11	.12	1.9	4.3	.19	.24	.18	.05	.03	.03
20	.09	.21	.11	.12	4.1	38	.19	.19	.10	.06	.03	.04
21	.09	.38	.12	.12	2.3	12	.28	.16	.07	.06	.03	.04
22	.09	.26	.11	.12	1.5	2.7	.40	.14	.06	.04	.02	.03
23	.09	.19	.12	.12	1.8	4.7	.28	.14	.06	.04	.02	.03
24	.09	.18	.12	.12	1.3	10	.50	.14	.07	.04	.02	.03
25	.39	.14	.12	.12	1.4	6.4	1.9	.14	.09	.04	.02	.03
26	.18	.11	.12	.12	3.5	5.1	.76	.13	.06	.04	.04	.04
27	.14	.12	.12	.12	5.3	8.2	.50	.12	.04	.03	.06	.04
28	.11	.13	.12	.12	3.3	2.6	.37	.11	.09	.04	.05	.04
29	.10	.31	.12	.12	3.3	1.6	.31	.15	.40	.07	.04	.04
30	.09	1.8	.12	.12	---	4.6	.24	.33	1.6	.06	.04	.04
31	.09	---	.12	.12	---	2.5	---	.23	---	.04	.08	---
TOTAL	3.54	6.63	12.52	3.74	34.86	151.51	14.48	10.48	4.51	4.85	1.15	2.12
MEAN	.11	.22	.40	.12	1.20	4.89	.48	.34	.15	.16	.037	.071
MAX	.39	1.8	3.5	.14	5.3	38	1.9	1.3	1.6	1.5	.08	.28
MIN	.09	.11	.11	.12	.12	.50	.19	.11	.04	.03	.02	.03
CFSM	.10	.19	.35	.10	1.04	4.25	.42	.30	.13	.14	.03	.06
IN.	.11	.21	.40	.12	1.13	4.90	.47	.34	.15	.16	.04	.07

CAL YR 1975 TOTAL 188.45 MEAN .52 MAX 20 MIN .02 CFSM .45 IN 6.09
WTR YR 1976 TOTAL 250.39 MEAN .68 MAX 38 MIN .02 CFSM .59 IN 8.09

04142000 RIFLE RIVER NEAR STERLING, MI

LOCATION.--Lat 44°04'21", long 84° 01'12", in NE¼ SW¼ sec.5, T.19 N., R.4 E., Arenac County, Hydrologic Unit 04080101, on left bank 30 ft (9 m) downstream from bridge on Old M-70, 2.8 mi (4.5 km) north of Sterling, and 20 mi (32 km) upstream from mouth.

DRAINAGE AREA.--320 mi^2 (830 km^2), approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1905 to December 1908 (gage heights and discharge measurements only), October 1936 to current year. Monthly discharge only for some periods, published in WSP 1307. Published as Rifle River at Michigan Highway 70 near Sterling 1936-61.

REVISED RECORDS.--WSP 1437: 1937(M), 1939-40(M).

GAGE.--Water-stage recorder. Datum of gage is 649.48 ft (197.962 m) above mean sea level. November 1905 to December 1908, nonrecording gage at site 400 ft (122 m) downstream at different datum. Jan. 13, 1937, to Jan. 10, 1939, nonrecording gage at same site and datum.

REMARKS.--Water-discharge records good except those for the winter period, which are poor. Occasional regulation from dams above station.

AVERAGE DISCHARGE.--40 years, 309 ft^3/s (8.751 m^3/s), 13.11 in/yr (333 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,340 ft^3/s (151 m^3/s) Mar. 28, 1950, gage height, 13.74 ft (4.188 m), from rating curve extended above 3,800 ft^3/s (108 m^3/s); minimum, 75 ft^3/s (2.12 m^3/s) Nov. 22, 1964, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,600 ft^3/s (45.3 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Mar. 21	1300	1,800	51.0	*a9.41	2.868	Mar. 25	1900	*2,280	64.6	8.24	2.512

a Ice jam.

Minimum discharge, 127 ft^3/s (3.60 m^3/s) Sept. 24; minimum gage height, 1.47 ft (0.448 m) Aug. 24, 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	223	218	552	235	280	450	1500	552	414	1060	166	164
2	229	222	407	240	275	430	1180	480	358	822	168	181
3	220	232	330	240	270	430	992	465	309	542	164	161
4	217	231	300	240	270	480	857	452	287	403	159	154
5	209	224	300	240	270	700	739	412	273	321	166	144
6	221	217	320	245	275	1100	650	433	259	266	170	146
7	227	226	300	250	280	920	595	397	249	248	164	141
8	219	264	280	250	280	720	555	438	237	353	157	138
9	216	273	280	250	285	620	530	642	233	314	153	141
10	230	257	270	250	290	520	502	612	231	267	150	162
11	224	251	265	250	290	480	492	495	223	250	153	161
12	216	238	265	255	300	480	462	424	215	222	155	146
13	211	234	280	260	300	520	438	390	219	214	161	138
14	207	233	494	260	310	490	431	358	217	201	167	133
15	203	255	771	260	320	450	443	335	215	219	174	133
16	223	249	599	260	330	420	452	450	253	241	162	136
17	217	246	460	260	350	380	431	660	237	219	154	138
18	210	239	330	260	360	350	409	585	215	207	147	131
19	194	235	300	260	370	400	388	475	255	197	147	131
20	198	235	280	260	380	640	402	409	239	189	154	136
21	195	301	270	260	380	1700	475	383	215	195	151	136
22	190	322	250	265	370	1350	412	350	209	187	147	131
23	187	284	245	270	370	1100	385	327	201	177	144	135
24	189	268	240	270	380	1100	383	319	203	177	138	130
25	237	257	235	270	400	2140	540	309	213	177	138	128
26	274	237	230	270	460	2160	612	307	203	170	139	131
27	245	243	230	270	550	2100	525	297	191	166	193	136
28	225	251	230	270	520	2160	825	287	201	168	159	139
29	216	269	235	270	480	1700	796	297	241	191	149	138
30	213	485	235	275	---	1430	628	358	535	187	141	138
31	223	---	235	280	---	1550	---	421	---	173	143	---
TOTAL	6708	7696	10018	7995	9995	29470	18029	13119	7550	8723	4833	4257
MEAN	216	257	323	258	345	951	601	423	252	281	156	142
MAX	274	485	771	280	550	2160	1500	660	535	1060	193	181
MIN	187	217	230	235	270	350	383	287	191	166	138	128
CFSM	.68	.80	1.01	.81	1.08	2.97	1.88	1.32	.79	.88	.49	.44
IN.	.78	.89	1.16	.93	1.16	3.43	2.10	1.53	.88	1.01	.56	.49

CAL YR 1975 TOTAL 118918 MEAN 326 MAX 2500 MIN 136 CFSM 1.02 IN 13.82
WTR YR 1976 TOTAL 128393 MEAN 351 MAX 2160 MIN 128 CFSM 1.10 IN 14.93

04142000 RIFLE RIVER NEAR STERLING, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1966-72, 1974 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: November 1974 to current year.
WATER TEMPERATURES: November 1974 to current year.
SUSPENDED-SEDIMENT DISCHARGE: Water year 1970.

INSTRUMENTATION.--Water quality monitor since Aug. 28, 1975.

REMARKS.--Monthly samples are collected as a cross-section sample at or near vicinity of bridge. Interruptions in the daily record are due to malfunctions of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 480 micromhos Feb. 10, 1975; minimum, 157 micromhos Aug. 31, 1975.
WATER TEMPEATURES: Maximum, 27.0°C July 28, Aug. 22, 27, 28, 1976; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 468 micromhos Feb. 3; minimum, 214 micromhos Mar. 26.
WATER TEMPERATURES: Maximum, 27.0°C July 28, Aug. 22, 27, 28; minimum, 0.0°C on many days during winter period.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT												
09...	1500	205	421	8.2	12.0	10.7	110	42	5	6	210	13
NOV												
21...	1200	305	428	8.0	6.0	12.9	106	230	38	130	200	11
DEC												
11...	1400	265	461	7.8	1.0	13.6	98	120	17	19	220	31
JAN												
08...	1430	250	436	8.2	.0	13.5	94	15	23	25	230	25
FEB												
12...	1500	301	444	7.9	.0	12.7	89	430	380	30	200	10
MAR												
11...	1330	433	338	7.8	1.5	13.7	100	21	200	16	150	7
APR												
08...	1500	492	336	8.0	8.0	11.3	97	<1	10	5	170	12
MAY												
13...	1500	376	387	8.4	14.0	11.5	114	22	5	5	200	0
JUN												
11...	1100	223	415	8.3	22.5	10.0	116	84	25	22	200	8
JUL												
15...	1400	231	403	8.3	24.0	10.3	124	110	30	32	200	16
AUG												
05...	1430	166	408	8.2	19.0	--	--	160	92	79	210	25
SEP												
01...	1200	166	425	8.3	21.0	12.7	144	190	200	86	200	36

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT												
09...	60	15	11	.3	1.1	240	0	197	2.2	29	17	.3
NOV												
21...	56	15	11	.3	1.1	230	0	189	3.7	28	17	.4
DEC												
11...	63	16	12	.4	1.2	230	0	189	5.8	30	19	.2
JAN												
08...	63	17	11	.3	1.2	250	0	205	2.5	31	17	.2
FEB												
12...	55	15	9.6	.3	.8	232	0	190	4.7	29	16	.1
MAR												
11...	39	12	6.6	.2	1.8	174	0	143	4.4	22	11	.2
APR												
08...	48	11	7.8	.3	1.3	192	0	157	3.1	26	13	.1
MAY												
13...	55	14	9.0	.3	1.1	208	19	203	1.6	26	15	.1
JUN												
11...	57	14	11	.3	1.0	234	0	192	1.9	29	18	.2

04142000 RIFLE RIVER NEAR STERLING, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT											
09...	6.3	265	258	147	.00	.26	1.2	.01	8	4.4	100
NOV											
21...	6.8	259	249	213	.03	.34	1.5	.03	2	1.6	100
DEC											
11...	9.0	284	264	203	.19	.55	2.4	.01	11	7.9	100
JAN											
08...	11	258	275	174	.25	.50	2.2	.03	42	28	100
FEB											
12...	9.6	259	249	210	.32	.32	1.4	.07	20	16	100
MAR											
11...	7.1	225	185	263	.28	.83	3.7	.04	28	33	100
APR											
08...	6.1	210	208	279	.32	1.1	5.0	.03	13	17	100
MAY											
13...	5.1	235	247	239	.06	.61	2.7	.03	16	16	100
JUN											
11...	5.9	249	251	150	.09	.44	1.9	.05	18	11	100
JUL											
15...	5.6	262	247	163	.00	.35	1.6	.03	12	7.5	100
AUG											
05...	5.9	242	250	108	.01	.61	2.7	.03	12	5.4	100
SEP											
01...	6.8	255	229	114	.01	.16	.71	.04	15	6.7	100

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
OCT												
09...	1500	2	2	1	0	<10	0	0	0	9	0	250
JAN												
08...	1430	2	1	0	0	<10	0	0	0	7	0	240
APR												
08...	1500	0	0	0	0	20	10	0	0	0	0	750
JUL												
15...	1400	3	2	2	2	10	<10	1	0	0	0	200

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT												
09...	20	18	0	30	0	.2	.0	0	0	60	20	6.6
JAN												
08...	30	10	0	--	10	.1	.1	0	0	30	0	6.0
APR												
08...	70	2	1	40	30	<.5	<.5	0	0	--	50	8.9
JUL												
15...	30	--	15	20	10	<.5	<.5	1	0	10	0	--

04142000 RIFLE RIVER NEAR STERLING, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
PERIPHYTON

DATE	LENGTH OF EXPOSURE (DAYS)	PERIPHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERIPHYTON BIOMASS ASH WEIGHT G/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL A MG/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL B MG/SQ M	BIOMASS CHLOROPHYLL RATIO PERIPHYTON (UNITS)
OCT						
09...	--	360	340	25.0	.100	--
NOV						
21...	43	360	34.0	25.0	.100	710
FEB						
12...	35	3.10	2.20	.800	.100	1100
SEP						
01...	27	151	142	3.43	.152	2300

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

OCT. 9, 1975
1500 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,400 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
L	....OOCYSTIS			0
	..TETRASPORALES			
	...PALMELLACEAE			
L	....SPHAEROCYSTIS			0
	..ZYGNEMATALES			
	...DESMIDIACEAE	PLACODERM DESMIDS		
	....STAURASTRUM		19	1
		TOTALS	19	1
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		400	28
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		38	3
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
	....FRAGILARIA		150	11
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		38	3
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		130	9
	...NITZSCHIACEAE			
	....NITZSCHIA		96	7
		TOTALS	870	61
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
D	....DINOBRYON		460	32
	....OCHROMONAS		58	4
		TOTALS	520	36
	EUGLENOPHYTA	EUGLENOIDS		
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
	....TRACHELOMONAS		19	1
		TOTALS	19	1

04142000 RIFLE RIVER NEAR STERLING, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

NOV. 21, 1975
1200 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,400 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....SCENEDESMUS		110	5
		TOTALS	110	5
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		43	2
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		22	1
	....COCCONEIS		22	1
	...CYMBELLACEAE			
	....CYMBELLA		170	7
	...DIATOMACEAE			
D	....DIATOMA		410	17
	...FRAGILARIACEAE			
	....FRAGILARIA		43	2
D	....SYNEDRA		560	23
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		43	2
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		480	20
	....PINNULARIA		43	2
	...NITZSCHIACEAE			
D	....NITZSCHIA		450	19
		TOTALS	2,300	96

DEC. 11, 1975
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

580 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		25	4
		TOTALS	25	4
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		25	4
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		25	4
	....COCCONEIS		25	4
	...CYMBELLACEAE			
L	....CYMBELLA			0
	...DIATOMACEAE			
D	....DIATOMA		150	26
	...FRAGILARIACEAE			
	....SYNEDRA		50	9
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		50	9
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		100	17
	...NITZSCHIACEAE			
D	....NITZSCHIA		130	22
		TOTALS	550	95
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
L	....OSCILLATORIA			0

04142000 RIFLE RIVER NEAR STERLING, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JAN. 8, 1976
1430 HOURS

IDENTIFICATION OF PHYTOPLANKTON

150 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
L	....CYCLOTELLA			0
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		13	8
	....COCCONEIS		6	4
	...CYMBELLACEAE			
L	....AMPHORA			0
	....CYMBELLA		13	8
	...DIATOMACEAE			
	....DIATOMA		6	4
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
L	....FRAGILARIA			0
D	....SYNEDRA		32	21
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		13	8
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		44	29
L	....PINNULARIA			0
	...NITZSCHIACEAE			
	....NITZSCHIA		19	12
	...SURIRELLACEAE			
L	....CYMATOPLEURA		0	0
		TOTALS	150	94
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		6	4
		TOTALS	6	4

FEB. 12, 1976
1500 HOURS

IDENTIFICATION OF PHYTOPLANKTON

880 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		34	4
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		120	14
	....COCCONEIS		23	3
	....RHOICOSPHENIA		11	1
	...CYMBELLACEAE			
	....AMPHORA		11	1
	....CYMBELLA		68	8
	...DIATOMACEAE			
	....DIATOMA		45	5
	...FRAGILARIACEAE			
	....FRAGILARIA		110	13
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		23	3
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		230	26
	....NEIDIUM		11	1
	...NITZSCHIACEAE			
	....NITZSCHIA		100	12
		TOTALS	790	91
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
	....OSCILLATORIA		90	10
		TOTALS	90	10

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

APR. 8, 1976
1500 HOURS

IDENTIFICATION OF PHYTOPLANKTON

580 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		41	7
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		41	7
	....COCCONEIS		14	2
L	....RHOICOSPHENIA			0
	...CYMBELLACEAE			
L	....AMPHORA			0
	....CYMBELLA		14	2
	...DIATOMACEAE			
	....DIATOMA		68	12
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
	....FRAGILARIA		54	9
	....SYNEDRA		14	2
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		14	2
	...MERIDIONACEAE			
L	....MERIDION			0
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		110	19
	...NITZSCHIACEAE			
	....NITZSCHIA		54	9
	...SURIRELLACEAE			
L	....SURIRELLA		0	0
		TOTALS	420	71
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		160	28
		TOTALS	160	28

MAY 13, 1976
1500 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,700 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...MICRACTINIACEAE			
	....MICRACTINIUM		220	13
	...OOCYSTACEAE			
	....KIRCHNERIELLA		55	3
	....TETRAEDRON		55	3
		TOTALS	330	19
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		160	10
	..PENNALES	PENNATE		
	...NAVICULACEAE	NAVICULOID		
D	....NAVICULA		990	58
	...NITZSCHIACEAE			
	....NITZSCHIA		160	10
	...SURIRELLACEAE			
	....SURIRELLA		55	3
		TOTALS	1,400	81

04142000 RIFLE RIVER NEAR STERLING, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JUNE 11, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

5,500 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...SCENEDESMACEAE				
	....SCENEDESMUS			490	9
			TOTALS	490	9
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
D	....CYCLOTELLA			3,900	71
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			120	2
	....COCCONEIS			120	2
	...CYMBELLACEAE				
	....CYMBELLA			250	4
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			490	9
	...NITZSCHIACEAE				
	....NITZSCHIA			120	2
			TOTALS	5,000	90

JULY 15, 1976
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

720 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...SCENEDESMACEAE				
	....SCENEDESMUS			36	5
			TOTALS	36	5
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
D	....CYCLOTELLA			190	26
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....COCCONEIS			63	9
	....RHOICOSPHENIA			27	4
	...DIATOMACEAE				
	....DIATOMA			9	1
	...NAVICULACEAE	NAVICULOID			
D	....NAVICULA			320	45
	...NITZSCHIACEAE				
	....NITZSCHIA			72	10
			TOTALS	690	95

04142000 RIFLE RIVER NEAR STERLING, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

AUG. 5, 1976
1430 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,600 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...SCENEDESMACEAE				
L	....ACTINASTRUM				0
	....SCENEDESMUS			52	3
			TOTALS	52	3
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			65	4
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
D	....ACHNANTHES			270	17
	....COCCONEIS			52	3
	....RHOICOSPHENIA			65	4
	...CYMBELLACEAE				
	....AMPHORA			13	1
	....CYMBELLA			190	12
	...DIATOMACEAE				
	....DIATOMA			120	7
	...FRAGILARIACEAE				
	....FRAGILARIA			26	2
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			26	2
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			220	14
	...NITZSCHIACEAE				
	....NITZSCHIA			170	10
			TOTALS	1,200	76
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..CHROOCOCCALES	COCCOID			
	...CHROOCOCCACEAE				
D	....ANACYSTIS			340	21
			TOTALS	340	21
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOMONODACEAE				
	....CRYPTOMONAS			13	1
			TOTALS	13	1

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

SEP. 1, 1976
1200 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,500 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....SCENEDESMUS		320	13
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		27	1
		TOTALS	350	14
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		290	12
	....MELOSIRA		53	2
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		80	3
	....RHOICOSPHENIA		80	3
	...CYMBELLACEAE			
	....CYMBELLA		80	3
	...GOMPHONEMATACEAE			
	....GOMPHONEMA		27	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		80	3
	...NITZSCHIACEAE			
	....NITZSCHIA		190	7
		TOTALS	880	34
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
D	....APHANIZOMENON		720	29
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		530	21
		TOTALS	1,200	50
	EUGLENOPHYTA	EUGLENOIDS		
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
	....TRACHELOMONAS		27	1
		TOTALS	27	1

NOTE: D - DOMINANT ORGANISM; GREATER OR EQUAL TO 15%
L - LESS THEN 1%; MAY NOT HAVE BEEN ACTUALLY COUNTED

04142000 RIFLE RIVER NEAR STERLING, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	422	412	418	430	426	428	426	417	419	421	415	418
2	415	408	412	433	427	430	431	420	425	425	422	423
3	418	414	416	432	425	429	443	415	431	426	419	422
4	423	414	419	432	428	430	445	441	443	422	417	421
5	426	416	420	435	429	433	446	422	438	440	389	424
6	424	398	415	437	430	434	447	411	426	448	434	441
7	412	404	410	438	430	435	452	445	448	444	425	436
8	413	406	412	439	429	436	458	449	455	436	419	427
9	416	405	411	441	430	437	457	451	453	451	423	437
10	415	404	411	443	437	440	457	455	456	456	451	453
11	415	409	412	441	439	440	461	456	458	452	434	444
12	415	410	413	442	434	440	457	454	456	439	426	431
13	420	413	417	442	437	440	457	427	446	428	421	425
14	424	417	421	440	430	437	425	308	351	425	422	424
15	426	418	422	436	429	430	388	309	350	434	427	430
16	429	416	422	426	421	424	398	386	391	439	433	436
17	416	412	414	431	424	428	417	399	410	441	436	438
18	416	414	415	433	426	431	429	417	424	453	440	445
19	424	417	420	435	429	432	445	428	433	458	451	456
20	428	423	426	437	426	434	445	438	442	451	439	445
21	428	423	426	448	428	432	436	416	426	441	432	435
22	430	424	428	449	429	437	437	416	427	435	432	433
23	433	427	430	444	436	439	438	432	436	440	437	438
24	435	427	430	446	437	442	433	431	432	445	440	443
25	435	421	426	443	435	440	435	430	433	446	438	441
26	440	423	432	444	440	443	431	426	429	440	436	438
27	431	428	429	445	438	440	428	424	426	438	436	437
28	435	431	433	444	438	441	428	424	426	445	437	440
29	435	431	433	446	416	438	432	427	429	450	442	446
30	431	422	428	429	362	395	438	424	430	449	443	445
31	427	423	424	---	---	---	427	418	423	451	445	447
MONTH	440	398	421	449	362	434	461	308	428	458	389	436

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	451	445	448	379	368	375	254	242	246	369	360	365
2	451	444	448	383	374	380	270	254	263	374	368	371
3	468	452	458	383	378	380	286	271	278	372	367	369
4	465	452	457	382	336	372	303	286	294	373	367	370
5	456	450	454	330	284	295	315	303	309	378	372	374
6	455	452	453	286	278	281	324	314	319	376	369	372
7	458	454	455	290	279	285	333	325	329	372	370	371
8	460	455	458	307	259	288	338	332	335	375	369	372
9	456	453	454	320	276	308	346	338	341	377	373	374
10	455	450	452	328	316	323	354	347	350	381	374	377
11	452	445	448	338	327	332	360	354	357	383	380	382
12	447	438	444	339	330	335	367	360	363	386	380	383
13	446	437	442	332	325	329	375	364	369	---	---	---
14	453	443	446	340	332	336	385	376	381	---	---	---
15	451	440	446	349	339	344	384	374	380	---	---	---
16	439	431	435	356	346	352	373	362	366	---	---	---
17	433	422	426	370	353	360	369	361	365	---	---	---
18	422	404	415	374	369	372	380	369	375	---	---	---
19	401	398	400	381	306	359	378	368	374	---	---	---
20	400	398	398	331	242	288	374	367	370	---	---	---
21	396	393	395	242	230	236	379	370	374	---	---	---
22	397	395	396	256	228	242	381	370	375	---	---	---
23	406	396	401	271	256	266	386	380	383	---	---	---
24	412	395	402	277	261	272	388	380	384	---	---	---
25	399	380	390	261	242	251	380	360	369	---	---	---
26	377	372	375	241	214	231	360	353	355	---	---	---
27	390	369	378	235	221	229	359	355	356	---	---	---
28	392	389	391	235	231	233	361	354	358	---	---	---
29	389	369	380	242	231	236	355	350	352	---	---	---
30	---	---	---	248	242	246	361	353	356	---	---	---
31	---	---	---	250	245	248	---	---	---	---	---	---
MONTH	468	369	426	383	214	303	388	242	348	---	---	---

04142000 RIFLE RIVER NEAR STERLING, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	---	---	---	---	---	---	382	370	378
2	---	---	---	---	---	---	---	---	---	377	365	371
3	---	---	---	---	---	---	---	---	---	381	374	377
4	---	---	---	---	---	---	---	---	---	389	380	385
5	---	---	---	---	---	---	---	---	---	390	385	387
6	---	---	---	---	---	---	---	---	---	386	379	382
7	---	---	---	---	---	---	---	---	---	392	381	386
8	---	---	---	---	---	---	---	---	---	399	389	393
9	---	---	---	---	---	---	---	---	---	395	377	385
10	---	---	---	---	---	---	---	---	---	386	380	384
11	---	---	---	---	---	---	---	---	---	387	382	385
12	440	412	424	---	---	---	412	403	411	394	384	388
13	443	416	430	---	---	---	413	404	410	399	391	395
14	446	421	432	---	---	---	411	392	401	403	394	397
15	438	420	432	---	---	---	408	393	401	399	394	398
16	438	419	426	392	370	382	402	394	398	397	394	396
17	438	419	429	394	374	383	406	393	399	402	394	398
18	441	432	437	395	384	389	406	393	399	400	394	396
19	436	422	430	398	389	393	407	396	401	403	394	397
20	436	427	432	410	398	402	406	395	400	398	392	395
21	437	430	434	414	405	408	398	391	395	398	389	393
22	445	436	441	409	401	406	406	392	399	393	388	390
23	447	435	442	413	404	409	403	392	397	396	389	392
24	450	437	444	415	410	413	399	389	394	395	392	393
25	454	443	448	417	411	413	398	389	393	397	392	394
26	452	435	447	415	411	412	399	392	394	394	392	393
27	457	438	448	422	416	419	390	367	378	398	395	396
28	467	429	446	---	---	---	399	376	391	399	394	397
29	---	---	---	---	---	---	391	381	387	401	395	398
30	---	---	---	---	---	---	386	378	383	402	395	398
31	---	---	---	---	---	---	390	381	385	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	403	365	391

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	14.0	12.0	13.0	8.0	6.0	7.0	3.5	1.0	2.0	0.0	0.0	0.0
2	12.0	9.0	10.5	10.5	7.5	9.0	1.0	0.0	0.5	0.0	0.0	0.0
3	12.5	8.0	10.0	11.0	9.0	10.0	0.0	0.0	0.0	0.5	0.0	0.0
4	14.0	9.5	11.0	11.0	9.5	10.5	0.0	0.0	0.0	0.5	0.0	0.0
5	14.0	10.0	11.5	10.5	8.5	9.5	1.5	0.0	0.5	0.5	0.0	0.0
6	14.5	10.5	12.0	11.0	8.5	9.5	2.0	0.5	1.5	0.0	0.0	0.0
7	13.5	10.0	11.5	12.0	10.0	11.0	0.5	0.0	0.5	0.0	0.0	0.0
8	12.5	9.5	11.0	12.5	11.0	11.5	1.0	0.0	0.5	0.0	0.0	0.0
9	12.0	11.0	11.5	11.0	10.5	10.5	1.5	0.5	1.0	0.0	0.0	0.0
10	12.5	11.5	12.0	11.5	8.5	10.5	1.5	0.5	1.0	0.0	0.0	0.0
11	12.5	10.5	11.5	8.5	7.0	7.5	1.5	0.5	1.0	0.0	0.0	0.0
12	12.0	9.0	10.5	8.0	7.0	7.5	1.0	0.5	0.5	0.0	0.0	0.0
13	15.5	10.5	12.5	7.0	4.5	6.0	1.5	0.5	1.0	0.0	0.0	0.0
14	16.5	12.5	14.5	4.5	3.5	4.0	4.5	2.0	3.0	0.0	0.0	0.0
15	16.0	13.0	15.0	5.0	3.0	3.5	4.5	2.0	3.5	0.0	0.0	0.0
16	13.0	11.5	12.5	4.5	3.0	4.0	2.0	0.5	1.0	0.0	0.0	0.0
17	11.5	10.0	10.5	6.0	3.5	4.5	1.0	0.0	0.0	0.0	0.0	0.0
18	10.5	8.5	9.5	8.0	5.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0
19	10.0	9.5	10.0	7.5	6.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0
20	11.5	10.0	10.5	7.0	5.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
21	11.0	9.5	10.5	6.5	5.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
22	11.5	9.5	10.5	5.0	3.5	4.5	0.0	0.0	0.0	0.0	0.0	0.0
23	14.0	10.0	11.5	4.0	3.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0
24	13.0	10.5	11.5	3.5	2.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
25	12.5	10.0	12.0	2.0	0.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0
26	10.0	8.0	9.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	9.5	6.5	8.0	1.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
28	10.0	7.0	8.5	2.0	1.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0
29	8.5	6.0	7.5	3.0	1.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0
30	6.0	4.5	5.5	5.0	3.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
31	7.0	5.0	5.5	---	---	---	0.0	0.0	0.0	0.0	0.0	0.0
MONTH	16.5	4.5	10.5	12.5	0.0	6.0	4.5	0.0	0.5	0.5	0.0	0.0

04142000 RIFLE RIVER NEAR STERLING, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	0.0	0.0	0.0	1.5	0.0	1.0	5.0	4.5	5.0	15.0	10.5	12.5
2	0.0	0.0	0.0	0.0	0.0	0.0	6.0	4.5	5.0	12.5	9.5	11.0
3	0.0	0.0	0.0	0.5	0.0	0.5	7.0	5.0	6.0	9.0	7.5	8.0
4	0.0	0.0	0.0	0.5	0.5	0.5	8.0	5.5	6.5	11.0	6.0	8.5
5	0.0	0.0	0.0	1.0	0.5	0.5	8.0	5.0	6.5	12.5	9.0	10.5
6	0.0	0.0	0.0	1.0	0.0	0.5	8.5	5.5	7.0	10.5	9.0	9.5
7	0.0	0.0	0.0	1.0	0.0	0.5	8.5	6.0	7.0	9.5	8.0	8.5
8	0.0	0.0	0.0	1.5	0.0	0.5	8.5	5.0	6.5	12.0	7.0	9.5
9	0.0	0.0	0.0	2.0	0.0	1.0	8.5	5.0	6.5	15.5	10.0	12.5
10	0.0	0.0	0.0	2.5	1.0	1.5	8.0	6.0	7.0	17.0	11.5	14.0
11	0.0	0.0	0.0	2.5	0.5	1.5	8.5	5.5	6.5	15.0	12.5	13.5
12	0.0	0.0	0.0	1.0	0.5	1.0	8.5	4.5	6.5	15.5	10.5	12.5
13	0.0	0.0	0.0	2.0	0.5	1.0	10.5	5.0	7.5	---	---	---
14	0.0	0.0	0.0	2.0	0.5	1.0	12.5	8.0	10.0	---	---	---
15	0.0	0.0	0.0	3.0	0.5	1.5	15.0	11.0	13.0	---	---	---
16	0.0	0.0	0.0	3.0	1.0	1.5	19.0	13.0	15.5	---	---	---
17	0.0	0.0	0.0	1.5	0.0	0.5	19.5	15.5	17.5	---	---	---
18	0.0	0.0	0.0	1.5	0.0	1.0	20.5	16.0	18.0	---	---	---
19	0.0	0.0	0.0	5.5	1.0	3.0	20.0	16.0	18.0	---	---	---
20	0.0	0.0	0.0	4.0	2.0	3.0	17.5	14.0	15.5	---	---	---
21	0.0	0.0	0.0	2.0	0.5	1.0	14.5	12.5	13.5	---	---	---
22	0.0	0.0	0.0	1.5	0.0	1.0	14.5	12.5	13.5	---	---	---
23	0.0	0.0	0.0	3.0	0.5	2.0	15.0	11.0	12.5	---	---	---
24	0.0	0.0	0.0	5.0	2.5	3.5	13.0	9.0	11.0	---	---	---
25	0.5	0.0	0.0	4.5	3.0	4.0	8.5	6.0	7.0	---	---	---
26	0.5	0.0	0.0	5.0	3.5	4.0	6.0	5.5	5.5	---	---	---
27	1.5	0.0	0.5	5.5	4.0	5.0	8.5	5.0	6.5	---	---	---
28	3.0	1.0	1.5	4.0	3.0	3.5	12.5	6.5	9.0	---	---	---
29	2.5	1.0	1.5	5.0	4.0	4.0	13.0	8.5	10.5	---	---	---
30	---	---	---	6.0	5.0	5.5	12.5	10.0	11.5	---	---	---
31	---	---	---	6.0	5.0	5.5	---	---	---	---	---	---
MONTH	3.0	0.0	0.0	6.0	0.0	2.0	20.5	4.5	9.5	---	---	---

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	---	---	---	---	---	---	23.0	20.5	22.0
2	---	---	---	---	---	---	---	---	---	21.5	17.0	19.5
3	---	---	---	---	---	---	---	---	---	22.5	17.5	20.0
4	---	---	---	---	---	---	---	---	---	23.0	20.0	22.0
5	---	---	---	---	---	---	---	---	---	22.0	19.5	21.0
6	---	---	---	---	---	---	---	---	---	21.0	16.5	19.0
7	---	---	---	---	---	---	---	---	---	22.5	17.5	20.0
8	---	---	---	---	---	---	---	---	---	24.5	19.5	22.0
9	---	---	---	---	---	---	---	---	---	23.0	19.0	20.5
10	---	---	---	---	---	---	---	---	---	20.0	17.0	18.5
11	---	---	---	---	---	---	---	---	---	21.0	17.0	19.0
12	24.0	18.5	21.5	---	---	---	24.0	20.5	22.5	21.5	17.5	19.5
13	25.5	18.5	21.5	---	---	---	24.5	20.5	23.0	21.5	17.5	19.5
14	25.5	20.0	23.0	---	---	---	23.5	18.5	20.5	22.5	18.0	20.5
15	24.0	20.5	22.0	---	---	---	21.0	16.5	18.5	21.5	19.0	20.0
16	22.0	18.0	19.5	24.5	21.0	23.0	21.5	15.5	18.5	18.5	18.0	18.0
17	21.5	16.5	18.5	23.0	17.5	20.0	22.5	16.5	19.5	21.0	17.0	19.0
18	22.5	16.5	19.0	23.5	17.0	20.0	23.5	17.0	20.5	21.0	16.5	19.0
19	22.5	17.0	20.0	23.5	18.5	21.0	24.0	19.5	21.5	21.0	17.0	19.0
20	23.0	16.5	19.5	22.5	20.0	21.0	26.0	20.5	23.5	20.0	17.5	18.5
21	22.0	17.0	19.5	24.5	18.5	21.5	26.5	21.0	24.0	16.5	14.0	15.5
22	22.0	18.0	19.5	25.0	19.0	22.0	27.0	21.5	24.5	14.5	11.5	13.0
23	24.0	17.5	20.5	26.5	21.0	23.5	26.0	22.0	24.5	14.5	12.0	13.0
24	22.5	18.0	19.5	25.0	21.5	23.5	25.5	20.5	23.0	13.5	9.5	11.5
25	23.5	17.0	20.0	23.5	19.0	21.5	25.5	20.5	23.0	13.0	9.5	11.5
26	24.5	18.0	21.0	25.5	19.0	22.5	25.0	22.5	24.0	12.0	10.0	10.5
27	26.0	19.0	22.5	27.0	21.5	24.0	27.0	22.0	24.5	12.0	10.5	11.5
28	22.5	19.0	20.5	---	---	---	27.0	23.5	25.5	12.5	9.0	10.5
29	---	---	---	---	---	---	24.5	20.5	22.0	13.5	9.5	11.5
30	---	---	---	---	---	---	22.0	17.0	20.0	14.0	9.5	12.0
31	---	---	---	---	---	---	23.0	18.0	20.5	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	24.5	9.0	17.0

04143500 NORTH BRANCH KAWKAWLIN RIVER NEAR KAWKAWLIN, MI

LOCATION.--Lat 43°40'05", long 83°58'13", in SE¼ SE¼ sec.27, T.15 N., R.4 E., Bay County, Hydrologic Unit 04080102, on left bank 50 ft (15 m) upstream from bridge on Beaver Road, 1.7 mi (2.7 km) northwest of Kawkawlin, and 2.4 mi (3.9 km) upstream from mouth.

DRAINAGE AREA.--101 mi^2 (262 km^2).

PERIOD OF RECORD.--March 1951 to current year.

GAGE.--Water-stage recorder. Datum of gage is 584.00 ft (178.003 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to Sept. 26, 1951, nonrecording gage at site 70 ft (21 m) downstream, and Sept. 27, 1951, to Sept. 30, 1960, water-stage recorder at present site, at datum 2.00 ft (0.610 m) higher.

REMARKS.--Records good except those for the winter period, and those for period of no gage-height record, Apr. 13 to May 25, which are poor. Some diversion above station for irrigation. Some regulation during low flows from dams above station. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--25 years, 61.3 ft^3/s (1.736 m^3/s), 8.24 in/yr (209 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,610 ft^3/s (45.6 m^3/s) May 18, 1974, gage height, 10.92 ft (3.328 m); no flow at times in each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,420 ft^3/s (40.2 m^3/s) Mar. 22, gage height, 10.44 ft (3.182 m); no flow Aug. 12-14, Aug. 17 to Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	2.8	159	30	36	670	358	310	23	8.6	1.1	
2	14	4.4	157	30	36	632	321	250	20	12	.98	
3	13	7.8	225	30	36	590	272	200	19	13	.91	
4	13	11	241	31	36	494	226	190	17	11	.74	
5	12	10	210	31	36	558	193	240	16	10	.54	
6	11	8.9	223	31	37	670	168	440	15	8.0	.49	
7	9.5	11	182	32	37	871	149	680	14	9.0	.33	
8	8.7	15	164	32	38	988	129	720	14	9.0	.28	
9	8.3	16	155	32	38	742	105	600	14	8.4	.15	
10	7.5	18	140	32	38	562	91	440	14	7.3	.03	
11	6.4	19	130	31	39	472	83	300	13	6.0	.02	
12	5.7	20	120	31	41	409	72	230	12	5.2	0	
13	4.8	24	116	31	43	511	66	190	10	4.7	0	
14	4.2	31	201	31	47	536	61	150	8.9	4.3	0	
15	3.9	28	281	32	54	580	64	140	7.7	4.0	.08	
16	3.6	22	286	33	140	529	80	140	6.8	3.8	.03	
17	3.6	18	409	33	210	478	62	180	6.1	3.6	0	
18	3.4	15	330	34	300	338	56	200	5.3	3.3	0	
19	3.6	13	240	34	430	404	53	190	4.9	3.2	0	
20	3.4	12	170	35	740	602	51	160	4.5	3.0	0	
21	2.7	13	120	35	940	994	48	130	4.3	2.9	0	
22	2.2	12	90	36	880	1360	49	100	3.6	2.3	0	
23	1.8	12	68	36	760	1060	50	80	3.3	1.6	0	
24	1.5	12	56	36	700	745	70	62	3.1	1.0	0	
25	2.3	12	45	36	630	570	200	51	3.0	.56	0	
26	3.4	15	42	36	640	527	460	50	2.9	.34	0	
27	4.4	23	39	36	760	556	660	43	2.9	.24	0	
28	4.6	32	37	36	787	524	640	33	3.0	.22	0	
29	4.2	50	35	36	742	484	450	27	3.7	.82	0	
30	3.3	196	32	36	---	471	370	26	7.0	1.1	0	
31	2.5	---	29	36	---	416	---	25	---	1.2	0	---
TOTAL	189.5	683.9	4732	1031	9251	19343	5657	6577	282.0	149.68	5.68	0
MEAN	6.11	22.8	153	33.3	319	624	189	212	9.40	4.83	.18	0
MAX	17	196	409	36	940	1360	660	720	23	13	1.1	0
MIN	1.5	2.8	29	30	36	338	48	25	2.9	.22	0	0
CFSM	.06	.23	1.51	.33	3.16	6.18	1.87	2.10	.09	.05	.001	0
IN.	.07	.25	1.74	.38	3.41	7.12	2.08	2.42	.10	.06	.002	0

CAL YR 1975 TOTAL 29349.52 MEAN 80.4 MAX 492 MIN 0 CFSM .80 IN 10.81
WTR YR 1976 TOTAL 47901.76 MEAN 131 MAX 1360 MIN 0 CFSM 1.30 IN 17.64

04143900 SHIAWASSEE RIVER AT LINDEN, MI

LOCATION.--Lat 42°48'56", long 83°48'08", in SW¼ sec.19, T.5 N., R.6 E., Genesee County, Hydrologic Unit 04080203, on right bank at upstream side of bridge on Hogan Road, 1.0 mi (1.6 km) west of Linden.

DRAINAGE AREA.--81.2 mi^2 (210.3 km^2).

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 850 ft (259 m) from topographic map.

REMARKS.--Records good except those for the winter period, which are fair. Low flow regulated at times by lakes above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--9 years, 66.9 ft^3/s (1.895 m^3/s), 11.19 in/yr (284 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 476 ft^3/s (13.5 m^3/s) Apr. 22, 1975, gage height, 7.43 ft (2.265 m); minimum, 0.74 ft^3/s (0.021 m^3/s) May 22, 23, 1971; minimum gage height, 2.82 ft (0.860 m) Aug. 2, 1971.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 293 ft^3/s (8.30 m^3/s) Mar. 7, 8, gage height, 6.51 ft (1.984 m); minimum, 7.3 ft^3/s (0.21 m^3/s) July 21, gage height, 3.18 ft (0.969 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	82	53	82	92	78	213	160	183	69	84	24	24
2	82	53	104	94	78	218	161	184	70	94	24	23
3	81	63	104	94	80	229	162	178	68	89	24	23
4	79	59	94	94	82	237	164	162	64	87	26	23
5	79	60	94	92	80	262	154	151	62	79	28	23
6	75	72	108	90	80	277	135	160	62	77	30	23
7	62	76	112	80	78	286	139	169	61	74	29	23
8	51	77	129	22	76	286	150	164	62	83	28	23
9	50	76	142	38	74	271	147	161	61	64	28	24
10	45	79	121	48	72	260	143	160	59	53	27	24
11	37	80	91	52	68	255	139	162	56	47	27	23
12	37	81	127	57	66	243	130	163	50	46	27	23
13	38	93	143	62	78	231	128	161	22	47	27	23
14	41	95	151	66	84	213	124	155	20	48	28	23
15	45	98	173	70	96	220	107	116	20	48	29	25
16	45	98	163	73	127	210	112	119	21	48	28	23
17	45	97	153	74	142	170	115	122	21	48	28	23
18	44	94	145	74	152	174	124	122	18	48	28	23
19	55	84	138	76	172	188	121	122	24	48	27	23
20	55	82	140	78	172	180	106	119	24	42	27	23
21	52	90	130	78	208	161	101	109	25	12	26	23
22	52	85	130	78	249	160	100	106	25	15	26	23
23	51	65	125	78	246	172	96	99	26	17	25	23
24	52	63	120	80	240	168	106	91	30	21	25	22
25	53	63	115	82	240	163	114	83	40	21	24	22
26	52	64	110	88	250	154	114	78	40	21	25	23
27	52	66	110	98	240	167	134	75	40	21	27	23
28	55	65	105	108	234	169	162	73	40	21	26	22
29	55	67	99	100	225	167	164	70	42	24	25	23
30	54	75	94	90	---	174	169	68	60	24	25	23
31	52	---	92	80	---	169	---	72	---	24	24	---
TOTAL	1708	2273	3744	2386	4067	6447	3981	3957	1282	1475	822	692
MEAN	55.1	75.8	121	77.0	140	208	133	128	42.7	47.6	26.5	23.1
MAX	82	98	173	108	250	286	169	184	70	94	30	25
MIN	37	53	82	22	66	154	96	68	18	12	24	22
CFSM	.68	.93	1.49	.95	1.72	2.56	1.64	1.58	.53	.59	.33	.28
IN.	.78	1.04	1.72	1.09	1.86	2.95	1.82	1.81	.59	.68	.38	.32

CAL YR 1975 TOTAL 35822 MEAN 98.1 MAX 472 MIN 19 CFSM 1.21 IN 16.41
WTR YR 1976 TOTAL 32834 MEAN 89.7 MAX 286 MIN 12 CFSM 1.10 IN 15.04

04144000 SHIAWASSEE RIVER AT BYRON, MI

LOCATION.--Lat 42°49'25", long 83°56'45", in NE¼ NE¼ sec.23, T.5 N., R.4 E., Shiawassee County, Hydrologic Unit 04080203, on left bank at upstream side of highway bridge at Byron, 0.3 mi (0.5 km) downstream from milldam which is just upstream from South Branch Shiawassee River.

DRAINAGE AREA.--368 mi^2 (953 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1947 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1144: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 811.54 ft (247.357 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to Oct. 17, 1960, nonrecording gage and crest-stage gage at same site and datum.

REMARKS.--Water-discharge record good. Low flow slightly regulated at times by mills above station.

AVERAGE DISCHARGE.--29 years, 256 ft^3/s (7.250 m^3/s), 9.45 in/yr (240 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,880 ft^3/s (110 m^3/s) Apr. 22, 1975, gage height, 15.25 ft (4.648 m); minimum, 19 ft^3/s (0.54 m^3/s), Aug. 16, 1965; minimum gage height, 3.55 ft (1.082 m) Sept. 16, 1960.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,770 ft^3/s (50.1 m^3/s) Mar. 7, gage height, 11.31 ft (3.447 m); minimum, 53 ft^3/s (1.50 m^3/s) Sept. 7, 8; minimum gage height, 4.28 ft (1.305 m) Sept. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	220	228	374	370	270	817	684	811	244	266	110	84
2	220	219	433	360	280	856	633	681	256	386	105	83
3	217	238	468	340	290	979	590	577	244	446	105	77
4	214	242	452	300	300	1160	585	556	214	436	108	68
5	213	261	442	280	300	1450	598	531	197	360	107	65
6	199	263	538	270	300	1670	588	547	192	310	113	59
7	191	264	562	270	290	1760	563	709	174	266	113	54
8	188	271	596	270	290	1710	498	856	167	224	107	54
9	189	305	638	270	280	1570	421	1000	156	201	102	59
10	186	327	628	270	280	1310	424	1010	149	188	101	68
11	182	340	589	270	280	1110	415	933	152	178	99	81
12	174	362	544	270	280	1000	400	802	148	171	98	76
13	163	360	520	270	300	970	377	689	148	163	97	66
14	159	341	582	270	360	904	371	608	140	158	105	74
15	157	320	739	270	540	844	370	543	136	161	110	87
16	153	306	808	270	712	805	367	485	136	149	101	98
17	147	295	898	260	889	754	365	449	138	124	103	125
18	146	292	880	250	1150	700	380	437	131	124	94	159
19	156	277	856	230	1340	662	350	430	140	115	94	144
20	166	241	730	210	1420	648	320	410	188	113	94	107
21	177	237	665	210	1480	672	301	366	236	110	92	98
22	190	235	609	210	1530	658	285	342	226	108	94	95
23	192	233	560	220	1490	662	274	323	186	102	96	94
24	190	223	504	230	1510	638	271	306	161	95	98	92
25	196	222	441	230	1430	571	444	297	150	87	89	90
26	202	218	406	230	1320	534	710	291	150	79	84	96
27	204	220	400	240	1220	548	985	285	158	82	97	106
28	210	220	390	240	1050	729	1100	274	149	90	97	113
29	227	239	370	240	892	874	1070	244	145	115	89	110
30	232	333	370	250	---	866	949	216	190	138	81	106
31	230	---	370	260	---	753	---	216	---	125	82	---
TOTAL	5890	8132	17362	8130	22073	29184	15688	16224	5201	5670	3065	2688
MEAN	190	271	560	262	761	941	523	523	173	183	98.9	89.6
MAX	232	362	898	370	1530	1760	1100	1010	256	446	113	159
MIN	146	218	370	210	270	534	271	216	131	79	81	54
CFSM	.52	.74	1.52	.71	2.07	2.56	1.42	1.42	.47	.50	.27	.24
IN.	.60	.82	1.76	.82	2.23	2.95	1.59	1.64	.53	.57	.31	.27

CAL YR 1975 TOTAL 158275 MEAN 434 MAX 3840 MIN 76 CFSM 1.18 IN 16.00
WTR YR 1976 TOTAL 139307 MEAN 381 MAX 1760 MIN 54 CFSM 1.04 IN 14.08

04144000 SHIAWASSEE RIVER AT BYRON, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Water years 1962 to current year.

INSTRUMENTATION.--Temperature recorder since March 1962.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 29.0°C on several days in 1971, 1974 and 1975; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 27.0°C July 24, 27; minimum, 0.0°C on many days during winter period.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	15.0	14.0	7.5	6.5	5.5	3.0	0.0	0.0	0.0	0.0	5.5	4.0
2	14.0	12.0	9.5	7.5	3.0	2.0	0.0	0.0	0.0	0.0	4.0	3.0
3	12.0	11.0	11.0	9.5	2.0	1.5	0.0	0.0	0.0	0.0	3.0	2.5
4	12.0	10.5	12.5	11.0	1.5	1.5	0.0	0.0	0.0	0.0	2.5	2.5
5	13.0	11.5	13.0	12.5	3.5	1.5	0.0	0.0	0.0	0.0	4.5	3.0
6	14.0	12.5	13.5	13.0	4.5	3.5	0.0	0.0	0.0	0.0	4.5	3.5
7	14.0	12.5	14.0	13.5	3.5	2.0	0.0	0.0	0.0	0.0	3.5	3.0
8	14.0	12.5	14.5	14.0	2.0	2.0	0.0	0.0	0.0	0.0	3.0	2.5
9	13.0	13.0	14.5	14.0	2.0	1.5	0.0	0.0	0.0	0.0	3.5	2.5
10	13.0	12.5	14.0	12.0	1.5	1.5	0.0	0.0	0.0	0.0	4.0	3.5
11	13.0	12.5	12.0	10.5	1.5	1.5	0.0	0.0	0.0	0.0	4.0	3.0
12	12.5	11.0	10.5	10.0	1.5	1.5	0.0	0.0	0.0	0.0	4.0	3.5
13	14.0	12.0	10.0	7.5	2.5	1.5	0.0	0.0	0.0	0.0	4.0	4.0
14	15.5	14.0	7.5	6.0	5.5	2.5	0.0	0.0	0.0	0.0	4.0	3.0
15	15.5	15.0	6.0	5.0	6.0	5.0	0.0	0.0	0.0	0.0	4.0	3.0
16	15.0	13.0	6.0	5.0	5.0	4.0	0.0	0.0	0.0	0.0	4.5	4.0
17	13.0	10.5	7.5	6.0	4.0	1.5	0.0	0.0	0.0	0.0	4.0	2.5
18	10.5	9.5	9.0	7.5	1.5	1.0	0.0	0.0	0.0	0.0	2.5	2.0
19	9.5	9.0	9.0	8.5	1.0	0.5	0.0	0.0	0.0	0.0	8.0	3.0
20	9.5	9.0	9.0	8.5	0.5	0.5	0.0	0.0	0.0	0.0	10.0	8.0
21	10.5	9.5	9.0	7.5	0.5	0.5	0.0	0.0	0.0	0.0	10.0	7.0
22	11.0	10.5	7.5	6.0	0.5	0.5	0.0	0.0	0.5	0.0	7.0	5.0
23	12.0	11.0	6.0	5.0	0.5	0.5	0.0	0.0	0.5	0.5	6.5	4.5
24	13.5	12.0	5.0	4.0	0.5	0.0	0.0	0.0	1.0	0.5	10.0	6.5
25	13.5	12.5	3.5	2.5	0.0	0.0	0.0	0.0	3.0	1.0	11.0	10.0
26	12.5	11.0	2.5	2.0	0.0	0.0	0.0	0.0	4.5	3.0	12.0	11.0
27	10.5	9.0	2.0	1.5	0.0	0.0	0.0	0.0	5.0	4.5	12.0	9.5
28	9.5	9.5	2.5	1.5	0.0	0.0	0.0	0.0	5.5	5.0	9.5	8.0
29	9.5	9.0	3.0	2.5	0.0	0.0	0.0	0.0	5.5	5.0	9.5	8.5
30	9.0	7.5	5.5	3.0	0.0	0.0	0.0	0.0	---	---	11.5	8.5
31	7.5	6.5	---	---	0.0	0.0	0.0	0.0	---	---	11.5	9.5
MONTH	15.5	6.5	14.5	1.5	6.0	0.0	0.0	0.0	5.5	0.0	12.0	2.0

04144000 SHIAWASSEE RIVER AT BYRON, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

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

04144500 SHIAWASSEE RIVER AT OWOSSO, MI

LOCATION.--Lat 43°00'54", long 84°10'52", in SW¼ sec.12, T.7 N., R.2 E., Shiawassee County, Hydrologic Unit 04080203, on right bank on grounds of sewage-treatment plant, 1.5 mi (2.4 km) north of Owosso.

DRAINAGE AREA.--538 mi^2 (1,393 km^2).

PERIOD OF RECORD.--March 1931 to current year. Monthly discharge only for some periods, published in WSP 1307. Gage-height record for flood seasons collected in this vicinity 1904, 1910-30 are contained in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 1307: 1949(M). WSP 1337: 1932, 1934, 1936-38, 1944.

GAGE.--Water-stage recorder. Datum of gage is 707.25 ft (215.570 m) above mean sea level. Prior to Oct. 15, 1933, at site 1.5 mi (2.4 km) upstream at datum 5.46 ft (1.66 m) higher.

REMARKS.--Records good. Flow regulated below about 800 ft^3/s (22.7 m^3/s) by powerplant at Shiawasseetown prior to February 1953; occasional regulation at low stages since. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--45 years, 333 ft^3/s (9.431 m^3/s), 8.41 in/yr (214 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximim discharge, 6,240 ft^3/s (177 m^3/s) Apr. 6, 1947, gage height, 10.35 ft (3.155 m); minimum, 0.2 ft^3/s (0.006 m^3/s) July 27, 1934, gage height, 1.12 ft (0.341 m); minimum daily, 2.0 ft^3/s (0.057 m^3/s) July 28, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft^3/s (42.5 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	0900	2,730	77.3	7.09	2.161	Mar. 28	0300	1,720	48.7	5.77	1.759
Feb. 22	0500	3,560	101	8.04	2.451	Apr. 25	2100	1,980	56.1	6.15	1.875
Mar. 5	1700	*3,660	104	*8.15	2.484	May 7	0300	1,970	55.8	6.13	1.868

Minimum discharge, 59 ft^3/s (1.67 m^3/s) Sept. 9, gage height, 2.13 ft (0.649 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	267	276	809	499	387	1160	1030	1180	286	685	162	96
2	264	280	703	483	412	1610	973	1030	294	510	138	100
3	258	333	680	464	408	2870	889	910	298	519	128	98
4	254	371	661	373	387	2920	817	782	279	543	120	96
5	251	360	627	333	387	3380	787	738	250	488	133	84
6	247	364	1110	317	383	3100	802	1120	224	403	137	78
7	232	366	1200	350	380	2890	778	1840	214	358	136	74
8	225	369	1000	370	362	2710	719	1520	196	321	139	67
9	228	373	939	360	362	2510	631	1380	180	270	126	84
10	226	416	905	355	336	2260	547	1340	164	244	115	87
11	218	454	843	339	366	1880	547	1260	154	230	112	82
12	215	458	763	339	438	1610	519	1120	152	218	114	89
13	205	472	768	333	655	1920	499	968	150	208	112	93
14	193	456	1300	323	968	1630	468	828	145	201	116	81
15	186	432	2550	349	1250	1430	476	738	141	195	124	85
16	183	405	1990	339	2160	1270	889	705	139	192	132	110
17	175	396	1640	359	2160	1140	701	672	137	183	122	127
18	168	383	1310	345	2450	1040	580	619	141	151	117	144
19	179	383	1070	314	2840	978	531	572	149	149	114	183
20	192	365	1040	271	2580	943	472	543	143	143	106	179
21	198	337	910	283	2660	1050	445	503	199	144	109	138
22	206	327	738	283	3360	988	426	438	255	133	107	114
23	221	323	734	290	2790	929	380	408	249	128	105	110
24	223	315	692	300	2450	919	380	383	222	125	112	105
25	232	311	623	310	2530	848	1510	362	201	113	116	104
26	238	304	543	310	2180	743	1850	349	170	104	129	114
27	243	312	507	310	1890	948	1690	336	169	97	135	121
28	246	318	503	310	1640	1600	1620	329	180	110	117	123
29	251	366	468	317	1350	1400	1540	323	180	125	115	133
30	267	732	464	326	---	1320	1380	301	635	141	110	129
31	270	---	503	355	---	1180	---	286	---	171	98	---
TOTAL	6961	11357	28593	10609	40521	51176	24876	23883	6296	7602	3756	3228
MEAN	225	379	922	342	1397	1651	829	770	210	245	121	108
MAX	270	732	2550	499	3360	3380	1850	1840	635	685	162	183
MIN	168	276	464	271	336	743	380	286	137	97	98	67
CFSM	.42	.70	1.71	.64	2.60	3.07	1.54	1.43	.39	.46	.22	.20
IN.	.48	.79	1.98	.73	2.80	3.54	1.72	1.65	.44	.53	.26	.22

CAL YR 1975 TOTAL 237168 MEAN 650 MAX 4780 MIN 88 CFSM 1.21 IN 16.40
WTR YR 1976 TOTAL 218858 MEAN 598 MAX 3380 MIN 67 CFSM 1.11 IN 15.13

04145000 SHIAWASSEE RIVER NEAR FERGUS, MI

LOCATION.--Lat 43°15'17", long 84°06'20", in sec.22, T.10 N., R.3 E., Saginaw County, Hydrologic Unit 04080203, on right bank at downstream side of county highway bridge, 1.2 mi (1.9 km) east of Fergus, 1.8 mi (2.9 km) upstream from Bear Creek, and 14 mi (22 km) above mouth.

DRAINAGE AREA.--637 mi^2 (1,650 km^2).

PERIOD OF RECORD.--October 1939 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1337: 1940(M), 1941-42, 1943(M), 1944, 1945(M), 1946, 1947(M), 1948, 1950. WSP 1627: 1952, 1954(M), 1957.

GAGE.--Water-stage recorder. Datum of gage is 585.80 ft (178.552 m) above mean sea level. Prior to Aug. 22, 1968, nonrecording gage at same site and datum. Prior to Oct. 1, 1970, at datum 2.00 ft (0.610 m) higher.

REMARKS.--Records good except those for the winter period, which are fair. Some regulation at low stages by powerplant above Owosso prior to February 1953; occasional regulation at low stages since. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--37 years, 426 ft^3/s (12.06 m^3/s), 9.08 in/yr (231 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,500 ft^3/s (212 m^3/s) Apr. 6, 1947 (includes overflow bypassing gage); maximum gage height, 15.44 ft (4.706 m), present datum, Mar. 29, 1960; minimum discharge, 27 ft^3/s (0.76 m^3/s) Aug. 8, 1966; minimum gage height, 1.83 ft (0.558 m) Sept. 13, 14, 1971.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,930 ft^3/s (140 m^3/s) Mar. 5, gage height, 12.52 ft (3.816 m); maximum gage height, 14.82 ft (4.517 m) Feb. 19 (backwater from ice); minimum discharge, 72 ft^3/s (2.04 m^3/s) Sept. 9, gage height, 2.26 ft (0.689 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	348	310	1100	600	490	1610	1250	1470	334	1980	153	105
2	345	322	920	600	520	1760	1180	1280	312	942	158	101
3	335	345	800	580	530	3710	1100	1150	314	690	138	97
4	331	386	776	540	520	4630	1020	958	308	647	127	94
5	326	399	726	500	500	4580	962	864	299	619	124	94
6	324	394	1190	450	500	4180	942	1600	279	510	130	90
7	319	397	1700	450	500	3300	919	2930	260	436	135	81
8	303	408	1400	450	490	2980	889	2120	253	395	133	77
9	299	411	1220	450	480	2740	833	1650	236	344	133	73
10	301	405	1140	450	480	2530	736	1520	224	301	130	82
11	299	455	1090	450	490	2250	693	1450	214	283	123	94
12	289	479	1020	450	600	1910	670	1330	206	262	117	85
13	285	488	998	450	900	2260	641	1140	202	243	117	85
14	278	485	1640	450	1300	2090	619	998	198	232	127	90
15	263	458	3980	450	1800	1840	587	897	190	222	130	90
16	254	440	3510	450	2600	1630	1170	850	196	214	124	91
17	250	413	2350	450	2900	1460	1100	826	190	204	124	111
18	246	405	1880	450	3200	1310	809	779	184	194	124	123
19	236	399	1700	420	3700	1250	703	703	192	167	117	136
20	246	397	1400	380	3400	1200	657	647	192	160	117	175
21	250	383	1200	360	3210	1400	641	612	186	160	111	175
22	254	360	1100	360	3550	1250	641	565	236	167	110	146
23	263	348	1000	360	3740	1140	587	510	279	151	110	127
24	276	343	900	360	3120	1100	562	486	272	139	108	124
25	276	350	800	360	3310	1070	1830	451	253	138	108	120
26	283	348	750	360	3720	966	2910	428	222	126	110	120
27	285	343	700	360	2690	958	2280	411	202	120	118	127
28	287	343	660	360	2270	1720	1960	395	194	115	129	129
29	294	360	620	370	1930	1660	1820	390	206	118	120	126
30	299	840	620	390	---	1540	1670	384	766	130	115	127
31	303	---	600	430	---	1440	---	359	---	132	112	---
TOTAL	8947	12214	39490	13540	53440	63464	32381	30153	7599	10541	3832	3295
MEAN	289	407	1274	437	1843	2047	1079	973	253	340	124	110
MAX	348	840	3980	600	3740	4630	2910	2930	766	1980	158	175
MIN	236	310	600	360	480	958	562	359	184	115	108	73
CFSM	.45	.64	2.00	.69	2.89	3.21	1.69	1.53	.40	.53	.19	.17
IN.	.52	.71	2.31	.79	3.12	3.71	1.89	1.76	.44	.62	.22	.19

CAL YR 1975 TOTAL 300820 MEAN 824 MAX 5160 MIN 96 CFSM 1.29 IN 17.57
WTR YR 1976 TOTAL 278896 MEAN 762 MAX 4630 MIN 73 CFSM 1.20 IN 16.29

04146000 FARMERS CREEK NEAR LAPEER, MI

LOCATION.--Lat 43°02'41", long 83°20'14", in sec.6, T.7 N., R.10 E., Lapeer County, Hydrologic Unit 04080204, on left bank at sewage-treatment plant at Michigan Home and Training School, 2.0 mi (3.2 km) west of Lapeer.

DRAINAGE AREA.--55.2 mi^2 (143.0 km^2).

PERIOD OF RECORD.--October 1932 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 924: 1940. WSP 1084: 1942(M), 1943. WSP 1337: 1934-38, 1940(M), 1944(M), 1945, 1946(M), 1948-51(M). WSP 1727: 1952(M). WRD MI-71: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 805.79 ft (245.605 m) above mean sea level. Prior to May 25, 1954, nonrecording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are poor. Prior to 1941, occasional regulation by dam above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--44 years, 30.4 ft^3/s (0.861 m^3/s), 7.48 in/yr (190 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,280 ft^3/s (36.2 m^3/s) Apr. 6, 1947, gage height, 19.87 ft (6.056 m), from flood-mark, from rating curve extended above 660 ft^3/s (18.7 m^3/s) on basis of contracted-opening measurement of peak flow; minimum not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 160 ft^3/s (4.53 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 17	0800	174	4.93	16.73	5.099	Mar. 6	2000	322	9.12	17.41	5.307
Feb. 18	1500	*337	9.54	*17.47	5.325	Apr. 27	2400	229	6.49	17.02	5.188
Feb. 23	1000	*337	9.54	*17.47	5.325						

Minimum discharge, 2.8 ft^3/s (0.079 m^3/s) Sept. 8, 9, gage height, 15.08 ft (4.596 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	30	57	54	36	156	88	131	26	26	10	3.8
2	26	30	65	54	36	152	88	100	26	29	9.6	3.5
3	26	33	77	50	36	165	83	88	25	29	8.9	3.5
4	21	36	69	48	36	188	79	78	22	28	8.5	3.2
5	26	41	66	46	36	275	75	71	20	26	8.1	3.0
6	25	45	86	44	36	306	70	77	18	22	8.5	3.0
7	22	46	87	42	36	306	67	90	17	19	9.2	3.0
8	22	45	108	40	37	240	64	105	16	20	9.6	2.8
9	22	43	116	40	40	195	64	131	15	20	9.6	3.2
10	23	48	108	39	45	162	60	127	14	18	9.2	5.9
11	24	45	96	38	55	142	56	111	15	17	8.9	6.2
12	26	46	90	38	64	129	53	74	16	16	8.1	6.2
13	27	46	84	38	77	126	50	50	14	14	7.7	6.2
14	28	43	93	38	90	115	48	48	13	13	8.5	6.2
15	28	41	124	38	124	113	46	50	12	12	9.2	8.5
16	28	38	146	38	214	110	59	55	13	11	9.2	9.2
17	28	36	169	38	282	104	60	56	12	10	8.9	10
18	26	34	140	38	314	95	67	61	12	9.2	8.9	11
19	25	32	120	38	277	92	69	78	16	8.9	8.5	11
20	24	31	100	38	259	84	67	79	19	8.5	8.1	11
21	24	31	90	37	247	86	64	66	21	9.2	7.7	10
22	24	30	80	37	254	78	60	45	22	8.9	7.3	10
23	24	28	70	37	289	79	56	36	21	9.6	7.0	9.6
24	24	28	65	37	263	84	56	34	20	12	6.2	9.2
25	25	28	56	37	214	82	102	31	20	13	5.6	8.5
26	26	29	57	36	181	78	126	21	20	12	5.3	8.9
27	39	31	54	36	166	79	204	20	20	12	5.3	10
28	46	35	57	36	158	82	219	21	18	11	5.3	11
29	40	40	53	36	150	80	180	22	17	11	4.7	11
30	35	54	53	36	---	86	145	24	21	11	4.1	11
31	31	---	54	36	---	87	---	25	---	11	3.8	---
TOTAL	843	1123	2690	1238	4052	4156	2525	2005	541	477.3	239.5	219.6
MEAN	27.2	37.4	86.8	39.9	140	134	84.2	64.7	18.0	15.4	7.73	7.32
MAX	46	54	169	54	314	306	219	131	26	29	10	11
MIN	21	28	53	36	36	78	46	20	12	8.5	3.8	2.8
CFSM	.49	.68	1.57	.72	2.54	2.43	1.53	1.17	.33	.28	.14	.13
IN.	.57	.76	1.81	.83	2.73	2.80	1.70	1.35	.36	.32	.16	.15

CAL YR 1975 TOTAL 23013.3 MEAN 63.1 MAX 700 MIN 7.0 CFSM 1.14 IN 15.51
WTR YR 1976 TOTAL 20109.4 MEAN 54.9 MAX 314 MIN 2.8 CFSM .99 IN 13.55

04147000 HOLLOWAY RESERVOIR NEAR OTISVILLE, MI

LOCATION.--Lat 43°07'15", long 83°29'45", in NW¼ sec.11, T.8 N., R.8 E., Genesee County, Hydrologic Unit 04080204, in gatehouse on right side of Holloway Dam on Flint River, 3.5 mi (5.6 km) southeast of Otisville.

DRAINAGE AREA.--526 mi^2 (1,362 km^2).

PERIOD OF RECORD.--March 1954 to current year.

REVISED RECORDS.--WSP 2111: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level (levels by city of Flint).

REMARKS.--Reservoir is formed by an earth-fill dam with concrete spillway completed in 1953. Capacity of reservoir, 1,256,000,000 cu ft (35.6 hm^3) at elevation 760.00 ft (231.65 m). The spillway section includes two 90 foot (27.4 m) drum gates with minimum crest elevation of 751 ft (228.9 m), maximum at 755 ft (230.1 m), three 20-foot (6.1 m) radial gates with sill elevation of 745 ft (227.1 m), and 2 sluices (each 4 by 6 ft), one on each side with valve controls. Entrance elevation of sluiceways is 724 ft (220.7 m). Reservoir is used to regulate flow for sewage dilution for city of Flint.

COOPERATION.--Reservoir elevations furnished by city of Flint.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 996,000,000 cu ft (28.2 hm^3) Mar. 8, 1956, elevation, 757.4 ft (230.86 m); minimum, reservoir empty at times during October, November, 1954, January, February, 1955, October, 1971.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 929,000,000 cu ft (26.3 hm^3) Mar. 7, elevation, 756.73 ft (230.65 m); minimum, 24,900,000 cu ft (0.705 hm^3) Feb. 12, elevation, 737.53 ft (224.80 m).

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

Date	Elevation (feet)	Contents (millions of cubic feet)	Change in contents during month: Millions of cubic feet	Change in contents during month: Equivalent in ft^3/s
Sept. 30	755.16	784	--	--
Oct. 31	751.21	486	-298	-111
Nov. 30	748.29	320	-166	-64.0
Dec. 31	744.96	183	-137	-51.1
CAL YR 1975	--	--	-302	-9.6
Jan. 31	743.70	145	-38	-14.2
Feb. 29	752.46	569	+424	+169
Mar. 31	746.42	239	-330	-123
Apr. 30	755.58	822	+583	+225
May 31	754.94	765	-57	-21.3
June 30	755.08	777	+12	+4.6
July 31	754.01	688	-89	-33.2
Aug. 31	752.87	598	-90	-33.6
Sept. 30	752.47	570	-28	-10.8
WTR YR 1976	--	--	-214	-6.8

04147500 FLINT RIVER NEAR OTISVILLE, MI

LOCATION.--Lat 43°06'40", long 83°31'10", in SE¼ sec.9, T.8 N., R.8 E., Genesee County, Hydrologic Unit 04080204, on left bank 20 ft (6 m) downstream from bridge on State Highway 15, 1.5 mi (2.4 km) downstream from Holloway Reservoir, 3.5 mi (5.6 km) upstream from Powers-Cullen drain, and 3.8 mi (6.1 km) south of Otisville.

DRAINAGE AREA.--531 mi^2 (1,375 km^2).

PERIOD OF RECORD.--October 1952 to current year.

REVISED RECORDS.--WSP 2111: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 721.39 ft (219.880 m) above mean sea level.

REMARKS.--Records good. Flow regulated by Holloway Reservoir, 1.5 mi (2.4 km) above station (see preceding page). Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--24 years, 298 ft^3/s (8.439 m^3/s), 7.62 in/yr (194 mm/yr), adjusted for storage since 1954.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,150 ft^3/s (174 m^3/s) Apr. 1, 1960, gage height, 14.97 ft (4.563 m); minimum, 2.1 ft^3/s (0.059 m^3/s) Oct. 11, 12, 1971, gage height, 1.57 ft (0.479 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,680 ft^3/s (133 m^3/s) Mar. 7, gage height, 14.18 ft (4.322 m); minimum, 6.3 ft^3/s (0.18 m^3/s) Jan. 27, gage height, 1.76 ft (0.536 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	305	179	401	508	508	2120	911	1330	250	287	189	56
2	442	194	516	483	549	1910	900	1210	271	351	188	56
3	485	315	596	557	508	1790	883	1080	272	413	187	56
4	560	431	696	553	466	1900	853	970	259	485	187	56
5	557	390	737	546	460	2630	806	886	249	513	187	57
6	555	476	830	514	424	3910	771	936	235	505	160	57
7	551	648	825	474	399	4640	733	1180	223	463	131	85
8	545	641	827	443	348	4150	695	1480	215	445	131	110
9	545	634	831	375	358	3320	459	1540	206	392	131	77
10	541	635	922	335	317	2910	239	1570	177	349	133	77
11	538	709	1070	335	313	2900	374	1520	146	331	133	77
12	533	768	1100	303	317	2710	433	1370	161	301	133	77
13	261	430	1110	271	324	2560	457	1080	151	256	133	78
14	72	153	991	272	355	2360	462	821	144	216	131	79
15	106	198	208	279	366	2200	455	815	144	193	131	77
16	133	283	23	281	411	2060	523	796	145	167	131	77
17	154	387	712	319	480	1900	584	773	144	149	130	77
18	154	385	1410	327	647	1720	618	630	148	143	130	75
19	145	318	1340	305	861	1510	321	438	163	160	130	77
20	143	205	1240	295	1060	1310	13	497	167	196	114	77
21	152	228	1130	398	1920	1180	13	538	180	197	90	77
22	165	264	1100	517	2210	1120	13	529	182	195	90	77
23	189	263	1260	514	2570	1070	127	497	180	194	90	77
24	213	262	1430	490	2640	1040	384	457	186	194	90	77
25	193	266	1200	293	2600	1010	452	428	179	193	75	79
26	197	266	975	11	2500	963	447	402	173	192	59	79
27	189	267	819	10	2420	920	443	393	174	192	58	103
28	189	266	713	10	2430	932	575	308	170	192	58	179
29	196	268	636	10	2260	934	993	203	168	191	58	179
30	191	305	582	187	---	918	1320	202	225	190	57	144
31	180	---	568	534	---	915	---	216	---	189	57	---
TOTAL	9379	11034	26798	10749	31021	61512	16257	25095	5687	8434	3702	2529
MEAN	303	368	864	347	1070	1984	542	810	190	272	119	84.3
MAX	560	768	1430	557	2640	4640	1320	1570	272	513	189	179
MIN	72	153	23	10	313	915	13	202	144	143	57	56
MEAN+	192	304	813	333	1239	1861	767	789	195	239	85.4	73.5
CFSM+	.36	.57	1.53	.63	2.33	3.50	1.44	1.49	.37	.45	.16	.14
IN+	.42	.64	1.77	.72	2.52	4.04	1.61	1.71	.41	.52	.19	.15

CAL YR 1975 TOTAL 191903 MEAN 526 MAX 3910 MIN 13 MEAN+ 516 CFSM+ .97 IN+ 13.19
WTR YR 1976 TOTAL 212197 MEAN 580 MAX 4640 MIN 10 MEAN+ 573 CFSM+ 1.08 IN+ 14.69

+Adjusted for change in contents in Holloway Reservoir.

04147990 BUTTERNUT CREEK NEAR GENESEE, MI

LOCATION.--Lat 43°08'09", long 83°35'57", in NE¼ NE¼ sec.2, T.8 N., R.7 E., Genesee County, Hydrologic Unit 04080204, on right bank 10 ft (3 m) downstream from bridge on Frances Road, 2.3 mi (3.7 km) upstream from mouth, and 2.0 mi (3.2 km) northeast of Genesee.

DRAINAGE AREA.--34.5 mi^2 (89.4 km^2).

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

GAGE.--Water-stage recorder. Altitude of gage is 730 ft (223 m) from topographic map (nearest 10 ft). Prior to June 11, 1970, non-recording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--6 years, 25.1 ft^3/s (0.711 m^3/s), 9.88 in/yr (251 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 533 ft^3/s (15.1 m^3/s) May 17, 1974, gage height, 8.21 ft (2.502 m); maximum gage height, 8.68 ft (2.646 m) Dec. 31, 1972; minimum discharge, 1.2 ft^3/s (0.034 m^3/s) Dec. 1, 1971, result of freezeup; minimum gage height, 1.56 ft (0.475 m) Aug. 8, 9, 1971.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 200 ft^3/s (5.66 m^3/s), revised, and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	0500	299	8.47	8.01	2.441	Mar. 13	0300	235	6.66	7.33	2.234
Feb. 15	2400	314	8.89	8.13	2.478	Mar. 27	2200	250	7.08	7.52	2.292
Feb. 18	2200	290	8.21	7.93	2.417	Apr. 25	1500	260	7.36	7.65	2.332
Feb. 21	2300	278	7.87	7.83	2.387	May 6	2400	282	7.99	7.86	2.396
Feb. 24	2400	228	6.46	7.23	2.204	May 31	0600	285	8.07	7.89	2.405
Mar. 5	1100	*334	9.46	*8.28	2.524						

Minimum discharge, 2.7 ft^3/s (0.076 m^3/s) Aug. 22, 23, 24, 25, Sept. 6, 7, 8; minimum gage height, 1.67 ft (0.509 m) Aug. 4, 22, 23, 24, 25, Sept. 6, 7, 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.5	6.6	52	20	14	72	50	49	105	33	5.0	3.2
2	6.2	7.2	35	19	14	80	57	42	59	31	4.9	3.2
3	5.9	12	28	18	14	295	50	46	39	22	4.6	3.1
4	5.7	13	25	18	14	255	43	42	27	18	4.1	3.0
5	5.6	11	27	16	14	292	38	36	21	14	3.9	3.0
6	5.6	9.6	122	15	14	231	35	140	17	12	4.5	3.0
7	5.3	9.7	62	15	14	198	31	220	15	9.8	5.6	2.9
8	5.3	11	42	14	14	158	27	135	13	8.7	4.6	2.9
9	5.7	9.9	37	14	14	131	24	112	11	7.9	4.3	3.5
10	6.4	15	33	14	17	107	22	91	9.8	7.4	4.1	5.0
11	6.2	16	29	14	22	94	22	79	9.3	7.3	4.0	4.8
12	5.8	12	26	13	30	102	21	60	8.9	7.0	4.1	4.0
13	5.8	11	38	13	40	182	19	46	9.0	6.6	4.3	3.5
14	5.8	9.7	101	13	58	119	18	40	12	6.4	4.2	3.3
15	5.7	8.9	237	13	130	111	17	36	9.1	6.1	4.7	3.9
16	5.7	8.3	106	13	250	102	79	62	8.5	5.7	4.1	4.0
17	5.7	7.9	79	13	170	76	50	61	8.3	5.6	3.6	4.0
18	5.9	7.5	60	13	212	61	40	54	8.2	5.5	3.4	3.7
19	6.1	7.3	48	13	226	61	32	42	9.5	5.3	3.2	3.4
20	6.3	7.3	40	13	182	64	25	34	8.8	5.4	3.2	3.8
21	6.1	8.1	35	13	208	105	21	29	8.0	5.6	3.0	4.1
22	6.1	8.0	30	13	234	62	20	25	7.9	5.3	2.9	3.7
23	5.8	7.4	27	13	179	55	19	22	7.5	5.4	2.9	3.9
24	5.7	7.1	24	13	143	50	19	20	7.7	5.2	3.0	3.6
25	6.9	7.7	22	13	180	46	190	19	8.7	5.1	2.9	3.6
26	7.9	8.2	21	13	142	43	180	17	7.8	4.9	3.1	3.9
27	7.2	9.4	20	13	112	101	125	15	6.6	4.8	3.4	4.7
28	6.9	12	20	13	97	151	97	14	7.1	4.9	3.2	4.5
29	6.7	20	20	13	84	83	80	14	6.7	5.6	3.0	4.2
30	6.5	106	20	13	---	71	63	18	26	5.4	3.1	4.0
31	6.3	---	20	13	---	59	---	216	---	5.2	3.1	---
TOTAL	189.3	394.8	1486	437	2842	3617	1514	1836	502.4	282.1	118.0	111.4
MEAN	6.11	13.2	47.9	14.1	98.0	117	50.5	59.2	16.7	9.10	3.81	3.71
MAX	7.9	106	237	20	250	295	190	220	105	33	5.6	5.0
MIN	5.3	6.6	20	13	14	43	17	14	6.6	4.8	2.9	2.9
CFSM	.18	.38	1.39	.41	2.84	3.39	1.46	1.72	.48	.26	.11	.11
IN.	.20	.43	1.60	.47	3.06	3.90	1.63	1.98	.54	.30	.13	.12

CAL YR 1975 TOTAL 9798.8 MEAN 26.8 MAX 254 MIN 3.2 CFSM .78 IN 10.57
WTR YR 1976 TOTAL 13330.0 MEAN 36.4 MAX 295 MIN 2.9 CFSM 1.06 IN 14.37

04148140 KEARSLEY CREEK NEAR DAVISON, MI

LOCATION.--Lat 43°02'01", long 83°34'53", in NE¼ sec.12, T.7 N., R.7 E., Genesee County, Hydrologic Unit 04080204, on right bank 10 ft (3 m) upstream from bridge on State Highway 21, 1.4 mi (2.3 km) downstream from Black Creek, and 3.3 mi (5.3 km) west of Davison.

DRAINAGE AREA.--99.6 mi^2 (258.0 km^2).

PERIOD OF RECORD.--October 1965 to current year.

REVISED RECORDS.--WSP 2111: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 760 ft (232 m) from topographic map.

REMARKS.--Records good except those for the winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--11 years, 75.3 ft^3/s (2.132 m^3/s), 10.27 in/yr (261 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,430 ft^3/s (40.5 m^3/s) Apr. 21, 1975, gage height, 11.32 ft (3.450 m); minimum, 2.7 ft^3/s (0.076 m^3/s) July 9, 1966; minimum gage height, 2.69 ft (0.820 m) Sept. 12, 1969.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 350 ft^3/s (9.91 m^3/s), revised, and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 6	1600	432	12.2	8.46	2.579	Apr. 25	2200	564	16.0	9.19	2.801
Dec. 15	0900	694	19.7	9.71	2.960	May 7	0600	444	12.6	8.35	2.545
Feb. 22	0300	*795	22.5	*10.00	3.048	May 9	0800	362	10.3	7.66	2.335
Mar. 5	1700	728	20.6	9.81	2.990						

Minimum discharge, 6.2 ft^3/s (0.18 m^3/s) Sept. 8, gage height, 2.99 ft (0.911 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	44	173	90	58	225	155	233	51	84	23	9.5
2	53	44	183	90	58	254	162	191	49	85	20	9.6
3	52	58	187	86	58	381	152	182	47	65	22	9.1
4	50	61	178	84	58	496	142	147	44	56	15	9.1
5	48	69	169	80	60	646	135	124	41	48	15	8.1
6	45	83	348	76	60	622	139	202	37	41	19	7.9
7	42	93	291	72	62	564	130	391	35	41	32	8.1
8	42	90	206	68	64	494	122	288	29	46	28	7.2
9	42	85	215	65	68	406	119	357	20	33	28	9.2
10	42	103	195	62	75	293	109	257	21	34	25	20
11	41	104	162	60	90	248	100	209	23	35	22	15
12	39	98	143	58	110	226	90	167	22	31	18	16
13	40	98	171	58	150	288	85	142	22	28	19	15
14	40	92	289	58	250	246	77	122	20	25	20	13
15	40	83	598	58	366	246	60	103	19	23	21	19
16	40	75	487	58	520	233	153	116	21	20	24	15
17	39	68	453	58	466	211	124	110	20	18	25	17
18	38	63	387	58	565	187	136	118	24	16	21	18
19	40	60	318	58	609	175	137	131	37	16	18	17
20	41	58	235	58	540	162	111	125	32	16	16	16
21	43	64	156	58	611	237	84	108	39	19	14	15
22	46	58	140	58	701	194	112	90	39	16	14	15
23	48	58	125	58	540	226	88	77	33	16	12	15
24	48	60	115	58	514	216	82	70	31	18	10	14
25	52	63	110	58	512	164	364	59	32	21	9.1	14
26	48	60	105	58	446	142	478	47	32	21	9.5	16
27	46	57	100	58	373	153	437	51	37	17	10	18
28	47	67	95	58	280	191	439	53	35	16	11	20
29	47	84	95	58	248	172	412	51	36	20	13	24
30	46	195	90	58	---	169	340	50	90	19	12	22
31	44	---	90	58	---	162	---	55	---	24	10	---
TOTAL	1383	2295	6609	1993	8512	8629	5274	4426	1018	968	555.6	431.8
MEAN	44.6	76.5	213	64.3	294	278	176	143	33.9	31.2	17.9	14.4
MAX	54	195	598	90	701	646	478	391	90	85	32	24
MIN	38	44	90	58	58	142	60	47	19	16	9.1	7.2
CFSM	.45	.77	2.14	.65	2.95	2.79	1.77	1.44	.34	.31	.18	.14
IN.	.52	.86	2.47	.74	3.18	3.22	1.97	1.65	.38	.36	.21	.16

CAL YR 1975 TOTAL 50347.0 MEAN 138 MAX 1370 MIN 11 CFSM 1.39 IN 18.80
WTR YR 1976 TOTAL 42094.4 MEAN 115 MAX 701 MIN 7.2 CFSM 1.15 IN 15.72

04148160 GILKEY CREEK NEAR FLINT, MI

LOCATION.--Lat 43°01'27", long 83°37'32", in NE¼ SW¼ sec.10, T.7 N., R.7 E., Genesee County, Hydrologic Unit 04080204, on right bank 25 ft (8 m) downstream from culvert (revised) on extension of Arapaho Street, 5.1 mi (8.2 km) upstream from mouth, and 3.5 mi (5.6 km) east of Flint.

DRAINAGE AREA.--6.29 mi^2 (16.29 km^2).

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

GAGE.--Water-stage recorder. Datum of gage is 759.32 ft (231.441 m) above mean sea level.

