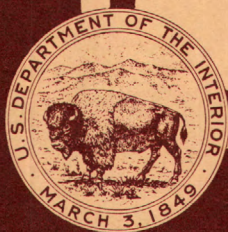


1973

Water Resources Data for Michigan

Part 1. Surface Water Records



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

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

CALENDAR FOR WATER YEAR 1973

1972

OCTOBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
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NOVEMBER

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1973

JANUARY

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JUNE

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JULY

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AUGUST

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SEPTEMBER

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23	24	25	26	27	28	29
30						

1973

**Water Resources Data
for
Michigan**

Part 1. Surface Water Records



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

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

Prepared in cooperation with

Michigan State Department of Natural Resources
Water Resources Commission
Geological Survey Division
Michigan Department of State Highways
Genesee County Drain Commission
Kalamazoo County Board of Supervisors
Macomb County Board of Supervisors
Macomb County Road Commission
Oakland County Department of Public Works
Oakland County Drain Commission
Washtenaw County Drain Commission
Washtenaw County Planning Commission
Huron-Clinton Metropolitan Authority
Township of York
Township of Ypsilanti
City of Kalamazoo
City of Saline
City of Ypsilanti
City of Milan
Village of Imlay City
Corps of Engineers, U.S. Army
Soil Conservation Service, U.S. Department of Agriculture

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

1. Water Resources Data for Michigan
Part 1: Surface Water Records
2. Water Resources Data for Michigan
Part 2: Water Quality Records

Copies of this report may be obtained from
District Chief, Water Resources Division
U.S. Geological Survey
2400 Science Parkway
Okemos, Michigan 48864

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WATER RESOURCES DATA FOR MICHIGAN, 1973

PART 1: SURFACE-WATER RECORDS

INTRODUCTION

Surface-water records for the 1973 water year for gaging stations, partial-record stations, and miscellaneous sites within the State of Michigan are given in this report. For convenience there are also included records for a few pertinent gaging stations in bordering States. The records were collected and computed by the Water Resources Division of the U.S. Geological Survey, under the direction of T.R. Cummings, district chief. These data represent that portion of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Michigan.

Records of discharge and stage of streams, and contents and stage of lakes or reservoirs are 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 since then are in a 5-year series. Since 1951 there have been 20 volumes in the series; each volume covered an area whose boundaries coincided with those of certain natural drainage areas. The records in Michigan are contained in Part 4 of that series.

Beginning with the 1961 water year, streamflow records and related data have been released by the Geological Survey in annual reports on a State-boundary basis. Distribution of these basic-data reports is limited and primarily for local needs.

COOPERATION

The systematic collection of streamflow records by the U.S. Geological Survey began in 1898 through cooperation with cities, municipalities, and private organizations. Cooperative agreements between the U.S. Geological Survey and organizations of the State of Michigan for the collection of streamflow records began in 1930. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreements with the Survey are:

Michigan State Department of Natural Resources, R. A. MacMullen, director, succeeded by A. G. Gazlay.

Water Resources Commission, R. W. Purdy, executive secretary.

Geological Survey Division, A. E. Slaughter, chief.

Michigan Department of State Highways, H. E. Stafseth, director, succeeded by J. P. Woodford.

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 Weather Bureau, ESSA, U.S. Department of Commerce; and the Soil Conservation Service, U.S. Department of Agriculture.

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; Washtenaw County Drain Commission; Washtenaw County Planning Commission; Huron-Clinton Metropolitan Authority; Townships of York and Ypsilanti, Cities or villages of Imlay City, Milan, Saline and Ypsilanti; Consumers Power Co.; Cleveland-Cliffs Iron Co.; Hanna Mining Co.; Michigan Power Co.; Michigan Sugar Co.; Upper Peninsula Power Co.; and Wisconsin-Michigan Power Co.

DEFINITION OF TERMS

Terms related to streamflow and other hydrologic data, as used in this report, are defined below. See also table for converting English units to International System of units (SI) on page 12.

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.

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.9835 acre-feet, or about 646,000 gallons, and represents a runoff of 0.0372 inch from 1 square mile.

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.

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 (ft³/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.

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

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

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

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

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 gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is obtained.

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

Runoff in inches (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.

Stage-discharge relation is the relation between gage height and the amount of water flowing in a channel, expressed as volume per unit of time.

WRD is used as an abbreviation for "Water-Resources Data" in the summary REVISIONS paragraph to previously published State annual basic-data reports.

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

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.

DOWNSTREAM ORDER AND STATION NUMBERS

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

As an added means of identification, each gaging station and partial-record station has been assigned a station number. These are in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging 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 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 04040500 which appears just to the left of the station name includes the 2-digit part number "04" plus the 6-digit downstream order number "040500". All records in this report are in Part 4 (St. Lawrence River basin) and are listed in downstream order. All records for a drainage basin encompassing more than one State could be arranged in downstream order by assembling pages from the various State reports by station number to include all records in the basin.

EXPLANATION OF DATA

Collection and Computation of Data

The base data collected at gaging stations consist of records of stage and measurements of discharge of streams, and stage, 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 direct readings on a nonrecording gage or from a water-stage recorder that gives a continuous graph of the fluctuations or a tape punched at 15-, 30-, or 60-minute intervals. Measurements of discharge are made with a current meter, using the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. 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 defined by discharge measurements. 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, or computation of flow over dams or weirs), velocity-area studies, and logarithmic plotting. The application of the daily mean gage height to those rating tables gives the daily mean discharge, from which the monthly and yearly mean discharge are computed. 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 in effect 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 determining discharge. Information required for determining 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. For such stations, the rate of change in stage is used as a factor in determining discharge.

At some 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 being given to the available information on temperature, and precipitation, notes by gage observers and hydrologists, 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, adjoining good record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise daily contents may be estimated on the basis of operator's log, adjoining good record, 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 the 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 is given. Tables of daily mean gage heights are included for some stations. Records are published for the water year, which begins on October 1 and ends on September 30. A calendar for the current water year is shown on the reverse side of the front cover to facilitate finding the day of the week for any date.

The description of the gaging station gives the location, drainage area, period of record, type and history of gages, average discharge, extremes of discharge or contents, general remarks, and notations of revisions of previously published records. 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". 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. 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. The maximum discharge (or contents) and the maximum gage height, the minimum discharge if there is little or no regulation (or the minimum contents), and the minimum gage height if it is significant are given under "EXTREMES". The minimum daily discharge is given if there is extensive regulation (also the minimum discharge and gage height if they are abnormally low). In the first paragraph headed "Current year:" the data given are for the complete current water year otherwise specified. In the second paragraph under "EXTREMES" headed "Period of record:" the data given are for the period of record given in the PERIOD OF RECORD paragraph. Reliable information concerning major floods that occurred outside the period of record is given in the third or last paragraph under "EXTREMES". Unless otherwise qualified, the maximum discharge (or contents) corresponds 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 at the same time as the maximum discharge (or contents), it is given separately. Information pertaining to the accuracy of the discharge records, to conditions that affect the natural flow at the gaging station, and availability of Water Quality records, 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 also given under "REMARKS".

Previously published 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 "REVISIONS (WATER YEARS)" 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, 1933 stands for the water year October 1, 1932, to September 30, 1933. If no daily, monthly, or annual figures of discharge were revised, that 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 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, or if the drainage area includes large noncontributing areas.

In the yearly summary below the monthly summary, the figures following "MAX" are the maximum daily discharges for the calendar and water years; likewise, those following "MIN" are the minimum daily discharges.

In a general footnote introduced by the word "NOTE" certain periods are indicated 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. Footnotes to reservoir tables may be used to explain the use of new capacity tables or for other special conditions.

Peak discharges and their times of occurrence and corresponding gage heights for many stations are listed below the yearly summary. All independent peaks above the selected base are given. The base discharge, which is given in parentheses, is selected so that an average of about three peaks a year can 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 and 1:30 p.m. is 1330.

For reservoir stations the monthly summary gives the elevation (or gage height) at the end of the month and the change in contents during the month. For reservoir stations the yearly summary gives the change in contents for the calendar year and for the water year.

Data collected at partial-record stations and at miscellaneous sites are given in three tables at the end of the surface-water records in this report. The first is a table of discharge measurements at low-flow partial-record stations, the second is a table of annual maximum stage and discharge at crest-stage stations, and the third is a table of discharge measurements at miscellaneous sites. 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 given in special tables after the list of measurements at miscellaneous sites.

Accuracy of data

The accuracy of discharge 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 discharge 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.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumptive use, regulation, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, discharge in cubic feet per second per square mile and runoff in inches are not published unless satisfactory adjustments can be made for such effects. 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 unadjusted losses (consumptive use, evaporation, seepage, etc.) are large in comparison with the observed discharge.

Publications

In each water-supply paper entitled, "Surface Water Supply of the United States" there is a list of numbers of preceding water-supply papers containing streamflow information for the area covered by that report. In addition, there is a list of numbers of water-supply papers containing detailed information on major floods in the area. Records for stations in Michigan for the period October 1960 to September 1965 are in Water-Supply Papers 1911 and 1912.

Two series of summary reports entitled, "Compilation of Records of Surface Waters of the United States" have been published; the first series covers the entire period of record through September 1950 and the second series covers the period October 1950 to September 1960. These reports contain summaries of monthly and annual discharge and monthend storage for all previously published records, as well as some records not contained in the annual series of water-supply papers. All records were reexamined and revised where warranted. Estimates of discharge were made to fill short gaps whenever practical. The yearly summary table for each gaging station lists the numbers of the water-supply papers in which daily records were published for that station. Records for stations in Michigan are compiled in Water-Supply Papers 1307 through September 1950, and in 1727 for October 1950 to September 1960.

Special reports on major floods or droughts or of other hydrologic studies for the area have been issued in publications other than water-supply papers. Information relative to these reports may be obtained from the district office.

Other Data Available

More detailed information than that published for most of the gaging stations, such as discharge measurements, gage-height records, and rating tables, is on file in the district office. Many gaging-station records in Michigan through 1967 have been analyzed to give several statistical summaries: (1) the number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year.

At or near some gaging stations, water-quality records also are collected. Data are obtained on the chemical quality of the stream water, on the water temperature, and on the sediment. These data are given in Part 2 of this report. Under the "REMARKS" paragraph of the gaging-station description, reference is made to water-quality records collected on a regular basis.

HYDROLOGIC CONDITIONS

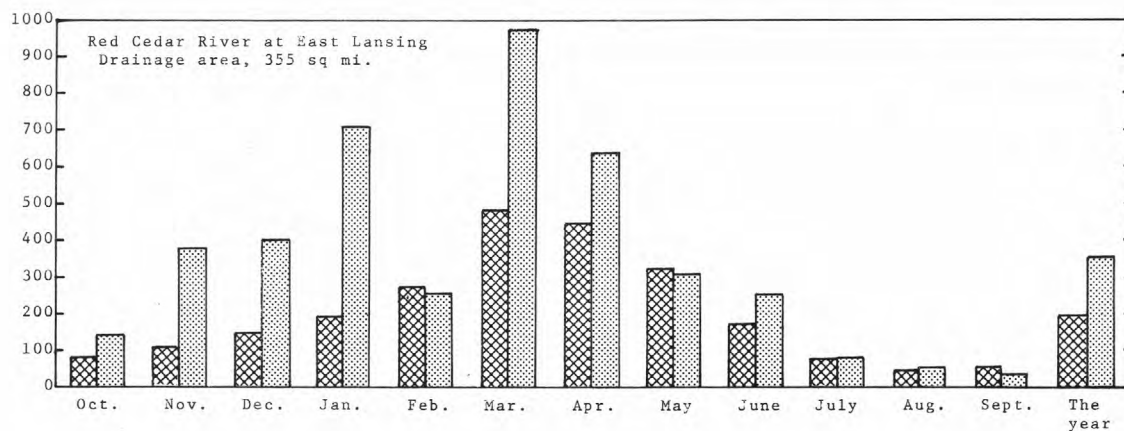
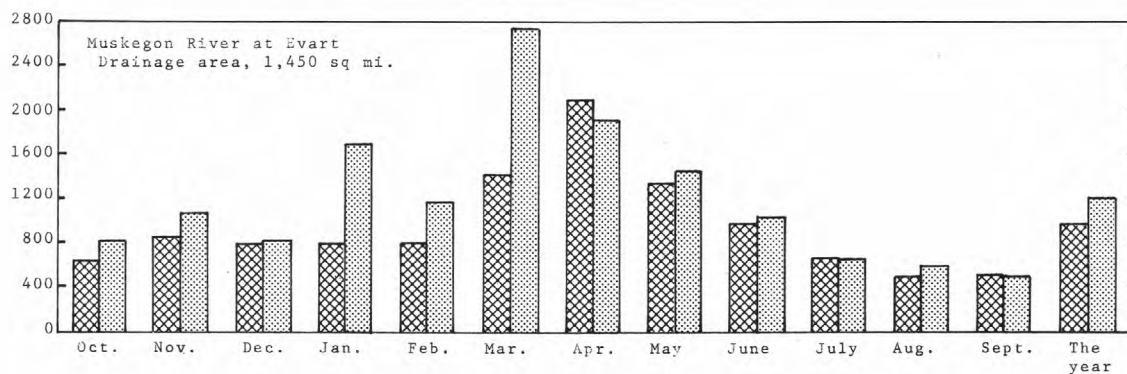
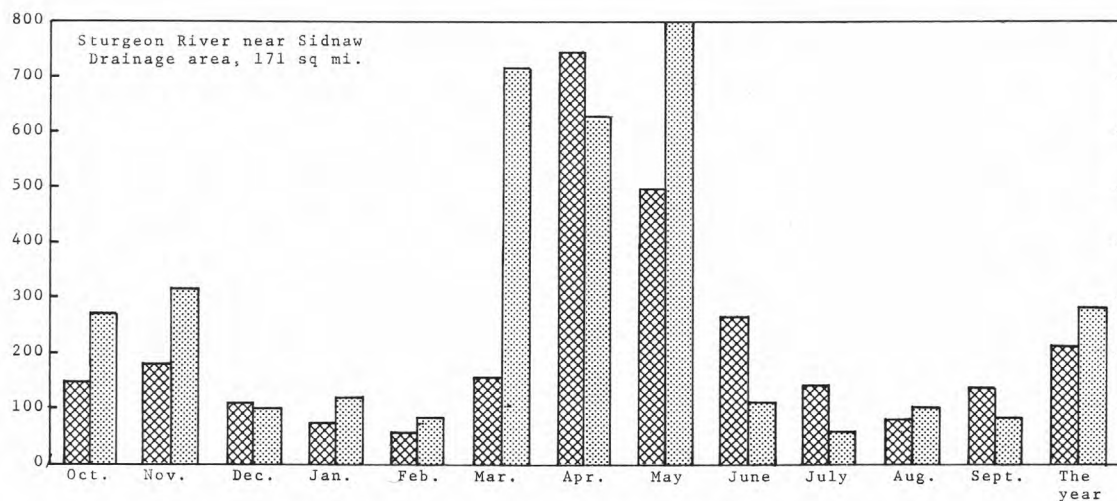
Annual runoff during the 1973 water year was well above normal in both the Upper and Lower Peninsulas.

The year was characterized by excessive runoff during five of the first six months at the three index stations. This was due primarily to above normal rainfall and unseasonable warm weather during the winter months. The last half of the year was characterized by normal runoff.