REMARKS.--Records fair except those for the winter period and those below 1.0 ft^3/s (0.028 m^3/s), which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--6 years, 8.17 ft^3/s (0.231 m^3/s), 12.61 in/yr (320 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 285 ft^3/s (8.07 m^3/s) Apr. 19, 1975, gage height, 7.66 ft (2.335 m); no flow on many days during 1970, 1973, 1974, 1975, and 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 80 ft^3/s (2.27 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 6	0900	120	3.40	3.85	1.173	Mar. 3	1800	148	4.19	4.52	1.378
Dec. 15	0400	*212	6.00	*6.16	1.878	Mar. 5	0800	141	3.99	4.35	1.326
Feb. 15	2300	168	4.76	5.04	1.536	Apr. 25	1700	186	5.27	5.46	1.664
Feb. 18	1900	102	2.89	3.38	1.030	May 7	0100	122	3.46	3.85	1.173
Feb. 21	2000	151	4.28	4.60	1.402	June 30	0100	114	3.23	3.59	1.094

No flow Aug. 10-12, Aug. 23 to Sept. 8, Sept. 13, 14, 18, and 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.48	.81	15	1.7	1.3	5.8	5.8	4.6	.81	28	.25	0
2	.40	.81	8.2	1.6	1.3	34	10	8.2	.54	13	.15	0
3	.36	7.7	6.0	1.5	1.3	94	6.8	11	.40	4.2	.09	0
4	.33	1.9	4.8	1.5	1.3	67	4.8	5.1	.35	3.2	.05	0
5	.36	1.2	7.4	1.4	1.3	91	3.4	3.6	.31	1.8	.10	0
6	.31	.95	81	1.4	1.3	29	12	51	.28	1.6	.06	0
7	.27	2.2	27	1.4	1.4	17	6.3	73	.26	3.0	.03	0
8	.30	1.9	13	1.3	1.4	10	3.8	22	.25	3.7	.02	0
9	.69	1.1	9.2	1.3	1.5	7.9	2.8	14	.23	1.4	.01	2.6
10	.52	9.2	7.7	1.3	1.6	9.5	2.5	8.7	.22	1.1	0	2.0
11	.33	3.6	6.8	1.3	2.5	9.2	2.9	8.4	.20	.95	0	.40
12	.27	2.2	7.4	1.3	8.0	18	1.8	4.8	.19	.60	0	.05
13	.27	1.8	32	1.3	30	37	1.7	3.4	.18	.40	1.4	0
14	.33	1.5	68	1.3	57	22	1.6	2.8	.18	.20	.70	0
15	.33	1.3	147	1.3	78	19	2.5	2.8	.20	.17	.50	6.0
16	.30	1.2	38	1.3	92	14	45	17	3.1	.16	.30	.40
17	.30	1.0	22	1.3	60	10	14	7.4	.60	.15	.15	.05
18	.44	.95	14	1.3	79	4.8	6.5	5.1	.70	.14	.10	0
19	.81	.88	11	1.3	48	5.5	3.4	3.2	6.0	.14	.05	0
20	.44	1.3	5.2	1.3	25	6.8	2.0	2.3	1.0	1.5	.03	.01
21	.27	3.1	4.4	1.3	82	29	1.7	1.7	.70	1.3	.02	.02
22	.20	1.3	3.9	1.3	69	10	1.9	1.1	.60	.90	.01	.02
23	.20	1.0	3.5	1.3	27	6.8	1.3	.75	.80	.90	0	.01
24	.18	.95	3.2	1.3	24	5.1	3.2	.48	1.5	.80	0	.01
25	2.9	1.7	2.9	1.3	25	4.0	140	.40	.90	.70	0	.01
26	.57	1.9	2.6	1.3	18	3.1	68	.35	.60	.65	0	1.4
27	.33	2.6	2.4	1.3	14	18	29	.32	.45	.60	0	.80
28	.27	4.8	2.2	1.3	10	22	16	.30	.45	1.5	0	.01
29	.24	11	2.0	1.3	7.7	13	9.8	.30	7.0	1.1	0	.01
30	.22	39	1.9	1.3	---	9.0	6.0	.70	52	.70	0	.01
31	.22	---	1.8	1.3	---	5.8	---	1.4	---	.40	0	---
TOTAL	13.44	110.85	561.5	41.7	769.9	637.3	416.5	266.20	81.00	74.96	4.02	13.81
MEAN	.43	3.70	18.1	1.35	26.5	20.6	13.9	8.59	2.70	2.42	.13	.46
MAX	2.9	39	147	1.7	92	94	140	73	52	28	1.4	6.0
MIN	.18	.81	1.8	1.3	1.3	3.1	1.3	.30	.18	.14	0	0
CFSM	.07	.59	2.88	.21	4.21	3.28	2.21	1.37	.43	.38	.02	.07
IN.	.08	.66	3.32	.25	4.55	3.77	2.46	1.57	.48	.44	.02	.08

CAL YR 1975 TOTAL 3310.17 MEAN 9.07 MAX 250 MIN .07 CFSM 1.44 IN 19.57
WTR YR 1976 TOTAL 2991.18 MEAN 8.17 MAX 147 MIN 0 CFSM 1.30 IN 17.69

04148300 SWARTZ CREEK AT FLINT, MI

LOCATION.--Lat 42°59'16", long 83°43'57", in NW¼ sec.26, T.7 N., R.6 E., Genesee County, Hydrologic Unit 04080204, on right bank 6 ft (2 m) downstream from bridge on South Ballenger Highway, in Flint, 3.6 mi (5.8 km) upstream from mouth.

DRAINAGE AREA.--115 mi^2 (298 km^2).

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

REVISED RECORDS.--WDR MI-75: 1971-73.

GAGE.--Water-stage recorder. Altitude of gage is 730 ft (222 m) from topographic map (nearest 10 ft). Prior to Sept. 4, 1970, non-recording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--6 years, 101 ft^3/s (2.860 m^3/s), 11.93 in/yr (303 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,160 ft^3/s (89.5 m^3/s) Apr. 19, 1975, gage height, 9.02 ft (2.749 m); minimum, 0.98 ft^3/s (0.028 m^3/s) Sept. 15, 1973; minimum gage height, 1.16 ft (0.354 m) Aug. 19, 1971.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 800 ft^3/s (22.7 m^3/s), revised, and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	0900	*1,610	45.6	*7.70	2.347	Mar. 3	1800	1,270	36.0	7.32	2.231
Feb. 15	2300	1,300	36.8	7.36	2.243	Mar. 5	1200	1,200	34.0	7.24	2.207
Feb. 18	2200	1,110	31.4	7.13	2.173	Apr. 25	2000	1,190	33.7	7.22	2.201
Feb. 21	2300	1,380	39.1	7.44	2.268						

Minimum discharge, 1.0 ft^3/s (0.028 m^3/s) Sept. 7; minimum gage height, 2.09 ft (0.637 m) Sept. 6, 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	23	202	80	57	205	156	188	48	79	6.5	4.8
2	35	29	136	76	57	472	163	179	41	48	6.2	3.4
3	34	72	110	72	58	978	156	177	35	35	6.2	2.1
4	31	51	99	70	58	895	147	158	33	30	6.2	2.1
5	30	44	106	66	59	1030	136	142	29	27	11	1.8
6	28	41	600	64	60	665	156	313	27	25	15	1.4
7	28	54	435	63	60	466	144	647	25	31	9.3	1.2
8	27	58	237	61	60	380	129	360	24	29	7.6	1.4
9	31	53	184	60	60	337	118	232	22	29	6.9	15
10	27	82	162	59	65	314	110	188	20	25	6.5	11
11	25	77	151	58	80	286	106	171	18	22	6.5	5.7
12	24	66	145	58	120	292	99	153	18	20	6.5	4.1
13	23	61	235	58	250	444	93	139	15	18	7.5	3.5
14	22	56	548	56	419	314	88	126	14	17	7.3	3.4
15	21	52	1370	56	619	286	89	116	13	16	7.5	9.1
16	21	50	627	54	1020	240	374	150	17	14	6.3	12
17	21	47	372	54	839	196	212	129	13	12	5.8	12
18	21	45	235	52	876	184	148	109	16	11	5.2	6.8
19	23	43	204	54	810	177	121	95	30	10	5.1	5.6
20	21	45	186	55	503	174	104	85	21	15	4.8	7.6
21	20	48	161	55	837	235	95	75	16	12	4.7	8.7
22	20	44	147	55	1040	195	90	68	15	8.4	4.6	6.8
23	19	40	139	55	559	171	83	62	15	9.7	4.4	6.5
24	19	38	134	55	480	161	90	58	22	10	4.2	5.7
25	36	44	119	55	446	152	824	55	21	8.0	4.0	5.3
26	26	43	111	56	387	144	836	50	17	6.9	4.2	15
27	24	49	105	56	323	267	450	47	14	6.9	5.3	12
28	22	61	98	56	268	389	296	43	14	8.8	5.3	9.0
29	21	103	95	56	230	238	241	46	24	12	4.8	7.2
30	20	340	90	56	---	193	209	48	153	8.8	4.7	6.5
31	19	---	85	56	---	168	---	71	---	7.2	4.7	---
TOTAL	775	1859	7628	1837	10700	10648	6063	4480	790	611.7	194.8	196.7
MEAN	25.0	62.0	246	59.3	369	343	202	145	26.3	19.7	6.28	6.56
MAX	36	340	1370	80	1040	1030	836	647	153	79	15	15
MIN	19	23	85	52	57	144	83	43	13	6.9	4.0	1.2
CFSM	.22	.54	2.14	.52	3.21	2.98	1.76	1.26	.23	.17	.05	.06
IN.	.25	.60	2.47	.59	3.46	3.44	1.96	1.45	.26	.20	.06	.06

CAL YR 1975 TOTAL 52036.2 MEAN 143 MAX 2690 MIN 3.3 CFSM 1.24 IN 16.83
WTR YR 1976 TOTAL 45783.2 MEAN 125 MAX 1370 MIN 1.2 CFSM 1.09 IN 14.81

04148440 THREAD CREEK NEAR FLINT, MI

LOCATION.--Lat 42°58'30", long 83°38'09", in SE¼ SE¼ sec.28, T.7 N., R.7 E., Genesee County, Hydrologic Unit 04080204, on left bank 20 ft (6 m) downstream from bridge on Bristol Road, 6.0 mi (9.7 km) upstream from mouth, and 4.0 mi (6.4 km) southeast of Flint.

DRAINAGE AREA.--55.6 mi^2 (144.0 km^2).

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

GAGE.--Water-stage recorder. Altitude of gage is 770 ft (235 m) from topographic map (nearest 10 ft). Prior to May 13, 1970, non-recording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--6 years, 45.8 ft^3/s (1.297 m^3/s), 11.19 in/yr (284 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,260 ft^3/s (35.7 m^3/s) Apr. 19, 1975, gage height, 7.65 ft (2.332 m) from high water marks; no flow Aug. 7, 8, 10, 1971.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 300 ft^3/s (8.50 m^3/s), revised, and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	0600	470	13.3	5.80	1.768	Mar. 5	1100	424	12.0	5.67	1.728
Feb. 15	2400	*592	16.8	*6.13	1.868	Apr. 25	1200	370	10.5	5.50	1.676
Feb. 21	2000	418	11.8	5.65	1.722						

Minimum discharge, 1.6 ft^3/s (0.045 m^3/s) Sept. 8, gage height, 0.75 ft (0.229 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	18	88	40	28	106	74	107	22	41	7.7	4.4
2	26	18	96	37	28	164	78	99	21	35	7.7	3.8
3	25	49	81	35	28	292	71	86	20	32	9.6	3.9
4	23	35	68	34	28	319	70	66	18	29	7.3	3.8
5	23	42	61	33	28	355	65	58	16	22	10	3.6
6	21	47	192	32	28	306	80	126	14	18	15	3.2
7	21	50	168	31	28	220	65	190	12	27	7.8	2.7
8	20	43	169	30	29	171	63	180	11	34	8.2	2.3
9	26	38	135	30	30	144	59	142	10	16	8.3	3.6
10	23	54	108	29	32	128	55	104	8.0	12	8.6	12
11	22	44	87	29	40	119	51	90	8.5	11	8.4	5.4
12	22	47	76	29	60	120	46	72	8.0	10	6.9	5.5
13	19	44	98	28	120	144	42	62	7.6	8.8	5.9	5.8
14	21	39	151	28	200	140	39	54	7.1	7.9	8.2	5.8
15	22	33	359	28	320	133	38	49	6.4	7.1	8.1	15
16	20	28	257	28	465	120	138	74	7.2	6.7	7.9	8.1
17	19	27	200	28	439	96	95	61	6.6	6.4	11	7.6
18	21	24	152	28	355	85	86	62	6.5	6.2	8.9	7.9
19	23	23	121	28	293	79	63	61	26	5.0	7.3	7.8
20	24	23	106	28	228	74	51	61	11	5.1	6.3	8.2
21	25	28	86	28	290	126	43	53	11	7.4	5.4	8.4
22	24	25	78	28	340	92	42	42	11	5.0	4.7	8.3
23	23	25	69	28	281	84	40	35	10	9.9	5.2	7.9
24	22	25	63	28	204	75	45	29	14	7.5	4.7	7.5
25	28	28	57	28	180	71	274	26	14	7.0	4.0	7.2
26	24	28	54	28	162	66	311	24	11	6.8	3.7	10
27	23	31	52	28	148	85	274	22	10	6.6	4.9	13
28	22	38	50	28	133	105	202	21	9.9	6.8	4.0	9.8
29	20	49	47	28	118	104	162	20	12	11	3.8	10
30	18	105	45	28	---	97	129	20	74	7.4	4.1	10
31	17	---	43	28	---	82	---	22	---	7.2	4.7	---
TOTAL	694	1108	3417	921	4663	4302	2851	2118	423.8	422.8	218.3	212.5
MEAN	22.4	36.9	110	29.7	161	139	95.0	68.3	14.1	13.6	7.04	7.08
MAX	28	105	359	40	465	355	311	190	74	41	15	15
MIN	17	18	43	28	28	66	38	20	6.4	5.0	3.7	2.3
CFSM	.40	.66	1.98	.53	2.90	2.50	1.71	1.23	.25	.24	.13	.13
IN.	.46	.74	2.29	.62	3.12	2.88	1.91	1.42	.28	.28	.15	.14

CAL YR 1975 TOTAL 26535.2 MEAN 72.7 MAX 1160 MIN 1.9 CFSM 1.31 IN 17.75
WTR YR 1976 TOTAL 21351.4 MEAN 58.3 MAX 465 MIN 2.3 CFSM 1.05 IN 14.29

04148500 FLINT RIVER NEAR FLINT, MI

LOCATION.--Lat 43°02'20", long 83°46'10", in SW¼ sec.4, T.7 N., R.6 E., Genesee County, on left bank on grounds of sewage treatment plant, 1.2 mi (1.9 km) upstream from Pirnie Creek, 1.8 mi (2.9 km) downstream from Flint, and 5.0 mi (8.0 km) downstream from Swartz Creek.

DRAINAGE AREA.--954 mi^2 (2,471 km^2).

PERIOD OF RECORD.--September 1903 to March 1904 (gage heights only), August 1932 to current year. Gage-height records for flood seasons collected in this vicinity 1911-32, are contained in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 954: 1941. WSP 1337: 1933-34(M), 1935-37. WSP 2111: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 678.80 ft (206.898 m) above mean sea level (levels by U.S. Weather Bureau and city of Flint).

REMARKS.--Records good. Some regulation by reservoirs above station (see sta 04147000). Occasional diversion for industrial use. Since Dec. 17, 1967, flow contains up to 50 ft^3/s (1.42 m^3/s) as sewage effluent which originates outside the basin. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--44 years, 578 ft^3/s (16.37 m^3/s), 8.23 in/yr (209 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,900 ft^3/s (422 m^3/s) Apr. 6, 1947, gage height, 16.35 ft (4.983 m); minimum, 9.0 ft^3/s (0.25 m^3/s) Aug. 7, 1934.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,300 ft^3/s (207 m^3/s) Mar. 5, gage height, 13.06 ft (3.981 m); minimum, 129 ft^3/s (3.65 m^3/s) Sept. 24, gage height, 2.82 ft (0.860 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	294	369	1180	1010	629	3220	1300	2290	698	975	316	170
2	580	368	983	961	670	3350	1360	2310	582	800	326	169
3	590	617	952	911	682	5060	1410	2180	539	732	316	167
4	730	787	960	879	692	5660	1370	1590	500	760	319	161
5	715	689	992	821	696	6430	1250	1440	468	705	351	156
6	740	643	2110	866	698	6430	1330	2190	434	723	385	150
7	756	913	2190	866	686	6710	1220	3800	415	745	292	157
8	742	936	1860	826	670	6860	1220	3180	399	785	253	220
9	775	911	1630	796	657	6060	1070	2820	380	669	262	493
10	719	974	1640	729	697	5000	591	2710	355	588	268	597
11	676	1070	1780	718	802	4280	651	2650	311	565	265	417
12	656	1090	1750	736	831	4060	784	2320	294	529	265	381
13	612	1050	1910	738	1270	4500	831	1990	273	497	305	405
14	277	573	2530	727	1560	4030	932	1580	275	437	358	377
15	240	496	4840	681	1810	3610	850	1500	278	401	298	409
16	263	381	2740	658	3270	3300	1610	1800	294	358	274	389
17	312	533	1940	613	3140	2990	1090	1590	273	302	268	377
18	368	619	1950	569	3250	2710	1060	1290	277	247	268	534
19	335	609	2320	559	3910	2370	1070	894	459	271	265	405
20	320	617	2080	544	3180	2120	944	866	328	326	262	274
21	314	797	1920	554	4020	2170	867	993	323	465	241	238
22	311	713	1470	592	5640	1860	778	919	329	354	211	170
23	309	691	1600	635	4920	1640	424	807	331	316	214	141
24	358	678	1780	655	4680	1580	496	820	380	330	208	136
25	493	704	1720	657	4600	1570	2590	745	384	323	197	200
26	395	672	1450	644	4370	1500	3210	694	325	323	190	156
27	371	671	1290	508	3960	1780	2500	641	307	330	187	170
28	364	711	1210	393	3550	2180	2080	588	317	333	174	150
29	372	751	1000	364	3390	1820	2000	473	401	393	167	163
30	360	1340	1100	276	---	1680	2050	442	1350	323	165	312
31	371	---	1030	303	---	1350	---	652	---	337	169	---
TOTAL	14718	21973	53907	20789	68930	107880	38938	48764	12279	15242	8039	8244
MEAN	475	732	1739	671	2377	3480	1298	1573	409	492	259	275
MAX	775	1340	4840	1010	5640	6860	3210	3800	1350	975	385	597
MIN	240	368	952	276	629	1350	424	442	273	247	165	136
MEAN+	364	668	1688	657	2546	3357	1523	1552	414	459	225	264
CFSM+	.38	.70	1.77	.69	2.67	3.52	1.60	1.63	.43	.48	.24	.28
IN+	.44	.78	2.04	.79	2.88	4.06	1.78	1.88	.48	.55	.27	.31

CAL YR 1975 TOTAL 412884 MEAN 1131 MAX 8570 MIN 204 MEAN+ 1121 CFSM+ 1.18 IN+ 15.95
WTR YR 1976 TOTAL 419703 MEAN 1147 MAX 6860 MIN 136 MEAN+ 1140 CFSM+ 1.20 IN+ 16.27

+Adjusted for change in contents in Holloway Reservoir.

04148720 BRENT RUN NEAR MONTROSE, MI

LOCATION.--Lat 43°10'12", long 83°50'03", in SE¼ NE¼ sec.23, T.9 N., R.5 E., Genesee County, Hydrologic Unit 04080204, on right bank 10 ft (3 m) downstream from bridge on Morrish Road, 0.8 mi (1.3 km) upstream from Central-Stadler Drain, 3.0 mi (4.8 km) upstream from mouth, and 3.1 mi (5.0 km) east of Montrose.

DRAINAGE AREA.--18.3 mi^2 (47.4 km^2).

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

GAGE.--Water-stage recorder. Altitude of gage is 655 ft (200 m) from topographic map (nearest 5 ft). Prior to Aug. 26, 1970, non-recording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--6 years, 17.5 ft^3/s (0.496 m^3/s), 12.99 in/yr (330 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 730 ft^3/s (20.7 m^3/s) Dec. 31, 1972, gage height, 6.34 ft (1.932 m); maximum gage height, 7.08 ft (2.158 m) Mar. 15, 1971 (backwater from ice); minimum discharge, 2.1 ft^3/s (0.059 m^3/s) Sept. 5, 1973; minimum gage height, 1.01 ft (0.308 m) Aug. 9, 17, 1971.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 250 ft^3/s (7.08 m^3/s), revised, and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	1500	452	12.8	5.26	1.603	Mar. 5	2200	377	10.7	4.85	1.478
Feb. 16	1700	452	12.8	5.26	1.603	Mar. 28	0900	298	8.44	4.32	1.317
Feb. 19	0900	312	8.84	4.40	1.341	Apr. 26	0100	334	9.46	4.58	1.396
Feb. 22	1200	325	9.20	4.44	1.353	May 7	1100	333	9.43	4.59	1.399
Mar. 3	1700	*470	13.3	*5.35	1.631						

Minimum discharge, 2.5 ft^3/s (.071 m^3/s) Aug. 11, Sept. 8, 9, gage height, 1.11 ft (0.338 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.4	6.1	50	8.5	6.5	23	17	15	16	78	4.5	2.9
2	5.6	12	19	8.5	6.5	34	20	14	10	26	4.3	3.0
3	5.3	18	17	8.0	6.5	256	19	20	8.8	13	3.7	3.1
4	5.6	15	14	8.0	6.5	297	15	16	7.8	11	3.6	3.2
5	5.9	9.7	15	7.5	6.5	218	14	14	7.4	9.5	3.9	3.0
6	6.7	8.2	46	7.5	6.5	170	14	56	6.9	7.3	5.3	2.8
7	6.4	8.0	104	7.0	6.5	46	21	230	6.5	6.5	4.8	2.9
8	7.6	14	22	7.0	7.0	28	13	81	6.9	9.1	4.2	2.7
9	8.4	9.3	16	7.0	8.0	22	13	28	6.6	7.1	3.4	3.1
10	12	8.9	15	6.5	10	20	12	19	6.1	6.3	3.1	16
11	9.9	21	13	6.5	14	21	13	19	5.8	6.2	2.9	7.0
12	8.9	10	12	6.5	25	22	14	19	5.7	8.1	2.8	4.3
13	8.3	9.1	16	6.4	45	77	11	13	5.6	5.8	2.8	3.6
14	7.5	8.8	61	6.5	70	62	12	13	4.9	5.5	12	3.3
15	8.6	8.5	260	6.5	120	38	12	12	4.5	5.5	10	3.8
16	11	8.1	130	6.5	282	27	49	20	5.0	5.2	5.8	8.8
17	11	7.2	37	6.5	257	20	54	29	5.2	5.1	4.3	10
18	9.3	6.8	27	6.5	169	16	18	19	5.1	5.0	4.3	5.3
19	11	7.3	23	6.5	222	16	14	13	7.8	4.9	4.1	4.6
20	13	7.3	20	6.5	78	18	12	12	11	4.5	3.8	5.0
21	14	9.2	17	6.5	61	45	12	11	5.8	4.9	3.7	5.8
22	12	10	15	6.5	223	33	11	10	5.1	5.2	3.7	5.8
23	11	7.5	14	6.5	102	17	11	9.6	5.0	5.1	3.4	6.2
24	11	6.6	13	6.5	53	16	12	9.4	5.2	7.3	3.0	4.9
25	12	6.9	12	6.5	98	15	94	8.8	9.2	5.2	2.8	4.8
26	23	9.9	11	6.5	73	13	237	9.1	6.9	4.5	3.0	4.9
27	7.3	12	11	6.5	46	34	74	8.8	5.1	4.0	3.2	8.5
28	5.2	14	10	6.5	34	184	32	8.8	4.5	4.0	3.6	7.6
29	6.4	20	9.5	6.5	25	59	21	9.7	4.4	6.1	2.9	5.2
30	6.1	60	9.0	6.5	---	30	17	14	36	6.0	2.9	4.8
31	5.7	---	9.0	6.5	---	22	---	25	---	5.0	2.8	---
TOTAL	281.1	359.4	1047.5	211.9	2067.5	1899	888	786.2	230.8	286.9	128.6	156.9
MEAN	9.07	12.0	33.8	6.84	71.3	61.3	29.6	25.4	7.69	9.25	4.15	5.23
MAX	23	60	260	8.5	282	297	237	230	36	78	12	16
MIN	5.2	6.1	9.0	6.4	6.5	13	11	8.8	4.4	4.0	2.8	2.7
CFSM	.50	.66	1.85	.37	3.90	3.35	1.62	1.39	.42	.51	.23	.29
IN.	.57	.73	2.13	.43	4.20	3.86	1.81	1.60	.47	.58	.26	.32

CAL YR 1975 TOTAL 8156.6 MEAN 22.3 MAX 301 MIN 3.5 CFSM 1.22 IN 16.58
WTR YR 1976 TOTAL 8343.8 MEAN 22.8 MAX 297 MIN 2.7 CFSM 1.25 IN 16.96

04149000 FLINT RIVER NEAR FOSTERS, MI

LOCATION.--Lat 43°18'30", long 83°57'13", in SE¼ SE¼ sec.35, T.11 N., R.4 E., Saginaw County, Hydrologic Unit 04080204, on left bank 20 ft (6 m) downstream from bridge on State Highway 13, 2 mi (3 km) west of Fosters and 6.5 mi (10.5 km) downstream from Silver Creek. Records include flow of Birch Run.

DRAINAGE AREA.--1,189 mi^2 (3,080 km^2), includes that of Birch Run above State Highway 13.

PERIOD OF RECORD.--October 1939 to current year. Monthly discharge only for some periods, published in WSP 1307. Gage-height records for flood seasons collected in this vicinity 1910-20, 1922-27 are contained in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 954: 1941. WSP 1337: 1940, 1942, 1943-44(M), 1945, 1946-47(M), 1948-50. WSP 2111: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 600 ft (183 m) from topographic map. Prior to Oct. 1, 1969, nonrecording gage at site 2.2 mi (3.5 km) upstream at datum 582.22 ft (177.461 m) above mean sea level.

REMARKS.--Records good except those for the winter period and those for periods Feb. 16-25, Mar. 3-18, which are poor. Some regulation by reservoirs above Flint. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--37 years, 736 ft^3/s (20.84 m^3/s), 8.41 in/yr (214 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,000 ft^3/s (538 m^3/s) Apr. 7, 1947 (including flow bypassing gage); maximum gage height, 18.6 ft (5.67 m) Feb. 2, 1968, site and datum then in use; minimum discharge observed, 27 ft^3/s (0.76 m^3/s) Aug. 6, 1941.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of March 1904, reached a stage of 18.4 ft (5.61 m) from U.S. Weather Bureau data, site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 9,000 ft^3/s (283 m^3/s) Mar. 8; maximum gage height, 16.25 ft (4.953 m) Feb. 16 (backwater from ice); minimum discharge, 140 ft^3/s (3.96 m^3/s) Sept. 30, gage height, 2.08 ft (0.634).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	379	429	1920	1190	800	3780	1680	2430	1090	2390	347	175
2	441	453	1410	1150	850	3680	1660	2510	908	1500	329	175
3	660	555	1210	1090	850	5400	1690	2660	764	1000	326	168
4	690	767	1160	1070	850	7000	1650	2090	707	896	315	166
5	773	881	1170	1050	850	8000	1510	1680	649	815	317	162
6	776	767	1940	1100	850	8000	1480	2360	601	752	372	153
7	800	809	3360	1100	850	8500	1510	5660	558	761	379	146
8	803	1070	2530	1100	840	9000	1430	5280	525	821	300	148
9	803	749	1990	1050	840	7500	1270	4020	485	782	265	234
10	836	737	1840	1000	900	6600	1020	3530	456	668	269	566
11	776	1180	1930	1000	1000	5500	698	3320	432	603	271	456
12	749	1220	1920	1000	1100	4900	869	2950	388	593	265	370
13	725	1200	2010	1000	1700	5200	872	2530	349	536	269	338
14	620	1020	2920	950	2000	4800	968	2000	347	504	358	372
15	349	663	7130	920	2500	4400	1000	1740	368	446	372	326
16	324	609	7110	880	4500	4000	1720	1820	372	408	311	393
17	347	495	3970	840	5600	3600	1970	2020	384	370	281	365
18	444	687	2430	780	4990	3300	1310	1840	358	317	269	405
19	456	719	2530	740	5800	2900	1220	1380	417	271	267	460
20	420	693	2590	700	5000	2610	1130	1030	531	281	260	298
21	403	887	2300	700	6500	2720	1020	1120	422	384	256	250
22	396	839	1990	750	8500	2680	923	1120	424	429	243	231
23	393	812	1990	800	7000	2290	728	1030	410	358	229	169
24	391	788	1880	820	6200	2090	544	941	432	340	220	148
25	451	842	2000	800	5500	2000	2270	956	512	340	216	148
26	585	824	1800	760	4950	1900	5990	872	458	324	204	207
27	472	812	1500	650	4630	1940	4900	824	393	329	200	168
28	451	839	1430	550	4270	3220	3580	758	365	340	195	191
29	446	866	1280	450	4000	2910	2710	722	379	377	184	154
30	444	1580	1130	360	---	2510	2420	647	1120	398	171	216
31	432	---	1270	500	---	1960	---	809	---	340	168	---
TOTAL	17035	24792	71640	26850	94220	134890	51742	62649	15604	18673	8428	7758
MEAN	550	826	2311	866	3249	4351	1725	2021	520	602	272	259
MAX	836	1580	7130	1190	8500	9000	5990	5660	1120	2390	379	566
MIN	324	429	1130	360	800	1900	544	647	347	271	168	146

CAL YR 1975 TOTAL 537305 MEAN 1472 MAX 7900 MIN 250
WTR YR 1976 TOTAL 534281 MEAN 1460 MAX 9000 MIN 146

NOTE.--Flow bypassing gage during period Feb. 16-25 and Mar. 3-18.

04149500 FLINT RIVER NEAR ALICIA, MI

LOCATION.--Lat 43°18'40", long 84°02'00", in SE¼ sec.31, T.11 N., R.4 E., Saginaw County, Hydrologic Unit 04080204, on left bank 100 ft (30 m) downstream from the Prairie Farms Association flood-pumping station, 2.8 mi (4.5 km) north of Alicia, and 4 mi (6 km) upstream from mouth.

PERIOD OF RECORD.--November 1948 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is 577.00 ft (175.870 m) above mean sea level.

REMARKS.--Records good except those during period Mar. 7-9 which may be affected by ice in stilling well. Records represent stages in the Shiawassee Flats area.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 13.70 ft (4.176 m) Apr. 3, 1960; minimum, less than 1.5 ft (0.46 m) during many days in 1949, 1958, 1959, 1963, 1964, 1966-69.

EXTREMES FOR CURRENT YEAR.--Maximum gage height recorded, 13.39 ft (4.081 m) Mar. 7; minimum gage height, 1.94 ft (0.591 m) Nov. 10.

GAGE HEIGHT, IN FEET, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.66	3.73	4.87	4.93	3.95	10.24	7.22	8.07	5.98	8.29	5.28	4.96
2	5.18	4.10	6.64	4.50	4.29	10.00	6.84	7.40	5.87	8.00	5.36	4.96
3	4.16	4.16	5.47	4.17	4.29	10.61	6.70	6.90	5.51	7.37	4.84	3.85
4	4.84	4.27	5.18	4.55	4.29	11.95	6.88	6.63	5.32	6.81	4.82	4.38
5	4.34	4.31	4.77	4.44	4.34	12.85	6.30	6.13	5.23	6.20	4.69	4.92
6	4.64	4.22	5.49	4.27	4.27	13.32	6.01	7.20	5.18	5.71	5.46	4.52
7	4.80	4.22	6.35	4.63	4.25	13.39	5.96	8.99	5.12	5.42	5.30	4.25
8	4.65	4.23	6.12	4.51	4.20	13.39	5.95	9.74	5.05	5.58	5.09	4.47
9	4.74	4.53	5.90	4.35	4.18	13.37	5.67	9.62	5.05	5.27	5.01	4.59
10	4.48	3.28	5.48	4.40	4.10	13.06	5.29	9.03	4.77	4.99	4.86	4.84
11	4.62	4.38	5.39	4.33	4.32	---	5.83	8.32	5.08	5.16	4.69	4.64
12	4.63	4.28	5.55	4.24	4.53	---	5.24	7.67	5.48	5.67	4.54	4.36
13	4.20	4.82	5.33	4.32	4.63	---	5.04	7.03	4.71	5.39	4.97	4.31
14	4.62	5.02	5.62	4.40	5.28	---	4.99	6.48	4.81	5.20	5.32	4.26
15	4.12	4.00	8.68	4.56	5.81	---	4.84	6.25	4.67	5.17	5.18	4.85
16	4.62	4.28	9.92	4.36	8.02	---	5.34	5.99	4.64	5.24	5.01	4.99
17	5.06	3.89	9.53	4.46	10.04	---	5.87	6.09	5.16	5.16	4.98	4.84
18	6.10	4.18	8.65	4.20	10.83	---	5.54	6.52	4.86	4.96	4.87	4.52
19	5.12	4.08	7.68	3.85	11.43	---	5.26	6.41	5.19	4.94	4.67	4.36
20	4.26	4.18	7.63	4.10	11.83	---	5.42	6.02	5.20	4.68	4.74	4.69
21	4.22	3.54	7.69	4.22	11.78	8.27	5.38	5.86	5.26	5.40	4.73	4.40
22	4.46	4.46	7.26	4.39	11.76	9.45	4.95	5.83	5.20	5.16	4.67	4.41
23	4.03	4.42	7.01	4.37	11.90	10.13	5.35	5.71	5.09	4.89	5.35	4.18
24	4.11	4.39	6.79	4.24	11.61	9.91	5.57	5.67	5.05	5.37	5.11	4.40
25	3.78	5.68	6.49	4.18	11.31	9.28	7.90	5.61	4.88	5.12	4.81	4.32
26	4.37	4.72	6.14	4.19	11.34	8.71	9.69	5.34	4.79	4.65	4.63	4.25
27	4.00	4.80	5.86	4.22	11.24	8.27	10.41	5.18	4.90	5.09	4.45	4.46
28	4.14	4.12	5.43	4.16	11.00	8.51	10.49	5.18	5.08	5.29	4.47	4.31
29	4.83	4.02	5.04	4.17	10.67	8.70	9.84	5.20	5.12	5.48	5.14	3.75
30	4.72	3.88	4.98	4.36	---	8.32	8.97	5.31	6.62	5.10	4.90	4.24
31	3.65	---	4.96	4.05	---	7.68	---	5.34	---	5.33	4.52	---
MEAN	4.52	4.27	6.38	4.33	7.64	---	6.49	6.67	5.16	5.55	4.92	4.48
MAX	6.10	5.68	9.92	4.93	11.90	---	10.49	9.74	6.62	8.29	5.46	4.99
MIN	3.65	3.28	4.77	3.85	3.95	---	4.84	5.18	4.64	4.65	4.45	3.75

04150000 SOUTH BRANCH CASS RIVER NEAR CASS CITY, MI

LOCATION.--Lat 43°34'01", long 83°06'43", in SW¼ NW¼ sec.7, T.13 N., R.12 E., Sanilac County, Hydrologic Unit 04080205, on left bank 1.5 mi (2.4 km) downstream from bridge on State Highway 53, 3.9 mi (6.3 km) southeast of Cass City, 4.2 mi (6.8 km) upstream from confluence with North Branch.

DRAINAGE AREA.--251 mi^2 (650 km^2).

PERIOD OF RECORD.--October 1948 to current year. Monthly discharge only for some periods, published in WSP 1307. Prior to October 1963, published as East Branch Cass River near Cass City.

REVISED RECORDS.--WSP 1337: 1949-50. WSP 1707: 1951-53, 1959.

GAGE.--Water-stage recorder. Datum of gage is 719.5 ft (219.3 m) above mean sea level. Prior to Nov. 8, 1952, nonrecording gage at site 1.5 mi (2.4 km) upstream at different datum.

REMARKS.--Records good except those for the winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--28 years, 126 ft^3/s (3.568 m^3/s), 6.82 in/yr (173 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,400 ft^3/s (181 m^3/s) Mar. 28, 1967, gage height, 14.86 ft (4.529 m); minimum, 0.2 ft^3/s (0.006 m^3/s) Sept. 20-23, 1955, Aug. 19, 20, 1958.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,100 ft^3/s (31.2 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	1900	2,920	82.7	10.21	3.112	Mar. 14	--	2,500	70.8	ice jam	
Feb. 20	--	2,730	77.3	ice jam		Mar. 22	0100	2,520	71.4	9.56	2.914
Feb. 27	--	2,450	69.4	ice jam		Apr. 26	0600	2,530	71.6	9.62	2.932
Mar. 6	0600	*5,630	159	*13.90	4.237	May 7	unknown	2,990	84.7	unknown	

Minimum discharge, 4.8 ft^3/s (0.14 m^3/s) Sept. 6, 7, gage height, 1.81 ft (0.552 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	9.1	170	45	41	1320	240	165	72	416	18	6.3
2	12	10	141	46	41	1010	287	150	59	416	14	6.3
3	11	12	83	43	41	1800	262	260	50	231	12	5.9
4	11	16	56	42	41	4200	193	230	43	133	11	5.4
5	10	18	52	40	41	4900	155	200	38	84	9.8	5.4
6	9.9	16	165	38	41	5560	131	1000	33	55	9.2	4.9
7	8.7	15	327	37	42	4120	104	2300	30	66	9.1	4.9
8	9.1	15	214	37	42	1200	101	1300	28	204	9.4	5.0
9	9.3	16	117	37	43	820	92	700	26	166	8.0	5.6
10	9.3	20	89	38	44	660	84	420	23	111	7.5	7.8
11	9.2	23	77	38	45	520	82	270	21	111	7.7	12
12	9.4	25	67	39	47	700	78	210	20	81	7.4	14
13	9.3	24	64	38	49	2300	71	162	18	50	7.4	9.7
14	9.6	22	287	38	52	2100	67	126	17	35	15	7.4
15	9.2	19	2100	39	58	1000	62	109	17	31	84	8.0
16	8.9	16	1530	39	250	800	66	133	18	27	117	9.2
17	8.8	15	455	39	660	500	79	439	16	26	54	9.0
18	8.5	14	218	39	1050	380	70	278	17	22	24	8.7
19	8.5	14	150	39	1800	450	58	161	21	18	15	7.8
20	8.8	13	125	40	2500	1000	51	116	20	16	12	7.8
21	9.1	15	110	40	2000	2040	47	113	24	18	9.7	8.1
22	9.2	16	90	40	1600	1540	49	99	21	88	8.3	7.5
23	9.2	17	78	40	1400	765	50	81	18	68	7.4	8.0
24	8.9	16	68	41	1250	380	57	73	16	32	6.9	7.5
25	11	17	60	41	1250	353	682	66	17	21	6.8	7.2
26	11	17	54	41	1900	273	2130	63	18	16	6.6	7.2
27	11	20	52	41	2200	315	1250	61	17	14	6.2	7.3
28	11	27	49	41	1900	929	618	59	15	12	6.0	7.4
29	10	33	48	41	1700	792	349	58	21	19	5.7	7.4
30	9.3	113	46	41	---	460	227	60	42	24	5.4	7.2
31	8.8	---	44	41	---	333	---	63	---	25	5.5	---
TOTAL	302.0	623.1	7186	1239	22128	43520	7792	9525	796	2636	526.0	225.9
MEAN	9.74	20.8	232	40.0	763	1404	260	307	26.5	85.0	17.0	7.53
MAX	13	113	2100	46	2500	5560	2130	2300	72	416	117	14
MIN	8.5	9.1	44	37	41	273	47	58	15	12	5.4	4.9
CFSM	.04	.08	.92	.16	3.04	5.59	1.04	1.22	.11	.34	.07	.03
IN.	.04	.09	1.07	.18	3.28	6.45	1.15	1.41	.12	.39	.08	.03

CAL YR 1975 TOTAL 48248.6 MEAN 132 MAX 3740 MIN 6.9 CFSM .53 IN 7.15
WTR YR 1976 TOTAL 96499.0 MEAN 264 MAX 5560 MIN 4.9 CFSM 1.05 IN 14.30

04150500 CASS RIVER AT CASS CITY, MI

LOCATION.--Lat 43°35'03", long 83°10'34", in NE¼ NE¼ sec.4, T.13 N., R.11 E., Tuscola County, Hydrologic Unit 04080205, on left bank 600 ft (183 m) downstream from bridge on Cemetary Road, 0.3 mi (0.5 km) downstream from confluence of North and South Branches, and 1.1 mi (1.8 km) south of Cass City.

DRAINAGE AREA.--370 mi^2 (960 km^2), approximately.

PERIOD OF RECORD.--October 1947 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1337: 1949-50. WSP 1727: 1948(M), 1950.

GAGE.--Water-stage recorder. Datum of gage is 697.92 ft (212.726 m) above mean sea level. Prior to Nov. 14, 1952, nonrecording gage at site 600 ft (183 m) upstream at present datum.

REMARKS.--Records good except those for the winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--29 years, 203 ft^3/s (5.749 m^3/s), 7.45 in/yr (189 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,460 ft^3/s (240 m^3/s) Mar. 20, 1948, gage height, 15.80 ft (4.816 m), from graph based on gage readings; minimum, 0.50 ft^3/s (0.014 m^3/s) Sept. 26, 1948.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,400 ft^3/s (39.6 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	2130	3,090	87.5	10.66	3.249
Feb. 20	--	2,700	76.5	ice jam	
Feb. 27	--	3,120	88.4	ice jam	
Mar. 6	1430	*6,810	193	*14.37	4.380
Mar. 13	1600	3,980	113	11.67	3.557
Mar. 21	unknown	3,720	105	unknown	
Mar. 28	unknown	1,560	44.2	unknown	
Apr. 26	0900	2,850	80.7	10.36	3.158
May 7	1600	3,520	99.7	11.16	3.402

Minimum discharge, 5.2 ft^3/s (0.15 m^3/s) Sept. 7, gage height, 4.50 ft (1.372 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	15	227	98	90	2000	540	382	100	389	25	7.5
2	17	16	205	95	90	1290	510	313	87	458	21	7.9
3	16	19	140	92	90	1900	480	466	74	250	19	7.4
4	16	25	120	91	91	4500	400	410	65	151	17	6.7
5	15	29	115	90	92	5490	320	361	56	98	17	6.0
6	14	27	170	90	92	6650	270	1440	50	68	15	5.9
7	14	26	400	87	92	5030	240	3000	44	63	14	5.4
8	13	26	316	84	92	2200	213	2040	41	175	14	5.6
9	13	27	210	82	93	1500	191	1030	37	162	13	6.9
10	13	31	169	81	96	1200	174	653	34	111	12	9.9
11	13	36	150	82	98	1050	167	522	31	120	11	11
12	13	38	137	84	100	965	157	467	28	95	11	16
13	14	38	135	83	110	2980	146	353	26	67	11	14
14	14	37	366	82	120	2600	139	286	25	52	12	11
15	14	35	2140	82	160	1700	132	241	24	44	52	9.6
16	14	32	2100	84	450	1000	135	263	30	45	82	11
17	13	29	932	84	800	700	139	632	28	39	58	11
18	12	27	598	84	1700	560	132	499	29	34	29	11
19	12	27	400	86	2100	580	117	339	37	31	21	10
20	12	26	310	86	2600	1700	108	270	38	28	17	10
21	13	28	240	87	2300	3100	100	236	39	28	14	10
22	13	30	190	89	2000	2500	102	209	35	59	12	9.8
23	13	30	160	90	1800	1300	108	174	31	72	11	10
24	13	31	145	90	1600	860	126	151	29	40	10	10
25	15	33	130	90	1600	680	767	132	29	27	9.5	9.6
26	16	34	120	89	2200	600	2540	121	29	23	9.0	9.6
27	17	38	115	89	2600	760	1860	111	27	20	8.0	9.6
28	17	48	110	90	2300	1300	1140	103	23	18	7.6	9.5
29	16	61	105	91	2020	1100	750	100	28	23	7.2	9.4
30	15	147	100	90	---	840	518	100	54	27	6.8	9.3
31	15	---	100	90	---	670	---	99	---	31	6.4	---
TOTAL	443	1046	10855	2712	27576	59305	12721	15503	1208	2848	572.5	280.6
MEAN	14.3	34.9	350	87.5	951	1913	424	500	40.3	91.9	18.5	9.35
MAX	18	147	2140	98	2600	6650	2540	3000	100	458	82	16
MIN	12	15	100	81	90	560	100	99	23	18	6.4	5.4
CFSM	.04	.09	.95	.24	2.57	5.17	1.15	1.35	.11	.25	.05	.03
IN.	.04	.11	1.09	.27	2.77	5.96	1.28	1.56	.12	.29	.06	.03

CAL YR 1975 TOTAL 81260.8 MEAN 223 MAX 4020 MIN 7.8 CFSM .60 IN 8.17
WTR YR 1976 TOTAL 135070.1 MEAN 369 MAX 6650 MIN 5.4 CFSM 1.00 IN 13.58

04150800 CASS RIVER AT WAHJAMEGA, MI

LOCATION.--Lat 43°27'02", long 83°26'29", in NW¼ NW¼ sec.20, T.12 N., R.9 E., Tuscola County, Hydrologic Unit 04080205, on right bank 90 ft (27 m) upstream from bridge on Chambers Road, on grounds of Caro Regional Center at Wahjamega, 1.9 mi (3.1 km) downstream from Michigan Sugar Co. dam, and 40 mi (64 km) upstream from mouth.

DRAINAGE AREA.--637 mi^2 (1,650 km^2).

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 650 ft (198 m) from topographic map. Prior to June 19, 1969, nonrecording gage at bridge 90 ft (27 m) downstream at present datum.

REMARKS.--Records good except those for the winter period, which are poor. Some regulation by dam at Michigan Sugar Co., 1.9 mi (3.1 km) above station. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--8 years, 431 ft^3/s (12.21 m^3/s), 9.19 in/yr (233 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,700 ft^3/s (331 m^3/s) Mar. 6, 1976, gage height, 19.92 ft (6.072 m); minimum, 22 ft^3/s (0.62 m^3/s) Sept. 22, 1969, and part or all of each day Aug. 9, 10, 16-22, 1971.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,400 ft^3/s (68.0 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 16	1000	4,130	117	12.71	3.874	Mar. 21	2300	6,500	184	15.80	4.816
Feb. 21	0100	4,620	131	13.53	4.124	Mar. 28	2000	2,860	81.0	10.58	3.225
Feb. 27	1500	5,080	144	14.29	4.356	Apr. 26	1800	4,630	131	13.55	4.130
Mar. 6	0700	*11,700	331	*19.92	6.072	May 8	0200	5,050	143	14.24	4.340
Mar. 14	0400	5,970	169	15.27	4.654						

Minimum discharge, 29 ft^3/s (0.82 m^3/s) Sept. 7, 8; minimum gage height, 2.97 ft (0.905 m) Sept. 7-9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	57	428	180	175	2850	1220	840	220	629	75	32
2	54	61	442	175	175	2490	1140	693	206	891	70	31
3	49	75	318	170	175	3110	1120	852	184	580	58	31
4	50	89	260	170	175	6800	918	957	167	362	53	31
5	47	91	232	170	175	9750	765	780	152	259	51	31
6	46	92	289	165	175	11500	664	2190	140	198	51	30
7	43	93	609	165	180	9560	578	4190	130	200	46	29
8	42	94	629	160	180	5200	510	4380	120	366	43	29
9	43	90	441	160	185	3320	454	2340	114	340	42	32
10	44	98	342	160	190	2630	421	1430	106	259	40	36
11	43	110	295	160	190	2240	403	1130	101	213	40	39
12	43	108	264	155	200	1940	382	1040	89	195	38	41
13	44	113	254	150	210	3740	364	836	81	161	38	42
14	46	108	416	150	250	5120	344	667	77	135	40	43
15	44	103	2070	155	374	2980	331	567	76	120	57	43
16	43	100	3790	160	912	2340	368	573	109	121	114	42
17	43	91	2070	160	1740	1670	378	1030	95	109	150	44
18	42	87	1030	165	2370	1250	355	1130	84	95	119	45
19	41	82	686	170	3340	1130	317	759	102	86	82	44
20	43	82	500	170	4340	3040	283	583	102	81	61	48
21	44	90	410	170	4340	5390	261	486	95	90	51	49
22	45	91	350	170	3640	5110	260	429	93	87	46	46
23	45	92	310	170	3320	2820	267	368	90	114	44	47
24	46	90	280	175	2910	2020	316	325	91	126	40	45
25	52	97	250	175	2930	1590	1480	289	95	93	38	44
26	58	96	220	175	4120	1270	4170	261	86	73	38	44
27	60	112	210	180	4980	1330	3720	241	78	64	37	45
28	60	122	200	180	4510	2640	2460	224	80	58	36	45
29	59	141	190	180	3320	2640	1600	220	121	73	34	43
30	55	214	190	180	---	2080	1100	224	341	71	33	43
31	53	---	185	175	---	1610	---	225	---	74	32	---
TOTAL	1485	2969	18160	5200	49781	111160	26949	30259	3625	6323	1697	1194
MEAN	47.9	99.0	586	168	1717	3586	898	976	121	204	54.7	39.8
MAX	60	214	3790	180	4980	11500	4170	4380	341	891	150	49
MIN	41	57	185	150	175	1130	260	220	76	58	32	29
CFSM	.08	.16	.92	.26	2.70	5.63	1.41	1.53	.19	.32	.09	.06
IN.	.09	.17	1.06	.30	2.91	6.49	1.57	1.77	.21	.37	.10	.07

CAL YR 1975 TOTAL 151818 MEAN 416 MAX 6610 MIN 29 CFSM .65 IN 8.87
WTR YR 1976 TOTAL 258802 MEAN 707 MAX 11500 MIN 29 CFSM 1.11 IN 15.11

04151500 CASS RIVER AT FRANKENMUTH, MI

LOCATION.--Lat 43°19'40", long 83°44'53", in NW¼ SE¼ sec.27, T.11 N., R.6 E., Saginaw County, Hydrologic Unit 04080205, on right bank 2,000 ft (610 m) below dam in Frankenmuth, 3,600 ft (1,097 m) above highway bridge on Dehmel Road, 3.4 mi (5.5 km) upstream from Dead Creek, and 17 mi (27 km) upstream from mouth.

DRAINAGE AREA.--848 mi^2 (2,196 km^2).

PERIOD OF RECORD.--February 1908 to March 1909, July 1935 to September 1936, June 1939 to current year.

REVISED RECORDS.--WSP 1307: 1936(M), 1940(M). WSP 1727: 1952. WSP 1911: 1952.

GAGE.--Water-stage recorder. Datum of gage is 583.96 ft (177.991 m) above mean sea level (levels by Michigan Department of Natural Resources). February 1908 to March 1909, nonrecording gage at site 2,000 ft (610 m) upstream at datum 1.81 ft (0.552 m) lower. July 18 to Sept. 11, 1935, nonrecording gage, Sept. 12, 1935, to Sept. 30, 1936, and June 20, 1939, to Sept. 30, 1949, water-stage recorder, at site 3,600 ft (1,097 m) downstream at datum 0.04 ft (0.012 m) higher.

REMARKS.--Records good except those for the winter period, which are poor. Occasional regulation by dams above station. Prior to 1950, regulation at low and medium flows by mill above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--38 years, 483 ft^3/s (13.68 m^3/s), 7.73 in/yr (196 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,700 ft^3/s (501 m^3/s) Mar. 18, 1942, gage height, 20.88 ft (6.364 m), site and datum then in use; maximum gage height, 23.37 ft (7.123 m) Feb. 3, 1968 (backwater from ice); minimum daily discharge, about 1.5 ft^3/s (0.042 m^3/s) Aug. 6, 1944.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,500 ft^3/s (99.1 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 16	1800	4,820	136	15.78	4.810	Mar. 22	1100	7,300	207	18.33	5.587
Feb. 21	--	5,620	159	ice jam		Mar. 28	2300	4,140	117	14.90	4.542
Feb. 28	0200	5,790	164	16.88	5.145	Apr. 27	0500	5,920	168	17.26	5.261
Mar. 6	0400	*13,700	388	*22.83	6.959	May 8	1300	6,090	172	17.57	5.355
Mar. 14	1700	6,920	196	18.02	5.492						

Minimum discharge, 43 ft^3/s (1.22 m^3/s) Sept. 7, gage height, 3.40 ft (1.036 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	105	83	589	270	250	3320	1920	1280	1360	1070	113	57
2	100	91	630	260	250	3670	1680	1010	776	1500	111	55
3	93	116	507	255	250	7550	1650	1020	494	1200	104	54
4	84	140	387	250	250	9150	1430	1240	357	752	94	55
5	83	144	358	250	250	12200	1180	1080	291	509	93	51
6	78	138	537	245	250	13500	1010	2230	252	371	92	46
7	79	137	714	240	255	12200	878	5310	234	293	86	45
8	76	147	867	240	260	9020	769	5910	218	392	79	44
9	74	142	679	240	265	5290	685	4010	201	446	75	54
10	75	146	535	235	270	3800	620	2260	181	386	74	84
11	75	176	445	235	280	3290	594	1610	172	312	70	79
12	72	165	392	235	290	2780	553	1400	162	266	69	68
13	71	159	398	230	320	4120	526	1180	147	241	70	64
14	72	162	753	230	420	6470	484	916	140	205	104	65
15	72	148	3210	230	700	5020	460	743	140	180	136	71
16	71	140	4580	230	1500	3470	742	717	172	164	123	72
17	69	134	3420	235	2700	2660	799	934	170	159	158	71
18	72	129	1670	240	3500	1910	636	1440	150	145	171	69
19	69	125	860	245	4700	1630	530	1100	154	135	138	67
20	67	122	730	245	5500	2550	450	787	165	145	113	69
21	73	131	620	245	5400	5540	395	632	156	178	93	72
22	74	136	540	245	4600	6980	376	535	154	151	81	73
23	75	127	470	250	4100	4490	370	463	144	139	76	75
24	76	125	430	250	3830	2900	400	406	147	168	70	74
25	80	135	390	250	3920	2260	1860	371	156	156	68	67
26	87	139	360	250	4850	1840	5030	332	150	128	69	67
27	89	152	330	250	5510	2020	5570	307	134	115	66	69
28	91	177	310	250	5540	3960	3960	282	127	106	63	72
29	88	207	300	250	4320	3950	2520	272	196	113	58	72
30	86	464	280	250	---	3220	1730	490	365	126	53	69
31	82	---	270	250	---	2470	---	2120	---	119	52	---
TOTAL	2458	4537	26561	7580	64530	153230	39807	42387	7665	10370	2822	1950
MEAN	79.3	151	857	245	2225	4943	1327	1367	256	335	91.0	65.0
MAX	105	464	4580	270	5540	13500	5570	5910	1360	1500	171	84
MIN	67	83	270	230	250	1630	370	272	127	106	52	44
CFSM	.09	.18	1.01	.29	2.62	5.83	1.56	1.61	.30	.40	.11	.08
IN.	.11	.20	1.17	.33	2.83	6.72	1.75	1.86	.34	.45	.12	.09

CAL YR 1975 TOTAL 199034 MEAN 545 MAX 7240 MIN 41 CFSM .64 IN 8.73
WTR YR 1976 TOTAL 363897 MEAN 994 MAX 13500 MIN 44 CFSM 1.17 IN 15.96

04152500 TOBACCO RIVER AT BEAVERTON, MI

LOCATION.--Lat 43°52'43", long 84°28'18", in NW¼ SE¼ sec.7, T.17 N., R.1 W., Gladwin County, Hydrologic Unit 04080201, on left bank 15 ft (5 m) downstream from bridge on Glidden Road, 1.0 mi (1.6 km) downstream from dam in Beaverton, and 2.0 mi (3.2 km) upstream from Venison Creek.

DRAINAGE AREA.--487 mi^2 (1,261 km^2).

PERIOD OF RECORD.--July 1948 to current year.

REVISED RECORDS.--WSP 1307: 1948(M).

GAGE.--Water-stage recorder. Datum of gage is 683.27 ft (208.261 m) above mean sea level (levels by Michigan Department of Natural Resources).

REMARKS.--Records good except those for the winter period, which are fair. Prior to Feb. 21, 1961, regulation at all stages by hydroelectric powerplant 1.0 mi (1.6 km) above station; occasional regulation since. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--28 years, 384 ft^3/s (10.87 m^3/s), 10.71 in/yr (272 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,680 ft^3/s (217 m^3/s) July 9, 1957, gage height, 12.95 ft (3.947 m); minimum, 5.6 ft^3/s (0.16 m^3/s) July 12, 13, 14, 1959, Aug. 21, 1961; minimum daily, 5.9 ft^3/s (0.17 m^3/s) July 12, 13, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,640 ft^3/s (160 m^3/s) Mar. 21, gage height, 11.04 ft (3.365 m); minimum, 16 ft^3/s (0.45 m^3/s) Aug. 11, gage height, 0.68 ft (0.207 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	254	263	1200	345	310	1470	1230	614	720	1120	253	241
2	283	282	802	340	310	1120	1140	591	680	1180	663	279
3	315	319	593	335	315	856	901	857	469	596	553	273
4	303	378	520	330	310	1300	666	908	411	417	260	252
5	292	405	541	330	310	3610	684	712	390	387	247	234
6	278	370	597	325	320	4320	670	1420	363	363	247	197
7	272	356	642	320	320	3500	609	1530	312	302	241	195
8	211	475	546	325	325	3000	459	1040	302	298	229	204
9	241	536	433	330	330	2600	517	664	310	312	216	210
10	302	503	414	335	340	2100	476	632	305	310	212	302
11	290	399	412	335	350	1800	493	588	278	305	99	312
12	284	371	393	335	350	1850	536	532	268	290	44	277
13	279	338	391	335	350	2300	517	518	272	275	71	220
14	422	342	721	330	355	2500	499	490	275	236	113	215
15	517	332	1680	325	380	2000	500	472	280	232	69	245
16	329	319	1590	325	500	1600	541	652	424	240	142	244
17	299	309	908	325	839	1400	543	1520	411	234	201	240
18	299	306	431	320	925	1300	508	1280	328	234	270	230
19	273	305	332	320	1180	1600	471	824	338	234	245	207
20	264	304	401	315	1410	3500	331	608	414	234	199	219
21	268	358	450	315	1470	5400	368	528	342	240	192	225
22	264	462	416	310	1320	3000	558	511	308	242	187	248
23	247	430	413	310	926	1650	606	469	300	240	190	317
24	248	376	401	310	908	1670	618	448	335	233	191	299
25	319	355	390	310	960	2290	2060	414	476	227	190	223
26	489	340	383	315	1320	2260	2800	430	366	222	190	213
27	352	333	382	315	1520	1970	1840	427	288	218	236	218
28	270	338	375	320	1430	1930	1040	369	288	234	284	241
29	276	388	370	320	1710	1720	746	369	348	301	234	247
30	272	942	360	315	---	1310	643	536	604	269	207	233
31	261	---	350	315	---	1130	---	720	---	266	203	---
TOTAL	9273	11534	17837	10035	21393	68056	23570	21673	11205	10491	6878	7260
MEAN	299	384	575	324	738	2195	786	699	374	338	222	242
MAX	517	942	1680	345	1710	5400	2800	1530	720	1180	663	317
MIN	211	263	332	310	310	856	331	369	268	218	44	195
CFSM	.61	.79	1.18	.67	1.52	4.51	1.61	1.44	.77	.69	.46	.50
IN.	.71	.88	1.36	.77	1.63	5.20	1.80	1.66	.86	.80	.53	.55

CAL YR 1975 TOTAL 169181 MEAN 464 MAX 4930 MIN 146 CFSM .95 IN 12.92
WTR YR 1976 TOTAL 219205 MEAN 599 MAX 5400 MIN 44 CFSM 1.23 IN 16.74

04154000 CHIPPEWA RIVER NEAR MOUNT PLEASANT, MI

LOCATION.--Lat 43°37'32", long 84°42'28", in NW¼ NW¼ sec.8, T.14 N., R.3 W., Isabella County, Hydrologic Unit 04080202, on right bank 12 ft (4 m) downstream from bridge on South Leaton Road, 3.8 mi (6.1 km) northeast of Mount Pleasant, and 36 mi (58 km) upstream from mouth.

DRAINAGE AREA.--416 mi^2 (1,077 km^2).

PERIOD OF RECORD.--October 1930 to September 1931, October 1932 to current year. Monthly discharge only for some periods published in WSP 1307. Gage-height records for flood seasons collected in this vicinity 1910-27, are contained in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 744: Drainage area. WSP 1337: 1931, 1933-40, 1945, 1948-49.

GAGE.--Water-stage recorder. Datum of gage is 710.38 ft (216.524 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to Oct. 21, 1938, nonrecording gage at site 30 ft (9 m) upstream at present datum.

REMARKS.--Records good except those for the winter period, which are poor. Diurnal fluctuation below 750 ft^3/s (21.2 m^3/s) caused by powerplant at Mount Pleasant prior to 1962, occasional regulation at low flow since. Since July 30, 1968, occasional regulation from control structures on lake outlets. Several observations of water temperature were made during the year. National Weather Service gage-height telemark at station.

AVERAGE DISCHARGE.--45 years, 307 ft^3/s (8.694 m^3/s), 10.02 in/yr (255 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,960 ft^3/s (140 m^3/s) Mar. 8, 1946, gage height, 12.78 ft (3.895 m); minimum, 12 ft^3/s (0.34 m^3/s) Aug. 18, 1945; minimum daily, 19 ft^3/s (0.54 m^3/s) Aug. 16, 1936; minimum gage height, 2.70 ft (0.823 m) Oct. 8, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft^3/s (28.3 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	2000	1,260	35.7	6.39	1.948	Mar. 21	2000	*3,050	86.4	*10.41	3.173
Feb. 21	1600	1,270	36.0	6.44	1.963	Apr. 26	0400	2,260	64.0	8.81	2.685
Feb. 27	1700	1,450	41.1	6.67	2.033	May 6	2200	1,450	41.1	6.77	2.063
Mar. 1	1500	1,570	44.5	7.00	2.134	May 17	2300	1,000	28.3	5.51	1.679
Mar. 6	1500	2,400	68.0	9.08	2.768	July 3	0200	1,210	34.3	6.26	1.908
Mar. 13	2300	1,770	50.1	7.54	2.298						

Minimum discharge, 172 ft^3/s (4.87 m^3/s) Aug. 31; minimum gage height, 3.14 ft (0.957 m) Sept. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	393	319	838	340	280	1520	1440	1100	756	932	237	183
2	371	333	729	330	280	1410	1380	990	760	1140	231	189
3	354	370	685	325	280	1300	1320	1020	721	1170	221	196
4	350	390	602	320	280	1170	1240	1000	648	973	217	195
5	339	396	557	315	280	1540	1150	977	584	742	219	194
6	337	407	615	300	280	2240	1070	1260	532	603	221	190
7	322	384	581	290	280	2120	990	1310	483	495	222	190
8	315	387	528	280	285	1990	928	1210	447	456	222	184
9	311	404	493	285	290	1800	872	1140	432	414	215	194
10	309	427	474	290	300	1610	822	1020	411	396	207	213
11	304	423	450	295	300	1460	780	906	384	378	208	213
12	303	394	431	295	300	1350	756	820	358	351	213	211
13	304	385	432	290	305	1590	732	770	341	324	216	204
14	308	363	668	285	310	1670	707	710	326	312	218	194
15	302	353	1130	280	330	1500	707	668	311	303	226	194
16	303	346	800	280	450	1300	791	732	322	285	225	193
17	293	338	660	280	800	1100	738	878	344	255	216	194
18	287	333	580	275	837	1250	707	948	355	261	211	192
19	283	326	540	275	1120	1110	676	917	382	258	206	197
20	290	321	510	275	1180	2040	602	906	389	250	202	198
21	289	351	490	275	1230	2760	584	812	373	261	198	195
22	284	356	450	275	1180	2600	606	700	354	258	198	197
23	283	363	440	275	1070	2240	606	637	340	244	194	199
24	284	359	420	275	980	2070	676	588	339	240	184	197
25	334	351	400	275	1020	1920	1480	556	342	235	183	196
26	379	342	390	275	1390	1790	2140	539	335	229	183	200
27	395	339	380	275	1420	1750	1900	510	322	221	188	203
28	379	348	370	275	1380	1810	1750	477	310	213	192	202
29	355	366	360	275	1330	1730	1470	489	332	225	191	202
30	337	656	350	280	---	1670	1240	546	399	244	183	206
31	324	---	340	280	---	1570	---	682	---	242	178	---
TOTAL	10021	11230	16693	8940	19767	52980	30860	25818	12732	12910	6425	5915
MEAN	323	374	538	288	682	1709	1029	833	424	416	207	197
MAX	395	656	1130	340	1420	2760	2140	1310	760	1170	237	213
MIN	283	319	340	275	280	1100	584	477	310	213	178	183
CFSM	.78	.90	1.29	.69	1.64	4.11	2.47	2.00	1.02	1.00	.50	.47
IN.	.90	1.00	1.49	.80	1.77	4.74	2.76	2.31	1.14	1.15	.57	.53

CAL YR 1975 TOTAL 167688 MEAN 459 MAX 3150 MIN 142 CFSM 1.10 IN 15.00
WTR YR 1976 TOTAL 214291 MEAN 585 MAX 2760 MIN 178 CFSM 1.41 IN 19.16

04155000 PINE RIVER AT ALMA, MI

LOCATION.--Lat 43°22'46", long 84°39'20", in SW¼ SE¼ sec.34, T.12 N., R.3 W., Gratiot County, Hydrologic Unit 04080202, on right bank 270 ft (32 m) downstream from Superior Street Bridge in Alma, 0.6 mi (1.0 km) downstream from municipal reservoir, and 38 mi (61 km) upstream from mouth.

DRAINAGE AREA.--288 mi^2 (746 km^2).

PERIOD OF RECORD.--October 1930 to current year. Gage-height records for flood seasons collected in this vicinity 1910-28 are contained in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 744: Drainage area. WSP 1307: 1945(M). WSP 1337: 1931, 1932-34(M), 1936, 1939, 1945, 1949.

GAGE.--Water-stage recorder. Datum of gage is 718.37 ft (218.959 m) above mean sea level. Prior to Dec. 10, 1930, nonrecording gage at Superior Street Bridge at different datum. Dec. 10, 1930, to June 15, 1938, nonrecording gage at site 70 ft (21 m) downstream from bridge and June 16 to October 25, 1938, nonrecording gage at bridge at present datum.

REMARKS.--Records good except those for the winter period, and those for period of no gage-height record, Dec. 9 to Mar. 23, which are poor. Occasional regulation caused by dam 0.6 mi (1.0 km) above station and by variable backwater from powerplant at St. Louis, 5.2 mi (8.4 km) below station. Since July 1965, about 2.5 ft^3/s (0.07 m^3/s) diverted above station for municipal and industrial use; sewage effluent is returned below station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--46 years, 214 ft^3/s (6.060 m^3/s), 10.09 in/yr (256 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,400 ft^3/s (125 m^3/s) Mar. 19, 1948, gage height, 10.81 ft (3.295 m); minimum daily, 0.40 ft^3/s (0.011 m^3/s) Sept. 6, 1964, caused by closing dam during construction of waterworks.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,630 ft^3/s (74.5 m^3/s) Mar. 5, gage height, 8.82 ft (2.688 m); minimum, 51 ft^3/s (1.44 m^3/s) Sept. 8, 9, gage height, 1.17 ft (0.357 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	237	204	432	220	185	780	685	715	354	495	170	82
2	235	208	449	220	185	860	643	644	411	439	175	86
3	229	226	490	210	185	980	593	640	418	444	141	92
4	222	254	546	210	185	1500	568	603	390	472	126	87
5	217	271	491	205	185	2270	535	630	351	471	110	93
6	205	290	462	200	185	2090	520	1430	312	429	111	94
7	227	313	414	195	185	1600	494	1420	288	362	131	86
8	208	309	383	190	190	1400	467	1140	266	307	144	58
9	227	286	350	190	190	1200	450	1020	239	270	116	61
10	206	269	330	195	195	1100	434	877	238	234	89	77
11	194	253	320	195	200	1020	415	741	212	210	83	98
12	186	276	310	195	200	1100	394	608	203	191	90	123
13	181	237	300	190	200	1440	370	555	200	179	94	124
14	178	224	370	190	210	1150	375	508	183	168	126	94
15	180	222	620	190	250	1080	376	466	169	151	163	67
16	167	210	590	185	400	992	409	488	168	148	164	78
17	165	205	520	185	600	820	407	476	169	130	143	86
18	169	198	450	180	980	740	436	488	170	129	132	104
19	189	191	400	180	1190	1140	466	568	180	131	128	114
20	188	188	350	180	1180	1420	442	578	186	111	107	107
21	181	197	330	180	1260	1590	428	526	189	121	81	88
22	198	203	310	180	1100	1860	442	468	192	116	89	90
23	205	221	290	180	1050	1860	422	413	189	128	81	104
24	188	235	280	180	856	1500	424	394	190	126	73	94
25	202	226	270	180	952	1110	876	363	186	133	75	90
26	209	202	260	180	1180	932	1090	266	177	137	75	111
27	236	198	250	180	1160	877	1200	324	177	101	71	110
28	266	215	250	180	1030	864	1300	320	190	111	63	95
29	279	212	240	180	952	810	1070	320	189	137	67	99
30	262	377	230	180	---	815	847	304	334	132	75	98
31	223	---	220	185	---	746	---	324	---	136	77	---
TOTAL	6459	7120	11507	5890	16820	37646	17578	18617	7120	6849	3370	2790
MEAN	208	237	371	190	580	1214	586	601	237	221	109	93.0
MAX	279	377	620	220	1260	2270	1300	1430	418	495	175	124
MIN	165	188	220	180	185	740	370	266	168	101	63	58
CFSM	.72	.82	1.29	.66	2.01	4.22	2.03	2.09	.82	.77	.38	.32
IN.	.83	.92	1.49	.76	2.17	4.86	2.27	2.40	.92	.88	.44	.36

CAL YR 1975 TOTAL 122413 MEAN 335 MAX 2360 MIN 40 CFSM 1.16 IN 15.81
WTR YR 1976 TOTAL 141766 MEAN 387 MAX 2270 MIN 58 CFSM 1.34 IN 18.31

04155500 PINE RIVER NEAR MIDLAND, MI

LOCATION.--Lat 43°33'52", long 84°22'09", in SW¼ NW¼ sec.4, T.13 N., R.1 E., Midland County, Hydrologic Unit 04080202, on left bank at downstream side of bridge on Meridian Road, 7.2 mi (11.6 km) southwest of Midland, and 7.8 mi (12.6 km) upstream from Chippewa River.

DRAINAGE AREA.--390 mi^2 (1,010 km^2), approximately.

PERIOD OF RECORD.--May 1934 to September 1938, February 1948 to current year.

REVISED RECORDS.--WSP 1207: Drainage area. WSP 1307: 1935(M). WSP 1337: 1936-38, 1948-49.

GAGE.--Water-stage recorder. Datum of gage is 623.94 ft (190.177 m) above mean sea level. Prior to Sept. 30, 1938, nonrecording gage at same site, at datum 5.55 ft (1.692 m) lower. Feb. 3, 1948, to Dec. 13, 1951, nonrecording gage at present site and datum.

REMARKS.--Records good except those for the winter period, and those for period of no gage-height record, July 28 to Sept. 1, which are poor. Regulation at low and medium flows by hydroelectric powerplant at St. Louis. Some diversion above station for irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--32 years, 300 ft^3/s (8.496 m^3/s), 10.45 in/yr (265 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,360 ft^3/s (180 m^3/s) Mar. 20, 1948, gage height, 10.00 ft (3.048 m), from graph based on gage readings; maximum gage height, 12.08 ft (3.682 m) Feb. 2, 1968 (backwater from ice); minimum discharge, not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,200 ft^3/s (34.6 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	1800	1,300	36.8	5.03	1.533	Mar. 13	1200	2,550	72.2	6.36	1.939
Feb. 22	0200	2,200	62.3	8.67	2.643	Mar. 21	0300	3,150	89.2	6.91	2.106
Feb. 26	1300	2,600	73.6	*8.76	2.670	Apr. 26	0100	2,410	68.3	6.18	1.884
Mar. 6	0800	*3,860	109	7.70	2.347	May 6	2300	2,570	72.8	6.31	1.923

Minimum discharge recorded, 77 ft^3/s (2.18 m^3/s) Sept. 29, gage height, 2.52 ft (0.768 m), but may have been less during period of no gage-height record, July 28 to Sept. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	219	263	745	260	220	1050	903	932	358	852	185	100
2	222	218	651	255	220	1150	818	821	404	680	220	88
3	232	248	639	255	220	1360	791	834	474	526	200	92
4	234	259	661	250	220	1890	667	811	453	499	170	110
5	241	305	746	250	220	2690	669	761	415	508	145	95
6	240	345	698	240	225	3590	639	1910	368	467	140	95
7	232	336	658	230	225	2630	611	2290	292	435	150	97
8	219	381	561	230	225	2040	579	1700	296	346	175	134
9	212	367	520	230	230	1760	554	1300	317	297	190	110
10	213	382	510	235	230	1750	509	1160	198	293	150	90
11	206	329	497	235	235	1530	513	982	261	237	125	88
12	206	197	470	235	240	1430	491	825	219	211	115	93
13	205	407	316	230	245	2400	453	688	188	186	120	107
14	191	226	640	230	250	2030	436	642	185	190	140	161
15	182	259	1080	230	300	1590	441	611	199	217	175	152
16	184	273	1050	225	500	1460	582	617	166	140	215	86
17	181	249	800	225	680	1270	533	804	158	175	215	95
18	178	249	620	220	1000	1050	516	680	175	159	180	86
19	143	241	540	215	1400	1230	540	638	192	96	165	90
20	187	256	480	215	1700	2200	583	703	164	219	155	99
21	223	244	440	215	1950	2770	583	667	172	113	120	132
22	170	273	400	215	2000	2110	645	607	189	154	110	103
23	183	257	370	215	1500	2160	605	543	189	132	115	84
24	226	265	330	215	1350	2040	595	381	206	158	110	111
25	233	315	320	215	1400	1630	1480	471	196	119	98	111
26	228	303	310	220	1700	1250	2080	413	182	92	92	83
27	215	278	300	220	1350	1150	1560	230	189	200	86	95
28	229	229	290	220	1250	1170	1510	365	175	150	84	150
29	260	324	280	220	1150	1070	1450	345	250	150	84	103
30	274	577	280	220	---	1010	1120	436	246	170	88	110
31	308	---	270	220	---	1000	---	313	---	170	94	---
TOTAL	6676	8855	16472	7090	22435	53460	23456	24480	7476	8341	4411	3150
MEAN	215	295	531	229	774	1725	782	790	249	269	142	105
MAX	308	577	1080	260	2000	3590	2080	2290	474	852	220	161
MIN	143	197	270	215	220	1000	436	230	158	92	84	83
CFSM	.55	.76	1.36	.59	1.98	4.42	2.01	2.03	.64	.69	.36	.27
IN.	.64	.84	1.57	.68	2.14	5.10	2.24	2.34	.71	.80	.42	.30

CAL YR 1975 TOTAL 159530 MEAN 437 MAX 2970 MIN 78 CFSM 1.12 IN 15.22
WTR YR 1976 TOTAL 186302 MEAN 509 MAX 3590 MIN 83 CFSM 1.31 IN 17.77

04156000 TITTABAWASSEE RIVER AT MIDLAND, MI

LOCATION.--Lat 43°35'43", long 84°14'08", in NW¼ NE¼ sec.28, T.14 N., R.2 E., Midland County, Hydrologic Unit 04080201, on right bank 2,000 ft (610 m) downstream from dam at Dow Chemical Co. powerplant in Midland, 0.7 mi (1.1 km) upstream from Bullock Creek, 1.4 mi (2.3 km) downstream from Chippewa River and 23 mi (37 km) upstream from mouth.

DRAINAGE AREA.--2,400 mi^2 (6,200 km^2), approximately.

PERIOD OF RECORD.--March 1936 to current year. Gage-height records for flood seasons collected in this vicinity 1910-26, 1928, and since 1946 are contained in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 1045: 1945. WSP 1144: 1948.

GAGE.--Water-stage recorder. Datum of gage is 580.28 ft (176.869 m) above mean sea level. Prior to Sept. 30, 1955, at datum 10.00 ft (3.048 m) higher.

REMARKS.--Records good except those for the winter period, which are fair. Water is diverted from river a short distance above station for industrial use. Small part returned to river at gage, small part returned to river 0.25 mi (0.4 km) below station, remainder returned 1 mi (1.6 km) below. Extremes and daily discharges not adjusted for diversion. Prior to May 20, 1970, discharge below 4,000 ft^3/s (113 m^3/s) regulated by dam 2,000 ft (610 m) above station; fixed crest dam since. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--40 years, 1,680 ft^3/s (47.58 m^3/s), 9.51 in/yr (242 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 34,000 ft^3/s (963 m^3/s) Mar. 21, 1948, gage height, 29.50 ft (8.992 m); minimum, 39 ft^3/s (1.10 m^3/s) Oct. 12, 1942; minimum daily, 111 ft^3/s (3.14 m^3/s) Aug. 21, 1949; minimum gage height, 9.04 ft (2.755 m) Aug. 19, 1954, caused by bridge construction above station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since at least 1907, 29.7 ft (9.05 m) Mar. 28, 1916, discharge, 34,800 ft^3/s (986 m^3/s), from information by U.S. Weather Bureau.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 7,000 ft^3/s (198 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 16	0500	8,590	243	19.27	5.873	Mar. 14	0800	10,900	309	21.30	6.492
Feb. 23	0130	9,790	277	20.36	6.206	Mar. 22	0500	*26,400	748	*27.60	8.412
Mar. 1	1800	9,100	258	19.74	6.017	Apr. 26	1730	15,700	445	24.19	7.373
Mar. 7	1200	20,100	569	25.72	7.839	May 7	1000	9,620	272	20.21	6.160

Minimum discharge, 268 ft^3/s (7.59 m^3/s) Aug. 25, gage height, 9.87 ft (3.008 m); minimum daily, 365 ft^3/s (10.3 m^3/s) Sept. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1410	843	5830	1420	1000	9060	5780	5130	2760	5300	420	449
2	1340	768	5340	2070	1300	8900	5430	3400	2900	5400	687	604
3	1320	1460	4550	1740	1900	8090	5200	4000	2730	4450	727	934
4	925	1700	4270	1010	2100	7510	4850	5180	2870	2640	845	582
5	846	1690	4200	1740	1800	10200	4650	4800	1650	1870	739	375
6	1380	2020	2920	2580	1700	15400	4480	6610	1190	2330	575	365
7	1420	2270	2850	1900	1300	19500	4400	9100	1310	2490	415	438
8	874	1520	3120	1650	960	15400	3890	7320	1420	2010	380	515
9	1270	1120	3160	1500	1200	10700	4130	6120	1470	1690	658	503
10	1360	1880	3050	1300	2920	8930	2670	5270	1050	1000	560	561
11	819	2440	3100	1100	2970	7630	2120	4530	1160	765	514	529
12	749	1830	3110	1500	2940	7430	2700	3770	842	1000	478	411
13	1560	2120	1970	2200	2840	9750	2970	3480	720	787	462	569
14	1670	2100	2840	2300	2070	10700	2920	3300	818	743	415	862
15	1670	1110	6870	2100	1570	9360	2910	2480	979	750	395	717
16	1910	841	8200	1900	3900	7640	3450	2210	941	663	664	670
17	1120	1160	6700	1500	6030	6260	2940	5130	1240	554	630	583
18	711	1410	4860	1100	6940	5540	2220	6460	1350	526	600	448
19	675	1350	4290	1800	7760	5820	2070	4890	1040	575	654	367
20	1230	1590	2450	2100	8280	10700	2700	4520	719	610	538	455
21	794	1680	1530	2050	8960	20700	2870	4300	896	662	460	531
22	781	1280	2360	2150	9590	24800	3330	4020	912	839	370	509
23	821	908	3620	2500	9230	16400	3600	2300	898	650	601	640
24	873	1710	2900	1500	7660	11500	3560	1820	918	530	535	529
25	789	1920	1610	1100	7160	11000	7730	2270	1250	480	475	441
26	848	1900	2280	1500	7720	10700	14500	2260	742	550	450	411
27	1270	1260	1930	2000	8280	10000	12900	1760	667	650	460	689
28	1470	1460	1340	2400	8600	9550	9060	1900	956	700	430	761
29	1490	1360	2120	2650	8850	8090	6920	1470	1260	830	370	559
30	1490	2970	2370	2100	---	6840	5770	1390	1790	955	495	685
31	1520	---	2260	1400	---	6250	---	1500	---	555	510	---
TOTAL	36405	47670	108000	55860	137530	330350	142720	122690	39448	43554	16512	16692
MEAN	1174	1589	3484	1802	4742	10660	4757	3958	1315	1405	533	556
MAX	1910	2970	8200	2650	9590	24800	14500	9100	2900	5400	845	934
MIN	675	768	1340	1010	960	5540	2070	1390	667	480	370	365
+	45.2	38.0	42.9	39.0	5.24	47.9	42.6	49.4	37.1	41.7	37.2	35.4
MEAN‡	1219	1627	3527	1841	4747	10708	4800	4007	1352	1447	570	591
CFSM‡	.51	.68	1.47	.77	1.98	4.46	2.00	1.67	.56	.60	.24	.25
IN‡	.59	.76	1.69	.88	2.13	5.14	2.23	1.92	.63	.70	.27	.27

CAL YR 1975 TOTAL 944523 MEAN 2588 MAX 21200 MIN 351 MEAN‡ 2632 CFSM‡ 1.10 IN‡ 14.88
WTR YR 1976 TOTAL 1097431 MEAN 2998 MAX 24800 MIN 365 MEAN‡ 3037 CFSM‡ 1.27 IN‡ 17.21

+Diversion in cubic feet per second, for industrial use; furnished by Dow Chemical Co.

‡Adjusted for diversion made by Dow Chemical Co.

04157000 SAGINAW RIVER AT SAGINAW, MI

LOCATION.--Lat 43°24'46", long 83°57'47", in NW¼ SE¼ sec.26, T.12 N., R.4 E., Saginaw County, Hydrologic Unit 04080206, on right bank 1,000 ft (305 m) downstream from bridge on Rust Avenue in Saginaw, 1.9 mi (3.1 km) downstream from Tittabawassee River and 20.3 mi (32.7 km) upstream from mouth. Water quality sampling site at downstream side of bridge on Rust Avenue.

DRAINAGE AREA.--6,060 mi^2 (15,700 km^2), approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--1904, 1908-9, 1912-13, 1916, 1918-19, 1929-30, and 1942 (flood discharge for certain periods only) in WSP 1084: December 1942 to current year (high-water periods only); no high water 1944, 1949, 1953, 1955, 1958, 1961, 1963, 1964, 1966. Gage-height records for flood seasons collected in this vicinity 1910-20, and for entire years since 1921 are contained in reports of U.S. Weather Bureau.

GAGE.--Water-stage recorder. Datum of gage is 565.11 ft (172.246 m), International Great Lakes datum. Prior to Oct. 1, 1972, non-recording gage at site 1.9 mi (3.1 km) downstream at same datum. Auxiliary water-stage recorder on right bank near Alpin Beach, 19.9 mi (32.0 km) downstream.

REMARKS.--Water-discharge records good. Considerable diversion through metropolitan area of Saginaw. Corps of Engineers gage-height telemark at station.

COOPERATION.--Auxiliary gage-height record furnished by NOAA-National Ocean Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 68,000 ft^3/s (1,930 m^3/s) Mar. 30, 1904, gage height, 24.9 ft (7.59 m), site then in use.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 41,000 ft^3/s (1,160 m^3/s) Mar. 7, 8; maximum daily gage height, 21.53 ft (6.562 m) Mar. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1			---		---	27400	14900	16600	---	15500		
2			---		---	26900	13200	13700	---	12900		
3			---		---	28500	11600	11200	---	11700		
4			---		---	30500	11500	11700	---	10400		
5			---		---	39000	11000	11500	---	---		
6			---		---	40300	---	11900	---	---		
7			---		---	41000	---	17400	---	---		
8			---		---	41000	---	22300	---	---		
9			---		---	40200	---	22600	---	---		
10			---		---	38500	---	20700	---	---		
11			---		---	35100	---	15900	---	---		
12			---		---	32800	---	14000	---	---		
13			---		---	30600	---	11700	---	---		
14			---		---	31200	---	---	---	---		
15			13100		---	29800	---	---	---	---		
16			20200		10500	28500	---	---	---	---		
17			21500		17100	24800	---	---	---	---		
18			19600		21600	21400	---	---	---	---		
19			16400		32000	18500	---	---	---	---		
20			17800		33800	17900	---	---	---	---		
21			17600		34200	20400	---	---	---	---		
22			15700		34200	27700	---	---	---	---		
23			15100		34800	31700	---	---	---	---		
24			15800		33100	29900	---	---	---	---		
25			14300		31500	25300	11400	---	---	---		
26			12100		31500	23200	20600	---	---	---		
27			13000		31500	20800	26800	---	---	---		
28			---		32700	19700	28400	---	---	---		
29			---		31300	20800	25300	---	---	---		
30			---		---	20900	21200	---	13300	---		
31			---		---	17100	---	---	---	---		

04157000 SAGINAW RIVER AT SAGINAW, MI--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: November 1974 to current year.
WATER TEMPERATURES: November 1974 to current year.

REMARKS.--Daily specific conductance and temperature records are based on once daily measurements between 1700 and 2100 hours.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: (Water year 1975) Maximum daily, 1,120 micromhos Dec. 24, 1974; minimum daily, 324 micromhos Feb. 26, 1975.
WATER TEMPERATURES: Maximum daily, 27.5°C Aug. 1, 1975; minimum daily, 0.0°C on many days during winter periods.