Although streamflow for the year was significantly above normal, no serious flooding occurred. The above normal streamflow continued to keep the Great Lakes at their high levels.

SELECTED REFERENCES

- Carter, R. W., and Davidian, Jacob, 1968, General procedures for gaging streams: U. S. Geol. Survey Techniques of Water-Resources Inv., book 3, chap. A6, 13 p.
- Corbett, D. M., and others, 1943, reprinted 1957, Stream-gaging procedures, a manual describing methods and practices of the Geological Survey: U.S. Geol. Survey Water-Supply Paper 888, 245 p.
- Langbein, W. B. and Iseri, K. T., 1960, General introduction and hydrologic definitions: U. S. Geol. Survey Water-Supply Paper 1541-A, 29 p.



Explanation

⊠ Monthly and yearly mean discharge for period 1931-60.

⋯ Monthly and yearly mean discharge for 1973 water year.

Figure 1.--Comparison of mean discharge at three long-term representative gaging stations during 1973 water year with mean discharge for period 1931-60.

Table 1.--Factors for converting English units to
International System (SI) units

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

Multiply English units	By	To obtain SI units
<i>Length</i>		
inches (in)	25.4	millimeters (mm)
	.0254	meters (m)
feet (ft)	.3048	meters (m)
yards (yd)	.9144	meters (m)
rods	5.0292	meters (m)
miles (mi)	1.609	kilometers (km)
<i>Area</i>		
acres	4047	square meters (m ²)
	.4047	*hectares (ha)
	.4047	square hectometer (hm ²)
	.004047	square kilometers (km ²)
square miles (mi ²)	2.590	square kilometers (km ²)
<i>Volume</i>		
gallons (gal)	3.785	**liters (l)
	3.785	cubic decimeters (dm ³)
	3.785x10 ⁻³	cubic meters (m ³)
million gallons (10 ⁶ gal)	3785	cubic meters (m ³)
	3.785x10 ⁻³	cubic hectometers (hm ³)
cubic feet (ft ³)	28.32	cubic decimeters (dm ³)
	.02832	cubic meters (m ³)
cfs-day (ft ³ /s-day)	2447	cubic meters (m ³)
	2.447x10 ⁻³	cubic hectometers (hm ³)
acre-feet (acre-ft)	1233	cubic meters (m ³)
	1.233x10 ⁻³	cubic hectometers (hm ³)
	1.233x10 ⁻⁶	cubic kilometers (km ³)
<i>Flow</i>		
cubic feet per second (ft ³ /s)	28.32	liters per second (l/s)
	28.32	cubic decimeters per second (dm ³ /s)
	.02832	cubic meters per second (m ³ /s)
gallons per minute (gpm)	.06309	liters per second (l/s)
	.06309	cubic decimeters per second (dm ³ /s)
	6.309x10 ⁻⁵	cubic meters per second (m ³ /s)
million gallons per day (mgd)	43.81	cubic decimeters per second (dm ³ /s)
	.04381	cubic meters per second (m ³ /s)
<i>Mass</i>		
ton (short)	.9072	tonne (t)

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

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



Figure 3.—Map showing identification number and location of gaging stations in Lower Peninsula of Michigan.

SURFACE-WATER RECORDS

15

STREAMS TRIBUTARY TO LAKE SUPERIOR

04001000 Washington Creek at Windigo, Mich.
(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, 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 mi² (34.2 km²).

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

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

AVERAGE DISCHARGE.--9 years, 20.8 ft³/s (0.589 m³/s), 21.40 in/yr (544 mm/yr).

EXTREMES.--Current year: Maximum discharge, 131 ft³/s (3.71 m³/s) Apr. 16 (gage height, 5.15 ft or 1.570 m); minimum daily, 1.3 ft³/s (0.037 m³/s) Sept. 20; minimum gage height, 2.76 ft (0.841 m) Aug. 4.

Period of record: Maximum discharge, 480 ft³/s (13.6 m³/s) May 1, 1972 (gage height, 6.82 ft or 2.079 m), from rating curve extended above 160 ft³/s (4.53 m³/s) based on runoff characteristics of nearby stations; minimum, 0.57 ft³/s (0.016 m³/s) Aug. 21, 1970 (gage height, 2.57 ft or 0.783 m).

REMARKS.--Records fair except those for July, August and September, which are poor. Recording rain gage at station and capacity rain gage located near mouth. Records of chemical analyses, water temperatures, and suspended sediment loads for the current year are published in Part 2 of this report. 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 the 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	2.8	3.1	2.4	2.1	1.6	49	25	19	4.4	7.0	7.5
2	4.2	3.6	2.4	2.3	2.1	1.7	44	81	20	4.0	3.5	15
3	8.8	5.6	2.2	2.2	2.2	2.0	47	65	25	3.5	2.2	13
4	7.5	4.7	2.1	2.1	2.1	2.3	49	58	32	3.3	1.5	10
5	6.2	4.9	2.0	2.1	2.1	2.0	45	59	24	3.0	4.5	8.0
6	8.0	13	1.9	2.0	2.0	2.0	37	55	16	18	3.5	6.5
7	4.5	20	1.8	2.0	2.0	5.0	33	47	14	13	2.8	5.5
8	3.0	18	1.8	1.9	1.9	7.0	29	41	17	9.3	3.3	4.5
9	3.2	14	1.7	1.9	1.8	15	25	35	19	6.2	3.7	4.0
10	4.3	13	1.6	1.9	1.7	12	23	31	15	5.2	3.2	3.2
11	2.5	11	1.5	1.9	1.7	19	21	27	13	4.2	2.9	2.7
12	3.4	9.3	1.6	1.9	1.7	64	21	24	11	5.3	2.5	2.3
13	3.0	7.6	1.6	1.8	1.6	37	21	22	8.6	5.1	2.4	2.1
14	2.8	6.1	1.5	1.9	1.6	33	28	19	7.3	4.3	2.3	1.9
15	2.5	5.3	1.6	1.8	1.6	50	74	17	7.2	3.8	2.2	2.5
16	2.5	4.9	1.5	1.8	1.5	37	117	15	6.6	3.2	2.2	2.1
17	2.3	4.7	1.4	1.9	1.5	31	79	14	7.4	2.8	6.0	1.8
18	2.2	4.3	1.4	2.2	1.5	27	62	13	8.3	3.3	3.3	1.6
19	2.1	4.1	1.4	3.1	1.5	24	75	12	8.6	4.5	4.2	1.5
20	2.1	4.0	1.5	2.5	1.5	22	100	11	7.7	3.2	5.5	1.3
21	4.3	3.7	1.5	2.3	1.5	19	110	11	6.2	2.5	5.2	1.7
22	5.3	3.3	1.5	2.6	1.5	17	86	10	5.0	2.2	4.3	3.0
23	4.2	3.2	1.5	2.6	1.5	16	55	9.5	4.0	2.4	3.5	5.0
24	3.8	3.4	1.5	2.4	1.5	15	42	9.8	3.4	3.0	2.8	6.2
25	3.5	3.7	1.5	2.2	1.5	19	35	27	3.2	4.2	2.4	7.9
26	3.5	4.8	1.5	2.2	1.5	25	30	28	4.2	3.4	2.0	12
27	3.4	4.6	1.5	2.2	1.5	29	27	26	4.0	6.0	1.7	19
28	3.2	3.8	1.5	2.1	1.5	42	23	23	4.2	12	1.5	13
29	3.0	3.3	1.4	2.1	-----	50	21	19	4.6	7.0	1.4	9.7
30	2.7	3.4	2.0	2.3	-----	49	19	19	4.8	5.5	2.5	7.5
31	2.7	-----	2.5	2.2	-----	51	-----	19	-----	11	3.5	-----
TOTAL	119.7	198.1	53.5	66.8	47.7	726.6	1,427	872.3	330.3	168.8	99.5	182.0
MEAN	3.86	6.60	1.73	2.15	1.70	23.4	47.6	28.1	11.0	5.45	3.21	6.07
MAX	8.8	20	3.1	3.1	2.2	64	117	81	32	18	7.0	19
MIN	2.1	2.8	1.4	1.8	1.5	1.6	19	9.5	3.2	2.2	1.4	1.3
CFSM	.29	.50	.13	.16	.13	1.77	3.61	2.13	.83	.41	.24	.46
IN.	.34	.56	.15	.19	.13	2.05	4.02	2.46	.93	.48	.28	.51

CAL YR 1972 TOTAL 6,365.5 MEAN 17.4 MAX 386 MIN 1.4 CFSM 1.32 IN 17.94
WTR YR 1973 TOTAL 4,292.3 MEAN 11.8 MAX 117 MIN 1.3 CFSM .89 IN 12.10

PEAK DISCHARGE (BASE, 110 FT³/S).--Apr. 16 (1000) 131 ft³/s (5.15 FT); Apr. 21 (0200) 116 FT³/s (4.98 FT).