EXTREMES OUTSIDE PERIOD OF DAILY RECORD.--A specific conductance of 301 micromhos was observed on Mar. 6, 1976. A temperature of 27.0°C was observed on July 16, 1976.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum daily, 26.5°C July 15, 16; minimum daily, 0.0°C on many days during winter periods.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT												
10...	1200	3480	726	8.1	13.0	7.2	73	12000	820	100	300	70
NOV												
20...	1630	2450	836	8.0	8.0	11.0	94	3100	250	38	310	64
DEC												
12...	1200	8000	700	7.8	.5	12.3	82	5600	4300	1000	290	85
JAN												
09...	1100	--	780	7.7	.0	10.7	74	4400	940	100	320	82
FEB												
13...	1200	5580	960	7.8	.0	9.8	68	5200	>6000	1200	290	69
MAR												
12...	1130	32800	378	7.6	1.5	12.6	91	760	10000	210	150	25
APR												
09...	1100	5100	503	8.0	8.0	9.9	85	2400	3800	110	220	40
29...	0930	25900	--	--	8.5	--	--	--	--	--	--	--
MAY												
14...	1130	9280	531	7.9	15.0	9.2	92	4300	370	110	240	55
JUN												
15...	1100	--	750	8.3	25.0	8.8	107	310	120	120	270	70
24...	1030	2380	--	--	24.0	--	--	--	--	--	--	--
JUL												
16...	1230	3380	779	8.2	27.0	10.0	125	260	150	50	280	73
AUG												
06...	1100	1300	734	8.1	21.5	7.2	83	1500	550	440	260	80
SEP												
01...	1530	3750	890	8.3	21.0	5.7	65	2600	3100	1100	300	130

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT												
10...	80	24	30	.8	3.5	280	0	230	3.6	52	67	.3
NOV												
20...	86	24	34	.8	3.4	300	0	246	4.8	47	71	.5
DEC												
12...	82	20	25	.6	3.0	250	0	205	6.3	53	57	.3
JAN												
09...	87	24	28	.7	3.1	290	0	238	9.3	57	59	.3
FEB												
13...	78	23	45	1.2	2.8	270	0	221	6.8	55	99	.1
MAR												
12...	40	12	10	.4	2.4	152	0	125	6.1	31	22	.2
APR												
09...	63	16	18	.5	2.4	220	0	180	3.5	44	39	.2
29...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
14...	66	18	15	.4	2.4	226	0	185	4.6	40	32	.2
JUN												
15...	74	21	38	1.0	3.2	244	0	200	2.0	54	79	.2
24...	--	--	--	--	--	--	--	--	--	--	--	--
JUL												
16...	73	24	42	1.1	3.0	252	0	207	2.5	59	93	.2
AUG												
06...	70	21	41	1.1	3.0	220	0	180	2.8	60	92	.2
SEP												
01...	80	25	61	1.5	4.1	212	0	174	1.7	73	130	.3

04157000 SAGINAW RIVER AT SAGINAW, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT											
10...	5.8	393	401	3690	.49	1.6	7.0	.25	31	291	100
NOV											
20...	5.2	466	419	3080	.70	2.1	9.3	.29	15	99	100
DEC											
12...	7.3	378	371	8160	1.4	2.1	9.5	.13	16	346	100
JAN											
09...	8.7	400	410	--	1.2	2.2	9.7	.19	7	--	100
FEB											
13...	9.0	492	445	7410	.86	2.0	8.7	.21	2	30	100
MAR											
12...	5.0	235	197	20800	1.4	2.1	9.2	.11	25	2210	100
APR											
09...	3.4	332	294	4570	.81	1.8	7.8	.17	47	661	100
29...	--	--	--	--	--	--	--	--	57	3990	--
MAY											
14...	3.2	306	288	7670	1.1	2.1	9.3	.18	59	1480	100
JUN											
15...	.5	449	390	--	.72	2.1	9.4	.35	70	--	100
24...	--	--	--	--	--	--	--	--	41	263	--
JUL											
16...	2.9	500	421	4560	.69	2.4	11	.24	34	310	100
AUG											
06...	3.0	441	399	1550	.28	1.7	7.4	.24	43	151	100
SEP											
01...	2.2	590	480	5970	.50	2.1	9.3	.38	18	182	100

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
OCT												
10...	1200	3	3	1	0	<10	0	0	0	7	2	1100
JAN												
09...	1100	2	1	4	0	10	0	0	0	10	4	460
APR												
09...	1100	0	0	0	0	10	<10	0	0	10	0	1500
JUL												
16...	1230	3	3	1	1	10	10	1	0	0	0	1100

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT												
10...	30	12	0	100	20	.2	.2	0	0	50	7	10
JAN												
09...	40	62	0	60	40	.1	.1	0	0	70	10	11
APR												
09...	30	7	2	80	50	<.5	<.5	0	0	20	10	12
JUL												
16...	10	10	2	100	10	<.5	<.5	1	0	20	0	13

04157000 SAGINAW RIVER AT SAGINAW, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

OCT. 10, 1975
1200 HOURS

IDENTIFICATION OF PHYTOPLANKTON

31,000 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...CHARACIACEAE			
	....SCHROEDERIA		270	1
	...COELASTRACEAE			
L	....COELASTRUM			0
	...OOCYSTACEAE			
	....ANKISTRODESMUS		530	2
D	....DICTYOSPHAERIUM		16,000	51
L	....OOCYSTIS			0
	...SCENEDESMACEAE			
L	....SCENEDESMUS			0
L	....TETRASTRUM			0
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
L	....CHLAMYDOMONAS			0
	...VOLVOCACEAE			
L	....PANDORINA			0
	..ZYGNEMATALES			
	...DESMIDIACEAE	PLACODERM DESMIDS		
L	....STAURASTRUM			0
	...ZYGNEMATACEAE			
L	....MOUGEOTIA			0
		TOTALS	17,000	54
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		1,900	6
	....MELOSIRA		2,700	8
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....COCCONEIS			0
	...EUNOTIACEAE			
L	....EUNOTIA			0
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
L	....NAVICULA			0
	...NITZSCHIACEAE			
	....NITZSCHIA		270	1
	...SURIRELLACEAE			
L	....CYMATOPLEURA			0
L	....SURIRELLA			0
		TOTALS	4,800	15
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
L	....GOMPHOSPHAERIA			0
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
L	....ANABAENA			0
	....APHANIZOMENON		3,500	11
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		6,400	20
		TOTALS	9,900	31
	EUGLENOPHYTA	EUGLENOIDS		
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
L	....EUGLENA			0
L	....TRACHELOMONAS			0

NOV. 20, 1975
1630 HOURS

IDENTIFICATION OF PHYTOPLANKTON

12,000 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			220	2
D	....DICTYOSPHAERIUM			3,500	30
	...SCENEDESMACEAE				
	....SCENEDESMUS			440	4
	..VOLVOCALES				
	...CHLAMYDOMONADACEAE				
	....CHLAMYDOMONAS			220	2
			TOTALS	4,400	38
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
D	....CYCLOTELLA			4,600	40
	....MELOSIRA			220	2
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
L	....COCCONEIS				0
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			440	4
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			870	8
	...NITZSCHIACEAE				
	....NITZSCHIA			650	6
			TOTALS	6,700	60
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..OSCILLATORIALES	FILAMENTOUS			
	...NOSTOCACEAE				
L	....APHANIZOMENON				0
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOMONODACEAE				
	....CRYPTOMONAS			440	4
			TOTALS	440	4
	.EUGLENOPHYCEAE				
	..EUGLENALES				
	...EUGLENACEAE				
L	....EUGLENA				0

04157000 SAGINAW RIVER AT SAGINAW, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DEC. 12, 1975
1200 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,300 CELLS/ML

	ORGANISM NAME	COMMON NAME	CELLS/ML	PER CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		34	3
	...SCENEDESMACEAE			
	....SCENEDESMUS		140	11
		TOTALS	170	14
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		640	50
	....MELOSIRA		68	5
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....COCCONEIS			0
L	....RHOICOSPHENIA			0
	...DIATOMACEAE			
	....DIATOMA		34	3
	...FRAGILARIACEAE			
	....ASTERIONELLA		68	5
	....FRAGILARIA		68	5
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		170	13
	...NITZSCHIACEAE			
	....NITZSCHIA		34	3
	...SURIRELLACEAE			
L	....SURIRELLA			0
		TOTALS	1,100	84
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
L	....DINOBRYON			0
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
L	....LYNGBYA			0
L	....OSCILLATORIA			0
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		34	3
		TOTALS	34	3
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
L	....EUGLENA			0

04157000 SAGINAW RIVER AT SAGINAW, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JAN. 9, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

390 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
L	....ANKISTRODESMUS			0
	...SCENEDESMACEAE			
	....SCENEDESMUS		11	3
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		11	3
		TOTALS	22	6
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		16	4
	....MELOSIRA		22	6
	..PENNALES	PENNATE		
	...DIATOMACEAE			
	....DIATOMA		5	1
	...MERIDIONACEAE			
L	....MERIDION			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		22	6
	...NITZSCHIACEAE			
	....NITZSCHIA		5	1
		TOTALS	71	18
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS		11	3
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		270	70
		TOTALS	290	73
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		11	3
		TOTALS	11	3

FEB. 13, 1976
1200 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,000 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..PENNALES	PENNATE		
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		220	11
	...NITZSCHIACEAE			
L	....NITZSCHIA			0
		TOTALS	220	11
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		1,800	89
		TOTALS	1,800	89

04157000 SAGINAW RIVER AT SAGINAW, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

APR. 9, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

4,900 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		79	2
	...SCENEDESMACEAE			
L	....SCENEDESMUS		0	0
		TOTALS	79	2
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		3,200	65
D	....MELOSIRA		950	19
L	....STEPHANODISCUS			0
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....ACHNANTHES			0
L	....COCCONEIS			0
L	....RHOICOSPHENIA			0
	...CYMBELLACEAE			
L	....AMPHORA			0
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
L	....FRAGILARIA			0
L	....SYNEDRA			0
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
L	....CALONEIS			0
	....NAVICULA		400	8
	...NITZSCHIACEAE			
	....NITZSCHIA		320	6
	...SURIRELLACEAE			
L	....SURIRELLA		0	0
		TOTALS	4,800	98
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
L	....OSCILLATORIA			0
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
L	....CRYPTOMONAS			0

04157000 SAGINAW RIVER AT SAGINAW, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAY 14, 1976
1130 HOURS

IDENTIFICATION OF PHYTOPLANKTON

7,900 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...MICRACTINIACEAE			
	....GOLENKINIA		190	2
		TOTALS	190	2
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		3,300	41
	....MELOSIRA		380	5
	....STEPHANODISCUS		580	7
	..PENNALES	PENNATE		
	...DIATOMACEAE			
	....DIATOMA		960	12
	...FRAGILARIACEAE			
	....ASTERIONELLA		770	10
	....SYNEDRA		190	2
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		580	7
	...NITZSCHIACEAE			
	....NITZSCHIA		960	12
		TOTALS	7,700	96

JUNE 15, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

59,000 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...MICRACTINIACEAE			
	....MICRACTINIUM		1,400	2
	...OOCYSTACEAE			
	....ANKISTRODESMUS		710	1
	....KIRCHNERIELLA		360	1
	...SCENEDESMACEAE			
D	....SCENEDESMUS		13,000	22
		TOTALS	16,000	26
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		27,000	45
	....MELOSIRA		3,200	5
	..PENNALES	PENNATE		
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		360	1
	...NITZSCHIACEAE			
	....NITZSCHIA		2,100	4
		TOTALS	32,000	55
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....ANACYSTIS		9,300	16
		TOTALS	9,300	16
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		360	1
		TOTALS	360	1
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
	....TRACHELOMONAS		1,100	2
		TOTALS	1,100	2

04157000 SAGINAW RIVER AT SAGINAW, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JULY 16, 1976
1230 HOURS

IDENTIFICATION OF PHYTOPLANKTON

53,000 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...CHARACIACEAE			
	....SCHROEDERIA		330	1
	...HYDRODICTYACEAE			
	....PEDIASTRUM		5,300	10
	...OOCYSTACEAE			
	....TETRAEDRON		330	1
	...SCENEDESMACEAE			
	....SCENEDESMUS		6,600	12
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		16,000	31
D	....MELOSIRA		14,000	26
	..PENNALES	PENNATE		
	...NITZSCHIACEAE			
	....NITZSCHIA		1,700	3
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....OCHROMONAS		660	1
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS		6,600	12
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
	....OSCILLATORIA		1,300	2
	EUGLENOPHYTA	EUGLENOIDS		
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
	....EUGLENA		330	1

04157000 SAGINAW RIVER AT SAGINAW, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

AUG. 6, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

69,000 CELLS/ML

	ORGANISM NAME	COMMON NAME	CELLS/ML	PER CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...CHARACIACEAE			
	....SCHROEDERIA		980	1
	...MICRACTINIACEAE			
L	....GOLENKINIA			0
	....MICRACTINIUM		2,500	4
	...OOCYSTACEAE			
	....ANKISTRODESMUS		2,600	4
	....KIRCHNERIELLA		610	1
	....OOCYSTIS		490	1
	...SCENEDESMACEAE			
	....ACTINASTRUM		490	1
D	....SCENEDESMUS		12,000	18
	..VOLVOCALES			
	...PHACOTACEAE			
L	....PHACOTUS			0
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		11,000	16
	....MELOSIRA		2,800	4
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....COCCONEIS			0
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
	....FRAGILARIA		740	1
	...NAVICULACEAE	NAVICULOID		
L	....NAVICULA			0
	...NITZSCHIACEAE			
	....NITZSCHIA		1,200	2
	...ACHNANTHACEAE			
L	....RHOICOSPHENIA			0
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....AGMENELLUM		5,900	9
D	....ANACYSTIS		11,000	17
L	....GOMPHOSPHAERIA			0
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
L	....ANABAENA			0
D	....APHANIZOMENON			
	...OSCILLATORIACEAE		12,000	18
	....OSCILLATORIA		1,500	2
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOCHRYSIDACEAE			
	....CHROOMONAS			
	...CRYPTOMONODACEAE		490	1
L	....CRYPTOMONAS			0
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
L	....PHACUS			0
L	....TRACHELOMONAS			0
	PYRRHOPHYTA			
	.DINOPHYCEAE	DINOFLAGELLATES		
	..GYMNODINIALES			
	...GYMNODINIACEAE			
L	....GYMNODINIUM			0
	..PERIDINIALES			
	...CERATIACEAE			
L	....CERATIUM			0

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

SEP. 1, 1976
1530 HOURS

IDENTIFICATION OF PHYTOPLANKTON

42,000 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...COELASTRACEAE			
L	....COELASTRUM			0
	...HYDRODICTYACEAE			
L	....PEDIASTRUM			0
	...OOCYSTACEAE			
	....ANKISTRODESMUS		2,000	5
L	....OOCYSTIS			0
L	....SELENASTRUM			0
	....TETRAEDRON		330	1
	...SCENEDESMACEAE			
L	....CRUCIGENIA			0
D	....SCENEDESMUS		7,200	17
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		330	1
	...PHACOTACEAE			
	....PHACOTUS		980	2
		TOTALS	11,000	26
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		10,000	25
	..PENNALES	PENNATE		
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		330	1
	...NITZSCHIACEAE			
	....NITZSCHIA		1,600	4
		TOTALS	12,000	30
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....ANACYSTIS		8,200	20
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		9,500	23
		TOTALS	18,000	43
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		660	2
		TOTALS	660	2
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
L	....PHACUS			0
L	....TRACHELOMONAS			0
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..PERIDINIALES			
	...CERATIACEAE			
L	....CERATIUM			0

NOTE: D - DOMINANT ORGANISM; GREATER OR EQUAL TO 15%
L - LESS THEN 1%; MAY NOT HAVE BEEN ACTUALLY COUNTED

04157000 SAGINAW RIVER AT SAGINAW, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	810	786	610	---	---	417	---	475	586	505	732	875
2	815	831	---	717	---	---	472	500	493	477	756	835
3	802	849	625	655	---	---	459	541	510	489	---	767
4	774	736	661	---	---	---	525	---	557	523	695	788
5	774	693	668	---	---	354	503	533	---	548	683	---
6	734	733	715	---	---	301	510	491	629	598	713	741
7	768	711	659	---	---	314	---	430	657	572	741	829
8	773	676	647	---	---	314	517	399	678	582	687	949
9	626	726	633	---	---	322	535	396	---	609	713	---
10	777	774	654	---	---	343	---	426	665	627	842	991
11	733	748	---	---	---	357	612	---	633	575	718	---
12	749	675	680	---	---	373	626	489	716	643	---	722
13	666	672	726	---	---	378	541	510	629	708	---	727
14	682	686	713	---	---	390	535	520	---	---	---	861
15	682	682	554	---	---	---	582	538	706	689	---	888
16	659	712	461	---	---	391	595	549	---	743	722	817
17	659	739	450	---	---	---	---	575	560	697	835	836
18	663	776	491	---	---	---	---	---	711	701	751	---
19	742	729	532	---	391	---	---	527	633	715	736	683
20	893	720	558	---	378	437	---	549	644	723	---	678
21	987	728	605	---	376	363	---	517	687	---	732	777
22	---	719	633	---	384	---	---	549	760	724	700	---
23	---	730	648	---	394	319	---	557	689	---	751	823
24	985	748	661	---	408	396	---	610	---	818	788	823
25	---	853	---	---	410	413	---	633	699	836	772	829
26	862	720	652	---	416	418	---	599	703	836	736	823
27	853	734	667	---	398	423	399	---	659	875	---	---
28	892	817	689	---	391	432	392	551	723	830	794	918
29	821	788	690	---	421	439	420	625	826	830	783	756
30	764	796	651	---	---	455	446	614	672	753	855	---
31	743	---	666	---	---	452	---	633	---	753	835	---
MAX	987	853	726	---	---	---	---	633	826	875	---	---
MIN	626	672	450	---	---	---	---	396	493	477	---	---

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.5	9.0	2.5	---	0.0	---	---	13.0	18.5	20.0	24.5	21.5
2	14.0	10.5	---	0.5	0.0	---	7.5	12.0	19.5	19.0	25.0	21.0
3	12.5	11.5	---	0.0	0.0	---	8.0	9.5	19.5	19.5	---	20.0
4	14.5	13.0	1.0	---	0.0	---	9.0	---	21.0	21.5	23.0	21.0
5	---	13.5	2.0	---	0.0	---	9.0	12.5	---	23.5	22.5	---
6	15.5	13.5	2.5	0.0	0.0	---	10.0	11.0	23.5	24.5	22.5	21.0
7	15.0	---	2.5	0.0	0.0	---	---	10.0	24.5	24.5	21.5	21.0
8	14.5	14.5	2.0	0.0	0.0	---	10.0	9.0	24.5	24.5	22.0	21.5
9	14.0	14.5	1.5	0.0	0.0	---	10.0	12.5	---	24.5	22.0	---
10	14.0	12.5	1.5	0.0	0.0	---	---	14.5	24.5	25.0	23.0	21.0
11	13.5	11.0	---	---	0.0	---	9.5	---	25.0	25.5	24.0	---
12	---	10.0	1.5	0.0	0.0	2.0	9.0	15.5	25.0	25.0	---	20.0
13	14.0	9.5	2.0	0.0	0.0	2.0	10.0	16.0	25.0	24.5	---	21.0
14	15.5	7.0	5.0	0.0	0.0	2.0	11.5	17.5	---	---	---	21.0
15	17.0	6.0	6.0	0.0	0.0	---	14.5	17.5	26.0	26.5	---	21.0
16	16.0	6.5	5.0	0.0	0.0	2.0	15.5	17.5	---	26.5	22.5	19.5
17	14.0	7.0	3.0	0.0	0.0	---	---	16.5	23.5	25.5	23.0	19.0
18	13.5	8.5	0.0	0.0	0.0	---	---	---	23.5	24.5	23.5	---
19	10.5	9.0	0.0	0.0	0.0	---	---	15.0	24.0	24.5	24.0	20.0
20	11.5	9.0	0.0	0.0	0.5	7.0	---	17.0	24.5	24.0	---	19.0
21	12.5	8.0	0.0	0.0	0.0	4.5	---	17.5	24.0	---	25.5	19.0
22	12.5	6.5	0.0	0.0	0.0	---	---	18.0	24.0	24.5	26.0	---
23	---	5.0	0.0	0.0	0.0	4.5	---	17.5	24.0	---	24.5	16.0
24	14.5	4.0	0.0	0.0	0.5	7.5	---	17.5	23.5	26.0	25.0	15.0
25	---	3.0	0.0	0.0	1.0	8.0	---	17.0	23.5	26.0	25.0	15.0
26	13.0	2.0	0.0	0.0	1.5	9.0	---	18.0	24.0	26.0	25.0	15.0
27	12.0	1.5	0.0	0.0	2.0	8.0	7.0	---	25.0	25.0	---	---
28	11.5	2.0	0.0	0.0	---	8.5	7.5	19.5	25.0	25.0	24.0	14.5
29	11.0	2.0	0.0	0.0	---	7.5	9.5	19.0	24.5	24.0	23.0	14.5
30	9.5	5.0	0.0	0.0	---	9.5	11.0	18.5	21.5	25.0	24.0	---
31	8.5	---	0.5	0.0	---	8.5	---	18.5	---	24.5	22.0	---
MAX	17.0	14.5	6.0	0.5	2.0	---	---	19.5	26.0	26.5	---	---
MIN	8.5	1.5	0.0	0.0	0.0	---	---	9.0	18.5	19.0	---	---

04158500 PIGEON RIVER NEAR OWENDALE, MI

LOCATION.--Lat 43°45'49", long 83°14'46", in SW¼ SE¼ sec.36, T.16 N., R.10 E., Huron County, Hydrologic Unit 04080103, on left bank 600 ft (183 m) downstream from bridge on Kilmanagh Road, 2.5 mi (4.0 km) downstream from confluence of East and West Branches, and 2.5 mi (4.0 km) northeast of Owendale.

DRAINAGE AREA.--55 mi^2 (140 km^2), approximately.

PERIOD OF RECORD.--October 1952 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 645 ft (197 m) from topographic map. Prior to June 10, 1954, nonrecording gage at site 600 ft (183 m) upstream at same datum.

REMARKS.--Records fair except those for the winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--24 years, 31.9 ft^3/s (0.903 m^3/s), 7.88 in/yr (200 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,550 ft^3/s (72.2 m^3/s) Mar. 25, 1954, gage height, 10.75 ft (3.277 m), from rating curve extended above 1,200 ft^3/s (34.0 m^3/s), site and datum then in use; minimum, 0.1 ft^3/s (0.003 m^3/s) July 31, Aug. 1, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft^3/s (14.2 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 19	--	780	22.1	ice jam		Mar. 21	1000	969	27.4	9.83	2.996
Feb. 26	--	680	19.3	ice jam		Mar. 28	0800	788	22.3	8.82	2.688
Mar. 6	--	*1,040	29.5	*a10.47	3.191	May 6	1800	789	22.3	8.77	2.673
Mar. 13	--	710	20.1	ice jam							

a Ice jam.

Minimum daily discharge, 1.1 ft^3/s (0.031 m^3/s) Aug. 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.9	3.8	51	13	12	270	85	56	24	44	4.7	2.3
2	4.7	4.1	34	13	12	210	85	53	21	47	3.9	2.7
3	4.4	4.9	21	12	12	200	78	84	19	29	3.7	2.4
4	4.1	7.9	19	12	12	300	67	86	16	21	3.1	2.3
5	4.3	6.4	17	12	12	600	58	72	15	15	2.4	2.3
6	4.1	5.0	29	12	12	900	52	535	14	12	2.4	2.2
7	4.1	4.9	48	11	12	400	46	440	13	11	2.3	2.0
8	4.3	5.0	36	11	12	170	42	152	13	12	2.1	2.0
9	4.4	4.9	27	11	12	120	39	97	12	13	2.1	2.3
10	4.4	5.9	24	11	12	123	38	79	11	18	2.7	3.5
11	4.4	8.3	21	11	13	107	37	88	11	31	2.0	3.3
12	4.5	7.6	18	11	15	120	35	83	9.8	17	1.5	2.6
13	4.5	6.8	20	11	16	560	34	68	8.4	11	2.2	2.2
14	4.3	6.4	64	11	19	450	33	59	8.2	9.2	2.4	2.1
15	4.5	5.9	216	11	25	260	33	54	7.9	9.3	4.1	2.3
16	4.4	5.6	191	11	100	190	31	60	10	16	3.5	2.6
17	4.5	5.3	74	11	250	120	29	73	10	10	3.0	3.0
18	4.5	5.1	50	11	380	100	27	71	8.6	7.5	2.7	2.9
19	4.5	4.8	42	10	620	250	26	58	10	5.9	2.3	2.7
20	4.5	4.7	34	11	780	761	26	50	9.5	5.6	1.3	2.7
21	4.4	5.6	29	11	540	884	25	47	8.4	9.4	1.5	3.0
22	4.1	6.0	25	11	460	376	26	43	7.8	7.7	1.9	3.0
23	4.1	5.5	21	12	390	125	29	39	7.6	5.9	1.7	2.8
24	3.9	5.0	19	12	350	105	32	36	7.4	4.4	1.7	2.7
25	3.8	5.5	17	12	350	105	106	34	9.0	3.7	1.9	2.7
26	3.8	6.1	16	12	640	90	281	31	7.2	3.2	1.8	2.8
27	3.6	7.7	15	12	600	159	131	29	6.0	3.1	1.2	3.0
28	3.4	9.7	14	12	450	630	94	27	5.7	3.1	1.3	3.0
29	3.4	11	13	12	370	281	75	26	6.4	6.7	1.1	2.7
30	3.7	38	13	12	---	148	63	26	11	6.9	1.1	2.5
31	3.7	---	13	12	---	105	---	25	---	5.9	1.8	---
TOTAL	130.2	213.4	1231	357	6488	9219	1763	2681	327.9	404.5	71.4	78.6
MEAN	4.20	7.11	39.7	11.5	224	297	58.8	86.5	10.9	13.0	2.30	2.62
MAX	4.9	38	216	13	780	900	281	535	24	47	4.7	3.5
MIN	3.4	3.8	13	10	12	90	25	25	5.7	3.1	1.1	2.0
CFSM	.08	.13	.72	.21	4.07	5.40	1.07	1.57	.20	.24	.04	.05
IN.	.09	.14	.83	.24	4.39	6.24	1.19	1.81	.22	.27	.05	.05

CAL YR 1975 TOTAL 14015.1 MEAN 38.4 MAX 796 MIN 2.0 CFSM .70 IN 9.48
WTR YR 1976 TOTAL 22965.0 MEAN 62.7 MAX 900 MIN 1.1 CFSM 1.14 IN 15.53

04159500 BLACK RIVER NEAR FARGO, MI

LOCATION.--Lat 43°05'32", long 82°37'05", in NW¼ sec.32, T.8 N., R.16 E., St. Clair County, Hydrologic Unit 04090001, on left bank 20 ft (6 m) downstream from bridge on Norman Road, 2.1 mi (3.4 km) east of Fargo, 5.3 mi (8.5 km) upstream from Mill Creek, and 12 mi (19 km) northwest of Port Huron.

DRAINAGE AREA.--480 mi^2 (1,243 km^2).

PERIOD OF RECORD.--February 1944 to current year.

REVISED RECORDS.--WSP 1307: 1950(M). WSP 1627: 1956-58. WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 613.75 ft (187.071 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to July 9, 1954, nonrecording gage at same site and datum.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, May 25 to June 29, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--32 years, 282 ft^3/s (7.986 m^3/s), 7.98 in/yr (203 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,400 ft^3/s (408 m^3/s) Apr. 5, 1947, gage height, 16.06 ft (4.895 m), from flood-mark, from rating curve extended above 9,500 ft^3/s (269 m^3/s); maximum gage height observed, 18.05 ft (5.502 m) Feb. 20, 1951 (backwater from ice); minimum discharge observed, 1.8 ft^3/s (0.051 m^3/s) Sept. 18, 19, 1946.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,500 ft^3/s (99.1 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 22	0700	4360	123	10.57	3.222	Mar. 6	0500	*8360	237	*14.07	4.289
Feb. 27	1700	3680	104	9.72	2.963	May 7	2000	3870	110	10.11	3.082

Minimum discharge, 14 ft^3/s (0.40 m^3/s) Sept. 1, 8, 9, 25; minimum gage height, 1.76 ft (0.536 m) Sept. 1, 8, 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	19	180	65	55	2040	473	469	90	90	46	16
2	24	24	189	65	55	1830	454	391	85	382	38	16
3	24	25	150	65	55	4150	482	367	80	340	33	19
4	22	26	104	60	55	6860	397	406	77	210	30	18
5	23	32	94	60	55	6510	318	334	70	137	28	18
6	26	33	295	60	55	7740	268	606	65	95	27	18
7	26	30	613	60	58	6140	235	3280	60	76	26	17
8	21	30	457	60	60	5610	205	3260	55	71	29	16
9	20	29	288	60	60	3880	180	2060	50	68	29	18
10	20	34	209	60	65	2340	165	944	48	89	25	30
11	18	40	172	55	70	1590	159	538	46	127	24	28
12	18	49	145	55	90	1110	145	463	44	112	23	32
13	23	46	137	55	130	2010	137	376	43	80	29	33
14	20	43	378	55	220	2940	129	288	43	61	139	28
15	20	40	1680	55	400	2310	125	242	43	171	205	25
16	18	39	2400	55	900	1410	135	238	45	252	165	24
17	18	36	1460	55	2200	1010	156	288	50	108	84	23
18	18	32	600	55	2900	688	165	370	55	78	57	23
19	21	30	400	55	3300	521	141	298	60	59	44	23
20	24	30	230	55	3400	1170	119	232	80	51	36	23
21	20	31	170	55	3880	2400	108	250	120	100	32	22
22	20	34	140	55	4240	2870	110	258	100	150	28	19
23	21	39	120	55	3390	1540	107	176	80	100	26	19
24	20	36	100	55	2600	771	107	145	80	72	23	16
25	21	36	90	55	2440	642	971	120	180	53	22	16
26	28	38	85	55	3320	553	3240	110	160	44	20	19
27	25	45	80	55	3610	470	2870	100	110	39	19	19
28	21	67	75	55	3470	555	2320	95	80	36	21	19
29	20	91	70	55	2710	839	1330	95	65	35	20	19
30	19	122	70	55	---	754	688	95	66	37	19	19
31	19	---	70	55	---	593	---	95	---	47	18	---
TOTAL	665	1206	11251	1770	43843	73846	16439	16989	2230	3370	1365	635
MEAN	21.5	40.2	363	57.1	1512	2382	548	548	74.3	109	44.0	21.2
MAX	28	122	2400	65	4240	7740	3240	3280	180	382	205	33
MIN	18	19	70	55	55	470	107	95	43	35	18	16
CFSM	.04	.08	.76	.12	3.15	4.96	1.14	1.14	.15	.23	.09	.04
IN.	.05	.09	.87	.14	3.40	5.72	1.27	1.32	.17	.26	.11	.05

CAL YR 1975 TOTAL 110368 MEAN 302 MAX 8640 MIN 18 CFSM .63 IN 8.55
WTR YR 1976 TOTAL 173609 MEAN 474 MAX 7740 MIN 16 CFSM .99 IN 13.45

04160570 NORTH BRANCH BELLE RIVER AT IMLAY CITY, MI

LOCATION.--Lat 43°01'49", long 83°04'02", in SW¼ NW¼ sec.16, T.7 N., R.12 E., Lapeer County, Hydrologic Unit 04090001, on left bank 12 ft (4 m) upstream from bridge on State Highway 21, and 0.6 mi (1.0 km) northeast of Imlay City.

DRAINAGE AREA.--18.0 mi^2 (46.6 km^2).

PERIOD OF RECORD.--August 1965 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 800 ft (244 m) from topographic map (nearest 10 ft).

REMARKS.--Records good except those for the winter period, which are fair. Some diversion by pumping for sprinkler irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--11 years, 12.0 ft^3/s (0.340 m^3/s), 9.05 in/yr (230 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 334 ft^3/s (9.46 m^3/s) Apr. 19, 1975, gage height, 9.33 ft (2.844 m); minimum, 0.06 ft^3/s (0.002 m^3/s) July 25, 26, 27, 1966, Aug. 15, 1967; minimum gage height, 2.96 ft (0.902 m) July 25, 26, 27, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 60 ft^3/s (1.70 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	0900	90	2.55	5.32	1.622	Mar. 5	1500	*179	5.07	*7.12	2.170
Feb. 18	2100	130	3.68	6.23	1.899	Mar. 13	0300	80	2.27	5.14	1.567
Feb. 21	2200	123	3.48	6.07	1.850	Apr. 25	2100	127	3.60	6.27	1.911
Feb. 25	2200	92	2.61	5.35	1.631	May 7	0600	107	3.03	5.78	1.762

Minimum discharge, 0.44 ft^3/s (0.012 m^3/s) Sept. 8, gage height, 3.11 ft (0.948 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.2	5.8	28	8.0	6.2	30	17	17	8.0	9.0	3.1	1.1
2	5.5	6.4	17	7.5	6.2	59	20	18	7.1	12	2.8	.93
3	4.2	7.8	13	7.5	6.2	135	18	25	6.4	8.7	1.8	1.3
4	3.8	7.7	11	7.0	6.2	154	16	19	5.0	6.9	2.1	.85
5	3.0	6.9	11	7.0	6.5	166	15	15	4.2	5.3	2.3	.84
6	3.9	6.4	49	7.0	6.5	132	13	42	3.8	3.8	2.8	1.0
7	3.4	7.3	41	7.0	6.5	72	11	96	3.7	7.6	2.4	.72
8	3.1	9.1	24	7.0	7.0	47	9.9	59	3.2	6.3	2.5	.51
9	3.9	7.6	19	7.0	7.0	39	9.0	38	2.9	4.5	2.1	2.1
10	4.5	11	16	7.0	7.0	36	8.7	27	2.7	4.5	1.6	4.2
11	4.2	11	14	6.5	8.0	34	9.0	26	2.7	4.2	1.4	2.6
12	4.0	9.1	13	6.5	12	39	7.8	22	2.7	3.5	1.9	2.0
13	4.6	8.1	15	6.5	20	66	7.7	17	3.2	2.6	1.7	1.7
14	4.8	7.5	41	6.5	30	45	7.4	15	2.6	2.0	3.5	1.6
15	4.0	6.8	82	6.5	50	40	7.4	14	2.6	1.7	3.0	2.1
16	3.8	6.4	52	6.5	90	33	20	17	4.7	1.5	2.4	2.7
17	3.7	6.1	26	6.4	110	31	16	17	4.1	1.6	2.0	3.0
18	4.2	5.8	19	6.2	113	22	13	15	4.0	1.8	2.0	2.5
19	5.7	5.6	14	6.2	117	23	9.6	12	17	1.5	1.8	2.2
20	5.1	5.9	11	6.2	86	25	7.7	10	14	1.2	1.4	2.1
21	5.2	8.7	11	6.2	95	31	7.1	8.7	12	1.4	2.2	2.6
22	4.8	7.8	10	6.2	113	22	7.3	7.7	9.5	1.7	1.5	2.7
23	4.3	6.8	9.5	6.2	79	19	7.0	7.2	7.0	1.8	1.3	2.5
24	4.7	6.2	9.0	6.2	65	17	7.9	6.9	7.5	2.3	1.1	2.3
25	5.7	6.8	9.0	6.2	85	18	86	6.6	14	1.6	.94	2.2
26	5.7	7.3	8.5	6.2	77	16	111	6.2	9.6	1.3	1.4	3.2
27	5.9	7.9	8.5	6.2	57	20	66	6.1	6.3	1.3	1.0	4.4
28	5.2	9.0	8.5	6.2	44	27	41	6.1	4.9	2.2	.88	3.6
29	4.9	9.2	8.0	6.2	35	22	29	7.2	4.5	5.6	.84	3.1
30	4.7	31	8.0	6.2	---	19	22	8.7	8.5	3.6	.78	2.9
31	4.5	---	8.0	6.2	---	17	---	8.3	---	3.0	1.1	---
TOTAL	139.2	249.0	614.0	204.2	1351.3	1456	627.5	600.7	188.4	116.0	57.64	65.55
MEAN	4.49	8.30	19.8	6.59	46.6	47.0	20.9	19.4	6.28	3.74	1.86	2.19
MAX	5.9	31	82	8.0	117	166	111	96	17	12	3.5	4.4
MIN	3.0	5.6	8.0	6.2	6.2	16	7.0	6.1	2.6	1.2	.78	.51
CFSM	.25	.46	1.10	.37	2.59	2.61	1.16	1.08	.35	.21	.10	.12
IN.	.29	.51	1.27	.42	2.79	3.01	1.30	1.24	.39	.24	.12	.14

CAL YR 1975 TOTAL 6077.04 MEAN 16.6 MAX 307 MIN .70 CFSM .92 IN 12.56
WTR YR 1976 TOTAL 5669.49 MEAN 15.5 MAX 166 MIN .51 CFSM .86 IN 11.72

04160600 BELLE RIVER AT MEMPHIS, MI

LOCATION.--Lat 42°54'03", long 82°46'09", in NW¼ SE¼ sec.35, T.6 N., R.14 E., St. Clair County, Hydrologic Unit 04090001, on right bank, at downstream side of bridge on State Highway 19 at Memphis.

DRAINAGE AREA.--151 mi^2 (391 km^2).

PERIOD OF RECORD.--October 1962 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 720 ft (219 m) from topographic map (nearest 5 ft).

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--14 years, 89.0 ft^3/s (2.520 m^3/s), 8.00 in/yr (203 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,520 ft^3/s (128 m^3/s) Apr. 19, 1975, gage height, 8.96 ft (2.731 m); minimum, 3.1 ft^3/s (0.088 m^3/s) Mar. 10, 1964, gage height, 1.19 ft (0.363 m).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 1947, reached a stage of about 9 ft (2.7 m), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 600 ft^3/s (17.0 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 16	0600	648	18.4	4.76	1.451	Mar. 13	2200	722	20.4	4.99	1.521
Feb. 19	1500	*1790	50.7	*7.32	2.231	Apr. 26	0800	1500	42.5	6.91	2.106
Feb. 21	2400	1560	44.2	7.01	2.137	May 7	2300	1000	28.3	5.87	1.789
Mar. 5	2300	1560	44.2	7.02	2.140						

Minimum discharge, 5.2 ft^3/s (0.15 m^3/s) Sept. 6, 7, 9, gage height, 1.30 ft (0.396 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	23	287	52	44	269	106	169	40	25	17	6.2
2	24	24	201	50	44	445	110	155	38	31	14	6.2
3	24	30	125	50	44	1060	129	173	34	31	13	5.8
4	23	34	95	49	44	1250	117	209	32	28	12	5.8
5	22	37	72	48	45	1360	99	159	29	23	12	6.2
6	21	32	296	47	45	1230	87	195	27	20	14	5.8
7	20	30	521	47	45	860	79	746	25	19	13	5.8
8	20	30	370	46	46	605	73	827	23	20	13	5.5
9	20	35	200	46	47	337	66	540	21	22	12	6.2
10	21	44	152	45	48	249	58	323	19	21	11	9.4
11	25	73	120	45	54	227	55	213	19	20	11	13
12	25	71	103	44	75	251	55	177	18	18	9.8	13
13	24	54	120	44	130	587	53	137	18	18	10	10
14	24	45	344	44	210	596	52	113	17	16	13	9.0
15	25	40	539	43	400	402	51	95	17	15	13	8.6
16	25	37	607	43	745	307	61	104	17	15	14	8.6
17	23	35	413	42	1470	231	113	117	19	14	13	10
18	23	33	215	42	1480	171	106	92	20	13	11	11
19	23	31	118	42	1690	147	79	87	23	12	9.8	11
20	26	31	100	42	1390	191	60	76	27	12	9.0	10
21	29	33	85	42	1230	347	52	66	32	12	8.2	9.8
22	28	40	75	42	1430	239	53	67	27	11	7.8	9.0
23	27	41	70	42	1030	163	54	52	25	11	8.2	10
24	27	37	66	42	734	137	54	40	23	11	7.8	9.8
25	26	35	63	42	650	125	487	38	23	13	7.8	9.4
26	27	36	60	43	740	113	1290	39	30	13	7.4	11
27	28	42	58	43	617	108	924	39	29	12	7.4	11
28	27	42	56	43	462	143	620	38	23	11	7.0	13
29	27	59	55	43	337	163	363	38	21	13	6.6	14
30	26	186	54	43	---	139	227	38	21	18	6.2	12
31	24	---	53	43	---	123	---	41	---	19	6.2	---
TOTAL	758	1320	5693	1379	15326	12575	5733	5203	737	537	325.2	276.1
MEAN	24.5	44.0	184	44.5	528	406	191	168	24.6	17.3	10.5	9.20
MAX	29	186	607	52	1690	1360	1290	827	40	31	17	14
MIN	20	23	53	42	44	108	51	38	17	11	6.2	5.5
CFSM	.16	.29	1.22	.29	3.50	2.69	1.26	1.11	.16	.11	.07	.06
IN.	.19	.33	1.40	.34	3.78	3.10	1.41	1.28	.18	.13	.08	.07

CAL YR 1975 TOTAL 54608.3 MEAN 150 MAX 3320 MIN 9.5 CFSM .99 IN 13.45
WTR YR 1976 TOTAL 49862.3 MEAN 136 MAX 1690 MIN 5.5 CFSM .90 IN 12.28

04160800 SASHABAW CREEK NEAR DRAYTON PLAINS, MI

LOCATION.--Lat 42°43'12", long 83°21'13", in SE¼ sec.26, T.4 N., R.9 E., Oakland County, Hydrologic Unit 04090003, on right bank 25 ft (8 m) upstream from bridge on Maybee Road, 1.1 mi (1.8 km) upstream from mouth, and 2.5 mi (4.0 km) northeast of Drayton Plains.

DRAINAGE AREA.--20.9 mi^2 (54.1 km^2).

PERIOD OF RECORD.--October 1959 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Metal V-notch weir Aug. 30, 1961, to Mar. 6, 1968. Altitude of gage is 970 ft (296 m) from topographic map (nearest 10 ft).

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--17 years, 12.5 ft^3/s (0.354 m^3/s), 8.12 in/yr (206 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 161 ft^3/s (4.56 m^3/s) Feb. 23, 1974, gage height, 4.38 ft (1.335 m); minimum, 0.2 ft^3/s (0.006 m^3/s) on many days during 1961, 1963, 1964, 1965, 1966; minimum gage height, 1.59 ft (0.485 m) Aug. 1, 2, 1960.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 45 ft^3/s (1.27 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 23	0800	*126	3.57	*4.14	1.262	Mar. 21	1000	66	1.87	3.57	1.088
Mar. 5	1400	105	2.97	3.98	1.213	Apr. 25	2100	86	2.44	3.79	1.155
Mar. 13	0900	79	2.24	3.73	1.137	May 7	0800	83	2.35	3.76	1.146
Mar. 17	0800	100	2.83	3.90	1.189	May 16	1200	46	1.30	3.31	1.009

Minimum discharge, 1.0 ft^3/s (0.028 m^3/s) Sept. 8, 9, gage height, 1.79 ft (0.546 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	8.1	30	19	18	55	39	31	18	18	4.7	1.7
2	16	8.6	27	19	18	64	39	32	16	13	4.4	1.6
3	15	15	23	19	18	81	37	36	15	11	4.0	1.5
4	14	15	21	19	18	86	33	33	13	9.0	3.7	1.4
5	10	15	21	19	18	96	31	32	12	8.0	3.5	1.3
6	9.0	14	35	19	18	88	37	45	11	7.0	4.3	1.2
7	8.5	17	32	19	18	80	30	78	10	6.3	3.9	1.2
8	8.5	19	27	19	18	70	26	63	9.7	5.8	3.7	1.1
9	8.7	17	24	19	18	64	26	50	9.0	5.2	3.5	1.3
10	8.9	22	23	19	19	62	26	41	8.5	6.5	3.5	2.2
11	8.8	21	22	19	21	61	31	33	7.9	6.6	3.3	2.0
12	8.5	20	22	19	22	62	30	30	7.7	6.0	3.2	1.6
13	8.1	19	25	19	23	76	28	35	7.0	5.7	3.2	1.4
14	7.7	18	37	19	24	70	26	31	6.2	5.2	4.5	1.3
15	7.4	16	43	19	25	67	24	30	5.2	4.9	4.8	1.4
16	7.3	16	35	18	35	62	35	43	6.6	4.5	4.1	1.6
17	7.4	15	30	18	50	61	32	40	5.2	4.1	3.8	1.7
18	8.0	16	25	18	57	50	33	35	4.5	3.9	3.1	1.6
19	9.6	16	19	18	59	50	27	31	11	3.5	3.4	1.6
20	9.7	17	18	18	58	50	21	28	13	3.7	3.4	1.7
21	9.4	19	18	18	63	63	22	26	9.2	4.0	2.7	1.8
22	8.8	18	18	18	86	56	25	24	8.1	3.4	2.4	1.7
23	8.4	17	19	18	82	51	21	22	10	4.0	2.4	1.6
24	8.4	17	19	18	61	47	22	22	18	4.1	2.1	1.5
25	9.2	17	19	18	59	47	63	21	16	3.7	1.9	1.6
26	9.6	17	19	19	59	44	77	20	13	3.4	2.5	2.1
27	9.3	17	19	19	58	46	61	19	9.0	3.3	3.7	3.1
28	8.6	18	19	18	56	53	48	18	8.0	3.5	2.9	2.5
29	8.1	20	19	18	55	48	39	18	10	7.3	2.3	2.2
30	7.9	33	19	18	---	45	33	19	16	6.3	2.1	2.1
31	7.7	---	19	18	---	41	---	19	---	5.5	1.9	---
TOTAL	294.5	517.7	746	575	1134	1896	1022	1005	313.8	186.4	102.9	50.6
MEAN	9.50	17.3	24.1	18.5	39.1	61.2	34.1	32.4	10.5	6.01	3.32	1.69
MAX	18	33	43	19	86	96	77	78	18	18	4.8	3.1
MIN	7.3	8.1	18	18	18	41	21	18	4.5	3.3	1.9	1.1
CFSM	.45	.83	1.15	.89	1.87	2.93	1.63	1.55	.50	.29	.16	.08
IN.	.52	.92	1.33	1.02	2.02	3.37	1.82	1.79	.56	.33	.18	.09

CAL YR 1975 TOTAL 8798.1 MEAN 24.1 MAX 85 MIN 2.8 CFSM 1.15 IN 15.66
WTR YR 1976 TOTAL 7843.9 MEAN 21.4 MAX 96 MIN 1.1 CFSM 1.02 IN 13.96

04160900 CLINTON RIVER NEAR DRAYTON PLAINS, MI

LOCATION.--Lat 42°39'37", long 83°23'25", in NE¼ sec.21, T.3 N., R.9 E., Oakland County, Hydrologic Unit 04090003, on left bank 14 ft (4 m) downstream from bridge on State Highway 59, 1.0 mi (1.6 km) downstream from State fish hatchery, and 2.0 mi (3.2 km) south of Drayton Plains.

DRAINAGE AREA.--79.2 mi^2 (205.1 km^2).

PERIOD OF RECORD.--October 1959 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 940 ft (287 m) from topographic map (nearest 10 ft). Jan. 29 to July 9, 1964, non-recording gage at same site and datum.

REMARKS.--Records good. Some regulation and occasional diversion for lake level control at many lakes above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--17 years, 52.5 ft^3/s (1.487 m^3/s), 9.00 in/yr (229 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 276 ft^3/s (7.82 m^3/s) Mar. 12, 1974, gage height, 4.95 ft (1.509 m); minimum, 2.4 ft^3/s (0.068 m^3/s) May 31, 1961; minimum gage height, 1.23 ft (0.375 m) Jan. 4, 1961.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 221 ft^3/s (6.26 m^3/s) Mar. 7, 8, gage height, 4.65 ft (1.417 m); minimum, 16 ft^3/s (0.45 m^3/s) Aug. 25, Sept. 8, 9, 20, 21, minimum gage height, 2.21 ft (0.674 m) Aug. 25, Sept. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78	46	70	83	70	168	148	140	83	75	24	23
2	78	45	75	83	71	180	149	133	79	78	23	21
3	74	52	77	83	71	188	149	129	71	48	23	19
4	68	55	78	83	71	193	146	128	58	51	25	19
5	62	57	77	86	70	211	140	127	34	50	25	18
6	57	58	85	82	67	213	140	146	36	49	28	18
7	57	62	83	82	68	218	136	164	39	46	27	17
8	55	62	82	82	67	221	132	168	41	45	25	17
9	55	63	82	81	64	215	129	172	37	50	25	18
10	50	65	81	80	64	210	120	172	37	57	25	19
11	46	62	83	81	66	206	115	169	30	57	24	18
12	45	61	84	80	66	207	106	164	28	56	24	18
13	46	71	85	81	68	210	101	156	28	51	25	18
14	45	77	86	80	69	208	100	147	28	44	26	17
15	44	78	91	80	73	207	93	144	32	37	26	18
16	48	78	90	78	79	204	93	149	39	35	25	18
17	51	78	90	77	88	196	87	144	25	22	25	18
18	51	76	88	76	98	189	83	136	23	22	25	17
19	51	74	86	72	102	180	81	132	29	22	25	17
20	53	71	84	70	106	175	81	128	29	22	24	17
21	54	69	84	69	122	176	82	126	30	22	23	16
22	55	66	84	69	133	171	78	126	31	22	23	17
23	55	67	84	71	141	171	78	122	31	22	27	18
24	55	69	83	68	150	172	81	119	34	22	37	18
25	60	69	82	68	156	166	102	113	51	22	18	19
26	61	67	83	69	159	163	104	106	66	22	21	23
27	60	70	84	69	160	166	118	99	69	23	22	25
28	56	68	83	69	161	166	135	90	73	25	18	25
29	53	68	84	68	163	163	143	88	64	29	17	24
30	51	72	84	69	---	164	143	87	47	26	18	25
31	49	---	83	69	---	157	---	86	---	25	36	---
TOTAL	1723	1976	2575	2358	2843	5834	3393	4110	1302	1177	759	575
MEAN	55.6	65.9	83.1	76.1	98.0	188	113	133	43.4	38.0	24.5	19.2
MAX	78	78	91	86	163	221	149	172	83	78	37	25
MIN	44	45	70	68	64	157	78	86	23	22	17	16
CFSM	.70	.83	1.05	.96	1.24	2.37	1.43	1.68	.55	.48	.31	.24
IN.	.81	.93	1.21	1.11	1.34	2.74	1.59	1.93	.61	.55	.36	.27

CAL YR 1975 TOTAL 32341 MEAN 88.6 MAX 204 MIN 14 CFSM 1.12 IN 15.19
WTR YR 1976 TOTAL 28625 MEAN 78.2 MAX 221 MIN 16 CFSM .99 IN 13.44

04161000 CLINTON RIVER AT AUBURN HEIGHTS, MI

LOCATION.--Lat 42°38'00", long 83°13'28", in NW¼ sec.36, T.3 N., R.10 E., Oakland County, Hydrologic Unit 04090003, on right bank 30 ft (9 m) upstream from bridge on Auburn Road (revised) at Auburn Heights, and 2.8 mi (4.5 km) upstream from Galloway Creek.

DRAINAGE AREA.--123 mi^2 (319 km^2).

PERIOD OF RECORD.--May 1935 to June 1939 and February to September 1940 (published as "at Pontiac"), October 1956 to current year.

REVISED RECORDS.--WSP 1307: 1937(M). WSP 1507: Drainage area at former site.

GAGE.--Water-stage recorder. Datum of gage is 846.50 ft (258.013 m) above mean sea level. Prior to October 1940, nonrecording gage at site 3.3 mi (5.3 km) upstream at datum 876.01 ft (267.008 m) above mean sea level.

REMARKS.--Records good. Some regulation by many lakes above station. Flow includes waste from city of Pontiac water supply, most of which is obtained from sources outside the basin. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--23 years (1935-38, 1956-76), 101 ft^3/s (2.860 m^3/s), 11.15 in/yr (283 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,720 ft^3/s (48.7 m^3/s) Apr. 19, 1975, gage height, 5.37 ft (1.637 m); minimum observed, 4.8 ft^3/s (0.14 m^3/s) Sept. 4, 1936, site then in use.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 460 ft^3/s (13.0 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 16	2300	526	14.9	3.19	0.972	Mar. 20	2200	*795	22.5	*3.77	1.149
Feb. 21	1300	690	19.5	3.56	1.085	Apr. 25	1500	574	16.3	3.31	1.009
Mar. 2	1500	660	18.7	3.50	1.067	May 6	2100	*795	22.5	*3.77	1.149
Mar. 5	0700	638	18.1	3.45	1.052	May 16	0300	588	16.7	3.34	1.018
Mar. 12	2200	534	15.1	3.21	0.978	Aug. 26	2000	690	19.5	3.56	1.085

Minimum discharge, 32 ft^3/s (0.91 m^3/s) Sept. 13, gage height, 1.03 ft (0.314 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	176	116	156	160	128	315	296	244	198	90	36	54
2	168	111	152	159	151	512	302	240	193	67	38	50
3	166	140	146	157	138	408	282	247	186	87	40	45
4	152	118	148	152	134	334	267	239	168	90	40	40
5	143	111	146	154	132	419	265	238	112	96	58	37
6	141	111	232	158	129	391	299	455	78	98	85	35
7	112	127	159	156	123	397	256	442	68	100	49	38
8	102	109	155	152	120	386	250	324	66	106	52	39
9	108	102	166	150	127	378	247	299	56	116	58	84
10	103	215	161	143	149	377	239	308	48	128	58	65
11	95	134	165	143	168	367	232	322	53	94	59	44
12	91	122	169	150	157	405	230	313	45	86	69	40
13	98	120	202	156	193	412	229	342	40	83	109	38
14	103	113	204	158	159	364	221	307	43	75	93	41
15	106	110	240	156	201	347	219	280	52	72	76	41
16	117	111	196	157	261	346	261	360	86	65	75	42
17	136	120	185	146	279	342	213	305	47	54	75	42
18	147	124	169	130	278	338	200	285	49	46	78	39
19	142	126	116	155	232	336	199	272	134	45	77	39
20	138	147	115	150	215	384	197	264	51	48	74	47
21	134	144	123	146	413	390	191	250	48	46	74	42
22	121	135	151	143	357	347	156	242	48	42	72	41
23	88	128	177	141	281	338	179	235	46	47	76	41
24	80	132	179	138	272	332	202	232	132	45	77	39
25	120	151	177	131	271	344	454	229	111	45	77	37
26	98	138	180	157	273	324	303	225	158	52	171	76
27	107	145	179	146	273	360	253	218	178	47	109	57
28	131	153	169	143	270	330	239	212	197	69	81	44
29	136	165	165	143	276	312	231	217	149	91	70	42
30	133	184	181	137	---	308	227	204	177	48	69	45
31	123	---	170	133	---	297	---	208	---	42	61	---
TOTAL	3815	3962	5233	4600	6160	11240	7339	8558	3017	2220	2236	1364
MEAN	123	132	169	148	212	363	245	276	101	71.6	72.1	45.5
MAX	176	215	240	160	413	512	454	455	198	128	171	84
MIN	80	102	115	130	120	297	156	204	40	42	36	35

CAL YR 1975 TOTAL 62608 MEAN 172 MAX 751 MIN 35
WTR YR 1976 TOTAL 59744 MEAN 163 MAX 512 MIN 35

04161100 GALLOWAY CREEK NEAR AUBURN HEIGHTS, MI

LOCATION.--Lat 42°40'02", long 83°12'02", in SE¼ sec.18, T.3 N., R.11 E., Oakland County, Hydrologic Unit 04090003, on right bank 12 ft (4 m) downstream from wooden bridge on Oakland University property, and 2.7 mi (4.3 km) northeast of Auburn Heights.

DRAINAGE AREA.--17.9 mi^2 (46.4 km^2).

PERIOD OF RECORD.--October 1959 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Concrete control since Aug. 20, 1960. Datum of gage is 820.78 ft (250.174 m) above mean sea level (levels by Johnson and Anderson, Inc.).

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--17 years, 9.92 ft^3/s (0.281 m^3/s), 7.53 in/yr (191 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 368 ft^3/s (10.4 m^3/s) June 25, 1968, gage height, 6.27 ft (1.911 m); minimum, 0.01 ft^3/s (<0.001 m^3/s) on several days during July and August, 1964; minimum gage height, 0.82 ft (0.250 m) Aug. 1, 1960.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 90 ft^3/s (2.55 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 17	0200	102	2.89	4.79	1.460	Apr. 25	2100	95	2.69	4.70	1.433
Feb. 21	2400	104	2.95	4.81	1.466	May 6	2300	105	2.97	4.82	1.469
Mar. 5	0800	*108	3.06	*4.85	1.478						

Minimum discharge, 1.3 ft^3/s (0.037 m^3/s) Sept. 26; minimum gage height, 1.86 ft (0.567 m) Aug. 12, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	3.4	24	8.2	7.4	29	21	24	7.6	15	2.7	2.8
2	5.2	3.7	19	8.2	7.4	68	22	25	6.6	11	2.4	2.7
3	4.5	5.7	14	8.2	7.4	84	21	26	5.7	8.8	2.0	2.5
4	4.0	6.4	12	8.0	7.5	82	19	23	4.8	7.4	2.0	2.3
5	3.7	5.8	11	8.0	7.6	93	17	22	4.3	5.7	2.3	2.0
6	3.4	5.3	29	8.0	7.6	77	24	45	3.7	4.8	4.2	2.0
7	3.1	5.8	30	8.0	7.8	58	23	93	3.3	4.2	2.8	1.6
8	3.0	6.0	22	8.0	8.2	44	20	67	3.0	3.6	2.5	1.5
9	3.3	5.3	19	7.4	8.6	37	17	46	2.7	3.1	2.2	3.0
10	3.3	18	17	6.8	10	34	16	33	2.5	8.4	2.0	5.5
11	3.3	17	15	7.0	13	32	15	28	8.2	5.2	1.9	3.3
12	3.1	14	14	7.0	16	35	14	23	5.5	4.2	1.8	2.5
13	3.0	11	19	7.0	25	56	13	20	3.4	3.4	2.2	2.3
14	3.0	9.0	36	7.0	35	48	12	17	2.7	2.8	2.7	2.0
15	3.0	7.4	51	7.1	50	39	11	16	2.2	2.7	2.4	2.0
16	3.0	6.4	41	7.2	82	34	18	34	6.2	2.7	2.0	2.0
17	2.8	5.7	29	7.2	91	26	16	32	3.4	2.7	1.9	2.2
18	3.3	5.2	18	7.2	84	23	14	25	3.0	2.8	1.8	1.9
19	4.3	4.8	14	7.2	78	23	13	20	14	2.5	1.8	1.8
20	4.2	5.3	10	7.2	62	25	11	17	12	2.4	1.8	2.2
21	4.0	8.2	9.5	7.1	79	52	11	14	8.6	2.7	1.6	1.6
22	3.9	7.2	9.2	7.0	92	41	11	13	6.4	2.2	1.6	1.5
23	3.6	6.2	9.1	7.0	74	32	11	11	5.2	2.4	1.6	1.5
24	3.4	5.5	9.0	7.0	55	26	11	9.2	14	2.2	1.5	1.4
25	5.0	6.2	8.8	7.1	48	26	69	7.8	24	2.0	1.5	1.4
26	4.6	6.2	8.7	7.2	45	23	85	7.0	14	1.8	15	2.8
27	4.2	6.8	8.6	7.2	37	27	62	6.4	10	1.9	16	3.7
28	4.5	8.4	8.5	7.2	32	35	44	5.8	9.0	1.9	6.4	2.5
29	3.9	11	8.3	7.2	29	31	34	7.2	7.8	5.3	4.6	2.2
30	3.4	26	8.2	7.2	---	26	27	7.6	18	3.6	4.2	1.9
31	3.4	---	8.2	7.3	---	23	---	8.2	---	3.3	3.4	---
TOTAL	116.4	242.9	540.1	228.4	1106.5	1289	702	733.2	221.8	132.7	102.8	68.6
MEAN	3.75	8.10	17.4	7.37	38.2	41.6	23.4	23.7	7.39	4.28	3.32	2.29
MAX	6.0	26	51	8.2	92	93	85	93	24	15	16	5.5
MIN	2.8	3.4	8.2	6.8	7.4	23	11	5.8	2.2	1.8	1.5	1.4
CFSM	.21	.45	.97	.41	2.13	2.32	1.31	1.32	.41	.24	.19	.13
IN.	.24	.50	1.12	.47	2.30	2.68	1.46	1.52	.46	.28	.21	.14

CAL YR 1975 TOTAL 5397.1 MEAN 14.8 MAX 134 MIN 1.4 CFSM .83 IN 11.22
WTR YR 1976 TOTAL 5484.4 MEAN 15.0 MAX 93 MIN 1.4 CFSM .84 IN 11.40

04161540 PAINT CREEK AT ROCHESTER, MI

LOCATION.--Lat 42°41'18", long 83°08'35", in NW¼ SE¼ sec.10, T.3 N., R.11 E., Oakland County, Hydrologic Unit 04090003, on right bank at upstream side of bridge on Ludlow Street in Rochester, and 1.5 mi (2.4 km) upstream from mouth.

DRAINAGE AREA.--70.9 mi^2 (183.6 km^2).

PERIOD OF RECORD.--October 1959 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 755.11 ft (230.158 m) above mean sea level.

REMARKS.--Records good except those for the winter period, which are fair. Occasional regulation by Lake Orion. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--17 years, 52.1 ft^3/s (1.475 m^3/s), 9.98 in/yr (253 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 918 ft^3/s (26.0 m^3/s) Feb. 1, 1968; maximum gage height, 5.95 ft (1.814 m) Feb. 10, 1965 (backwater from ice); minimum discharge, 1.2 ft^3/s (0.034 m^3/s) Aug. 19, 1974, caused by regulation due to bridge construction; minimum gage height, 1.26 ft (0.384 m) Sept. 16, 1960.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 200 ft^3/s (5.66 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 17	0500	268	7.59	3.17	0.966	Mar. 13	0800	235	6.66	3.04	0.927
Feb. 18	2400	265	7.50	3.16	0.963	Mar. 21	0700	220	6.23	2.98	0.908
Feb. 22	0100	526	14.9	3.94	1.201	Apr. 25	1700	329	9.32	3.38	1.030
Mar. 5	1600	*546	15.5	*3.99	1.216	May 7	0600	356	10.1	3.47	1.058

Minimum discharge, 14 ft^3/s (0.40 m^3/s) Sept. 8, 9, gage height, 1.57 ft (0.479 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75	42	101	71	63	170	128	125	59	68	34	34
2	65	43	87	70	63	252	128	127	53	57	31	22
3	62	61	82	69	63	314	123	130	46	35	33	21
4	61	59	81	68	63	341	120	127	31	33	29	25
5	62	56	82	68	63	449	116	120	38	36	30	24
6	59	57	134	68	64	382	127	182	39	38	47	23
7	56	64	118	68	65	335	120	308	38	38	39	22
8	60	67	104	68	65	281	113	210	37	36	36	17
9	64	67	106	68	66	242	109	182	36	33	34	22
10	64	98	108	68	68	207	108	164	35	59	33	26
11	61	78	109	67	70	182	111	158	45	47	33	22
12	56	69	113	67	79	170	109	147	48	45	34	22
13	53	62	125	67	98	220	106	128	48	39	32	17
14	50	61	158	67	96	186	108	116	43	36	34	17
15	48	64	178	67	120	178	103	109	37	35	36	18
16	49	67	152	67	202	172	118	132	49	42	33	20
17	50	67	130	67	235	160	101	125	43	35	31	22
18	54	65	115	67	217	150	93	114	41	33	29	22
19	60	64	105	67	227	149	88	106	79	30	27	22
20	59	65	100	67	207	149	87	100	65	29	28	24
21	55	74	96	67	317	198	87	92	53	30	26	24
22	49	68	90	66	449	158	87	85	48	29	25	23
23	48	65	86	66	323	149	82	79	47	44	24	22
24	47	64	84	66	287	145	88	74	72	41	23	21
25	53	67	82	66	265	145	257	71	90	34	23	21
26	49	65	80	66	235	137	240	68	65	31	44	29
27	43	68	78	66	205	145	192	64	55	29	34	34
28	39	71	76	65	182	154	194	60	53	33	29	29
29	37	72	74	65	174	139	170	62	53	47	27	27
30	38	109	73	64	---	139	130	65	81	40	24	26
31	39	---	72	63	---	136	---	62	---	37	34	---
TOTAL	1665	1999	3179	2076	4631	6334	3743	3692	1527	1199	976	698
MEAN	53.7	66.6	103	67.0	160	204	125	119	50.9	38.7	31.5	23.3
MAX	75	109	178	71	449	449	257	308	90	68	47	34
MIN	37	42	72	63	63	136	82	60	31	29	23	17
CFSM	.76	.94	1.45	.94	2.26	2.88	1.76	1.68	.72	.55	.44	.33
IN.	.87	1.05	1.67	1.09	2.43	3.32	1.96	1.94	.80	.63	.51	.37

CAL YR 1975 TOTAL 33305 MEAN 91.2 MAX 614 MIN 19 CFSM 1.29 IN 17.47
WTR YR 1976 TOTAL 31719 MEAN 86.7 MAX 449 MIN 17 CFSM 1.22 IN 16.64

04161580 STONY CREEK NEAR ROMEO, MI

LOCATION.--Lat 42°48'03", long 83°05'25", in SW¼, sec.31, T.5 N., R.12 E., Macomb County, Hydrologic Unit 04090003, on right bank at upstream side of bridge on Romeo Road, and 4.0 mi (6.4 km) west of Romeo.

DRAINAGE AREA.--25.6 mi^2 (66.3 km^2).

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 861.64 ft (262.628 m) above mean sea level.

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--12 years, 18.6 ft^3/s (0.527 m^3/s), 9.87 in/yr (251 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 290 ft^3/s (8.21 m^3/s) Apr. 19, 1975, gage height, 5.19 ft (1.582 m); minimum, 0.92 ft^3/s (0.026 m^3/s) Oct. 5, 9, 1967; minimum gage height, 1.28 ft (0.390 m) July 27, 28, 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft^3/s (2.83 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 23	0900	*175	4.96	*4.23	1.289	Apr. 25	1900	108	3.06	3.59	1.094
Mar. 5	0800	*175	4.96	*4.23	1.289						

Minimum discharge, 3.7 ft^3/s (0.10 m^3/s) Sept. 26; minimum gage height, 1.51 ft (0.460 m) Sept. 6, 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	15	49	26	26	81	37	58	17	23	10	7.4
2	19	16	41	26	26	97	38	55	15	18	8.5	6.9
3	15	31	42	25	26	130	36	54	14	16	7.6	5.8
4	14	28	39	24	27	148	34	49	13	14	10	4.8
5	14	24	38	24	27	159	32	43	12	12	14	4.6
6	14	21	57	23	27	147	34	60	12	11	23	4.6
7	13	22	55	23	27	127	32	94	13	11	20	5.6
8	13	22	47	23	27	111	30	85	12	12	15	5.4
9	19	20	42	23	27	100	27	69	11	12	10	6.2
10	19	35	41	23	27	90	25	54	10	16	7.8	11
11	18	35	48	23	28	80	25	47	10	18	7.6	7.6
12	17	30	49	23	28	95	23	47	11	16	8.5	5.6
13	16	28	51	23	29	95	22	45	10	11	12	4.8
14	16	22	59	23	30	90	22	42	9.8	9.5	14	4.4
15	15	19	69	24	33	81	21	39	9.5	12	12	5.2
16	14	18	65	24	35	74	39	45	12	20	9.3	5.6
17	14	17	50	24	56	65	35	43	13	18	7.8	6.0
18	14	16	40	24	80	57	29	41	13	17	7.1	6.4
19	19	22	35	24	111	58	26	36	25	13	8.5	5.0
20	19	24	34	24	116	59	25	25	24	11	8.8	5.0
21	16	29	33	24	124	71	24	20	17	11	8.3	5.2
22	16	26	33	25	133	61	26	19	14	10	7.8	5.2
23	15	23	32	25	139	54	24	18	17	18	7.4	4.8
24	14	21	31	25	112	46	26	17	25	18	12	4.0
25	17	23	30	25	109	43	86	17	34	14	15	3.9
26	17	24	30	25	109	39	101	16	26	14	17	5.8
27	15	25	29	25	104	43	85	16	20	11	19	10
28	14	28	29	25	95	48	78	16	16	10	15	6.0
29	14	29	28	26	86	43	74	18	18	23	11	5.0
30	15	46	27	26	---	41	65	20	29	17	8.8	4.4
31	14	---	27	26	---	38	---	19	---	12	7.6	---
TOTAL	490	739	1280	753	1824	2471	1181	1227	482.3	448.5	350.4	172.2
MEAN	15.8	24.6	41.3	24.3	62.9	79.7	39.4	39.6	16.1	14.5	11.3	5.74
MAX	21	46	69	26	139	159	101	94	34	23	23	11
MIN	13	15	27	23	26	38	21	16	9.5	9.5	7.1	3.9
CFSM	.62	.96	1.61	.95	2.46	3.11	1.54	1.55	.63	.57	.44	.22
IN.	.71	1.07	1.86	1.09	2.65	3.59	1.72	1.78	.70	.65	.51	.25

CAL YR 1975 TOTAL 12816.0 MEAN 35.1 MAX 245 MIN 5.3 CFSM 1.37 IN 18.62
WTR YR 1976 TOTAL 11418.4 MEAN 31.2 MAX 159 MIN 3.9 CFSM 1.22 IN 16.59

04161790 STONY LAKE NEAR WASHINGTON, MI

LOCATION.--Lat 42°42'58", long 83°05'58", in SE¼ sec.31, T.4 N., R.12 E., Macomb County, Hydrologic Unit 04090003, on left bank 1,000 ft (305 m) east of bridge over dam on Stony Creek, and 2.7 mi (4.3 km) west of Washington.

DRAINAGE AREA.--68.0 mi^2 (176.1 km^2).

PERIOD OF RECORD.--February 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is 790.00 ft (240.792 m) above mean sea level (levels by Huron-Clinton Metropolitan Authority). Gage readings have been converted to elevations above mean sea level.

REMARKS.--Reservoir is formed by an earthfill dam with concrete spillway completed in 1962. The spillway section includes a drum gate with minimum crest elevation of 796 ft (242.6 m), maximum of 802 ft (244.4 m); and 2 sluices, one on each side, with valve controls capable of draining lake. Total capacity (new capacity table put into use Oct. 1, 1973), 4,649 acre-ft (5.73 hm^3) at elevation of 802 ft (244.4 m). The reservoir began filling February 1963. Lake is used for recreational purposes.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 5,495 acre-ft (6.78 hm^3) May 17, 18, 1974, Apr. 20, 1975, elevation 803.6 ft (244.94 m); minimum recorded, 1,758 acre-ft (2.17 hm^3) Nov. 21, 1967, elevation, 794.7 ft (242.22 m).

EXTREMES FOR CURRENT YEAR. Maximum contents, 5,065 acre-ft (6.24 hm^3) May 7, elevation, 802.8 ft (244.69 m); minimum, 3,961 acre-ft (4.88 hm^3) Nov. 23-29, elevation, 800.6 ft (244.02 m).

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

Date	Elevation (feet)	Contents (acre-feet)	Change in contents during month	
			Acre-feet	Equivalent in ft^3/s
Sept. 30	802.4	4857	--	--
Oct. 31	801.5	4399	-458	-7.4
Nov. 30	801.0	4153	-246	-4.1
Dec. 31	800.8	4057	-96	-1.6
CAL YR 1975	--	--	+772	+1.1
Jan. 31	800.8	4057	0	0
Feb. 29	801.0	4153	+96	+1.7
Mar. 31	801.3	4299	+146	+2.4
Apr. 30	802.1	4701	+402	+6.8
May 31	802.3	4805	+104	+1.7
June 30	802.2	4753	-52	-0.9
July 31	802.2	4753	0	0
Aug. 31	802.1	4701	-52	-0.8
Sept. 30	802.6	4961	+260	+4.4
WTR YR 1976	--	--	+104	+0.1

04161800 STONY CREEK NEAR WASHINGTON, MI

LOCATION.--Lat 42°42'55", long 83°05'31", in SW¼ sec.31, T.4 N., R.12 E., Macomb County, Hydrologic Unit 04090003, on left bank 15 ft (5 m) downstream from bridge on Mt. Vernon Road, 500 ft (152 m) downstream from Stony Lake Dam, and 2.9 mi (4.7 km) west of Washington.

DRAINAGE AREA.--68.2 mi^2 (176.6 km^2).

PERIOD OF RECORD.--July 1958 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 772.59 ft (235.485 m) above mean sea level (levels by Huron-Clinton Metropolitan Authority).

REMARKS.--Records good. Occasional diurnal fluctuation caused by mills above station prior to February 1963; occasional regulation by Stony Lake since (see sta 04161790). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--18 years, 42.2 ft^3/s (1.195 m^3/s), 8.40 in/yr (213 mm/yr), adjusted for storage since 1963.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 427 ft^3/s (12.1 m^3/s) Feb. 2, 1968, gage height, 5.86 ft (1.786 m); maximum gage height, 6.71 ft (2.045 m) Mar. 6, 1959, backwater from ice; minimum discharge, 0.9 ft^3/s (0.025 m^3/s) July 10, 1963; minimum gage height, 1.84 ft (0.561 m) July 31, 1964; minimum daily discharge, 1.3 ft^3/s (0.037 m^3/s) July 31, Aug. 1, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 399 ft^3/s (11.3 m^3/s) Mar. 5, gage height, 5.72 ft (1.743 m); minimum, 11 ft^3/s (0.31 m^3/s) Sept. 7, gage height, 2.22 ft (0.677 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	50	100	71	63	176	96	146	52	68	37	20
2	50	47	104	66	62	218	97	139	46	63	31	17
3	47	55	95	62	56	281	96	130	42	52	25	15
4	44	66	88	60	59	330	93	78	39	46	23	15
5	42	78	83	61	59	386	82	80	38	42	26	14
6	41	74	107	62	58	388	52	139	35	38	53	12
7	40	68	116	64	57	360	52	229	32	35	49	11
8	38	64	112	59	55	317	69	231	31	34	43	12
9	38	61	104	56	55	270	69	207	29	30	40	16
10	40	76	97	55	55	234	71	172	28	37	34	23
11	40	83	95	58	62	212	75	151	28	46	29	22
12	40	99	97	56	69	204	35	128	27	50	27	20
13	40	95	98	59	76	240	34	116	25	42	27	18
14	41	76	113	63	83	239	49	109	24	36	32	17
15	40	66	140	59	94	216	55	106	23	34	35	18
16	38	60	143	60	130	191	71	113	32	37	31	18
17	40	71	136	58	183	162	79	117	30	36	27	19
18	42	78	111	55	221	142	83	105	29	35	24	15
19	40	73	93	55	250	134	78	95	49	34	22	14
20	44	92	83	56	244	137	74	87	55	33	21	16
21	71	103	70	58	275	180	70	79	55	35	20	15
22	59	77	59	59	326	173	73	68	49	30	20	14
23	49	66	65	59	294	154	69	38	44	44	21	14
24	45	60	80	58	263	137	73	26	49	55	16	13
25	46	61	86	58	235	133	174	36	72	45	16	13
26	44	58	79	65	219	121	265	40	71	38	26	18
27	121	66	72	66	210	119	265	43	61	34	42	25
28	90	65	69	65	196	123	226	43	56	32	37	21
29	63	66	73	66	180	58	185	46	51	44	30	20
30	47	83	74	67	---	61	156	48	61	45	23	18
31	53	---	71	66	---	87	---	50	---	44	21	---
TOTAL	1528	2137	2913	1882	4189	6183	2966	3195	1263	1274	908	503
MEAN	49.3	71.2	94.0	60.7	144	199	98.9	103	42.1	41.1	29.3	16.8
MAX	121	103	143	71	326	388	265	231	72	68	53	25
MIN	38	47	59	55	55	58	34	26	23	30	16	11
MEAN+	41.9	67.1	92.4	60.7	146	202	106	105	41.2	41.1	28.5	21.2
CFSM+	.61	.98	1.35	.89	2.14	2.96	1.55	1.54	.60	.60	.42	.31
IN+	.71	1.10	1.56	1.03	2.31	3.41	1.73	1.77	.67	.69	.48	.35

CAL YR 1975	TOTAL	29048	MEAN	79.6	MAX	391	MIN	11	MEAN+	80.7	CFSM+	1.18	IN+	16.06
WTR YR 1976	TOTAL	28941	MEAN	79.1	MAX	388	MIN	11	MEAN+	79.2	CFSM+	1.16	IN+	15.80

+Adjusted for change in contents in Stony Lake.

04162900 BIG BEAVER CREEK NEAR WARREN, MI

LOCATION.--Lat 42°32'31", long 83°02'52", in NW¼ SW¼ sec.33, T.2 N., R.12 E., Macomb County, Hydrologic Unit 04090003, on left bank between bridges on Mound Road, 1.0 mi (1.6 km) north of Warren, and 2.0 mi (3.2 km) upstream from mouth.

DRAINAGE AREA.--23.5 mi^2 (60.9 km^2).

PERIOD OF RECORD.--October 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is 598.80 ft (182.514 m) above mean sea level (Macomb County bench mark). Prior to Aug. 26, 1960, nonrecording gage and crest-stage gage at same site and datum.

REMARKS.--Records fair except those for the winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--18 years, 13.9 ft^3/s (0.394 m^3/s), 8.03 in/yr (204 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,240 ft^3/s (35.1 m^3/s) June 26, 1968, gage height, 14.45 ft (4.404 m); no flow on several days in June and July 1962, caused by unusual regulation above gage; minimum natural discharge, 0.03 ft^3/s (0.001 m^3/s) Sept. 26, 1974.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 300 ft^3/s (8.50 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
May 6	2200	396	11.2	9.27	2.825	July 29	0400	*535	15.2	*10.35	3.155

Minimum discharge, 0.14 ft^3/s (0.004 m^3/s) Nov. 14, gage height, 4.73 ft (1.442 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.5	.34	15	1.2	1.1	9.9	1.9	4.1	.60	3.3	9.7	3.2
2	1.2	.31	4.1	1.2	1.1	132	2.0	3.7	.37	1.2	3.0	5.2
3	.38	.93	2.0	1.2	1.1	113	1.7	5.4	.26	1.0	1.5	3.0
4	.31	2.0	1.6	1.2	1.1	83	1.4	1.7	.26	.58	1.1	1.5
5	.27	.78	1.6	1.2	1.1	70	1.1	1.3	.34	.39	1.9	1.3
6	.27	.52	31	1.2	1.1	25	4.7	155	.45	.36	19	1.2
7	.45	.55	7.4	1.3	1.1	10	1.8	150	.42	.86	2.7	1.3
8	.80	.90	2.5	1.3	1.2	4.8	1.3	35	.51	.84	1.1	1.3
9	1.5	.53	3.7	1.2	1.2	4.0	1.5	15	.38	2.6	.97	14
10	.60	25	4.6	1.1	9.0	4.6	1.1	9.5	.43	5.9	1.1	13
11	.35	4.5	4.8	1.1	40	5.1	1.1	3.1	1.8	9.1	1.0	6.0
12	.25	1.0	4.9	1.1	30	18	.97	1.7	3.6	.83	1.1	2.9
13	.40	.49	35	1.1	50	26	.97	1.3	.51	.79	3.4	2.8
14	.70	.16	28	1.1	30	8.5	1.1	2.3	.34	.41	2.8	1.8
15	.35	.24	64	1.1	45	5.1	1.5	2.3	.28	.40	1.3	1.2
16	.45	.33	14	1.1	70	4.2	7.8	5.7	4.5	2.5	1.1	2.8
17	.60	.35	6.0	1.1	102	3.8	1.7	9.7	1.1	8.1	3.3	2.3
18	1.5	.49	3.0	1.1	61	3.7	1.2	3.1	.34	.92	4.6	1.2
19	4.0	.40	2.0	1.1	27	7.7	.97	1.3	12	1.4	1.5	.52
20	1.5	.74	1.5	1.1	12	2.8	.94	1.2	1.0	1.2	1.2	1.0
21	.60	5.6	1.3	1.1	73	2.4	2.9	1.1	.45	2.5	1.4	.82
22	.55	.99	1.3	1.1	72	1.7	6.0	.69	1.1	1.4	1.3	.87
23	.50	.44	1.3	1.1	23	1.9	1.8	.61	.58	3.2	1.5	.49
24	.62	.46	1.2	1.1	14	2.0	4.8	.62	33	1.9	4.4	.61
25	2.8	2.3	1.2	1.1	12	3.3	155	.69	83	1.3	2.0	.57
26	1.4	2.4	1.2	1.1	9.6	1.9	53	.62	12	1.1	11	6.3
27	.68	6.1	1.2	1.1	5.9	5.1	20	.66	2.0	1.3	12	8.8
28	.60	14	1.2	1.1	4.0	4.3	9.9	.63	.84	20	4.1	2.6
29	.35	18	1.2	1.1	3.6	6.8	5.0	1.1	.66	241	1.3	.94
30	.29	29	1.2	1.1	---	2.9	2.1	.72	9.6	41	3.7	.44
31	.27	---	1.2	1.1	---	2.0	---	1.3	---	25	4.1	---
TOTAL	30.04	119.85	250.2	35.2	703.2	575.5	297.25	421.14	172.72	382.28	110.17	89.96
MEAN	.97	4.00	8.07	1.14	24.2	18.6	9.91	13.6	5.76	12.3	3.55	3.00
MAX	5.5	29	64	1.3	102	132	155	155	83	241	19	14
MIN	.25	.16	1.2	1.1	1.1	1.7	.94	.61	.26	.36	.97	.44
CFSM	.04	.17	.34	.05	1.03	.79	.42	.58	.25	.52	.15	.13
IN.	.05	.19	.40	.06	1.11	.91	.47	.67	.27	.61	.17	.14

CAL YR 1975 TOTAL 2658.75 MEAN 7.28 MAX 250 MIN .16 CFSM .31 IN 4.21
WTR YR 1976 TOTAL 3187.61 MEAN 8.71 MAX 241 MIN .16 CFSM .37 IN 5.05

04163400 PLUM BROOK AT UTICA, MI

LOCATION.--Lat 42°36'05", long 83°04'27", in SE¼ NE¼ sec.7, T.2 N., R.12 E., Macomb County, Hydrologic Unit 04090003, on left bank at upstream side of bridge on Ryan Road, 1.0 mi (1.6 km) southwest of Utica.

DRAINAGE AREA.--16.5 mi^2 (42.7 km^2).

PERIOD OF RECORD.--July 1965 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 625 ft (190 m) from topographic map (nearest 5 ft).

REMARKS.--Records good except those for the winter period, which are poor. Occasional diversion for sprinkler irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--11 years, 13.3 ft^3/s (0.377 m^3/s), 10.95 in/yr (278 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,160 ft^3/s (32.9 m^3/s) June 26, 1968, gage height, 10.36 ft (3.158 m); no flow part of each day July 19, 28, 1966, Aug. 22-28, Sept. 3, 11, 1969; minimum gage height, 1.23 ft (0.375 m) Sept. 16, 1967.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 200 ft^3/s (5.66 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 16	0200	250	7.08	6.59	2.009	Mar. 5	1400	224	6.34	6.22	1.896
Feb. 17	0500	309	8.75	7.24	2.207	Apr. 25	1800	356	10.1	7.63	2.326
Feb. 21	2400	334	9.46	7.46	2.274	May 6	2400	486	13.8	8.40	2.560
Mar. 2	2000	363	10.3	7.68	2.341	July 29	0800	*488	13.8	*8.41	2.563

Minimum discharge, 0.17 ft^3/s (0.005 m^3/s) Sept. 4, 6, 7; minimum gage height, 1.63 ft (0.497 m) Sept. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	2.1	35	7.1	6.3	24	14	21	5.8	20	11	.75
2	3.2	2.6	15	7.1	6.3	215	14	25	4.9	8.8	6.6	.67
3	2.5	3.0	10	7.0	6.3	217	13	25	4.3	5.8	4.9	.53
4	2.6	3.0	9.2	7.0	6.3	145	12	17	3.8	4.7	3.8	.47
5	2.5	2.5	12	6.9	6.4	161	10	13	3.6	3.6	4.3	.47
6	2.5	2.3	47	6.8	6.5	64	17	162	3.4	4.9	13	.35
7	2.1	3.0	37	7.3	6.6	41	15	309	3.0	4.5	5.1	.35
8	2.5	2.8	23	6.8	6.8	31	13	64	2.8	3.6	3.8	.35
9	2.5	2.3	19	6.0	7.2	24	9.8	37	2.8	2.8	3.0	3.8
10	2.6	35	21	5.8	7.8	24	9.2	29	2.6	7.8	2.5	7.3
11	2.3	14	18	5.8	76	23	9.2	26	7.6	6.6	2.1	2.8
12	2.1	6.3	18	5.9	60	34	8.1	19	25	4.3	2.8	1.6
13	2.1	5.1	36	6.0	100	75	7.6	15	7.6	3.0	3.8	3.8
14	2.3	4.3	59	6.0	70	35	7.0	13	4.0	3.2	4.0	2.8
15	2.3	3.8	87	6.0	100	28	8.1	13	3.2	2.8	3.0	1.6
16	2.1	3.4	45	6.0	177	24	16	31	8.8	3.0	2.1	4.7
17	2.0	3.0	25	6.0	220	19	11	27	6.6	2.6	1.6	3.2
18	2.5	3.0	15	6.0	146	16	8.5	20	4.0	2.8	1.5	1.9
19	3.8	2.8	10	6.0	96	19	6.8	14	27	2.5	1.4	1.3
20	3.2	3.4	7.8	6.0	47	19	6.0	11	14	3.0	1.3	1.4
21	2.6	6.1	8.1	6.0	160	18	7.8	9.5	5.6	4.5	1.4	1.0
22	3.0	4.5	7.6	6.0	208	13	13	7.8	4.0	2.6	1.3	.94
23	2.5	3.6	7.5	6.0	58	13	9.5	7.3	3.4	4.5	1.1	.94
24	2.1	3.0	7.3	6.0	37	12	9.5	6.8	14	2.8	1.0	.94
25	3.0	4.7	7.3	6.0	32	17	226	6.1	61	2.1	1.1	1.0
26	2.5	5.3	7.3	6.2	29	15	146	5.8	16	1.9	4.0	4.5
27	2.0	5.8	7.2	6.4	25	18	44	5.6	6.6	1.9	7.6	6.8
28	1.9	11	7.2	6.4	21	24	30	5.3	4.9	4.9	2.5	7.3
29	1.7	17	7.1	6.4	20	21	25	6.1	4.0	260	1.5	2.8
30	1.7	47	7.1	6.4	---	18	22	6.8	29	35	2.0	2.0
31	2.0	---	7.1	6.4	---	16	---	6.3	---	19	1.1	---
TOTAL	79.3	215.7	629.8	195.7	1748.5	1423	748.1	964.4	293.3	439.5	106.2	68.36
MEAN	2.56	7.19	20.3	6.31	60.3	45.9	24.9	31.1	9.78	14.2	3.43	2.28
MAX	6.6	47	87	7.3	220	217	226	309	61	260	13	7.3
MIN	1.7	2.1	7.1	5.8	6.3	12	6.0	5.3	2.6	1.9	1.0	.35
CFSM	.16	.44	1.23	.38	3.65	2.78	1.51	1.88	.59	.86	.21	.14
IN.	.18	.49	1.42	.44	3.94	3.21	1.69	2.17	.66	.99	.24	.15

CAL YR 1975 TOTAL 5419.18 MEAN 14.8 MAX 425 MIN .42 CFSM .90 IN 12.22
WTR YR 1976 TOTAL 6911.86 MEAN 18.9 MAX 309 MIN .35 CFSM 1.15 IN 15.58

04164000 CLINTON RIVER NEAR FRASER, MI

LOCATION.--Lat 42°34'40", long 82°57'00", in NW¼ sec.20, T.2 N., R.13 E., Macomb County, Hydrologic Unit 04090003, on left bank 800 ft (244 m) downstream from bridge on Garfield Road, 2.8 mi (4.5 km) north of Fraser, and 4.0 mi (6.4 km) upstream from North Branch.

DRAINAGE AREA.--444 mi^2 (1,150 km^2).

PERIOD OF RECORD.--May 1947 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 577.71 ft (176.086 m) above mean sea level. Prior to Nov. 17, 1949, nonrecording gage at site 800 ft (244 m) upstream at same datum.