STREAMS TRIBUTARY TO LAKE SUPERIOR

04031000 Black River near Bessemer, Mich.

LOCATION.--Lat 46°30'41", Long 90°04'28", in NE 1/4 Sec. 32, T.48 N., R.46 W., Gogebic County, 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 mi² (518 km²).

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

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

AVERAGE DISCHARGE.--19 years, 238 ft³/s (6.740 m³/s), 16.16 in/yr (410 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,000 ft³/s (56.6 m³/s) Mar. 15 (gage height, 5.68 ft or 1.731 m); minimum, 18 ft³/s (0.51 m³/s) Sept. 20 (gage height, 0.58 ft or 0.177 m).

Period of record: Maximum discharge, 14,800 ft³/s (419 m³/s) Apr. 24, 1960 (gage height, 14.27 ft or 4.349 m, from flood mark), from rating curve extended above 5,300 ft³/s (150 m³/s) on basis of slope-area measurement of peak flow; minimum, 7.8 ft³/s (0.22 m³/s) Sept. 9, 1970 (gage height, 0.36 ft or 0.110 m).

REMARKS.--Records good except those for winter periods, which are fair. Prior to 1967, some ground water pumped from mines at Bessemer.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	401	110	130	100	98	60	1,340	664	186	186	95	55
2	331	641	120	105	105	63	1,130	1,400	163	150	70	47
3	435	1,280	110	100	110	70	906	1,290	152	117	58	44
4	755	998	100	98	110	85	734	1,210	243	94	51	49
5	730	839	90	95	105	90	602	1,270	615	76	47	43
6	706	744	85	93	100	75	530	1,100	566	66	53	39
7	602	1,140	82	91	95	115	516	894	729	59	60	32
8	478	1,370	78	90	90	390	450	892	683	51	166	30
9	379	1,040	77	90	85	375	372	927	526	46	272	28
10	313	814	76	89	80	360	300	1,450	375	52	175	28
11	274	688	75	88	76	500	292	1,190	288	49	133	28
12	243	563	74	87	73	750	282	903	223	151	107	25
13	221	455	74	86	70	1,240	270	717	173	163	103	22
14	195	367	74	85	68	1,600	295	576	140	116	122	21
15	171	300	74	84	65	1,830	511	474	115	93	105	21
16	159	273	74	84	63	1,410	1,040	426	103	75	94	21
17	140	227	74	84	61	1,170	1,140	367	92	64	79	20
18	134	203	73	90	61	991	1,070	319	81	59	84	19
19	124	201	73	115	60	901	929	293	74	55	109	19
20	120	180	73	150	60	806	817	257	66	48	82	19
21	183	162	73	145	59	718	722	225	60	44	62	21
22	192	145	73	135	59	682	670	200	58	41	53	52
23	183	120	73	130	59	678	554	176	75	38	63	50
24	177	135	72	120	59	718	464	175	68	36	60	42
25	164	150	72	115	59	924	386	468	62	39	54	40
26	158	140	72	110	58	1,140	324	492	248	40	50	110
27	151	130	72	105	58	1,280	275	411	258	43	46	282
28	139	120	72	100	59	1,550	237	338	268	50	42	200
29	125	105	76	100	-----	1,680	210	269	243	44	37	174
30	118	125	85	98	-----	1,560	189	220	228	92	38	152
31	114	-----	95	98	-----	1,480	-----	208	-----	90	57	-----
TOTAL	8,615	13,765	2,521	3,160	2,105	25,291	17,557	19,801	7,161	2,327	2,627	1,733
MEAN	278	459	81.3	102	75.2	816	585	639	239	75.1	84.7	57.8
MAX	755	1,370	130	150	110	1,830	1,340	1,450	729	186	272	282
MIN	114	105	72	84	58	60	189	175	58	36	37	19
CFSM	1.39	2.30	.41	.51	.38	4.08	2.93	3.20	1.20	.38	.42	.29
IN.	1.60	2.56	.47	.59	.39	4.70	3.27	3.68	1.33	.43	.49	.32

CAL YR 1972 TOTAL 109,595 MEAN 299 MAX 5,830 MIN 33 CFSM 1.50 IN 20.38
WTR YR 1973 TOTAL 106,663 MEAN 292 MAX 1,830 MIN 19 CFSM 1.46 IN 19.84

PEAK DISCHARGE (BASE, 1,500 FT³/S)

DATE	TIME	G.H.	DISCHARGE
03-15	0400	5.68	2,000
03-29	0100	5.26	1,750
05-10	0200	4.83	1,510

STREAMS TRIBUTARY TO LAKE SUPERIOR

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04031500 Presque Isle River at Marenisco, Mich.

LOCATION.--Lat 46°22'20", long 89°41'32", in SE¼NW¼ sec.21, T.46 N., R.43 W., Gogebic County, 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 mi² (443 km²).

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

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.

AVERAGE DISCHARGE.--28 years, 179 ft³/s (5.069 m³/s), 14.22 in/yr (361 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,050 ft³/s (29.7 m³/s) Mar. 16 (gage height, 7.34 ft or 2.237 m); maximum gage height, 7.42 ft (2.262 m) Mar. 13 (backwater from ice); minimum discharge, 57 ft³/s (1.61 m³/s) July 25; minimum gage height, 3.59 ft (1.094 m) Aug. 30.

Period of record: Maximum discharge, 3,520 ft³/s (99.7 m³/s) Apr. 25, 1960 (gage height, 11.25 ft or 3.429 m); minimum observed, 13 ft³/s (0.37 m³/s) Sept. 30, 1948 (gage height, 2.25 ft or 0.686 m, site and datum then in use).

REMARKS.--Records good except those for winter periods, which are fair. Occasional regulation for lake or pond level control at several places above station.

REVISIONS (WATER YEARS).--WSP 1707: 1954. WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	287	192	155	135	120	105	673	355	241	120	120	343
2	266	307	145	135	120	105	655	665	231	108	107	231
3	364	510	135	135	120	110	619	834	215	102	85	175
4	524	567	135	130	120	115	530	809	224	90	71	178
5	554	578	130	130	120	115	465	770	257	85	64	151
6	545	540	130	125	120	140	448	735	243	84	63	126
7	517	565	135	120	120	200	421	700	256	81	72	108
8	459	635	135	120	115	280	393	774	276	74	151	95
9	389	642	140	120	115	340	368	811	252	71	225	88
10	338	584	140	120	110	290	344	832	220	76	164	84
11	332	528	140	120	110	350	281	842	200	74	119	76
12	325	462	140	120	110	430	298	781	182	132	94	70
13	322	407	135	120	110	530	344	657	165	188	106	67
14	296	295	135	120	115	680	335	555	151	133	184	67
15	282	225	135	120	115	880	362	480	140	101	151	66
16	176	236	130	125	110	1,020	491	416	145	85	116	66
17	163	250	130	130	110	980	690	388	232	76	93	64
18	183	233	130	140	105	850	762	363	230	71	102	63
19	189	236	125	150	105	756	752	359	186	71	136	61
20	193	227	125	145	105	679	692	352	158	68	112	65
21	215	208	125	145	105	610	630	325	144	65	94	66
22	224	199	125	140	105	562	567	304	136	63	87	92
23	240	170	125	135	105	530	523	283	134	61	98	93
24	257	190	125	135	105	468	473	274	127	63	98	84
25	250	181	125	130	105	478	433	354	126	62	86	81
26	240	179	120	130	105	538	384	413	147	81	76	230
27	230	177	120	125	105	583	326	375	149	137	71	492
28	223	172	120	125	105	646	270	333	140	146	66	471
29	203	130	125	120	-----	708	245	293	130	122	61	299
30	197	160	125	120	-----	724	237	265	131	97	110	204
31	197	-----	130	120	-----	694	-----	250	-----	107	407	-----
TOTAL	9,180	9,985	4,070	3,985	3,115	15,496	14,011	15,947	5,568	2,894	3,589	4,356
MEAN	296	333	131	129	111	500	467	514	186	93.4	116	145
MAX	554	642	155	150	120	1,020	762	842	276	188	407	492
MIN	163	130	120	120	105	105	237	250	126	61	61	61
CFSM	1.73	1.95	.77	.75	.65	2.92	2.73	3.01	1.09	.55	.68	.85
IN.	2.00	2.17	.89	.87	.68	3.37	3.05	3.47	1.21	.63	.78	.95
CAL YR 1972	TOTAL 83,947	MEAN 229	MAX 1,180	MIN 64	CFSM 1.34	IN 18.26						
WTR YR 1973	TOTAL 92,196	MEAN 253	MAX 1,020	MIN 61	CFSM 1.48	IN 20.06						

LOCATION.—Lat 46°32'49", long 89°46'38", in NW $\frac{1}{4}$ sec.23, T.48 N., R.44 W., Gogebic County, on downstream handrail of bridge on State Highway 28, 2.0 mi (3.2 km) east of Tula, 5.5 mi (8.8 km) downstream from Little Presque Isle River, and 7 mi (11 km) southwest of Merrileather.

PERIOD OF RECORD.--February 1945 to September 1973 (discontinued as a continuous-record station; converted to a crest-stage partial-record station).

AVERAGE DISCHARGE.--28 years, 280 ft³/s (7.930 m³/s), 14.57 in/yr (370 mm/yr).

EXTREMES.—Current year: Maximum discharge, 2,130 ft³/s (60.3 m³/s) Mar. 16 (gage height, 10.57 ft or 3.222 m); minimum, 75 ft³/s (2.12 m³/s) Sept. 20, 21 (gage height, 4.67 ft or 1.423 m).
Period of record: Maximum discharge, 4,640 ft³/s (131 m³/s) Apr. 25, 1960 (gage height, 14.04 ft or 4.279 m); minimum, 22 ft³/s (0.62 m³/s) Oct. 5, 6, 1948 (gage height, 4.22 ft or 1.286 m).

REVISIONS (WATER YEARS).--WSP 1387: 1945. WSP 1707: 1953-55. WSP 1911: Drainage area.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	500	260	210	170	165	150	1,400	391	352	200	165	391
2	466	271	195	175	165	155	1,290	946	314	183	172	270
3	415	890	185	170	165	165	1,140	1,370	305	172	168	205
4	650	1,260	180	165	165	190	1,020	1,370	309	165	162	190
5	970	1,290	180	165	165	250	865	1,330	347	123	160	170
6	952	1,000	175	160	165	245	742	1,330	355	121	158	155
7	914	1,020	180	160	165	230	700	1,230	370	121	162	143
8	800	1,320	180	160	165	260	638	1,190	460	155	280	130
9	697	1,390	180	155	165	340	585	1,270	438	106	432	115
10	578	1,180	180	155	160	500	520	1,540	360	104	443	109
11	500	998	180	155	155	650	472	1,620	309	155	429	104
12	443	830	180	155	155	800	412	1,380	264	114	300	95
13	415	725	175	155	155	1,000	399	1,190	230	203	227	86
14	370	602	175	160	160	1,400	463	970	216	218	218	83
15	350	449	170	160	160	1,700	532	812	194	150	210	78
16	333	328	170	160	160	2,110	882	680	187	118	201	80
17	260	352	170	170	155	2,090	1,260	578	220	114	162	86
18	245	352	165	180	150	1,920	1,350	529	267	110	134	77
19	242	340	165	200	150	1,690	1,310	496	249	109	190	76
20	242	328	165	210	150	1,510	1,190	470	209	104	227	75
21	238	304	165	200	150	1,350	1,100	460	187	94	172	75
22	280	280	160	195	150	1,230	1,000	421	174	85	150	99
23	368	260	160	190	150	1,140	882	375	168	81	132	127
24	328	256	160	190	150	1,100	760	352	160	78	139	141
25	310	258	160	185	150	1,100	655	365	158	81	130	139
26	304	250	160	180	150	1,220	592	571	280	86	120	282
27	309	251	155	175	150	1,340	502	630	250	98	111	544
28	295	251	155	175	150	1,420	435	530	238	156	108	697
29	280	240	160	170	-----	1,540	357	449	240	180	100	630
30	264	225	165	170	-----	1,590	316	390	229	138	86	410
31	260	-----	165	165	-----	1,500	-----	370	-----	152	203	-----
TOTAL	13,578	17,762	5,325	5,335	4,395	31,885	23,769	25,611	8,039	4,064	6,051	5,862
MEAN	438	592	172	172	157	1,029	792	826	268	131	195	195
MAX	970	1,390	210	210	165	2,110	1,400	1,620	460	218	443	697
MIN	238	225	155	155	150	150	316	352	158	78	86	75
CFSM	1.68	2.27	.56	.66	.60	3.94	3.03	3.16	1.03	.50	.75	.75
IN.	1.94	2.53	.76	.76	.63	4.54	3.39	3.65				

CAL YR 1972	TOTAL 137,212	MEAN 375	MAX 3,490	MIN 90	CFSM 1.44	IN 19.56
WTR YR 1973	TOTAL 151,676	MEAN 416	MAX 2,110	MIN 75	CFSM 1.59	IN 21.62

STREAMS TRIBUTARY TO LAKE SUPERIOR

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04033000 Middle Branch Ontonagon River near Paulding, Mich.

LOCATION.--Lat 46°21'25", long 89°04'38", in SE 1/4 sec. 29, T. 46 N., R. 38 W., Ontonagon County, Ottawa National Forest, on right bank 25 ft (8 m) downstream from highway bridge, 2.4 mi (3.9 km) upstream from Bond Falls Reservoir, and 5.7 mi (9.2 km) southeast of Paulding.

DRAINAGE AREA.--164 mi² (425 km²).

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

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.

AVERAGE DISCHARGE.--31 years, 174 ft³/s (4.928 m³/s), 14.41 in/yr (366 mm/yr).

EXTREMES.--Current year: Maximum discharge, 812 ft³/s (23.0 m³/s) May 11 (gage height, 7.10 ft or 2.164 m); minimum, 103 ft³/s (2.92 m³/s) Nov. 29 (gage height, 3.64 ft or 1.109 m, result of freezeup).
Period of record: Maximum discharge, 2,050 ft³/s (58.1 m³/s) Apr. 30, 1951 (gage height, 10.0 ft or 3.048 m, from high-water mark); minimum, 27 ft³/s (0.76 m³/s) Nov. 22, 1946, result of freezeup; minimum gage height, 2.96 ft (0.902 m) Nov. 26, 1942, result of freezeup.