REMARKS.--Records good. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--29 years, 370 ft^3/s (10.48 m^3/s), 11.32 in/yr (288 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,000 ft^3/s (277 m^3/s) May 11, 1948, gage height, 19.5 ft (5.94 m), from graph based on gage readings, from rating curve extended above 4,000 ft^3/s (113 m^3/s); minimum, 47 ft^3/s (1.33 m^3/s) Sept. 6, 1955; minimum gage height, 4.29 ft (1.308 m) Sept. 7, 1954.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 5 or 6, 1947, reached a stage of 20 ft (6.1 m), from floodmarks, discharge, 9,000 ft^3/s (255 m^3/s), from rating curve extended above 4,000 ft^3/s (113 m^3/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,000 ft^3/s (56.6 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	1000	2,070	58.6	13.14	4.005	Apr. 25	1700	3,580	101	15.13	4.612
Feb. 18	1900	2,270	64.3	13.51	4.118	May 7	0100	5,470	155	16.76	5.108
Feb. 22	0200	3,450	97.7	15.01	4.575	June 25	0200	2,330	66.0	13.61	4.148
Mar. 2	2200	5,160	146	16.50	5.029	July 29	0700	*7,050	200	*18.00	5.486

Minimum discharge, 130 ft^3/s (3.68 m^3/s) Sept. 7; minimum gage height, 5.46 ft (1.664 m) July 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	451	294	665	503	392	953	726	729	452	509	299	194
2	410	283	544	468	343	2700	734	765	435	367	239	188
3	381	314	483	485	380	3540	706	754	411	372	224	168
4	355	387	448	431	383	2680	672	698	380	317	205	153
5	338	333	443	384	367	2650	637	616	343	269	206	147
6	329	332	784	412	352	2180	719	2040	292	286	647	137
7	323	336	783	454	347	1740	677	3880	260	309	278	135
8	295	355	585	379	340	1500	624	2050	248	344	226	142
9	307	313	556	397	338	1350	606	1330	240	265	214	295
10	311	695	565	441	442	1220	583	1040	233	427	223	678
11	293	567	538	401	890	1140	572	938	234	338	214	246
12	272	414	560	377	794	1140	556	832	386	296	214	171
13	270	399	777	385	1270	1430	516	755	242	271	288	160
14	279	367	946	393	1100	1330	516	706	219	254	351	160
15	280	338	1610	377	951	1130	520	677	220	238	254	173
16	280	318	1060	402	1610	1050	793	903	359	232	222	190
17	289	319	762	364	2760	967	610	955	264	228	216	191
18	354	338	644	343	2190	893	543	779	216	205	210	168
19	378	348	509	340	1820	878	511	699	625	186	197	151
20	349	349	480	405	1390	850	499	660	443	187	198	180
21	331	515	461	374	1870	877	513	621	289	207	190	174
22	347	405	402	367	3040	996	576	568	261	192	192	177
23	317	354	466	330	2090	892	501	534	250	203	190	161
24	271	335	442	345	1490	850	507	486	461	238	196	151
25	400	404	445	357	1310	873	2380	484	1530	195	192	147
26	325	413	452	622	1200	823	2320	475	526	182	276	296
27	275	497	470	544	1110	838	1580	463	449	167	632	410
28	367	542	453	458	987	913	1150	455	414	231	282	215
29	333	515	412	465	902	830	959	461	421	4800	220	184
30	306	736	514	441	---	749	807	469	708	1050	198	165
31	290	---	602	407	---	734	---	510	---	396	200	---
TOTAL	10106	12115	18861	12851	32458	40696	23613	27332	11811	13761	7893	6107
MEAN	326	404	608	415	1119	1313	787	882	394	444	255	204
MAX	451	736	1610	622	3040	3540	2380	3880	1530	4800	647	678
MIN	270	283	402	330	338	734	499	455	216	167	190	135
CFSM	.73	.91	1.37	.93	2.52	2.96	1.77	1.99	.89	1.00	.57	.46
IN.	.85	1.02	1.58	1.08	2.72	3.41	1.98	2.29	.99	1.15	.66	.51

CAL YR 1975 TOTAL 210342 MEAN 576 MAX 4100 MIN 136 CFSM 1.30 IN 17.62
WTR YR 1976 TOTAL 217604 MEAN 595 MAX 4800 MIN 135 CFSM 1.34 IN 18.23

04164100 EAST POND CREEK AT ROMEO, MI

LOCATION.--Lat 42°49'21", long 83°01'13", in NE¼ SE¼ sec.27, T.5 N., R.12 E., Macomb County, Hydrologic Unit 04090003, on right bank 10 ft (3 m) upstream from bridge on State Highway 53, and 1.4 mi (2.3 km) north of Romeo.

DRAINAGE AREA.--21.8 mi^2 (56.5 km^2).

PERIOD OF RECORD.--September 1958 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 780 ft (238 m) from topographic map (nearest 10 ft).

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--18 years, 15.6 ft^3/s (0.442 m^3/s), 9.72 in/yr (247 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 358 ft^3/s (10.1 m^3/s) Feb. 10, 1965, gage height, 4.48 ft (1.366 m); maximum gage height, 4.56 ft (1.390 m) Mar. 12, 1962, backwater from ice; minimum discharge, 0.8 ft^3/s (0.023 m^3/s) July 30, 31, 1964, Aug. 6, 7, 1965; minimum gage height, 0.71 ft (0.216 m) July 21, 1959.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 80 ft^3/s (2.27 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 18	2100	108	3.06	2.58	0.786	Mar. 13	0300	86	2.44	2.29	0.698
Feb. 22	0200	138	3.91	2.85	0.869	Apr. 25	1700	129	3.65	2.82	0.860
Mar. 5	0900	*177	5.01	*3.19	0.972	May 7	0400	90	2.55	2.44	0.744

Minimum discharge, 3.8 ft^3/s (0.11 m^3/s) Sept. 6, 7, gage height, 1.04 ft (0.317 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	14	38	22	21	54	37	45	21	24	17	8.1
2	18	14	33	22	20	77	36	43	20	21	15	5.5
3	17	25	31	22	20	137	35	42	19	19	7.6	4.9
4	16	22	32	22	19	134	34	39	18	18	10	4.4
5	16	19	31	22	18	153	32	36	17	16	11	4.2
6	15	18	47	22	18	123	32	49	16	14	15	4.2
7	14	20	44	22	17	97	31	81	15	14	12	4.2
8	14	20	40	22	17	80	29	60	15	13	11	4.2
9	15	19	39	22	18	71	27	53	14	13	11	5.2
10	16	35	37	22	18	67	26	47	14	14	12	12
11	15	30	35	22	19	65	26	44	13	15	6.5	17
12	14	26	34	22	19	64	25	41	12	14	13	6.9
13	14	24	36	21	21	81	24	38	11	16	14	5.5
14	12	23	43	21	23	69	24	35	8.1	13	19	5.5
15	12	22	48	21	34	65	23	33	12	13	18	6.5
16	13	21	44	21	60	59	35	36	14	18	15	12
17	12	20	40	21	85	52	31	35	13	15	14	11
18	13	20	36	21	95	50	28	33	13	13	13	9.8
19	17	19	34	21	97	50	25	32	20	12	12	8.9
20	18	20	32	21	83	50	25	30	18	11	11	5.8
21	16	26	30	21	101	68	25	28	17	10	9.4	5.5
22	15	22	28	21	120	52	26	27	17	9.6	8.5	5.5
23	14	20	27	21	99	48	24	26	16	16	7.2	4.9
24	14	19	26	21	78	45	25	25	18	16	5.2	5.5
25	16	21	26	21	73	45	93	24	24	13	5.2	8.5
26	17	21	25	21	71	42	91	23	20	11	5.5	14
27	16	23	24	21	67	43	75	23	17	10	5.8	14
28	15	24	24	21	62	45	64	20	13	10	5.8	10
29	15	25	23	21	57	41	55	21	15	19	6.1	6.1
30	14	40	22	21	---	40	49	21	28	19	11	9.8
31	14	---	22	21	---	38	---	21	---	18	9.8	---
TOTAL	466	672	1031	663	1450	2105	1112	1111	488.1	457.6	336.6	229.6
MEAN	15.0	22.4	33.3	21.4	50.0	67.9	37.1	35.8	16.3	14.8	10.9	7.65
MAX	19	40	48	22	120	153	93	81	28	24	19	17
MIN	12	14	22	21	17	38	23	20	8.1	9.6	5.2	4.2
CFSM	.69	1.03	1.53	.98	2.29	3.11	1.70	1.64	.75	.68	.50	.35
IN.	.80	1.15	1.76	1.13	2.47	3.59	1.90	1.90	.83	.78	.57	.39

CAL YR 1975 TOTAL 11603.4 MEAN 31.8 MAX 285 MIN 3.1 CFSM 1.46 IN 19.80
WTR YR 1976 TOTAL 10121.9 MEAN 27.7 MAX 153 MIN 4.2 CFSM 1.27 IN 17.27

04164300 EAST BRANCH COON CREEK AT ARMADA, MI

LOCATION.--Lat 42°50'45", long 82°53'06", in NE¼ sec.23, T.5 N., R.13 E., Macomb County, Hydrologic Unit 04090003, on right bank 10 ft (3 m) downstream from bridge on Prospect Street in Armada.

DRAINAGE AREA.--13.0 mi^2 (33.7 km^2).

PERIOD OF RECORD.--October 1958 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 735 ft (224 m) from topographic map (nearest 5 ft).

REMARKS.--Records good except those for the winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--18 years, 6.85 ft^3/s (0.194 m^3/s), 7.16 in/yr (182 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 910 ft^3/s (25.8 m^3/s) Apr. 19, 1975, gage height, 6.69 ft (2.039 m); no flow Jan. 25 to Feb. 10, 1961, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft^3/s (2.83 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 6	1500	207	5.86	3.61	1.100	Mar. 5	1100	308	8.72	4.19	1.277
Feb. 15	--	320	9.06	ice jam		Mar. 13	0400	196	5.55	3.53	1.076
Feb. 18	2100	290	8.21	4.08	1.244	Mar. 21	0300	166	4.70	3.34	1.018
Feb. 21	2100	396	11.2	4.64	1.414	Apr. 25	1700	358	10.1	4.45	1.356
Mar. 3	0100	*412	11.7	*4.73	1.442	May 7	0300	245	6.94	3.83	1.167

Minimum discharge, 0.02 ft^3/s (0.001 m^3/s) Sept. 13, 14; minimum gage height, 1.19 ft (0.363 m) Sept. 8, 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	.76	35	1.9	1.1	15	4.8	5.8	.99	.91	.19	.08
2	1.7	.76	13	1.9	1.1	145	5.9	5.7	.83	.72	.18	.08
3	1.5	1.8	6.0	1.9	1.1	309	5.3	5.4	.69	.54	.16	.06
4	1.3	1.6	4.4	1.9	1.1	150	4.4	4.5	.61	.49	.13	.08
5	1.2	1.2	4.6	1.9	1.1	193	3.6	3.6	.55	.38	.39	.11
6	1.2	1.1	99	1.9	1.1	74	3.5	26	.50	.37	.38	.08
7	.99	1.1	49	1.9	1.1	29	3.2	157	.43	.36	.16	.06
8	.91	1.2	20	1.8	1.1	13	2.9	43	.40	.34	.15	.06
9	.91	1.3	10	1.8	2.0	8.6	2.7	17	.42	.24	.13	.41
10	.91	15	9.1	1.7	2.5	8.6	2.6	9.4	.30	.29	.12	.39
11	.83	12	8.2	1.7	4.0	8.6	2.7	7.5	.22	.29	.13	.14
12	.83	5.1	7.0	1.7	6.0	45	2.4	6.1	.20	.19	.14	.06
13	.83	3.6	20	1.6	15	118	2.3	4.5	.19	.13	.17	.04
14	.76	2.9	76	1.5	30	35	2.2	3.8	.18	.13	.44	.04
15	.76	2.1	79	1.5	70	20	2.2	3.5	.16	.15	.29	.11
16	.69	1.8	35	1.4	200	13	5.8	4.4	.29	.30	.20	.17
17	.62	1.7	14	1.4	190	8.0	4.6	4.5	.23	.16	.17	.17
18	.69	1.6	5.0	1.3	192	5.6	3.5	3.7	.22	.14	.14	.20
19	.83	1.7	3.5	1.3	184	5.7	2.7	2.9	.82	.14	.14	.17
20	.76	1.7	3.0	1.2	121	23	2.2	2.4	.48	.15	.11	.17
21	.83	3.4	2.6	1.1	217	84	2.2	1.9	.49	.23	.14	.17
22	.76	2.9	2.3	1.0	192	15	2.4	1.6	.44	.21	.14	.24
23	.69	2.2	2.2	1.0	68	9.2	2.1	1.5	.33	.51	.20	.20
24	.62	1.8	2.1	1.0	48	7.4	2.5	1.3	.96	.21	.20	.14
25	.69	2.0	2.0	1.0	68	7.4	197	1.3	1.0	.17	.11	.14
26	.76	2.1	2.0	1.1	57	6.0	134	1.2	.80	.17	.14	.44
27	.76	2.1	2.0	1.1	35	6.6	46	1.1	.46	.15	.11	.39
28	.69	3.8	1.9	1.1	23	12	18	.96	.27	.21	.11	.17
29	.69	13	1.9	1.1	16	7.4	11	.97	.47	.72	.17	.17
30	.69	65	1.9	1.1	---	6.0	7.1	1.1	1.1	.21	.11	.17
31	.69	---	1.9	1.1	---	5.5	---	1.0	---	.18	.11	---
TOTAL	28.09	158.32	523.6	44.9	1749.3	1393.6	491.8	334.63	15.03	9.39	5.46	4.91
MEAN	.91	5.28	16.9	1.45	60.3	45.0	16.4	10.8	.50	.30	.18	.16
MAX	2.0	65	99	1.9	217	309	197	157	1.1	.91	.44	.44
MIN	.62	.76	1.9	1.0	1.1	5.5	2.1	.96	.16	.13	.11	.04
CFSM	.07	.41	1.30	.11	4.64	3.46	1.26	.83	.04	.02	.01	.01
IN.	.08	.45	1.50	.13	5.01	3.99	1.41	.96	.04	.03	.02	.01

CAL YR 1975 TOTAL 4982.91 MEAN 13.7 MAX 497 MIN .14 CFSM 1.05 IN 14.26
WTR YR 1976 TOTAL 4759.03 MEAN 13.0 MAX 309 MIN .04 CFSM 1.00 IN 13.62

04164500 NORTH BRANCH CLINTON RIVER NEAR MOUNT CLEMENS, MI

LOCATION.--Lat 42°37'45", long 82°53'25", in SW¼ sec.35, T.3 N., R.13 E., Macomb County, Hydrologic Unit 04090003, on left bank 30 ft (9 m) upstream from bridge on State Highway 59, 2 mi (3 km) north of Mount Clemens, and 3.6 mi (5.8 km) upstream from mouth.

DRAINAGE AREA.--199 mi^2 (515 km^2).

PERIOD OF RECORD.--May 1947 to current year.

REVISED RECORDS.--WSP 1437: 1948. WSP 1557: Drainage area.

GAGE.--Water-stage recorder. Concrete control since September 1961. Datum of gage is 576.38 ft (175.681 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to Nov. 15, 1949, nonrecording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are fair. Some regulation at times by mill above station. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--29 years, 123 ft^3/s (3.483 m^3/s), 8.39 in/yr (213 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,700 ft^3/s (190 m^3/s) Feb. 2, 1968, gage height, 18.62 ft (5.675 m); minimum, 0.2 ft^3/s (0.006 m^3/s) Sept. 13, 14, 1954, July 30, 1965; minimum gage height, 3.12 ft (0.951 m) Sept. 13, 14, 1954.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 5 or 6, 1947, reached a stage of 20.0 ft (6.10 m), from floodmark.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,200 ft^3/s (34.0 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 18	0300	*3,310	93.7	*15.34	4.676	Apr. 26	1700	2,720	77.0	14.72	4.487
Feb. 22	1900	3,260	92.3	15.29	4.660	May 8	0200	1,780	50.4	13.45	4.100
Mar. 4	0400	3,050	86.4	15.08	4.596						

Minimum discharge, 5.3 ft^3/s (0.15 m^3/s) Sept. 9, gage height, 4.07 ft (1.241 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	79	38	560	90	84	305	179	244	59	71	44	14
2	80	38	634	90	85	525	171	215	55	78	33	12
3	70	44	402	88	85	2160	182	219	50	61	27	11
4	62	100	216	86	85	2900	168	208	44	49	22	9.4
5	57	110	175	84	85	2020	145	172	40	41	19	8.7
6	51	85	271	84	86	1860	133	231	37	36	94	8.2
7	49	72	631	84	86	1180	133	1150	33	30	59	7.1
8	45	70	799	84	86	659	126	1530	32	29	38	5.9
9	45	72	485	78	86	435	109	909	29	28	30	11
10	45	82	289	78	86	330	100	503	28	74	25	30
11	49	253	257	78	140	308	96	288	27	82	23	25
12	48	307	231	78	210	312	92	226	26	84	19	20
13	44	194	230	78	310	476	87	195	25	49	18	16
14	41	130	405	79	450	953	83	158	23	37	24	13
15	38	105	680	80	650	737	80	138	20	30	38	11
16	37	91	826	80	1200	487	84	136	21	26	39	15
17	37	82	639	80	2300	348	152	159	27	32	30	20
18	36	76	300	80	3000	256	152	159	27	29	25	17
19	38	71	200	80	2410	217	107	135	33	25	21	14
20	48	68	150	80	1660	220	90	112	49	21	19	12
21	60	85	130	82	1120	250	82	98	51	21	17	14
22	53	139	120	82	2470	475	83	87	39	21	17	14
23	48	118	115	82	1960	465	90	79	34	28	15	13
24	44	91	110	82	941	267	85	75	40	37	13	12
25	44	82	110	82	590	225	293	70	84	34	11	11
26	46	89	105	82	541	218	2020	66	75	25	20	13
27	50	105	105	83	561	198	1730	62	55	19	29	21
28	48	141	100	83	476	220	887	58	39	23	16	26
29	45	228	100	84	368	268	532	55	33	417	13	24
30	41	382	95	84	---	228	336	56	37	147	11	19
31	39	---	95	84	---	200	---	61	---	67	11	---
TOTAL	1517	3548	9565	2549	22211	19702	8607	7854	1172	1751	820	447.3
MEAN	48.9	118	309	82.2	766	636	287	253	39.1	56.5	26.5	14.9
MAX	80	382	826	90	3000	2900	2020	1530	84	417	94	30
MIN	36	38	95	78	84	198	80	55	20	19	11	5.9
CFSM	.25	.59	1.55	.41	3.85	3.20	1.44	1.27	.20	.28	.13	.07
IN.	.28	.66	1.79	.48	4.15	3.68	1.61	1.47	.22	.33	.15	.08

CAL YR 1975 TOTAL 83777.0 MEAN 230 MAX 5040 MIN 11 CFSM 1.16 IN 15.66
WTR YR 1976 TOTAL 79743.3 MEAN 218 MAX 3000 MIN 5.9 CFSM 1.10 IN 14.91

04164800 MIDDLE BRANCH CLINTON RIVER AT MACOMB, MI

LOCATION.--Lat 42°42'23", long 82°57'33", in SW¼ sec.5, T.3 N., R.13 E., Macomb County, Hydrologic Unit 04090003, on left bank at downstream side of bridge on Romeo Plank Road, 0.4 mi (0.6 km) north of Macomb.

DRAINAGE AREA.--41.0 mi^2 (106.2 km^2).

PERIOD OF RECORD.--Water years 1959-62, 1969 (annual maximum and occasional low-flow measurements), October 1962 to September 1968, October 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is 603.23 ft (183.865 m) above mean sea level (levels by Corps of Engineers). Oct. 28, 1958, to Nov. 14, 1962, and Oct. 12, 1968, to Dec. 17, 1969, crest-stage gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--13 years, 28.0 ft^3/s (0.793 m^3/s), 9.27 in/yr (235 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,580 ft^3/s (44.7 m^3/s) June 26, 1968; maximum gage height, 16.16 ft (4.926 m) Mar. 12, 1962, backwater from ice; minimum discharge, 0.10 ft^3/s (0.003 m^3/s) July 22, 1971; minimum gage height, 4.68 ft (1.426 m) July 11, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 300 ft^3/s (8.50 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 6	1300	426	12.1	8.95	2.728	Mar. 3	unknown	818	23.2	11.80	3.597
Feb. 16	0900	709	20.1	11.04	3.365	Mar. 5	unknown	675	19.1	10.80	3.292
Feb. 18	0300	454	12.9	9.16	2.792	Apr. 25	2100	*973	27.6	*12.73	3.880
Feb. 21	0700	900	25.5	12.34	3.761	May 7	0400	896	25.4	12.27	3.740

Minimum discharge, 0.80 ft^3/s (0.023 m^3/s) Aug. 24, gage height, 4.90 ft (1.494 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	11	97	27	24	45	34	41	15	17	8.0	4.4
2	15	12	52	26	24	236	34	48	12	13	7.0	4.9
3	14	24	42	25	24	624	31	48	10	9.8	6.0	4.0
4	12	22	39	25	24	417	31	39	9.5	9.0	5.2	3.3
5	12	17	43	25	24	373	26	32	9.0	7.5	9.8	2.6
6	11	16	227	24	24	281	35	167	8.4	6.3	41	2.6
7	10	18	96	24	24	100	31	540	8.3	6.0	8.0	2.6
8	10	18	57	24	24	80	25	124	7.8	5.6	4.8	2.2
9	12	16	50	24	24	75	22	72	7.4	4.7	3.3	3.7
10	12	118	53	24	24	70	22	50	7.2	21	2.2	18
11	11	60	47	24	40	70	22	48	7.2	24	2.1	7.0
12	10	37	46	24	80	110	19	40	7.2	17	2.2	4.9
13	10	29	86	24	140	210	19	33	6.6	8.6	2.2	4.0
14	10	24	158	24	250	160	19	30	6.2	6.9	4.3	3.3
15	10	21	179	24	400	100	18	29	5.8	6.1	6.0	4.0
16	9.2	20	87	24	516	60	35	40	9.4	7.5	2.6	6.0
17	9.7	19	55	24	322	46	27	39	7.2	5.6	1.9	5.4
18	11	18	46	24	303	39	22	31	6.5	5.1	1.9	4.4
19	17	17	43	24	137	47	19	26	18	4.2	1.5	3.7
20	17	18	41	24	257	46	17	22	12	3.9	1.5	4.4
21	15	37	39	24	615	126	18	19	9.3	5.1	1.5	4.4
22	13	26	37	24	350	54	27	18	8.8	4.1	1.2	4.0
23	13	21	35	24	200	44	21	17	7.5	22	1.2	3.7
24	12	19	34	24	140	39	23	16	11	10	1.2	3.3
25	14	23	33	24	120	46	534	15	35	5.9	1.2	3.3
26	14	25	32	24	120	37	406	15	13	5.0	3.0	7.0
27	12	30	31	24	114	49	127	14	9.1	4.1	21	11
28	12	46	30	24	52	65	78	13	8.6	3.9	7.0	6.0
29	12	68	29	24	44	45	55	14	8.2	32	4.9	4.4
30	11	194	28	24	---	43	43	16	20	12	4.4	4.0
31	11	---	27	24	---	37	---	15	---	9.5	4.4	---
TOTAL	379.9	1024	1899	752	4440	3774	1840	1671	311.2	302.4	172.5	146.5
MEAN	12.3	34.1	61.3	24.3	153	122	61.3	53.9	10.4	9.75	5.56	4.88
MAX	18	194	227	27	615	624	534	540	35	32	41	18
MIN	9.2	11	27	24	24	37	17	13	5.8	3.9	1.2	2.2
CFSM	.30	.83	1.50	.59	3.73	2.98	1.50	1.31	.25	.24	.14	.12
IN.	.34	.93	1.72	.68	4.03	3.42	1.67	1.52	.28	.27	.16	.13

CAL YR 1975 TOTAL 17336.2 MEAN 47.5 MAX 883 MIN 3.0 CFSM 1.16 IN 15.73
WTR YR 1976 TOTAL 16712.5 MEAN 45.7 MAX 624 MIN 1.2 CFSM 1.11 IN 15.16

04165500 CLINTON RIVER AT MOUNT CLEMENS, MI

LOCATION.--Lat 42°35'45", long 82°54'35", Macomb County, Hydrologic Unit 04090003, on left bank 20 ft (6 m) downstream from bridge on Moravian Drive, 0.2 mi (0.3 km) downstream from North Branch, and 0.5 mi (0.8 km) west of Mount Clemens.

DRAINAGE AREA.--734 mi^2 (1,901 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1934 to current year.

REVISED RECORDS.--WSP 1084: 1943, 1945-46. WSP 1937: 1935, 1936(M), 1937-39, 1949(M), 1950. WSP 1557: Drainage area. WSP 1727: 1952(M), 1954(M).

GAGE.--Water-stage recorder. Datum of gage is 570.43 ft (173.867 m) above mean sea level. May 10, 1934, to Jan. 11, 1939, nonrecording gage at same site and datum. Auxiliary gage is a water-stage recorder on right bank 2.0 mi (3.2 km) downstream from base gage at same datum. Mar. 15, 1938, to Jan. 3, 1952, auxiliary nonrecording gage 1.6 mi (2.6 km) downstream from base gage at same datum.

REMARKS.--Water-discharge records good. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--42 years, 524 ft^3/s (14.84 m^3/s), 9.69 in/yr (246 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,200 ft^3/s (600 m^3/s) Apr. 6, 1947, gage height, 23.55 ft (7.178 m), from floodmark; minimum not determined; minimum gage height, 2.72 ft (0.829 m) Nov. 29, 1963.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,000 ft^3/s (85.0 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	1500	3,050	86.4	9.13	2.783	Apr. 26	1700	5,840	165	12.44	3.792
Feb. 17	1100	6,580	186	13.18	4.017	May 7	0900	6,890	195	13.46	4.103
Feb. 22	1900	6,900	195	13.47	4.106	July 29	1200	6,450	183	13.05	3.978
Mar. 3	0800	*6,910	196	*13.48	4.109						

Minimum daily discharge, 176 ft^3/s (4.98 m^3/s) Sept. 7, 8; minimum gage height, 5.35 ft (1.631 m) Feb. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	590	381	1560	680	540	1350	952	986	560	601	370	234
2	511	366	1420	660	500	3070	950	1020	520	443	300	237
3	485	410	1100	630	520	6730	925	1020	470	413	270	225
4	445	551	819	600	520	6470	864	939	440	363	250	200
5	419	508	769	540	520	5320	813	811	400	320	250	186
6	396	482	1370	580	500	4520	876	1670	360	330	850	185
7	379	468	1780	620	500	3150	870	6270	330	350	379	176
8	357	492	1650	540	500	2230	787	4370	310	380	290	176
9	354	446	1300	540	500	1820	744	2440	290	323	253	294
10	387	960	1080	600	600	1590	714	1590	290	590	279	867
11	364	1010	993	560	1300	1480	691	1250	300	465	250	331
12	323	854	981	520	1300	1470	672	1070	475	437	250	243
13	335	716	1270	520	2000	2160	634	965	280	342	305	223
14	334	595	1800	530	2100	2410	622	882	260	286	426	212
15	363	535	2680	520	2150	2040	618	824	305	294	302	205
16	312	501	2320	560	3560	1660	896	1010	371	270	277	230
17	322	486	1720	520	6170	1400	779	1120	325	297	267	256
18	379	499	1210	500	5830	1210	710	959	264	255	251	204
19	466	502	807	500	5010	1160	620	853	678	244	248	234
20	452	510	736	560	3630	1130	584	773	506	209	228	219
21	435	720	693	520	3260	1240	608	722	337	251	229	185
22	440	654	627	520	6330	1460	708	650	305	283	226	256
23	413	568	683	480	4810	1410	628	605	287	254	203	259
24	355	517	660	480	2740	1160	611	580	509	310	281	190
25	518	587	657	500	2120	1130	2660	560	1670	308	223	189
26	426	605	655	800	1930	1080	5300	540	649	191	337	315
27	365	716	682	700	1850	1080	3880	530	505	227	778	517
28	471	845	666	620	1620	1180	2180	530	448	349	241	280
29	423	902	607	620	1400	1130	1530	530	430	4740	282	252
30	364	1460	713	600	---	1050	1160	560	768	1550	243	227
31	385	---	760	560	---	973	---	556	---	476	255	---
TOTAL	12568	18846	34768	17680	64310	65263	34586	37185	13642	16151	9593	7807
MEAN	405	628	1122	570	2218	2105	1153	1200	455	521	309	260
MAX	590	1460	2680	800	6330	6730	5300	6270	1670	4740	850	867
MIN	312	366	607	480	500	973	584	530	260	191	203	176
CFSM	.55	.86	1.53	.78	3.02	2.87	1.57	1.63	.62	.71	.42	.35
IN.	.64	.96	1.76	.90	3.26	3.31	1.75	1.88	.69	.82	.49	.40

CAL YR 1975 TOTAL 350078 MEAN 959 MAX 10300 MIN 160 CFSM 1.31 IN 17.74
WTR YR 1976 TOTAL 332399 MEAN 908 MAX 6730 MIN 176 CFSM 1.24 IN 16.85

04165500 CLINTON RIVER AT MOUNT CLEMENS--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1974 to current year.
WATER TEMPERATURES: October 1974 to current year.

INSTRUMENTATION.--Water quality monitor since Aug. 12, 1975.

REMARKS.--Interruptions in daily record were due to malfunctions of the instrument. Monthly samples are collected as a cross section sample at the bridge.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 2,760 micromhos Jan. 26, 1976; minimum, 126 micromhos, July 29, 1976.
WATER TEMPERATURES: Maximum, 26.5°C June 22, 23, July 2, 3, 1975; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 2,760 micromhos, Jan. 26; minimum, 126 micromhos, July 29.
WATER TEMPERATURES: Maximum recorded, 26.0°C July 15, 16, 24; minimum, 0.0°C on many days during winter periods.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT												
24...	1300	316	800	7.9	14.5	6.8	67	5100	480	160	290	85
NOV												
20...	1000	489	745	7.9	8.0	10.6	90	1300	170	160	270	40
DEC												
19...	1400	774	900	8.2	.0	12.6	88	560	90	280	320	98
JAN												
21...	1100	520	960	7.8	.0	10.4	72	2800	30	200	290	69
FEB												
19...	1000	5110	355	7.9	.5	--	--	2300	12000	2800	170	45
MAR												
18...	1030	1200	605	7.9	1.5	12.6	92	580	--	730	280	70
APR												
16...	0930	1080	595	7.9	17.0	16.9	178	71000	1000	2600	210	49
MAY												
20...	1030	790	755	8.0	14.0	8.5	83	260	180	80	270	44
JUN												
11...	1000	300	750	7.8	23.5	--	--	1000	240	230	290	72
JUL												
08...	1100	380	659	7.8	23.5	--	--	11000	10000	>2000	200	44
AUG												
12...	1000	250	750	8.0	22.5	5.6	65	7000	800	1200	--	--
SEP												
23...	1000	308	787	8.1	14.5	8.2	81	5300	400	280	240	68

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT												
24...	80	23	39	1.0	4.3	256	0	210	5.2	59	66	.5
NOV												
20...	75	21	34	.9	3.7	280	0	230	5.6	50	59	.3
DEC												
19...	90	23	37	.9	3.6	271	0	222	2.7	60	72	.3
JAN												
21...	81	22	65	1.7	3.5	270	0	221	6.8	58	11	4.0
FEB												
19...	48	12	22	.7	3.6	152	0	125	3.1	39	43	.0
MAR												
18...	74	22	35	.9	3.1	256	0	210	5.2	51	63	.2
APR												
16...	58	17	47	1.4	4.1	196	0	161	3.9	56	83	.3
MAY												
20...	74	20	33	.9	2.9	276	0	226	4.4	50	62	.3
JUN												
11...	81	21	55	1.4	5.0	266	0	218	6.7	76	90	.4
JUL												
08...	54	16	40	1.2	4.2	190	0	156	4.8	52	65	.3
AUG												
12...	--	--	--	--	--	236	0	194	3.8	36	46	.3
SEP												
23...	65	19	56	1.6	5.2	210	0	172	2.7	76	83	.6

04165500 CLINTON RIVER AT MOUNT CLEMENS, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT											
24...	4.6	417	403	356	2.6	3.6	16	.25	15	13	100
NOV											
20...	5.0	398	386	525	2.1	3.1	14	.25	11	15	100
DEC											
19...	7.3	468	427	978	2.0	3.0	13	.13	22	46	100
JAN											
21...	6.8	50	384	E710	2.2	3.2	14	.23	11	E15	100
FEB											
19...	5.3	264	248	3640	1.8	2.4	11	.16	52	717	100
MAR											
18...	5.0	407	379	1320	1.5	1.7	7.5	.13	18	58	100
APR											
16...	3.1	384	365	1120	2.8	4.0	18	.30	213	621	91
MAY											
20...	4.1	400	382	853	1.5	2.4	11	.16	46	98	100
JUN											
11...	4.9	477	464	E386	2.6	3.3	15	.30	15	E12	100
JUL											
08...	4.5	370	330	E339	2.4	3.3	15	.23	--	--	--
AUG											
12...	3.9	337	--	E227	3.0	4.0	18	.40	11	E7.4	100
SEP											
23...	7.1	464	415	386	3.5	4.5	20	.32	12	10	100

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
OCT												
24...	1300	2	2	0	0	<10	0	2	0	11	4	540
JAN												
21...	1100	1	0	3	2	<10	<10	0	0	10	10	540
APR												
16...	0930	0	0	2	0	20	0	2	0	10	0	3100
JUL												
08...	1100	3	2	--	1	20	10	2	1	10	10	1800

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT												
24...	260	18	8	40	40	.1	.1	0	0	40	20	11
JAN												
21...	50	8	2	70	60	<.5	<.5	2	0	70	70	8.5
APR												
16...	30	54	2	160	100	<.5	<.5	0	0	80	10	11
JUL												
08...	30	29	1	90	40	<.5	<.5	0	0	50	10	13

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL CHLORDANE (UG/L)	CHLORDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MATERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDT (UG/L)	DDT IN BOTTOM MATERIAL (UG/KG)
MAY 20...	1030	ND	ND	ND	0	ND	ND	ND	ND	ND	ND
AUG 12...	1000	ND	--	ND	--	ND	--	ND	--	ND	--

DATE	TOTAL DIAZINON (UG/L)	DIAZINON IN BOTTOM MATERIAL (UG/KG)	TOTAL DIELDRIN (UG/L)	DIELDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ETHION (UG/L)	ETHION IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR (UG/L)	HEPTACHLOR IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR EPOXIDE (UG/L)
MAY 20...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 12...	ND	--	ND	--	ND	--	ND	--	ND	--	ND

DATE	HEPTACHLOR EPOXIDE IN BOTTOM MATERIAL (UG/KG)	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL MALATHION (UG/L)	MALATHION IN BOTTOM MATERIAL (UG/KG)	TOTAL METHOXYCHLOR (UG/L)	TOTAL METHYL PARATHION (UG/L)	METHYL PARATHION IN BOTTOM MATERIAL (UG/KG)	TOTAL METHYL TRITHION (UG/L)	METHYL TRITHION IN BOTTOM MATERIAL (UG/KG)	TOTAL PARATHION (UG/L)
MAY 20...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 12...	--	ND	--	ND	--	ND	ND	--	ND	--	ND

DATE	PARATHION IN BOTTOM MATERIAL (UG/KG)	TOTAL TOXAPHENE (UG/L)	TOXAPHENE IN BOTTOM MATERIAL (UG/KG)	TOTAL TRITHION (UG/L)	TRITHION IN BOTTOM MATERIAL (UG/KG)	TOTAL 2,4-D (UG/L)	2,4-D IN BOTTOM MATERIAL (UG/KG)	TOTAL 2,4,5-T (UG/L)	2,4,5-T IN BOTTOM MATERIAL (UG/KG)	TOTAL SILVEX (UG/L)	SILVEX IN BOTTOM MATERIAL (UG/KG)
MAY 20...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 12...	--	ND	--	ND	--	ND	--	ND	--	ND	--

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

PERIPHYTON

DATE	LENGTH OF EXPOSURE (DAYS)	PERIPHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERIPHYTON BIOMASS ASH WEIGHT G/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL A MG/SQ M	UNCORRECTED PERIPHYTON CHLOROPHYLL B MG/SQ M	BIOMASS CHLOROPHYLL RATIO PERIPHYTON (UNITS)
NOV 20...	27	16.0	11.0	110	8.80	45
MAY 20...	34	47.0	41.5	5.95	.528	920
AUG 12...	35	91.7	62.6	47.7	10.8	610

ND--NOT DETECTED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

OCT. 24, 1975
1300 HOURS

IDENTIFICATION OF PHYTOPLANKTON

13,000 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			450	3
	....KIRCHNERIELLA			89	1
	...SCENEDESMACEAE				
	....CRUCIGENIA			1,100	8
	....SCENEDESMUS			890	7
			TOTALS	2,500	19
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....MELOSIRA			180	1
	..PENNALES	PENNATE			
	...DIATOMACEAE				
	....DIATOMA			270	2
	...FRAGILARIACEAE				
	....ASTERIONELLA			89	1
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			89	1
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			1,200	9
	....NEIDIUM			89	1
	...NITZSCHIACEAE				
	....NITZSCHIA			1,200	9
	...SURIRELLACEAE				
	....SURIRELLA			180	1
			TOTALS	3,300	25
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..OSCILLATORIALES	FILAMENTOUS			
	...NOSTOCACEAE				
L	....APHANIZOMENON				0
	...OSCILLATORIACEAE				
D	....OSCILLATORIA			7,600	57
			TOTALS	7,600	57
	EUGLENOPHYTA	EUGLENOIDS			
	.EUGLENOPHYCEAE				
	..EUGLENALES				
	...EUGLENACEAE				
L	....EUGLENA				0

04165500 CLINTON RIVER AT MOUNT CLEMENS, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

NOV. 20, 1975
1000 HOURS

IDENTIFICATION OF PHYTOPLANKTON

6,900 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			120	2
	...SCENEDESMACEAE				
	....SCENEDESMUS			290	4
			TOTALS	410	6
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			59	1
	....MELOSIRA			120	2
L	....STEPHANODISCUS				0
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....RHOICOSPHENIA			180	3
	...FRAGILARIACEAE				
	....ASTERIONELLA			59	1
	....SYNEDRA			59	1
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			180	3
	...NAVICULACEAE	NAVICULOID			
L	....DIPLONEIS				0
	....NAVICULA			410	6
	...NITZSCHIACEAE				
	....NITZSCHIA			290	4
			TOTALS	1,400	21
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..OSCILLATORIALES	FILAMENTOUS			
	...OSCILLATORIACEAE				
D	....OSCILLATORIA			5,200	75
			TOTALS	5,200	75

04165500 CLINTON RIVER AT MOUNT CLEMENS, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DEC. 19, 1975
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

6,400 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
L	....ANKISTRODESMUS				0
	...SCENEDESMACEAE				
L	....SCENEDESMUS				0
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
L	....CYCLOTELLA				0
	..PENNALES	PENNATE			
	...CYMBELLACEAE				
L	....CYMBELLA				0
	...DIATOMACEAE				
L	....DIATOMA				0
	...FRAGILARIACEAE				
L	....ASTERIONELLA				0
L	....SYNEDRA				0
	...GOMPHONEMATACEAE				
L	....GOMPHONEMA				0
	...NAVICULACEAE	NAVICULOID			
L	....DIPLONEIS				0
	....NAVICULA			140	2
	...NITZSCHIACEAE				
	....NITZSCHIA			86	1
			TOTALS	370	3
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..OSCILLATORIALES	FILAMENTOUS			
	...OSCILLATORIACEAE				
D	....OSCILLATORIA			6,000	94
			TOTALS	6,000	94
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOMONODACEAE				
L	....CRYPTOMONAS				0
			TOTALS	29	0

04165500 CLINTON RIVER AT MOUNT CLEMENS, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JAN. 21, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,600 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....CRUCIGENIA		150	6
		TOTALS	150	6
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....MELOSIRA		73	3
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....RHOICOSPHENIA			0
	...DIATOMACEAE			
L	....DIATOMA			0
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		110	4
	...NITZSCHIACEAE			
	....NITZSCHIA		37	1
		TOTALS	220	8
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		2,200	85
		TOTALS	2,200	85
	EUGLENOPHYTA	EUGLENOIDS		
	.CRYPTOPHYCEAE	CRYPTOMONADS		
	..CRYPTOMONIDALES			
	...CRYPTOMONODACEAE			
	....CRYPTOMONAS		37	1
		TOTALS	37	1
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
L	....TRACHELOMONAS			0

04165500 CLINTON RIVER AT MOUNT CLEMENS, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

FEB. 19, 1976
1000 HOURS

IDENTIFICATION OF PHYTOPLANKTON

560 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		67	12
		TOTALS	67	12
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		45	8
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....COCCONEIS			0
L	....RHOICOSPHENIA			0
	...DIATOMACEAE			
	....DIATOMA		67	12
	...GOMPHONEMATACEAE			
D	....GOMPHONEMA		89	16
	...NAVICULACEAE	NAVICULOID		
	....GYROSIGMA		22	4
D	....NAVICULA		200	36
	....STAURONEIS		22	4
	...NITZSCHIACEAE			
	....NITZSCHIA		22	4
	...SURIRELLACEAE			
	....SURIRELLA		22	4
		TOTALS	490	88

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAR. 18, 1976
1030 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,500 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			24	1
	....DICTYOSPHAERIUM			94	4
			TOTALS	120	5
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			31	1
	....MELOSIRA			120	5
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			39	2
L	....RHOICOSPHENIA				0
	...CYMBELLACEAE				
L	....CYMBELLA				0
	...DIATOMACEAE				
L	....DIATOMA				0
	...FRAGILARIACEAE				
	....ASTERIONELLA			39	2
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			55	2
	...NITZSCHIACEAE				
	....NITZSCHIA			31	1
	...TABELLARIACEAE				
L	....TABELLARIA				0
			TOTALS	340	13
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..OSCILLATORIALES	FILAMENTOUS			
	...OSCILLATORIACEAE				
D	....OSCILLATORIA			2,000	81
			TOTALS	2,000	81
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOMONODACEAE				
L	....CRYPTOMONAS				0
			TOTALS	8	0
	.EUGLENOPHYCEAE				
	..EUGLENALES				
	...EUGLENACEAE				
	....TRACHELOMONAS			16	1
			TOTALS	16	1

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

APR. 16, 1976
0930 HOURS

IDENTIFICATION OF PHYTOPLANKTON

3,200 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
D	....ANKISTRODESMUS			460	15
			TOTALS	460	15
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....MELOSIRA			77	2
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
L	....ACHNANTHES				0
	...CYMBELLACEAE				
	....CYMBELLA			230	7
	...DIATOMACEAE				
	....DIATOMA			150	5
	...FRAGILARIACEAE				
	....SYNEDRA			150	5
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			77	2
	...NAVICULACEAE	NAVICULOID			
D	....NAVICULA			770	24
	...NITZSCHIACEAE				
D	....NITZSCHIA			770	24
	...SURIRELLACEAE				
D	....SURIRELLA			460	15
			TOTALS	2,700	84

MAY 20, 1976
1030 HOURS

IDENTIFICATION OF PHYTOPLANKTON

1,500 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....KIRCHNERIELLA			41	3
			TOTALS	41	3
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....COCCONEIS			41	3
	...NAVICULACEAE	NAVICULOID			
D	....NAVICULA			450	31
	...NITZSCHIACEAE				
D	....NITZSCHIA			250	17
	...SURIRELLACEAE				
	....SURIRELLA			41	3
			TOTALS	780	54
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...OCHROMONADACEAE				
D	....DINOBRYON			620	42
			TOTALS	620	42
	EUGLENOPHYTA	EUGLENOIDS			
	.EUGLENOPHYCEAE				
	..EUGLENALES				
	...EUGLENACEAE				
	....TRACHELOMONAS			41	3
			TOTALS	41	3

04165500 CLINTON RIVER AT MOUNT CLEMENS, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JUNE 11, 1976
1000 HOURS

IDENTIFICATION OF PHYTOPLANKTON

3,500 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			310	9
	...SCENEDESMACEAE				
	....SCENEDESMUS			360	10
	..VOLVOCALES				
	...CHLAMYDOMONADACEAE				
	....CHLAMYDOMONAS			67	2
			TOTALS	740	21
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			490	14
	....MELOSIRA			110	3
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			22	1
L	....COCCONEIS				0
	....RHOICOSPHENIA			22	1
	...FRAGILARIACEAE				
	....ASTERIONELLA			89	3
	....SYNEDRA			89	3
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			22	1
	...NAVICULACEAE	NAVICULOID			
	....CALONEIS			22	1
	....NAVICULA			200	6
	...NITZSCHIACEAE				
D	....NITZSCHIA			1,100	32
	...SURIRELLACEAE				
	....SURIRELLA			22	1
			TOTALS	2,200	66
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...CHROMULINACEAE				
	....CHRYSOCOCCUS			22	1
	...OCHROMONADACEAE				
	....DINOBRYON			22	1
			TOTALS	45	2
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..OSCILLATORIALES	FILAMENTOUS			
	...OSCILLATORIACEAE				
	....OSCILLATORIA			220	6
			TOTALS	220	6
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOMONODACEAE				
	....CRYPTOMONAS			45	1
			TOTALS	45	1
	.EUGLENOPHYCEAE				
	..EUGLENALES				
	...EUGLENACEAE				
	....EUGLENA			67	2
	....LEPOCINCLIS			89	3
	....PHACUS			22	1
	....TRACHELOMONAS			45	1
			TOTALS	220	7

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JULY 8, 1976
1100 HOURS

IDENTIFICATION OF PHYTOPLANKTON

4,600 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...CHARACIACEAE				
	....SCHROEDERIA			33	1
	...OOCYSTACEAE				
	....ANKISTRODESMUS			130	3
	....KIRCHNERIELLA			170	4
	....OOCYSTIS			130	3
	...SCENEDESMACEAE				
	....CRUCIGENIA			260	6
	....SCENEDESMUS			260	6
	..VOLVOCALES				
	...VOLVOCACEAE				
	....PANDORINA			260	6
			TOTALS	1,300	29
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
D	....CYCLOTELLA			1,300	27
	....MELOSIRA			170	4
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....ACHNANTHES			66	1
	....RHOICOSPHENIA			200	4
	...CYMBELLACEAE				
	....CYMBELLA			33	1
	...GOMPHONEMATACEAE				
	....GOMPHONEMA			33	1
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			230	5
	...NITZSCHIACEAE				
	....NITZSCHIA			660	14
			TOTALS	2,600	57
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..OSCILLATORIALES	FILAMENTOUS			
	...OSCILLATORIACEAE				
	....OSCILLATORIA			660	14
			TOTALS	660	14
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOMONODACEAE				
	....CRYPTOMONAS			33	1
			TOTALS	33	1
	.EUGLENOPHYCEAE				
	..EUGLENALES				
	...EUGLENACEAE				
	....TRACHELOMONAS			33	1
			TOTALS	33	1

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

AUG. 12, 1976
1000 HOURS

IDENTIFICATION OF PHYTOPLANKTON

670 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..VOLVOCALES			
	...CHLAMYDOMONADACEAE			
	....CHLAMYDOMONAS		20	3
		TOTALS	20	3
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		360	53
	....MELOSIRA		40	6
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....COCCONEIS		20	3
	....RHOICOSPHENIA		40	6
	...FRAGILARIACEAE			
	....SYNEDRA		20	3
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		60	9
	...NITZSCHIACEAE			
	....HANTZSCHIA		20	3
D	....NITZSCHIA		99	15
		TOTALS	650	98

04165500 CLINTON RIVER AT MOUNT CLEMENS, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

SEP. 23, 1976
1000 HOURS

IDENTIFICATION OF PHYTOPLANKTON

4,600 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			99	2
	....TREUBARIA			33	1
	...SCENEDESMACEAE				
	....CRUCIGENIA			260	6
	....SCENEDESMUS			360	8
	..VOLVOCALES				
	...CHLAMYDOMONADACEAE				
	....CHLAMYDOMONAS			66	1
	...PHACOTACEAE				
L	....PHACOTUS			0	0
			TOTALS	830	18
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			260	6
	....MELOSIRA			200	4
	..PENNALES	PENNATE			
	...ACHNANTHACEAE				
	....RHOICOSPHENIA			66	1
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			170	4
	...NITZSCHIACEAE				
	....NITZSCHIA			330	7
			TOTALS	1,000	22
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..CHROOCOCCALES	COCCOID			
	...CHROOCOCCACEAE				
D	....ANACYSTIS			1,200	25
	..OSCILLATORIALES	FILAMENTOUS			
	...SCYTONEMATACEAE				
D	....PLECTONEMA			1,600	34
			TOTALS	2,700	59
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOMONODACEAE				
	....CRYPTOMONAS			33	1
			TOTALS	33	1

NOTE: D - DOMINANT ORGANISM; GREATER OR EQUAL TO 15%
L - LESS THEN 1%; MAY NOT HAVE BEEN ACTUALLY COUNTED

04165500 CLINTON RIVER AT MOUNT CLEMENS, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	585	583	584	777	742	761	676	643	659	1130	1100	1120
2	586	583	585	763	734	751	689	643	656	1100	970	1020
3	587	584	585	756	727	742	805	698	742	983	969	976
4	587	586	586	758	726	740	854	810	832	996	984	990
5	588	586	587	762	735	747	958	853	917	995	980	988
6	589	586	587	771	747	761	1040	693	882	987	972	979
7	590	588	589	770	751	760	691	597	625	976	968	973
8	591	588	589	776	760	769	632	592	603	1020	977	995
9	590	586	588	776	760	769	781	639	701	1110	975	1010
10	593	587	589	767	546	647	978	797	916	1020	948	969
11	591	589	591	687	596	651	970	884	913	952	918	929
12	593	591	592	681	668	674	1120	968	1010	996	917	941
13	593	589	592	712	685	694	1470	1040	1290	1200	1000	1090
14	596	593	594	740	716	728	1020	735	823	1180	983	1040
15	595	593	594	752	740	746	751	635	679	1050	1020	1030
16	600	597	599	765	753	757	648	633	639	1080	1010	1040
17	600	593	597	757	748	752	698	651	670	1230	1030	1150
18	595	592	593	751	721	736	796	705	743	1180	956	1010
19	604	589	594	747	725	736	839	803	819	988	922	954
20	600	588	595	749	732	742	841	834	837	925	889	907
21	605	596	599	788	695	720	861	844	849	1020	898	924
22	603	593	598	761	724	750	899	862	880	1050	959	1000
23	713	593	603	768	751	758	905	900	902	1030	988	1010
24	755	744	750	768	751	760	906	899	903	1030	945	981
25	773	576	705	1100	753	800	912	903	906	999	904	932
26	698	642	684	1080	871	941	904	883	891	2760	938	1650
27	718	702	711	1070	813	909	902	879	886	1650	1300	1510
28	716	656	686	1030	862	938	915	901	907	1290	1050	1160
29	732	686	711	954	864	908	930	913	918	1040	940	986
30	746	731	738	864	672	746	970	885	915	951	926	936
31	762	741	755	---	---	---	1120	983	1060	1040	946	992
MONTH	773	576	624	1100	546	763	1470	592	838	2760	889	1040

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	1020	955	981	721	633	669	666	652	658	665	641	647
2	980	930	959	1150	426	687	672	665	669	677	648	658
3	998	916	955	398	342	364	665	658	662	662	634	647
4	943	883	911	357	334	342	659	647	651	645	635	639
5	911	884	896	392	326	362	661	649	655	669	649	664
6	929	912	920	385	373	378	693	652	666	715	367	578
7	941	922	930	458	389	424	675	651	665	365	323	335
8	932	912	922	546	460	504	680	673	677	415	325	371
9	961	923	939	588	548	566	681	671	676	547	423	490
10	1540	966	1030	613	586	597	679	674	676	625	551	593
11	2220	1260	1520	618	609	615	680	667	673	671	630	655
12	1260	1030	1090	660	602	620	676	671	674	671	658	665
13	1040	714	848	661	504	565	692	676	680	674	667	671
14	703	572	633	498	443	464	697	686	693	692	678	686
15	580	521	560	520	447	478	691	673	684	706	693	699
16	510	350	403	586	524	558	751	593	654	774	619	688
17	380	340	357	618	587	604	657	635	649	682	621	651
18	358	332	342	630	606	618	670	646	655	686	650	667
19	375	344	359	644	629	636	675	659	667	702	686	690
20	439	374	398	650	635	641	688	662	673	702	680	692
21	504	415	468	640	608	627	720	674	689	712	682	696
22	407	335	366	608	511	555	750	684	715	697	670	686
23	405	335	362	577	515	542	721	682	696	686	667	677
24	557	408	482	628	582	608	717	675	694	684	667	674
25	618	560	591	660	624	648	702	376	493	685	676	680
26	634	595	614	660	641	646	370	278	304	684	677	680
27	598	584	590	691	639	651	382	292	332	685	676	680
28	610	598	602	689	621	644	521	393	462	699	680	687
29	640	607	627	627	618	622	603	528	569	711	692	700
30	---	---	---	672	631	655	643	601	621	707	701	703
31	---	---	---	671	652	660	---	---	---	702	693	699
MONTH	2220	332	712	1150	326	566	751	278	631	774	323	643

04165500 CLINTON RIVER AT MOUNT CLEMENS, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	689	683	686	---	---	---	773	673	722	---	---	---
2	682	675	678	---	---	---	773	754	762	---	---	---
3	688	674	678	---	---	---	823	763	784	---	---	---
4	713	680	694	---	---	---	823	789	797	---	---	---
5	741	705	722	---	---	---	856	786	808	---	---	---
6	755	733	746	---	---	---	850	399	581	---	---	---
7	760	750	756	---	---	---	588	534	557	---	---	---
8	762	752	756	---	---	---	704	594	652	---	---	---
9	760	748	754	735	710	727	733	707	720	---	---	---
10	752	743	749	748	545	646	742	724	735	---	641	---
11	---	---	---	603	533	579	755	731	740	---	548	---
12	---	---	---	594	550	566	770	747	753	---	551	---
13	---	---	---	657	596	639	780	756	768	---	566	---
14	---	---	---	710	664	692	800	536	604	---	571	---
15	---	---	---	751	713	740	690	625	652	---	571	---
16	---	---	---	768	736	753	705	690	697	---	573	---
17	---	---	---	749	718	736	707	688	694	---	---	---
18	---	---	---	736	701	716	715	700	706	656	---	646
19	---	---	---	741	714	727	729	707	715	646	---	568
20	---	---	---	744	711	730	750	729	741	569	---	560
21	---	---	---	766	732	746	750	740	743	571	---	568
22	---	---	---	779	752	765	756	736	742	573	---	572
23	---	---	---	744	680	721	756	744	747	575	---	573
24	---	---	---	730	674	694	744	729	735	577	---	575
25	---	---	---	688	636	655	753	736	741	579	575	576
26	---	---	---	712	676	685	767	753	758	577	574	575
27	---	---	---	724	690	702	---	---	---	581	574	576
28	---	---	---	740	662	720	---	---	---	581	579	---
29	---	---	---	594	126	238	---	---	---	581	578	---
30	---	---	---	565	301	440	---	---	---	584	579	---
31	---	---	---	670	569	636	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	856	399	717	---	---	---

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	16.0	15.0	16.0	9.5	8.5	9.0	6.5	3.5	5.0	1.5	1.0	1.5
2	15.0	13.0	14.0	12.0	9.5	11.0	3.5	2.0	2.5	1.5	0.5	1.0
3	13.0	11.5	12.5	13.5	12.0	13.0	2.0	1.5	1.5	1.5	0.5	1.0
4	14.0	12.5	13.5	14.5	13.5	14.0	2.5	1.0	2.0	0.5	0.0	0.0
5	15.0	13.5	14.5	14.5	13.5	14.0	5.0	2.0	3.0	0.0	0.0	0.0
6	16.0	14.5	15.0	14.5	13.0	13.5	7.0	4.5	5.5	0.0	0.0	0.0
7	15.5	14.5	15.0	15.0	14.0	14.5	4.5	2.0	3.0	0.5	0.0	0.5
8	15.0	14.0	14.5	15.0	14.5	15.0	2.0	1.5	1.5	0.0	0.0	0.0
9	15.0	14.5	14.5	15.0	14.0	14.5	2.5	1.5	2.0	0.0	0.0	0.0
10	16.0	14.5	15.0	15.0	12.5	14.0	2.5	2.5	2.5	0.0	0.0	0.0
11	16.0	14.5	15.0	12.5	10.0	11.0	2.5	2.5	2.5	0.0	0.0	0.0
12	14.5	13.5	14.0	10.0	9.5	9.5	2.5	2.0	2.5	0.0	0.0	0.0
13	15.5	13.5	14.5	9.5	8.0	9.0	4.5	2.5	3.5	0.5	0.0	0.0
14	18.0	15.5	17.0	8.0	6.0	7.0	6.5	4.0	5.0	0.5	0.0	0.0
15	18.0	17.5	18.0	6.0	5.5	5.5	8.5	6.5	7.5	0.5	0.0	0.0
16	17.0	15.0	15.5	6.5	5.5	6.0	6.0	4.0	5.0	0.5	0.0	0.5
17	15.0	12.5	13.5	8.0	6.5	7.0	4.0	1.5	2.5	0.0	0.0	0.0
18	12.5	11.0	11.5	9.0	8.0	8.5	1.5	0.0	0.0	0.0	0.0	0.0
19	11.5	11.5	11.5	9.5	9.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0
20	12.0	11.0	11.5	9.0	8.5	9.0	0.0	0.0	0.0	0.0	0.0	0.0
21	13.0	11.5	12.5	10.5	7.5	9.0	0.0	0.0	0.0	0.0	0.0	0.0
22	13.5	13.0	13.5	7.5	6.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0
23	15.0	13.5	13.5	6.0	4.5	5.0	0.5	0.0	0.0	0.0	0.0	0.0
24	15.0	13.5	14.5	4.5	4.0	4.5	0.5	0.0	0.0	0.0	0.0	0.0
25	15.5	14.5	15.0	5.5	4.5	5.0	0.5	0.0	0.5	0.0	0.0	0.0
26	14.5	12.0	13.0	5.0	4.5	4.5	0.5	0.5	0.5	2.0	0.0	1.0
27	12.0	10.5	11.0	5.0	3.0	3.5	1.5	0.5	1.0	1.0	0.0	0.5
28	11.5	10.5	11.0	4.5	4.0	4.0	1.5	1.0	1.5	0.0	0.0	0.0
29	11.5	11.0	11.5	5.0	3.5	4.0	1.0	0.0	0.5	0.5	0.0	0.0
30	11.0	9.0	9.5	6.5	5.0	6.0	2.0	0.0	1.0	0.5	0.0	0.0
31	9.0	8.5	8.5	---	---	---	2.5	1.5	2.0	0.0	0.0	0.0
MONTH	18.0	8.5	13.5	15.0	3.0	9.0	8.5	0.0	2.0	2.0	0.0	0.0

04165500 CLINTON RIVER AT MOUNT CLEMENS, MI--CONTINUED

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

	FEBRUARY			MARCH			APRIL			MAY		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	0.0	0.0	0.0	6.0	4.5	5.0	8.5	7.5	8.0	13.5	13.0	13.5
2	0.0	0.0	0.0	4.5	2.0	2.5	7.5	6.5	7.0	13.5	12.5	13.0
3	0.0	0.0	0.0	2.0	1.0	1.5	8.5	6.5	7.5	12.5	10.5	11.5
4	0.0	0.0	0.0	2.5	1.5	2.5	10.0	8.5	9.0	11.5	9.5	10.5
5	0.0	0.0	0.0	5.5	2.5	4.5	9.5	8.0	9.0	14.5	11.0	12.5
6	0.0	0.0	0.0	5.0	4.0	4.5	11.0	9.0	10.0	14.5	9.5	12.5
7	0.0	0.0	0.0	4.0	2.5	3.0	11.0	10.0	10.5	9.5	8.0	8.5
8	1.0	0.0	0.0	2.5	1.5	2.0	10.0	8.5	9.0	11.0	8.5	9.5
9	0.0	0.0	0.0	4.0	2.0	3.0	9.0	7.5	8.5	13.5	10.5	12.0
10	2.0	0.0	0.5	4.0	4.0	4.0	10.0	8.5	9.5	15.5	13.5	14.5
11	2.5	1.5	1.5	4.0	2.5	3.5	10.0	8.5	9.5	15.5	15.0	15.5
12	1.5	1.0	1.0	4.5	3.5	3.5	9.0	7.5	8.5	15.0	13.5	14.5
13	1.5	1.0	1.0	4.5	3.0	4.0	11.0	8.0	9.5	15.5	14.0	14.5
14	1.0	0.0	0.0	2.5	1.5	2.0	13.0	10.0	11.5	17.0	15.0	16.0
15	1.0	0.0	0.5	3.5	2.0	3.0	16.0	12.5	14.5	17.0	16.5	17.0
16	0.0	0.0	0.0	4.0	3.5	3.5	17.5	16.0	16.5	17.5	16.5	17.0
17	3.0	0.0	2.0	3.0	1.5	2.0	19.0	17.0	18.0	17.5	15.5	17.0
18	2.5	0.5	1.5	2.5	1.5	2.0	19.5	18.0	18.5	15.5	14.0	14.5
19	1.5	0.5	1.0	6.5	2.5	4.5	20.5	18.5	19.0	15.0	13.5	14.0
20	2.5	0.5	1.5	10.0	7.0	8.5	19.0	16.0	18.0	17.0	14.0	15.5
21	3.0	2.5	3.0	10.0	7.0	9.0	16.0	15.0	15.0	18.5	17.0	17.5
22	2.5	1.5	2.0	7.0	4.5	5.5	16.5	15.0	15.5	17.0	16.0	16.5
23	1.0	0.0	0.5	6.0	4.0	5.0	16.5	14.5	15.5	16.5	14.5	15.5
24	2.5	0.5	1.0	9.0	6.0	7.5	15.5	14.0	15.0	16.0	14.5	15.0
25	5.5	2.5	4.0	11.0	9.0	10.0	13.5	6.5	10.0	16.5	15.0	15.5
26	6.0	5.5	5.5	11.5	10.0	10.5	6.0	4.5	5.0	16.5	14.5	15.5
27	6.5	6.0	6.0	12.0	10.0	11.0	6.0	4.5	5.5	17.5	15.0	16.0
28	6.5	5.5	6.0	10.0	8.0	8.5	9.0	6.0	7.5	18.5	17.0	17.5
29	6.0	5.5	5.5	8.5	8.0	8.0	11.0	9.0	10.0	18.5	17.5	18.0
30	---	---	---	10.5	8.0	9.0	13.5	11.0	12.0	19.0	17.0	18.0
31	---	---	---	10.0	8.5	9.5	---	---	---	19.0	18.5	18.5
MONTH	6.5	0.0	1.5	12.0	1.0	5.0	20.5	4.5	11.5	19.0	8.0	14.5

	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	19.5	18.5	19.0	---	---	---	23.0	20.5	22.0	---	---	---
2	20.0	18.0	19.0	---	---	---	23.0	21.0	22.0	---	---	---
3	20.5	18.5	19.5	---	---	---	22.5	19.5	21.0	---	---	---
4	21.5	19.0	20.0	---	---	---	22.5	21.0	22.0	---	---	---
5	22.0	19.5	21.0	---	---	---	23.0	21.5	22.0	---	---	---
6	22.5	20.0	21.5	---	---	---	22.5	21.0	21.5	---	---	---
7	23.0	21.0	22.0	---	---	---	19.5	18.5	18.5	---	---	---
8	24.0	22.0	23.0	---	---	---	19.0	18.5	18.5	---	---	---
9	24.5	23.0	23.5	24.0	22.0	23.0	21.0	18.5	19.5	---	---	---
10	24.5	23.0	24.0	23.5	22.0	23.0	22.0	20.0	21.0	---	---	---
11	---	---	---	25.0	23.5	24.0	22.5	21.5	22.0	---	---	---
12	---	---	---	25.0	22.5	23.5	24.0	22.5	22.5	---	---	---
13	---	---	---	23.0	21.0	22.5	24.0	23.0	23.5	---	---	---
14	---	---	---	24.5	21.5	22.5	23.0	21.5	22.0	---	---	---
15	---	---	---	26.0	24.0	24.5	21.5	20.0	21.0	---	---	---
16	---	---	---	26.0	24.0	25.0	21.5	19.0	20.5	---	---	---
17	---	---	---	24.0	22.0	23.0	22.0	19.5	20.5	---	---	---
18	---	---	---	23.0	21.0	22.5	22.0	20.0	21.5	---	---	---
19	---	---	---	24.0	22.5	23.0	22.5	20.5	21.5	---	---	---
20	---	---	---	24.0	22.5	23.5	23.0	21.5	22.5	---	---	---
21	---	---	---	25.0	22.5	23.5	23.5	22.0	23.0	---	---	---
22	---	---	---	25.0	23.0	24.0	24.0	22.0	23.0	---	---	---
23	---	---	---	25.0	24.0	24.5	24.0	22.5	23.5	---	---	---
24	---	---	---	26.0	24.0	25.0	23.5	22.0	23.0	---	---	---
25	---	---	---	25.5	23.0	24.0	24.0	22.5	23.0	---	---	---
26	---	---	---	24.5	22.5	23.5	24.0	23.0	23.5	---	---	---
27	---	---	---	25.5	24.0	24.5	---	---	---	---	---	---
28	---	---	---	25.5	24.5	25.0	---	---	---	20.5	6.5	19.0
29	---	---	---	24.0	22.5	23.0	---	---	---	23.0	20.5	21.5
30	---	---	---	23.0	22.0	22.5	---	---	---	24.0	23.0	23.5
31	---	---	---	23.0	22.5	23.0	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	24.0	18.5	21.5	---	---	---
YEAR	26.0	0.0	10.5									

04165700 DETROIT RIVER AT DETROIT, MI
(National stream-quality accounting network station)

LOCATION.--Lat 42°20'50", long 82°57'31", in T.2 S., R.13 E., Wayne County, at Detroit municipal raw-water intake at Water Works Park at Detroit.

DRAINAGE AREA.--228,800 mi^2 (592,600 km^2), approximately.

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

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: February 1974 to current year.
WATER TEMPERATURES: October 1973 to current year.

REMARKS.--Primary sampling point is raw water tap at Detroit municipal treatment plant. Plant intake is in lagoon at north end of Belle Isle in the Detroit River. Daily specific and conductance valves are the means of several measurements taken daily. Water discharges are obtained from U.S. Army Corps of Engineers and represent the monthly mean discharges for the respective months during which samples were collected.

COOPERATION.--Daily mean temperature and specific conductance records provided by treatment plant personnel.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily mean, 300 micromhos Mar. 9, 1976; minimum daily mean, 194 micromhos, July 24, 1976.
WATER TEMPERATURES: Maximum daily mean, 24.0°C July 8-10, Aug. 2, 3, 5, 1975; minimum daily, 0.5°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily mean, 300 micromhos Mar. 9; minimum daily mean, 194 micromhos July 24.
WATER TEMPERATURES: Maximum daily mean, 23.5°C Aug. 25-28; minimum daily mean, 0.5°C on many days during winter period.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT 23...	1300	230000	205	7.7	15.0	9.2	92	9	1	2	100	18
NOV 19...	1330	223000	260	7.7	11.5	14.5	134	12	3	28	100	10
DEC 18...	1200	226000	221	7.9	--	12.3	99	18	7	20	100	18
JAN 20...	1300	204000	296	7.7	--	13.6	107	1	<1	100	110	26
FEB 18...	1330	209000	204	7.9	--	14.7	117	3	17	2	96	14
MAR 17...	1400	229000	189	7.9	--	14.4	112	<1	32	<1	93	6
APR 15...	1400	231000	207	8.0	--	11.6	104	1	--	<1	98	13
MAY 19...	1300	238000	--	7.9	13.0	10.8	104	13	<1	<1	89	2
JUN 10...	1300	237000	--	7.9	1.9	--	--	2	<1	2	100	13
JUL 07...	1330	242000	221	8.2	21.5	8.0	92	5	1	2	95	6
AUG 11...	1400	236000	190	8.1	21.5	8.5	98	10	1	2	--	--
SEP 22...	1430	231000	204	8.1	19.5	8.2	90	18	5	3	97	12

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 23...	29	7.1	3.7	.2	.9	100	0	82	3.2	15	7.4	.2
NOV 19...	28	7.3	4.0	.2	1.0	110	0	90	3.5	15	7.1	.2
DEC 18...	29	7.1	4.2	.2	.9	100	0	82	2.0	17	7.0	.1
JAN 20...	30	7.4	4.5	.2	1.2	102	0	84	3.3	17	8.1	.2
FEB 18...	27	7.0	4.5	.2	.7	100	0	82	2.0	16	7.7	.0
MAR 17...	25	7.5	4.1	.2	1.0	106	0	87	2.1	17	7.1	.2
APR 15...	27	7.4	3.5	.2	1.0	104	0	85	1.7	15	5.8	.1
MAY 19...	29	4.0	4.6	.2	1.9	106	0	87	2.1	18	9.8	.1
JUN 10...	29	7.3	4.3	.2	1.0	106	0	87	2.1	25	7.7	.1
JUL 07...	27	6.7	3.0	.1	.9	108	0	89	1.1	17	7.6	.1
AUG 11...	--	--	--	--	--	104	0	85	1.3	--	--	--
SEP 22...	27	7.2	3.6	.2	.8	104	0	85	1.3	11	6.3	.1

04165700 DETROIT RIVER AT DETROIT, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)
OCT 23...	.3	100	113	62100	.24	.42	1.9	.01
NOV 19...	.6	103	117	62000	.23	.40	1.8	.01
DEC 18...	.9	108	115	65900	.29	.44	1.9	.02
JAN 20...	.9	126	120	69400	.28	.63	2.8	.01
FEB 18...	.9	106	113	59800	.40	.51	2.3	.02
MAR 17...	.9	131	115	81000	.33	.53	2.3	.02
APR 15...	.8	112	112	69900	.27	.42	1.9	.01
MAY 19...	.3	90	120	57800	.30	.57	2.5	.01
JUN 10...	.4	125	127	80000	.29	.49	2.2	.02
JUL 07...	.6	134	116	87600	.32	.62	2.7	.02
SEP 22...	.9	117	108	73000	.21	.36	1.6	.02

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
OCT 23...	1300	1	0	0	0	<10	0	0	0	10	1	370
JAN 20...	1300	1	0	1	0	20	0	0	0	12	4	40
APR 15...	1400	0	0	0	0	10	<10	0	0	0	0	120
JUL 07...	1330	0	0	1	1	<10	<10	2	2	10	10	210

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 23...	0	12	11	10	0	.0	.0	0	0	50	6	4.4
JAN 20...	0	7	0	0	0	.0	.0	0	0	20	0	3.0
APR 15...	10	2	0	0	10	<.5	<.5	0	0	0	0	8.6
JUL 07...	0	6	3	0	0	<.5	<.5	0	0	10	10	2.6

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

		PERIPHYTON				
DATE	LENGTH OF EXPO-SURE (DAYS)	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M	UNCOR-RECTED PERI-PHYTON CHLORO-PHYLL A MG/SQ M	UNCOR-RECTED PERI-PHYTON CHLORO-PHYLL B MG/SQ M	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)
NOV 19...	27	1.10	.600	.500	.000	910
MAR 17...	28	.700	.600	.000	.000	0
AUG 11...	35	35.3	30.0	13.9	1.14	380

04165700 DETROIT RIVER AT DETROIT, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

OCT. 23, 1975
1300 HOURS

IDENTIFICATION OF PHYTOPLANKTON

5,600 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...SCENEDESMACEAE			
	....SCENEDESMUS		170	3
		TOTALS	170	3
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		4,900	88
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....ACHNANTHES			0
	...FRAGILARIACEAE			
	....SYNEDRA		83	1
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		83	1
	...NITZSCHIACEAE			
	....NITZSCHIA		83	1
		TOTALS	5,100	91
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....DINOBRYON		170	3
		TOTALS	170	3
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
	....ANACYSTIS		83	1
		TOTALS	83	1

NOV. 19, 1975
1330 HOURS

IDENTIFICATION OF PHYTOPLANKTON

3,600 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
L	....DICTYOSPHAERIUM			0
	...SCENEDESMACEAE			
L	....SCENEDESMUS			0
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		3,400	94
	..PENNALES	PENNATE		
	...CYMBELLACEAE			
L	....CYMBELLA			0
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
L	....FRAGILARIA			0
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		110	3
	...NITZSCHIACEAE			
	....NITZSCHIA		110	3
	...SURIRELLACEAE			
L	....CYMATOPLEURA			0
L	....SURIRELLA			0
		TOTALS	3,600	100
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
L	....DINOBRYON			0

04165700 DETROIT RIVER AT DETROIT, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DEC. 18, 1975
1200 HOURS

IDENTIFICATION OF PHYTOPLANKTON

6,900 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
L	....TETRAEDRON			0
	..ZYGNEMATALES			
	...ZYGNEMATACEAE			
L	....MOUGEOTIA			0
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		1,000	15
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
L	....RHOICOSPHENIA			0
	...CYMBELLACEAE			
L	....AMPHORA			0
	...FRAGILARIACEAE			
L	....ASTERIONELLA			0
	....FRAGILARIA		340	5
	...NAVICULACEAE	NAVICULOID		
L	....NAVICULA			0
	...NITZSCHIACEAE			
	....NITZSCHIA		84	1
	...SURIRELLACEAE			
L	....SURIRELLA			0
	...TABELLARIACEAE			
L	....TABELLARIA			0
		TOTALS	1,400	21
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....DINOBRYON		130	2
		TOTALS	130	2
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
L	....ANACYSTIS			0
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....LYNGBYA		5,400	77
		TOTALS	5,400	77

04165700 DETROIT RIVER AT DETROIT, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JAN. 20, 1976
1300 HOURS

IDENTIFICATION OF PHYTOPLANKTON

5,300 CELLS/ML

	ORGANISM NAME	COMMON NAME	CELLS/ML	PER CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
L	....ANKISTRODESMUS			0
	...SCENEDESMACEAE			
L	....SCENEDESMUS			0
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		230	4
L	....MELOSIRA			0
	..PENNALES	PENNATE		
	...FRAGILARIACEAE			
	....ASTERIONELLA		120	2
L	....FRAGILARIA			0
L	....SYNEDRA			0
	...NITZSCHIACEAE			
L	....NITZSCHIA			0
	...TABELLARIACEAE			
L	....TABELLARIA			0
		TOTALS	350	6
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
L	....GOMPHOSPHAERIA			0
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
D	....OSCILLATORIA		4,900	93
		TOTALS	4,900	93

04165700 DETROIT RIVER AT DETROIT, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

FEB. 18, 1976
1330 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,000 CELLS/ML

	_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		11	1
	....DICTYOSPHAERIUM		42	2
	...SCENEDESMACEAE			
L	....SCENEDESMUS			0
	..TETRASPORALES			
	...COCCOMYXACEAE			
L	....ELAKATOTHRIX			0
		TOTALS	53	3
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		180	9
D	....MELOSIRA		470	24
	..PENNALES	PENNATE		
	...DIATOMACEAE			
	....DIATOMA		74	4
	...FRAGILARIACEAE			
	....ASTERIONELLA		170	9
	....FRAGILARIA		120	6
	...NAVICULACEAE	NAVICULOID		
L	....NAVICULA			0
	...NITZSCHIACEAE			
	....NITZSCHIA		95	5
	...SURIRELLACEAE			
L	....SURIRELLA			0
	...TABELLARIACEAE			
	....TABELLARIA		84	4
		TOTALS	1,200	61
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
L	....DINOBRYON			0
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..CHROOCOCCALES	COCCOID		
	...CHROOCOCCACEAE			
D	....ANACYSTIS		390	20
	..OSCILLATORIALES	FILAMENTOUS		
	...OSCILLATORIACEAE			
	....LYNGBYA		260	13
	....OSCILLATORIA		84	4
		TOTALS	740	37

04165700 DETROIT RIVER AT DETROIT, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAR. 17, 1976
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,500 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		36	1
	...SCENEDESMACEAE			
L	....SCENEDESMUS			0
	..ZYGNEMATALES			
	...DESMIDIACEAE	PLACODERM DESMIDS		
L	....STAURASTRUM			0
		TOTALS	36	1
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		720	29
L	....MELOSIRA			0
	..PENNALES	PENNATE		
	...CYMBELLACEAE			
L	....AMPHORA			0
L	....CYMBELLA			0
	...DIATOMACEAE			
	....DIATOMA		180	7
	...FRAGILARIACEAE			
	....ASTERIONELLA		360	14
D	....FRAGILARIA		930	37
	...GOMPHONEMATACEAE			
L	....GOMPHONEMA			0
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		72	3
	...NITZSCHIACEAE			
	....NITZSCHIA		36	1
	...TABELLARIACEAE			
	....TABELLARIA		72	3
		TOTALS	2,400	94
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....OCHROMONAS		110	4
		TOTALS	110	4

04165700 DETROIT RIVER AT DETROIT, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

APR. 15, 1976
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,200 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			35	2
	..TETRASPORALES				
	...COCCOMYXACEAE				
	....ELAKATOTHRIX			71	3
			TOTALS	110	5
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
D	....CYCLOTELLA			560	26
	....MELOSIRA			180	8
	..PENNALES	PENNATE			
	...CYMBELLACEAE				
	....CYMBELLA			71	3
	...FRAGILARIACEAE				
	....ASTERIONELLA			210	10
	....FRAGILARIA			180	8
	....SYNEDRA			110	5
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			110	5
	...NITZSCHIACEAE				
D	....NITZSCHIA			320	15
	...TABELLARIACEAE				
	....TABELLARIA			180	8
			TOTALS	1,900	88
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...OCHROMONADACEAE				
	....DINOBRYON			180	8
			TOTALS	180	8

04165700 DETROIT RIVER AT DETROIT, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

MAY 19, 1976
1300 HOURS

IDENTIFICATION OF PHYTOPLANKTON

3,200 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....ANKISTRODESMUS		96	3
L	....TETRAEDRON			0
	...SCENEDESMACEAE			
	....SCENEDESMUS		160	5
		TOTALS	270	8
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		470	15
D	....MELOSIRA		520	16
	...RHIZOSOLENIACEAE			
L	....RHIZOSOLENIA			0
	..PENNALES	PENNATE		
	...ACHNANTHACEAE			
	....ACHNANTHES		27	1
L	....COCCONEIS			0
	...FRAGILARIACEAE			
	....ASTERIONELLA		41	1
D	....FRAGILARIA		520	16
L	....SYNEDRA			0
	...NAVICULACEAE	NAVICULOID		
L	....NAVICULA			0
	...NITZSCHIACEAE			
	....NITZSCHIA		430	13
	...SURIRELLACEAE			
L	....SURIRELLA			0
	...TABELLARIACEAE			
	....TABELLARIA		69	2
		TOTALS	2,100	64
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE		
	..CHRYSOMONADALES			
	...OCHROMONADACEAE			
	....DINOBRYON		230	7
		TOTALS	230	7
	CYANOPHYTA	BLUE-GREEN ALGAE		
	.MYXOPHYCEAE			
	..OSCILLATORIALES	FILAMENTOUS		
	...NOSTOCACEAE			
	....ANABAENA		150	5
	...OSCILLATORIACEAE			
	....OSCILLATORIA		360	11
		TOTALS	510	16
	EUGLENOPHYTA	EUGLENOIDS		
	.EUGLENOPHYCEAE			
	..EUGLENALES			
	...EUGLENACEAE			
L	....EUGLENA			0
		TOTALS	14	0
	PYRRHOPHYTA	FIRE ALGAE		
	.DINOPHYCEAE	DINOFLAGELLATES		
	..GYMNODINIALES			
	...GYMNODINIACEAE			
L	....GYMNODINIUM			0
		TOTALS	14	0

04165700 DETROIT RIVER AT DETROIT, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JUNE 10, 1976
1300 HOURS

IDENTIFICATION OF PHYTOPLANKTON

660 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			13	2
	....KIRCHNERIELLA			13	2
	...SCENEDESMACEAE				
	....SCENEDESMUS			78	12
			TOTALS	100	16
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			13	2
	....MELOSIRA			39	6
	..PENNALES	PENNATE			
	...FRAGILARIACEAE				
	....ASTERIONELLA			65	10
	....FRAGILARIA			39	6
	...NAVICULACEAE	NAVICULOID			
	....NAVICULA			52	8
	...NITZSCHIACEAE				
	....NITZSCHIA			26	4
	...TABELLARIACEAE				
	....TABELLARIA			65	10
			TOTALS	300	46
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...OCHROMONADACEAE				
D	....DINOBRYON			180	27
			TOTALS	180	27
	EUGLENOPHYTA	EUGLENOIDS			
	.CRYPTOPHYCEAE	CRYPTOMONADS			
	..CRYPTOMONIDALES				
	...CRYPTOCHRYSIDACEAE				
	....CHROOMONAS			65	10
	...CRYPTOMONODACEAE				
	....CRYPTOMONAS			13	2
			TOTALS	78	12

04165700 DETROIT RIVER AT DETROIT, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

JULY 7, 1976
1330 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,200 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE			
	.CHLOROPHYCEAE				
	..CHLOROCOCCALES				
	...OOCYSTACEAE				
	....ANKISTRODESMUS			22	1
	...SCENEDESMACEAE				
	....SCENEDESMUS			44	2
			TOTALS	66	3
	CHRYSOPHYTA				
	.BACILLARIOPHYCEAE	DIATOMS			
	..CENTRALES	CENTRIC			
	...COSCINODISCACEAE				
	....CYCLOTELLA			270	12
	..PENNALES	PENNATE			
	...FRAGILARIACEAE				
	....FRAGILARIA			22	1
	...NITZSCHIACEAE				
	....DENTICULA			22	1
	....NITZSCHIA			22	1
	...TABELLARIACEAE				
	....TABELLARIA			44	2
			TOTALS	380	17
	.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
	..CHRYSOMONADALES				
	...OCHROMONADACEAE				
	....DINOBRYON			110	5
			TOTALS	110	5
	CYANOPHYTA	BLUE-GREEN ALGAE			
	.MYXOPHYCEAE				
	..CHROOCOCCALES	COCCOID			
	...CHROOCOCCACEAE				
	....ANACYSTIS			130	6
	..OSCILLATORIALES	FILAMENTOUS			
	...OSCILLATORIACEAE				
D	....OSCILLATORIA			1,500	69
			TOTALS	1,700	75

04165700 DETROIT RIVER AT DETROIT, MI--CONTINUED

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

AUG. 11, 1976
1400 HOURS

IDENTIFICATION OF PHYTOPLANKTON

560 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...OOCYSTACEAE			
	....CHODATELLA		30	5
	....KIRCHNERIELLA		30	5
		TOTALS	59	10
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
D	....CYCLOTELLA		360	63
	....MELOSIRA		30	5
	..PENNALES	PENNATE		
	...FRAGILARIACEAE			
	....SYNEDRA		30	5
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		59	11
	...NITZSCHIACEAE			
	....NITZSCHIA		30	5
		TOTALS	500	89

SEP. 22, 1976
1430 HOURS

IDENTIFICATION OF PHYTOPLANKTON

5,200 CELLS/ML

	_ORGANISM__NAME_____	_COMMON__NAME_____	CELLS/ML	PER_CENT
	CHLOROPHYTA	GREEN ALGAE		
	.CHLOROPHYCEAE			
	..CHLOROCOCCALES			
	...COELASTRACEAE			
	....COELASTRUM		410	8
	...OOCYSTACEAE			
D	....DICTYOSPHAERIUM		3,700	71
	...SCENEDESMACEAE			
	....SCENEDESMUS		200	4
	..TETRASPORALES			
	...COCCOMYXACEAE			
	....ELAKATOTHRIX		100	2
		TOTALS	4,400	85
	CHRYSOPHYTA			
	.BACILLARIOPHYCEAE	DIATOMS		
	..CENTRALES	CENTRIC		
	...COSCINODISCACEAE			
	....CYCLOTELLA		710	14
	..PENNALES	PENNATE		
	...NAVICULACEAE	NAVICULOID		
	....NAVICULA		51	1
	...NITZSCHIACEAE			
	....NITZSCHIA		51	1
		TOTALS	810	16

NOTE: D - DOMINANT ORGANISM; GREATER OR EQUAL TO 15%
L - LESS THEN 1%; MAY NOT HAVE BEEN ACTUALLY COUNTED

04165700 DETROIT RIVER AT DETROIT, MI--CONTINUED

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	209	211	213	226	212	212	225	222	224	221	204	212
2	206	210	215	213	207	224	218	238	219	208	202	214
3	206	218	222	205	235	212	212	224	230	212	206	211
4	206	---	209	213	232	205	214	212	213	225	208	212
5	206	---	218	217	232	208	222	213	---	224	201	215
6	208	225	224	212	252	---	216	212	205	224	203	213
7	206	221	213	214	212	---	202	220	213	219	205	---
8	218	222	207	244	251	295	201	217	217	225	212	215
9	206	224	211	222	204	300	202	215	228	209	223	214
10	214	216	216	219	232	240	---	202	222	209	213	204
11	215	---	219	214	248	237	---	215	221	218	214	206
12	215	216	207	220	235	227	204	210	224	215	214	206
13	202	208	205	222	206	210	202	212	224	215	211	206
14	223	216	217	224	211	206	200	224	224	217	212	206
15	224	208	213	218	206	220	217	217	221	223	212	206
16	216	210	206	210	216	202	209	217	220	214	214	210
17	211	213	206	224	220	207	214	232	224	212	212	221
18	215	214	215	219	218	220	215	224	212	227	214	221
19	216	209	206	204	212	215	222	217	210	222	212	214
20	215	204	206	204	227	228	---	205	224	218	220	224
21	216	206	206	210	207	220	230	207	224	210	217	225
22	213	206	245	211	231	214	244	209	224	206	210	222
23	213	206	206	216	214	213	204	206	216	212	224	226
24	206	206	206	209	205	220	206	221	224	194	217	216
25	206	206	206	216	209	224	204	---	224	214	224	210
26	206	206	206	222	230	204	211	224	222	216	229	206
27	206	210	212	222	224	210	208	236	228	214	217	208
28	206	210	209	223	235	229	201	235	228	213	212	204
29	209	210	217	225	214	210	207	235	225	211	210	205
30	206	---	---	224	---	207	214	238	217	195	210	204
31	212	---	215	214	---	207	---	245	---	204	212	---
MAX	224	225	245	244	252	300	244	245	230	227	229	226
MIN	202	204	205	204	204	202	200	202	205	194	201	204

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

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

04166000 RIVER ROUGE AT BIRMINGHAM, MI

LOCATION.--Lat 42°32'45", long 83°13'25", in NW¼ sec.36, T.2 N., R.10 E., Oakland County, Hydrologic Unit 04090004, on left bank 25 ft (8 m) downstream from mouth of Quarton Lake outlet, and 100 ft (30 m) upstream from bridge on Maple Road, in Birmingham.

DRAINAGE AREA.--33.3 mi^2 (86.2 km^2). Prior to water year 1971, drainage area was 36.9 mi^2 (95.6 km^2). An area of 3.6 mi^2 (9.3 km^2) noncontributing since then.

PERIOD OF RECORD.--June 1950 to current year.

REVISED RECORDS.--WSP 1387: 1951-52(M). WSP 1557: Drainage area.

GAGE.--Water-stage recorder. Concrete control since July 27, 1962. Datum of gage is 715.94 ft (218.219 m) above mean sea level.