REMARKS.--Records good except those for winter periods, which are fair.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	344	180	180	160	120	110	448	294	219	148	209	204
2	290	240	160	160	120	110	443	545	210	138	174	176
3	275	453	155	155	120	115	417	671	205	134	150	161
4	303	468	150	155	120	115	379	658	247	127	136	162
5	295	422	150	150	120	120	340	626	237	123	130	160
6	310	366	150	145	120	135	313	596	210	122	125	146
7	317	384	155	140	120	190	313	573	209	121	128	139
8	305	450	160	140	115	250	299	641	220	121	147	134
9	270	448	160	140	115	230	278	666	218	119	197	129
10	243	405	165	135	110	225	262	724	203	133	192	124
11	239	354	160	135	110	300	249	802	194	135	172	124
12	237	316	155	135	110	380	241	746	183	142	159	123
13	227	287	155	135	110	464	229	626	175	170	160	120
14	213	265	155	140	115	532	222	528	166	161	237	121
15	203	247	155	140	115	612	260	451	163	138	203	122
16	194	232	155	140	110	622	447	398	156	128	178	122
17	189	225	155	150	105	572	576	364	153	124	169	120
18	178	209	155	165	105	486	581	332	154	127	160	117
19	175	198	155	180	105	473	519	313	149	158	156	116
20	169	199	150	190	105	409	475	298	140	140	151	120
21	181	191	150	175	105	371	447	277	138	130	143	117
22	196	170	150	160	105	352	420	259	150	124	137	139
23	222	150	150	155	105	344	389	242	149	118	136	149
24	238	180	145	155	105	334	359	235	147	118	137	142
25	227	170	145	150	105	350	328	281	140	123	135	135
26	226	160	145	145	110	394	301	337	141	123	133	150
27	223	181	145	140	110	429	279	321	142	132	132	250
28	211	175	145	135	110	453	256	285	150	142	128	256
29	198	156	140	135	-----	482	238	259	151	139	125	207
30	191	190	140	130	-----	487	226	236	151	139	125	167
31	186	-----	150	120	-----	461	-----	224	-----	178	182	-----
TOTAL	7,275	8,071	4,740	4,590	3,125	10,907	10,534	13,808	5,270	4,175	4,846	4,452
MEAN	235	269	153	148	112	352	351	445	176	135	156	148
MAX	344	468	180	190	120	622	581	802	247	178	237	256
MIN	169	150	140	120	105	110	222	224	138	118	125	116
CFSM	1.43	1.64	.93	.90	.68	2.15	2.14	2.71	1.07	.82	.95	.90
IN.	1.65	1.83	1.08	1.04	.71	2.47	2.39	3.13	1.20	.95	1.10	1.01
CAL YR 1972	TOTAL 73,413	MEAN 201	MAX 979	MIN 90	CFSM 1.23	IN 16.65						
WTR YR 1973	TOTAL 81,793	MEAN 224	MAX 802	MIN 105	CFSM 1.37	IN 18.55						

STREAMS TRIBUTARY TO LAKE SUPERIOR

04033500 Bond Falls Canal near Paulding, Mich.

LOCATION.--Lat 46°23'57", long 89°08'47", in SW 1/4 sec. 11, T.46 N., R.39 W., Ontonagon County, 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.

AVERAGE DISCHARGE.--31 years, 139 ft³/s (3.936 m³/s).

EXTREMES.--Current year: Maximum discharge, 336 ft³/s (9.52 m³/s) Oct. 24 (gage height, 5.97 ft or 1.820 m); no flow Apr. 7, 8; minimum gage height, 0.54 ft (0.165 m) Sept. 17 (two drain holes in weir open, water surface below weir crest and canal gate closed).

Period of record: Maximum discharge, 373 ft³/s (10.6 m³/s) Sept. 23, 1960 (gage height, 6.17 ft or 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).

REMARKS.--Records excellent except those between 0 and 15 ft³/s (0 and 0.42 m³/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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64	297	310	310	223	300	2.7	306	304	182	178	202
2	65	299	310	310	222	298	1.9	306	304	287	178	202
3	65	298	310	310	222	296	1.9	305	304	311	178	202
4	65	298	310	263	222	294	2.1	308	304	310	178	201
5	65	299	310	227	266	299	2.2	309	303	307	177	175
6	66	299	310	229	305	141	1.0	309	303	305	177	145
7	38	201	310	230	305	10	0	308	303	305	177	137
8	14	110	310	230	305	9.0	0	308	302	304	177	70
9	14	195	310	230	304	8.5	27	308	302	303	116	9.4
10	14	288	310	230	302	8.5	140	308	302	301	65	5.4
11	14	311	310	230	301	10	273	307	302	300	64	4.1
12	14	311	310	230	299	9.2	245	308	301	299	64	4.2
13	14	151	310	230	297	9.1	192	307	301	242	93	3.0
14	14	17	310	230	298	9.6	192	306	299	196	144	1.3
15	14	16	310	230	296	9.8	193	154	299	196	144	1.2
16	14	177	308	230	296	9.4	251	1.8	299	219	167	1.1
17	62	302	307	202	294	9.4	307	4.8	298	238	203	18
18	142	196	304	156	295	9.5	308	5.0	297	239	202	129
19	174	117	250	129	297	9.8	308	57	296	238	202	190
20	174	156	201	129	300	9.9	308	98	305	238	227	198
21	174	188	226	73	305	10	307	195	312	236	258	198
22	174	188	248	21	305	10	306	286	308	235	256	197
23	257	188	243	48	309	10	305	286	306	234	256	196
24	319	265	237	74	308	11	305	295	305	233	255	196
25	303	312	239	74	306	11	305	305	256	232	254	196
26	302	310	278	74	301	11	305	305	187	182	253	197
27	301	310	313	98	298	9.7	305	305	186	140	252	131
28	301	310	308	119	299	6.2	305	305	164	140	251	49
29	300	310	310	147	-----	6.1	304	305	145	139	250	39
30	300	310	310	174	-----	4.5	304	304	145	153	248	39
31	298	-----	311	194	-----	3.8	-----	305	-----	167	223	-----
TOTAL	4,135	7,029	9,043	5,661	8,080	1,853.0	5,806.8	7,819.6	8,342	7,411	5,867	3,336.7
MEAN	133	234	292	183	289	59.8	194	252	278	239	189	111
MAX	319	312	313	310	309	300	308	309	312	311	258	202
MIN	14	16	201	21	222	3.8	0	1.8	145	139	64	1.1

CAL YR 1972 TOTAL 60,436.20 MEAN 165 MAX 319 MIN .10
WTR YR 1973 TOTAL 74,384.10 MEAN 204 MAX 319 MIN 0

STREAMS TRIBUTARY TO LAKE SUPERIOR

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04034000 Bond Falls Reservoir near Paulding, Mich.

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

DRAINAGE AREA.-- 190 mi² (492 km²).

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

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

EXTREMES.-- Current year: Maximum contents, 40,410 acre-ft (49.8 hm³) May 15, 16 (gage height, 140.63 ft or 42.864 m); minimum, 10,380 acre-ft (12.8 hm³) Mar. 6 (gage height, 126.20 ft or 38.446 m).

1947 - 73: Maximum contents observed, 42,880 acre-ft (52.9 hm³) July 3, 1953 (gage height, 141.66 ft or 43.178 m), of which 1,610 acre-ft (2.0 hm³) was uncontrolled storage; no usable storage at times during 1961-64, 1967, 1968, 1970, 1972; minimum gage height observed, 115.98 ft (35.351 m) Mar. 21, 1970.

REMARKS.-- Reservoir is formed by earth fill and concrete dam with one taintor gate; dam completed 1937. Usable capacity, 39,720 acre-ft (49.0 hm³) 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.

REVISIONS.-- WSP 1911: Drainage area.