REMARKS.--Records good. Occasional regulation by Quarton Lake above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--20 years (1950-70), 15.3 ft^3/s (0.433 m^3/s), 5.63 in/yr (143 mm/yr); 6 years (water years 1971-76), 24.1 ft^3/s (0.683 m^3/s), 9.83 in/yr (250 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,390 ft^3/s (39.4 m^3/s) June 26, 1968, gage height, 8.70 ft (2.652 m); minimum, 0.10 ft^3/s (0.003 m^3/s) Aug. 8, 9, 1963; minimum gage height, 1.02 ft (0.311 m) Oct. 12, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 180 ft^3/s (5.10 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 17	0600	284	8.04	3.78	1.152	Apr. 25	1900	259	7.33	3.67	1.119
Feb. 22	0500	336	9.52	4.07	1.241	May 7	0200	*419	11.9	*4.53	1.381
Mar. 3	unknown	370	10.5	unknown		July 29	0500	404	11.4	4.46	1.359

Minimum discharge, 3.4 ft^3/s (0.096 m^3/s) Sept. 5, 6, 7, 8, gage height, 1.57 ft (0.479 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	9.2	33	25	22	52	35	33	23	30	13	4.4
2	14	9.2	23	24	23	175	37	41	19	22	8.7	4.4
3	13	11	20	25	23	300	34	39	18	18	7.1	4.4
4	12	13	19	21	22	240	33	34	16	16	6.5	4.2
5	11	12	19	20	20	240	31	32	15	15	8.7	3.9
6	11	9.6	53	18	20	150	39	134	14	13	30	3.6
7	11	12	41	20	19	74	36	284	14	13	14	3.6
8	10	12	29	19	20	57	31	101	13	12	10	3.4
9	12	11	28	18	20	53	29	67	11	11	9.2	7.5
10	12	43	27	18	24	52	28	52	9.6	15	8.3	16
11	10	21	27	20	46	51	28	46	17	14	7.5	8.7
12	9.6	15	27	20	43	57	27	41	23	12	7.1	5.9
13	9.6	13	40	20	68	99	26	36	13	10	12	4.7
14	9.6	12	63	22	69	64	25	34	11	9.6	17	4.5
15	8.7	11	87	20	65	53	23	34	10	8.7	11	5.6
16	7.9	11	49	20	136	51	34	84	19	8.7	8.3	6.6
17	7.9	11	37	18	214	49	27	61	13	7.9	7.5	6.1
18	9.6	11	27	19	142	46	23	48	13	7.9	6.8	6.1
19	14	10	22	20	127	47	22	40	51	7.1	6.5	5.3
20	14	11	23	19	79	44	20	34	25	8.3	6.1	6.3
21	12	15	23	20	142	47	21	33	16	9.2	6.1	6.4
22	11	13	22	18	257	39	25	30	14	7.5	5.0	6.2
23	9.6	12	22	19	107	36	21	28	13	7.9	4.7	6.3
24	9.6	12	21	19	74	36	23	28	43	8.7	4.7	5.6
25	14	15	21	19	68	42	163	26	79	8.3	4.7	5.4
26	12	15	23	28	65	36	133	24	26	7.5	5.7	15
27	11	17	22	27	54	44	64	23	18	7.1	9.6	19
28	11	19	21	25	53	53	44	19	16	33	7.5	11
29	9.2	25	20	24	51	40	36	23	14	174	5.0	8.2
30	8.7	55	26	23	---	40	32	24	55	26	4.4	7.8
31	8.7	---	29	23	---	37	---	27	---	17	4.2	---
TOTAL	340.7	466.0	944	651	2073	2404	1150	1560	641.6	565.4	266.9	206.1
MEAN	11.0	15.5	30.5	21.0	71.5	77.5	38.3	50.3	21.4	18.2	8.61	6.87
MAX	17	55	87	28	257	300	163	284	79	174	30	19
MIN	7.9	9.2	19	18	19	36	20	19	9.6	7.1	4.2	3.4
CFSM	.33	.47	.92	.63	2.15	2.33	1.15	1.51	.64	.55	.26	.21
IN.	.38	.52	1.05	.73	2.32	2.69	1.28	1.74	.72	.63	.30	.23

CAL YR 1975 TOTAL 9996.6 MEAN 27.4 MAX 386 MIN 4.0 CFSM .82 IN 11.17
WTR YR 1976 TOTAL 11268.7 MEAN 30.8 MAX 300 MIN 3.4 CFSM .92 IN 12.59

04166100 RIVER ROUGE AT SOUTHFIELD, MI

LOCATION.--Lat 42°26'52", long 83°17'52", in SW¼ sec.32, T.1 N., R.10 E., Oakland County, Hydrologic Unit 04090004, on right bank at downstream side of bridge on Beech Road at Southfield, 4.2 mi (6.8 km) east of Farmington.

DRAINAGE AREA.--87.9 mi^2 (227.7 km^2).

PERIOD OF RECORD.--April 1958 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 609.62 ft (185.812 m) above mean sea level (city of Southfield bench mark). Prior to Sept. 30, 1958, nonrecording gage at same site and datum.

REMARKS.--Records fair except those for period of no gage-height record, Mar. 22 to Apr. 23, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--18 years, 57.7 ft^3/s (1.634 m^3/s), 8.91 in/yr (226 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,900 ft^3/s (139 m^3/s) June 26, 1968, gage height, 19.04 ft (5.803 m); minimum, 0.1 ft^3/s (0.003 m^3/s) Aug. 2, 1964, gage height, 1.15 ft (0.351 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft^3/s (14.2 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	1100	526	14.9	9.65	2.941	Apr. 25	2000	840	23.8	10.57	3.222
Feb. 17	0700	1,020	28.9	11.16	3.402	May 7	0200	*1,470	41.6	*12.54	3.822
Feb. 22	0300	1,010	28.6	11.11	3.386	June 25	0500	608	17.2	9.19	2.801
Mar. 2	2400	1,160	32.9	11.66	3.554	July 29	1200	1,300	36.8	11.53	3.514

Minimum discharge, 11 ft^3/s (0.31 m^3/s) Sept. 5, 6, 8, 9; minimum gage height, 2.71 ft (0.826 m) Sept. 8, 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	21	137	66	49	133	90	90	65	71	33	13
2	35	22	80	54	47	635	98	117	52	49	28	13
3	31	27	66	55	45	933	94	111	45	40	23	13
4	30	40	57	53	45	757	87	88	41	38	21	12
5	28	30	54	52	44	745	82	75	36	34	19	12
6	27	26	203	50	44	509	94	491	31	32	42	12
7	25	32	128	48	44	279	92	1080	28	35	31	12
8	24	38	75	46	44	199	78	397	27	38	23	12
9	32	31	66	44	45	149	70	199	26	30	20	15
10	30	163	64	42	55	142	67	141	24	34	19	41
11	24	79	57	46	154	140	68	121	24	31	18	20
12	22	45	59	46	156	168	67	103	46	28	17	15
13	21	37	126	45	314	369	63	89	28	25	32	13
14	22	33	212	44	318	198	62	82	25	25	35	12
15	23	30	403	42	297	149	60	84	24	24	26	13
16	21	29	139	52	694	131	170	299	74	23	20	15
17	19	28	83	40	873	118	100	254	30	21	18	16
18	21	28	55	45	622	112	70	143	26	21	17	15
19	34	30	44	46	518	114	62	103	148	20	16	14
20	30	31	44	48	251	106	55	88	64	20	15	17
21	29	49	45	49	509	104	60	77	36	26	14	15
22	25	40	47	48	863	97	60	71	32	21	14	15
23	22	33	46	44	395	90	56	66	29	19	14	15
24	20	32	41	43	221	87	60	61	93	21	13	14
25	40	43	41	43	186	105	576	59	358	19	13	14
26	39	51	44	54	161	95	567	54	68	18	14	38
27	29	54	47	64	139	110	214	49	46	17	20	52
28	23	75	46	62	118	150	134	45	41	19	17	25
29	22	105	61	58	109	115	102	57	35	907	14	19
30	20	273	75	54	---	105	84	62	127	109	13	17
31	19	---	80	52	---	98	---	93	---	43	13	---
TOTAL	830	1555	2725	1535	7360	7242	3542	4849	1729	1858	632	529
MEAN	26.8	51.8	87.9	49.5	254	234	118	156	57.6	59.9	20.4	17.6
MAX	43	273	403	66	873	933	576	1080	358	907	42	52
MIN	19	21	41	40	44	87	55	45	24	17	13	12
CFSM	.30	.59	1.00	.56	2.89	2.66	1.34	1.77	.66	.68	.23	.20
IN.	.35	.66	1.15	.65	3.11	3.06	1.50	2.05	.73	.79	.27	.22

CAL YR 1975 TOTAL 32516.5 MEAN 89.1 MAX 1260 MIN 8.8 CFSM 1.01 IN 13.76
WTR YR 1976 TOTAL 34386.0 MEAN 94.0 MAX 1080 MIN 12 CFSM 1.07 IN 14.55

04166200 EVANS DITCH AT SOUTHFIELD, MI

LOCATION.--Lat 42°27'28", long 83°16'03", in SE¼ sec.28, T.1 N., R.10 E., Oakland County, Hydrologic Unit 04090004, on right bank 20 ft (6 m) upstream from bridge on Nine-Mile Road, at Southfield, 1.6 mi (2.6 km) upstream from mouth, and 5.5 mi (8.8 km) east of Farmington.

DRAINAGE AREA.--9.49 mi^2 (24.58 km^2).

PERIOD OF RECORD.--September 1958 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 615.07 ft (187.473 m) above mean sea level (city of Southfield bench mark).

REMARKS.--Records good. Several observations of water temperature were made during the year.

AVERAGE DISCHARBE.--18 years, 8.31 ft^3/s (0.235 m^3/s), 11.89 in/yr (302 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 903 ft^3/s (25.6 m^3/s) June 25, 1968, gage height, 12.95 ft (3.947 m), from rating curve extended above 410 ft^3/s (11.6 m^3/s); minimum, 0.01 ft^3/s (<0.001 m^3/s) Oct. 3, 1967; minimum gage height, 5.08 ft (1.548 m) Sept. 13, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 200 ft^3/s (5.66 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	0400	249	7.05	7.88	2.402	Mar. 5	0900	261	7.39	7.98	2.432
Feb. 15	1930	201	5.69	7.48	2.280	Apr. 25	1200	305	8.64	8.44	2.573
Feb. 16	2400	469	13.3	9.71	2.960	May 6	2200	547	15.5	10.31	3.142
Feb. 21	1400	379	10.7	8.97	2.734	June 19	1100	209	5.92	7.55	2.301
Feb. 22	0100	250	7.08	7.89	2.405	July 29	0400	*688	19.5	*11.39	3.472
Mar. 2	2100	484	13.7	9.82	2.993						

Minimum discharge, 1.3 ft^3/s (0.037 m^3/s) Sept. 25; minimum gage height, 5.30 ft (1.615 m) Oct. 30, 31, Nov. 1, 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	2.2	10	8.3	4.5	26	6.1	12	4.0	6.7	3.5	3.1
2	3.7	1.8	6.7	7.7	4.5	202	8.0	10	3.1	4.8	2.9	2.9
3	3.5	6.7	5.1	8.3	5.6	101	5.6	7.7	2.9	7.4	2.4	2.7
4	3.3	5.9	6.1	5.9	5.9	64	5.3	6.4	2.7	4.2	2.4	2.2
5	4.2	2.2	6.4	4.5	5.3	80	4.8	5.6	3.1	3.3	3.5	2.0
6	3.1	2.0	32	4.5	5.3	22	10	245	3.1	4.5	13	1.8
7	2.7	6.4	9.6	5.1	5.3	15	5.1	109	2.9	14	3.1	2.0
8	2.9	3.7	7.0	3.7	6.1	12	4.2	13	2.9	8.0	2.7	2.4
9	8.3	2.2	9.6	4.2	6.1	11	4.0	8.6	2.9	2.9	2.4	19
10	3.3	47	8.3	4.2	21	13	4.0	6.7	3.1	7.0	2.2	12
11	3.1	5.9	9.6	4.8	33	10	4.8	7.0	9.6	3.3	2.7	3.7
12	2.9	4.0	10	4.5	24	24	3.7	5.1	10	3.1	2.2	2.4
13	2.9	3.3	36	4.5	60	21	4.0	4.5	4.2	3.1	14	2.2
14	2.7	2.9	24	4.8	26	11	4.0	4.0	3.7	3.1	4.2	2.2
15	2.9	2.9	76	4.5	51	9.0	4.2	7.7	4.0	3.1	2.9	8.3
16	2.4	2.2	14	4.8	80	9.6	23	22	23	3.3	2.0	5.1
17	2.2	2.0	9.6	3.7	90	7.4	5.6	13	4.5	3.3	2.0	4.5
18	5.3	2.0	6.7	3.5	57	6.7	4.2	5.9	6.4	3.3	2.0	2.0
19	7.0	2.0	5.1	4.8	26	7.0	3.7	4.2	75	3.1	2.2	1.6
20	2.9	5.6	5.1	4.2	17	6.7	3.5	4.0	6.4	4.0	2.4	8.0
21	2.4	7.4	5.1	4.5	118	6.4	12	3.5	4.8	6.1	2.7	2.4
22	2.4	3.1	4.8	4.5	62	5.3	10	3.3	4.2	2.2	2.4	3.1
23	2.2	2.2	4.2	5.1	20	5.6	6.7	3.1	4.0	2.7	2.7	4.2
24	2.2	1.8	4.0	4.8	16	6.1	13	3.5	83	5.1	3.1	1.8
25	13	9.0	4.0	4.8	15	9.3	177	3.7	47	2.0	3.3	1.8
26	2.9	4.8	4.5	27	14	6.1	20	3.5	6.1	2.0	5.6	30
27	2.0	12	5.3	12	12	15	11	4.0	4.5	2.0	5.6	14
28	3.1	14	5.6	7.7	10	8.3	8.6	3.7	5.9	10	2.9	2.9
29	2.2	24	5.3	5.9	11	6.4	7.4	9.3	4.5	250	2.2	2.2
30	1.8	30	18	5.1	---	7.7	6.4	4.5	28	7.5	2.4	1.8
31	1.6	---	13	4.5	---	5.9	---	9.3	---	4.8	2.7	---
TOTAL	109.6	221.2	370.7	186.4	811.6	740.5	389.9	552.8	369.5	389.9	110.3	154.3
MEAN	3.54	7.37	12.0	6.01	28.0	23.9	13.0	17.8	12.3	12.6	3.56	5.14
MAX	13	47	76	27	118	202	177	245	83	250	14	30
MIN	1.6	1.8	4.0	3.5	4.5	5.3	3.5	3.1	2.7	2.0	2.0	1.6
CFSM	.37	.78	1.26	.63	2.95	2.52	1.37	1.88	1.30	1.33	.38	.54
IN.	.43	.87	1.45	.73	3.18	2.90	1.53	2.17	1.45	1.53	.43	.60

CAL YR 1975 TOTAL 4418.6 MEAN 12.1 MAX 133 MIN 1.0 CFSM 1.28 IN 17.32
WTR YR 1976 TOTAL 4406.7 MEAN 12.0 MAX 250 MIN 1.6 CFSM 1.26 IN 17.27

04166300 UPPER RIVER ROUGE AT FARMINGTON, MI

LOCATION.--Lat 42°27'52", long 83°22'11", in NW¼ sec.27, T.1 N., R.9 E., Oakland County, Hydrologic Unit 04090004, on left bank 800 ft (244 m) downstream from bridge on Shiawassee Road at Farmington.

DRAINAGE AREA.--17.5 mi^2 (45.3 km^2).

PERIOD OF RECORD.--March 1958 to current year.

REVISED RECORDS.--WSP 1912: 1959(M), 1960(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 690.4 ft (210.43 m) above mean sea level.

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--18 years, 11.3 ft^3/s (0.320 m^3/s), 8.77 in/yr (223 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,500 ft^3/s (42.5 m^3/s) June 25, 1968, gage height, 8.70 ft (2.652 m); minimum, 0.07 ft^3/s (0.002 m^3/s) Aug. 30, 1966, result of regulation; minimum daily, 0.32 ft (0.009 m^3/s) Aug. 10, 1964, Aug. 29, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 80 ft^3/s (2.27 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	0800	104	2.95	3.93	1.198	Apr. 25	1700	149	4.22	4.21	1.283
Feb. 17	0200	248	7.02	4.77	1.454	May 6	2300	*349	9.88	*5.28	1.609
Feb. 22	0200	279	7.90	4.93	1.503	June 24	2200	92	2.61	3.88	1.183
Mar. 2	2100	264	7.48	4.85	1.478	July 29	0400	181	5.13	4.41	1.344
Mar. 5	1000	208	5.89	4.55	1.387						

Minimum discharge, 1.2 ft^3/s (0.034 m^3/s) Sept. 7, 8, 9, gage height, 2.78 ft (0.847 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.8	6.1	32	13	12	34	18	20	11	8.2	4.8	2.0
2	8.2	6.1	20	11	12	130	21	23	8.6	6.4	3.6	2.3
3	7.4	7.0	15	11	12	174	20	20	7.4	5.1	3.6	2.1
4	6.7	8.2	13	10	12	140	18	16	6.4	4.5	3.4	2.0
5	6.4	7.4	13	11	12	155	16	14	6.1	3.9	3.6	2.0
6	6.1	6.7	36	10	11	82	20	120	4.8	3.4	4.2	1.8
7	5.8	8.2	28	9.5	11	52	17	197	4.5	3.9	3.6	1.6
8	5.8	8.2	20	9.2	11	39	15	64	3.9	5.8	3.6	1.6
9	7.8	7.4	17	10	11	36	13	40	3.6	3.9	3.4	2.9
10	7.0	32	16	12	12	34	13	29	3.4	4.2	3.6	7.8
11	6.4	18	16	11	15	32	13	25	3.4	3.4	3.1	3.9
12	6.1	12	16	10	18	38	12	20	3.1	2.9	3.4	2.7
13	6.1	9.8	26	11	40	53	11	17	2.9	2.7	11	2.0
14	5.5	9.0	48	12	45	36	11	15	2.7	2.7	7.0	1.6
15	5.5	8.2	82	12	60	30	10	16	3.1	2.7	5.5	2.0
16	5.5	8.2	47	12	128	27	20	46	10	2.7	4.2	2.5
17	5.5	7.8	28	11	173	23	13	48	4.5	2.5	3.4	2.9
18	5.5	8.2	17	12	117	21	11	28	4.2	2.5	3.1	2.5
19	7.8	8.2	14	11	98	23	9.8	20	25	2.3	2.7	2.3
20	8.2	9.0	13	12	62	22	9.4	16	9.8	2.7	2.7	2.7
21	7.0	14	13	11	138	22	12	13	6.4	5.5	2.5	2.5
22	6.4	10	12	10	171	19	14	11	5.8	3.4	2.7	2.1
23	6.4	9.0	12	10	72	18	12	11	5.1	2.9	2.5	2.1
24	5.8	8.6	12	10	53	17	13	9.8	25	2.7	2.3	2.0
25	9.0	10	12	10	48	21	105	9.4	37	2.5	2.1	2.0
26	7.8	9.4	13	16	44	18	80	9.0	11	2.3	2.3	7.8
27	7.0	10	12	15	38	26	39	8.6	7.4	2.1	2.7	8.2
28	6.4	13	12	14	32	34	27	8.2	5.8	7.8	2.3	4.2
29	6.1	19	11	13	28	26	21	11	5.5	77	2.1	3.4
30	5.8	52	14	13	---	23	17	11	12	12	2.1	2.9
31	5.8	---	15	12	---	20	---	14	---	6.4	2.0	---
TOTAL	206.6	350.7	655	354.7	1496	1425	631.2	910.0	249.4	201.0	109.1	88.4
MEAN	6.66	11.7	21.1	11.4	51.6	46.0	21.0	29.4	8.31	6.48	3.52	2.95
MAX	9.8	52	82	16	173	174	105	197	37	77	11	8.2
MIN	5.5	6.1	11	9.2	11	17	9.4	8.2	2.7	2.1	2.0	1.6
CFSM	.38	.67	1.21	.65	2.95	2.63	1.20	1.68	.47	.37	.20	.17
IN.	.44	.75	1.39	.75	3.18	3.03	1.34	1.93	.53	.43	.23	.19

CAL YR 1975 TOTAL 6295.9 MEAN 17.2 MAX 260 MIN 1.5 CFSM .98 IN 13.38
WTR YR 1976 TOTAL 6677.1 MEAN 18.2 MAX 197 MIN 1.6 CFSM 1.04 IN 14.19

04166500 RIVER ROUGE AT DETROIT, MI

LOCATION.--Lat 42°22'20", long 83°15'20", in SW¼ sec.27, T.1 S., R.10 E., Wayne County, Hydrologic Unit 04090004, on right bank 500 ft (152 m) upstream from bridge on Plymouth Road in Detroit, and 4 mi (6 km) upstream from Middle River Rouge.

DRAINAGE AREA.--187 mi^2 (484 km^2).

PERIOD OF RECORD.--October 1930 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1034: 1933(M). WSP 1054: 1939, 1943, 1945(M). WSP 1437: 1931-32, 1934, 1936(M), 1937-38, 1944(M), 1945. WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 584.00 ft (178.003 m) above mean sea level. Prior to Oct. 16, 1948, nonrecording gage at site 1 mi (2 km) downstream at datum 4.6 ft (1.4 m) lower.

REMARKS.--Records good. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--46 years, 113 ft^3/s (3.200 m^3/s), 8.21 in/yr (209 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,000 ft^3/s (368 m^3/s) Apr. 5, 1947; maximum gage height, 23.0 ft (7.01 m) Apr. 6, 1947, from floodmark, site and datum then in use; minimum discharge, 1.8 ft^3/s (0.051 m^3/s) Aug. 1, 2, 1964, gage height, 3.00 ft (0.914 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,200 ft^3/s (34.0 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 17	1400	1,870	53.0	13.69	4.173	Apr. 26	0100	1,480	41.9	12.61	3.844
Feb. 22	1300	1,810	51.3	13.56	4.133	May 7	1100	3,060	86.7	16.07	4.898
Mar. 3	1000	2,400	68.0	14.91	4.545	July 29	0900	*3,330	94.3	*16.52	5.035

Minimum discharge, 21 ft^3/s (0.59 m^3/s) July 28; minimum gage height, 3.87 ft (1.180 m) Sept. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	88	42	287	127	102	232	146	136	112	146	79	28
2	67	44	156	111	100	1110	161	176	89	96	61	31
3	58	53	126	114	98	2180	154	169	79	82	51	30
4	54	92	108	111	96	1730	141	137	70	81	45	31
5	53	62	107	103	96	1450	132	118	64	62	43	30
6	48	51	297	98	97	1030	152	686	60	78	69	30
7	45	60	284	94	96	406	150	2530	57	74	63	30
8	45	81	154	87	97	294	128	1100	56	96	45	31
9	72	62	136	87	106	241	119	319	51	55	38	139
10	65	324	141	82	119	226	113	224	48	66	35	191
11	49	193	131	92	286	228	115	188	45	54	33	67
12	44	98	143	95	300	247	113	163	96	43	32	44
13	43	79	230	95	515	454	106	140	67	36	153	39
14	42	71	422	92	502	293	104	126	50	36	144	34
15	46	62	914	90	409	231	101	129	46	34	62	49
16	44	59	421	103	1010	207	403	391	162	38	46	59
17	42	57	207	88	1720	192	161	400	81	38	38	53
18	51	55	139	91	1150	178	120	245	58	30	35	43
19	76	54	120	91	813	179	110	167	331	29	33	38
20	75	60	101	98	388	173	102	139	180	32	30	67
21	58	99	103	98	691	165	120	124	81	72	31	50
22	49	82	106	95	1700	156	177	111	64	43	32	46
23	45	66	104	91	798	145	153	105	57	32	30	41
24	42	58	100	92	335	141	159	100	235	40	29	36
25	90	84	101	90	284	173	934	95	828	34	28	32
26	88	96	100	130	251	152	1120	91	173	28	45	126
27	57	110	102	139	225	174	345	86	97	26	64	196
28	50	152	98	128	196	252	210	77	93	77	41	66
29	45	176	81	119	178	182	167	100	76	2720	35	44
30	44	396	130	112	---	168	139	111	308	835	30	39
31	40	---	168	108	---	158	---	152	---	118	29	---
TOTAL	1715	2978	5817	3151	12758	13147	6355	8835	3814	5231	1529	1740
MEAN	55.3	99.3	188	102	440	424	212	285	127	169	49.3	58.0
MAX	90	396	914	139	1720	2180	1120	2530	828	2720	153	196
MIN	40	42	81	82	96	141	101	77	45	26	28	28
CFSM	.30	.53	1.01	.55	2.35	2.27	1.13	1.52	.68	.90	.26	.31
IN.	.34	.59	1.16	.63	2.54	2.62	1.26	1.76	.76	1.04	.30	.35

CAL YR 1975 TOTAL 61838 MEAN 169 MAX 2290 MIN 14 CFSM .90 IN 12.30
WTR YR 1976 TOTAL 67070 MEAN 183 MAX 2720 MIN 26 CFSM .98 IN 13.34

04167000 MIDDLE RIVER ROUGE NEAR GARDEN CITY, MI

LOCATION.--Lat 42°20'55", long 83°18'45", in SW¼ NW¼ sec.6, T.2 S., R.10 E., Wayne County, Hydrologic Unit 04090004, on right bank 200 ft (61 m) downstream from bridge on Inkster Road, 1.8 mi (2.9 km) northeast of Garden City, and 6.0 mi (9.7 km) upstream from mouth.

DRAINAGE AREA.--99.9 mi^2 (258.7 km^2).

PERIOD OF RECORD.--October 1930 to September 1933 (published as "at Detroit"), June 1947 to current year. Monthly discharge only for October, November 1930, published in WSP 1307.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 600.95 ft (183.170 m) above mean sea level. Nov. 21, 1930 to Sept. 30, 1933, nonrecording gage at site 4.8 mi (7.7 km) downstream at datum 17.48 ft (5.328 m) lower. June 6, 1947 to Oct. 18, 1948, nonrecording gage at site 200 ft (61 m) upstream at present datum.

REMARKS.--Records good except those for period of no gage-height record, Nov. 24 to Mar. 17, which are poor. Occasional regulation by reservoirs above station since 1956. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--32 years, 69.1 ft^3/s (1.957 m^3/s), 9.39 in/yr (239 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,330 ft^3/s (66.0 m^3/s) June 26, 1968; maximum gage height, 10.50 ft (3.200 m) May 10, 1948; minimum discharge, 0.9 ft^3/s (0.025 m^3/s) Aug. 16, 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 700 ft^3/s (19.8 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	unknown	828	23.4	8.11	2.472	Mar. 3	--	1,200	34.0	unknown	
Feb. 17	unknown	1,370	38.8	9.14	2.786	Apr. 25	1500	770	21.8	7.83	2.387
Feb. 22	--	1,100	31.2	unknown		May 7	1200	*1,670	47.3	*9.36	2.853

Minimum discharge, 17.0 ft^3/s (0.48 m^3/s) Sept. 5, 6, 7, 8; minimum gage height, 1.78 ft (0.543 m) Sept. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67	32	200	120	71	300	152	128	73	77	35	22
2	55	31	150	110	68	800	174	136	66	57	30	22
3	45	39	120	120	65	1100	155	128	60	50	28	21
4	43	48	110	110	62	950	150	107	57	44	27	20
5	40	43	100	94	60	800	132	100	53	39	37	19
6	37	38	200	82	60	500	148	544	48	75	32	18
7	34	55	210	76	60	330	136	1390	46	54	26	18
8	34	59	140	76	60	290	123	809	45	40	25	19
9	55	44	130	72	60	270	112	401	43	40	24	105
10	43	224	140	68	100	250	111	236	42	39	24	82
11	42	144	130	72	200	240	113	182	43	36	25	35
12	37	105	150	70	230	290	100	147	44	34	25	26
13	37	83	200	68	300	400	103	127	43	30	131	23
14	39	70	340	74	410	250	108	113	42	28	61	25
15	40	60	620	70	400	220	107	113	42	28	39	62
16	38	56	520	75	700	200	329	244	62	28	30	43
17	36	55	200	100	1100	180	184	339	65	29	27	38
18	46	51	130	76	800	162	143	261	51	28	25	27
19	64	50	120	66	550	166	118	182	177	26	24	24
20	51	59	110	70	360	164	109	134	104	33	24	51
21	47	83	105	70	600	157	160	111	62	52	24	35
22	41	62	100	68	1000	138	136	95	47	33	23	30
23	38	53	95	68	450	133	96	82	44	28	23	30
24	34	49	90	66	350	135	143	75	165	29	23	24
25	64	60	80	65	300	173	631	74	309	24	23	22
26	52	70	87	110	270	149	589	72	133	23	45	112
27	38	80	93	130	250	198	351	70	71	24	57	125
28	35	90	93	110	240	219	225	68	65	35	28	45
29	35	110	90	95	230	190	169	84	54	354	25	33
30	32	250	120	84	---	183	137	72	238	96	21	28
31	30	---	130	77	---	166	---	95	---	48	21	---
TOTAL	1329	2253	5103	2612	9406	9703	5444	6719	2394	1561	1012	1184
MEAN	42.9	75.1	165	84.3	324	313	181	217	79.8	50.4	32.6	39.5
MAX	67	250	620	130	1100	1100	631	1390	309	354	131	125
MIN	30	31	80	65	60	133	96	68	42	23	21	18
CFSM	.43	.75	1.65	.84	3.24	3.13	1.81	2.17	.80	.50	.33	.40
IN.	.49	.84	1.90	.97	3.50	3.61	2.03	2.50	.89	.58	.38	.44

CAL YR 1975 TOTAL 39425 MEAN 108 MAX 936 MIN 18 CFSM 1.08 IN 14.68
WTR YR 1976 TOTAL 48720 MEAN 133 MAX 1390 MIN 18 CFSM 1.33 IN 18.14

04168000 LOWER RIVER ROUGE AT INKSTER, MI

LOCATION.--Lat 42°18'00", long 83°18'00", in SW¼ SE¼ sec.19, T.2 S., R.10 E., Wayne County, Hydrologic Unit 04090004, on right bank 10 ft (3 m) downstream from bridge on John Daly Road, 0.6 mi (1.0 km) northeast of Inkster, and 4.8 mi (7.7 km) upstream from mouth.

DRAINAGE AREA.--83.2 mi^2 (215.5 km^2).

PERIOD OF RECORD.--June 1947 to current year.

REVISED RECORDS.--WSP 1174: 1948(M). WSP 1437: 1949. WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 593.14 ft (180.789 m) above mean sea level. Prior to Oct. 20, 1948, nonrecording gage at same site and datum.

REMARKS.--Records good. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--29 years, 51.3 ft^3/s (1.453 m^3/s), 8.37 in/yr (213 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,600 ft^3/s (102 m^3/s) June 26, 1968, gage height, 13.62 ft (4.151 m); minimum, 0.2 ft^3/s (0.006 m^3/s) Sept. 13, 1955, Jan. 23, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 900 ft^3/s (25.5 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 16	0400	1,010	28.6	9.24	2.816	Mar. 3	1300	1,400	39.6	10.91	3.325
Feb. 17	1900	*1,910	54.1	*11.50	3.505	Apr. 26	0600	920	26.1	8.87	2.704
Feb. 22	1400	1,210	34.3	10.18	3.103	May 7	1700	1,870	53.0	11.24	3.426

Minimum discharge, 1.4 ft^3/s (0.040 m^3/s) Sept. 2, 3, 6, 7; minimum gage height, 2.65 ft (0.808 m) Sept. 2, 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	7.3	240	57	19	108	40	47	25	39	2.4	1.7
2	22	7.0	93	54	17	738	46	51	20	18	2.4	1.6
3	16	9.1	58	59	16	1240	40	45	18	14	2.2	1.6
4	14	11	44	44	16	912	36	36	15	11	2.2	1.7
5	13	11	41	45	15	771	31	32	14	7.2	2.5	1.6
6	11	10	158	29	15	473	32	407	12	33	2.6	1.6
7	9.7	18	173	33	15	155	33	1430	11	37	2.2	1.5
8	9.2	18	79	30	15	86	24	591	9.7	17	2.2	1.6
9	25	18	72	24	20	65	21	172	10	5.8	2.1	104
10	16	171	77	18	30	57	19	100	8.6	5.1	2.2	41
11	17	147	74	20	130	51	19	73	7.6	4.4	2.2	7.7
12	13	62	88	19	174	75	17	50	6.7	2.9	2.3	3.6
13	13	45	144	18	419	200	16	41	6.7	2.7	68	2.3
14	15	32	396	21	513	104	16	36	5.7	2.2	40	2.7
15	14	24	774	19	498	78	16	42	6.5	1.9	5.2	6.6
16	13	20	633	21	962	70	140	139	16	2.1	3.2	24
17	12	18	194	28	1610	58	65	292	4.2	1.8	2.6	34
18	15	16	87	19	1110	50	35	158	6.1	2.1	2.4	12
19	29	14	59	16	609	53	25	76	55	1.7	2.0	6.4
20	19	17	42	18	258	52	20	49	16	23	1.8	52
21	16	29	34	18	458	49	40	39	7.4	72	1.9	9.8
22	13	24	33	17	1060	39	45	30	5.8	13	1.7	4.6
23	14	16	30	17	370	36	34	26	5.6	4.9	2.0	5.4
24	16	14	29	17	166	37	77	25	90	5.5	2.0	3.0
25	44	32	25	16	142	61	656	23	116	4.8	1.8	2.6
26	25	36	28	25	102	45	668	20	30	2.8	1.8	58
27	17	55	30	43	74	67	208	19	14	2.6	2.0	62
28	13	96	30	34	48	85	109	19	35	6.1	1.9	15
29	12	160	29	27	35	58	73	25	12	23	1.9	5.7
30	9.5	419	50	23	---	54	53	22	167	8.1	1.7	3.8
31	8.4	---	62	20	---	45	---	40	---	3.1	1.6	---
TOTAL	519.8	1556.4	3906	849	8916	5972	2654	4155	756.6	377.8	173.0	479.1
MEAN	16.8	51.9	126	27.4	307	193	88.5	134	25.2	12.2	5.58	16.0
MAX	44	419	774	59	1610	1240	668	1430	167	72	68	104
MIN	8.4	7.0	25	16	15	36	16	19	4.2	1.7	1.6	1.5
CFSM	.20	.62	1.51	.33	3.69	2.32	1.06	1.61	.30	.15	.07	.19
IN.	.23	.70	1.75	.38	3.99	2.67	1.19	1.86	.34	.17	.08	.21

CAL YR 1975 TOTAL 26443.2 MEAN 72.4 MAX 900 MIN 1.9 CFSM .87 IN 11.82
WTR YR 1976 TOTAL 30314.7 MEAN 82.8 MAX 1610 MIN 1.5 CFSM 1.00 IN 13.55

04170000 HURON RIVER AT MILFORD, MI

LOCATION.--Lat 42°34'44", long 83°37'36", in NE¼ sec.16, T.2 N., R.7 E., Oakland County, Hydrologic Unit 04090005, on left bank 40 ft (12 m) downstream from bridge on General Motors Road, 0.5 mi (0.8 km) downstream from Sherwood Creek, and 0.5 mi (0.8 km) west of Milford.

DRAINAGE AREA.--132 mi^2 (342 km^2).

PERIOD OF RECORD.--September 1948 to current year.

REVISED RECORDS.--WSP 1337: 1952(m). WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 880.00 ft (268.224 m) above mean sea level. Prior to Apr. 1, 1970, at site 240 ft (73 m) upstream at same datum.

REMARKS.--Records good. Flow below about 300 ft^3/s (8.50 m^3/s) regulated by powerplant 1.5 mi (2.4 km) above station prior to May 20, 1957; occasional regulation for lake level control since. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--28 years, 98.8 ft^3/s (2.798 m^3/s), 10.16 in/yr (258 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 645 ft^3/s (18.3 m^3/s) Apr. 5, 1950; maximum gage height, 8.26 ft (2.518 m) June 28, 1968; minimum daily discharge, 5.2 ft^3/s (0.15 m^3/s) Oct. 21, 1971.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 505 ft^3/s (14.3 m^3/s) Mar. 6, gage height, 7.56 ft (2.304 m); minimum, 6.1 ft^3/s (0.17 m^3/s) June 15; minimum gage height, 4.05 ft (1.234 m) June 14, 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	164	108	181	152	124	306	241	209	119	128	44	41
2	153	108	167	149	118	342	244	218	114	122	47	41
3	141	112	154	146	119	405	240	226	103	113	46	37
4	134	115	151	140	119	455	231	231	96	109	44	40
5	126	112	146	140	119	488	219	223	93	98	40	40
6	116	109	178	134	117	502	213	245	93	91	51	38
7	115	127	190	134	115	482	212	347	88	81	60	34
8	112	146	180	130	114	450	203	393	83	79	62	36
9	117	138	175	124	113	409	196	367	75	76	58	42
10	119	153	176	123	114	381	187	332	72	78	51	50
11	111	157	182	122	129	359	185	311	71	79	47	46
12	107	144	173	122	131	359	179	308	72	76	46	43
13	102	135	174	122	143	363	166	289	70	72	56	48
14	99	127	202	127	150	363	158	275	46	68	61	55
15	99	120	237	127	161	347	153	264	27	66	54	49
16	97	116	243	128	203	328	171	285	52	49	50	48
17	98	112	221	124	247	308	175	293	52	39	47	46
18	97	111	192	120	278	296	164	280	48	37	50	44
19	109	109	174	120	300	274	153	262	70	45	49	42
20	115	115	168	120	306	272	142	245	85	50	47	44
21	113	123	166	121	317	287	136	231	76	56	47	44
22	111	122	155	122	359	301	135	217	73	48	43	42
23	111	118	155	119	379	286	136	200	71	45	41	41
24	111	116	150	124	355	275	136	186	78	52	40	41
25	114	123	146	121	332	268	198	173	116	52	38	40
26	115	124	148	126	328	252	273	161	113	49	41	53
27	111	130	151	128	326	250	276	146	104	47	46	69
28	105	132	148	125	313	276	252	133	98	46	44	59
29	102	136	144	125	304	269	236	129	95	54	41	54
30	105	169	154	125	---	260	222	121	119	58	37	54
31	110	---	156	125	---	249	---	120	---	47	36	---
TOTAL	3539	3767	5337	3965	6233	10462	5832	7420	2472	2110	1464	1361
MEAN	114	126	172	128	215	337	194	239	82.4	68.1	47.2	45.4
MAX	164	169	243	152	379	502	276	393	119	128	62	69
MIN	97	108	144	119	113	249	135	120	27	37	36	34
CFSM	.86	.95	1.30	.97	1.63	2.55	1.47	1.81	.62	.52	.36	.34
IN.	1.00	1.06	1.50	1.12	1.76	2.95	1.64	2.09	.70	.59	.41	.38

CAL YR 1975 TOTAL 52459 MEAN 144 MAX 432 MIN 25 CFSM 1.09 IN 14.78
WTR YR 1976 TOTAL 53962 MEAN 147 MAX 502 MIN 27 CFSM 1.11 IN 15.21

04170500 HURON RIVER NEAR NEW HUDSON, MI

LOCATION.--Lat 42°30'45", long 83°40'35", in NE¼ sec.1, T.1 N., R.6 E., Livingston County, Hydrologic Unit 04090005, on right bank 150 ft (46 m) downstream from Kent Lake Dam, 2 mi (3 km) upstream from Woodruff Creek, and 3 mi (5 km) west of New Hudson.

DRAINAGE AREA.--148 mi^2 (383 km^2).

PERIOD OF RECORD.--August 1948 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 868.00 ft (264.566 m) above mean sea level.

REMARKS.--Records good. Occasional regulation by Kent Lake. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--28 years, 159 ft^3/s (4.503 m^3/s), 10.28 in/yr (261 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,080 ft^3/s (30.6 m^3/s) Dec. 29, 1950, gage height, 5.05 ft (1.539 m), from rating curve extended above 600 ft^3/s (17.0 m^3/s); minimum, 2.6 ft^3/s (0.074 m^3/s) May 27, 1963, gage height, 0.53 ft (0.162 m); minimum daily, 6.4 ft^3/s (0.18 m^3/s) May 7, 1963.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 406 ft^3/s (11.5 m^3/s) Mar. 7, gage height, 3.20 ft (0.975 m); maximum gage height, 3.26 ft (0.994 m) Nov. 2; minimum, 28 ft^3/s (0.79 m^3/s) Aug. 5; minimum gage height, 1.07 ft (0.326 m) Mar. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	157	142	301	185	140	295	250	231	151	151	37	40
2	154	222	254	180	136	326	257	225	142	140	35	43
3	147	217	222	175	138	353	258	227	135	133	32	36
4	145	182	202	170	137	321	254	226	130	130	32	38
5	138	164	191	165	138	244	236	216	126	122	32	39
6	133	154	202	160	138	352	236	257	122	114	39	35
7	130	154	204	158	139	397	238	298	118	105	41	33
8	129	162	205	153	139	403	232	320	115	98	46	35
9	134	223	204	145	136	289	212	327	110	86	53	40
10	132	236	198	141	137	232	203	316	104	79	50	55
11	132	217	205	141	143	186	207	300	101	82	45	52
12	130	191	210	138	150	166	194	280	101	79	43	50
13	127	179	200	137	157	262	189	265	94	70	58	49
14	126	169	200	138	162	300	182	250	91	69	73	52
15	126	200	232	130	171	319	189	245	74	70	69	62
16	126	212	238	132	194	322	200	245	77	64	61	66
17	132	181	237	134	230	311	195	240	79	51	54	68
18	132	202	227	131	261	303	191	235	78	42	50	61
19	133	218	222	126	283	297	182	230	97	38	49	59
20	137	185	213	125	292	290	169	225	104	39	50	65
21	138	176	203	127	314	302	162	220	105	52	52	61
22	140	171	200	128	338	312	158	215	102	46	53	59
23	138	166	195	129	346	309	168	210	101	39	53	59
24	152	221	190	131	345	293	170	200	110	41	44	57
25	184	230	185	132	336	297	210	195	128	36	39	59
26	143	195	180	136	289	282	237	185	129	34	41	76
27	115	187	180	136	181	280	254	173	124	35	45	96
28	124	178	180	138	234	305	255	164	129	35	47	92
29	130	174	185	139	277	311	247	163	122	47	45	85
30	128	250	185	139	---	269	236	155	146	46	37	86
31	127	---	185	140	---	237	---	151	---	44	34	---
TOTAL	4219	5758	6435	4439	6081	9165	6371	7189	3345	2217	1439	1708
MEAN	136	192	208	143	210	296	212	232	112	71.5	46.4	56.9
MAX	184	250	301	185	346	403	258	327	151	151	73	96
MIN	115	142	180	125	136	166	158	151	74	34	32	33
CFSM	.92	1.30	1.41	.97	1.42	2.00	1.43	1.57	.76	.48	.31	.38
IN.	1.06	1.45	1.62	1.12	1.53	2.30	1.60	1.81	.84	.56	.36	.43

CAL YR 1975 TOTAL 57724 MEAN 158 MAX 351 MIN 39 CFSM 1.07 IN 14.51
WTR YR 1976 TOTAL 58366 MEAN 159 MAX 403 MIN 32 CFSM 1.07 IN 14.67

04172000 HURON RIVER NEAR HAMBURG, MI

LOCATION.--Lat 42°27'55", long 83°48'00", in sec.24, T.1 N., R.5 E., Livingston County, Hydrologic Unit 04090005, on right bank at downstream side of bridge on Hamburg Road, 1.1 mi (1.8 km) north of Hamburg, and 3 mi (5 km) upstream from Strawberry Lake.

DRAINAGE AREA.--308 mi^2 (798 km^2).

PERIOD OF RECORD.--October 1951 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 850.00 ft (259.080 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to Aug. 12, 1953, nonrecording gage at same site and datum.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, Feb. 9 to Mar. 14, which are fair. Occasional regulation by Kent Lake, 11 mi (18 km) above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--25 years, 211 ft^3/s (5.976 m^3/s), 9.30 in/yr (236 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,560 ft^3/s (44.2 m^3/s) May 15, 1956; maximum gage height, 8.46 ft (2.579 m) June 30, 1968; minimum discharge, 32 ft^3/s (0.91 m^3/s) July 2, 3, 1965; minimum gage height, 3.16 ft (0.963 m) Aug. 1-3, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 880 ft^3/s (24.9 m^3/s) Mar. 8, based on runoff correlations with nearby stations; maximum gage height recorded, 6.52 ft (1.987 m) May 10; minimum discharge, 78 ft^3/s (2.21 m^3/s) Sept. 1; minimum gage height, 3.60 ft (1.097 m) Sept. 8, 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	285	176	328	230	230	500	538	534	316	340	108	79
2	270	202	392	220	230	600	520	514	308	346	102	81
3	255	254	421	220	230	700	512	496	299	339	96	81
4	240	292	402	215	230	750	508	476	288	323	93	82
5	225	287	371	210	230	700	498	457	280	304	91	82
6	215	258	361	210	230	530	485	471	271	285	91	81
7	210	241	355	210	235	740	468	536	266	264	89	82
8	205	238	357	210	235	840	456	609	263	247	91	81
9	200	239	361	215	240	870	446	686	259	226	94	84
10	200	272	358	215	240	670	432	719	252	209	97	95
11	205	318	355	215	250	520	415	715	242	193	97	99
12	200	331	353	215	265	420	397	681	236	179	97	100
13	200	320	360	215	275	350	383	639	230	166	97	98
14	195	294	374	215	285	540	369	601	225	154	116	97
15	190	266	403	215	300	643	361	574	218	148	130	99
16	195	262	428	215	330	657	376	554	208	143	129	106
17	190	280	461	215	410	657	388	543	201	135	124	112
18	195	277	472	215	490	637	392	532	199	124	117	111
19	200	268	430	215	550	615	388	515	216	115	110	106
20	209	285	410	215	590	596	375	494	239	108	106	104
21	212	289	390	215	640	594	361	472	252	114	103	103
22	213	275	360	220	680	591	357	450	252	118	101	102
23	210	257	340	220	720	591	347	435	249	117	100	100
24	205	243	320	220	750	588	352	419	261	114	95	96
25	214	260	300	220	740	583	401	400	301	108	91	95
26	236	292	280	220	720	567	456	378	318	105	88	104
27	224	300	270	225	620	567	507	357	318	101	90	133
28	193	286	260	225	500	572	548	341	309	99	92	146
29	184	275	250	225	400	575	563	328	300	106	89	143
30	181	294	245	230	---	586	551	323	320	113	85	137
31	177	---	240	230	---	577	---	322	---	114	81	---
TOTAL	6533	8131	11007	6755	11845	18926	13150	15571	7896	5557	3090	3019
MEAN	211	271	355	218	408	611	438	502	263	179	99.7	101
MAX	285	331	472	230	750	870	563	719	320	346	130	146
MIN	177	176	240	210	230	350	347	322	199	99	81	79
CFSM	.69	.88	1.15	.71	1.32	1.98	1.42	1.63	.85	.58	.32	.33
IN.	.79	.98	1.33	.82	1.43	2.29	1.59	1.88	.95	.67	.37	.36

CAL YR 1975 TOTAL 109400 MEAN 300 MAX 688 MIN 86 CFSM .97 IN 13.21
WTR YR 1976 TOTAL 111480 MEAN 305 MAX 870 MIN 79 CFSM .99 IN 13.46

04173000 HURON RIVER NEAR DEXTER, MI

LOCATION.--Lat 42°23'10", long 83°54'40", in S½ sec.13, T.1 S., R.4 E., Washtenaw County, Hydrologic Unit 04090005, on right bank 20 ft (6 m) downstream from bridge on North Territorial Road, 0.5 mi (0.8 km) east of Hudson Mills, 2.0 mi (3.2 km) downstream from Portage Lake Outlet and 4.0 mi (6.4 km) north of Dexter.

DRAINAGE AREA.--522 mi^2 (1,352 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August to December 1904 (gage heights only), March 1946 to September 1972, Water years 1973-75 (annual maximum only), October 1975 to September 1976. Published as "at Dover" 1904.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 837.11 ft (255.151 m) above mean sea level (levels by Michigan Department of Natural Resources). August to December 1904, nonrecording gage at site 1.0 mi (1.6 km) upstream at different datum. Mar. 5, 1946, to July 30, 1953, nonrecording gage at present site and datum. October 1, 1972, to September 30, 1975, crest-stage gage at same site and datum.

REMARKS.--Water-discharge record fair. No gage-height record Dec. 10 to Jan. 21, Feb. 15 to Mar. 21. Occasional regulation by lake level control operations above station.

AVERAGE DISCHARGE.--27 years, (water years 1947-72, 1976) 352 ft^3/s (9.969 m^3/s), 9.16 in/yr (233 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,120 ft^3/s (88.4 m^3/s) Apr. 9, 1947, gage height, 8.17 ft (2.490 m), from graph based on gage readings; minimum, 33 ft^3/s (0.93 m^3/s) Apr. 12, 1972, gage height, 2.05 ft (0.625 m).

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 2,500 ft^3/s (70.8 m^3/s) Mar. 5; minimum, 47 ft^3/s (1.33 m^3/s) Oct. 8, gage height, 2.33 ft (0.710 m); minimum daily, 98 ft^3/s (2.78 m^3/s) Sept. 4-8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	480	241	506	490	340	1300	859	882	511	512	138	109
2	326	234	500	490	340	1600	891	939	529	373	136	106
3	321	251	555	490	330	2200	796	811	374	474	132	100
4	338	281	633	450	330	2300	786	732	325	410	129	98
5	262	368	645	400	330	2500	712	816	381	415	126	98
6	342	455	621	400	330	2300	817	965	421	407	125	98
7	455	386	591	400	330	2200	821	710	228	332	121	98
8	189	382	567	360	330	2000	588	1130	230	321	117	98
9	195	373	567	391	347	1900	699	1260	315	278	115	105
10	186	435	560	386	410	1800	676	1200	270	307	117	118
11	368	470	560	380	475	1600	769	1010	233	328	116	115
12	351	460	560	380	425	1500	447	1110	215	256	118	113
13	269	400	560	380	430	1400	451	1130	228	218	136	114
14	301	511	700	380	440	1300	716	935	218	228	163	115
15	301	455	800	380	700	1200	564	1010	188	181	166	119
16	237	405	780	380	1200	1100	573	790	263	171	168	126
17	203	386	760	380	1600	1100	527	906	186	156	169	130
18	360	382	740	370	1700	1100	619	918	167	157	170	131
19	203	378	720	370	1900	1100	565	799	401	159	167	130
20	115	382	700	370	1600	1000	518	748	182	161	163	134
21	186	396	680	360	1900	1000	596	660	174	171	157	132
22	342	435	640	360	2300	997	492	731	262	165	153	130
23	248	430	580	350	2100	992	491	679	270	165	159	130
24	192	386	500	351	1900	984	829	610	428	163	154	125
25	506	364	530	338	1800	937	751	560	332	156	152	124
26	347	347	560	334	1700	907	802	515	293	149	150	207
27	223	373	540	330	1600	946	870	515	335	147	153	210
28	277	391	520	330	1500	945	861	440	323	197	151	107
29	355	460	470	347	1400	945	872	469	312	264	145	129
30	342	522	490	340	---	945	909	480	534	122	123	144
31	273	---	490	340	---	814	---	478	---	136	112	---
TOTAL	9093	11739	18625	11807	30087	42912	20867	24938	9128	7679	4401	3693
MEAN	293	391	601	381	1037	1384	696	804	304	248	142	123
MAX	506	522	800	490	2300	2500	909	1260	534	512	170	210
MIN	115	234	470	330	330	814	447	440	167	122	112	98
CFSM	.56	.75	1.15	.73	1.99	2.65	1.33	1.54	.58	.48	.27	.24
IN.	.65	.84	1.33	.84	2.14	3.06	1.49	1.78	.65	.55	.31	.26

WTR YR 1976 TOTAL 194969 MEAN 533 MAX 2500 MIN 98 CFSM 1.02 IN 13.89

04173000 HURON RIVER NEAR DEXTER, MI--CONTINUED

WATER-QUALITY RECORDS

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

COOPERATION.--Bimonthly samples were collected by the U.S. Geological Survey and were analyzed for nutrients, coliforms, and BOD by Washtenaw County Health Department.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	COMPLETE COLIFORM (MPN)	FECAL COLIFORM (EC BROTH) (MPN)	HARDNESS (CA,MG) (MG/L)
NOV 19...	1300	373	510	7.8	10.0	--	12.1	110	2.0	930	<30	--
JAN 22...	1400	360	620	8.1	.0	--	16.0	113	2.9	230	<30	--
MAR 22...	1555	999	484	8.3	5.0	18	10.2	82	1.1	430	<30	230
MAY 27...	1330	511	502	8.3	18.0	--	9.8	107	1.0	430	<30	--
JUL 15...	1155	186	515	8.3	25.5	--	9.1	115	1.3	4600	90	--
AUG 17...	1600	170	550	8.3	25.0	13	9.0	112	.9	930	<30	250

DATE	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV 19...	--	--	--	--	--	270	0	221	--	--	--
JAN 22...	--	--	--	--	--	280	0	230	--	--	--
MAR 22...	41	65	17	13	1.9	230	0	189	41	25	.1
MAY 27...	--	--	--	--	--	256	0	210	--	--	--
JUL 15...	--	--	--	--	--	212	0	174	--	--	--
AUG 17...	64	64	23	17	1.6	227	0	186	44	33	.2

04173000 HURON RIVER NEAR DEXTER, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)
NOV 19...	--	--	.03	.02	--	--	.02	--	--	--	.00
JAN 22...	--	--	.07	.02	--	--	.02	--	--	--	.02
MAR 22...	5.3	294	--	.01	--	--	.01	--	--	--	.03
MAY 27...	--	--	.01	.01	--	--	.02	--	--	--	.00
JUL 15...	--	--	.00	.01	--	--	.01	--	--	--	.00
AUG 17...	7.0	378	.03	.01	.04	.03	.05	.40	.45	.49	.14

DATE	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
NOV 19...	.00	--	--	--	--	--	--	--	--	.00
JAN 22...	.02	--	--	--	--	--	--	--	--	.00
MAR 22...	.01	.01	--	--	--	30	--	10	--	.00
MAY 27...	.00	--	--	--	--	--	--	--	--	.00
JUL 15...	.00	--	--	--	--	--	--	--	--	.00
AUG 17...	.01	.01	1	1	0	50	19	10	<.5	.00

04173254 MILL CREEK NEAR LIMA CENTER, MI

LOCATION.--Lat 42°16'54", long 83°55'22", in NE¼ sec.26, T.2 S., R.4 E., Washtenaw County, Hydrologic Unit 04090005, at bridge on Jerusalem Road, 0.3 mi (0.5 km) upstream from North Fork Mill Creek, 2.0 mi (3.2 km) southeast of Lima Center, 2.1 mi (3.4 km) upstream from gaging station near Dexter, and 6.2 mi (10 km) upstream from Huron River.

DRAINAGE AREA.--59.8 mi^2 (154.9 km^2).

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

REMARKS.--Estimates of water discharge are based on current records of streamflow at the gaging station near Dexter and previous records of streamflow at the discontinued partial-record station, North Fork Mill Creek near Lima Center.

COOPERATION.--Bimonthly samples were collected by the U.S. Geological Survey and were analyzed for nutrients, coliforms, and BOD by Washtenaw County Health Department.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	COMPLETE COLIFORM (MPN)	FECAL COLIFORM (EC BROTH) (MPN)	HARDNESS (CA,MG) (MG/L)
NOV 19...	1515	E23	700	7.9	9.0	--	13.6	120	.3	46000	1500	--
JAN 22...	1600	E25	760	7.9	.0	--	13.2	93	2.5	1500	90	--
MAR 23...	1030	E44	635	7.9	5.0	24	12.2	98	1.4	11000	930	340
MAY 27...	1525	E26	684	8.3	18.5	--	11.6	130	1.4	430	<30	--
JUL 15...	1405	E19	650	8.2	25.0	--	10.2	128	.8	11000	430	--
AUG 24...	0930	E13	681	7.7	15.5	11	3.5	36	.9	11000	750	340

DATE	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV 19...	--	--	--	--	--	380	0	312	--	--	--
JAN 22...	--	--	--	--	--	362	0	297	--	--	--
MAR 23...	87	100	22	10	2.0	308	0	253	80	24	.2
MAY 27...	--	--	--	--	--	359	0	294	--	--	--
JUL 15...	--	--	--	--	--	286	0	235	--	--	--
AUG 24...	70	90	27	9.3	2.5	324	0	266	68	17	.3

04173254 MILL CREEK NEAR LIMA CENTER, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)
NOV 19...	--	--	.02	.01	--	--	.01	--	--	--	.00	.00
JAN 22...	--	--	.10	.02	--	--	.01	--	--	--	.01	.01
MAR 23...	6.8	407	.09	.01	--	--	.02	--	--	--	.03	.01
MAY 27...	--	--	.04	.01	--	--	.01	--	--	--	.01	.01
JUL 15...	--	--	.01	.02	--	--	.01	--	--	--	.00	.00
AUG 24...	14	465	.11	.02	.13	.13	.02	.36	.38	.51	.07	.02

DATE	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
NOV 19...	--	--	--	--	--	--	--	--	--	--	--	.00
JAN 22...	--	--	--	--	--	--	--	--	--	--	--	.00
MAR 23...	.01	--	--	--	30	--	80	--	--	--	--	.00
MAY 27...	--	--	--	--	--	--	--	--	--	--	--	.00
JUL 15...	--	--	--	--	--	--	--	--	--	--	--	.00
AUG 24...	.01	0	1	1	80	8	40	<.5	9	0	10	.00

04173310 NORTH FORK MILL CREEK NEAR CHELSEA, MI

LOCATION.--Lat 42°19'34", long 84°00'57", in SE¼ sec.1, T.2 S., R.3 E., Washtenaw County, Hydrologic Unit 04090005, at bridge on McKinley Road, 0.4 mi (0.6 km) upstream from Letts Creek, 0.5 mi (0.8 km) north of Chelsea, and 6.6 mi (11 km) upstream from Mill Creek.

DRAINAGE AREA.--14.6 mi^2 (37.8 km^2).

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

COOPERATION.--Bimonthly samples were collected by the U.S. Geological Survey and were analyzed for nutrients, coliforms, and BOD by Washtenaw County Health Department.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STAGE (FT ABOVE DATUM)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	COMPLETE COLIFORM (MPN)	FECAL COLIFORM (EC BROTH) (MPN)	HARDNESS (CA,MG) (MG/L)
NOV 19...	1400	41.36	475	7.4	7.5	--	11.9	103	.9	11000	<30	--
JAN 22...	1510	41.45	520	8.2	.0	--	14.2	100	2.4	390	40	--
MAR 23...	0815	41.97	435	7.9	2.0	16	12.0	90	1.1	1500	430	210
MAY 27...	1430	41.49	452	8.3	17.0	--	8.5	90	.4	230	230	--
JUL 15...	1255	41.23	460	8.1	21.0	--	7.7	90	.4	4600	30	--
AUG 17...	1930	41.03	553	8.2	18.5	17	8.0	88	.3	1500	430	290

DATE	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV 19...	--	--	--	--	--	270	0	221	--	--	--
JAN 22...	--	--	--	--	--	280	0	230	--	--	--
MAR 23...	25	59	14	6.8	1.1	226	0	185	28	16	.1
MAY 27...	--	--	--	--	--	263	0	216	--	--	--
JUL 15...	--	--	--	--	--	224	0	184	--	--	--
AUG 17...	58	81	22	9.6	1.2	286	0	235	42	22	.2

04173310 NORTH FORK MILL CREEK NEAR CHELSEA, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)
NOV											
19...	--	--	.02	.01	--	--	.02	--	--	--	.00
JAN											
22...	--	--	.04	.02	--	--	.01	--	--	--	.01
MAR											
23...	5.9	254	--	.00	--	--	.01	--	--	--	.01
MAY											
27...	--	--	.03	.01	--	--	.02	--	--	--	.00
JUL											
15...	--	--	.01	.01	--	--	.01	--	--	--	.00
AUG											
17...	13	381	.15	.02	.17	.15	.02	.23	.25	.42	.04

DATE	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO, PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
NOV										
19...	.00	--	--	--	--	--	--	--	--	.00
JAN										
22...	.01	--	--	--	--	--	--	--	--	.00
MAR										
23...	.01	.01	--	--	--	70	--	20	--	.00
MAY										
27...	.00	--	--	--	--	--	--	--	--	.00
JUL										
15...	.00	--	--	--	--	--	--	--	--	.00
AUG										
17...	.01	.01	1	1	0	50	5	10	<.5	.00

04173350 NORTH FORK MILL CREEK NEAR LIMA CENTER, MI

LOCATION.--Lat 42°17'46", long 83°57'33", in SW¼ sec.23, T.2 S., R.4 E., Washtenaw County, Hydrologic Unit 04090005, at bridge on Dancer Road, 1.2 mi (1.9 km) southeast of Lima Center, 5.1 mi (8.2 km) downstream from Letts Creek, and 1.1 mi (1.8 km) upstream from Mill Creek.

DRAINAGE AREA.--59.0 mi^2 (153 km^2).

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

REMARKS.--Estimates of discharge based on previous streamflow partial-record data and correlation with station 04173500.

COOPERATION.--Bimonthly samples were collected by the U.S. Geological Survey and were analyzed for nutrients, coliforms, and BOD by Washtenaw County Health Department.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	COMPLETE COLIFORM (MPN)	FECAL COLIFORM (EC BROTH) (MPN)	HARDNESS (CA,MG) (MG/L)
NOV 19...	1600	E25	690	7.7	8.5	--	12.5	110	.1	11000	150	--
JAN 22...	1630	E32	770	7.8	.0	--	13.0	92	2.7	110000	24000	--
MAR 23...	1130	E110	584	7.8	5.0	23	11.4	92	.7	4600	930	300
MAY 27...	1555	E29	690	8.1	17.0	--	8.8	94	3.6	4600	930	--
JUL 15...	1445	E10	700	8.1	23.0	--	10.2	123	1.6	24000	930	--
AUG 24...	1200	E5.0	855	8.1	19.0	13	8.0	88	1.0	11000	930	350

DATE	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV 19...	--	--	--	--	--	350	0	287	--	--	--
JAN 22...	--	--	--	--	--	332	0	272	--	--	--
MAR 23...	56	88	20	14	1.8	298	0	244	59	32	.2
MAY 27...	--	--	--	--	--	330	0	271	--	--	--
JUL 15...	--	--	--	--	--	272	0	223	--	--	--
AUG 24...	110	95	27	38	3.2	299	0	245	79	73	.3

E--ESTIMATED VALUE

04173350 NORTH FORK MILL CREEK NEAR LIMA CENTER, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)
NOV 19...	--	--	.06	.03	--	--	.02	--	--	--	.03
JAN 22...	--	--	.08	.03	--	--	.03	--	--	--	.02
MAR 23...	5.8	363	--	.01	--	--	.01	--	--	--	.06
MAY 27...	--	--	.04	.02	--	--	.02	--	--	--	.00
JUL 15...	--	--	.04	.05	--	--	.01	--	--	--	.00
AUG 24...	11	538	1.5	.08	1.6	1.6	.01	.39	.40	2.0	.06

DATE	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
NOV 19...	.03	--	--	--	--	--	--	--	--	.00
JAN 22...	.02	--	--	--	--	--	--	--	--	.00
MAR 23...	.02	.01	--	--	--	80	--	60	--	.00
MAY 27...	.00	--	--	--	--	--	--	--	--	.00
JUL 15...	.00	--	--	--	--	--	--	--	--	.00
AUG 24...	.03	.02	1	1	0	70	6	80	<.5	.00

04173500 MILL CREEK NEAR DEXTER, MI

LOCATION.--Lat 42°18'00", long 83°53'55", in SW¼ sec.18, T.2 S., R.5 E., Washtenaw County, Hydrologic Unit 04090005, on left bank 12 ft (4 m) downstream from bridge on Parker Road, 2.5 mi (4.0 km) south of Dexter, and 4 mi (6 km) upstream from mouth.

DRAINAGE AREA.--128 mi^2 (332 km^2).

PERIOD OF RECORD.--February 1952 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 850 ft (259 m) from topographic map (nearest 10 ft). Prior to May 23, 1958, non-recording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--24 years, 79.0 ft^3/s (2.237 m^3/s), 8.38 in/yr (213 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,500 ft^3/s (42.5 m^3/s) June 26, 1968, gage height, 12.95 ft (3.947 m); minimum, 7.3 ft^3/s (0.21 m^3/s) Dec. 13, 1963; minimum gage height, 4.94 ft (1.506 m) Dec. 13, 1963, Feb. 22, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft^3/s (14.2 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	1700	642	18.2	9.89	3.014	Mar. 5	2000	*1,050	29.7	*11.39	3.472
Feb. 17	1800	1,020	28.9	11.29	3.441	Apr. 25	2200	527	14.9	9.41	2.868
Feb. 22	0900	942	26.7	11.04	3.365	May 7	1400	903	25.6	10.91	3.325

Minimum discharge, 20 ft^3/s (0.57 m^3/s) Sept. 4, 5, 6, 7, 8; minimum gage height, 5.43 ft (1.655 m) Sept. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	48	344	74	67	242	148	146	122	107	30	21
2	56	49	218	72	66	529	154	140	99	91	29	22
3	52	50	155	71	66	856	148	143	81	67	28	22
4	50	55	127	70	66	952	138	129	69	56	28	21
5	48	53	117	70	66	1000	129	116	62	50	28	20
6	47	51	189	68	66	897	125	297	57	45	29	20
7	46	57	194	68	66	681	119	847	53	42	29	21
8	46	72	151	68	66	516	111	649	50	51	29	20
9	53	66	136	68	66	363	104	449	47	44	29	21
10	57	107	126	66	67	289	100	287	44	40	28	26
11	52	118	118	64	75	253	101	203	42	38	27	24
12	50	92	116	64	100	240	96	167	40	36	25	22
13	49	77	141	66	160	294	92	147	39	33	24	22
14	47	70	311	67	250	249	89	133	37	35	27	22
15	46	66	561	67	378	219	86	129	36	33	26	22
16	45	62	475	70	738	202	173	135	48	33	25	23
17	44	60	306	70	953	176	161	219	41	32	24	24
18	46	58	170	70	879	162	123	203	37	31	24	23
19	59	56	120	70	782	171	102	151	65	31	22	22
20	69	57	105	69	596	166	91	125	64	31	22	23
21	62	69	97	68	631	201	94	105	47	32	23	23
22	56	65	90	69	905	177	126	92	43	34	22	23
23	53	60	85	69	673	160	125	86	41	33	22	22
24	50	57	82	69	484	150	145	82	64	31	21	21
25	56	61	80	68	396	157	397	80	185	29	21	21
26	60	60	80	68	337	149	471	77	130	29	22	27
27	56	63	80	68	295	171	347	73	79	29	22	38
28	53	69	78	68	252	238	241	69	60	30	22	28
29	51	90	76	68	221	194	186	69	51	31	21	25
30	49	347	76	68	---	177	159	77	87	32	22	23
31	48	---	74	68	---	154	---	144	---	30	21	---
TOTAL	1617	2265	5078	2123	9767	10385	4681	5769	1920	1266	772	692
MEAN	52.2	75.5	164	68.5	337	335	156	186	64.0	40.8	24.9	23.1
MAX	69	347	561	74	953	1000	471	847	185	107	30	38
MIN	44	48	74	64	66	149	86	69	36	29	21	20
CFSM	.41	.59	1.28	.54	2.63	2.62	1.22	1.45	.50	.32	.19	.18
IN.	.47	.66	1.48	.62	2.84	3.02	1.36	1.68	.56	.37	.22	.20

CAL YR 1975 TOTAL 40242 MEAN 110 MAX 1130 MIN 20 CFSM .86 IN 11.70
WTR YR 1976 TOTAL 46335 MEAN 127 MAX 1000 MIN 20 CFSM .99 IN 13.47

04174050 HURON RIVER AT DELHI MILLS, MI

LOCATION.--Lat 42°20'01", long 83°48'34", in SE¼ sec.2, T.2 S., R.5 E., Washtenaw County, Hydrologic Unit 04090005, at bridge on Delhi Road, 5.0 mi (8.0 km) northwest of Ann Arbor, 5.2 mi (8.4 km) downstream from Mill Creek, 5.1 mi (8.2 km) upstream from Barton Dam, and 60.0 mi (96.5 km) upstream from mouth.

DRAINAGE AREA.--699 mi^2 (1,810 km^2).

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

COOPERATION.--Bimonthly samples were collected by the U.S. Geological Survey and were analyzed for nutrients, coliforms, and BOD by Washtenaw County Health Department.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STAGE (FT ABOVE DATUM)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	COMPLETE COLIFORM (MPN)	FECAL COLIFORM (EC BROTH) (MPN)	HARDNESS (CA+MG) (MG/L)
NOV 19...	1130	35.44	550	7.5	8.5	--	10.9	96	.3	930	40	--
JAN 22...	1300	37.79	650	8.2	.0	--	15.0	106	1.1	4600	40	--
MAR 22...	1430	36.74	507	8.2	4.5	19	12.0	95	.8	430	<30	250
MAY 27...	1130	35.76	540	8.3	16.5	--	9.5	100	1.2	430	40	--
JUL 15...	1045	34.99	530	8.1	24.0	--	6.4	79	1.8	4600	430	--
AUG 17...	1330	--	551	8.3	23.0	8	10.2	122	.5	150	90	270

DATE	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV 19...	--	--	--	--	--	280	0	230	--	--	--
JAN 22...	--	--	--	--	--	300	0	246	--	--	--
MAR 22...	51	71	18	13	2.0	242	0	198	49	28	.2
MAY 27...	--	--	--	--	--	272	0	223	--	--	--
JUL 15...	--	--	--	--	--	228	0	187	--	--	--
AUG 17...	81	71	22	19	1.9	228	0	187	49	35	.2

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)
NOV 19...	--	--	.04	.02	--	--	.05	--	--	--	.01	.01
JAN 22...	--	--	.06	.03	--	--	.02	--	--	--	.02	.02
MAR 22...	5.7	309	.05	.02	--	--	.00	--	--	--	.04	.01
MAY 27...	--	--	.01	.01	--	--	.01	--	--	--	.01	.00
JUL 15...	--	--	.02	.02	--	--	.01	--	--	--	.00	.00
AUG 17...	7.4	370	.08	.01	.09	.12	.01	.47	.48	.57	.03	.01

04174050 HURON RIVER AT DELHI MILLS, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV 19...	--	--	--	--	--	--	--	--	--	--	--
JAN 22...	--	--	--	--	--	--	--	--	--	--	--
MAR 22...	.01	--	--	--	20	--	30	--	--	--	--
MAY 27...	--	--	--	--	--	--	--	--	--	--	--
JUL 15...	--	--	--	--	--	--	--	--	--	--	--
AUG 17...	--	3	0	0	50	3	10	<.5	0	0	10

DATE	TOTAL ORGANIC CARBON (C) (MG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)	POLY-CHLO-RINATED NAPH-THA-LENES (UG/L)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR-DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)
NOV 19...	6.0	.00	.00	.0	.00	.0	.00	.00	.00	.00	.00	.00
JAN 22...	7.6	.00	.00	.0	.00	.0	.00	.00	.00	.00	.00	.00
MAR 22...	8.2	.00	.00	.0	.00	.0	.00	.00	.00	.00	.00	.00
MAY 27...	8.3	.00	.00	.0	.00	.0	.00	.00	.00	.00	.00	.00
JUL 15...	12	.00	.00	.0	.00	.0	.00	.00	.00	.01	.00	.00
AUG 17...	7.6	.00	.00	.0	.00	.0	.00	.00	.00	.01	.00	.00

DATE	TOTAL ETHION (UG/L)	TOTAL HEPTA-CHLOR (UG/L)	TOTAL HEPTA-CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA-THION (UG/L)	TOTAL METHYL TRI-THION (UG/L)	TOTAL PARA-THION (UG/L)	TOTAL TOX-APHENE (UG/L)	TOTAL TRI-THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 19...	.00	.00	.00	.00	.00	.00	.00	0	.00	--	--	--
JAN 22...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.04
MAR 22...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
MAY 27...	.00	.00	.00	.00	.00	.00	.00	0	.00	.47	.00	.00
JUL 15...	.00	.00	.00	.00	.00	.00	.00	0	.00	.07	.00	.05
AUG 17...	.00	.00	.00	.00	.00	.00	.00	0	.00	.08	.00	.07

04174500 HURON RIVER AT ANN ARBOR, MI

LOCATION.--Lat 42°17'10", long 83°44'00", in NW¼ sec.28, T.2 S., R.6 E., Washtenaw County, Hydrologic Unit 04090005, on left bank 100 ft (30 m) upstream from bridge on Wall Street in Ann Arbor, 0.7 mi (1.1 km) downstream from Argo Dam, and 4.2 mi (6.8 km) upstream from Geddes Dam.

DRAINAGE AREA.--729 mi^2 (1,888 km^2).

PERIOD OF RECORD.--February 1904 to current year. Monthly discharge only for some periods published in WSP 1307. Published as "at Geddes" February 1904 to December 1914 and as "at Barton" January 1914 to September 1940.

REVISED RECORDS.--WSP 874: 1938. WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 744.81 ft (227.018 m) above mean sea level (levels by Michigan Department of Natural Resources). February 1904 to December 1914 at Geddes Dam, 4.2 mi (6.8 km) downstream, and January 1914 to September 1947, at Barton Dam, 2.6 mi (4.2 km) upstream, flow computed from records of operation of powerplants and records of depth of flow over dam and/or flow through undersluices.

REMARKS.--Records fair. Diversion above station for Ann Arbor municipal supply had negligible effect on natural flow prior to 1955, figures of runoff adjusted since. Flow regulated by powerplants prior to May 1962, and since by occasional lake level control operations above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--72 years, 454 ft^3/s (12.86 m^3/s), 8.46 in/yr (215 mm/yr), adjusted for diversion since 1955.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 5,840 ft^3/s (165 m^3/s) Mar. 14, 1918; minimum daily, 4 ft^3/s (0.11 m^3/s) Aug. 2, Sept. 11, 1931 (plant leakage), but may be doubtful due to change in leakage.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,660 ft^3/s (104 m^3/s) Mar. 5, gage height, 16.45 ft (5.014 m); minimum, 48 ft^3/s (1.36 m^3/s) June 8, gage height, 11.62 ft (3.542 m); minimum daily discharge, 88 ft^3/s (2.49 m^3/s) Sept. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	618	336	1050	642	511	1760	989	1170	660	755	156	114
2	475	276	857	636	446	2110	1250	1180	755	588	190	120
3	390	318	797	636	571	2940	1030	1200	558	558	184	120
4	485	515	797	570	491	3130	1080	927	395	600	169	114
5	354	455	874	515	470	3510	931	948	450	495	163	109
6	358	546	881	520	478	3240	932	1500	525	535	168	108
7	487	490	923	535	493	3040	1250	2160	460	475	150	100
8	568	480	825	465	461	2840	681	2010	165	420	157	96
9	273	490	790	466	471	2580	942	2130	430	445	135	114
10	276	552	769	484	484	2440	783	1860	300	314	109	102
11	373	666	748	491	699	2200	944	1480	292	432	167	119
12	524	612	762	482	672	2050	838	1200	264	354	126	170
13	379	535	783	485	773	1860	459	1490	241	310	201	106
14	369	606	962	485	915	1770	847	1240	280	284	164	111
15	418	588	1450	499	1030	1580	788	1310	223	255	189	125
16	336	500	1520	498	1660	1380	840	1090	349	255	168	167
17	301	465	1320	495	2200	1490	827	1230	284	165	160	163
18	387	558	1140	480	2380	1440	800	1240	210	221	177	146
19	484	455	1030	471	2580	1360	810	1110	465	191	141	131
20	170	485	1000	486	2130	1320	673	967	405	213	164	155
21	290	505	916	460	2480	1270	714	831	230	281	161	154
22	339	505	790	475	3110	1320	831	828	304	224	124	143
23	498	546	769	478	2820	1280	589	886	331	235	115	153
24	249	500	648	473	2520	1260	994	731	582	235	159	117
25	552	490	714	497	2410	1230	1450	762	678	215	117	144
26	564	430	727	473	2330	1130	1460	647	535	210	131	207
27	264	480	708	468	2120	1250	1580	636	475	197	132	360
28	327	495	672	457	1980	1330	1330	582	455	195	135	132
29	420	570	606	511	1820	1320	1200	576	445	455	124	88
30	450	923	654	486	---	1260	1200	600	672	134	115	186
31	332	---	642	489	---	1190	---	690	---	202	115	---
TOTAL	12310	15372	27134	15608	41505	57880	29042	35211	12418	10448	4666	4174
MEAN	397	512	875	503	1431	1867	968	1136	414	337	151	139
MAX	618	923	1520	642	3110	3510	1580	2160	755	755	201	360
MIN	170	276	606	457	446	1130	459	576	165	134	109	88
MEAN+	416	531	891	521	1450	1884	986	1154	443	365	181	165
CFSM+	.57	.73	1.22	.71	1.99	2.58	1.35	1.58	.61	.50	.25	.23
IN+	.66	.81	1.41	.82	2.14	2.98	1.51	1.82	.68	.58	.29	.25

CAL YR 1975 TOTAL 230456 MEAN 631 MAX 2430 MIN 56 MEAN+ 652 CFSM+ .89 IN+ 12.14
WTR YR 1976 TOTAL 265768 MEAN 726 MAX 3510 MIN 88 MEAN+ 747 CFSM+ 1.02 IN+ 13.95

+Adjusted for diversion for municipal supply; record furnished by city of Ann Arbor.

04174800 HURON RIVER AT YPSILANTI, MI

LOCATION.--Lat 42°14'57", long 83°36'45", in SW¼ sec.4, T.3 S., R.7 E., Washtenaw County, Hydrologic Unit 04090005, on left bank 30 ft (9 m) downstream from bridge on Forest Avenue in Ypsilanti, 4.9 mi (7.9 km) downstream from Geddes Dam and 5.6 mi (9.0 km) upstream from Ford Dam, and at mile 42.8 (68.9 km).

DRAINAGE AREA.--807 mi^2 (2,090 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1974 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 700 ft (213 m) from topographic map (nearest 5 ft).

REMARKS.--Water-discharge records fair. Considerable regulation caused by many dams above station; storage capacity is small.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,300 ft^3/s (122 m^3/s) Mar. 5, 1976, gage height, 12.50 ft (3.810 m); minimum, 14 ft^3/s (0.40 m^3/s) June 15, 1976, gage height, 6.45 ft (1.966 m); minimum daily, 81 ft^3/s (2.29 m^3/s) Aug. 1, 1975.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,300 ft^3/s (122 m^3/s) Mar. 5, gage height, 12.50 ft (3.810 m); minimum, 14 ft^3/s (0.40 m^3/s) June 15, gage height, 6.45 ft (1.966 m); minimum daily, 125 ft^3/s (3.54 m^3/s) Sept. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	631	388	1180	766	580	1690	1150	1220	742	844	210	158
2	580	402	990	768	550	2290	1360	1210	737	694	250	157
3	363	375	872	772	620	3160	1210	1250	680	636	240	158
4	520	545	866	717	550	3430	1210	995	466	695	220	134
5	384	515	900	636	540	3920	1090	979	492	580	220	128
6	384	631	976	643	540	3260	1110	1750	566	622	220	152
7	535	605	991	688	555	2920	1330	2590	520	556	200	137
8	583	595	918	546	537	2670	804	1940	280	543	210	125
9	358	565	850	546	574	2330	977	2040	472	499	180	183
10	340	736	870	542	565	2260	863	1830	353	397	160	173
11	316	730	833	595	763	2050	971	1430	370	493	210	142
12	632	736	864	576	774	1950	936	1160	338	447	200	194
13	395	675	890	611	960	1820	536	1420	348	371	209	153
14	397	653	1130	577	1110	1720	874	1260	359	375	238	158
15	436	675	1880	603	1280	1580	886	1240	299	314	235	149
16	365	595	1680	622	2060	1450	998	1190	446	323	224	225
17	320	590	1450	509	2940	1520	941	1230	442	292	211	227
18	369	664	1240	534	2740	1490	871	1240	286	260	210	161
19	593	535	1170	495	2900	1450	913	1180	602	252	195	195
20	228	590	1110	540	2270	1430	756	1010	580	276	223	235
21	305	600	1010	530	2780	1400	736	959	354	470	188	209
22	360	585	819	540	3390	1420	905	817	360	245	183	190
23	611	653	909	540	2740	1400	658	958	453	327	199	222
24	304	565	758	550	2330	1380	981	830	736	322	193	180
25	531	605	816	560	2210	1380	1570	865	894	283	177	240
26	681	535	852	540	2160	1310	1510	737	643	270	182	340
27	411	605	825	540	1940	1400	1570	719	564	250	191	460
28	399	600	799	530	1840	1460	1330	674	574	350	171	190
29	444	730	717	580	1730	1410	1270	602	530	590	194	130
30	517	1140	783	560	---	1400	1220	694	762	200	150	240
31	444	---	794	570	---	1340	---	759	---	260	175	---
TOTAL	13744	18418	30742	18326	44528	59690	31536	36778	15248	13036	6268	5745
MEAN	443	614	992	591	1535	1925	1051	1186	508	421	202	192
MAX	681	1140	1880	772	3390	3920	1570	2590	894	844	250	460
MIN	228	375	717	495	537	1310	536	602	280	200	150	125
CFSM	.55	.76	1.23	.73	1.90	2.39	1.30	1.47	.63	.52	.25	.24
IN.	.63	.85	1.42	.84	2.05	2.75	1.45	1.70	.70	.60	.29	.26

CAL YR 1975 TOTAL 257184 MEAN 705 MAX 2480 MIN 81 CFSM .87 IN 11.86
WTR YR 1976 TOTAL 294059 MEAN 803 MAX 3920 MIN 125 CFSM 1.00 IN 13.56

04174800 HURON RIVER AT YPSILANTI--CONTINUED

WATER-QUALITY RECORDS

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

COOPERATION.--Bimonthly samples were collected by the U.S. Geological Survey and were analyzed for nutrients, coliforms, and BOD by Washtenaw County Health Department.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	COMPLETE COLIFORM (MPN)	FECAL COLIFORM (EC BROTH) (MPN)	HARDNESS (CA+MG) (MG/L)
NOV												
20...	0800	490	610	8.1	8.5	--	10.9	95	2.4	1500	40	--
JAN												
23...	0900	540	720	8.0	.0	--	14.6	103	2.2	40	<30	--
MAR												
24...	0800	1400	515	8.2	7.0	18	12.0	101	.6	2400	40	260
MAY												
28...	0800	585	553	7.9	16.0	--	9.6	100	2.0	1500	40	--
JUL												
16...	0745	346	600	8.0	23.5	--	6.3	76	2.4	11000	90	--
AUG												
18...	0930	350	648	8.1	21.5	12	8.6	99	4.1	2100	70	270

DATE	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV											
20...	--	--	--	--	--	242	0	198	--	--	--
JAN											
23...	--	--	--	--	--	304	0	249	--	--	--
MAR											
24...	55	75	18	16	2.3	250	0	205	50	32	.2
MAY											
28...	--	--	--	--	--	270	0	221	--	--	--
JUL											
16...	--	--	--	--	--	220	0	180	--	--	--
AUG											
18...	90	72	23	26	2.7	220	0	180	60	50	.3

04174800 HURON RIVER AT YPSILANTI, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)
NOV											
20...	--	--	.06	.04	--	--	.08	--	--	--	.04
JAN											
23...	--	--	.07	.04	--	--	.07	--	--	--	.05
MAR											
24...	5.6	327	--	.02	--	--	.01	--	--	--	.07
MAY											
28...	--	--	.03	.02	--	--	.05	--	--	--	.03
JUL											
16...	--	--	--	.09	--	--	.03	--	--	--	.02
AUG											
18...	6.8	437	1.3	.08	1.4	.88	.04	.66	.70	2.1	.16

DATE	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
NOV										
20...	.03	--	--	--	--	--	--	--	--	.00
JAN										
23...	.05	--	--	--	--	--	--	--	--	.00
MAR										
24...	.02	.01	--	--	--	40	--	30	--	.00
MAY										
28...	.01	--	--	--	--	--	--	--	--	.00
JUL										
16...	.01	--	--	--	--	--	--	--	--	.00
AUG										
18...	.07	.04	1	1	0	60	8	10	<.5	.00

04174900 FORD LAKE NEAR RAWSONVILLE, MI

LOCATION.--Lat 42°12'22", long 83°33'28", in SW¼ sec.24, T.3 S., R.7 E., Washtenaw County, Hydrologic Unit 04090005, at upstream side of Ford Dam at Rawsonville Road, 1 mi (1.6 km) west of Rawsonville, 3.0 mi (4.8 km) upstream from Belleville Dam, 3.5 mi (5.6 km) southeast of Ypsilanti, 4.2 mi (6.8 km) downstream from gaging station at Ypsilanti, and 37.4 mi (60.1 km) upstream from mouth.

DRAINAGE AREA.--814 mi^2 (2,108 km^2).

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

COOPERATION.--Bimonthly samples were collected by the U.S. Geological Survey and were analyzed for nutrients, coliforms, and BOD by Washtenaw County Health Department.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	COMPLETE COLIFORM (MPN)	FECAL COLIFORM (EC BROTH) (MPN)	HARDNESS (CA,MG) (MG/L)
NOV											
20...	0845	600	8.1	8.0	--	10.4	90	1.4	1500	<30	--
FEB											
23...	1025	530	8.0	2.0	--	13.4	99	3.4	930	430	--
MAR											
24...	0935	538	8.0	8.0	17	11.2	97	1.4	230	40	260
MAY											
28...	0850	558	8.0	15.5	--	7.1	73	1.0	230	<30	--
JUL											
16...	0845	520	8.3	24.5	--	13.3	164	2.8	4600	210	--
AUG											
18...	0700	593	8.3	22.5	10	6.7	79	1.5	4600	150	250

DATE	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV											
20...	--	--	--	--	--	276	0	226	--	--	--
FEB											
23...	--	--	--	--	--	220	0	180	--	--	--
MAR											
24...	58	74	18	17	2.3	246	0	202	53	34	.2
MAY											
28...	--	--	--	--	--	263	0	216	--	--	--
JUL											
16...	--	--	--	--	--	228	0	187	--	--	--
AUG											
18...	75	64	22	25	2.6	213	0	175	57	51	.3

04174900 FORD LAKE NEAR RAWSONVILLE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)
NOV 20...	--	--	.05	.05	--	--	.08	--	--	--	.03	.01
FEB 23...	--	--	.08	.04	--	--	.04	--	--	--	.09	.08
MAR 24...	5.8	335	.07	.02	--	--	.03	--	--	--	.05	.02
MAY 28...	--	--	--	.02	--	--	.04	--	--	--	.01	.00
JUL 16...	--	--	--	.02	--	--	.02	--	--	--	.00	.00
AUG 18...	2.8	408	.32	.09	.41	.37	.23	.77	1.0	1.4	.25	.03

DATE	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
NOV 20...	--	--	--	--	--	--	--	--	--	--	--	.00
FEB 23...	--	--	--	--	--	--	--	--	--	--	--	.00
MAR 24...	.01	--	--	--	30	--	30	--	--	--	--	.00
MAY 28...	--	--	--	--	--	--	--	--	--	--	--	.00
JUL 16...	--	--	--	--	--	--	--	--	--	--	--	.00
AUG 18...	.01	1	0	1	70	8	0	<.5	31	0	10	.00

04175340 STONY CREEK AT OAKVILLE, MI

LOCATION.--Lat 42°05'05", long 83°34'43", in SE¼ SE¼ sec.34, T.4 S., R.7 E., Washtenaw County, Hydrologic Unit 04100001, on left bank at downstream side of bridge on Tuttle Hill Road, 300 ft (91 m) downstream from Paint Creek, and 0.2 mi (0.3 km) northeast of Oakville.

DRAINAGE AREA.--68.0 mi^2 (176.1 km^2).