MONTHEND GAGE HEIGHT AND CONTENTS AT 0930, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

Date	Gage height (feet)	Contents (acre- feet)	Change in contents during month	
			(Acre- feet)	Equivalent in ft ³ /s
Sept. 30	136.9	31,780	-	-
Oct. 31	139.0	36,600	+4,820	+78.4
Nov. 30	139.1	36,830	+230	+3.9
Dec. 31	134.3	26,130	-10,700	-174
Calendar year 1972	-	-	+11,380	+15.7
Jan. 31	132.7	22,900	-3,230	-52.5
Feb. 28	127.4	12,660	-10,240	-184
Mar. 31	137.4	32,920	+20,260	+329
Apr. 30	140.1	39,140	+6,220	+105
May 31	139.2	37,060	-2,080	-33.8
June 30	135.3	28,260	-8,800	-148
July 31	131.3	20,100	-8,160	-133
Aug. 31	129.2	16,080	-4,020	-65.4
Sept. 30	129.9	17,410	+1,330	+22.4
Water year 1973 - 73	-	-	-14,370	-19.8

STREAMS TRIBUTARY TO LAKE SUPERIOR

04034500 Middle Branch Ontonagon River near Trout Creek, Mich.

LOCATION.--Lat 46°28'40", long 89°05'25", in SW $\frac{1}{4}$ sec.8, T.47 N., R.38 W., Ontonagon County, 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 mi² (526 km²).

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

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 Nov. 4, 1942, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--31 years, 71.4 ft³/s (2.022 m³/s).

EXTREMES.--Current year: Maximum discharge, 582 ft³/s (16.5 m³/s) May 10 (gage height, 3.27 ft or 0.997 m); minimum, 34 ft³/s (0.96 m³/s) Mar. 5, 22 (gage height, 1.50 ft or 0.457 m), result of freezeup; minimum daily 43 ft³/s (1.22 m³/s) Sept. 18.

Period of record: Maximum discharge, 1,750 ft³/s (49.6 m³/s) Nov. 7, 1951 (gage height, 5.05 ft or 1.539 m); minimum, 14 ft³/s (0.40 m³/s) sometime during period Jan. 23 to Feb. 13, 1947 (gage height, 1.14 ft or 0.347 m, from recorded range in stage), caused by ice jams upstream.

REMARKS.--Records good except those for winter periods, which are fair. Flow regulated by Bond Falls Reservoir (see sta 04034000). Diversion to South Branch Ontonagon River by Bond Falls Canal (see sta 04033500).

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	50	45	45	44	50	45	57	80	50	56	61	54
2	48	77	46	47	49	47	58	142	48	55	57	55
3	57	74	46	50	49	49	57	260	49	55	56	55
4	55	59	46	49	48	49	54	389	55	55	56	52
5	50	56	46	49	48	47	51	461	58	54	55	44
6	65	56	46	49	48	47	85	456	57	54	56	44
7	54	77	46	49	50	83	155	458	59	53	56	44
8	50	71	46	49	46	65	154	479	59	53	59	45
9	48	57	46	49	50	60	153	464	58	55	57	45
10	47	52	46	49	49	58	125	552	58	56	55	45
11	48	51	46	48	48	88	48	546	58	54	55	45
12	48	50	46	48	47	86	48	533	58	57	54	45
13	48	109	46	48	47	85	47	529	58	55	57	45
14	46	200	46	48	47	90	48	511	58	55	56	45
15	46	200	47	48	49	101	55	489	58	54	55	46
16	46	136	47	48	49	79	75	489	65	55	54	46
17	46	49	48	49	49	65	120	486	63	54	56	45
18	46	48	48	54	48	59	212	461	62	57	54	43
19	46	48	48	52	48	57	252	370	60	63	54	45
20	46	48	48	49	48	54	268	339	60	56	53	46
21	49	48	48	48	47	53	220	274	60	55	54	47
22	48	48	48	50	46	53	217	176	60	55	54	48
23	50	48	48	49	45	55	201	99	60	55	55	47
24	48	48	48	48	45	58	146	49	59	56	54	46
25	48	48	48	49	46	67	48	55	60	56	55	46
26	47	49	48	49	46	69	46	52	60	57	55	77
27	46	49	49	48	45	65	46	49	59	57	54	59
28	46	47	49	46	45	68	45	48	59	58	53	50
29	46	45	48	47	-----	65	45	46	58	56	53	48
30	45	50	50	48	-----	60	45	46	58	63	55	48
31	45	-----	50	49	-----	57	-----	47	-----	63	56	-----
TOTAL	1,508	2,043	1,463	1,507	1,332	1,984	3,181	9,435	1,744	1,737	1,714	1,450
MEAN	48.6	68.1	47.2	48.6	47.6	64.0	106	304	58.1	56.0	55.3	48.3
MAX	65	200	50	54	50	101	268	552	65	63	61	77
MIN	45	45	45	44	45	45	45	46	48	53	53	43
CAL YR 1972	TOTAL 19,484		MEAN 53.2		MAX 200		MIN 42					
WTR YR 1973	TOTAL 29,098		MEAN 79.7		MAX 552		MIN 43					

04035000 East Branch Ontonagon River near Mass, Mich.

LOCATION.--Lat 46°41'24", long 89°04'24", in SW¼NW¼ sec.33, T.50 N., R.38 W., Ontonagon County, 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 mi² (704 km²).

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

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 Oct. 1, 1949, nonrecording gage at site 700 ft (213 m) upstream at same datum.

AVERAGE DISCHARGE.--31 years, 261 ft³/s (7.392 m³/s), 13.03 in/yr (331 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,480 ft³/s (70.2 m³/s) May 10 (gage height, 8.40 ft or 2.560 m); minimum, 127 ft³/s (3.60 m³/s) Sept 12-14 (gage height, 3.58 ft or 1.091 m).

Period of record: Maximum discharge, 4,590 ft³/s (130 m³/s) July 1, 1953 (gage height, 10.57 ft or 3.222 m); maximum gage height, 10.65 ft (3.246 m) Apr. 24, 1960; minimum discharge, 60 ft³/s (1.70 m³/s) Aug. 25, 1948 (gage height, 3.55 ft or 1.082 m, site then in use).

REMARKS.--Records good except those for winter periods, which are fair.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	444	177	230	190	170	155	707	531	215	208	399	233
2	348	642	215	195	170	155	664	1,310	215	188	298	198
3	572	1,260	205	195	170	160	631	1,200	214	177	222	169
4	645	728	190	190	170	180	580	1,050	234	164	181	160
5	451	626	190	190	170	210	503	1,110	233	159	159	159
6	576	573	185	185	170	190	450	872	215	154	152	147
7	507	890	185	180	165	400	467	678	211	151	160	139
8	370	1,020	185	180	165	600	415	1,210	230	147	193	135
9	300	677	185	175	160	570	355	898	241	137	315	132
10	256	533	185	175	155	560	312	2,060	230	169	255	131
11	243	442	185	170	155	800	293	1,430	216	169	206	131
12	244	368	185	170	155	1,050	265	1,020	198	180	178	130
13	230	316	185	170	155	1,200	255	747	180	219	165	127
14	215	279	185	170	160	1,570	322	580	168	185	206	129
15	201	252	185	175	160	1,880	519	471	163	160	227	134
16	190	249	185	175	155	1,470	1,080	422	207	148	199	138
17	183	247	185	180	150	960	1,100	407	269	140	175	137
18	178	220	185	200	150	778	788	363	287	136	163	134
19	176	220	185	225	150	700	647	332	276	153	171	133
20	174	214	185	240	155	620	558	309	231	190	177	135
21	234	211	185	230	155	570	496	288	195	170	165	136
22	278	209	185	215	155	550	459	263	181	152	151	200
23	247	175	185	205	155	546	400	246	184	141	153	203
24	273	150	185	200	155	561	350	237	181	136	155	186
25	250	200	180	195	155	814	310	281	180	166	146	171
26	236	249	180	190	155	991	260	349	283	192	144	639
27	232	224	180	185	155	970	240	322	245	167	144	540
28	218	211	180	180	155	1,060	225	281	227	191	140	351
29	202	182	180	180	-----	1,040	220	248	226	177	135	261
30	189	210	180	175	-----	889	210	226	221	182	148	209
31	185	-----	185	175	-----	804	-----	216	-----	343	271	-----
TOTAL	9,047	11,954	5,810	5,860	4,450	23,003	14,081	19,957	6,556	5,351	5,953	5,827
MEAN	292	398	187	189	159	742	469	644	219	173	192	194
MAX	645	1,260	230	240	170	1,880	1,100	2,060	287	343	399	639
MIN	174	150	180	170	150	155	210	216	163	136	135	127
CFSM	1.07	1.46	.69	.69	.58	2.73	1.72	2.37	.81	.64	.71	.71
IN.	1.24	1.63	.79	.80	.61	3.15	1.93	2.73	.90	.73	.81	.80