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

GAGE.--Water-stage recorder. Altitude of gage is 645 ft (197 m) from topographic map (nearest 5 ft). Prior to July 31, 1970, non-recording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--6 years, 46.5 ft^3/s (1.317 m^3/s), 9.29 in/yr (236 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 840 ft^3/s (23.8 m^3/s) Feb. 17, 1976, gage height, 8.20 ft (2.499 m); maximum gage height, 8.31 ft (2.533 m) Feb. 20, 1971, backwater from ice; minimum discharge, 2.7 ft^3/s (0.076 m^3/s) Aug. 24, 1971, gage height, 1.00 ft (0.305 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 300 ft^3/s (8.50 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 16	0300	380	10.8	7.01	2.137	Mar. 3	1200	731	20.7	7.98	2.432
Feb. 17	1200	*840	23.8	*8.20	2.499	Apr. 26	0300	326	9.23	6.76	2.060
Feb. 22	1000	654	18.5	7.81	2.380	May 7	1600	542	15.3	7.53	2.295

Minimum discharge, 4.8 ft^3/s (0.14 m^3/s) Sept. 8; minimum gage height recorded, 1.27 ft (0.387 m) Aug. 4, 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	19	154	34	28	190	55	49	30	43	8.4	6.3
2	26	19	76	33	28	465	55	56	26	30	8.3	7.4
3	23	20	58	33	28	699	52	51	23	21	9.6	6.6
4	21	20	50	33	28	649	49	43	21	19	7.4	5.8
5	20	18	48	32	28	607	47	39	20	17	9.8	5.4
6	19	17	61	32	28	458	46	75	20	18	10	5.4
7	19	18	80	32	28	227	44	454	19	31	9.4	5.2
8	19	22	60	32	28	146	40	307	18	22	8.1	5.3
9	20	20	56	31	28	121	38	116	17	19	9.8	6.4
10	23	44	56	30	29	106	37	81	17	17	6.4	15
11	21	62	53	29	46	102	37	65	16	14	6.4	11
12	20	43	53	28	70	100	34	55	17	12	6.5	7.3
13	19	36	70	28	110	148	34	48	15	13	7.2	6.4
14	18	31	182	28	210	101	33	43	15	13	9.6	6.3
15	18	29	234	28	341	84	34	41	16	12	9.8	7.9
16	18	28	279	28	593	77	40	47	18	10	9.4	11
17	17	26	141	28	790	67	34	102	16	11	9.0	14
18	19	25	91	28	594	63	31	86	14	11	8.6	13
19	23	25	60	28	528	67	30	57	21	10	8.4	8.7
20	26	25	50	28	327	65	31	47	23	10	8.2	9.8
21	23	29	47	28	331	60	33	42	17	15	7.9	12
22	21	28	44	28	607	51	34	36	17	15	7.8	10
23	20	25	42	28	401	50	32	32	16	12	7.6	8.6
24	18	24	40	28	204	50	37	30	18	11	7.5	8.2
25	19	27	39	28	191	78	170	29	55	8.1	7.4	9.6
26	27	31	38	28	146	76	245	28	35	7.8	7.4	12
27	22	31	37	28	118	78	108	26	25	7.8	7.4	20
28	21	38	36	28	96	94	76	25	19	9.7	7.4	17
29	20	45	35	28	84	72	60	27	18	11	7.4	13
30	19	189	35	28	---	70	51	29	44	15	7.3	11
31	19	---	34	28	---	61	---	32	---	11	7.2	---
TOTAL	649	1014	2339	911	6068	5282	1647	2198	646	476.4	252.6	285.6
MEAN	20.9	33.8	75.5	29.4	209	170	54.9	70.9	21.5	15.4	8.15	9.52
MAX	31	189	279	34	790	699	245	454	55	43	10	20
MIN	17	17	34	28	28	50	30	25	14	7.8	6.4	5.2
CFSM	.31	.50	1.11	.43	3.07	2.50	.81	1.04	.32	.23	.12	.14
IN.	.36	.55	1.28	.50	3.32	2.89	.90	1.20	.35	.26	.14	.16

CAL YR 1975 TOTAL 17709.5 MEAN 48.5 MAX 618 MIN 3.4 CFSM .71 IN 9.69
WTR YR 1976 TOTAL 21768.6 MEAN 59.5 MAX 790 MIN 5.2 CFSM .88 IN 11.91

04175597 RIVER RAISIN NEAR SHARONVILLE, MI

LOCATION.--Lat 42°10'04", long 84°07'21", in SW¼ sec.31, T.3 S., R.3 E., Washtenaw County, Hydrologic Unit 04100002, at bridge on Sharon Valley Road, 2.0 mi (3.2 km) southwest of Sharonville, 4.0 mi (6.4 km) upstream from gaging station near Manchester, 4.0 mi (6.4 km) northwest of Manchester, and 113 mi (182 km) upstream from mouth.

DRAINAGE AREA.--121 mi^2 (313 km^2).

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

REMARKS.--Estimates of water discharge are based on streamflow records at gaging station near Manchester.

COOPERATION.--Bimonthly samples were collected by the U.S. Geological Survey and were analyzed for nutrients, coliforms, and BOD by Washtenaw County Health Department.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	COMPLETE COLIFORM (MPN)	FECAL COLIFORM (EC BROTH) (MPN)	HARDNESS (CA,MG) (MG/L)
NOV												
20...	1330	E65	480	7.9	8.0	--	11.6	100	1.5	2100	70	--
FEB												
23...	1330	E430	397	8.1	1.5	--	12.6	93	2.5	430	40	--
MAR												
23...	1255	E240	452	8.3	6.5	12	12.6	107	1.2	2400	<30	230
MAY												
28...	1245	E85	464	8.0	17.0	--	9.2	98	1.3	230	40	--
JUL												
16...	1240	E40	480	8.2	23.5	--	7.8	94	1.4	930	150	--
AUG												
24...	1700	E20	454	8.3	24.5	20	10.0	123	.5	4600	230	240

DATE	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV											
20...	--	--	--	--	--	290	0	238	--	--	--
FEB											
23...	--	--	--	--	--	206	0	169	--	--	--
MAR											
23...	30	65	17	7.2	1.7	244	0	200	35	15	.2
MAY											
28...	--	--	--	--	--	266	0	218	--	--	--
JUL											
16...	--	--	--	--	--	228	0	187	--	--	--
AUG											
24...	41	57	23	8.2	1.7	239	0	196	30	15	.2

E--ESTIMATED VALUE

04175597 RIVER RAISIN NEAR SHARONVILLE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)
NOV											
20...	--	--	.03	.01	--	--	.02	--	--	--	.00
FEB											
23...	--	--	.08	.04	--	--	.01	--	--	--	.05
MAR											
23...	3.0	263	--	.02	--	--	.00	--	--	--	.01
MAY											
28...	--	--	--	.02	--	--	.01	--	--	--	.01
JUL											
16...	--	--	.02	.02	--	--	.01	--	--	--	.01
AUG											
24...	4.5	310	.53	.01	.54	.54	.02	.43	.45	.99	.03

DATE	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
NOV										
20...	.00	--	--	--	--	--	--	--	--	.00
FEB										
23...	.03	--	--	--	--	--	--	--	--	.00
MAR										
23...	.01	.01	--	--	--	50	--	20	--	.00
MAY										
28...	.00	--	--	--	--	--	--	--	--	.00
JUL										
16...	.00	--	--	--	--	--	--	--	--	.00
AUG										
24...	.01	.01	3	0	0	30	5	20	<.5	.00

04175600 RIVER RAISIN NEAR MANCHESTER, MI

LOCATION.--Lat 42°10'05", long 84°04'34", in NE¼ SE¼ sec.33, T.3 S., R.3 E., Washtenaw County, Hydrologic Unit 04100002, on left bank 8 ft (2 m) downstream from bridge on Sharon Valley Road, and 2.5 mi (4.0 km) northwest of Manchester.

DRAINAGE AREA.--132 mi^2 (342 km^2).

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

GAGE.--Water-stage recorder. Altitude of gage is 900 ft (274 m) from topographic map (nearest 10 ft). Prior to July 30, 1970, non-recording gage at same site and datum.

REMARKS.--Records good except those for the winter period, which are fair. Occasional regulation by many dams above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--6 years, 108 ft^3/s (3.059 m^3/s), 11.11 in/yr (282 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 565 ft^3/s (16.0 m^3/s) Mar. 5, 1976, gage height, 6.46 ft (1.969 m); minimum, 4.5 ft^3/s (0.13 m^3/s) Nov. 29, 1971; minimum gage height, 1.31 ft (0.399 m) Nov. 14, 1973, Oct. 4, 1974, Sept. 24, 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 280 ft^3/s (7.93 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Mar. 5	1300	*565	16.0	*6.46	1.969	May 7	1400	338	9.57	5.40	1.646

Minimum discharge, 8.4 ft^3/s (0.24 m^3/s) Sept. 24, gage height, 1.31 ft (0.399 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67	57	240	94	81	395	235	160	107	109	32	16
2	68	61	173	92	81	411	234	154	109	110	30	14
3	58	57	148	90	80	466	228	151	87	102	28	19
4	50	60	129	90	80	510	222	146	72	93	27	14
5	53	58	122	90	80	550	211	139	71	88	26	15
6	44	59	141	91	79	537	202	186	70	81	25	15
7	45	65	147	92	79	512	196	318	68	81	26	16
8	44	72	136	93	79	482	216	318	64	82	17	16
9	53	78	129	92	78	448	206	291	61	73	11	16
10	60	98	126	91	78	427	186	277	58	68	11	23
11	63	123	128	91	90	409	159	257	54	64	11	22
12	63	128	129	90	105	395	149	221	52	57	11	12
13	59	114	134	90	125	395	149	198	50	50	11	16
14	60	105	170	90	155	373	143	183	48	48	16	20
15	54	89	225	89	197	356	141	176	46	44	10	18
16	50	84	237	88	277	335	139	176	57	41	9.5	22
17	55	73	216	88	376	319	136	195	54	40	11	16
18	48	66	200	87	386	302	132	224	47	37	12	18
19	70	68	154	87	393	296	114	206	48	36	17	19
20	60	70	145	86	373	287	101	182	49	36	18	24
21	62	71	135	86	404	285	103	165	44	42	22	23
22	62	74	130	86	464	269	123	148	44	41	17	20
23	63	69	125	85	436	262	122	136	44	39	17	21
24	58	72	120	85	424	256	130	127	52	37	24	18
25	71	73	115	84	417	256	195	117	102	36	19	18
26	64	73	110	84	406	244	227	110	103	35	20	28
27	63	77	105	84	395	252	221	103	94	34	18	27
28	66	81	103	83	375	263	210	96	84	33	19	28
29	60	110	102	83	402	259	188	95	79	34	19	30
30	58	150	99	82	---	252	171	96	91	35	14	26
31	57	---	96	82	---	246	---	101	---	34	20	---
TOTAL	1808	2435	4469	2725	6995	11049	5189	5452	2009	1740	568.5	590
MEAN	58.3	81.2	144	87.9	241	356	173	176	67.0	56.1	18.3	19.7
MAX	71	150	240	94	464	550	235	318	109	110	32	30
MIN	44	57	96	82	78	244	101	95	44	33	9.5	12
CFSM	.44	.62	1.09	.67	1.83	2.70	1.31	1.33	.51	.43	.14	.15
IN.	.51	.69	1.26	.77	1.97	3.11	1.46	1.54	.57	.49	.16	.17

CAL YR 1975 TOTAL 41629.0 MEAN 114 MAX 390 MIN 19 CFSM .86 IN 11.73
WTR YR 1976 TOTAL 45029.5 MEAN 123 MAX 550 MIN 9.5 CFSM .93 IN 12.69

04175610 RIVER RAISIN AT MANCHESTER, MI

LOCATION.--Lat 42°08'52", long 84°00'56", in SE¼ sec.1, T.4 S., R.3 E., Washtenaw County, Hydrologic Unit 04100002, at bridge on Austin Road, 1.0 mi (1.6 km) east of Manchester, 0.6 mi (1.0 km) downstream from Ford Dam, 5.3 mi (8.5 km) downstream from gaging station near Manchester, and 104 mi (167 km) upstream from mouth.

DRAINAGE AREA.--148 mi^2 (383 km^2).

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

COOPERATION.--Bimonthly samples were collected by the U.S. Geological Survey and were analyzed for nutrients, coliforms, and BOD by Washtenaw County Health Department.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STAGE (FT ABOVE DATUM)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	COMPLETE COLIFORM (MPN)	FECAL COLIFORM (EC BROTH) (MPN)	HARDNESS (CA,MG) (MG/L)
NOV												
20...	1230	38.74	500	8.0	8.0	--	11.8	103	1.2	1500	90	--
JAN												
23...	1200	39.17	550	8.0	.0	--	13.8	97	1.5	930	930	--
MAR												
23...	1400	40.21	459	8.1	8.0	12	12.0	104	1.0	930	230	230
MAY												
28...	1150	39.14	456	8.0	12.0	--	10.0	96	.4	2100	430	--
JUL												
16...	1145	38.56	490	8.1	23.0	--	7.1	85	1.7	1500	930	--
AUG												
24...	1545	38.29	490	8.2	24.5	7	7.0	85	1.7	4600	150	250

DATE	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV											
20...	--	--	--	--	--	296	0	243	--	--	--
JAN											
23...	--	--	--	--	--	294	0	241	--	--	--
MAR											
23...	27	65	17	7.5	1.7	248	0	203	35	15	.2
MAY											
28...	--	--	--	--	--	268	0	220	--	--	--
JUL											
16...	--	--	--	--	--	228	0	187	--	--	--
AUG											
24...	60	61	23	9.7	1.8	232	0	190	36	18	.2

04175610 RIVER RAISIN AT MANCHESTER, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)
NOV											
20...	--	--	.04	.01	--	--	.03	--	--	--	.03
JAN											
23...	--	--	.07	.03	--	--	.02	--	--	--	.02
MAR											
23...	2.8	269	--	.02	--	--	--	--	--	--	.03
MAY											
28...	--	--	.03	.01	--	--	.02	--	--	--	.01
JUL											
16...	--	--	--	.02	--	--	.01	--	--	--	.00
AUG											
24...	7.0	316	.45	.05	.50	.53	.12	.53	.65	1.2	.09

DATE	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO, PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
NOV										
20...	.02	--	--	--	--	--	--	--	--	.00
JAN										
23...	.02	--	--	--	--	--	--	--	--	.00
MAR										
23...	.01	.01	--	--	--	50	--	20	--	.00
MAY										
28...	.01	--	--	--	--	--	--	--	--	.00
JUL										
16...	.00	--	--	--	--	--	--	--	--	.00
AUG										
24...	.06	.06	2	0	0	20	3	20	<.5	.00

04175700 RIVER RAISIN NEAR TECUMSEH, MI

LOCATION.--Lat 41°56'35", long 83°56'45", in NE¼ sec.21, T.6 S., R.4 E., Lenawee County, Hydrologic Unit 04100002, on right bank 12 ft (4 m) downstream from bridge on North Raisin Center Highway, 3.4 mi (5.5 km) upstream from South Branch River Raisin, and 4.5 mi (7.2 km) south of Tecumseh.

DRAINAGE AREA.--267 mi^2 (692 km^2).

PERIOD OF RECORD.--September 1956 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 707.0 ft (215.49 m) above mean sea level.

REMARKS.--Records good except those for the winter period, which are fair. Diurnal fluctuation caused by powerplant 5.5 mi (8.8 km) above station prior to June 27, 1968. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--20 years, 181 ft^3/s (5.126 m^3/s), 9.21 in/yr (234 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,920 ft^3/s (82.7 m^3/s) June 26, 1968, gage height, 12.66 ft (3.859 m); minimum, 6.4 ft^3/s (0.18 m^3/s) Aug. 26, 1964, gage height, 2.57 ft (0.783 m); minimum daily, 8.3 ft^3/s (0.24 m^3/s) Oct. 30, 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 700 ft^3/s (19.8 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 1	0500	732	20.7	8.98	2.737	Feb. 22	0400	1,230	34.8	10.08	3.072
Dec. 16	0200	740	21.0	9.00	2.743	Mar. 5	2300	*1,400	39.6	*10.43	3.179
Feb. 17	1800	1,360	38.5	10.35	3.155	May 7	2300	724	20.5	8.96	2.731

Minimum discharge, 40 ft^3/s (1.13 m^3/s) Aug. 19, Sept. 11; minimum gage height, 3.69 ft (1.125 m), Aug. 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	122	111	690	170	165	740	435	294	273	304	86	55
2	130	127	568	170	165	985	412	293	222	206	83	55
3	127	122	464	165	165	1250	396	275	203	205	80	55
4	123	115	324	165	165	1360	398	259	185	178	77	53
5	117	116	323	165	165	1350	382	247	162	163	75	54
6	113	125	300	165	165	1270	369	279	152	143	74	53
7	113	122	343	165	165	1090	355	586	149	313	75	53
8	122	160	325	165	165	960	339	658	147	211	76	53
9	115	161	300	165	165	884	332	595	138	177	76	85
10	122	192	283	165	167	824	339	525	135	152	69	83
11	128	247	270	165	180	776	323	463	129	140	63	40
12	127	252	268	165	230	740	295	417	123	123	61	43
13	128	214	276	165	290	796	263	343	119	120	61	46
14	135	199	425	165	350	740	252	327	147	112	61	51
15	113	154	576	165	553	694	241	311	130	109	63	55
16	79	154	693	165	768	658	252	301	128	103	62	80
17	113	144	581	165	1200	634	244	301	126	98	59	83
18	110	134	464	165	1100	592	237	305	123	94	55	76
19	146	135	389	165	990	552	229	311	151	89	41	64
20	105	134	300	165	872	540	233	312	152	89	48	69
21	138	164	250	165	848	527	242	292	137	96	53	67
22	151	139	210	165	1170	505	220	264	126	98	53	70
23	122	145	200	165	1050	489	221	241	119	100	55	69
24	116	141	190	165	912	469	213	225	130	98	55	64
25	141	144	180	165	836	489	323	219	225	93	52	60
26	137	141	175	165	792	467	453	209	208	89	58	73
27	131	161	170	165	716	461	431	198	185	89	62	107
28	139	146	170	165	688	485	387	188	167	86	55	85
29	119	183	170	165	655	483	353	186	149	88	55	82
30	121	465	170	165	---	475	319	186	333	88	55	113
31	119	---	170	165	---	457	---	223	---	87	56	---
TOTAL	3822	4947	10217	5125	15852	22742	9488	9833	4873	4141	1954	1996
MEAN	123	165	330	165	547	734	316	317	162	134	63.0	66.5
MAX	151	465	693	170	1200	1360	453	658	333	313	86	113
MIN	79	111	170	165	165	457	213	186	119	86	41	40
CFSM	.46	.62	1.24	.62	2.05	2.75	1.18	1.19	.61	.50	.24	.25
IN.	.53	.69	1.42	.71	2.21	3.17	1.32	1.37	.68	.58	.27	.28

CAL YR 1975 TOTAL 87584 MEAN 240 MAX 1090 MIN 48 CFSM .90 IN 12.20
WTR YR 1976 TOTAL 94990 MEAN 260 MAX 1360 MIN 40 CFSM .97 IN 13.23

04176000 RIVER RAISIN NEAR ADRIAN, MI

LOCATION.--Lat 41°54'15", long 83°58'50", in NW¼ sec.5, T.7 S., R.4 E., Lenawee County, Hydrologic Unit 04100002, on right bank 10 ft (3 m) downstream from bridge on Academy Road, 1.7 mi (2.7 km) east of Adrian, and 2.6 mi (4.2 km) downstream from South Branch River Raisin.

DRAINAGE AREA.--463 mi^2 (1,199 km^2).

PERIOD OF RECORD.--October 1953 to current year. Records for October 1930 to August 1931, October 1932 to April 1938, published as "Raisin River" in WSP 714, 744, 759, 784, 804, 824, and 854, have been found to be unreliable and should not be used.

REVISED RECORDS.--See PERIOD OF RECORD. WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 693.2 ft (211.29 m) above mean sea level.

REMARKS.--Records good except those for the winter period, which are fair. Diurnal fluctuation caused by powerplant at Tecumseh, 11 mi (18 km) above station, prior to June 27, 1968. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemark at station.

AVERAGE DISCHARGE.--23 years, 313 ft^3/s (8.864 m^3/s), 9.18 in/yr (233 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,580 ft^3/s (158 m^3/s) Apr. 30, 1956, gage height, 14.87 ft (4.532 m), from rating curve extended above 4,000 ft^3/s (113 m^3/s); minimum, 18 ft^3/s (0.51 m^3/s) Aug. 10, 1964, gage height, 1.33 ft (0.405 m); minimum daily, 25 ft^3/s (0.71 m^3/s) Oct. 26, 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,400 ft^3/s (39.6 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 2	0700	1,280	36.2	10.37	3.161	Feb. 23	0500	2,570	72.8	12.29	3.746
Dec. 17	0400	1,480	41.9	10.55	3.216	Mar. 5	1700	3,290	93.2	13.11	3.996
Feb. 18	0700	*3,510	99.4	*13.33	4.063						

Minimum discharge, 60 ft^3/s (1.70 m^3/s) Sept. 12, 13, gage height, 2.32 ft (0.707 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	162	151	1110	240	235	1310	617	425	352	571	119	70
2	170	165	1270	240	235	1880	600	414	347	382	115	70
3	166	151	1030	240	235	2610	563	393	284	336	111	68
4	160	162	685	240	235	3120	560	371	262	286	105	67
5	154	157	494	240	235	3260	540	356	236	258	101	66
6	148	158	482	240	235	3000	521	405	215	278	101	65
7	148	165	535	240	235	2260	503	772	214	461	101	65
8	148	193	534	237	235	1800	482	1170	203	396	101	66
9	181	207	468	235	235	1560	464	1130	196	303	101	85
10	156	254	423	235	235	1460	464	812	191	253	96	134
11	163	319	393	235	250	1320	458	651	187	224	86	66
12	174	345	381	235	350	1210	436	571	171	195	83	61
13	155	306	396	230	500	1210	406	502	167	185	84	62
14	162	303	607	230	800	1260	391	440	170	172	83	66
15	159	234	978	230	1380	1150	363	430	205	162	83	74
16	130	223	1410	230	1820	1030	377	415	215	153	82	106
17	152	203	1440	230	2800	925	369	408	192	146	80	118
18	125	172	1120	230	3410	854	357	409	187	137	78	104
19	193	179	662	230	2590	788	347	402	268	134	64	89
20	158	182	450	230	2100	762	336	405	251	127	64	103
21	167	208	360	230	1850	728	356	389	231	147	70	93
22	184	193	310	230	2320	704	325	362	203	144	70	88
23	170	198	290	230	2480	675	326	338	186	151	70	89
24	155	190	270	230	2000	649	316	319	209	146	73	83
25	183	195	260	230	1670	712	470	312	481	134	70	75
26	184	191	250	230	1570	726	656	300	523	127	73	100
27	170	203	240	230	1430	718	724	289	451	128	78	166
28	182	205	240	230	1270	756	609	277	327	124	71	107
29	159	245	240	235	1160	772	520	271	277	124	70	115
30	159	643	240	235	---	728	464	272	387	125	68	111
31	156	---	240	235	---	664	---	308	---	121	71	---
TOTAL	5033	6700	17808	7242	34100	40601	13920	14318	7788	6630	2622	2632
MEAN	162	223	574	234	1176	1310	464	462	260	214	84.6	87.7
MAX	193	643	1440	240	3410	3260	724	1170	523	571	119	166
MIN	125	151	240	230	235	649	316	271	167	121	64	61
CFSM	.35	.48	1.24	.51	2.54	2.83	1.00	1.00	.56	.46	.18	.19
IN.	.40	.54	1.43	.58	2.74	3.26	1.12	1.15	.63	.53	.21	.21

CAL YR 1975 TOTAL 145425 MEAN 398 MAX 1760 MIN 79 CFSM .86 IN 11.68
WTR YR 1976 TOTAL 159394 MEAN 436 MAX 3410 MIN 61 CFSM .94 IN 12.81

04176365 SALINE RIVER ABOVE SALINE, MI

LOCATION.--Lat 42°10'16", long 83°49'32", in SW¼ sec.34, T.3 S., R.5 E., Washtenaw County, Hydrologic Unit 04100002, at bridge on Dell Road, 2.5 mi (4.0 km) east of Saline, 6.9 mi (11.1 km) upstream from gaging station near Saline, 33 mi (53 km) upstream from River Raisin.

DRAINAGE AREA.--46 mi^2 (119 km^2), approximately.

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

COOPERATION.--Bimonthly samples were collected by the U.S. Geological Survey and were analyzed for nutrients, coliforms, and BOD by Washtenaw County Health Department.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STAGE (FT ABOVE DATUM)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	COMPLETE COLIFORM (MPN)	FECAL COLIFORM (EC BROTH) (MPN)	HARDNESS (CA,MG) (MG/L)
NOV												
20...	1115	40.14	770	7.8	6.5	--	12.3	102	1.5	11000	200	--
FEB												
23...	1225	42.97	538	7.9	1.5	--	12.9	95	2.6	4600	230	--
MAR												
23...	1510	40.65	659	8.0	10.0	24	11.4	105	.5	46000	2100	350
MAY												
28...	1050	40.19	750	7.8	13.0	--	9.3	90	.4	11000	930	--
JUL												
16...	1040	39.89	790	8.1	18.5	--	8.2	90	.5	4600	930	--
AUG												
24...	1400	39.67	741	8.2	19.0	15	7.0	77	1.4	11000	750	370

DATE	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV											
20...	--	--	--	--	--	356	0	292	--	--	--
FEB											
23...	--	--	--	--	--	180	0	148	--	--	--
MAR											
23...	110	100	24	7.7	2.9	294	0	241	110	20	.2
MAY											
28...	--	--	--	--	--	340	0	279	--	--	--
JUL											
16...	--	--	--	--	--	311	0	255	--	--	--
AUG											
24...	120	100	29	10	2.2	303	0	249	100	21	.4

04176365 SALINE RIVER ABOVE SALINE, MI--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)
NOV											
20...	--	--	.08	.02	--	--	.02	--	--	--	.01
FEB											
23...	--	--	.30	.04	--	--	.02	--	--	--	.12
MAR											
23...	5.9	419	.20	.02	--	--	.00	--	--	--	.04
MAY											
28...	--	--	.05	.01	--	--	.01	--	--	--	.00
JUL											
16...	--	--	.02	.01	--	--	.01	--	--	--	.00
AUG											
24...	12	464	.21	.01	.22	.22	.02	.31	.33	.55	.03

DATE	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO, PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
NOV										
20...	.00	--	--	--	--	--	--	--	--	.00
FEB										
23...	.01	--	--	--	--	--	--	--	--	.00
MAR										
23...	.01	.01	--	--	--	40	--	90	--	.00
MAY										
28...	.00	--	--	--	--	--	--	--	--	.00
JUL										
16...	.00	--	--	--	--	--	--	--	--	.00
AUG										
24...	.01	.01	1	1	0	50	5	50	<.5	.00

04176400 SALINE RIVER NEAR SALINE, MI

LOCATION.--Lat 42°07'50", long 83°46'35", in SW¼ sec.18, T.4 S., R.5 E., Washtenaw County, Hydrologic Unit 04100002, on right bank 20 ft (6 m) downstream from bridge on Maple Road, and 2.8 mi (4.5 km) south of Saline.

DRAINAGE AREA.--94.6 mi^2 (245.0 km^2).

PERIOD OF RECORD.--October 1965 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 710 ft (216 m), from topographic map (nearest 10 ft).

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, Nov. 21 to Jan. 7, which are fair. Slight regulation for lake level control. Pumpage for irrigation diverts an indeterminate amount of water. Flow contains city of Saline sewage effluent which originates as ground water. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--11 years, 66.3 ft^3/s (1.878 m^3/s), 9.52 in/yr (242 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,990 ft^3/s (113 m^3/s) June 26, 1968, gage height, 13.37 ft (4.075 m); minimum, 5.4 ft^3/s (0.15 m^3/s) Oct. 9, 12, 1966; minimum gage height, 3.26 ft (0.994 m) July 24, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 380 ft^3/s (10.8 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 15	unknown	500	14.2	unknown		Feb. 21	2300	995	28.2	10.78	3.286
Feb. 17	0700	*1,380	39.1	*11.40	3.475	Mar. 5	1600	940	26.6	10.60	3.231
Feb. 19	0400	758	21.5	10.28	3.133	May 7	1300	875	24.8	10.33	3.149

Minimum daily discharge, 11 ft^3/s (0.31 m^3/s) Aug. 31, Sept. 1, 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	23	200	47	40	213	81	70	50	94	18	11
2	30	23	159	47	40	546	79	69	45	66	18	12
3	29	26	120	47	39	798	75	68	41	51	17	12
4	28	27	85	47	38	824	72	63	39	43	17	12
5	27	26	80	47	37	826	67	58	36	37	18	12
6	27	26	110	47	37	517	66	111	34	33	18	12
7	26	34	110	47	36	315	63	619	33	31	18	12
8	26	53	90	47	36	241	56	294	32	30	18	11
9	30	44	80	45	39	200	57	190	31	25	18	15
10	32	109	72	42	43	171	55	141	30	22	18	24
11	30	103	68	40	56	149	55	111	29	22	17	18
12	28	73	66	39	74	166	52	92	27	23	16	16
13	27	58	100	38	190	234	51	79	27	22	19	15
14	26	50	230	37	339	165	50	71	26	22	21	15
15	26	45	350	35	337	138	49	68	26	21	19	14
16	25	41	300	37	820	126	54	69	31	21	17	14
17	25	39	180	39	1170	110	50	264	27	21	16	14
18	26	37	120	40	718	101	46	141	26	20	15	16
19	33	35	80	40	635	100	45	93	46	19	15	15
20	38	34	74	40	381	99	44	75	36	19	14	16
21	36	38	66	40	559	94	47	65	31	22	14	17
22	33	36	62	40	824	83	51	57	30	23	14	17
23	30	34	59	40	445	80	47	53	30	21	14	16
24	29	34	56	40	304	81	58	51	55	20	13	15
25	32	37	54	40	285	86	189	49	111	18	14	14
26	31	39	52	40	245	80	222	47	64	18	17	17
27	30	42	51	40	210	99	138	45	45	18	15	27
28	29	48	50	40	175	127	107	43	38	18	14	24
29	27	80	49	40	150	101	90	44	35	18	13	18
30	24	250	48	40	---	98	78	47	95	18	13	16
31	23	---	47	40	---	88	---	61	---	18	11	---
TOTAL	893	1544	3268	1288	8302	7056	2194	3308	1206	854	499	467
MEAN	28.8	51.5	105	41.5	286	228	73.1	107	40.2	27.5	16.1	15.6
MAX	38	250	350	47	1170	826	222	619	111	94	21	27
MIN	23	23	47	35	36	80	44	43	26	18	11	11
CFSM	.30	.54	1.11	.44	3.02	2.41	.77	1.13	.42	.29	.17	.16
IN.	.35	.61	1.29	.51	3.26	2.77	.86	1.30	.47	.34	.20	.18

CAL YR 1975 TOTAL 27470.5 MEAN 75.3 MAX 970 MIN 7.0 CFSM .80 IN 10.80
WTR YR 1976 TOTAL 30879.0 MEAN 84.4 MAX 1170 MIN 11 CFSM .89 IN 12.14

04176418 SALINE RIVER ABOVE MILAN, MI

LOCATION.--Lat 42°05'02", long 83°41'45", in SE¼ sec.34, T.4 S., R.6 E., Washtenaw County, Hydrologic Unit 04100002, at bridge on Platt Road, at Milan, 0.7 mi (1.1 km) upstream from dam at Milan, 9.9 mi (15.9 km) downstream from gaging station near Saline, and 16.2 mi (26.1 km) upstream from River Raisin.

DRAINAGE AREA.--112 mi^2 (290 km^2), approximately.

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

COOPERATION.--Bimonthly samples were collected by the U.S. Geological Survey and were analyzed for nutrients, coliforms, and BOD by Washtenaw County Health Department.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STAGE (FT ABOVE DATUM)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	COMPLETE COLIFORM (MPN)	FECAL COLIFORM (EC BROTH) (MPN)	HARDNESS (CA,MG) (MG/L)
NOV 20...	1000	34.94	810	7.8	7.0	--	9.2	77	2.7	4600	150	--
FEB 23...	1130	37.09	406	7.9	1.0	--	13.8	99	1.9	46000	930	--
MAR 24...	1100	34.59	730	8.0	9.0	11	10.2	90	2.1	930	230	380
MAY 28...	0935	34.99	793	7.8	14.5	--	7.3	74	1.3	4600	230	--
JUL 16...	0950	34.71	850	8.1	23.0	--	6.7	80	1.2	4600	2400	--
AUG 18...	1400	--	912	8.0	19.0	7	6.6	73	1.3	4600	430	330

DATE	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV 20...	--	--	--	--	--	362	0	297	--	--	--
FEB 23...	--	--	--	--	--	150	0	123	--	--	--
MAR 24...	130	110	25	19	3.0	302	0	248	110	36	.2
MAY 28...	--	--	--	--	--	333	0	273	--	--	--
JUL 16...	--	--	--	--	--	278	0	228	--	--	--
AUG 18...	120	84	30	50	3.4	253	0	208	130	63	.3

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)
NOV 20...	--	--	.20	.06	--	--	.03	--	--	--	.07	.06
FEB 23...	--	--	.20	.04	--	--	.02	--	--	--	.07	.01
MAR 24...	6.7	464	--	.02	--	--	.01	--	--	--	.09	.04
MAY 28...	--	--	.20	.03	--	--	.02	--	--	--	.03	.02
JUL 16...	--	--	.09	.01	--	--	.01	--	--	--	.02	.02
AUG 18...	10	585	1.2	.06	1.3	1.3	.05	.43	.48	1.8	.21	.15

DATE	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
NOV 20...	--	--	--	--	--	--	--	--	--	--	--	.00
FEB 23...	--	--	--	--	--	--	--	--	--	--	--	.00
MAR 24...	.02	--	--	--	30	--	80	--	--	--	--	.00
MAY 28...	--	--	--	--	--	--	--	--	--	--	--	.00
JUL 16...	--	--	--	--	--	--	--	--	--	--	--	.00
AUG 18...	.13	1	0	1	40	5	40	<.5	22	0	10	.00

04176500 RIVER RAISIN NEAR MONROE, MI

LOCATION.--Lat 41°57'38", long 83°31'52", Monroe County, Hydrologic Unit 04100002, on left bank 0.8 mi (1.3 km) downstream from bridge on Ida Maybee Road, 5.0 mi (8.0 km) downstream from Saline River, and 7.5 mi (12.1 km) west of Monroe.

DRAINAGE AREA.--1,042 mi^2 (2,699 km^2).

PERIOD OF RECORD.--September 1937 to current year. Published as "Raisin River at Monroe" 1937-52 and as "River Raisin at Monroe" 1952-53.

REVISED RECORDS.--WSP 954: 1938-40(m), 1941. WSP 1437: 1939, 1948. WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 616.26 ft (187.836 m) above mean sea level. Prior to Oct. 1, 1953, at site 9 mi (14 km) downstream at datum 46.26 ft (14.100 m) lower.

REMARKS.--Records good except those for the period of no gage-height record, Dec. 14 to Feb. 10, which are poor. Diurnal fluctuation caused by powerplants above station prior to June 27, 1968. Several observations of water temperature were made during the year. National Weather Service gage-height telemark at station.

AVERAGE DISCHARGE.--39 years, 698 ft^3/s (19.77 m^3/s), 9.10 in/yr (231 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,900 ft^3/s (365 m^3/s) May 19, 1945, Mar. 29, 1950; maximum gage height, 10.7 ft (3.26 m) Feb. 1, 1949, backwater from ice, site and datum then in use; minimum discharge, about 2 ft^3/s (0.06 m^3/s) Sept. 4, 1938, Sept. 19, 20, 1941, site then in use.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,500 ft^3/s (99.1 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 19	0700	*11,600	329	*9.74	2.969	Mar. 5	2300	8,800	249	9.20	2.804

Minimum discharge, 82 ft^3/s (2.32 m^3/s) Sept. 5, 6, 8, 9, gage height, 2.02 ft (0.616 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	250	261	1800	500	370	3020	1080	984	640	1110	155	91
2	261	254	1910	500	370	4340	984	832	592	1030	152	93
3	254	254	2120	500	370	6270	904	748	550	920	155	95
4	246	265	1980	490	370	7540	856	688	500	664	147	93
5	239	273	1750	490	370	8450	808	628	430	532	147	86
6	229	280	1340	490	370	8380	784	634	388	460	138	84
7	218	284	1240	490	370	7320	718	2050	357	598	130	86
8	218	277	1220	480	380	5850	688	2110	326	500	128	84
9	229	292	1230	470	380	4520	670	2340	317	610	117	88
10	232	366	1130	460	390	3490	634	2130	301	526	161	98
11	277	490	992	450	425	2760	610	1800	288	420	133	107
12	330	598	896	430	526	2300	598	1400	273	348	130	136
13	313	658	864	420	1060	2130	586	1090	265	301	120	128
14	280	592	860	410	1940	1980	568	928	250	265	100	102
15	258	505	1100	400	2530	1880	538	792	239	243	112	93
16	239	460	1800	390	4060	1790	510	700	269	222	117	102
17	239	397	2500	390	6810	1640	495	832	296	205	115	128
18	232	375	2500	390	9310	1480	495	872	309	195	115	144
19	229	348	2000	380	10700	1320	485	832	348	185	117	152
20	243	317	1200	380	8460	1250	470	700	415	179	115	161
21	277	309	800	380	7220	1180	470	646	445	176	100	149
22	317	309	650	380	7560	1110	480	604	450	173	93	144
23	309	317	600	380	6630	1040	485	562	384	189	86	144
24	309	322	580	380	5890	992	475	520	366	189	93	136
25	305	326	560	380	5300	1060	776	490	1260	182	93	130
26	284	317	540	370	4420	1110	1610	470	1660	185	102	144
27	288	330	520	370	3570	1140	1830	450	1610	173	93	158
28	313	339	510	370	2940	1220	1760	435	1420	167	93	158
29	301	379	500	370	2480	1210	1470	420	1020	161	93	208
30	292	1210	500	370	---	1220	1130	415	1000	155	93	198
31	280	---	500	370	---	1170	---	430	---	155	91	---
TOTAL	8291	11704	36692	13030	95571	90162	23967	28532	16968	11418	3634	3720
MEAN	267	390	1184	420	3296	2908	799	920	566	368	117	124
MAX	330	1210	2500	500	10700	8450	1830	2340	1660	1110	161	208
MIN	218	254	500	370	370	992	470	415	239	155	86	84
CFSM	.26	.37	1.14	.40	3.16	2.79	.77	.88	.54	.35	.11	.12
IN.	.30	.42	1.31	.47	3.41	3.22	.86	1.02	.61	.41	.13	.13

CAL YR 1975 TOTAL 307210 MEAN 842 MAX 6020 MIN 94 CFSM .81 IN 10.97
WTR YR 1976 TOTAL 343689 MEAN 939 MAX 10700 MIN 84 CFSM .90 IN 12.27

04184500 BEAN CREEK AT POWERS, OH

LOCATION.--Lat 41°40'39", long 84°13'56", in NE¼ sec.24, T.9 S., R.1 E., Fulton County, Hydrologic Unit 04100006, on right bank at downstream side of bridge on U.S. Highway 20, 1 mi (2 km) east of Powers, 2.2 mi (3.5 km) upstream from Iron Creek, 3 mi (5 km) downstream from Silver Creek, and 5.2 mi (8.4 km) east of Fayette.

DRAINAGE AREA.--206 mi^2 (534 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1940 to current year.

REVISED RECORDS.--WSP 1307: 1948(M). WSP 1912: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 722.57 ft (220.239 m) above mean sea level. Prior to Jan. 18, 1941, nonrecording gage at same site and datum.

REMARKS.--Water-discharge records good except those for the winter period, which are fair.

AVERAGE DISCHARGE.--36 years, 163 ft^3/s (4.616 m^3/s), 10.74 in/yr (273 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,250 ft^3/s (120 m^3/s) Apr. 29, 1956, gage height, 13.82 ft (4.212 m); minimum, 5.0 ft^3/s (0.14 m^3/s) Aug. 9, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,200 ft^3/s (34.0 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 16	0230	1,260	35.7	7.14	2.176	Feb. 22	0615	1,880	53.2	10.00	3.048
Feb. 17	1630	*2,590	73.3	*12.76	3.889	Mar. 5	1215	2,190	62.0	11.18	3.408

Minimum discharge, 10 ft^3/s (0.28 m^3/s) Sept. 8, 9.

REVISIONS.--The maximum discharge for water year 1975 has been revised to 1,640 ft^3/s (46.4 m^3/s) Jan. 11, 1975, gage height, 10.83 ft (3.031 m), superseding figures published in the report for 1975. Peak discharges of Apr. 20, 1975 (0145 hours) have been revised to 1,480 ft^3/s (41.9 m^3/s), gage height, 8.34 ft (2.542 m) and May 7, 1975 (0145 hours) 965 ft^3/s (27.3 m^3/s) gage height, 6.07 ft (1.850 m).

Revised daily discharges, in cubic feet per second, for the high water period in April and May 1975, are given below. These figures supersede those published in the report for 1975.

Apr. 19..... 1050	Apr. 21..... 932	May 6..... 621
Apr. 20..... 1380	Apr. 22..... 621	May 7..... 890
		May 8..... 573

Month	Total	Mean	Max	Min	Cfsm	In.
April 1975	11776	393	1380	146	1.91	2.13
May 1975	8032	259	890	128	1.26	1.45
Wtr Yr 1975	64563	177	1560	17	.86	11.66

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	36	1100	130	90	1060	236	171	105	240	33	12
2	36	36	703	120	82	1530	228	156	103	179	31	12
3	35	43	470	110	78	1860	220	144	96	133	29	12
4	34	47	328	100	74	1910	205	134	80	108	27	12
5	34	44	253	95	70	2150	201	127	69	91	26	11
6	32	43	283	90	66	1890	194	127	62	83	25	11
7	29	52	337	85	62	1600	185	408	57	81	25	11
8	29	95	263	80	60	1300	175	436	53	83	24	11
9	43	96	225	76	56	1100	167	343	50	94	23	12
10	50	158	205	74	130	850	159	269	45	69	22	17
11	49	205	191	72	268	650	156	219	41	57	21	16
12	43	143	185	76	472	540	151	186	39	48	21	16
13	43	113	227	90	890	450	144	164	36	43	21	14
14	41	94	550	86	1160	390	139	150	34	40	21	13
15	41	83	952	82	1250	360	136	141	33	37	21	14
16	42	73	1100	78	1610	340	132	138	49	35	20	14
17	41	67	701	74	2500	319	127	142	60	33	20	18
18	40	61	464	70	2330	307	121	137	46	31	19	21
19	43	59	270	66	1970	297	117	125	62	31	18	20
20	46	59	230	62	1440	289	113	115	116	29	18	22
21	49	65	200	60	1320	273	109	109	91	37	17	21
22	47	63	170	60	1820	256	109	104	68	39	16	21
23	46	61	150	58	1560	243	110	97	59	38	16	20
24	43	59	140	56	1180	235	113	91	71	40	15	18
25	44	64	130	54	918	278	211	85	711	36	14	18
26	46	65	120	75	734	299	269	83	484	31	14	24
27	43	69	110	150	601	276	250	78	268	29	14	30
28	43	70	110	190	502	306	208	71	184	29	14	30
29	41	138	110	170	435	288	194	68	138	31	14	27
30	39	906	120	140	---	274	189	76	273	30	13	24
31	36	---	140	110	---	256	---	93	---	32	13	---
TOTAL	1265	3167	10537	2839	23728	22176	5068	4787	3583	1917	625	522
MEAN	40.8	106	340	91.6	818	715	169	154	119	61.8	20.2	17.4
MAX	50	906	1100	190	2500	2150	269	436	711	240	33	30
MIN	29	36	110	54	56	235	109	68	33	29	13	11
CFSM	.20	.51	1.65	.44	3.97	3.47	.82	.75	.58	.30	.10	.08
IN.	.23	.57	1.90	.51	4.28	4.00	.92	.86	.65	.35	.11	.09

CAL YR 1975 TOTAL 74912 MEAN 205 MAX 1560 MIN 17 CFSM 1.00 IN 13.53
WTR YR 1976 TOTAL 80214 MEAN 219 MAX 2500 MIN 11 CFSM 1.06 IN 14.49

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited stream-flow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are useable in low-flow or floodflow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow partial-record stations are given in the following table. These measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of a stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during water year 1976

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements	
					Date	Discharge (ft^3/s)
		Streams tributary to Lake Superior				
04044545	Mud Creek near Kawbawgam Village, MI	Lat 46°28'42", long 87°12'57", in NW¼ sec. 17, T.47 N., R.23 W., Marquette County, at dam on outlet of Lake LaVasseur, 1.3 miles east of Kawbawgam Village.	16.2	1971-73 1976	01-13-76 02-25-76 04-09-76 05-06-76 06-02-76 08-30-76 09-13-76	a3.5 a3.0 b105 a30 a34 0 0
04044583	Cherry Creek near Harvey, MI	Lat 46°28'07", long 87°21'53", in NE¼ SE¼ sec. 13, T.47 N., R.25 W., Marquette County, 0.5 mile upstream from County Highway 551, 2.0 miles south of Harvey.	4.53	1966-70‡ 1971-76	10-22-75 07-13-76 09-16-76	19.2 19.6 19.4
		Streams tributary to Lake Michigan				
04057580	Whitefish River near Rapid River, MI	Lat 45°57'56", long 86°55'15", in SE¼ NW¼ sec. 10, T.41 N., R.21 W., Delta County, about 800 ft downstream from Chippeny Creek, 3.5 miles northeast of Rapid River.	284	1973-76	10-07-75 02-13-76 07-21-76	114 134 90.8
04058120	Green Creek near Palmer, MI	Lat 46°22'22", long 87°36'21", in NW¼ sec. 19, T.46 N., R.26 W., Marquette County, at bridge on County Highway 565, 4.5 miles south of Palmer.	c8.42	1961-65 1970-76	10-29-75 11-19-75 12-18-75 01-23-76 02-18-76 03-24-76 04-20-76 04-27-76 05-17-76 06-15-76 07-13-76 08-12-76 09-09-76	b16.1 b30.2 b26.2 b14.9 b27.4 b35.3 b65.0 b34.8 b32.1 b22.2 b17.0 b13.4 b8.90
04058250	Warner Creek tributary near Palmer, MI	Lat 46°25'20", long 87°36'09", in NW¼ SE¼ sec. 31, T.47 N., R.26 W., Marquette County, at double culvert on County Road 565, 0.3 mile upstream from mouth and 0.8 mile south of Palmer.	4.05	1972-76	10-21-75 11-21-75 12-18-75 01-23-76 02-18-76 03-31-76 04-27-76 05-17-76 06-15-76 07-14-76 08-12-76 09-09-76	b2.25 b2.34 b3.31 b.78 b.89 b21.3 b4.49 b8.45 b2.09 b.62 b3.07 b.35
04059042	Portage Creek at Escanaba, MI	Lat 45°43'15", long 87°05'53", in SW¼ NW¼ sec. 1, T.38 N., R.23 W., Delta County, at culvert on east-west runway of Delta County Airport, 600 ft downstream from Willow Creek, at Escanaba.	20.3	1973-76	10-17-75 03-10-76 05-13-76	3.37 5.09 21.1

See footnotes at end of the table

Discharge measurements made at low-flow partial-record stations during water year 1976--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements	
					Date	Discharge (ft^3/s)
		Streams tributary to Lake Michigan--Continued				
04059750	Big Cedar River near Cedar River, MI	Lat 45°31'26", long 87°23'42", in NW¼ NE¼ sec. 16, T.36 N., R.25 W., Menominee County, at bridge on county highway, 1.3 miles upstream from Devils Creek and 8 miles north of Cedar River.	270	1973-76	10-01-75 03-10-76 07-30-76	39.7 67.6 6.46
04059757	Big Brook near Ingalls, MI	Lat 45°23'25", long 87°30'54", in NE¼ NE¼ sec. 33, T.34 N., R.26 W., Menominee County, at bridge on county road, 1,500 ft downstream from Baird Creek, 4.7 miles east of Ingalls.	20.8	1973-76	10-01-75 03-10-76 07-30-76	0.73 3.16 0
04062210	Spurr River at Three Lakes, MI	Lat 46°32'47", long 88°11'11", in NE¼ sec. 21, T.48 N., R.31 W., Baraga County, at outlet of Beaufort Lake, 0.8 mile southeast of Three Lakes.	18.8	1971-76	12-04-75 03-04-76 04-20-76 07-01-76 08-18-76	32.2 11.7 b164 5.82 1.34
04065397	East Branch Sturgeon River at Hardwood, MI	Lat 45°58'35", long 87°41'21", in NW¼ SE¼ sec. 4, T.41 N., R.27 W., Dickinson County, 1.0 mile north of Hardwood.	89.8	1972-76	01-06-76 03-23-76 04-08-76 04-09-76 04-09-76 08-18-76	34.0 76.2 b169 b713 b699 15.1
04065570	Pine Creek near Merriman, MI	Lat 45°56'42", long 87°59'13", in SW¼ SW¼ sec. 18, T.41 N., R.29 W., Dickinson County, 500 ft upstream from Mounty's Creek, 3.7 miles northeast of Merriman.	8.79	1971-76	11-04-75 03-22-76 08-24-76	b2.10 b3.72 b.20
04065580	Mounty's Creek near Merriman, MI	Lat 45°56'41", long 87°59'23", in SW¼ SW¼ sec. 18, T.41 N., R.29 W., Dickinson County, 400 ft upstream from mouth, and 3.6 miles northeast of Merriman.	2.96	1971-76	11-04-75 03-22-76 08-24-76 08-30-76	.97 b15.3 b1.04 b.69
04065590	Steel Creek near Merriman, MI	Lat 45°56'31", long 87°59'33", in NE¼ NE¼ sec. 24, T.41 N., R.30 W., Dickinson County, 200 ft upstream from mouth, 3.6 miles northeast of Merriman.	3.52	1971-76	11-04-75 03-22-76 08-24-76	1.47 6.00 .81
04066615	Little Shakey Creek near Daggett, MI	Lat 45°27'18", long 87°45'10", in NE¼ SW¼ sec. 3, T.35 N., R.28 W., (Michigan meridian) Menominee County, at bridge 200 ft downstream from Lake Ann, 7.0 miles west of Daggett.	13.8	1973-76	10-01-75 03-10-76 04-16-76 07-30-76	3.48 4.24 b37.8 2.01
04096517	Hog Creek tributary near Allen, MI	Lat 41°57'33", long 84°49'33", in SW¼ SW¼ sec. 7, T.6 S., R.4 W., Hillsdale County, at Squires Road, 0.3 mile upstream from mouth, 3.0 miles west of Allen.	2.61	1969-76	11-28-75 05-28-76 08-13-76 09-20-76	.61 1.13 1.39 1.39
04115450	Fish Creek at Carson City, MI	Lat 43°10'40", long 84°51'24", in SW¼ sec. 12, T.9 N., R.5 W., Montcalm County, on downstream side of footbridge in park, 300 ft upstream of bridge on State Highway 57, at Carson City.	126	1974-76	10-22-75 02-11-76 05-28-76 07-08-76 08-11-76	84.4 98.4 144 102 41.6
04119061	Plaster Creek at Wyoming, MI	Lat 42°56'15", long 85°41'24", in NE¼ sec. 2, T.6 N., R.12 W., Kent County, at Godfrey St., at Wyoming.	57.1	1974-76	10-21-75 05-25-76 08-10-76 09-15-76	24.7 b43.6 22.7 19.3
*04120295	Black Creek near Muskegon, MI	Lat 43°12'14", long 86°09'52", in NE¼ NW¼ sec. 1, T.9 N., R.16 W., Muskegon County, at bridge on Mill Iron Road, 4.8 miles east of Muskegon, and 4.9 miles upstream from mouth.	d39	1974-76	03-30-76 06-16-76 07-08-76 08-11-76 09-15-76	b103 57.9 51.2 37.7 33.0
04121920	Tamarack Creek at Howard City, MI	Lat 43°24'03", long 84°28'06", in NW¼ SE¼ sec. 26, T.12 N., R.10 W., Montcalm County, at upstream side of bridge on highway U.S. 131, in Howard City.	85.4	1973-76	07-07-76 08-10-76	54.0 32.9

See footnotes at end of the table

Discharge measurements made at low-flow partial-record stations during water year 1976--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements	
					Date	Discharge (ft^3/s)
		Streams tributary to Lake Michigan--Continued				
*04122223	Pentwater River near Hart, MI	Lat 43°43'27", long 86°22'36", in NW¼ SW¼ sec. 5, T.15 N., R.17 W., Oceana County at culverts on county road, 0.85 miles downstream from hydroelectric plant on Hart Lake, 1.8 miles northwest of Hart.		1974-76	03-10-76 07-21-76 09-16-76	b174 86.7 16.0
*04122230	North Branch Pentwater River near Pentwater, MI	Lat 43°47'42", long 86°21'30", in NE¼ SE¼ sec. 8, T.16 N., R.17 W., Oceana County, at bridge on highway U.S. 31, 3.5 miles northwest of Pentwater, and 5.1 miles upstream from mouth.		1974-76	07-22-76 09-16-76	39.8 40.3
04122300	Pere Marquette River near Baldwin, MI	Lat 43°51'27", long 85°51'01", in SW¼ SE¼ sec. 15, T.17 N., R.13 W., Lake County, 300 ft upstream from bridge on M-37, 2.7 miles south of Baldwin.	167	1973-76	06-15-76 07-21-76 08-10-76 09-15-76	163 156 128 124
*04126600	Betsie River near Benzonia, MI	Lat 44°36'02", long 86°05'57", in NW¼ NW¼ sec. 2, T.25 N., R.15 W., Benzie County, at bridge on highway US-31, 1.2 miles south of Benzonia, and 1.4 miles downstream from Homestead Dam.		1974-76	07-15-76 09-17-76	149 142
04126610	Crystal Lake Outlet near Benzonia, MI	Lat 44°37'56", long 86°08'41", in NW¼ NE¼ sec. 29, T.26 N., R.15 W., Benzie County, at culvert on State Highway 115, 0.3 mile downstream from dam at outlet of Crystal Lake, and 2.5 miles west of Benzonia.	d32	1974-76	07-15-76 09-17-76	15.5 0.75
04127700	Elk River at Elk Rapids, MI	Lat 44°54'02", long 85°24'42", in SW¼ NW¼ sec. 21, T.29 N., R.9 W., Antrim County, on upstream side of highway bridge at nonoperative hydroelectric plant in Elk Rapids, 500 ft upstream from mouth.	513	1973-76	07-15-76	351
*04127850	Boyne River near Boyne City, MI	Lat 45°11'48", long 84°57'26", in NW¼ SW¼ sec. 5, T.32 N., R.5 W., Charlevoix County, at culvert on Dam Road, 0.3 mile downstream from nonoperative hydroelectric plant, 2.8 miles southeast of Boyne City, and 3.6 miles upstream from mouth.		1974-76	05-04-76 07-14-76	b119 76.3
		Streams tributary to Lake Huron				
04137800	Tawas River at Tawas City, MI	Lat 44°16'39", long 83°30'53", in NE¼ NW¼ sec. 30, T.22 N., R.8 E., Iosco County, on downstream side of bridge on State Highway 55,in Tawas City.	156	1973-76	07-20-76 08-17-76	65.8 58.6
04143200	Pine River near Standish, MI	Lat 43°59'06", long 83°53'15", in SE¼ SE¼ sec. 5, T.18 N., R.5 E., Arenac County, 100 ft downstream from confluence of North and South Branches, 3.5 miles east of Standish.	91.9	1973-76	07-20-76 08-30-76	13.8 2.5
04145930	South Branch Flint River near Lapeer, MI	Lat 43°02'35", long 83°17'04", in NW¼ sec. 10, T.7 N., R.10 E., Lapeer County, at Morris Rd., 0.2 mile south of State Highway 21 and 1.5 miles southeast of Lapeer.	77.9	1973-76	11-06-75 06-03-76 07-07-76 08-12-76	69.8 47.1 63.9 18.3
*04146020	South Branch Flint River near Millville, MI	Lat 43°04'44", long 83°18'25", in SE¼ sec. 29, T.8 N., R.10 E., Lapeer County, at bridge on Saginaw Road, 1.6 miles north of Lapeer.	160	1974-76	11-06-75 02-19-76 06-03-76 07-07-76 08-12-76	134 b755 89.2 96.8 34.7
		Streams tributary to St. Clair River				
04159300	Black River near Croswell, MI	Lat 43°13'24", long 82°36'49", in SE¼ sec. 8, T.9 N., R.16 E., Sanilac County, 3.5 miles south of Croswell.	376	1956-76	10-01-75 11-07-75 12-11-75	12.5 19.5 b117
*04160350	Pine River near Rattle Run, MI	Lat 42°52'49", long 82°34'04", in NE¼ sec. 9, T.5 N., R.16 E., St. Clair County, at bridge on Gratiot Road, 1.9 miles northeast of Rattle Run.	135	1974-76	11-06-75 03-04-76 06-04-76 07-08-76 08-13-76	13.0 b1,750 15.4 27.8 2.95

See footnotes at end of the table

Discharge measurements made at low-flow partial-record stations during water year 1976--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements	
					Date	Discharge (ft^3/s)
		Streams tributary to Lake St. Clair				
04161585	Stony Creek near Goodison, MI	Lat 42°45'49", long 83°04'28", in SW¼ sec. 17, T.4 N., R.12 E., at Inwood Road, Macomb County, 5.2 miles northeast of Goodison.	34.6	1972-76	10-31-75 05-28-76 07-07-76 08-02-76	24.5 28.2 21.2 19.2

* Also a crest-stage station.
‡ Operated as a continuous-record gaging station.
a Field estimate.
b Not base flow.
c Since 1970, affected by diversion for industrial use.
d Approximately.

Crest-stage partial-record stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain, but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained but is not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations during water year 1976

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
		Streams tributary to Lake Superior					
04032000	Presque Isle River near Tula, MI	Lat 46°32'49", long 89°46'38", in NW¼ sec.23, T.48 N., R.44 W., Gogebic County, at bridge on State Highway 28, 7 miles southwest of Merriweather, 5.5 miles downstream from Little Presque Isle River, and 2.0 miles east of Tula.	261	1945-73‡, 1974-76	04-17-76	11.02	2,400
04039500	South Branch Ontonagon River at Ewen, MI	Lat 46°31'58", long 89°16'37", in NW¼ sec.26, T.48 N., R.40 W., Ontonagon County, on piers of old State Highway 28 bridge, at Ewen.	348	1939-41, 1942-71‡, 1972-76	04-17-76	12.28	2,860
04041000	Perch River near Sidnaw, MI	Lat 46°31'06", long 88°39'48", in NE¼ sec.34, T.48 N., R.35 W., Baraga County, at State Highway 28, 2.5 miles east of Sidnaw.	63.1	1913-15‡, 1957-76	04-17-76	9.70	560
04042500	Otter River near Elo, MI	Lat 46°50'09", long 88°38'12", in NE¼ NE¼ sec.8, T.51 N., R.34 W., Houghton County, 50 feet upstream from highway bridge, 1.6 miles north of Pelkie, 2.5 miles south of Elo, and 5.5 miles upstream from Otter Lake.	162	1943-72‡, 1973-76	04-17-76	9.40	3,240
04044200	Carp Creek at Ishpeming, MI	Lat 46°29'11", long 87°41'21", in NW¼ sec.9, T.47 N., R.27 W., Marquette County, at bridge on Highway 41A, at Ishpeming.	16.5	1970-76	04-16-76	6.48	141
04044813	Two Hearted River near Paradise, MI	Lat 46°41'57", long 85°25'19", in NW¼ SW¼ sec.27, T.50 N., R.9 W., Luce County, at foot bridge in State Forest Campground, 0.4 mile upstream from mouth, and 18 miles northwest of Paradise.	201	1973-76	04-19-76	a7.74	1,600
04045538	West Branch Waiska River near Brimley, MI	Lat 46°21'18", long 84°35'35", in SW¼ NW¼ sec.29, T.46 N., R.2 W., Chippewa County, at bridge on county road, 3.2 miles upstream from mouth, and 3.5 miles south of Brimley.	40.7	1973-76	04-05-76	7.60	620
04045559	East Branch Waiska River near Brimley, MI	Lat 46°25'07", long 84°28'24", in NW¼ NE¼ sec.6, T.46 N., R.1 W., Chippewa County, at bridge on county road, 4.0 miles upstream from mouth, and 4.7 miles east of Brimley.	31.9	1973-76	04-05-76	12.59	807
		Streams tributary to Lake Michigan					
04049500	Manistique River at Germfask, MI	Lat 46°14'00", long 85°55'40", in SE¼ sec.4, T.44 N., R.13 W., Schoolcraft County, 600 feet upstream from bridge on State Highway 77, 1.0 mile south of Germfask.	341	1938-70‡, 1971-76	04-08-76	5.88	1,400
04055000	Manistique River near Blaney, MI	Lat 46°05'05", long 86°03'35", in SE¼ sec.28, T.43 N., R.14 W., Schoolcraft County, 40 feet downstream from logging bridge, 0.5 mile downstream from Duck Creek, and 7 miles southwest of Blaney.	704	1938-70‡, 1971-76	04-08-76	18.14	5,340
04057000	Indian River near Manistique, MI	Lat 45°59'30", long 86°17'15", in NE¼ sec.34, T.42 N., R.16 W., Schoolcraft County, near outlet of Indian Lake, 2.4 miles northwest of Manistique.	302	1938-71‡, 1972-76	04-25-76	5.65	936
04057900	Black River near Republic, MI	Lat 46°25'08", long 87°53'21", in NE¼ sec.2, T.46 N., R.29 W., Marquette County, at bridge on county road, 4.4 miles east of Republic.	34.4	1961-68‡, 1970-76	04-17-76	3.74	282
04062300	Michigamme River at Republic, MI	Lat 46°23'03", long 87°58'48", in SE¼ sec.18, T.46 N., R.29 W., Marquette County, on left bank 400 feet upstream from county highway bridge, 0.3 mile upstream from Trout Falls Creek, and 0.6 mile south of Republic.	240	1961-75‡, 1976	04-20-76	7.34	3,370

See footnotes at end of the table

Annual maximum discharge at crest-stage partial-record stations during water year 1976--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
		Streams tributary to Lake Michigan--Continued					
04096020	Galien River near Union Pier, MI	Lat 41°49'39", long 86°39'21", in NE¼ sec.32, T.7 S., R.20 W., Berrien County, on downstream side of bridge on Union Pier Road, 1.5 miles east of Union Pier.	86.1	1973-76	03-05-76	8.95	830
04097060	Little Portage Creek near Fulton, MI	Lat 42°05'19", long 85°23'29", in SW¼ sec.29, T.4 S., R.9 W., Kalamazoo County, at bridge on 38th Street, 2.8 miles southwest of Fulton.	27.0	1965-67‡, 1972-76	03-05-76	5.87	283
04097370	Flowerfield Creek at Flowerfield, MI	Lat 42°03'50", long 85°39'44", in SW¼ sec.1, T.5 S., R.12 W., St. Joseph County, at Flowerfield Road, at Flowerfield.	42.6	1964-76	03-27-76	1.96	86
04098500	Fawn River near White Pigeon, MI	Lat 41°46'56", long 85°35'00", in SW¼ sec.10, T.8 S., R.11 W., St. Joseph County, on right bank 0.3 mile downstream from bridge on county highway, 3.1 miles east of White Pigeon, and 3.5 miles upstream from Sherman Mill Creek.	192	1958-75‡, 1976	03-06-76	4.75	613
04112700	Sycamore Creek near Mason, MI	Lat 42°36'38", long 84°27'58", in NE¼ NE¼ sec.31, T.3 N., R.1 W., Ingham County, at bridge on Harper Road, 0.7 mile downstream from Aurelius and VeVoy Drain, and 2.6 miles northwest of Mason.	39.5	1975-76	03-05-76	9.64	315
04113090	Carrier Creek near Grand Ledge, MI	Lat 42°43'36", long 84°39'16", in SE¼ SW¼ sec.15, T.4 N., R.3 W., Eaton County, at bridge on St. Joe Highway, 3.7 miles upstream from mouth, and 4.0 miles southeast of Grand Ledge.	7.18	1975-76	02-21-76	4.81	96
04117000	Quaker Brook near Nashville, MI	Lat 42°33'57", long 85°05'37", in NW¼ sec.13, T.2 N., R.7 W., Barry County, on left bank 150 feet upstream from culvert on county road, 500 feet upstream from small tributary, and 2.5 miles south of Nashville.	7.60	1955-75‡, 1976	02-21-76	4.31	141
04119055	Plaster Creek at Grand Rapids, MI	Lat 42°54'46", long 85°39'02", in SE¼ sec.7, T.6 N., R.11 W., Kent County, on right downstream side of bridge on 28th Street, at Grand Rapids.	46.6	1974-76	12-15-75	9.84	850
04119160	Buck Creek at Grandville, MI	Lat 42°54'09", long 85°45'46", in SE¼ sec.18, T.6 N., R.12 W., Kent County, on right downstream side of bridge on Wilson Avenue, at Grandville.	50.5	1974-76	03-05-76	8.48	650
*04120295	Black Creek near Muskegon, MI	Lat 43°12'14", long 86°09'52", in NW¼ NW¼ sec.1, T.9 N., R.16 W., Muskegon County, at bridge on Mill Iron Road, 4.8 miles east of Muskegon.	b39	1974-76	-	c	-
04121000	Muskegon River near Merritt, MI	Lat 44°20'08", long 84°53'24", in NW¼ NW¼ sec.2, T.22 N., R.5 W., Missaukee County, on right bank 35 feet upstream from bridge on State Highway 55, 2.7 miles east of Merritt.	355	1946-73‡, 1974-76	03-28-76	8.59	1,290
*04122223	Pentwater River near Hart, MI	Lat 43°43'27", long 86°22'36", in NW¼ SW¼ sec.5, T.15 N., R.17 W., Oceana County, at culverts on county road, 0.8 mile downstream from hydroelectric plant on Hart Lake, 1.8 miles northwest of Hart.	b78	1975-76	03-06-76	3.81	240
*04122230	North Branch Pentwater River near Pentwater, MI	Lat 43°47'42", long 86°21'30", in NE¼ SE¼ sec.8, T.16 N., R.17 W., Oceana County, at bridge on U.S. Highway 31, 3.5 miles northwest of Pentwater.	b44	1975-76	03-06-76	2.48	192
04123500	Manistee River near Grayling, MI	Lat 44°41'35", long 84°50'50", in SW¼ NW¼ sec.31, T.27 N., R.4 W., Crawford County, on right bank 25 feet upstream from bridge on State Highway 72, 6.8 miles northwest of Grayling.	159	1942-73‡, 1974-76	03-28-76	1.61	343
04124500	East Branch Pine River near Tustin, MI	Lat 44°06'09", long 85°31'02", in NE¼ NW¼ sec.28, T.20 N., R.10 W., Osceola County, 75 feet downstream from highway bridge, 3.0 miles west of Tustin.	b63	1953-63‡, 1964-76	03-28-76	5.63	828

See footnotes at end of the table

Annual maximum discharge at crest-stage partial-record stations during water year 1976--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
		Streams tributary to Lake Michigan--Continued					
04126200	Little Manistee River near Freesoil, MI	Lat 44°11'00", long 86°10'00", in NE¼ NE¼ sec.31, T.21 N., R.15 W., Manistee County, on right bank 25 feet upstream from Six Mile Bridge, 5.8 miles north of Freesoil, 7.4 miles upstream from mouth, and 9.0 miles southeast of Manistee.	200	1956-75‡, 1976	03-30-76	3.88	595
*04126600	Betsie River near Benzonia, MI	Lat 44°36'02", long 86°05'57", in NW¼ NW¼ sec.2, T.25 N., R.15 W., Benzie County, at bridge on U.S. Highway 31, 1.2 miles south of Benzonia.	b170	1975-76	03-27-76	4.97	1,070
*04127850	Boyne River near Boyne City, MI	Lat 45°11'48", long 84°57'26", in NW¼ SW¼ sec.5, T.32 N., R.5 W., Charlevoix County, at culvert on Dam Road, 0.3 mile downstream from nonoperative hydroelectric plant, 2.8 miles southeast of Boyne City.	b65	1975-76	03-27-76	3.27	431
		Streams tributary to Lake Huron					
04132000	Black River near Cheboygan, MI	Lat 45°29'59", long 84°19'36", in NW¼ NW¼ sec.21, T.36 N., R.1 E., Cheboygan County, on left bank 0.3 mile downstream from Black Lake, 5.3 miles upstream from Alvarns Dam, and 12.6 miles southeast of Cheboygan.	597	1942-74‡, 1975-76	03-30-76	4.50	2,700
04132500	Thunder Bay River near Hillman, MI	Lat 45°00'30", long 83°58'21", in NE¼ SE¼ sec.8, T.30 N., R.4 E., Montmorency County, on left bank 25 feet upstream from bridge on State Highway 32, 5.2 miles southwest of Hillman.	232	1946-72‡, 1973-76	03-25-76	8.87	1,010
04138000	East Branch Au Gres River at McIvor, MI	Lat 44°13'57", long 83°42'03", in NW¼ NW¼ sec.10, T.21 N., R.6 E., Iosco County, on right bank 25 feet downstream from bridge on Whittemore Road at McIvor, and 11.5 miles upstream from mouth.	b84	1950-73‡, 1974-76	03-06-76	6.66	552
04138600	Gamble Creek at Lupton, MI	Lat 44°25'26", long 84°01'32", in SW¼ SW¼ sec.36, T.24 N., R.3 E., Ogemaw County, at culvert on Lupton Road, 0.5 mile south of Lupton.	9.47	1953-56, 1959-76	03-31-76	4.07	82
04138700	Bixby Creek near Rose City, MI	Lat 44°26'06", long 84°07'16", in NE¼ NW¼ sec.31, T.24 N., R.3 E., Ogemaw County, at bridge on State Highway 33, 0.9 mile north of Rose City.	2.68	1953-76	03-31-76	4.91	107
04138800	Houghton Creek at Rose City, MI	Lat 44°25'17", long 84°06'34", in NE¼ NE¼ sec.6, T.23 N., R.3 E., Ogemaw County, at bridge on Rose City Road, 0.3 mile east of Rose City.	13.3	1953-76	03-23-76	4.19	430
04138900	Wilkins Creek near Rose City, MI	Lat 44°24'18", long 84°06'59", in NE¼ NW¼ sec.7, T.23 N., R.3 E., Ogemaw County, at bridge on State Highway 33, 1.1 miles south of Rose City.	9.15	1953-76	03-31-76	3.43	193
04139000	Houghton Creek near Lupton, MI	Lat 44°23'45", long 84°02'50", in SE¼ SE¼ sec.10, T.23 N., R.3 E., Ogemaw County, 2.7 miles southwest of Lupton.	29.7	1950-72‡, 1973-76	03-24-76	5.68	355
04139500	Rifle River at "The Ranch" near Lupton, MI	Lat 44°23'36", long 84°02'18", in SE¼ SW¼ sec.11, T.23 N., R.3 E., Ogemaw County, at downstream side of bridge, 2.7 miles south of Lupton.	56.8	1951-71‡, 1972-76	03-24-76	9.67	530
04140000	Prior Creek near Selkirk, MI	Lat 44°20'06", long 84°04'06", in SE¼ SE¼ sec.33, T.23 N., R.3 E., Ogemaw County, on right bank 20 feet upstream from culverts on Peters Road, 1.5 miles north of Selkirk.	21.4	1950-72‡, 1973-76	03-24-76	5.31	255
04140200	Klacking Creek near Selkirk, MI	Lat 44°20'05", long 84°08'46", in NE¼ NE¼ sec.2, T.22 N., R.2 E., Ogemaw County, at bridge on Campbell Road, 4.0 miles northwest of Selkirk.	7.51	1953-76	03-20-76	2.93	175

See footnotes at end of the table

Annual maximum discharge at crest-stage partial-record stations during water year 1976--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
		Streams tributary to Lake Huron--Continued					
04141100	Shepards Creek near Selkirk, MI	Lat 44°18'27", long 84°05'05", in SE¼ SE¼ sec.8, T.22 N., R.3 E., Ogemaw County, at bridge on Bedtelyon Road, 1.1 miles southwest of Selkirk.	4.44	1953-76	03-20-76	4.40	310
04144180	Jones Creek near Gaines, MI	Lat 42°53'02", long 83°52'27", in SE¼ sec.28, T.6 N., R.5 E., Genesee County, at bridge on Baldwin Road, 1.7 miles northeast of Gaines.	7.60	1970-76	02-15-76	7.18	112
04144200	Porter Drain near Gaines, MI	Lat 42°53'26", long 83°50'59", in SE¼ sec.27, T.6 N., R.5 E., Genesee County, at bridge on Seymour Road, 3.2 miles east of Gaines.	4.68	1970-76	12-15-75	4.08	65
04144220	Jones Creek at Duffield, MI	Lat 42°54'45", long 83°54'27", in SE¼ sec.17, T.6 N., R.5 E., Genesee County, at bridge on Grand Blanc Road, 1.0 mile south of Duffield.	23.4	1970-76	12-15-75	8.52	410
*04146020	South Branch Flint River near Millville, MI	Lat 43°04'44", long 83°18'25", in SE¼ sec.29, T.8 N., R.10 E., Lapeer County, on downstream right wingwall of bridge on Saginaw Road, 1.6 miles north of Lapeer.	160	1974-76	02-23-76	8.18	770
04147800	Powers-Cullen Drain near Genesee, MI	Lat 43°05'33", long 83°33'31", in SE¼ sec.18, T.8 N., R.8 E., Genesee County, at bridge on Coldwater Road, 3.3 miles southeast of Genesee.	9.17	1970-76	12-15-75	3.81	277
04147900	Lefler-Scothan Drain near Otisville, MI	Lat 43°08'11", long 83°32'27", in NE¼ sec.5, T.8 N., R.8 E., Genesee County, at bridge on Frances Road, 2.2 miles south of Otisville.	4.90	1970-76	12-15-75	4.59	70
04148120	Kearsley Creek near Atlas, MI	Lat 42°57'15", long 83°32'42", in NE¼ sec.5, T.6 N., R.8 E., Genesee County, at bridge on Jordan Road, 1.2 miles north of Atlas.	55.7	1970-76	12-15-75	7.25	340
04148139	Black Creek near Davison, MI	Lat 43°01'28", long 83°33'24", in SE¼ sec.7, T.7 N., R.8 E., Genesee County, at bridge on Irish Road, 2.0 miles west of Davison.	22.8	1970-76	02-22-76	6.64	250
04148144	Chipmunk Creek near Genesee, MI	Lat 43°04'01", long 83°36'59", in SE¼ sec.27, T.8 N., R.7 E., Genesee County, at bridge on Genesee Road, 3.1 miles south of Genesee.	5.50	1970-76	12-15-75	4.30	245
04148200	Swartz Creek near Holly, MI	Lat 42°49'39", long 83°37'42", in SW¼ sec.15, T.5 N., R.7 E., Oakland County, on right bank 25 feet downstream from bridge on Elliot Road, 2.4 miles north of Holly.	12.0	1956-75‡, 1976	03-05-76	3.58	84
04148255	Swartz Creek near Grand Blanc, MI	Lat 42°53'09", long 83°41'29", in SE¼ sec.25, T.6 N., R.6 E., Genesee County, at bridge on Baldwin Road, 4.1 miles southwest of Grand Blanc.	36.0	1970-76	12-15-75	5.50	190
04148260	Swartz Creek near Swartz Creek, MI	Lat 42°58'22", long 83°45'43", in SW¼ sec.28, T.7 N., R.6 E., Genesee County, at bridge on Bristol Road, 3.9 miles east of Swartz Creek.	67.2	1970-76	02-21-76	8.26	820
04148265	Kimball Drain near Swartz Creek, MI	Lat 42°55'15", long 83°49'51", in NE¼ sec.14, T.6 N., R.5 E., Genesee County, at bridge on Morrish Road, 2.4 miles south of Swartz Creek.	10.6	1970-76	12-15-75	7.07	200
04148270	West Branch Swartz Creek near Swartz Creek, MI	Lat 42°58'22", long 83°46'08", in SW¼ sec.28, T.7 N., R.6 E., Genesee County, at bridge on Bristol Road, 3.2 miles east of Swartz Creek.	40.8	1970-76	12-15-75	9.50	1,100
04148410	Thread Creek near Goodrich, MI	Lat 42°53'19", long 83°32'10", in SE¼ sec.29, T.6 N., R.8 E., Genesee County, at bridge on Baldwin Road, 2.4 miles southwest of Goodrich.	28.5	1970-76	02-15-76	4.32	163
04148610	Cole Creek near Flushing, MI	Lat 43°02'44", long 83°51'06", in SW¼ sec.35, T.8 N., R.5 E., Genesee County, at bridge on Potter Road, 1.2 miles south of Flushing.	8.51	1970-76	12-15-75	6.43	192

See footnotes at end of the table

Annual maximum discharge at crest-stage partial-record stations during water year 1976--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
		Streams tributary to Lake Huron--Continued					
04148620	Freeman Drain near Montrose, MI	Lat 43°07'04", long 83°53'37", in SE¼ sec.5, T.8 N., R.5 E., Genesee County, at bridge on Mt. Morris Road, 4.0 miles south of Montrose.	8.21	1970-76	12-15-75	6.01	258
04148640	Armstrong Creek near Montrose, MI	Lat 43°08'04", long 83°50'03", in SE¼ sec.35, T.9 N., R.5 E., Genesee County, at bridge on Morrish Road, 4.1 miles southeast of Montrose.	11.0	1970-76	12-15-75	5.92	235
04148740	Central-Stadler Drain near Montrose, MI	Lat 43°09'46", long 83°50'14", in SE¼ sec.23, T.9 N., R.5 E., Genesee County, at bridge on Wilson Road, 3.1 miles east of Montrose.	14.2	1970-76	03-03-76	5.44	260
04148800	Pine Run near Montrose, MI	Lat 43°12'42", long 83°48'54", in SE¼ sec.1, T.9 N., R.5 E., Genesee County, at bridge on Elms Road, 4.7 miles northeast of Montrose.	27.8	1970-76	03-03-76	8.73	630
04148900	Silver Creek near Clio, MI	Lat 43°12'54", long 83°45'55", in NW¼ sec.4, T.9 N., R.6 E., Genesee County, at bridge on Weir Road, 3.0 miles northwest of Clio.	4.01	1970-76	03-03-76	4.08	123
04149300	Misteguay Creek near Flushing, MI	Lat 43°01'31", long 83°54'41", in NE¼ sec.7, T.7 N., R.5 E., Genesee County, at bridge on Duffield Road, 3.7 miles southwest of Flushing.	17.4	1970-76	12-15-75	9.18	730
04151000	Cass River at Vassar, MI	Lat 43°22'15", long 83°34'52", in NW¼ SW¼ sec.7, T.11 N., R.8 E., Tuscola County, at bridge on State Highway 15, at Vassar.	d710	1949-70‡, 1971-76	03-06-76	17.7	11,900
04153500	Salt River near North Bradley, MI	Lat 43°42'10", long 84°28'14", in NE¼ SE¼ sec.7, T.15 N., R.1 W., Midland County, at bridge on North Saginaw Road, 1.1 miles southeast of North Bradley.	138	1935-71‡, 1972-76	03-21-76	15.8	4,800
04154500	Chippewa River near Midland, MI	Lat 43°35'40", long 84°22'10", in NE¼ NE¼ sec.24, T.14 N., R.1 W., Midland County, on upstream side of bridge on Meridian Road, 6.5 miles southwest of Midland.	597	1947-72‡, 1973-76	03-22-76	8.83	7,320
		Streams tributary to St. Clair River					
04159900	Mill Creek near Avoca, MI	Lat 43°03'16", long 82°44'05", in NW¼ sec.8, T.7 N., R.15 E., St. Clair County, on left bank at downstream side of bridge on Bricker Road, 0.2 mile upstream from Gleason Drain, and 2.3 miles west of Avoca.	169	1963-75‡, 1976	03-05-76	7.72	2,150
*04160350	Pine River near Rattle Run, MI	Lat 42°52'49", long 82°34'04", in NE¼ sec.9, T.5 N., R.16 E., St. Clair County, on right downstream wingwall of bridge on Gratiot Road, 1.9 miles northeast of Rattle Run.	135	1974-76	03-03-76	19.05	2,400
		Streams tributary to Lake St. Clair					
04161500	Paint Creek near Lake Orion, MI	Lat 42°46'03", long 83°13'12", in NE¼ sec.13, T.4 N., R.10 E., Oakland County, on left bank 100 feet upstream from railroad bridge, 1.6 miles southeast of Lake Orion, and 2.8 miles upstream from Trout Creek.	38.5	1959-75‡, 1976	03-05-76	3.59	253
04161760	West Branch Stony Creek near Washington, MI	Lat 42°43'53", long 83°06'02", in SE¼ sec.25, T.4 N., R.11 E., Oakland County, at bridge on Huron-Clinton Metropolitan Park Road, and 3.4 miles west of Washington.	22.5	1965-76	03-05-76	3.60	210
04164010	North Branch Clinton River at Almont, MI	Lat 42°54'59", long 83°02'42", in NE¼ sec.28, T.6 N., R.12 E., Lapeer County, at bridge on State Highway 53, at Almont.	9.56	1959-62, 1963-68‡, 1969-76	04-25-76	4.79	215
04164050	North Branch Clinton River near Romeo, MI	Lat 42°49'11", long 82°58'35", in NW¼ sec.31, T.5 N., R.13 E., Macomb County, at bridge on 33 Mile Road, 2.2 miles northeast of Romeo.	49.7	1959-64, 1965-69‡, 1970-76	02-16-76	e4.51	1,250

See footnotes at end of the table

Annual maximum discharge at crest-stage partial-record stations during water year 1976--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
		Streams tributary to Lake St. Clair--Continued					
04164150	North Branch Clinton River near Meade, MI	Lat 42°43'50", long 82°54'23", in NE¼ sec.34, T.4 N., R.13 E., Macomb County, on left bank at bridge on 27 Mile Road, 1.9 miles northwest of Meade.	89.6	1959-67, 1968-72‡, 1973-76	02-17-76	6.92	1,830
04164200	Coon Creek near Armada, MI	Lat 42°47'41", long 82°52'58", in SW¼ sec.1, T.4 N., R.13 E., Macomb County, at bridge on North Road, 3.4 miles south of Armada.	10.0	1959-65, 1966-70‡, 1971-76	03-03-76	f5.61	250
04164250	Tupper Brook at Ray Center, MI	Lat 42°45'42", long 82°54'04", in NW¼ sec.23, T.4 N., R.13 E., Macomb County, at bridge on 29 Mile Road, at Ray Center.	8.62	1959, 1960-64‡, 1965-76	03-02-76	6.60	392
04164350	Highbank Creek near Armada, MI	Lat 42°28'24", long 82°51'08", in NW¼ sec.6, T.4 N., R.14 E., Macomb County, at bridge on 32 Mile Road, 3.0 miles southeast of Armada.	14.9	1959-65, 1966-70‡, 1971-76	03-02-76	15.34	760
04164360	East Branch Coon Creek near New Haven, MI	Lat 42°45'46", long 82°50'57", in NW¼ sec.19, T.4 N., R.14 E., Macomb County, at bridge on 29 Mile Road, 3.4 miles northwest of New Haven.	36.1	1959-67, 1967-72‡, 1973-76	02-22-76	7.91	1,120
04164400	Deer Creek near Meade, MI	Lat 42°42'39", long 82°51'32", in NW¼ sec.6, T.3 N., R.14 E., Macomb County, at bridge on 25½ Mile Road, 0.9 mile southeast of Meade.	12.7	1959-60, 1961-65‡, 1966-76	04-25-76	7.30	461
04164450	McBride Drain near Macomb, MI	Lat 42°41'14", long 82°55'14", in NE¼ NE¼ sec.16, T.3 N., R.13 E., Macomb County, at bridge on 24 Mile Road, 2.2 miles southeast of Macomb.	5.79	1960-64‡, 1965-76	03-02-76	8.48	130
04164600	Middle Branch Clinton River near Macomb, MI	Lat 42°42'03", long 82°59'44", in SE¼ sec.2, T.3 N., R.12 E., Macomb County, at bridge on Schoenherr Road, 2.0 miles west of Macomb.	22.2	1959-64, 1965-69‡, 1971-76	04-25-76	9.93	617
04165200	Gloede Ditch near Waldenburg, MI	Lat 42°37'39", long 82°57'10", in SW¼ sec.32, T.3 N., R.13 E., Macomb County, 2.2 miles south of Waldenburg.	16.0	1959, 1960-64‡, 1965-76	04-25-76	17.08	360
		Streams tributary to Detroit River					
04168660	Frank and Poet Drain at Trenton, MI	Lat 42°09'19", long 83°12'22", in NW¼ sec.13, T.4 S., R.10 E., Wayne County, at bridge on King Road, at Trenton.	19.3	1972-76	02-17-76	8.13	275
		Streams tributary to Lake Erie					
04168800	Huron River near Andersonville, MI	Lat 42°41'35", long 82°29'56", in NW¼ SE¼ sec.3, T.3 N., R.8 E., Oakland County, on downstream side of culvert on White Lake Road, 2.5 miles south of Andersonville.	14.0	1974-76	03-04-76	2.24	74
04169500	Huron River at Commerce, MI	Lat 42°35'25", long 83°29'05", in NE¼ SE¼ sec.10, T.2 N., R.8 E., Oakland County, on downstream left abutment of bridge on Commerce Road, 10 feet upstream from Hayes Creek, and 0.2 miles east of Commerce.	57.3	1946-75‡, 1976	03-05-76	2.48	145
04172500	Portage River near Pinckney, MI	Lat 42°25'40", long 83°57'35", in SW¼ sec.34, T.1 N., R.4 E., Livingston County, at bridge on Tiplady Road, 2.0 miles upstream from Little Portage Lake, and 2.2 miles southwest of Pinckney.	79.1	1945-71‡, 1972-76	03-05-76	4.46	264

See footnotes at end of the table

Annual maximum discharge at crest-stage partial-record stations during water year 1976--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
		Streams tributary to Lake Erie--Continued					
04173250	Mill Creek near Lima Center, MI	Lat 42°15'56", long 83°56'45", in NE¼ sec.34, T.2 S., R.4 E., Washtenaw County, at Guenther Road, 2.0 miles upstream from North Fork Mill Creek, and 2.2 miles south of Lima Center.	47.3	1973-76	03-05-76	9.48	520

‡ Operated as a continuous-record gaging station.
* Also a low-flow partial-record station.
a Occurred April 5, 1976 (backwater from sand bar at mouth).
b Approximately.
c Annual maximum stage not determined.
d Revised.
e Backwater from ice.
f Maximum gage height observed.

Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table. Those that are measurements of base flow are designated by an asterisk(*).

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		Streams tributary to Lake Superior				
Welsh Creek	Montreal River	Lat 46°29'30", long 90°10'23", in NW¼ NW¼ sec.10, T.47 N., R.47 W., Gogebic County, above county road above Ironwood Township sewage plant, 2 miles north of Ironwood, MI.	a5	1969-70, 1975	08-24-76	*0.29
Montreal River	Lake Superior	Lat 46°30'26", long 90°13'47", in SE¼ SW¼ sec.31, T.48 N., R.47 W., Michigan meridian, Gogebic County, 0.2 mile above Spring Creek, and 4.2 miles northwest of Ironwood, MI.	80.6	1970-71, 1973,1975	08-25-76	*4.71
Spring Creek	Montreal River	Lat 46°30'47", long 90°09'22", in SW¼ sec.35, T.48 N., R.47 W., Gogebic County, 4 miles north of Ironwood, MI.	a7	1962,1975	08-24-76	*.29
Mud Creek	do	Lat 46°34'12", long 90°10'35", in NW¼ SW¼ sec.10, T.48 N., R.47 W., Gogebic County, at county road, 8 miles north of Ironwood, MI.	a17	-	08-31-76	*b.02
Black River	Lake Superior	Lat 46°28'26", long 90°00'06", in NW¼ sec.13, T.47 N., R.46 W., Gogebic County, at bridge, in Ramsay, MI.	78.0	1922c, 1924-29c, 1969-70, 1975	08-23-76	*1.58
Plymouth Mine Pond Outlet	Alward Creek	Lat 46°28'14", long 89°58'56", in SE¼ NW¼ sec.18, T.47 N., R.45 W., Gogebic County, at culvert on Plymouth Road, at Ramsay, MI.	-	1974-75	11-05-75 02-04-76 03-16-76 08-23-76	*.56 *1.17 *1.39 *.60
Little Black River	Sunday Lake	Lat 46°28'00", long 89°56'40", in SW¼ sec.16, T.47 N., R.45 W., Gogebic County, at county road, 0.5 mile south of Wakefield, MI.	a24	-	08-30-76	*0
do	Black River	Lat 46°28'48", long 89°58'30", in SW¼ SE¼ sec.7, T.47 N., R.45 W., Gogebic County, at bridge on U.S. Highway 2, 2 miles west of Wakefield, MI.	a28	-	08-30-76	*.02
Jackson Creek	do	Lat 46°27'05", long 89°51'58", in SE¼ SE¼ sec.24, T.47 N., R.45 W., Gogebic County, at bridge on U.S. Highway 2, 3.5 miles southeast of Wakefield, MI.	a17	1975	08-23-76	*0
do	do	Lat 46°30'56", long 89°52'52", in NW¼ sec.36, T.48 N., R.45 W., Gogebic County, at bridge on State Highway M-28, 4.0 miles northeast of Wakefield, MI.	a40	1969-70	08-25-76	*.58
Planter Creek	Jackson Creek	Lat 46°29'56", long 89°55'39", in NW¼ SW¼ sec.3, T.47 N., R.45 W., Gogebic County, at culverts on county highway, 1 mile north of Wakefield, MI.	-	-	08-30-76	*.61
Unnamed tributary	Kallander Creek	Lat 46°28'46", long 90°03'07", in NE¼ sec.9, T.47 N., R.46 W., Gogebic County, at culverts on County Road 513, 0.1 mile above mouth, in Bessemer, MI.	a.3	1970	08-24-76	*0
Kallander Creek	Black River	Lat 46°28'52", long 90°02'59", in NW¼ sec.10, T.47 N., R.46 W., Gogebic County, immediately above Bessemer sewage plant, 0.1 mile below unnamed tributary, in Bessemer, MI.	a1.2	1970,1975	08-24-76	*0
Powder Mill Creek	do	Lat 46°30'39", long 90°04'22", in SW¼ sec. 33, T.48 N., R.46 W., Gogebic County, at mouth, 2.0 miles northwest of Bessemer, MI.	16.8	1970	08-24-76	*.06
Black River	Lake Superior	Lat 46°39'29", long 90°02'38", in NW¼ sec.10, T.49 N., R.46 W., Gogebic County, 0.7 mile above mouth, at Rainbow Falls, 12.0 miles north of Bessemer, MI.	257	1970	08-24-76	*19.1
Little Presque Isle River	Presque Isle River	Lat 46°24'18", long 89°46'45", in NW¼ sec.11, T.46 N., R.44 W., Gogebic County, at U.S. Highway 2, near Marenisco, MI.	a21	1947-48	08-23-76	*2.76

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Streams tributary to Lake Superior--Continued				
Presque Isle River	Lake Superior	Lat 46°32'49", long 89°46'38", in NW¼ sec.23, T.48 N., R.44 W., Gogebic County, at bridge on State Highway 28, 2.0 miles east of Tula, MI.	261	1945-73c, 1974-75de	08-25-76	*31.4
do	do	Lat 46°41'46", long 89°58'26", in SE¼ sec.30, T.50 N., R.45 W., Gogebic County, 1.0 mile above mouth, 10.0 miles north of Connorville, MI.	358	1969-70, 1972-75de	08-25-76	*39.7
Little Iron River	do	Lat 46°49'33", long 89°35'13", in SW¼ sec.12, T.51 N., R.42 W., Ontonagon County, 0.2 mile above mouth, 0.6 mile east of Silver City, MI.	17	1970	08-26-76	*.34
Iron River	do	Lat 46°48'54", long 89°34'10", in NW¼ sec.13, T.51 N., R.42 W., Ontonagon County, 1.0 mile above mouth, at Bonanza Falls, 1 mile south of Silver City, MI.	100	1952,1970	08-26-76	*1.16
Mineral River	do	Lat 46°44'00", long 89°33'46", in N½ sec.16, T.50 N., R.42 W., Ontonagon County, at bridge on State Highway M-64, 1.5 miles southeast of White Pine, MI.	6.80	1942,1970, 1975	08-25-76	*0
do	do	Lat 46°45'44", long 89°34'30", in NE¼ sec.5, T.50 N., R.42 W., Ontonagon County, at bridge on State Highway M-64, at White Pine, MI.	10.5	1952,1970, 1975	08-25-76	*0
Cranberry River	do	Lat 46°50'34", long 89°25'12", in NE¼ SE¼ sec.6, T.51 N., R.40 W., Ontonagon County, at mouth, 0.7 mile east of Green, MI.	20.3	1970	08-26-76	*0
Deer Creek	Potato River	Lat 46°45'34", long 89°17'09", in NE¼ sec.1, T.50 N., R.41 W., Ontonagon County, 8 miles southwest of Ontonagon, MI.	18.3	1942	08-26-76	*b.05
Cunningham Creek	do	Lat 46°45'16", long 89°17'16", in SE¼ sec.1, T.50 N., R.41 W., Ontonagon County, 8.5 miles southwest of Ontonagon, MI.	2.51	1942	08-26-76	*0
Potato River	Lake Superior	Lat 46°51'12", long 89°23'16", in SE¼ SW¼ sec.33, T.52 N., R.40 W., Ontonagon County, at mouth, 2.5 miles northeast of Green, MI.	22.4	1970	08-26-76	*0
Middle Branch Ontonagon River	Ontonagon River	Lat 46°16'30", long 89°10'39", in NW¼ NW¼ sec.27, T.45 N., R.39 W., Gogebic County, at bridge on U.S. Highway 45, 0.1 mile north of Watersmeet, MI.	48.0	1967, 1969-71, 1975	08-26-76	*19.7
Trout Creek	Middle Branch Ontonagon River	Lat 46°29'04", long 88°59'57", in NW¼ SE¼ sec. 12, T.47 N., R.38 W., Ontonagon County, at bridge on Duluth, South Shore, and Atlantic Railway, 0.6 mile east of Trout Creek, MI.	a23	1967, 1969-70	08-26-76	*11.1
Baltimore River	Ontonagon River	Lat 46°32'01", long 89°12'18", in NE¼ sec.29, T.48 N., R.39 W., Ontonagon County, 1.3 miles west of Bruce Crossing, MI.	19.2	1942,1975	08-26-76	*2.85
Clear Creek	Baltimore River	Lat 46°32'07", long 89°10'54", in SE¼ SE¼ sec. 21, T.48 N., R.39 W., Ontonagon County, at box culvert on State Highway 28, 0.1 mile west of Bruce Crossing, MI.	8.51	1942,1967, 1969-70, 1975	08-26-76	*3.81
East Branch Ontonagon River	Ontonagon River	Lat 46°29'09", long 88°53'22", in NE¼ sec.11, T.47 N., R.37 W., Houghton County, at railroad bridge at U.S. Forest Service ranger station, in Kenton, MI.	a69		08-26-76	*25.2
Adventure Creek	East Branch Ontonagon River	Lat 46°44'46", long 89°03'49", in SE¼ NW¼ sec.9, T.50 N., R.38 W., Ontonagon County, between Milwaukee, St. Paul, and Pacific Railway and county road, 1.5 miles southeast of Mass, MI.	a5	1969-70, 1975	08-26-76	*0
Merriweather Creek	Lake Gogebic	Lat 46°34'04", long 89°38'58", in SW¼ sec.11, T.48 N., R.43 W., Ontonagon County, at bridge on State Highway 28, 0.6 mile southwest of Merriweather, MI.	25.2	1970,1975	08-25-76	*0

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Streams tributary to Lake Superior--Continued				
Flintsteel River	Lake Superior	Lat 46°51'59", long 89°11'48", in SW¼ SE¼ sec. 25, T.52 N., R.39 W., Ontonagon County, at bridge on county road, 5.5 miles east of Ontonagon, MI.	a42	1963	08-26-76	*0.04
West Branch Firesteel River	Firesteel River	Lat 46°47'06", long 89°01'42", in NW¼ sec.29, T.51 N., R.37 W., Ontonagon County, at bridge on State Highway M-26, 3.5 miles northeast of Mass, MI.	a29	1963	08-26-76	*8.87
East Branch Firesteel River	do	Lat 46°47'53", long 89°01'03", in SE¼ sec.20, T.51 N., R.37 W., Ontonagon County, at bridge on State Highway M-26, 4 miles northeast of Mass, MI.	a13	1963	08-26-76	*5.10
Hills Creek	Lake Superior	Lat 47°16'52", long 88°26'47", in SW¼ NW¼ sec.1, T.56 N., R.33 W., Houghton County, 1.1 miles north of Centennial Heights, MI.	a2	1975	07-29-76	*.10
Eagle River	do	Lat 47°24'50", long 88°17'53", in NW¼ NW¼ sec. 19, T.58 N., R.31 W., Keweenaw County, at bridge on State Highway 26, at Eagle River, MI.	21.0	1975	07-29-76	*2.30
Tioga Creek	Sturgeon River	Lat 46°34'32", long 88°20'25", in NW¼ sec.8, T.48 N., R.32 W., Baraga County, at U.S. Highway 41, 10 miles east of Covington, MI.	18.5	1957-58	08-30-76	*.08
Perch River	do	Lat 46°31'06", long 88°39'48", in NE¼ sec.34, T.48 N., R.35 W., Baraga County, at State Highway 28, 2.5 miles east of Sidnaw, MI.	63.1	1913-15c, 1957-75e	08-26-76	*7.16
Sidnaw Creek	do	Lat 46°32'48", long 88°43'49", in N½ sec.19, T.48 N., R.35 W., Houghton County, at culvert on county road, 3 miles north of Sidnaw, MI.	17.6	1957-58	08-26-76	*2.94
Sturgeon River	Portage Lake	Lat 46°40'18", long 88°36'55", in NE¼ SE¼ sec. 6, T.49 N., R.35 W., at bridge on U.S. Forest Service Road 193, 4.5 miles southwest of Prickett Dam, 13 miles southwest of L'Anse, MI.	a335	1969-70	08-26-76	*70.0
Little Otter River	North Branch Otter River	Lat 47°01'58", long 88°36'55", in NW¼ SW¼ sec.34, T.54 N., R.34 W., Houghton County, at bridge on county road, 2.5 miles south of Baltic, MI.	a3.5	1970	08-25-76	*.28
Otter River	Otter Lake	Lat 46°50'09", long 88°38'12", in NE¼ NE¼ sec. 8, T.51 N., R.34 W., Houghton County, 50 feet upstream from highway bridge, 1.6 miles north of Pelkie, MI, 2.5 miles south of Elo, MI, 5.5 miles upstream from Otter Lake.	162	1943-72c, 1973-75e	08-25-76	*71.4
Gooseneck Creek	Portage Lake	Lat 47°07'45", long 88°29'27", in SE¼ SE¼ sec.28, T.55 N., R.33 W., Houghton County, at bridge on State Highway 26, 0.5 mile northeast of Dollar Bay, MI.	a5	1975	07-29-76	*.11
Slaughterhouse Creek	Scales Creek	Lat 47°16'42", long 88°23'21", in NW¼ SE¼ sec.5, T.56 N., R.32 W., Houghton County, at end of road, 0.3 mile south of Copper City, MI.	a8	1975	07-29-76	*.85
Hammel Creek	Trap Rock River	Lat 47°12'17", long 88°24'16", in NE¼ SE¼ sec.31, T.56 N., R.32 W., Hcughton County, at bridge on county road, 0.5 mile above mouth, at Lake Linden, MI.	a5	1969-70, 1975	07-29-76	*.15
Sawmill Creek	Torch Lake	Lat 47°11'10", long 88°23'37", in SW¼ SE¼ sec.5, T.55 N., R.32 W., Houghton County, at bridge on county highway, 1,000 feet upstream from mouth, 0.8 mile east of Lake Linden, MI.	a5	1975	07-29-76	*.52
Sixmile Creek	Keweenaw Bay	Lat 46°44'58", long 88°30'34", in NW¼ sec.12, T.50 N., R.34 W., Baraga County, at bridge on D.S.S.& A. Railway, 2.0 miles southwest of Baraga, MI.	a11	1969-70, 1975	07-28-76	*.42

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Streams tributary to Lake Superior--Continued				
Falls River	Keweenaw Bay	Lat 46°45'06", long 88°27'08", in SE¼ sec.5, T.50 N., R.33 W., Baraga County, at bridge on U.S. Highway 41, 0.5 mile upstream from mouth, at L'Anse, MI.	47.9	1955-56, 1975	07-28-76	*16.2
Linden Creek	do	Lat 46°45'37", long 88°26'48", in SW¼ NW¼ sec.4, T.50 N., R.33 W., Baraga County, 300 feet upstream from municipal sewage treatment plant, at L'Anse, MI.	a9	1975	07-28-76 08-30-76	*1.71 *1.33
Silver River	Huron Bay	Lat 46°48'16", long 88°18'58", in NW¼ sec.24, T.51 N., R.32 W., Baraga County, 7.5 miles northeast of L'Anse, MI.	a64	1963,1970	08-24-76	*6.86
Slate River	do	Lat 46°50'00", long 88°15'31", in NE¼ sec.8, T.51 N., R.31 W., Baraga County, at bridge on county road, 3.0 miles southwest of Skanee, MI.	18.3	-	08-25-76	*.79
Huron River	Lake Superior	Lat 46°51'54", long 88°04'57", in NW¼ sec.35, T.52 N., R.30 W., Marquette County, 6 miles east of Skanee, MI.	74.0	1964,1970, 1975	08-25-76	*4.74
Salmon Trout River	do	Lat 46°50'56", long 87°47'56", in NE¼ sec.1, T.51 N., R.28 W., Marquette County, at bridge on county road, 4 miles northwest of Big Bay, MI.	a40	1970-71	08-19-76	*29.9
Yellow Dog River	Lake Independence	Lat 46°45'26", long 87°39'40", in SW¼ sec.31, T.51 N., R.26 W., Marquette County, at bridge on County Road 550, 5 miles southeast of Big Bay, MI.	a68	1963,1970	08-19-76	*30.6
Big Garlic River	Sauk Head Lake	Lat 46°42'09", long 87°34'23", in SE¼ NE¼ sec. 29, T.50 N., R.26 W., Marquette County, above Wilson Creek, at bridge to Garlic Mountain, 11 miles southeast of Big Bay, MI.	15.9	-	08-23-76	*5.46
Garlic River	Lake Superior	Lat 46°40'27", long 87°32'27", in SE¼ NW¼ sec.3, T.49 N., R.26 W., Marquette County, at bridge on County Road 550, 13.5 miles southeast of Big Bay, MI.	a15	-	08-23-76	*1.30
Carp River	do	Lat 46°31'50", long 87°36'14", in N½ sec.30, T.48 N., R.26 W., Marquette County, at Baldwin Road, 1.75 miles north of Negaunee, MI.	43.8	1963,1975	08-24-76	31.0
do	do	Lat 46°31'37", long 87°33'39", in sec.33, T.48 N., R.26 W., Marquette County, at County Road 492, 2.5 miles northeast of Negaunee, MI.	52.2	1963,1975	08-24-76	32.8
do	do	Lat 46°29'39", long 87°28'15", in SE¼ sec.6, T.47 N., R.25 W., Marquette County, at county road, 200 ft upstream from Carp Lake, 5.5 miles west of Harvey, MI.	a62	1975	08-23-76	37.0
Morgan Creek	Carp River	Lat 46°31'10", long 87°30'44", in NE¼ NE¼ sec.35, T.48 N., R.26 W., Marquette County, at bridge on L.S.& I. Railway, 5 miles east of Negaunee, MI.	a2	1969	08-18-76	*3.08
do	do	Lat 46°30'26", long 87°26'30", in SE¼ SW¼ sec.33, T.48 N., R.25 W., Marquette County, 800 feet upstream from mouth, 3.5 miles southwest of Marquette, MI.	6.75	1965-70d	08-18-76	*9.52
Carp River	Lake Superior	Lat 46°30'37", long 87°23'25", in NE¼ SW¼ sec.35, T.48 N., R.25 W., Marquette County, 300 feet south of powerplant on canal, 1 mile south of Marquette, MI.	-	-	08-18-76	13.3
Carp Canal	Carp River	Lat 46°31'16", long 87°23'04", in NW¼ SW¼ sec.36, T.48 N., R.25 W., Marquette County, at mouth, 1 mile south of Marquette, MI.	-	-	08-18-76	36.0
Mud Creek	Chocolay River	Lat 46°27'50", long 87°11'46", in SW¼ sec.16, T.47 N., R.23 W., Marquette County, at bridge on County Road 480, 2.8 miles east of Mangum, MI.	a13	1972-74	07-13-76 08-30-76 09-13-76	*.03 *0 *0

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Streams tributary to Lake Superior--Continued				
Deer Lake Outlet	Lake Superior	Lat 46°28'39", long 86°56'12", in NE¼ NE¼ sec.17, T.47 N., R.21 W., Alger County, at culvert on State Highway M-28, at Shelter Bay, 4.5 miles east of Deerton, MI.	6.81	-	08-30-76	*0
Anna River	South Bay	Lat 46°23'04", long 86°41'25", in SE¼ NW¼ sec.16, T.46 N., R.19 W., Alger County, 150 feet upstream from mouth of unnamed tributary, 2.2 miles southwest of Munising, MI.	a4	-	07-19-76	*6.36
do	do	Lat 46°23'01", long 86°41'11", in NW¼ SE¼ sec.16, T.46 N., R.19 W., Alger County, 100 feet upstream from mouth of Valley Spur Creek, 2.1 miles southwest of Munising, MI.	a7	-	07-19-76	*6.28
Valley Spur Creek	Anna River	Lat 46°22'56", long 86°41'06", in NW¼ SE¼ sec.16, T.46 N., R.19 W., Alger County, at mouth, 2.1 miles southwest of Munising, MI.	a5	-	07-19-76	*10.8
Anna River	South Bay	Lat 46°23'23", long 86°38'59", in NE¼ NW¼ sec.14, T.46 N., R.19 W., Alger County, 150 feet upstream from mouth of Wagner Creek, 1.0 mile south of Munising, MI.	a15	-	07-19-76	*30.4
Wagner Creek	Anna River	Lat 46°23'23", long 86°38'57", in NE¼ NW¼ sec.14, T.46 N., R.19 W., Alger County, at mouth, 1.2 miles south of Munising, MI.	a5	1972	07-19-76	*4.00
Anna River	South Bay	Lat 46°24'12", long 86°38'52", in NW¼ NE¼ sec.11, T.46 N., R.19 W., Alger County, at bridge on State Highway 28, at Munising, MI.	a20	1949,1960, 1969-70	07-19-76	*35.0
Joes Creek	Anna River	Lat 46°24'09", long 86°38'56", in NW¼ NE¼ sec.11, T.46 N., R.19 W., Alger County, at Prospect Street, at Munising, MI.	a2	-	07-19-76	*1.40
Anna River	South Bay	Lat 46°24'18", long 86°38'42", in SW¼ SE¼ sec.2, T.46 N., R.19 W., Alger County, 100 feet upstream from municipal sewage treatment plant, at Munising, MI.	a23	-	07-19-76 08-30-76	*36.9 *34.5
Hurricane River	Lake Superior	Lat 46°39'48", long 86°09'57", in NW¼ NE¼ sec.10, T.49 N., R.15 W., Alger County, at bridge on truck trail, 8.5 miles west of Grand Marais, MI.	a15	1960	08-23-76	*8.26
Sucker River	do	Lat 46°39'59", long 85°54'50", in SW¼ SE¼ sec.3, T.49 N., R.13 W., Alger County, 900 feet downstream from Grand Marais Creek, 3.4 miles east of Grand Marais, MI.	a105	1973	08-23-76	*42.8
Two Hearted River	do	Lat 46°41'57", long 85°25'19", in NW¼ SW¼ sec.27, T.50 N., R.9 W., Luce County, at foot bridge in State Forest Campground, 0.4 mile upstream from mouth, and 18 miles northwest of Paradise, MI.	201	1973-75d	10-28-75 07-28-76 08-24-76	189 *139 *128
East Lake Creek	Teaspoon Creek	Lat 46°18'23", long 85°38'38", in SW¼ sec.11, T.45 N., R.11 W., Luce County, at outlet of East Lake, 3 miles southeast of McMillan, MI.	a3	1969	-	*0
Tahquamenon River	Lake Superior	Lat 46°22'22", long 86°30'33", NE¼ NE¼ sec.23, T.46 N., R.10 W., Luce County, at bridge on State Highway M-48, at Newberry, MI.	200	1931-33, 1934-36c, 1949-50, 1965	08-24-76	*121
West Branch Waiska River	Waiska River	Lat 46°21'18", long 84°35'35", in SW¼ NW¼ sec.29, T.46 N., R.2 W., Chippewa County, at bridge on county road, 3.2 miles upstream from mouth, and 3.5 miles south of Brimley, MI.	40.7	1973-75d	10-29-75	25.5
East Branch Waiska River	do	Lat 46°25'07", long 84°28'24", in NW¼ NE¼ sec.6, T.46 N., R.1 W., Chippewa County, at bridge on county road, 4.0 miles upstream from mouth, and 4.7 miles east of Brimley, MI.	31.9	1973-75d	10-29-75	3.07

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Streams tributary to Lake Michigan				
Manistique River	Lake Michigan	Lat 45°58'18", long 86°14'35", in SE¼ SE¼ sec.1, T.41 N., R.16 W., Schoolcraft County, at Wyman Nursery, 2,000 feet upstream from dam, at Manistique, MI.	1,440	-	10-17-75 11-14-75 12-12-75 02-18-76 04-02-76 04-30-76 05-26-76 06-24-76 07-21-76 08-26-76 09-21-76	*1,030 *2,020 2,630 *1,480 8,120 4,060 *1,860 *1,220 *995 *508 *601
Thompson Spring	Thompson Creek	Lat 45°55'10", long 86°20'22", in SW¼ NW¼ sec.29, T.41 N., R.16 W., Schoolcraft County, at Thompson Fish Hatchery, 40 feet upstream from Thompson Creek, 1.2 miles northwest of Thompson, MI.	-	1957,1966, 1969,1972	07-07-76 07-07-76 09-08-76	*3.54 f4.02 f3.88
Thompson Creek	Lake Michigan	Lat 45°54'59", long 86°20'20", in NE¼ SW¼ sec.29, T.41 N., R.16 W., Schoolcraft County, at Thompson Fish Hatchery, 0.3 mile downstream from Thompson Spring, 0.5 mile upstream from Williams Creek, and 0.9 mile northwest of Thompson, MI.	4.36	1966, 1969-70, 1972	09-08-76	f5.64
Williams Creek	Thompson Creek	Lat 45°54'29", long 86°20'08", in NE¼ NW¼ sec.32, T.41 N., R.16 W., Schoolcraft County, at Thompson Fish Hatchery, 1,000 feet above confluence with Thompson Creek, 0.2 mile northwest of Thompson, MI.	4.26	1969	09-08-76	*.74
Thompson Creek	Lake Michigan	Lat 45°54'30", long 86°19'55", in NW¼ NE¼ sec.32, T.41 N., R.16 W., Schoolcraft County, 400 feet downstream from Thompson Fish Hatchery, 0.2 mile north of Thompson, MI.	a9	-	09-08-76	f6.54
Dexter Creek	East Branch Whitefish River	Lat 46°12'49", long 86°53'10", in NE¼ NE¼ sec.14, T.44 N., R.21 W., Alger County, at bridge on county road, 4.2 miles northeast of Trenary, MI.	a20	-	08-04-76	*1.89
East Branch Whitefish River	Whitefish River	Lat 46°05'31", long 86°50'53", in NE¼ SE¼ sec.30, T.43 N., R.20 W., Delta County, at bridge on county road, 6.5 miles east of Osier, MI.	a70	-	08-04-76	*35.7
West Branch Whitefish River	do	Lat 46°05'42", long 86°53'47", in SW¼ NE¼ sec.26, T.43 N., R.21 W., Delta County, at bridge on county road, 4 miles upstream from mouth, 12 miles north of Rapid River, MI.	a120	-	08-04-76	*14.3
Haymeadow Creek	do	Lat 46°00'02", long 86°53'09", in SW¼ SW¼ sec.25, T.42 N., R.21 W., Delta County, at bridge on trail road, 6.4 miles northeast of Rapid River, MI.	a30	-	08-04-76	*5.02
Chippeny Creek	do	Lat 46°58'42", long 86°55'46", in SW¼ NW¼ sec.3, T.42 N., R.21 W., Delta County, at bridge on county road, 3.5 miles northeast of Rapid River, MI.	a15	-	08-04-76	*0
Bills Creek	do	Lat 45°57'09", long 86°55'28", in SE¼ NW¼ sec.15, T.41 N., R.21 W., Delta County, 0.4 mile upstream from mouth, 2.7 miles northeast of Rapid River, MI.	a23	1973-74	07-21-76	*3.51
Whitefish River	Little Bay de Noc	Lat 46°56'59", long 86°56'23", in NE¼ sec.16, T.41 N., R.21 W., Delta County, 1.5 miles northeast of Rapid River, MI.	307	1949-50, 1963,1970	04-14-76	1,730
Rapid River	do	Lat 46°06'05", long 87°02'05", in SE¼ SE¼ sec.22, T.43 N., R.22 W., Delta County, at bridge on County Road 432, 6 miles northeast of Rock, MI.	a55	1975	07-23-76	*.10
do	do	Lat 46°01'21", long 86°58'44", in SW¼ NE¼ sec.19, T.42 N., R.21 W., Delta County, at bridge on county road, 0.2 mile west of U.S. Highway 41, 5 miles northeast of Perkins, MI.	a100	1975	07-23-76	*1.36

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Streams tributary to Lake Michigan--Continued				
Inman Creek	Rapid River	Lat 45°57'04", long 86°58'18", in SW¼ NW¼ sec.17, T.41 N., R.21 W., Delta County, at bridge on U.S. Highway 41, 1.7 miles north of Rapid River, MI.	a20	-	08-04-76	*0.15
Rapid River	Little Bay de Noc	Lat 45°56'16", long 86°57'54", in NE¼ NW¼ sec.20, T.41 N., R.21 W., Delta County, at condemned steel truss bridge on county road, 0.8 mile north of Rapid River, MI.	a140	1949-50, 1963,1967, 1969-70, 1975	04-05-76 04-14-76 07-23-76	1,220 889 *3.18
Tacoosh River	do	Lat 45°58'41", long 87°04'08", in SE¼ NW¼ sec.4, T.41 N., R.22 W., Delta County, at bridge on county road, at Perkins, MI.	a20	1975	07-23-76	*0
do	do	Lat 45°56'17", long 86°58'56", in NW¼ sec.19, T.41 N., R.21 W., Delta County, at bridge on county road, 1 mile northwest of Rapid River, MI.	a60	1967, 1969-70, 1975	07-23-76	*.58
Days River	do	Lat 46°04'07", long 87°11'19", in NW¼ NE¼ sec.4, T.42 N., R.23 W., Delta County, at concrete dam in county park, 1 mile west of Rock, MI.	a9	1975	07-23-76	*0
do	do	Lat 45°55'49", long 87°04'11", in SW¼ sec.21, T.41 N., R.22 W., Delta County, at bridge on State Highway 35, at Brampton, MI.	a45	1975	07-23-76	*.69
do	do	Lat 45°53'43", long 86°59'33", in NW¼ NW¼ sec.2, T.40 N., R.22 W., Delta County, at bridge on county road (formerly U.S. Highways 2 and 41), 2.2 miles southwest of Rapid River, MI.	a70	1967, 1969-70, 1975	07-23-76	*5.50
Second River	Middle Branch Escanaba River	Lat 46°31'03", long 87°52'30", in NE¼ sec.36, T.48 N., R.29 W., Marquette County, at bridge on Chicago Northwestern Railway, 1.6 miles northeast of Humboldt, MI.	9.83	1961-63	08-19-76	*.22
Halfway Creek	do	Lat 46°30'04", long 87°55'07", in SW¼ NE¼ sec.3, T.47 N., R.29 W., Marquette County, 0.3 mile above mouth, at railroad bridge, 1.5 miles west of Humboldt, MI.	6.23	1962	08-19-76	*.73
Bell Creek	do	Lat 46°25'14", long 87°47'54", in NW¼ NW¼ sec.3, T.46 N., R.28 W., Marquette County, at mouth, 6.5 miles southeast of Humboldt, MI.	3.49	1971-72	08-31-76	*.01
Black River	Middle Branch Escanaba River	Lat 46°26'38", long 87°56'08", in NE¼ sec.28, T.47 N., R.29 W., Marquette County, at bridge on County Highway 601, 4.2 miles southwest of Humboldt, MI.	11.3	1961-65d	08-19-76	*0
do	do	Lat 46°25'08", long 87°53'21", in NE¼ sec.2, T.46 N., R.29 W., Marquette County, at bridge on county road, 4.4 miles east of Republic, MI.	34.4	1961-68c, 1969d, 1970-75e	04-21-76 08-19-76 08-31-76	233 *1.16 *.04
Middle Branch Escanaba River	Escanaba River	Lat 46°23'40", long 87°45'30", in NW¼ SW¼ sec.12, T.46 N., R.28 W., Marquette County, 0.5 mile downstream from County Highway 581, and 6.0 miles southwest of Ishpeming, MI.	128	1954-75c	08-31-76	32.3
West Branch Creek	Middle Branch Escanaba River	Lat 46°21'41", long 87°47'04", in NE¼ sec.27, T.46 N., R.28 W., Marquette County, at bridge on County Highway 581, 8 miles southwest of Ishpeming, MI.	19.6	1961-65d	08-18-76	*4.41
Rocky Creek	West Branch Creek	Lat 46°21'59", long 87°47'04", in SE¼ sec.22, T.46 N., R.28 W., Marquette County, 0.4 mile upstream from mouth, at bridge on County Highway 581, 8 miles southwest of Ishpeming, MI.	a2	1961-64	08-18-76	*b.10
Ely Creek	Schweitzer Creek	Lat 46°26'03", long 87°41'26", in NW¼ sec.33, T.47 N., R.27 W., Marquette County, at bridge on County Highway 476, 1.5 miles south of National Mine, MI.	9.25	1961-65d	08-18-76	*1.76
Warner Creek	East Branch Escanaba River	Lat 46°26'13", long 87°35'42", in SE¼ sec.30, T.47 N., R.26 W., Marquette County, at bridge on State Highway M-35, at Palmer, MI.	a6	1970	08-30-76	.93

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		Streams tributary to Lake Michigan--Continued				
Goose Lake Outlet	East Branch Escanaba River	Lat 46°27'32", long 87°30'09", in NW¼ sec.24, T.47 N., R.26 W., Marquette County, 1,000 feet below outlet of Goose Lake, 4.5 miles east of Palmer, MI.	14.6	1952, 1962-70d	08-30-76	*0.44
do	do	Lat 46°26'49", long 87°30'09", in NE¼ NW¼ sec.25, T.47 N., R.26 W., Marquette County, 4 miles east of Palmer, MI.	20.5	1962-64	08-30-76	*0
do	do	Lat 46°25'58", long 87°30'36", in NW¼ sec.36, T.47 N., R.26 W., Marquette County, at bridge, 3.7 miles east of Palmer, MI.	21.8	1960-65d, 1971	08-30-76	*.02
Unnamed tributary	Goose Lake Outlet	Lat 46°25'16", long 87°30'30", in SW¼ SW¼ sec.36, T.47 N., R.26 W., Marquette County, at mouth, 4.0 miles east of Palmer, MI.	5.6	-	08-31-76	*0
Goose Lake Outlet	East Branch Escanaba River	Lat 46°25'14", long 87°30'26", in SW¼ SW¼ sec.36, T.47 N., R.26 W., Marquette County, below unnamed tributary, 4.2 miles southeast of Palmer, MI.	31.0	1961-64	08-31-76	*.13
do	do	Lat 46°24'37", long 87°30'30", in NW¼ SW¼ sec.1, T.46 N., R.26 W., Marquette County, 4.5 miles southeast of Palmer, MI.	32.8	1962-64, 1971	08-31-76	*1.94
do	do	Lat 46°24'04", long 87°30'06", in SE¼ NW¼ sec.12, T.46 N., R.26 W., Marquette County, 5 miles southwest of Sands Station, MI.	36.0	1962-64	08-31-76	*2.20
Uncle Tom Creek	do	Lat 46°22'32", long 87°27'21", in NW¼ NE¼ sec.20, T.46 N., R.25 W., Marquette County, 1 mile west of Sands Station, MI.	4.25	1962,1964	08-19-76	*2.97
Halfway Creek	do	Lat 46°16'41", long 87°26'09", in SE¼ sec.21, T.45 N., R.25 W., Marquette County, 150 feet above mouth, at Gwinn, MI.	3.29	1963-64	08-19-76	*8.44
Big West Branch Escanaba River	Escanaba River	Lat 46°08'48", long 87°27'46", in SW¼ sec.5, T.43 N., R.25 W., Marquette County, 2 miles above mouth, 7 miles north of Arnold, MI.	a300	1963,1970	08-19-76	*61.6
Squaw Creek	do	Lat 45°58'29", long 87°13'33", in SE¼ sec.6, T.41 N., R.23 W., Delta County, 500 feet upstream from mouth, 5.0 miles north of Cornell, MI.	a22	1967-68, 1975	08-03-76	*.18
Indian Creek	do	Lat 45°58'16", long 87°12'50", in NW¼ sec.8, T.41 N., R.23 W., Delta County, 0.5 mile upstream from mouth, 4.8 miles north of Cornell, MI.	a6	1975	08-03-76	*b.005
Hunters Brook	do	Lat 45°57'13", long 87°14'03", in NW¼ sec.18, T.41 N., R.23 W., Delta County, at bridge on County Road 523, 3.7 miles north of Cornell, MI.	a40	1975	08-03-76	*1.72
Mosquito Creek	do	Lat 45°55'55", long 87°12'36", in SE¼ sec.20, T.41 N., R.23 W., Delta County, at culverts on trail road, 2.2 miles north of Cornell, MI.	a6	1975	08-03-76	*.30
Bobs Creek	do	Lat 45°55'00", long 87°13'15", in SW¼ sec.29, T.41 N., R.23 W., Delta County, at bridge on trail road, 0.5 mile upstream from mouth, 1.0 mile north of Cornell, MI.	a8	1975	08-03-76	*0
Silver Creek	do	Lat 45°53'02", long 87°05'48", in NW¼ sec.12, T.40 N., R.23 W., Delta County, at culvert on county road, 3.5 miles southwest of Brampton, MI.	a3	1975	08-03-76	*.05
Reno Creek	do	Lat 45°50'27", long 87°05'38", in SW¼ sec.24, T.40 N., R.23 W., Delta County, at culvert on county road, 3 miles west of Gladstone, MI.	a12	1975	08-03-76	*.48
Bichler Creek	do	Lat 45°48'29", long 87°06'01", in NE¼ sec.2, T.39 N., R.23 W., Delta County, at culvert on County Road 426, 2.8 miles north of Escanaba, MI.	a9	1975	08-03-76	*.34

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		Streams tributary to Lake Michigan--Continued				
Portage Creek	Little Bay de Noc	Lat 45°43'42", long 87°06'42", in NW¼ SE¼ sec.35, T.39 N., R.23 W., Delta County, at bridge on County Road C-31, at Escanaba, MI.	a15	1970,1975	08-03-76	*0.15
Willow Creek	Portage Creek	Lat 45°44'46", long 87°05'28", in NW¼ SE¼ sec.25, T.39 N., R.23 W., Delta County, at bridge on U.S. Highway 2, at Escanaba, MI.	a6	1970,1975	04-07-76 08-03-76	99.8 *.42
Portage Creek	Little Bay de Noc	Lat 45°42'43", long 87°05'36", in SE¼ SW¼ sec.1, T.38 N., R.23 W., Delta County, at State Highway 35, 0.4 mile upstream from mouth, at Escanaba, MI.	a30	1968,1975	08-03-76	*1.43
Twenty-four Mile Creek	Ford River	Lat 45°51'16", long 87°18'54", in NW¼ NE¼ sec.19, T.40 N., R.24 W., Delta County, 1 mile upstream from mouth, 4.5 miles northeast of Perronville, MI.	a9	1969,1971	08-04-76	*.17
Ten Mile Creek	do	Lat 45°53'36", long 87°30'44", in SE¼ NE¼ sec.4, T.40 N., R.26 W., Menominee County, at Faunus, MI.	a8	1969-71	08-04-76	*.01
West Branch Ten Mile Creek	Ten Mile Creek	Lat 46°53'12", long 87°31'19", in SE¼ SW¼ sec.4, T.40 N., R.26 W., Menominee County, 0.5 mile upstream from mouth, 0.8 mile southwest of Faunus, MI.	a4	-	08-04-76	*.004
Ten Mile Creek	Ford River	Lat 45°52'23", long 87°28'10", in NE¼ SE¼ sec.11, T.40 N., R.26 W., Menominee County, 0.3 mile south of LaBranche, MI.	a19	1969-71	08-04-76	*.09
do	do	Lat 45°51'57", long 87°25'42", in NE¼ NE¼ sec.18, T.40 N., R.25 W., Menominee County, 1,000 feet upstream from unnamed tributary, 2.2 miles southeast of LaBranche, MI.	a23	1969-71	08-04-76	*.10
Unnamed tributary	Ten Mile Creek	Lat 45°53'56", long 87°25'43", in SW¼ SW¼ sec.34, T.41 N., R.25 W., Menominee County, 3.3 miles north of County Highway 569, 2.5 miles northeast of LaBranche, MI.	a3	1969,1971	08-04-76	*.03
do	do	Lat 45°52'09", long 87°25'40", in SW¼ SW¼ sec.8, T.40 N., R.25 W., Menominee County, 1,500 feet upstream from mouth, 2 miles southeast of LaBranche, MI.	a6	1969-71	08-04-76	*.03
Ten Mile Creek	Ford River	Lat 45°51'07", long 87°23'13", in NE¼ NE¼ sec.21, T.40 N., R.25 W., Menominee County, 2 miles north of Whitney, MI.	a31	1969,1971	08-04-76	*.17
Bark River	Green Bay	Lat 45°40'52", long 87°17'04", in NW¼ NW¼ sec.21, T.38 N., R.24 W., Delta County, at bridge on county road, 2 miles south of Bark River, MI.	a25	1970,1975	08-03-76	*.48
Birch Creek	Springer Creek	Lat 45°12'08", long 87°35'12", in NW¼ NW¼ sec.1, T.32 N., R.27 W., Menominee County, at culvert on Birch Creek Road, 1.2 miles east of Birch Creek, MI.	a5	1975	07-30-76	*0
do	do	Lat 45°11'24", long 87°34'36", in NW¼ NE¼ sec.12, T.32 N., R.27 W., Menominee County, at bridge on Twin Creek Road, 2 miles southeast of Birch Creek, MI.	a6	1975	07-30-76	*.02
Bis Creek	Green Bay	Lat 45°11'14", long 87°35'47", in NW¼ NE¼ sec.11, T.32 N., R.27 W., Menominee County, at culvert on Twin Creek Road, 1 mile southeast of Birch Creek, MI.	a1	1975	07-30-76	*0
Iron River	Brule River	Lat 46°07'28", long 88°43'26", in NE¼ sec.18, T.43 N., R.35 W., Iron County, at bridge on county road, 3 miles southeast of Beechwood, MI.	24.9	1970	08-25-76	*11.7
Sunset Creek	Iron River	Lat 46°08'22", long 88°36'28", in SE¼ NW¼ sec.7, T.43 N., R.34 W., Iron County, at outlet of Sunset Lake, 3.5 miles northeast of Iron River, MI.	11.5	1974-75	06-29-76 07-28-76 09-01-76	*0 *0 *0
Dober Mine Pond Outlet	do	Lat 46°02'08", long 88°38'08", in NW¼ NW¼ sec.1, T.42 N., R.35 W., Iron County, at mouth, at Stambaugh, MI.	-	1973-75	10-14-75 07-27-76	*.20 *.05

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		Streams tributary to Lake Michigan--Continued				
Alpha Creek	Mastodon Creek	Lat 46°03'28", long 88°22'55", in NW¼ sec.12, T.42 N., R.33 W., Iron County, 500 feet below highway bridge, near Alpha, MI.	a3	1950	08-26-76	*0
Mastodon Creek	Buck Lake	Lat 46°02'03", long 88°23'18", in SE¼ sec.14, T.42 N., R.33 W., Iron County, below mouth of Alpha Creek, 1 mile southwest of Alpha, MI.	a7	1970	08-26-76	*0
Paint River	Brule River	Lat 46°13'46", long 88°42'00", in NW¼ sec.9, T.44 N., R.35 W., Iron County, at Gibbs City, MI.	204	1963,1970	08-25-76	*71.5
North Branch Net River	Net River	Lat 46°23'11", long 88°30'15", in NW¼ sec.13, T.46 N., R.34 W., Iron County, 11 miles north of Amasa, MI.	56	1963,1970	08-25-76	*0
East Branch Net River	do	Lat 46°22'24", long 88°29'26", in NW¼ sec.19, T.46 N., R.33 W., Iron County, 10 miles north of Amasa, MI.	43	1963,1970	08-25-76	*6.28
Hemlock River	Paint River	Lat 46°13'04", long 88°27'44", in NW¼ sec.17, T.44 N., R.33 W., Iron County, 1 mile southwest of Amasa, MI.	53	1963,1970	08-25-76	*5.49
Chicagon Creek	do	Lat 46°06'08", long 88°30'25", in SW¼ sec.24, T.43 N., R.34 W., Iron County, Chicagon Lake Outlet at U.S. Highway 2, 6.5 miles east of Iron River, MI.	17.4	1945-59d	08-25-76	*.82
Dishno Creek	Peshekee River	Lat 46°35'30", long 87°59'04", in NW¼ sec.6, T.48 N., R.29 W., Marquette County, at bridge on logging road, 1.2 miles upstream from mouth, 5 miles north of Champion, MI.	18.8	1963-72d	08-19-76	*.02
Peshekee River	Lake Michigamme	Lat 46°34'55", long 87°59'51", in SE¼, sec.1, T.48 N., R.30 W., Marquette County, at bridge on county highway, 0.2 mile downstream from Dishno Creek, 5 miles north of Champion, MI.	66.5	1961-68c	08-19-76	*1.05
Spruce River	Michigamme River	Lat 46°27'40", long 88°34'53", in NE¼ sec.20, T.47 N., R.30 W., Marquette County, 0.5 mile upstream from mouth, 7 miles southwest of Champion, MI.	31.0	1964-70d	08-19-76	*4.21
Michigamme River	Menominee River	Lat 46°23'03", long 87°58'48", in SE¼ sec.18, T.46 N., R.29 W., in Marquette County, 400 feet upstream from county highway bridge, 6.0 miles south of Republic, MI.	240	1961-75c	09-03-76	2.06
Trout Falls Creek	do	Lat 46°22'38", long 87°59'12", in NW¼ sec.19, T.46 N., R.29 W., Marquette County, at bridge on State Highway 95, 1.2 miles upstream from mouth, 2 miles south of Republic, MI.	23.1	1961-65d	08-19-76	*1.61
Fence River	do	Lat 46°16'46", long 88°09'14", in SW¼ sec.23, T.45 N., R.31 W., Iron County, 6.5 miles west of Witch Lake, MI.	148	1963,1970	08-18-76	*60.3
Deer River	do	Lat 46°12'14", long 88°19'06", in SW¼ sec.16, T.44 N., R.32 W., Iron County, at bridge on county road, 3 miles east of Balsam, MI.	58.2	1970	08-18-76	*22.0
Skunk Creek	East Branch Sturgeon River	Lat 46°01'51", long 87°49'46", in SE¼ SE¼ sec.17, T.42 N., R.28 W., Dickinson County, 0.3 mile upstream from mouth, 2.2 miles north of Felch, MI.	14.5	1973	04-19-74 04-22-74 04-21-75 04-24-75 04-07-76 05-17-76 08-18-76	g79.8 g76.5 g74.0 g231 95.9 133 *1.18
East Branch Sturgeon River	Sturgeon River	Lat 45°57'57", long 87°44'30", in NW¼ sec.7, T.41 N., R.27 W., Dickinson County, at bridge on County Road 569, at Foster City, MI.	106	1969-70, 1972-73	08-26-76	*5.50
Mounty's Creek	Pine Creek	Lat 45°57'13", long 88°00'05", in SE¼ NW¼ sec.13, T.41 N., R.30 W., Dickinson County, above Pond 2A outflow, 4 miles southeast of Randville, MI.	a1	-	08-30-76	*.07
do	do	Lat 45°57'09", long 87°59'52", in SW¼ NE¼ sec.13, T.41 N., R.30 W., Dickinson County, below Pond 2A outflow, 4 miles southeast of Randville, MI.	-	-	08-30-76	.58

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Streams tributary to Lake Michigan--Continued				
Pine Creek	Sturgeon River	Lat 45°49'38", long 87°53'50", in SW¼ sec.28, T.40 N., R.29 W., Dickinson County, at bridge on county road, 1.2 miles upstream from Fern Creek, 3 miles north of Norway, MI.	a54	1972,1975	07-29-76	11.8
Hamilton Creek	do	Lat 45°44'51", long 87°49'00", in NW¼ sec.30, T.39 N., R.28 W., Dickinson County, at outlet of Lake Mary, 2.0 miles south of Loretto, MI.	a15	1964-72d	08-26-76	*0
Little River	Menominee River	Lat 45°08'43", long 87°39'56", in SW¼ sec.20, T.32 N., R.27 W., Menominee County, 3.3 miles northwest of Menominee, MI.	a60	1967,1970, 1975	07-30-76	*0
Baw Beese Lake Outlet	St. Joseph River	Lat 41°54'18", long 84°37'01", in NE¼ SE¼ sec.35, T.6 S., R.3 W., Hillsdale County, at Lakeview Road, at Hillsdale, MI.	5.10	1974-75	12-05-75 02-17-76 03-23-76 04-29-76	*14.4 16.2 21.4 *10.2
do	do	Lat 41°54'23", long 84°37'21", in SW¼ NE¼ sec.35, T.6 S., R.3 W., Hillsdale County, at Griswald Road, at Hillsdale, MI.	-	1974	02-12-76	74.1
King Lake Inlet	do	Lat 41°53'48", long 84°39'04", in NE¼ NE¼ sec.4, T.7 S., R.3 W., Hillsdale County, at Cambria Road, 1.0 mile southwest of Hillsdale, MI.	-	1974-75	02-11-76	*1.04
King Lake Outlet	do	Lat 41°54'01", long 84°37'55", in SE¼ SE¼ sec.34, T.6 S., R.3 W., Hillsdale County, at M-99, 1.0 mile south of Hillsdale, MI.	-	1974-75	02-11-76	*4.69
do	do	Lat 41°54'26", long 84°37'28", in NE¼ NW¼ sec.35, T.6 S., R.3 W., Hillsdale County, at Steamburg Road, at Hillsdale, MI.	4.19	1974-75	11-04-75 12-05-75 01-20-76 02-27-76 03-23-76 04-29-76 06-23-76 09-28-76	1.99 *5.46 *2.66 *11.1 *9.03 *6.38 *2.92 *.53
St. Joseph River	Lake Michigan	Lat 41°54'58", long 84°37'32", in NE¼ SW¼ sec.26, T.6 S., R.3 W., Hillsdale County, at South Street, at Hillsdale, MI.	-	1974-75	02-12-76	16.1
do	do	Lat 41°55'45", long 84°38'22", in SW¼ SE¼ sec.22, T.6 S., R.3 W., Hillsdale County, at Fayette Street, at Hillsdale, MI.	12.4	1974-75	11-04-75 12-05-75 02-17-76 02-27-76 03-04-76 03-23-76 04-29-76 06-23-76 09-28-76	3.98 *22.9 60.3 *37.3 91.0 33.4 *19.8 *5.78 *3.45
Winona Lake Outlet	St. Joseph River	Lat 41°56'31", long 84°37'54", in SW¼ sec.14, T.6 S., R.3 W., Hillsdale County, at Hillsdale Street, at Hillsdale, MI.	-	1974-75	12-05-75	*3.29
Beebe Creek	do	Lat 41°56'31", long 84°31'16", in NE¼ NE¼ sec.22, T.6 S., R.2 W., Hillsdale County, at Mauck Road, 2.0 miles south of North Adams, MI.	-	1974-75	12-10-75 02-18-76	*4.61 52.9
do	do	Lat 41°56'38", long 84°31'32", in SW¼ SE¼ sec.15, T.6 S., R.2 W., Hillsdale County, at Knowles Road, 2.0 miles south of North Adams, MI.	-	1974-75	12-10-75 02-18-76	*11.6 105
do	do	Lat 41°56'27", long 84°33'02", in NW¼ NW¼ sec.21, T.6 S., R.3 W., Hillsdale County, at State Road, 4.5 miles west of Hillsdale, MI.	20.2	1974-75	11-20-75 02-17-76 02-19-76 03-04-76 09-23-76	*4.03 207 127 241 *1.30
do	do	Lat 41°57'04", long 84°34'26", in SW¼ NW¼ sec.17, T.6 S., R.2 W., Hillsdale County, at Lake Pleasant Road, 3.0 miles northwest of Hillsdale, MI.	24.6	1974-75	11-20-75 02-17-76 02-20-76 03-04-76 09-23-76	*7.06 231 119 273 *1.92

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Streams tributary to Lake Michigan--Continued				
Beebe Creek	St. Joseph River	Lat 41°57'44", long 84°35'35", in NW¼ SW¼ sec.7, T.6 S., R.2 W., Hillsdale County, at Milnes Road, 3.5 miles northwest of Hillsdale, MI.	-	1974-75	02-11-76 02-17-76 02-20-76 03-04-76	*16.2 226 131 274
Unnamed tributary	Beebe Creek	Lat 41°59'02", long 84°33'53", in NW¼ NE¼ sec.5, T.6 S., R.2 W., Hillsdale County, at Barker Road, 5.5 miles northwest of Hillsdale, MI.	-	1974-75	12-10-75	*2.98
do	do	Lat 41°58'08", long 84°35'35", in NW¼ NW¼ sec.7, T.6 S., R.2 W., Hillsdale County, at Milnes Road, 4.0 miles northeast of Hillsdale, MI.	7.19	1974-75	02-11-76 02-17-76 02-19-76 02-20-76 03-04-76 03-06-76	*5.24 73.4 37.8 35.2 70.8 50.8
do	Unnamed tributary	Lat 41°58'02", long 84°35'35", in NW¼ sec.7, T.6 S., R.2 W., Hillsdale County, at Milnes Road, 3.5 miles northwest of Hillsdale, MI.	.70	1974-75	02-12-76 02-17-76 02-19-76 05-10-76	*.83 4.23 2.13 *.91
do	Beebe Creek	Lat 41°57'49", long 84°35'48", in SE¼ NE¼ sec.12, T.6 S., R.3 W., Hillsdale County, at Ball Road, 3.5 miles northeast of Hillsdale, MI.	10.8	1974-75	10-22-75 04-28-76 06-22-76	*3.76 16.5 *5.27
St. Joseph River	Lake Michigan	Lat 41°57'23", long 84°39'31", in SW¼ SE¼ sec.9, T.6 S., R.3 W., Hillsdale County, at Moore Road, 1.2 miles northwest of Hillsdale, MI.	62.4	1967,1971, 1974-75	11-06-75 01-07-76 02-19-76 03-03-76 04-05-76 05-19-76 08-12-76	*24.8 *37.0 376 399 *86.7 *60.4 *15.2
do	do	Lat 41°58'58", long 84°39'52", in NE¼ NW¼ sec.4, T.6 S., R.3 W., Hillsdale County, at Chicago Street (US-12), at Jonesville, MI.	66.5	1974-75	11-06-75 01-07-76 02-18-76 02-20-76 03-04-76 04-22-76 07-14-76 08-12-76	*28.8 *44.4 404 336 516 62.8 *25.7 *18.4
Butternut Creek	St. Joseph River	Lat 41°58'58", long 84°42'35", in NW¼ NW¼ sec.6, T.6 S., R.3 W., Hillsdale County, at New York Central Railroad bridge, 1.5 miles west of Jonesville, MI.	1.88	-	05-18-76	*1.30
Herricksville Drain	do	Lat 42°01'43", long 84°44'53", in NW¼ sec.23, T.5 S., R.4 W., Hillsdale County, at Ash Road, 1.0 mile south of Litchfield, MI.	-	-	10-01-75 10-21-75 10-29-75 11-11-75	*.77 *.73 *.65 *.73
do	do	Lat 42°01'45", long 84°45'00", in NE¼ sec.22, T.5 S., R.4 W., Hillsdale County, at culvert on Herring Road, 1 mile south of Litchfield, MI.	-	1975	10-01-75 10-21-75 10-29-75 11-11-75	*.40 *.28 *.26 *.28
St. Joseph River	Lake Michigan	Lat 42°02'37", long 84°45'52", in NW¼ NW¼ sec.15, T.5 S., R.4 W., Hillsdale County, at Litchfield Road, at Litchfield, MI.	81.0	1974-75	10-15-75 11-19-75 03-16-76 04-07-76 05-11-76 06-08-76 08-10-76 09-14-76	*33.2 *40.3 225 113 157 *46.0 *20.0 *16.1
South Sand Lake Outlet	Middle Sand Lake	Lat 42°55'52", long 84°41'56", in SW¼ NE¼ sec.30, T.6 S., R.3 W., Hillsdale County, at Bacon Road, 3.0 miles west of Hillsdale, MI.	-	1974-75	12-09-75	*4.73
Unnamed tributary	Sand Creek	Lat 41°55'58", long 84°41'42", in NE¼ SE¼ sec.19, T.6 S., R.3 W., Hillsdale County, at Mechanic Road, below confluence of small lake outlets, 3.0 miles west of Hillsdale, MI.	-	1974-75	12-09-75	*2.73
Middle Sand Lake Outlet	do	Lat 42°56'34", long 84°42'06", in NE¼ SW¼ sec.19, T.6 S., R.3 W., Hillsdale County, at Mechanic Road, 3.5 miles west of Hillsdale, MI.	-	1974-75	12-09-75	*8.99

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Streams tributary to Lake Michigan--Continued				
Sand Creek	St. Joseph River	Lat 41°55'21", long 84°41'55", in SW¼ SW¼ sec.18, T.6 S., R.3 W., Hillsdale County, at Sand Lake Road, 4.0 miles northwest of Hillsdale, MI.	9.44	1974-75	11-06-75 01-07-76 03-25-76 04-23-76 05-19-76 08-12-76	8.75 *10.2 25.9 14.7 16.4 *5.08
do	do	Lat 41°57'47", long 84°44'20", in NW¼ SE¼ sec.11, T.6 S., R.4 W., Hillsdale County, at bridge on Chicago Road, 1.5 miles east of Allen, MI.	-	1964,1975	11-26-75 02-20-76	10.2 31.8
Unnamed tributary	Sand Creek	Lat 41°58'51", long 84°44'20", in NW¼ NE¼ sec.2, T.6 S., R.4 W., Hillsdale County, at Beulow Road, 4.0 miles west of Jonesville, MI.	-	1974-75	11-26-75 02-20-76	*.69 3.82
Sand Creek	St. Joseph River	Lat 41°59'08", long 84°45'04", in NE¼ NE¼ sec.3, T.6 S., R.4 W., Hillsdale County, at Jonesville Road, 4.0 miles west of Jonesville, MI.	-	1974-75	11-26-75	12.3
do	do	Lat 42°03'04", long 84°48'22", in SW¼ NW¼ sec.8, T.5 S., R.4 W., Hillsdale County, at mouth, near Storms Road, 2.5 miles west of Litchfield, MI.	23.2	1974-75	03-19-76 04-23-76 05-18-76 08-10-76	*60.1 37.9 45.3 *9.80
St. Joseph River	Lake Michigan	Lat 42°04'21", long 84°49'50", in SE¼ SE¼ sec.36, T.4 S., R.5 W., Calhoun County, at South County Line Road, 4.0 miles northwest of Litchfield, MI.	-	1974-75	11-25-75	67.4
Soap Creek	St. Joseph River	Lat 42°00'32", long 84°47'15", in SW¼ NW¼ sec.28, T.5 S., R.4 W., Hillsdale County, at McLain Road, 4.0 miles southwest of Litchfield, MI.	4.66	1974-75	11-19-75 02-20-76 03-03-76 04-07-76 07-14-76	*1.34 12.4 60.3 5.32 *.94
do	do	Lat 42°04'07", long 84°50'04", in NW¼ NE¼ sec.1, T.5 S., R.5 W., Branch County, at Ely Road, 6.0 miles northwest of Litchfield, MI.	13.1	1974-75	11-18-75 01-06-76 02-05-76 02-19-76 02-26-76 03-05-76 04-22-76 06-07-76 08-09-76 09-13-76	*9.86 *16.5 *13.1 228 172 411 19.6 *15.8 *5.56 *4.53
St. Joseph River	Lake Michigan	Lat 42°06'04", long 84°50'38", in NW¼ NW¼ sec.25, T.4 S., R.5 W., Calhoun County, at bridge on T-Drive South, 3.0 miles southwest of Homer, MI.	-	1975	11-25-75 02-19-76	76.5 479
Kalamazoo River	do	Lat 42°17'49", long 85°10'07", in NW¼ SE¼ sec.18, T.2 S., R.7 W., Calhoun County, at bridge on Beadle Lake Road, at Battle Creek, MI.	-	-	07-19-76 07-20-76	*h304 *h383
do	do	Lat 42°20'05", long 85°13'09", in SW¼ SW¼ sec.35, T.1 S., R.8 W., Calhoun County, at Bedford Road, at Battle Creek, MI.	-	-	07-19-76 07-20-76	*h391 *h343
do	do	Lat 42°21'02", long 85°16'32", in SW¼ SW¼ sec.29, T.1 S., R.8 W., Calhoun County, at Custer Road, 1.0 mile west of Battle Creek, MI.	-	-	07-19-76 07-20-76 09-15-76	*h480 *h438 *h395
do	do	Lat 42°21'04", long 85°18'09", in NE¼ SE¼ sec.25, T.1 S., R.9 W., Kalamazoo County, 700 feet north of River Road, 2.0 miles west of Battle Creek, MI.	-	-	07-19-76 07-20-76	*h475 *h524
do	do	Lat 42°20'56", long 85°19'37", in SW¼ SE¼ sec.26, T.1 S., R.9 W., Kalamazoo County, 1,000 feet southeast of State Highway M-96, 1.0 mile northeast of Augusta, MI.	-	-	07-19-76 07-20-76	*h538 *h557
do	do	Lat 42°20'07", long 85°20'42", in SW¼ SE¼ sec.34, T.1 S., R.9 W., Kalamazoo County, at Michigan Avenue, at Augusta, MI.	-	-	07-19-76 07-20-76 07-21-76 09-15-76	*h458 *h644 h957 *h424

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Streams tributary to Lake Michigan--Continued				
Kalamazoo River	Lake Michigan	Lat 42°16'48", long 85°25'43", in NW¼ SW¼ sec.24, T.2 S., R.10 W., Kalamazoo County, at 35th Street, at Galesburg, MI.	-	-	09-15-76	*h486
Comstock Creek	Kalamazoo River	Lat 42°19'03", long 85°29'08", in NW¼ sec.9, T.2 S., R.10 W., Kalamazoo County, at H Avenue, 2.8 miles northeast of Comstock, MI.	14.8	1969	12-19-75 08-26-76	*9.22 *6.10
Portage Creek	do	Lat 42°15'34", long 85°34'35", in SW¼ SE¼ sec.27, T.2 S., R.11 W., Kalamazoo County, at Cork Street, at Kalamazoo, MI.	-	-	08-16-76	*h33.8
do	do	Lat 42°17'40", long 85°34'23", in NE¼ SE¼ sec.15, T.2 S., R.11 W., Kalamazoo County, 0.1 mile upstream from mouth, at Kalamazoo Avenue, at Kalamazoo, MI.	-	1946-48, 1968,1970	08-16-76	*h44.9
Kalamazoo River	Lake Michigan	Lat 42°18'11", long 85°34'15", in NE¼ NE¼ sec.15, T.2 S., R.11 W., Kalamazoo County, at Patterson Street, at Kalamazoo, MI.	-	-	08-16-76	*h605
do	do	Lat 42°20'13", long 85°34'59", in NE¼ SW¼ sec.34, T.1 S., R.11 W., Kalamazoo County, 0.4 mile downstream from G Avenue extended, at Parchment, MI.	-	-	08-09-76 08-16-76 08-19-76	*h618 *h639 *h616
do	do	Lat 42°26'33", long 85°38'12", in NE¼ SW¼ sec.29, T.1 N., R.11 W., Allegan County, at State Highway M-89, at Plainwell, MI.	-	-	08-09-76 08-16-76	*h525 *h503
Kalamazoo River Bypass Channel	do	Lat 42°26'33", long 85°38'40", in NE¼ SE¼ sec.30, T.1 N., R.11 W., Allegan County, at 103rd Avenue, at Plainwell, MI.	-	-	08-09-76	*h187
Gun River	Kalamazoo River	Lat 42°28'28", long 85°38'30", in SW¼ NW¼ sec.17, T.1 N., R.11 W., Allegan County, at 10th Street, 1.5 miles north of Plainwell, MI.	-	-	08-09-76	*h54.8
Pine Creek	do	Lat 42°27'22", long 85°44'07", in NW¼ SW¼ sec.21, T.1 N., R.12 W., Allegan County, at mouth, at Jefferson Road, 1.0 mile west of Otsego, MI.	-	-	08-09-76	*h34.9
Kalamazoo River	Lake Michigan	Lat 42°28'56", long 85°47'54", in NW¼ SW¼ sec.12, T.1 N., R.13 W., Allegan County, at 26th Street, 3.0 miles southeast of Allegan, MI.	-	-	08-09-76	*h781
Grand River	do	Lat 42°10'08", long 84°23'02", in SE¼ NE¼ sec.35, T.3 S., R.1 W., Jackson County, at Draper Road, 2.0 miles south of Vandercook, MI.	41.0	1961, 1963-65d, 1974-75	03-25-76 06-22-76	h67.3 *h32.8
Spring Brook	Grand River	Lat 42°27'55", long 84°39'52", in SW¼ SE¼ sec.16, T.1 N., R.3 W., Eaton County, at Holmes Highway, 2.0 miles south of Eaton Rapids, MI.	-	-	03-04-76	h214
Grand River	Lake Michigan	Lat 42°37'51", long 84°37'21", in NW¼ SW¼ sec.24, T.3 N., R.3 W., Eaton County, at State Highway M-99, 1.0 mile southeast of Dimondale, MI.	-	-	11-24-75	h387
do	do	Lat 42°38'44", long 84°39'02", in SE¼ sec.15, T.3 N., R.3 W., Eaton County, at bridge in Dimondale, MI.	-	1975	10-02-75 10-13-75 11-06-75 12-11-75 02-10-76 02-26-76 03-23-76	*h381 *h436 *h339 h815 *h465 h2,120 h1,460
Red Cedar River	Grand River	Lat 42°40'00", long 84°05'00", in NE¼ sec.10, T.3 N., R.3 E., Livingston County, at sewage disposal pond, 0.6 mile north of Grand River Road, at Fowlerville, MI.	-	-	09-27-76	*13.8
Deer Creek	Red Cedar River	Lat 42°36'49", long 84°19'00", in NW¼ NW¼ sec.34, T.3 N., R.1 E., Ingham County, at Waldo Road, 4.0 miles north of Dansville, MI.	-	-	09-30-76	*h.88

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Streams tributary to Lake Michigan--Continued				
Grand River	Lake Michigan	Lat 42°45'40", long 84°38'56", in NW¼ SW¼ sec.3, T.4 N., R.3 W., Eaton County, at Webster Road, at Delta Mills, MI.	-	1975	10-02-75 10-13-75 11-06-75 11-24-75 12-11-75 01-13-76 01-28-76 02-10-76 02-26-76 03-23-76	*h569 *h525 *h516 h580 h1,180 *h838 *h704 *h703 h4,220 h2,190
Looking Glass River	Grand River	Lat 42°52'43", long 84°13'17", in SE¼ SE¼ sec.28, T.6 N., R.2 E., Shiawassee County, on State Highway M-52, 1.0 mile south of Pittsburg, MI.	-	-	02-19-76	h381
Remey Chandler Drain	Looking Glass River	Lat 42°46'56", long 84°29'01", in NE¼ NE¼ sec.36, T.5 N., R.1 W., Clinton County, at Chandler Road, 1.5 miles north of East Lansing, MI.	-	-	09-30-76	*h.11
do	do	Lat 42°47'54", long 84°30'17", in SE¼ SE¼ sec.23, T.5 N., R.2 W., Clinton County, at Stoll Road, 2.5 miles north of East Lansing, MI.	-	-	09-30-76	*h.28
		Streams tributary to Lake Huron				
Charlotte River	Lake Huron	Lat 46°19'48", long 84°14'34", in NE¼ NE¼ sec.1, T.45 N., R.1 E., Chippewa County, 1.4 miles above mouth, 1.7 miles east of McCarron, MI.	a55	-	08-25-76	*1.06
Little Munuscong River	do	Lat 46°13'43", long 84°17'22", in NE¼ sec.10, T.44 N., R.1 E., Chippewa County, at bridge on county highway, 4 miles south of Barbeau, MI.	a50	1949	08-25-76	*7.35
Munuscong River	do	Lat 46°12'13", long 84°19'37", in NE¼ sec.29, T.44 N., R.1 E., Chippewa County, at bridge on county highway, at Sterlingville, MI.	251	1949,1963	08-26-76	*15.9
North Branch Pine River	Pine River	Lat 46°13'50", long 84°36'18", in SE¼ SW¼ sec.6, T.44 N., R.2 W., Chippewa County, at bridge on State Highway 48, at Rudyard, MI.	a70	1962-63	08-25-76	16.2
Carp River	Lake Huron	Lat 46°01'06", long 84°43'06", in NE¼ SE¼ sec.19, T.42 N., R.3 W., Mackinac County, at bridge on Mackinac Trail, near Charles, MI.	74	1949	08-26-76	42.0
Van Etten Creek	Au Sable River	Lat 44°26'49", long 83°20'21", in SW¼ NW¼ sec.27, T.24 N., R.9 E., Iosco County, at Detroit and Mackinac Railroad bridge, 2.0 miles northwest of Oscoda, MI.	-	1973-75	06-16-76	*h132
Bad River	Shiawassee River	Lat 43°18'04", long 84°08'15", in SW¼ NE¼ sec.5, T.10 N., R.3 E., Saginaw County, at Penn Central Railroad bridge, at St. Charles, MI.	-	-	04-28-76 06-23-76	1,400 *75.4
Beaver Creek	Bad River	Lat 43°18'36", long 84°08'29", in SW¼ SE¼ sec.32, T.11 N., R.3 E., Saginaw County, at bridge on State Highway 47, 0.9 mile north of St. Charles, MI.	-	-	04-29-76 06-22-76	216 *10.5
Pickerel Creek	do	Lat 43°16'28", long 84°07'25", in NE¼ NW¼ sec.16, T.10 N., R.3 E., Saginaw County, at bridge on Sharon Road, 1.6 miles southeast of St. Charles, MI.	-	-	04-27-76 06-21-76	46.0 *.67
Bear Creek	Shiawassee River	Lat 43°15'46", long 84°05'05", in NW¼ NW¼ sec.23, T.10 N., R.3 E., Saginaw County, at bridge on West Verne Road, 2.3 miles northeast of Fergus, MI.	-	-	04-27-76 06-21-76	44.9 *.42
Shiawassee River	Saginaw River	Lat 43°20'09", long 84°04'32", in SE¼ SE¼ sec.23, T.11 N., R.3 E., Saginaw County, at bridge on South Miller Road, 4.0 miles northeast of St. Charles, MI.	-	-	06-22-76	*323

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Streams tributary to Lake Huron--Continued				
Marsh Creek	Shiawassee River	Lat 43°21'13", long 84°07'52", in SE¼ SE¼ sec.17, T.11 N., R.3 E., Saginaw County, at bridge on Teft Road, 3.6 miles north of St. Charles, MI.	-	-	04-28-76 06-21-76	54.2 *3.93
Swan Creek	Marsh Creek	Lat 43°22'46", long 84°05'58", in NW¼ NE¼ sec.10, T.11 N., R.3 E., Saginaw County, at bridge on Swan Creek Road, 5.9 miles northeast of St. Charles, MI.	-	-	04-28-76 06-23-76	486 *36.3
Marsh Creek	Shiawassee River	Lat 43°21'18", long 84°04'19", in NE¼ SE¼ sec.14, T.11 N., R.3 E., Saginaw County, at bridge on South Miller Road, 5.3 miles northeast of St. Charles, MI.	-	-	06-22-76	*99.7
Swartz Creek	Flint River	Lat 42°50'03", long 83°41'12", in SW¼ NW¼ sec.18, T.5 N., R.7 E., Oakland County, 0.2 mile upstream of confluence of Crooked Lake Outlet, and 2.0 miles northeast of Fenton, MI.	-	-	02-20-76	h171
Flint River Cutoff	Shiawassee River	Lat 43°19'20", long 84°00'14", in SE¼ SW¼ sec.28, T.11 N., R.4 E., Saginaw County, at bridge on Curtis Road, 3.9 miles northeast of Alicia, MI.	-	-	04-27-76 06-21-76	2,840 *0
Flint River	do	Lat 43°18'40", long 84°02'00", SE¼ sec.31, T.11 N., R.4 E., Saginaw County, on left bank 100 feet downstream from the Prairie Farms Association flood-pumping station, 2.8 miles north of Alicia, MI, and 4 miles upstream from mouth.	-	-	04-29-76 06-23-76	1,230 *623
Birch Run	do	Lat 43°19'18", long 83°58'29", in SE¼ SE¼ sec.27, T.11 N., R.4 E., Saginaw County, at bridge on Curtis Road, 5.4 miles southwest of Bridgeport, MI.	-	-	04-28-76 06-21-76	413 *307
Cass River	Saginaw River	Lat 43°21'54", long 83°57'18", in NE¼ NE¼ sec.14, T.11 N., R.4 E., Saginaw County, at bridge on State Highway 13, 3.8 miles west of Bridgeport, MI.	905	1974	04-28-76 06-22-76	4,810 *145
Sugar River	Tittabawassee River	Lat 44°06'23", long 84°25'37", in NE¼ SE¼ sec.21, T.20 N., R.1 W., Gladwin County, at bridge on Hockaday Road, 9.3 miles north of Gladwin, MI.	20	1968,1975	11-13-75 06-16-76 08-13-76	*h22.0 *h28.2 *h16.8
do	do	Lat 44°03'35", long 84°23'17", in SE¼ SE¼ sec.2, T.19 N., R.1 W., Gladwin County, at end of Breaut Road, 7.1 miles northeast of Gladwin, MI.	-	1975	11-13-75 06-16-76 08-13-76	*h26.8 *h29.6 *h17.8
South Branch Tobacco River	Tobacco River	Lat 43°49'50", long 84°45'09", in SE¼ SE¼ sec.26, T.17 N., R.4 W., Clare County, 200 feet below Lake Shamrock Dam, at Clare, MI.	-	-	08-09-76	*52.8
do	do	Lat 43°52'01", long 84°32'43", in SW¼ NW¼ sec.15, T.17 N., R.2 W., Gladwin County, at bridge on Grout Road, 3.2 miles southwest of Beaverton, MI.	160	1960-63, 1967	08-09-76	*68.2
Middle Branch Tobacco River	do	Lat 43°53'20", long 84°31'30", in SW¼ SW¼ sec.2, T.17 N., R.2 W., Gladwin County, at bridge on McCulloch Road, 2 miles west of Beaverton, MI.	33.8	1958-63, 1966-67	08-09-76	*23.8
North Branch Tobacco River	do	Lat 43°54'07", long 84°31'19", in NW¼ NW¼ sec.2, T.17 N., R.2 W., Gladwin County, at bridge on Calhoun Road, 2.3 miles northwest of Beaverton, MI.	71.6	1958,1967	08-09-76	*41.9
Cedar River	do	Lat 43°58'50", long 84°29'46", in NE¼ SW¼ sec.1, T.18 N., R.2 W., Gladwin County, at bridge on M-61, at Gladwin, MI.	-	-	08-09-76	*77.9
do	do	Lat 43°54'56", long 84°28'44", in NE¼ NW¼ sec.31, T.18 N., R.1 W., Gladwin County, at bridge on Howard Road, 3.4 miles upstream from mouth, 2.3 miles north of Beaverton, MI.	140	1967	08-09-76	*79.9

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		Streams tributary to Lake Huron--Continued				
Tittabawassee River	Saginaw River	Lat 43°23'37", long 84°00'54", in NW¼ NW¼ sec.4, T.11 N., R.4 E., Saginaw County, at bridge on Center Road, 1.1 miles southwest of Saginaw, MI.	-	-	04-28-76 06-24-76	11,700 *1,100
Pinnebog River	Lake Huron	Lat 43°55'14", long 83°07'32", in NE¼ NE¼ sec.12, T.17 N., R.11 E., Huron County, at bridge on Limerick Road, 1.5 miles southwest of Pinnebog, MI.	-	1973-75	06-17-76	*h8.74
		Streams tributary to Lake St. Clair				
Clinton River	Lake St. Clair	Lat 42°37'27", long 83°18'57", in SW¼ sec.31, T.3 N., R.10 E., Oakland County, at Orchard Lake Road, at Pontiac, MI.	107	1966-67, 1969	09-01-76 09-17-76	18.4 5.87
Red Run	Clinton River	Lat 42°31'32", long 83°01'46", in NE¼ SE¼ sec.4, T.1 N., R.12 E., Macomb County, at Van Dyke Road, at Warren, MI.	43.8	1969	09-01-76 09-17-76	*2.32 10.9
Bear Creek	Red Run	Lat 42°31'25", long 83°01'23", in SE¼ SW¼ sec.3, T.1 N., R.12 E., Macomb County, at Miller Drain, at Warren, MI.	18.7	-	09-01-76 09-17-76	*6.90 13.6
Red Run	Clinton River	Lat 42°33'08", long 82°59'11", in SW¼ SW¼ sec.25, T.2 N., R.12 E., Macomb County, at 15 Mile Road, at Sterling Heights, MI.	92.0	-	09-02-76 09-17-76	*50.3 98.6
Plum Brook	Red Run	Lat 42°34'21", long 82°59'25", in NW¼ SW¼ sec.24, T.2 N., R.12 E., Macomb County, at Schoener Road, at Sterling Heights, MI.	27.6	-	09-02-76 09-17-76	*12.6 8.64
Coon Creek	North Branch Clinton River	Lat 42°43'03", long 82°52'55", in NE¼ sec.2, T.3 N., R.13 E., Macomb County, at 26 Mile Road, 0.3 mile west of Meade, MI, 2.0 miles above mouth.	71.8	1959-64, 1966-67	09-03-76 09-17-76	*.02 .10
		Streams tributary to Detroit River				
Franklin Branch	River Rouge	Lat 42°30'04", long 83°16'43", in NW¼ sec.16, T.1 N., R.10 E., Oakland County, at 12 Mile Road, at Southfield, MI.	17.0	-	05-13-76 05-17-76 05-26-76 06-14-76 07-29-76	*20.7 53.3 *14.1 *7.45 24.9
Upper River Rouge	do	Lat 42°23'59", long 83°17'11", in NW¼ sec.20, T.1 S., R.10 E., Wayne County, at 5 Mile Road, at Redford, MI.	22.2	1967-68	05-13-76 05-17-76 05-26-76 06-14-76 07-29-76	*18.5 76.5 *12.8 *3.43 101
Bell Branch	Upper River Rouge	Lat 42°23'32", long 83°17'45", in SW¼ sec.20, T.1 S., R.10 E., Wayne County, at Beech Daily Road, at Redford, MI.	40.8	1967-68	05-13-76 05-17-76 05-26-76 06-14-76 07-30-76	*18.1 166 *10.5 *3.97 33.2
Walled Lake Branch	Johnson Drain	Lat 42°25'45", long 83°28'42", in NE¼ SE¼ sec.3, T.1 S., R.8 E., Wayne County, at Beal Street, 0.2 mile upstream from mouth, at Northville, MI.	24.6	-	05-11-76 05-18-76 05-25-76 06-15-76	*37.6 46.2 *22.3 *13.1
Johnson Drain	Middle River Rouge	Lat 42°25'33", long 83°28'43", in SE¼ sec.3, T.1 S., R.8 E., Wayne County, at 7 Mile Road, at Northville, MI.	26.1	1967-68	05-14-76 05-18-76 05-25-76 06-15-76	*36.4 63.7 *28.2 *9.50
Middle River Rouge	River Rouge	Lat 42°22'18", long 83°26'44", in SW¼ sec.25, T.1 S., R.8 E., Wayne County, at Haggerty Road, at Plymouth, MI.	60.7	1967-68	05-14-76 05-18-76 05-25-76 06-14-76	*62.9 128 *48.8 *26.7
do	do	Lat 42°21'05", long 83°22'22", in NE¼ NE¼ sec.4, T.2 S., R.9 E., Wayne County, at Ann Arbor Trail, downstream from Nankin Lake Dam, at Nankin Mills, MI.	63.4	-	05-13-76 05-17-76 05-26-76 06-14-76 07-29-76	*83.3 236 *54.4 *34.5 154
Tonquish Creek	Middle River Rouge	Lat 42°21'07", long 83°23'10", in NW¼ sec.4, T.2 S., R.9 E., Wayne County, at Wayne Road, 0.7 mile west of Nankin Mills, MI.	24.2	1967-68	05-14-76 05-17-76 05-26-76 06-14-76 07-29-76	*12.8 108 *8.74 *4.29 20.3

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		Streams tributary to Detroit River--Continued				
Lower River Rouge	River Rouge	Lat 42°17'46", long 83°32'31", in NW¼ SW¼ sec.19, T.2 S., R.8 E., Wayne County, at Ridge Road, 0.7 mile south of Cherry Hill, MI.	7.34	-	05-11-76 05-18-76 05-25-76 06-15-76	*5.72 12.1 *2.29 *.24
do	do	Lat 42°16'57", long 83°26'14", in SW¼ sec.25, T.2 S., R.8 E., Wayne County, at Lotz Road, 0.5 mile west of Wayne, MI.	37.5	-	05-11-76 05-18-76 05-25-76 06-15-76	*31.0 51.2 *8.96 *.81
Fellows Creek	Lower River Rouge	Lat 42°17'38", long 83°26'11", in NE¼ sec.25, T.2 S., R.8 E., Wayne County, at Palmer Road, 3.0 miles west of Wayne, MI.	16.0	1967-68	05-11-76 05-18-76 05-25-76 06-15-76	*12.8 30.8 *4.60 *.32
River Rouge	Detroit River	Lat 42°16'50", long 83°07'44", in private claim 114, T.2 S., R.11 E., Wayne County, at Jefferson Avenue, at River Rouge, MI.	a462	-	06-14-76	*1,510
		Streams tributary to Lake Erie				
Huron River	Lake Erie	Lat 42°35'25", long 83°29'05", in NE¼ SE¼ sec.10, T.2 N., R.8 E., Oakland County, at Commerce Road, 0.2 mile east of Commerce, MI.	57.3	1946-75c, 1976e	07-29-76 09-08-76	19.5 *9.32
Norton Creek	Huron River	Lat 42°33'09", long 83°33'44", in NE¼ NE¼ sec.25, T.2 N., R.7 E., Oakland County, at Buno Road, 3.0 miles southeast of Milford, MI.	15.8	1966-69d, 1970-71	07-27-76 07-29-76	*b5.8 29.3
Woodruff Creek	do	Lat 42°40'00", long 83°42'34", in NW¼ sec.2, T.1 N., R.6 E., Livingston County, at Grand River Road, 4.5 miles west of New Hudson, MI.	36.3	1970	07-27-76 07-29-76	*12.9 17.4
Davis Creek	do	Lat 42°28'08", long 83°44'38", in NW¼ sec.21, T.1 N., R.6 E., Livingston County, at Silver Lake Road, 2.0 miles north of Whitmore Lake, MI.	66.5	1970-71	07-27-76 07-29-76	*13.9 15.9
South Ore Creek	do	Lat 42°29'52", long 83°48'09", in NW¼ sec.12, T.1 N., R.5 E., Livingston County, at Hamburg Road, 2.5 miles southwest of Brighton, MI.	a31.0	1951-69c, 1970-71	07-27-76 07-29-76	*12.1 12.8
Horseshoe Lake Outlet	do	Lat 42°27'11", long 83°49'17", in NW¼ sec.26, T.1 N., R.5 E., Livingston County, at Merrill Road, 1.0 mile west of Hamburg, MI.	30.7	1970-71	07-28-76 07-29-76	3.84 6.82
Portage River	do	Lat 42°25'40", long 83°57'35", in SW¼ sec.34, T.1 N., R.4 E., Livingston County, at bridge on Tiplady Road, 2.0 miles upstream from Little Portage Lake, and 2.2 miles southwest of Pinckney, MI.	79.1	1944-72c, 1973-75e	07-29-76	20.4
North Fork Mill Creek	Mill Creek	Lat 42°19'19", long 83°58'45", in NE¼ sec.8, T.2 S., R.4 E., Washtenaw County, at Dexter Chelsea Road, 1.5 miles east of Chelsea, MI.	38.2	1944-47, 1961	07-28-76	9.62
Fleming Creek	Huron River	Lat 42°16'28", long 83°40'02", in SE¼ sec.25, T.2 S., R.6 E., Washtenaw County, at Geddes Road, 0.5 mile north of Geddes, MI.	30.6	1970-72	07-28-76	9.88
Huron River	Lake Erie	Lat 42°11'15", long 83°25'31", in NE¼ sec.36, T.3 S., R.8 E., Wayne County, at Lower Huron Metropolitan Parkway, 1.0 mile northwest of New Boston, MI.	849	-	06-15-76	*311
Stony Creek	do	Lat 41°56'55", long 83°18'36", in NE¼ sec.25, T.6 S., R.9 E., Monroe County, at North Dixie Highway, at Woodland Beach, MI.	-	-	02-19-76	1,110
Sandy Creek	do	Lat 41°56'48", long 83°22'03", in NW¼ NE¼ sec.28, T.6 S., R.9 E., Monroe County, at Vivian Road, at Golfcrest, MI.	-	-	02-19-76	191
Plum Creek	do	Lat 41°54'13", long 83°23'53", in private claim 499, T.7 S., R.9 E., Monroe County, at La Plaisance Road, at Monroe, MI.	-	-	02-19-76	149

See footnotes at end of the table

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1976--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Streams tributary to Lake Erie--Continued				
Otter Creek	Lake Erie	Lat 41°52'00", long 83°27'13", in NW¼ sec.23, T.7 S., R.8 E., Monroe County, at U.S. 25, at La Salle, MI.	-	-	02-19-76	463

* Base flow.
a Approximately.
b Field estimate.
c Operated as a continuous-record gaging station.
d Operated as a low-flow partial-record station.
e Operated as a crest-stage partial-record station.
f Includes 0.8 cfs inflow from wells.
g Not previously published.
h Discharge measurement made by employees of Michigan Department of Natural Resources.

Water-quality partial-record stations are particular sites where chemical-quality, biological and or sediment data are collected systematically over a period of years for use in hydrologic analyses. The data are collected usually less than quarterly.

STREAMS TRIBUTARY TO LAKE MICHIGAN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	CARBONATE (CO3) (MG/L)
04065570 - PINE CREEK NEAR MERRIMAN, MICH. (LAT 45 56 42 LONG 087 59 13.01)									
NOV , 1975									
04...	1320	2.1	615	8.2	13.5	5.0	12.6	100	0
MAR , 1976									
22...	1400	3.7	254	7.4	1.0	.0	13.6	96	0
04065580 - MOUNTY'S CREEK NR MERRIMAN, MICH. (LAT 45 56 41 LONG 087 59 23.01)									
NOV , 1975									
04...	1250	.97	180	8.1	13.5	5.5	12.0	98	0
MAR , 1976									
22...	1300	15	693	6.8	.0	.0	13.1	93	0
04065590 - STEEL CREEK NR MERRIMAN, MICH. (LAT 45 56 31 LONG 087 59 33.01)									
NOV , 1975									
04...	1140	1.5	280	8.2	13.5	5.0	11.9	97	0
MAR , 1976									
22...	1130	5.8	177	7.2	-4.0	.0	10.2	72	0

STREAMS TRIBUTARY TO LAKE MICHIGAN--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)
04096209 - BAW BEESE LK OUT AT GRSWLD RD AT HILLSDALE, MICH (LAT 41 54 23 LONG 084 37 21.01)								
FEB , 1976								
12...	1105	14	395	--	4.0	2.5	.06	.01
04096210 - KING LK INLET AT CAMBRIA RD AT HILLSDALE, MICH.. (LAT 41 53 48 LONG 084 39 04.01)								
FEB , 1976								
11...	1005	1.0	840	--	.5	1.0	1.4	.01
04096212 - KING LAKE OUTLET AT M-99 AT HILLSDALE, MICH. . (LAT 41 54 01 LONG 084 37 55.01)								
FEB , 1976								
11...	1125	4.7	655	--	1.0	2.0	2.1	.01
04096217 - ST. JOSEPH RIVER AT SOUTH ST AT HILLSDALE, MICH. (LAT 41 54 58 LONG 084 37 32.01)								
FEB , 1976								
12...	1235	16	460	--	5.0	2.0	.66	.01
04096235 - WINONA LK OUT AT HILLSDALE ST AT HILLSDALE, MICH (LAT 41 56 31 LONG 084 37 54.01)								
DEC , 1975								
05...	1320	3.3	450	8.0	12.5	7.5	.21	.01
04096239 - BEEBE CR AT SLATER RD NR N ADAMS (LAT 41 56 27 LONG 084 30 57.01)								
FEB , 1976								
18...	1420	53	--	--	--	2.0	2.0	.03
04096240 - BEEBE CREEK AT MAUCK RD NEAR NORTH ADAMS, MICH.. (LAT 41 56 31 LONG 084 31 16.01)								
DEC , 1975								
10...	1155	4.6	590	7.9	.0	1.5	1.7	.01
04096245 - BEEBE CREEK AT KNOWLES RD NR NORTH ADAMS, MICH.. (LAT 41 56 38 LONG 084 31 32.01)								
DEC , 1975								
10...	1045	12	630	7.8	-2.5	1.5	2.0	.02
FEB , 1976								
18...	1320	105	--	--	--	1.5	2.3	.03
04096257 - BEEBE CREEK AT MILNES RD NEAR HILLSDALE, MICH. . (LAT 41 57 44 LONG 084 35 35.01)								
FEB , 1976								
11...	1415	16	625	--	2.0	3.5	.78	.01

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

STREAMS TRIBUTARY TO LAKE MICHIGAN--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	TOTAL ORGANIC PHOS-PHORUS (P) (MG/L)
04096209 - BAW BEESE LK OUT AT GRSWLD RD AT HILLSDALE, MICH (LAT 41 54 23 LONG 084 37 21.01)								
FEB , 1976								
12...	.07	.33	.40	.47	2.1	.02	.02	--
04096210 - KING LK INLET AT CAMBRIA RD AT HILLSDALE, MICH.. (LAT 41 53 48 LONG 084 39 04.01)								
FEB , 1976								
11...	.23	.77	1.0	2.4	11	.06	.03	--
04096212 - KING LAKE OUTLET AT M-99 AT HILLSDALE, MICH. . (LAT 41 54 01 LONG 084 37 55.01)								
FEB , 1976								
11...	.07	.55	.62	2.7	12	.03	.03	.00
04096217 - ST. JOSEPH RIVER AT SOUTH ST AT HILLSDALE, MICH. (LAT 41 54 58 LONG 084 37 32.01)								
FEB , 1976								
12...	.18	.69	.87	1.5	6.8	.03	.02	--
04096235 - WINONA LK OUT AT HILLSDALE ST AT HILLSDALE, MICH (LAT 41 56 31 LONG 084 37 54.01)								
DEC , 1975								
05...	.11	.81	.92	1.1	5.0	.02	.00	--
04096239 - BEEBE CR AT SLATER RD NR N ADAMS (LAT 41 56 27 LONG 084 30 57.01)								
FEB , 1976								
18...	.07	1.0	1.1	3.1	14	.07	.05	--
04096240 - BEEBE CREEK AT MAUCK RD NEAR NORTH ADAMS, MICH.. (LAT 41 56 31 LONG 084 31 16.01)								
DEC , 1975								
10...	.03	1.1	1.1	2.8	12	.04	.01	--
04096245 - BEEBE CREEK AT KNOWLES RD NR NORTH ADAMS, MICH.. (LAT 41 56 38 LONG 084 31 32.01)								
DEC , 1975								
10...	.06	.94	1.0	3.0	13	.03	.01	--
FEB , 1976								
18...	.13	.85	.98	3.3	15	.11	.08	--
04096257 - BEEBE CREEK AT MILNES RD NEAR HILLSDALE, MICH. . (LAT 41 57 44 LONG 084 35 35.01)								
FEB , 1976								
11...	.14	.66	.80	1.6	7.0	.02	.02	--

STREAMS TRIBUTARY TO LAKE MICHIGAN--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)
04096260 - BEEBE C TRIB AT BARKER RD NR NORTH ADAMS, MICH.. (LAT 41 59 02 LONG 084 33 53.01)								
DEC , 1975								
10...	0925	3.0	495	7.9	-2.5	1.0	.35	.01
04096262 - BEEBE C TRIB AT MILNES RD NEAR HILLSDALE, MICH.. (LAT 41 58 08 LONG 084 35 35.01)								
FEB , 1976								
11...	1325	5.2	590	--	1.5	2.0	1.4	.01
19...	1535	--	--	--	--	1.0	1.5	.02
04096264 - TR TO BEEBE C TR AT MILNES RD NR HILLSDALE, MICH (LAT 41 58 02 LONG 084 35 35.01)								
FEB , 1976								
12...	0955	.83	630	--	3.5	4.5	2.6	.01
19...	1550	--	--	--	--	--	3.5	.01
MAY								
10...	1315	.91	620	8.4	18.5	16.5	1.1	.09
04096265 - HALF MOON LK OUT,N ADAMS RD,NR JONESVILLE, MICH. (LAT 41 58 38 LONG 084 36 40.01)								
FEB , 1976								
12...	0920	E1.0	800	--	3.5	2.0	.35	.01
04096280 - BUTTERNUT CREEK NEAR JONESVILLE, MICH. . (LAT 41 58 58 LONG 084 42 34.01)								
MAY , 1976								
18...	1220	1.3	620	8.2	1.2	14.0	3.4	.07
04096285 - ST. JOSEPH R AT MILL POND AT LITCHFIELD, MICH. . (LAT 42 01 58 LONG 084 44 13.01)								
FEB , 1976								
19...	1020	--	--	--	--	.5	1.5	.02
04096293 - S SAND LK OUTLET AT BACON RD NR HILLSDALE, MICH. (LAT 42 55 52 LONG 084 41 56.01)								
DEC , 1975								
09...	1240	4.7	410	8.2	.0	4.0	.11	.00
04096298 - SAND C TRIB BELOW MECHANIC RD NR HILLSDALE, MICH (LAT 41 55 58 LONG 084 41 42.01)								
DEC , 1975								
09...	1005	2.7	475	7.9	.5	2.5	.86	.01
04096299 - M SAND LK OUT AT MECHANIC RD NR HILLSDALE, MICH. (LAT 42 56 34 LONG 084 42 06.01)								
DEC , 1975								
09...	1125	9.0	410	8.1	.0	3.5	.43	.01

STREAMS TRIBUTARY TO LAKE MICHIGAN--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	TOTAL ORGANIC PHOS-PHORUS (P) (MG/L)
04096260 - BEEBE C TRIB AT BARKER RD NR NORTH ADAMS, MICH.. (LAT 41 59 02 LONG 084 33 53.01)								
DEC , 1975								
10...	.01	.77	.78	1.1	5.0	.03	.00	--
04096262 - BEEBE C TRIB AT MILNES RD NEAR HILLSDALE, MICH.. (LAT 41 58 08 LONG 084 35 35.01)								
FEB , 1976								
11...	.12	.52	.64	2.0	9.0	.04	.03	--
19...	.04	.96	1.0	2.5	11	.05	.04	--
04096264 - TR TO BEEBE C TR AT MILNES RD NR HILLSDALE, MICH (LAT 41 58 02 LONG 084 35 35.01)								
FEB , 1976								
12...	.03	.56	.59	3.2	14	.04	.03	--
19...	.04	.81	.85	4.4	19	.04	.04	--
MAY								
10...	.01	.32	.33	1.5	6.8	.05	.01	--
04096265 - HALF MOON LK OUT,N ADAMS RD,NR JONESVILLE, MICH. (LAT 41 58 38 LONG 084 36 40.01)								
FEB , 1976								
12...	.22	.57	.79	1.2	5.1	.01	.01	--
04096280 - BUTTERNUT CREEK NEAR JONESVILLE, MICH. . (LAT 41 58 58 LONG 084 42 34.01)								
MAY , 1976								
18...	.04	.51	.55	4.1	18	.03	.01	--
04096285 - ST. JOSEPH R AT MILL POND AT LITCHFIELD, MICH. . (LAT 42 01 58 LONG 084 44 13.01)								
FEB , 1976								
19...	.12	.87	.99	2.5	11	.09	.07	--
04096293 - S SAND LK OUTLET AT BACON RD NR HILLSDALE, MICH. (LAT 42 55 52 LONG 084 41 56.01)								
DEC , 1975								
09...	.09	.42	.51	.62	2.7	.01	.00	--
04096298 - SAND C TRIB BELOW MECHANIC RD NR HILLSDALE, MICH (LAT 41 55 58 LONG 084 41 42.01)								
DEC , 1975								
09...	.03	.44	.47	1.3	5.9	.02	.00	--
04096299 - M SAND LK OUT AT MECHANIC RD NR HILLSDALE, MICH. (LAT 42 56 34 LONG 084 42 06.01)								
DEC , 1975								
09...	.10	.48	.58	1.0	4.5	.01	.00	--

STREAMS TRIBUTARY TO LAKE MICHIGAN--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	AIR TEMPERATURE (DEG C)	TEMPERATURE (DEG C)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)
04096304 - SAND CREEK AT US-12 NEAR ALLEN, MICH. . (LAT 41 57 47 LONG 084 44 20.01)								
NOV , 1975								
26...	1230	10	750	8.2	.5	4.0	1.3	.01
04096307 - SAND C TRIBUTARY AT BEULOW RD NEAR ALLEN, MICH.. (LAT 41 58 51 LONG 084 44 20.01)								
NOV , 1975								
26...	1130	.69	760	8.2	-1.0	2.5	3.7	.01
04096308 - SAND CREEK AT JONESVILLE RD NR ALLEN, MICH. . (LAT 41 59 08 LONG 084 45 04.01)								
NOV , 1975								
26...	1010	12	545	8.3	.0	2.5	1.4	.01
04096317 - ST. JOSEPH R AT S CO LINE RD NR LITCHFIELD, MICH (LAT 42 04 21 LONG 084 49 50.01)								
NOV , 1975								
04...	1430	--	500	--	--	13.0	1.2	.01
25...	1240	67	645	8.3	.0	2.5	1.6	.01
04096332 - ST. JOSEPH R AT T DRIVE SOUTH NEAR HOMER, MICH.. (LAT 42 06 04 LONG 084 50 38.01)								
NOV , 1975								
25...	1030	76	590	8.2	-.5	2.5	1.5	.01

DATE	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC PHOSPHORUS (P) (MG/L)
04096304 - SAND CREEK AT US-12 NEAR ALLEN, MICH. . (LAT 41 57 47 LONG 084 44 20.01)								
NOV , 1975								
26...	.07	.41	.48	1.8	7.9	.01	.01	--
04096307 - SAND C TRIBUTARY AT BEULOW RD NEAR ALLEN, MICH.. (LAT 41 58 51 LONG 084 44 20.01)								
NOV , 1975								
26...	.01	.31	.32	4.0	18	.01	.01	--
04096308 - SAND CREEK AT JONESVILLE RD NR ALLEN, MICH. . (LAT 41 59 08 LONG 084 45 04.01)								
NOV , 1975								
26...	.07	.36	.43	1.8	8.1	.01	.01	--
04096317 - ST. JOSEPH R AT S CO LINE RD NR LITCHFIELD, MICH (LAT 42 04 21 LONG 084 49 50.01)								
NOV , 1975								
04...	.02	.43	.45	1.7	7.3	.01	.00	--
25...	.01	.43	.44	2.0	9.0	.10	.09	.00
04096332 - ST. JOSEPH R AT T DRIVE SOUTH NEAR HOMER, MICH.. (LAT 42 06 04 LONG 084 50 38.01)								
NOV , 1975								
25...	.02	.45	.47	2.0	8.7	.07	.06	--

STREAMS TRIBUTARY TO LAKE MICHIGAN

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
04096209 - BAW BEESE LK OUT AT GRSWLD RD AT HILLSDALE, MICH (LAT 41 54 23 LONG 084 37 21.01)					
FEB , 1976					
12...	1105	14	2.5	E1	E.04
04096210 - KING LK INLET AT CAMBRIA RD AT HILLSDALE, MICH.. (LAT 41 53 48 LONG 084 39 04.01)					
FEB , 1976					
11...	1005	1.0	1.0	25	.07
04096212 - KING LAKE OUTLET AT M-99 AT HILLSDALE, MICH. . (LAT 41 54 01 LONG 084 37 55.01)					
FEB , 1976					
11...	1125	4.7	2.0	8	.10
04096217 - ST. JOSEPH RIVER AT SOUTH ST AT HILLSDALE, MICH. (LAT 41 54 58 LONG 084 37 32.01)					
FEB , 1976					
12...	1235	16	2.0	6	.26
17...	1705	E55	1.0	8	E1.2
04096235 - WINONA LK OUT AT HILLSDALE ST AT HILLSDALE, MICH (LAT 41 56 31 LONG 084 37 54.01)					
DEC , 1975					
05...	1320	3.3	7.5	3	.03
FEB , 1976					
17...	1745	E5.0	2.0	1	E.01
04096240 - BEEBE CREEK AT MAUCK RD NEAR NORTH ADAMS, MICH.. (LAT 41 56 31 LONG 084 31 16.01)					
DEC , 1975					
10...	1155	4.6	1.5	2	.02
FEB , 1976					
18...	1355	E55	2.0	6	E.89
04096245 - BEEBE CREEK AT KNOWLES RD NR NORTH ADAMS, MICH.. (LAT 41 56 38 LONG 084 31 32.01)					
DEC , 1975					
10...	1045	12	1.5	5	.16
FEB , 1976					
17...	1410	128	1.0	42	15
18...	1320	105	1.5	10	2.8
04096257 - BEEBE CREEK AT MILNES RD NEAR HILLSDALE, MICH. . (LAT 41 57 44 LONG 084 35 35.01)					
FEB , 1976					
11...	1415	16	3.5	6	.26
17...	1715	226	.5	10	6.1
20...	1215	131	2.0	6	2.1
MAR					
04...	1450	274	4.0	2	1.5
06...	1205	260	4.0	6	4.2

E--ESTIMATED VALUE

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
04096260 - BEEBE C TRIB AT BARKER RD NR NORTH ADAMS, MICH.. (LAT 41 59 02 LONG 084 33 53.01)					
DEC , 1975					
10...	0925	3.0	1.0	7	.06
FEB , 1976					
17...	1305	E25	.5	18	E1.2
04096262 - BEEBE C TRIB AT MILNES RD NEAR HILLSDALE, MICH.. (LAT 41 58 08 LONG 084 35 35.01)					
FEB , 1976					
11...	1325	5.2	2.0	6	.08
17...	1300	73	.0	22	4.3
19...	1345	38	1.0	4	.41
20...	1100	35	1.5	8	.76
MAR					
04...	1730	71	5.0	4	.77
05...	1420	72	7.5	10	1.9
06...	1035	51	1.0	1	.14
04096264 - TR TO BEEBE C TR AT MILNES RD NR HILLSDALE, MICH (LAT 41 58 02 LONG 084 35 35.01)					
FEB , 1976					
12...	0955	.83	4.5	31	.07
17...	1350	4.2	3.5	22	.25
19...	1445	2.1	1.0	4	.02
MAR					
05...	1435	6.5	7.5	26	.46
MAY					
10...	1315	.91	16.5	71	.17
04096265 - HALF MOON LK OUT,N ADAMS RD,NR JONESVILLE, MICH. (LAT 41 58 38 LONG 084 36 40.01)					
FEB , 1976					
12...	0920	E1.0	2.0	1	E.00
17...	1325	E4.0	.5	1	E.01
04096280 - BUTTERNUT CREEK NEAR JONESVILLE, MICH. . (LAT 41 58 58 LONG 084 42 34.01)					
MAY , 1976					
18...	1220	1.3	14.0	6	.02
04096285 - ST. JOSEPH R AT MILL POND AT LITCHFIELD, MICH. . (LAT 42 01 58 LONG 084 44 13.01)					
FEB , 1976					
19...	1020	--	.5	5	--
04096293 - S SAND LK OUTLET AT BACON RD NR HILLSDALE, MICH. (LAT 42 55 52 LONG 084 41 56.01)					
DEC , 1975					
09...	1240	4.7	4.0	1	.01

E--ESTIMATED VALUE

STREAMS TRIBUTARY TO LAKE MICHIGAN--CONTINUED

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
04096298 - SAND C TRIB BELOW MECHANIC RD NR HILLSDALE, MICH (LAT 41 55 58 LONG 084 41 42.01)					
DEC , 1975					
09...	1005	2.7	2.5	10	.07
04096299 - M SAND LK OUT AT MECHANIC RD NR HILLSDALE, MICH. (LAT 42 56 34 LONG 084 42 06.01)					
DEC , 1975					
09...	1125	9.0	3.5	7	.17
04096304 - SAND CREEK AT US-12 NEAR ALLEN, MICH. . (LAT 41 57 47 LONG 084 44 20.01)					
NOV , 1975					
26...	1230	10	4.0	11	.30
FEB , 1976					
17...	1815	E25	3.5	5	E.34
19...	1515	E32	3.5	2	E.17
20...	1340	32	4.5	7	.60
04096307 - SAND C TRIBUTARY AT BEULOW RD NEAR ALLEN, MICH.. (LAT 41 58 51 LONG 084 44 20.01)					
NOV , 1975					
26...	1130	.69	2.5	7	.01
FEB , 1976					
17...	1835	E4.0	3.0	5	E.05
19...	1530	5.2	4.5	8	.11
20...	1150	3.8	4.5	9	.09
04096308 - SAND CREEK AT JONESVILLE RD NR ALLEN, MICH. . (LAT 41 59 08 LONG 084 45 04.01)					
NOV , 1975					
26...	1010	12	2.5	5	.17
FEB , 1976					
19...	1545	40	4.0	2	.22
MAR					
06...	1300	80	4.0	7	1.5
04096317 - ST. JOSEPH R AT S CO LINE RD NR LITCHFIELD, MICH (LAT 42 04 21 LONG 084 49 50.01)					
NOV , 1975					
25...	1240	67	2.5	6	1.1
FEB , 1976					
18...	1030	E340	1.0	5	E4.6
04096332 - ST. JOSEPH R AT T DRIVE SOUTH NEAR HOMER, MICH.. (LAT 42 06 04 LONG 084 50 38.01)					
NOV , 1975					
25...	1030	76	2.5	5	1.0
FEB , 1976					
19...	1450	479	1.5	5	6.5

E--ESTIMATED VALUE

Samples are collected at sites other than gaging stations and partial-record stations to give better areal coverage in a river basin. Such sites are referred to as miscellaneous sites.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

STREAMS TRIBUTARY TO LAKE MICHIGAN

421426085544701 - BROWNWOOD LAKE, SITE 1, NEAR PAW PAW, MI (LAT 42 14 26 LONG 085 54 47)

DATE	TIME	DEPTH OF RESER-VOIR (FT)	DEPTH TO TOP OF SAMPLE INTER-VAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTER-VAL (FT)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	DIS-SOLVED OXYGEN (MG/L)	PER-CENT SATUR-ATION	IMME-DIATE COLI-FORM (COL. PER 100 ML)
JUN 30...	1000	6.0	.00	4.0	210	7.7	22.5	7.3	85	14

DATE	FECAL COLI-FORM (COL. PER 100 ML)	STREP-TOCOCCI (COL-ONIFS PER 100 ML)	BICAR-BONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)
JUN 30...	20	36	180	5.7	.01	.01	.02	.09	.56

DATE	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	TOTAL HYDRO-LYZABLE PHOS-PHORUS (P) (MG/L)	TOTAL ORGANIC PHOS-PHORUS (P) (MG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)	TOTAL PHYTO-PLANK-TON (CELLS PER ML)
JUN 30...	.65	.67	3.0	.05	.01	.03	.01	.00	68000

JUNE 30, 1976
1000 HOURS

IDENTIFICATION OF PHYTOPLANKTON

68,000 CELLS/ML

_ORGANISM__NAME	_COMMON__NAME	CELLS/ML	PER_CENT
CHLOROPHYTA	GREEN ALGAE		
.CHLOROPHYCEAE			
..CHLOROCOCCALES			
...OOCYSTACEAE			
....OOCYSTIS		380	1
...SCENEDESMACEAE			
....SCENEDESMUS		0	0
	TOTALS	560	1
CHRYSOPHYTA			
.BACILLARIOPHYCEAE	DIATOMS		
..PENNALES	PENNATE		
...ACHNANTHACEAE			
....ACHNANTHES			0
...GOMPHONEMATACEAE			
....GOMPHONEMA			0
...NAVICULACEAE	NAVICULOID		
....NAVICULA		0	0
	TOTALS	380	0
CYANOPHYTA	BLUE-GREEN ALGAE		
.MYXOPHYCEAE			
..CHROOCOCCALES	COCCOID		
...CHROOCOCCACEAE			
....ANACYSTIS		62,000	91
..OSCILLATORIALES	FILAMENTOUS		
...NOSTOCACEAE			
....ANABAENA		5,000	7
	TOTALS	67,000	98
EUGLENOPHYTA	EUGLENOIDS		
.CRYPTOPHYCEAE	CRYPTOMONADS		
..CRYPTOMONIDALES			
...CRYPTOCHRYSIDACEAE			
....CHROOMONAS		0	0
	TOTALS	94	0

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

STREAMS TRIBUTARY TO LAKE MICHIGAN--CONTINUED

421433085544201 - BROWNWOOD LAKE, SITE 2, NEAR PAW PAW, MI (LAT 42 14 33 LONG 085 54 42)

DATE	TIME	DEPTH OF RESER-VOIR (FT)	DEPTH TO TOP OF SAMPLE INTER-VAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTER-VAL (FT)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	DIS-SOLVED OXYGEN (MG/L)	PER-CENT SATUR-ATION
JUN									
30...	1045	4.5	.00	4.0	208	8.2	23.0	7.6	90

DATE	IMME-DIATE COLI-FORM (COL. PER 100 ML)	FECAL COLI-FORM (COL. PER 100 ML)	STREP-TOCOCCI (COL-ONIES PER 100 ML)	BICAR-BONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)
JUN									
30...	20	8	20	116	1.2	.00	.01	.01	.05

DATE	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	TOTAL HYDRO-LYZABLE PHOS-PHORUS (P) (MG/L)	TOTAL ORGANIC PHOS-PHORUS (P) (MG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
JUN									
30...	.58	.63	.64	2.8	.03	.01	.02	.00	.00

421428085550801 - BROWNWOOD LAKE, SITE 3, NEAR PAW PAW, MI (LAT 42 14 28 LONG 085 55 08)

DATE	TIME	DEPTH OF RESER-VOIR (FT)	DEPTH TO TOP OF SAMPLE INTER-VAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTER-VAL (FT)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)
JUN										
30...	1300	43	.00	4.0	220	8.4	23.5	3	100	18
30...	1305	--	38	38	271	7.5	9.0	3	120	2

DATE	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)
JUN									
30...	25	10	3.3	.7	104	0	85	4.6	1.1
30...	33	9.6	3.2	.9	146	0	120	5.2	4.1

DATE	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)
JUN									
30...	128	.01	.02	.03	.03	.05	.58	.63	.66
30...	150	.02	.01	.03	.06	.70	.70	1.4	1.4

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

STREAMS TRIBUTARY TO LAKE MICHIGAN--CONTINUED

421428085550801 - BROWNWOOD LAKE, SITE 3, NEAR PAW PAW, MI (LAT 42 14 28 LONG 085 55 08)--CONTINUED

DATE	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (P04) (MG/L)	TOTAL HYDRO-LYZABLE PHOS-PHORUS (P) (MG/L)	TOTAL ORGANIC PHOS-PHORUS (P) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
JUN									
30...	2.9	.03	.01	.03	.09	.02	.00	10	2
30...	6.3	.05	.01	.04	.12	.03	.01	30	1000

DATE	DEPTH (FT)	TEMPER-ATURE (DEG C)	DIS-SOLVED OXYGEN (MG/L)	PER-CENT SATUR-ATION
JUN				
30...	2.0	23.5	6.8	82
30...	6.0	23.5	5.5	66
30...	10	23.5	2.0	25
30...	14	21.5	1.8	21
30...	18	16.5	1.8	19
30...	22	13.5	1.4	13
30...	26	11.5	.9	8
30...	30	10.0	.9	8
30...	34	9.5	.8	7
30...	38	9.0	.6	5

04102414 - VAN AUKEN LAKE NEAR MCDONALD, MI (LAT 42 15 00 LONG 086 11 26)

DATE	TIME	AZIMUTH FROM OUTLET (DEG)	DIS-TANCE FROM SOUTH-ERNMOST POINT (FT)	TEMPER-ATURE (DEG C)	CHLORO-PHYLL A (UG/L)	CHLORO-PHYLL B (UG/L)
JUN						
28...	1730	45.0	2150	23.0	10.8	.000

DATE	DEPTH (FT)	TEMPER-ATURE (DEG C)	DIS-SOLVED OXYGEN (MG/L)	PER-CENT SATUR-ATION
JUN				
28...	4.0	23.0	9.2	108
28...	6.0	23.0	9.2	108
28...	10	23.0	9.2	108
28...	14	23.0	9.0	106
28...	17	23.0	8.6	101
28...	20	23.0	.8	9
28...	24	12.0	.7	6
28...	28	12.0	.4	4
28...	32	12.0	.4	4
28...	36	11.5	.2	2
28...	40	11.5	.2	2

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

STREAMS TRIBUTARY TO LAKE MICHIGAN--CONTINUED

421424086122601 - RUSH LAKE, SITE 1, NEAR TOQUIN, MI (LAT 42 14 24 LONG 086 12 26)

DATE	TIME	DEPTH OF RESER-VOIR (FT)	DEPTH TO TOP OF SAMPLE INTER-VAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTER-VAL (FT)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	DIS-SOLVED OXYGEN (MG/L)	PER-CENT SATUR-ATION	IMME-DIATE COLI-FORM (COL. PER 100 ML)
JUN 29...	1230	6.0	.00	4.0	316	8.2	24.0	17.4	212	17

DATE	FECAL COLI-FORM (COL. PER 100 ML)	STREP-TOCOCCI (COL-ONIES PER 100 ML)	BICAR-BONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)
JUN 29...	<1	<1	184	1.9	.00	.01	.01	.05	.50	.55

DATE	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	TOTAL HYDRO-LYZABLE PHOS-PHORUS (P) (MG/L)	TOTAL ORGANIC PHOS-PHORUS (P) (MG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)	TOTAL PHYTO-PLANK-TON (CELLS PER ML)	POTEN-TIAL ALGAL GROWTH BOTTLE TEST (MG/L)
JUN 29...	.56	2.5	.02	.01	.01	.00	.00	2600	.5

JUNE 29, 1976
1230 HOURS

IDENTIFICATION OF PHYTOPLANKTON

2,600 CELLS/ML

_ORGANISM__NAME_____	_COMMON__NAME_____		CELLS/ML	PER_CENT
CHLOROPHYTA	GREEN ALGAE			
.CHLOROPHYCEAE				
..CHLOROCOCCALES				
...COELASTRACEAE				
....COELASTRUM			140	6
...OOCYSTACEAE				
....ANKISTRODESMUS			200	8
..TETRASPORALES				
...COCCOMYXACEAE				
....ELAKATOTHRIX			120	5
..VOLVOCALES				
...PHACOTACEAE				
....PHACOTUS			61	2
		TOTALS	530	21
CHRYSOPHYTA				
.BACILLARIOPHYCEAE	DIATOMS			
..PENNALES	PENNATE			
...ACHNANTHACEAE				
....ACHNANTHES			20	1
...FRAGILARIACEAE				
....FRAGILARIA			200	8
...NITZSCHIACEAE				
....NITZSCHIA			82	3
		TOTALS	310	12
.CHRYSOPHYCEAE	YELLOW-BROWN ALGAE			
..CHRYSOMONADALES				
...OCHROMONADACEAE				
....DINOBRYON			41	2
....OCHROMONAS			570	22
		TOTALS	610	24

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

STREAMS TRIBUTARY TO LAKE MICHIGAN--CONTINUED

421424086122601 - RUSH LAKE, SITE 1, NEAR TOQUIN, MI (LAT 42 14 24 LONG 086 12 26)--CONTINUED

IDENTIFICATION OF PHYTOPLANKTON--CONTINUED

JUNE 29, 1976 1230 HOURS

CYANOPHYTA	BLUE-GREEN ALGAE		
.MYXOPHYCEAE			
..CHROOCOCCALES	COCCOID		
...CHROOCOCCACEAE			
....ANACYSTIS		920	36
	TOTALS	920	36
EUGLENOPHYTA	EUGLENOIDS		
.CRYPTOPHYCEAE	CRYPTOMONADS		
..CRYPTOMONIDALES			
...CRYPTOMONODACEAE			
....CRYPTOMONAS		120	5
	TOTALS	120	5
.EUGLENOPHYCEAE			
..EUGLENALES			
...EUGLENACEAE			
....TRACHELOMONAS		41	2
	TOTALS	41	2
PYRRHOPHYTA	FIRE ALGAE		
.DINOPHYCEAE	DINOFLAGELLATES		
..PERIDINIALES			
...CERATIACEAE			
....CERATIUM		20	1
	TOTALS	20	1

421433086121401 - RUSH LAKE, SITE 2, NEAR TOQUIN, MI (LAT 42 14 33 LONG 086 12 14)

DATE	TIME	DEPTH OF RESER-VOIR (FT)	DEPTH TO TOP OF SAMPLE INTER-VAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTER-VAL (FT)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	DIS-SOLVED OXYGEN (MG/L)	PER-CENT SATUR-ATION
JUN 29...	1345	29	.00	4.0	333	8.4	23.0	16.2	193

DATE	IMME-DIATE COLI-FORM (COL. PER 100 ML)	FECAL COLI-FORM (COL. PER 100 ML)	STREP-TOCOCCI (COL-ONIES PER 100 ML)	BICAR-BONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)
JUN 29...	100	<1	<1	192	1.2	.00	.01	.01	.03

DATE	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	TOTAL HYDRO-LYZABLE PHOS-PHORUS (P) (MG/L)	TOTAL ORGANIC PHOS-PHORUS (P) (MG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
JUN 29...	.47	.50	.51	2.3	.03	.01	.01	.01	.00

DATE	DEPTH (FT)	TEMPER-ATURE (DEG C)	DIS-SOLVED OXYGEN (MG/L)	PER-CENT SATUR-ATION
JUN				
29...	2.0	23.0	16.2	193
29...	4.0	23.0	16.0	191
29...	6.0	23.0	15.0	179
29...	10	23.0	13.8	164
29...	14	22.0	9.2	107
29...	18	16.0	1.9	20
29...	22	13.0	.8	8
29...	26	11.0	.6	6
29...	28	10.5	.5	5

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

STREAMS TRIBUTARY TO LAKE MICHIGAN--CONTINUED

421440086122501 - RUSH LAKE, SITE 3, NEAR TOQUIN, MI (LAT 42 14 40 LONG 086 12 25)

DATE	TIME	DEPTH OF RESER-VOIR (FT)	DEPTH TO TOP OF SAMPLE INTER-VAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTER-VAL (FT)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)
JUN										
29...	1430	48	.00	4.0	324	8.3	23.0	2	170	25
29...	1435	--	40	40	383	7.5	8.0	2	190	31

DATE	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)
JUN									
29...	38	18	2.0	1.3	176	0	144	3.8	6.5
29...	46	19	2.0	1.5	198	0	162	3.7	10

DATE	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)
JUN									
29...	201	.00	.01	.01	.01	.04	.49	.53	.54
29...	224	.01	.00	.01	.01	1.2	.00	1.2	1.2

DATE	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (P04) (MG/L)	TOTAL HYDRO-LYZABLE PHOS-PHORUS (P) (MG/L)	TOTAL ORGANIC PHOS-PHORUS (P) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
JUN									
29...	2.4	.02	.01	.01	.03	.01	.00	50	10
29...	5.4	.16	.10	.10	.31	.13	.00	50	910

DATE	DEPTH (FT)	TEMPER-ATURE (DEG C)	DIS-SOLVED OXYGEN (MG/L)	PER-CENT SATUR-ATION
JUN				
29...	2.0	23.0	15.4	183
29...	6.0	23.0	8.0	95
29...	10	23.0	7.6	90
29...	14	21.0	6.2	71
29...	18	16.0	4.4	45
29...	22	12.0	1.4	13
29...	26	11.0	.8	7
29...	30	10.0	.6	5
29...	34	9.0	.4	4
29...	38	8.0	.4	3
29...	42	8.0	.3	3
29...	46	7.5	.2	2

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
STREAMS TRIBUTARY TO LAKE HURON					
BAD RIVER AT ST. CHARLES, MI (LAT 43 18 04 LONG 084 08 15)					
APR. 28...	1200	1,400	7.0	25	94
JUNE 23...	1405	75	24.5	33	6.7
BEAVER CREEK AT ST. CHARLES, MI (LAT 43 18 36 LONG 084 08 29)					
APR. 29...	1545	216	11.5	10	5.8
JUNE 23...	1600	10	21.5	29	0.78
PICKEREL CREEK AT ST. CHARLES, MI (LAT 43 16 28 LONG 084 07 25)					
APR. 27...	1600	--	8.5	25	--
JUNE 21...	1415	0.67	21.5	16	0.03
BEAR CREEK NEAR FERGUS, MI (LAT 43 15 46 LONG 084 05 05)					
APR. 27...	1435	45	7.0	21	2.6
JUNE 21...	1305	0.42	21.0	21	0.02
SHIAWASSEE RIVER NEAR ST. CHARLES, MI (LAT 43 20 09 LONG 084 04 32)					
JUNE 22...	1200	--	22.5	77	--
MARSH CREEK NEAR ST. CHARLES, MI (LAT 43 21 13 LONG 084 07 52)					
APR. 28...	0910	54	8.0	19	2.8
JUNE 21...	1550	3.9	20.5	39	0.41
SWAN CREEK NEAR ST. CHARLES, MI (LAT 43 22 46 LONG 084 05 58)					
APR. 28...	1440	49	8.5	35	4.6
JUNE 23...	1640	36	27.5	46	4.5
MARSH CREEK NEAR ST. CHARLES, MI (LAT 43 21 18 LONG 084 04 19)					
APR. 28...	1720	1,610	8.5	31	135
JUNE 22...	1015	100	22.0	98	26
FLINT RIVER CUTOFF NEAR ALICIA, MI (LAT 43 19 20 LONG 084 00 14)					
APR. 27	1700	2,840	6.5	90	690
JUNE 21...	1530	0	23.5	29	0
04149500 FLINT RIVER NEAR ALICIA, MI (LAT 43 18 40 LONG 084 02 00)					
APR. 29...	1315	--	8.5	80	--
JUNE 23...	1030	62	24.0	39	6.5
BIRCH RUN NEAR BRIDGEPORT, MI (LAT 43 19 18 LONG 083 58 29)					
APR. 28...	1155	--	6.0	16	--
JUNE 21...	1420	--	24.0	17	--

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1975 to SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
STREAMS TRIBUTARY TO LAKE HURON--CONTINUED					
CASS RIVER NEAR BRIDGEPORT, MI (LAT 43 21 54 LONG 083 57 18)					
APR. 28...	0955	4,810	5.5	38	494
JUNE 22...	1750	--	27.5	50	--
TITTABAWASSEE RIVER NEAR SAGINAW, MI (LAT 43 23 37 LONG 084 00 54)					
APR. 28...	1705	11,700	8.5	31	979
JUNE 24...	0930	1,100	24.0	23	68
STREAMS TRIBUTARY TO DETROIT RIVER					
04166040 FRANKLIN BRANCH AT SOUTHFIELD, MI (LAT 42 30 04 LONG 083 16 43)					
MAY 26...	0845	14.0	12.0	187	7.1
JUNE 14...	0950	7.4	20.5	62	1.2
JULY 29...	1845	25.0	22.5	232	16
04166350 UPPER RIVER ROUGE AT REDFORD, MI (LAT 42 23 59 LONG 083 17 11)					
MAY 26...	0945	13.0	13.0	59	2.1
JUNE 14...	1040	3.4	22.0	32	.29
JULY 29...	1745	101	23.0	1,350	368
04166450 BELL BRANCH AT REDFORD, MI (LAT 42 23 32 LONG 083 17 45)					
MAY 26...	1025	10.0	12.0	102	2.8
JUNE 14...	1115	4.0	22.0	14	.15
JULY 30...	1020	33	21.5	95	8.5
04166610 WALLED LAKE BRANCH AT NORTHVILLE, MI (LAT 42 25 45 LONG 083 28 42)					
MAY 25...	1020	22.0	--	66	3.9
JUNE 15...	1450	13.0	22.5	28	.98
04166700 JOHNSON DRAIN AT NORTHVILLE, MI (LAT 42 25 33 LONG 083 28 43)					
MAY 25...	1155	28.0	12.0	62	4.7
JUNE 15...	1355	9.5	19.5	19	.49
04166750 MIDDLE RIVER ROUGE AT PLYMOUTH, MI (LAT 42 22 18 LONG 083 26 44)					
MAY 25...	1320	49.0	16.5	45	6.0
JUNE 14...	1300	27.0	24.0	14	1.0
04166780 MIDDLE RIVER ROUGE AT NANKIN MILLS, MI (LAT 42 21 05 LONG 083 22 22)					
MAY 26...	1330	54.0	17.0	48	7.0
JUNE 14...	1450	34.0	25.5	32	2.9
JULY 29...	1630	154	25.5	36	15

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1975 to SEPTEMBER 1976--CONTINUED

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
		STREAMS TRIBUTARY TO DETROIT RIVER--CONTINUED			
04166900 TONQUISH CREEK AT NANKIN MILLS, MI (LAT 42 21 07 LONG 085 23 10)					
MAY 26...	1145	8.7	12.5	94	2.2
JUNE 14...	1415	4.3	23.0	17	.20
JULY 29...	1515	20.0	23.0	131	7.1
04167268 LOWER RIVER ROUGE AT CHERRY HILL, MI (LAT 42 17 46 LONG 083 32 31)					
MAY 25...	1615	2.3	15.5	37	.23
JUNE 15...	1240	.24	25.5	32	.02
04167500 LOWER RIVER ROUGE AT WAYNE, MI (LAT 42 16 57 LONG 083 26 14)					
MAY 25...	1510	9.0	22.5	175	4.2
JUNE 15...	1150	.81	23.0	72	.16
04167600 FELLOWS CREEK AT PALMER ROAD NEAR WAYNE, MI (LAT 42 17 38 LONG 083 26 11)					
MAY 25...	1415	4.6	16.5	114	1.4
JUNE 15...	1110	.32	23.0	63	.05
		STREAMS TRIBUTARY TO LAKE ERIE			
HURON RIVER AT COMMERCE, MI (LAT 42 35 25 LONG 083 29 05)					
JULY 29...	1230	19.5	23.5	6	.32
NORTON CREEK AT BUNG ROAD NEAR MILFORD, MI (LAT 42 33 09 LONG 083 33 44)					
JULY 29...	1120	29.3	21.0	68	5.3
WOODRUFF CREEK AT GRAND RIVER ROAD NEAR NEW HUDSON, MI (LAT 42 40 00 LONG 083 42 34)					
JULY 29...	1030	17.4	--	51	2.3
DAVIS CREEK AT SILVER LAKE ROAD NEAR WHITMORE LAKE, MI (LAT 42 28 08 LONG 083 44 38)					
JULY 29...	1115	16.0	--	18	.78
ORE CREEK AT HAMBURG ROAD NEAR BRIGHTON, MI (LAT 42 29 52 LONG 083 48 09)					
JULY 29...	1305	12.8	--	12	.42
HORSESHOE LAKE OUTLET AT MERRILL ROAD NEAR HAMBURG, MI (LAT 42 27 11 LONG 083 49 17)					
JULY 29...	1445	6.8	--	27	.50
PORTAGE CREEK NEAR PINCKNEY, MI (LAT 42 25 40 LONG 083 57 35)					
JULY 29...	1530	20.4	--	2	.11

FIGURE 9.--Map showing location of observation wells published in this report.

ALGER COUNTY

461608086373801. Local number, 45N 19W 25BDDB.
LOCATION.--Lat 46°16'08", long 086°37'38", Hydrologic Unit 04060106, 250 ft (76 m) northwest of highway M-44, 0.2 mi (0.3 km) northeast of Kentucky.
Owner: U.S. Forest Service.
AQUIFER.--Glacial deposits of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 6 in (15 cm), depth 66 ft (20 m).
DATUM.--Altitude of land-surface datum is 850 ft (259 m). Measuring point: Top of casing, 3.60 ft (1.10 m) above land-surface datum.
PERIOD OF RECORD.--June 1959 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.35 ft (1.94 m) below land-surface datum, June 29, 1960; lowest measured, 14.19 ft (4.33 m) below land-surface datum, Apr. 3, 1964.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 17	11.65	APR 9	11.49	SEP 10	12.05

BARAGA COUNTY

463353088144301. Local number, 48N 32W 12DDCC.
LOCATION.--Lat 46°33'53", long 088°14'43", Hydrologic Unit 04030107, 95 ft (29 m) north of U.S. Highway 41 and 0.5 mi (0.8 km) southeast of Nestoria Road.
Owner: Michigan State Highway Department.
AQUIFER.--Sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled water-table well, diameter 1¼ in (3.2 cm), depth 10 ft (3 m), screened 7 to 10 ft (2 to 3 m).
DATUM.--Altitude of land-surface datum is 1,630 ft (497 m). Measuring point: Top of casing, 4.78 ft (1.46 m) above land-surface datum.
REMARKS.--Measurements made by Wisconsin-Michigan Power Company.
PERIOD OF RECORD.--September 1948 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.27 ft (1.00 m) below land-surface datum, Apr. 30, 1965; lowest measured, 8.09 ft (2.47 m) below land surface datum, Sept. 2, 1960.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	7.18	DEC 31	7.02	MAR 1	7.16	APR 30	6.13	JUN 30	6.89	AUG 31	7.01
DEC 1	6.55	JAN 31	7.18	31	6.00	MAY 27	6.98	AUG 2	6.84		

BAY COUNTY

435128083582401. Local number, 17N 4E 22DCAA.
LOCATION.--Lat 43°51'28", long 083°58'24", Hydrologic Unit 04080102, at end of Second Street, Pinconning.
Owner: Pinconning Township.
AQUIFER.--Saginaw Formation of Pennsylvania Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 6 in (15 cm), depth 110 ft (33 m), cased to 60 ft (18 m), open end.
DATUM.--Altitude of land-surface datum is 620 ft (189 m). Measuring point: Plywood shelter base, 2.00 ft (0.61 m) above land-surface datum.
REMARKS.--Water levels affected by regional pumping.
PERIOD OF RECORD.--August 1962 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level 0.05 ft (0.02 m) below land-surface datum, Mar. 5, 1976; lowest, 10.53 ft (3.21 m) below land-surface datum, Aug. 8, 1963.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	1.25	1.32	1.00	1.12	1.11	0.25	--	1.00	3.10	--	1.99	3.15
10	1.22	1.25	1.00	--	0.95	0.20	--	1.15	--	--	2.63	2.75
15	1.73	1.15	1.02	--	1.15	0.15	1.25	--	--	--	2.12	3.04
20	1.21	1.11	1.12	0.99	0.68	--	1.19	--	--	2.65	2.18	2.67
25	1.67	1.30	1.00	1.07	0.32	--	0.99	1.22	2.41	2.78	--	2.80
EOM	1.27	1.07	1.05	0.96	0.31	--	1.16	1.38	2.00	3.12	3.06	2.24

WTR YEAR 1976 MAX 0.05 MAR 5, 1976 MIN 3.24 SEP 6, 1976

BRANCH COUNTY

415602084593701. Local number, 6S 6W 22CABA.
LOCATION.--Lat 41°56'02", long 084°59'37", Hydrologic Unit 04050001, at Bennett and Tibbits Streets, Coldwater.
Owner: City of Coldwater.
AQUIFER.--Sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 6 in (15 cm), depth 113 ft (34 m), screened 73 to 113 ft (22 to 34 m).
DATUM.--Altitude of land-surface datum is 970 ft (296 m). Measuring point: Plywood shelter base, 2.50 ft (0.76 m) above land-surface datum.
REMARKS.--Water levels affected by nearby pumping.
PERIOD OF RECORD.--January 1964 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 9.0 ft (2.7 m) below land-surface datum, May 6, 1975; lowest, 24.8 ft (7.6 m) below land-surface datum, Aug. 20, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	14.7	16.7	16.3	--	16.6	13.4	14.4	14.9	21.7	--	23.3	17.2
10	18.2	18.8	16.2	--	16.6	13.6	13.2	19.8	22.5	18.3	23.8	--
15	18.3	15.2	17.1	15.7	15.4	13.7	14.8	13.3	21.7	23.7	19.9	--
20	16.4	18.5	16.0	16.3	15.2	12.6	14.9	--	18.5	23.3	24.8	--
25	15.2	16.9	14.0	13.6	14.7	14.2	12.7	21.5	22.4	--	23.4	--
EOM	--	--	--	13.7	12.4	14.2	14.8	16.7	--	--	22.3	--

WTR YEAR 1976 MAX 9.2 MAR 7, 1976 MIN 24.8 AUG 20, 1976

CALHOUN COUNTY

422422085071501. Local number, 1S 7W 10BBAB.
LOCATION.--Lat 42°24'22", long 085°07'15", Hydrologic Unit 04050003, at highways M-78 and M-66, 5 mi (8 km) north of Battle Creek.
Owner: Rilla Sabin.
AQUIFER.--Glacial deposits of Pleistocene Age.
WELL CHARACTERISTICS.--Dug water-table well, diameter 15 in (38 cm), depth 12 ft (4 m), open tile bottom.
DATUM.--Land-surface datum is 907.99 ft (276.76 m) above mean sea level. Measuring point: Top of casing, 1.50 ft (0.46 m) above land-surface datum.
REMARKS.--Measured by observer.
PERIOD OF RECORD.--September 1946 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.89 ft (0.27 m) below land-surface datum, Mar. 28, 1950; lowest, dry, July 29, 1964.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	3.80	DEC 3	4.34	FEB 11	3.74	APR 21	2.74	JUN 23	3.19	AUG 25	4.02
8	3.86	10	4.10	18	3.50	28	2.69	30	3.24	SEP 1	3.98
15	4.00	17	4.10	25	2.95	MAY 5	2.70	JUL 7	3.26	8	4.02
22	4.10	24	3.59	MAR 3	3.00	12	2.87	14	3.32	15	4.20
29	4.18	JAN 7	3.62	10	2.96	19	2.90	21	3.50	22	4.22
NOV 5	4.10	15	3.66	17	2.56	26	2.98	28	3.70	29	4.32
12	4.18	22	3.74	25	2.62	JUN 2	3.00	AUG 4	3.74		
19	4.30	28	3.83	APR 7	2.70	9	2.98	11	3.86		
26	4.34	FEB 6	3.81	14	2.78	16	3.10	18	3.94		

CITY OF BATTLE CREEK

422025085084001. Local number, 1S 7W 32DABA.
LOCATION.--Lat 42°20'25", long 085°08'40", Hydrologic Unit 04050003, at Verona well field, Battle Creek.
Owner: City of Battle Creek.
AQUIFER: Marshall Formation of Mississippian Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 8 in (20 cm), depth 127 ft (39 m), cased to 103 ft (31 m).
DATUM.--Land-surface datum is 830.79 ft (253.22 m) above mean sea level. Measuring point: Recorder base, 2.10 ft (0.64 m) above land-surface datum.
REMARKS.--Water levels affected by nearby municipal pumping. Measurements made daily by Water Department.
PERIOD OF RECORD.--October 1939 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 0.7 ft (0.2 m) below land-surface datum, Apr. 26-27, 1950; lowest, 16.75 ft (5.11 m) below land-surface datum, July 16, 1959.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.75	4.90	5.40	4.45	4.60	4.20	3.20	4.20	3.70	4.85	6.75	6.40
10	4.90	4.95	4.35	4.45	4.60	3.45	4.50	4.20	4.85	5.80	6.90	6.75
15	5.60	4.55	5.30	4.75	4.60	3.35	4.10	4.70	6.20	7.30	5.80	7.10
20	5.95	5.40	4.50	4.80	4.90	3.30	4.55	4.20	4.70	6.50	7.40	6.20
25	5.00	5.10	4.30	4.55	4.75	3.95	4.20	3.90	4.95	5.40	7.55	5.65
EOM	5.65	4.75	4.30	4.40	3.90	3.15	4.55	3.50	4.80	6.50	7.50	5.65

WTR YEAR 1976 MAX 3.10 APR 2, 1976 MIN 7.55 AUG 25, 1976

CASS COUNTY

414651085575601. Local number, 8S 14W 17BAAA.
LOCATION.--Lat 41°46'51", long 085°57'56", Hydrologic Unit 04050001, 2 mi (3 km) east of Adamsville on U.S. Highway 112.
Owner: Ted Little.
AQUIFER.--Glacial deposits of Pleistocene Age.
WELL CHARACTERISTICS.--Dug water-table well, diameter 28 in (71 cm), depth 55 ft (17 m), cribbed with brick to open bottom.
DATUM.--Altitude of land-surface datum is 840 ft (256 m). Measuring point: Top of wooden platform, 1.00 ft (0.30 m) above land-surface datum.
REMARKS.--Measured by observer.
PERIOD OF RECORD.--September 1945 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 46.20 ft (14.08 m) below land-surface datum, July 16, 1950; lowest, dry, Mar. 10, 1947.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	51.00	DEC 22	51.20	FEB 19	50.80	APR 25	50.35	JUN 24	49.35	AUG 25	49.05
NOV 25	51.00	JAN 22	51.10	MAR 23	50.60	MAY 24	49.70	JUL 27	48.80	SEP 22	49.40

CHIPPEWA COUNTY

462159084442201. Local number, 46N 4W 24DADA.
LOCATION.--Lat 46°21'59", long 084°44'22", Hydrologic Unit 04020203, on trail 0.2 mi (0.3 km) south of highway M-28 and 1 mi (2 km) west of Raco.
Owner: U.S. Forest Service.
AQUIFER.--Glacial deposits of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 6 in (15 cm), depth 54 ft (16 m).
DATUM.--Altitude of land-surface datum is 850 ft (259 m). Measuring point: Top of shelter base, 3.07 ft (0.94 m) above land-surface datum.
PERIOD OF RECORD.--June 1952 to April 1965. November 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 18.40 ft (5.61 m) below land-surface datum, June 7, 1971; lowest, 28.43 ft (8.67 m) below land-surface datum, Apr. 14, 1964.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	22.25	22.77	23.11	22.87	--	23.58	23.36	20.35	20.35	20.91	21.60	22.31
10	22.32	22.87	23.09	22.90	23.34	23.69	23.02	20.29	20.38	21.03	21.67	22.41
15	22.40	22.92	23.12	22.95	23.33	23.74	22.53	20.24	20.49	21.17	21.82	22.54
20	22.45	22.98	23.07	23.00	23.40	23.80	21.77	20.23	20.65	21.25	21.92	22.62
25	22.54	23.06	22.95	23.10	23.46	23.87	21.09	20.23	20.76	21.34	22.02	22.74
EOM	22.65	23.03	22.84	23.14	23.53	23.69	20.63	20.24	20.83	21.49	22.16	22.84

WTR YEAR 1976 MAX 22.21 MAY 17, 1976 MIN 23.89 MAR 28, 1976

CLINTON COUNTY

425410084323501. Local number, 6N 2W 16DDAD.
LOCATION.--Lat 42°54'10", long 084°32'35", Hydrologic Unit 04050005, at U.S. Highway 27, 6 mi (10 km) south of St. Johns.
Owner: State Highway Department.
AQUIFER.--Gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Driven observation water-table well, diameter 2 in (51 cm), depth 26 ft (8 m), screened 23 to 26 ft (7 to 8 m).
DATUM.--Land-surface datum is 803.32 ft (244.85 m) above mean sea level. Measuring point: Top of casing, 1.30 ft (0.40 m) above land-surface datum.
REMARKS.--Federal key well.
PERIOD OF RECORD.--August 1948 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.84 ft (4.22 m) above land-surface datum, Apr. 30, 1974; lowest measured, 19.93 ft (6.07 m) below land-surface datum, Feb. 27, 1964.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24	16.15	NOV 24	16.43	JAN 26	15.90	APR 23	14.35	MAY 26	14.06	JUL 27	16.12
29	15.50	DEC 22	15.42	FEB 20	15.43	28	14.10	JUN 25	15.54	AUG 24	16.82
31	16.34	JAN 7	15.75	MAR 22	14.20	MAY 25	14.26	JUL 7	15.78	SEP 22	17.13

CRAWFORD COUNTY

443308084245001. Local number, 25N 1W 15DDCD.
LOCATION.--Lat 44°33'08", long 084°24'50", Hydrologic Unit 04070007, 2.6 mi (4.2 km) south of Eldorado on highway M-18.
Owner: U.S. Forest Service.
AQUIFER.--Glacial deposits of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 6 in (15 cm), depth 56 ft (17 m), cased.
DATUM.--Altitude of land-surface datum is 1,190 ft (363 m). Measuring point: Top of shelter base, 2.95 ft (0.90 m) above land-surface datum.
PERIOD OF RECORD.--November 1948 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 25.71 ft (7.84 m) below land-surface datum, May 10, 1976; lowest, 35.97 ft (10.96 m) below land-surface datum, Apr. 4-6, 1951.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	27.34	27.31	27.60	27.90	28.15	28.33	--	25.77	26.01	26.29	26.60	26.97
10	27.25	27.33	27.63	27.94	28.12	28.36	--	25.74	25.99	26.31	26.66	26.99
15	27.20	27.41	27.69	27.97	28.20	28.41	--	25.76	26.05	26.37	26.71	27.08
20	27.20	27.45	27.79	--	28.25	28.40	26.25	25.76	26.15	26.45	26.77	27.11
25	27.22	27.51	27.78	28.03	28.25	28.43	25.99	--	26.21	26.50	26.82	27.20
EOM	27.29	27.49	27.85	28.06	28.29	28.26	25.87	25.89	26.21	26.56	26.88	27.25

WTR YEAR 1976 MAX 25.71 MAY 10, 1976 MIN 28.49 MAR 22, 1976

GENESEE COUNTY

425552083382801. Local number, 6N 7E 9DCCC.
LOCATION.--Lat 42°55'52", long 083°38'28", Hydrologic Unit 04080204, at Fisher Body Plant, Grand Blanc.
Owner: General Motors Corporation.
AQUIFER.--Saginaw Formation of Pennsylvanian Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 10 in (25 cm), depth 385 ft (117 m), cased to 150 ft (46 m).
DATUM.--Land-surface datum is 837.0 ft (255.1 m) above mean sea level. Measuring point: Base for recorder, 1.50 ft (0.46 m) above land-surface datum.
REMARKS.--Water levels affected by nearby pumping. Measurements made by Plant Water Department.
PERIOD OF RECORD.--January 1974 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 52.3 ft (15.9 m) below land-surface datum, Dec. 29, 1975; lowest, 84.5 ft (25.7 m) below land-surface datum, Aug. 26, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	56.9	62.0	64.6	55.1	62.8	58.2	68.5	67.4	64.9	62.0	77.5	72.5
10	62.8	60.4	61.7	--	66.7	65.2	61.8	63.0	81.0	63.8	72.0	79.0
15	62.4	57.2	60.4	61.8	63.4	66.0	70.8	59.3	75.8	64.9	67.8	75.4
20	55.5	62.3	57.4	62.8	62.8	57.8	68.8	69.8	80.5	75.9	70.6	73.1
25	58.5	63.5	55.5	58.8	69.8	68.2	57.9	69.2	70.5	77.5	84.0	71.8
EOM	62.7	57.7	53.5	61.9	56.5	69.4	59.3	60.1	74.6	66.0	81.2	65.6

WTR YEAR 1976 MAX 52.3 DEC 29, 1975 MIN 84.5 AUG 26, 1976

GOGEBIC COUNTY

463029090133401. Local number, 48N 47W 31DCDC.
LOCATION.--Lat 46°30'29", long 090°13'34", Hydrologic Unit 04010302, 1.3 mi (2.1 km) west of Junet on West Junet Road.
Owner: City of Ironwood.
AQUIFER.--Sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 1¼ in (3.2 cm), depth 115 ft (35 m), screened 112 to 115 ft (34 to 35 m).
DATUM.--Altitude of land-surface datum is 1,170 ft (357 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
REMARKS.--Water levels affected by nearby pumping.
PERIOD OF RECORD.--August 1963 to July 1976.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 12.6 ft (3.8 m) below land-surface datum, June 2, 1966; lowest, 44.4 ft (13.5 m) below land-surface datum, Feb. 10, 1974.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	18.4	DEC 17	16.9	MAR 16	18.2	MAY 15	15.5	JUL 22	17.9
30	18.2	FEB 17	18.7	APR 15	13.1	JUN 5	16.5	Meas. Disc.	

INGHAM COUNTY

424502084331301. Local number, 4N 2W 9BDAD.
LOCATION.--Lat 42°45'02", long 084°33'13", Hydrologic Unit 04050004, at North Grand River Avenue and Josephine Streets, Lansing.
Owner: City of Lansing.
AQUIFER.--Saginaw Formation of Pennsylvanian Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 14 in (36 cm), depth 395 ft (120 m), cased to 49 ft (15 m).
DATUM.--Land-surface datum is 828.81 ft (252.62 m) above mean sea level. Measuring point: Plywood shelter base, 9.4 ft (2.9 m) below land-surface datum.
REMARKS.--Water levels affected by regional pumping.
PERIOD OF RECORD.--December 1929 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 15.63 ft (4.76 m) below land-surface datum, Mar. 26, 1931; lowest, 179.4 ft (54.7 m) below land-surface datum, Apr. 29, 1968.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	106.5	102.2	--	96.1	94.1	94.5	95.7	94.4	93.5	96.4	93.7	93.6
10	105.4	100.6	--	95.8	93.1	95.1	95.8	94.2	95.9	95.8	93.3	94.7
15	104.4	100.6	--	95.1	93.5	95.6	95.3	93.9	98.0	96.9	93.0	94.9
20	103.7	100.0	96.6	95.0	93.3	95.2	95.5	93.6	97.8	97.4	94.2	93.0
25	103.3	--	96.4	94.5	93.1	95.7	95.0	93.4	97.1	95.1	95.5	92.0
EOM	103.0	--	95.9	93.7	92.7	95.4	95.2	92.8	96.3	93.8	95.3	90.0

WTR YEAR 1976 MAX 90.0 SEP 30, 1976 MIN 106.9 OCT 1, 1975

IRON COUNTY

460455088412901. Local number, 43N 35W 33BDAD.
LOCATION.--Lat 46°04'55", long 088°41'29", Hydrologic Unit 04030106, 1.3 mi (2.1 km) south of junction U.S. 2 on highway M-73.
Owner: State Highway Department.
AQUIFER.--Sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Driven water-table well, diameter 1¼ in (3.2 cm), depth 12 ft (4 m), screened 9 to 12 ft (3 to 4 m).
DATUM.--Altitude of land-surface datum is 1,520 ft (463 m). Measuring point: Top of casing, 2.05 ft (0.62 m) above land-surface datum.
REMARKS.--Measured by Wisconsin-Michigan Power Company.
PERIOD OF RECORD.--September 1948 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.66 ft (0.51 m) below land-surface datum, June 1, 1973; lowest measured, 8.44 ft (2.57 m) below land-surface datum, Mar. 15, 1949.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	5.00	JAN 2	5.05	MAR 2	5.53	MAY 3	2.89	JUL 1	3.48	SEP 1	4.77
NOV 3	5.23	FEB 2	5.42	APR 1	4.62	28	2.88	AUG 3	4.19	30	5.29
DEC 2	5.03										

KALAMAZOO COUNTY

421641085350601. Local number, 2S 11W 22CDBB.
LOCATION.--Lat 42°16'41", long 085°35'06", Hydrologic Unit 04050003, at southwest corner Crosstown Parkway and Stockbridge Avenue, Kalamazoo.
Owner: City of Kalamazoo.
AQUIFER.--Glacial deposits of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled water-table well, diameter 4 in (10 cm), depth 137 ft (42 m), screened 134 to 137 ft (41 to 42 m).
DATUM.--Land-surface datum is 764.7 ft (233.1 m) above mean sea level. Measuring point: Top of casing, 2.00 ft (0.61 m) above land surface datum,
REMARKS.--Water levels affected by nearby pumping.
PERIOD OF RECORD.--August 1960 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.81 ft (1.47 m) below land-surface datum, Feb. 5, 1975; lowest, 31.08 ft (9.47 m) below land-surface datum, Aug. 19, 1961.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	8.95	8.65	8.40	--	--	--	6.85	7.70	8.22	--	11.52	--
10	9.36	8.91	8.15	--	8.80	--	7.61	7.60	10.80	--	11.85	--
15	9.62	8.19	7.91	--	--	--	8.01	8.07	11.14	--	11.72	--
20	9.15	8.32	7.99	--	--	7.36	8.14	8.30	--	--	12.60	--
25	--	8.10	8.07	--	--	7.53	7.85	8.14	--	--	13.33	--
EOM	8.95	6.75	7.72	--	--	7.50	8.31	7.85	--	11.70	12.64	11.28

WTR YEAR 1976 MAX 5.20 MAR 1976 MIN 13.80 AUG 26, 1976

KALAMAZOO COUNTY

421325085404801. Local number, 3S 12W 11BDAD.
LOCATION.--Lat 42°13'25", long 085°40'48", Hydrologic Unit 04050003, at Kalamazoo Community College.
Owner: City of Kalamazoo.
AQUIFER.--Glacial deposits of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 3 in (7.6 cm), depth 248 ft (76 m).
DATUM.--Altitude of land-surface is 880 ft (268 m). Measuring point: Top of shelter base, 4.0 ft (1.2 m) above land-surface datum.
PERIOD OF RECORD.--March 1961 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, +2.98 ft (+0.91 m) above land-surface datum, Sept. 4, 1969; lowest, 0.31 ft (0.09 m) below land-surface datum, Jan. 21, 1965.

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	+2.60	+2.32	+2.41	+1.59	+1.25	+1.23	--	--	--	+1.67	+1.57	+1.08
10	2.59	2.30	2.02	1.51	1.34	1.25	--	--	--	1.72	1.55	1.34
15	2.05	2.35	1.80	1.46	1.29	1.25	--	--	--	1.49	1.52	1.53
20	1.95	2.25	1.64	1.45	1.31	--	--	--	--	1.42	1.51	1.51
25	2.26	2.31	1.66	1.41	1.22	--	--	--	--	1.52	1.21	1.49
EOM	2.34	2.32	1.54	1.36	1.21	--	--	--	--	1.58	1.31	1.46

WTR YEAR 1976 MAX +2.61 JAN 5, 1976 MIN +1.06 SEP 8, 1976

KENT COUNTY

425305085432001. Local number, 6N 12W 27BBBA.
LOCATION.--Lat 42°53'05", long 085°43'20", Hydrologic Unit 04050006, at 44th Street and Byron Avenue, Wyoming.
Owner: City of Wyoming.
AQUIFER.--Marshall Formation of Mississippian Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 14 in (36 cm), depth 265 ft (81 m), cased to 207 ft (63 m).
DATUM.--Land-surface datum is 707.24 ft (215.57 m) above mean sea level. Measuring point: Top of shelter base, 1.50 ft (0.46 m) above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--October 1962 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 46.38 ft (14.14 m) below land-surface datum, May 21, 1974; lowest, 56.05 ft (17.08 m) below land-surface datum, Aug. 8, 1964.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	47.17	--	47.23	--	--	46.52	46.32	46.10	46.08	--	46.95	47.55
10	47.18	--	47.14	--	--	46.28	46.40	45.91	46.15	46.39	46.90	47.38
15	47.22	47.41	47.02	--	--	46.25	46.36	46.00	46.22	46.60	47.07	47.40
20	47.21	47.24	47.10	--		46.23	46.20	45.95	46.35	46.62	47.25	47.27
25	47.35	47.30	46.80	--	--	46.26	46.27	45.90	46.40	46.85	47.35	47.37
EOM	47.34	47.13	--	--	47.79	46.25	46.20	45.87	46.28	46.96	47.25	--

WTR YEAR 1976 MAX 45.75 APR 10, 1976 MIN 47.55 SEP 4, 1976

KENT COUNTY

425030085434901. Local number, 5N 12W 4DCCD.
LOCATION.--Lat 42°50'30", long 085°43'49", Hydrologic Unit 04050006, 2.1 mi (3.4 km) north of Byron Center and 0.4 mi (0.6 km) west of Byron Center Road.
Owner: City of Wyoming.
AQUIFER.--Sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 6 in (15 cm), depth 86 ft (26 m).
DATUM.--Land-surface datum is 685.97 ft (209.08 m) above mean sea level. Measuring point: Top of shelter base, 2.50 ft (0.76 m) above land-surface datum.
PERIOD OF RECORD.--October 1962 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 8.28 ft (2.52 m) below land-surface datum, Apr. 14, 1974; lowest, 12.91 ft (3.93 m) below land-surface datum, Aug. 19, 1964.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	10.23	--	9.97	9.46	9.84	8.50	8.85	8.84	9.16	9.71	10.35	10.77
10	10.29	--	9.90	9.52	9.79	8.32	8.96	8.42	9.29	9.83	10.44	10.82
15	10.34	--	9.44	9.57	9.47	8.48	9.05	8.58	9.46	10.03	10.56	10.85
20	10.34	--	9.15	9.63	9.16	8.59	9.04	8.74	9.58	10.18	10.64	10.82
25	10.36	10.24	9.20	9.69	8.91	8.68	8.96	8.89	9.62	10.23	10.72	10.81
EOM	10.35	10.07	9.37	9.76	8.98	8.74	8.81	8.94	9.70	10.27	10.71	10.82

WTR YEAR 1976 MAX 8.14 MAR 12, 1976 MIN 10.86 SEP 8, 1976

LAKE COUNTY

435348085514401. Local number, 17N 13W 4ADAA.
LOCATION.--Lat 43°53'48", long 085°51'44", Hydrologic Unit 04060101, at Aster Road and 8th Street, Baldwin.
Owner: Chesapeake and Ohio Railroad.
AQUIFER.--Glacial deposits of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 8 in (20 cm), depth 83 ft (25 m).
DATUM.--Altitude of land-surface datum is 840 ft (256 m). Measuring point: Top of casing, 11.5 ft (3.5 m) below land-surface datum.
PERIOD OF RECORD.--July 1957 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.16 ft (4.62 m) below land-surface datum, July 15, 1969; lowest measured, 20.36 ft (6.21 m) below land-surface datum, May 23, 1958.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	16.29	DEC 4	16.94	APR 23	14.83	JUL 9	15.29

MACKINAC COUNTY

460321084354801. Local number 42N 2W 7AABB.
LOCATION.--Lat 46°03'21", long 084°35'48", Hydrologic Unit 04070002, 2 mi (3 km) north of Pontchartrain Shores at Pontchartrain and St. Ignace Roads.
Owner: U.S. Forest Service.
AQUIFER.--Manistique Dolomite of Silurian Age.
WELL CHARACTERISTICS.--Drilled water-table well, diameter 6 in (15 cm), depth 102 ft (31 m).
DATUM.--Altitude of land-surface datum is 650 ft (198 m). Measuring point: Top of shelter floor, 2.3 ft (0.7 m) above land-surface datum.
PERIOD OF RECORD.--June 1956 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 13.1 ft (4.0 m) below land-surface datum, May 11, 1960; lowest, 32.2 ft (9.8 m) below land-surface datum, Nov. 22, 1963.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	26.4	27.3	24.1	24.8	26.5	26.7	16.2	20.0	23.2	25.5	27.2	28.7
10	26.6	26.9	24.2	25.1	26.5	26.7	15.5	20.6	23.6	25.8	27.5	28.8
15	26.7	25.6	23.9	25.4	26.7	26.8	16.8	21.2	24.0	26.1	27.7	29.1
20	26.9	25.8	23.4	25.6	26.9	26.6	17.7	21.3	24.6	26.3	28.0	29.2
25	27.0	25.6	23.9	25.9	26.9	24.2	17.9	21.8	24.9	26.6	28.2	29.5
EOM	27.3	25.6	24.4	26.1	26.8	19.2	19.0	22.5	25.2	26.9	28.5	29.6

WTR YEAR 1976 MAX 15.1 APR 8, 1976 MIN 29.6 SEP 28, 1976

MARQUETTE COUNTY

462938087475901. Local number, 47N 28W 3CCDC.
LOCATION.--Lat 46°29'38", long 087°47'59", Hydrologic Unit 04020105, 4.8 mi (7.7 km) west of Ishpeming on U.S. Highway 41 and M-28.
Owner: Ely Township.
AQUIFER.--Sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 8 in (20 cm), depth 72 ft (22 m), screened 68 to 72 ft (19 to 22 m).
DATUM.--Land-surface datum is 1,571.99 ft (479.14 m) above mean sea level. Measuring point: Top of recorder base, 3.0 ft (0.9 m) above land-surface datum.
REMARKS.--Federal key well.
PERIOD OF RECORD.--August 1961 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 9.74 ft (2.97 m) below land-surface datum, May 13, 1974; lowest, 19.26 ft (5.87 m) below land-surface datum, Apr. 10-11, 1964.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	14.49	14.94	13.68	14.07	14.76	15.25	13.93	11.71	12.15	12.92	13.88	14.86
10	14.60	14.98	13.80	14.17	14.83	15.34	13.11	11.78	12.18	13.01	14.03	15.00
15	14.73	14.77	13.75	14.28	14.94	15.41	12.73	11.89	12.28	13.16	14.21	15.18
20	14.81	14.51	13.80	14.42	15.02	15.37	12.08	11.81	12.46	13.31	14.33	15.30
25	14.88	14.16	13.83	14.52	15.13	15.06	11.83	11.92	12.59	13.50	14.50	15.44
EOM	14.86	14.05	13.97	14.60	15.21	14.60	11.66	12.01	12.75	13.71	14.70	15.57

WTR YEAR 1976 MAX 11.62 MAY 1, 1976 MIN 15.57 SEP 30, 1976

PRESQUE ISLE COUNTY

451307084134901. Local number, 33N 2E 30DACB.
LOCATION.--Lat 45°13'07", long 084°13'49", Hydrologic Unit 04070005, 10 mi (16 km) south of Onaway and 1 mi (2 km) west of highway M-33 on Canada Creek Highway.
Owner: State Department of Natural Resources.
AQUIFER.--Sand of Pleistocene Age.
WELL CHARACTERISTICS.--Driven water-table well, diameter 2 in (5.1 cm), depth 14 ft (4 m), open bottom.
DATUM.--Altitude of land-surface datum is 800 ft (243 m). Measuring point: Top of casing, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--December 1934 to October 1944, October 1948 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.61 ft (0.19 m) below land-surface datum, July 12, 1960; lowest measured, 5.69 ft (1.73 m) below land-surface datum, Jan. 27, 1956.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	2.92	DEC 10	3.20	APR 7	2.02

ROSCOMMON COUNTY

442722084350701. Local number, 24N 2W 20BABA.
LOCATION.--Lat 44°27'22", long 084°35'07", Hydrologic Unit 04070007, 2 mi (3 km) south of Roscommon and 0.5 mi (0.8 km) east of highway M-18 on highway M-103.
Owner: State Department of Natural Resources.
AQUIFER.--Sand of Pleistocene Age.
WELL CHARACTERISTICS.--Jetted water-table well, diameter 8 in (20 cm), depth 14 ft (4 m), open bottom.
DATUM.--Land-surface datum is 1,145.30 ft (349.09 m) above mean sea level. Measuring point: Top of casing, 2.50 ft (0.76 m) above land-surface datum.
REMARKS.--Federal key well.
PERIOD OF RECORD.--December 1934 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.30 ft (0.70 m) below land-surface datum, Apr. 23, 1971; lowest, 6.23 ft (1.90 m) below land-surface datum, Dec. 6-11, 1949.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.47	3.89	3.91	4.15	4.36	4.23	2.11	2.79	3.29	3.81	4.49	5.01
10	3.54	3.92	3.94	4.17	4.39	3.86	2.20	2.85	3.39	3.88	4.60	5.05
15	3.62	3.96	3.97	4.20	4.41	3.87	2.37	2.89	3.51	3.99	4.67	5.10
20	3.68	4.02	3.99	4.24	4.35	3.83	2.52	3.01	3.61	4.11	4.78	5.15
25	3.76	4.08	4.03	4.27	4.35	3.48	2.62	3.10	3.75	4.27	4.88	5.18
EOM	3.82	4.06	4.11	4.31	4.26	2.34	2.71	3.19	3.77	4.38	4.97	5.21

WTR YEAR 1976 MAX 2.09 MAY 5, 1976 MIN 5.21 SEP 30, 1976

SANILAC COUNTY

432508082554501. Local number 12N 13E 33DDDD.
LOCATION.--Lat 43°25'08", long 082°55'45", Hydrologic Unit 04080205, at highways M-46 and M-19, Elmer.
Owner: State Highway Department.
AQUIFER.--Lower part of the Marshall Formation of Mississippian Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 3 in (7.6 cm), depth 150 ft (46 m), cased to 53 ft (16 m).
DATUM.--Altitude of land-surface datum is 800 ft (243 m). Measuring point: Top of casing, 1.00 ft (3.05 m) above land-surface datum.
REMARKS.--Measured by observer.
PERIOD OF RECORD.--December 1948 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.45 ft (4.71 m) below land-surface datum, Apr. 25, 1951; lowest measured, 25.64 ft (7.82 m) below land-surface datum, Jan. 6, 1965.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	21.50	NOV 26	22.34	JAN 30	20.00	MAR 31	16.83	JUN 3	17.68	AUG 11	20.20
9	21.49	DEC 4	22.10	FEB 4	20.10	APR 7	16.79	9	18.10	20	20.08
15	21.68	12	21.86	11	20.10	14	17.25	23	18.67	25	20.23
22	21.96	18	21.60	18	19.97	22	17.46	29	18.76	SEP 2	20.64
31	22.08	24	21.30	25	20.00	28	17.49	JUL 7	18.70	8	20.98
NOV 5	22.17	31	20.90	MAR 11	19.00	MAY 7	16.80	15	18.76	15	21.00
14	22.20	JAN 9	20.25	17	18.00	19	16.63	22	19.17	23	21.27
20	22.28	21	20.00	25	17.00	28	17.43	AUG 6	20.00	29	21.39

SCHOOLCRAFT COUNTY

461720085565201. Local number, 45N 13W 16CCCB.
LOCATION.--Lat 46°17'20", long 085°56'52", Hydrologic Unit 04060106, at headquarters building Seney Wildlife refuge.
Owner: U.S. Fish and Wildlife Service.
AQUIFER.--Limestones of Upper Ordovician Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 4 in (10 cm), depth 151 ft (46 m), cased to 65 ft (20 m).
DATUM.--Altitude of land-surface datum is 710 ft (216 m). Measuring point: Top of casing, 3.60 ft (1.10 m) below land-surface datum.
PERIOD OF RECORD.--June 1952 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.64 ft (1.41 m) below land-surface datum, Apr. 13, 1971; lowest, 6.50 ft (1.98 m) below land-surface datum, Oct. 23, 1963.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	5.69	5.71	5.41	5.33	5.20	5.01	4.91	5.37	5.51	5.73	5.89	6.25
10	5.68	5.63	5.39	5.31	5.11	5.07	5.22	5.40	5.50	5.76	5.94	6.37
15	5.65	5.54	5.28	5.28	5.16	5.04	5.32	5.43	5.55	5.78	5.98	6.40
20	5.68	5.57	5.37	5.23	5.09	4.98	5.33	5.35	5.57	5.71	6.01	6.40
25	5.67	5.58	5.26	5.23	5.10	5.01	5.33	5.42	5.62	5.75	6.08	6.45
EOM	5.71	5.51	5.32	5.19	5.08	4.93	5.37	5.41	5.68	5.81	6.14	6.44

WTR YEAR 1976 MAX 4.89 APR 5, 1976 MIN 6.46 SEP 24, 1976

WASHTENAW COUNTY

421228083331601. Local number, 3S 7E 24CACA.
LOCATION.--Lat 42°12'28", long 083°33'16", Hydrologic Unit 04090005, at Ypsilanti Township water works on Bridge Street.
Owner: Ypsilanti Township.
AQUIFER: Sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled water-table well, diameter 4 in (10 cm), depth 80 ft (24 m), screened 77 to 80 ft (23 to 24 m).
DATUM.--Land-surface datum is 665.56 ft (202.86 m) above mean sea level. Measuring point: Top of coupling, 3.00 ft (0.91 m) above land-surface datum.
REMARKS.--Water level affected by nearby pumping.
PERIOD OF RECORD.--July 1943 to June 1945, December 1949 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.79 ft (1.76 m) below land-surface datum, Jan. 5, 1950; lowest, 22.66 ft (6.91 m) below land-surface datum, Feb. 13, 1971.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
LOW VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	14.36	14.00	14.37	14.49	15.43	13.51	14.59	13.35	13.22	16.78	17.60	16.70
10	14.26	13.93	14.29	14.70	15.30	13.42	14.66	12.98	13.60	16.82	17.64	16.54
15	14.17	13.81	14.30	14.75	15.30	13.89	14.60	12.88	15.48	17.20	17.42	16.36
20	14.12	14.28	14.39	14.87	--	14.19	14.53	12.85	16.25	17.60	17.17	15.71
25	--	14.57	14.38	15.08	13.91	14.48	14.02	13.10	16.80	17.76	17.12	14.82
EOM	--	14.43	14.28	15.18	14.24	14.52	13.62	13.05	17.20	17.77	17.01	14.11

WTR YEAR 1976 MAX 12.80 MAY 17, 1976 MIN 17.80 JUL 29, 1976

WEXFORD COUNTY

441503084242201. Local number, 21N 9W 4ABBC.
LOCATION.--Lat 44°15'03", long 084°24'22", Hydrologic Unit 04060102, at Pine and Lake Streets, Cadillac.
Owner: City of Cadillac.
AQUIFER.--Glacial deposits of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 6 in (15 cm), reported depth 277 ft (84 m).
DATUM.--Land-surface datum is 1,291.10 ft (393.53 m) above mean sea level. Measuring point: Top of shelter base, 4.13 ft (1.26 m) above land-surface datum.
REMARKS--Water level affected by nearby pumping.
PERIOD OF RECORD.--March 1949 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 19.99 ft (6.09 m) below land-surface datum, July 6, 1953; lowest, 27.59 ft (8.41 m) below land-surface datum, June 30, 1964.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	20.92	DEC 11	20.44	APR 23	19.74	JUN 22	19.38	JUL 9	19.47

Temperatures of ground water are measured as part of a state-wide water resource investigation in cooperation with Michigan Department of Natural Resources. The purpose of these measurements is to determine the natural ground-water temperature of selected points throughout the State. These data, when combined with existing theory, can be used to estimate ground-water temperatures at moderate depth at any point in the State. Measurements of temperature were made by means of "lazy" thermometers (Heath 1964), which remain in the well except when being read.

TEMPERATURE (°C) OF GROUND WATER AT INDICATED DEPTH

DATE	WATER TEMPERATURE (°C)	DATE	WATER TEMPERATURE (°C)	DATE	WATER TEMPERATURE (°C)
ALGER COUNTY, 45N19W25BD (LAT 46°16'08", LONG 86°37'38") DEPTH 66 ft (20 m)					
DEC. 17, 1975	9.0	APR. 09, 1976	7.0	SEP. 10 . . .	9.0
CLINTON COUNTY, 06N02W16DDAD (LAT 42°54'10", LONG 84°32'35") DEPTH 23 ft (7 m)					
OCT. 24, 1975	11.5	FEB. 20 . . .	10.5	JULY 27 . . .	10.0
NOV. 24 . . .	11.5	APR. 23 . . .	9.5	AUG. 24 . . .	10.5
DEC. 22 . . .	11.5	MAY 25 . . .	9.0	SEP. 22 . . .	11.0
JAN. 26, 1976	11.0	JUNE 25 . . .	9.5		
DICKINSON COUNTY, 43N28W32AD (LAT 46°04'59", LONG 87°49'37") DEPTH 31 ft (9 m)					
NOV. 10, 1975	7.5	FEB. 10 . . .	7.5	MAY 14 . . .	6.5
DEC. 09 . . .	7.5	MAR. 12 . . .	7.0	JUNE 11 . . .	6.5
JAN. 07, 1976	7.5	APR. 12 . . .	6.5	SEP. 03 . . .	6.5
HILLSDALE COUNTY, 07S02W10BDDD (LAT 41°52'36", LONG 84°31'37") DEPTH 20 ft (6 m)					
OCT. 24, 1975	11.0	APR. 27 . . .	8.5	AUG. 30 . . .	9.5
NOV. 25 . . .	10.5	MAY 24 . . .	8.5	SEP. 30 . . .	10.5
DEC. 31 . . .	10.0	JULY 06 . . .	8.5		
FEB. 03, 1976	10.0	AUG. 03 . . .	8.5		
INGHAM COUNTY, 03N01E07DDCA (LAT 42°39'34", LONG 84°21'49") DEPTH 41 ft (12 m)					
OCT. 14, 1975	10.5	FEB. 20 . . .	9.5	JUNE 22 . . .	10.5
NOV. 18 . . .	10.5	MAR. 22 . . .	9.5	JULY 27 . . .	11.0
DEC. 22 . . .	9.5	APR. 20 . . .	10.0	AUG. 24 . . .	11.0
JAN. 26, 1976	10.0	MAY 14 . . .	10.0	SEP. 27 . . .	11.0
KENT COUNTY, 10N12W13DDDA (LAT 43°15'00", LONG 85°40'22") DEPTH 30 ft (9 m)					
OCT. 01, 1975	13.0	JAN. 12, 1976	6.0	JULY 07 . . .	13.0
NOV. 04 . . .	11.5	FEB. 10 . . .	5.5		
DEC. 02 . . .	8.5	APR. 12 . . .	6.5		
LENAWEE COUNTY, 05S01E12DDBD (LAT 42°02'46", LONG 84°15'06") DEPTH 39 ft (12 m)					
OCT. 22, 1975	9.5	MAR. 25 . . .	9.5	AUG. 02 . . .	9.5
NOV. 24 . . .	9.5	APR. 23 . . .	9.5	SEP. 07 . . .	9.5
DEC. 23 . . .	9.5	MAY 18 . . .	9.5		
FEB. 20, 1976	9.5	JULY 02 . . .	9.5		

TEMPERATURE (°C) OF GROUND WATER AT INDICATED DEPTH--Continued

MARQUETTE COUNTY, 47N29W02DA (LAT 46°29'59", LONG 87°53'13") DEPTH 19 ft (6 m)

DATE	WATER TEMPERATURE (°C)	DATE	WATER TEMPERATURE (°C)	DATE	WATER TEMPERATURE (°C)
OCT. 15, 1975	9.5	MAR. 26 . . .	5.5	JUNE 01 . . .	5.0
DEC. 16 . . .	7.5	APR. 20 . . .	5.0	JULY 06 . . .	7.0
JAN. 27, 1976	6.0	MAY 28 . . .	5.0	AUG. 17 . . .	8.5

MENOMINEE COUNTY, 37N26W19DA (LAT 45°35'00", LONG 87°33'15") DEPTH 17 ft (5 m)

DEC. 12, 1975	9.5	MAR. 04 . . .	6.0	APR. 16 . . .	5.5
JAN. 23, 1976	7.5				

MONROE COUNTY, 07S06E15AD (LAT 41°52'35", LONG 83°41'40") DEPTH 17 ft (5 m)

OCT. 22, 1975	11.5	MAR. 16 . . .	9.5	JULY 06 . . .	9.5
DEC. 02 . . .	11.5	APR. 21 . . .	9.0	AUG. 11 . . .	10.5
JAN. 08, 1976	11.5	MAY 24 . . .	9.0	SEP. 16 . . .	11.5
FEB. 10 . . .	10.5	JUNE 14 . . .	9.0		

MUSKEGON COUNTY, 11N15W34DA (LAT 43°18'06", LONG 86°04'44") DEPTH 31 ft (9 m)

OCT. 03, 1975	11.0	JAN. 14, 1976	8.0	JULY 09 . . .	9.5
NOV. 05 . . .	10.5	FEB. 11 . . .	8.0		
DEC. 03 . . .	9.0	APR. 12 . . .	7.5		

OAKLAND COUNTY, 05N08E08ACAC (LAT 42°51'16", LONG 83°32'15") DEPTH 42 ft (13 m)

OCT. 20, 1975	9.0	FEB. 19 . . .	9.0	JULY 01 . . .	8.5
NOV. 21 . . .	9.0	MAR. 24 . . .	9.0	JULY 30 . . .	9.0
DEC. 15 . . .	9.0	APR. 21 . . .	9.5	SEP. 01 . . .	9.0
JAN. 20, 1976	9.0	MAY 17 . . .	9.0		

ONTONAGON COUNTY, 46N38W30ADD (LAT 46°21'18", LONG 89°05'43") DEPTH 50 ft (15 m)

DEC. 18, 1975	7.0	APR. 21 . . .	6.0	JULY 20 . . .	6.5
MAR. 15, 1976	6.5	JUNE 08 . . .	6.0	AUG. 26 . . .	7.0

ROSCOMMON COUNTY, 24N02W20BABA (LAT 44°27'22", LONG 84°35'07") DEPTH 14 ft (4 m)

OCT. 16, 1975	9.5	FEB. 20 . . .	6.0	JUNE 29 . . .	7.5
NOV. 20 . . .	9.0	MAR. 19 . . .	5.0	JULY 19 . . .	8.5
DEC. 18 . . .	7.5	APR. 20 . . .	5.5	AUG. 17 . . .	9.0
JAN. 22, 1976	6.5	MAY 26 . . .	6.5	SEP. 20 . . .	9.5

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FACTORS FOR CONVERTING ENGLISH UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

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

Multiply English units	By	To obtain SI units
	Length	
inches (in)	2.54×10^{1}	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^{0}	kilometers (km)
	Area	
acres	4.047×10^{3}	square meters (m^2)
	4.047×10^{-1}	*hectares (ha)
	4.047×10^{-1}	square hectometers (hm^2)
	4.047×10^{-3}	square kilometers (km^2)
square miles (mi^2)	2.590×10^{0}	square kilometers (km^2)
	Volume	
gallons (gal)	3.785×10^{0}	**liters (l)
	3.785×10^{0}	cubic decimeters (dm^3)
	3.785×10^{-3}	cubic meters (m^3)
million gallons (10^6 gal)	3.785×10^{3}	cubic meters (m^3)
	3.785×10^{-3}	cubic hectometers (hm^3)
cubic feet (ft^3)	2.832×10^{1}	cubic decimeters (dm^3)
	2.832×10^{-2}	cubic meters (m^3)
cfs-days [(ft^3/s) · d]	2.447×10^{3}	cubic meters (m^3)
	2.447×10^{-3}	cubic hectometers (hm^3)
acre-feet (acre-ft)	1.233×10^{3}	cubic meters (m^3)
	1.233×10^{-3}	cubic hectometers (hm^3)
	1.233×10^{-6}	cubic kilometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	2.832×10^{1}	liters per second (l/s)
	2.832×10^{1}	cubic decimeters per second (dm^3/s)
	2.832×10^{-2}	cubic meters per second (m^3/s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (l/s)
	6.309×10^{-2}	cubic decimeters per second (dm^3/s)
	6.309×10^{-5}	cubic meters per second (m^3/s)
million gallons per day (mgal/d)	4.381×10^{1}	cubic decimeters per second (dm^3/s)
	4.381×10^{-2}	cubic meters per second (m^3/s)
	Mass	
tons (short)	9.072×10^{-1}	tonnes (t)

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

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