CAL YR 1972 TOTAL 111,742 MEAN 305 MAX 2,260 MIN 115 CFSM 1.12 IN 15.28
WTR YR 1973 TOTAL 117,849 MEAN 323 MAX 2,060 MIN 127 CFSM 1.19 IN 16.12

PEAK DISCHARGE (BASE, 1,400 FT³/S)

DATE	TIME	G.H.	DISCHARGE
11-03	0500	6.96	1,510
03-15	1200	7.70	1,990
05-10	1100	8.40	2,480
09-26	1700	6.85	1,440

STREAMS TRIBUTARY TO LAKE SUPERIOR

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04036000 West Branch Ontonagon River near Bergland, Mich.

LOCATION.--Lat 46°35'15", long 89°32'30", in SW¼ sec. 3, T.48 N., R.42 W., Ontonagon County, 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 mi² (420 km²).

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

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

AVERAGE DISCHARGE.--31 years, 177 ft³/s (5.013 m³/s), 14.84 in/yr (377 mm/yr).

EXTREMES.--Current year: Maximum discharge, 936 ft³/s (26.5 m³/s) May 11 (gage height, 4.94 ft or 1.506 m); minimum daily, 7.5 ft³/s (0.21 m³/s) Sept. 21.

Period of record: Maximum discharge, 1,400 ft³/s (39.6 m³/s) Apr. 26, 1960 (gage height, 5.98 ft or 1.823 m); minimum daily, 0.70 ft³/s (0.020 m³/s) Sept. 26 to Oct. 19, 1963; minimum gage height observed, 0.13 ft (0.040 m) Oct. 2, 1963.

REMARKS.--Records fair except those below 20 ft³/s (0.6 m³/s), which are poor. Flow regulated by Gogebic Lake (usable capacity, 35,200 acre-ft or 43.4 km³).

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.0	60	225	253	253	156	600	25	199	230	44	74
2	8.0	85	180	234	257	154	618	262	150	220	72	71
3	129	471	221	222	253	152	622	689	120	210	60	69
4	354	651	300	235	248	149	618	842	126	200	61	78
5	439	648	310	252	239	148	614	852	130	185	58	69
6	437	646	307	244	237	147	601	865	125	175	59	93
7	465	654	286	232	231	168	589	856	126	165	62	101
8	394	693	269	250	227	176	577	875	133	140	66	94
9	287	710	260	281	220	180	397	881	132	120	78	90
10	254	701	246	283	214	187	208	916	129	115	94	95
11	221	698	232	273	209	206	232	925	121	125	90	79
12	286	669	221	262	204	237	233	902	118	135	86	63
13	337	401	219	255	201	256	234	878	113	147	167	55
14	342	229	208	246	197	281	234	855	54	123	162	55
15	404	239	230	260	194	319	243	845	22	116	58	29
16	346	237	244	262	193	356	428	616	25	119	12	12
17	342	172	232	250	188	379	542	380	24	84	46	11
18	347	26	221	299	183	394	557	270	23	60	78	9.6
19	342	23	210	328	181	407	623	240	25	58	83	8.9
20	322	128	255	320	179	416	675	195	21	52	98	8.2
21	289	140	309	312	175	421	685	189	42	51	126	7.5
22	261	107	273	312	175	426	674	184	115	49	107	12
23	108	105	248	309	174	430	640	129	118	19	93	9.5
24	58	158	234	299	171	430	269	56	121	12	91	8.2
25	71	123	225	296	167	437	30	40	161	12	89	8.2
26	75	90	253	286	163	455	27	178	180	13	78	16
27	75	154	257	278	161	479	24	266	190	15	57	29
28	62	229	241	273	159	504	23	261	182	14	54	37
29	56	252	239	269	-----	538	22	257	212	14	49	36
30	58	291	253	262	-----	565	22	264	230	14	50	42
31	62	-----	258	255	-----	581	-----	247	-----	14	68	-----
TOTAL	7,239.0	9,790	7,666	8,392	5,653	10,134	11,861	15,240	3,467	3,006	2,396	1,370.1
MEAN	234	326	247	271	202	327	395	492	116	97.0	77.3	45.7
MAX	465	710	310	328	257	581	685	925	230	230	167	101
MIN	8.0	23	180	222	159	147	22	25	21	12	12	7.5
CAL YR 1972	TOTAL 86,652.4	MEAN 237	MAX 1,070	MIN 8.0								
WTR YR 1973	TOTAL 86,214.1	MEAN 236	MAX 925	MIN 7.5								

STREAMS TRIBUTARY TO LAKE SUPERIOR

04037500 Cisco Branch Ontonagon River at Cisco Lake Outlet, Mich.

LOCATION.—Lat 46°15'12", long 89°27'05", in E½ sec.32, T.45 N., R.41 W., Gogebic County, 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 mi² (131.3 km²).

PERIOD OF RECORD.—October 1944 to current year.

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

AVERAGE DISCHARGE.—29 years, 47.4 ft³/s (1.342 m³/s), 12.70 in/yr (323 mm/yr).

EXTREMES.—Current year: Maximum discharge, 200 ft³/s (5.66 m³/s) May 10, 11 (gage height, 5.61 ft or 1.710 m); minimum daily, 0.34 ft³/s (0.010 m³/s) Sept. 20; minimum gage height, 3.88 ft (1.183 m) Sept. 19–21.
Period of record: Maximum discharge, 288 ft³/s (8.16 m³/s) May 1–4, 1951 (gage height, 6.10 ft or 1.859 m, present datum); minimum daily, 0.13 ft³/s (0.004 m³/s) Aug. 4–7, Aug. 22 to Sept. 5, 1970.

REMARKS.—Records good except those below 25 ft³/s (0.7 m³/s), which are fair. Flow completely regulated by Cisco Lake (usable capacity, 15,600 acre-ft or 19.2 hm³).

REVISIONS.—WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	121	97	46	50	36	46	108	6.7	48	17	42	112
2	120	100	46	57	39	46	109	60	49	17	44	108
3	121	105	46	63	47	39	110	118	49	1.8	44	107
4	121	106	46	70	46	30	109	124	91	1.6	44	107
5	119	106	46	74	46	30	110	136	119	1.7	43	80
6	122	107	47	73	46	30	108	130	106	1.8	44	28
7	121	108	46	72	46	63	107	142	97	2.1	44	1.7
8	115	110	46	66	46	87	105	179	97	1.7	67	1.5
9	115	111	46	53	47	87	102	191	94	1.8	83	1.2
10	116	109	46	46	47	87	100	199	93	17	79	.55
11	129	105	46	46	47	99	87	196	42	29	77	.40
12	142	103	46	46	46	103	77	189	3.4	110	67	.40
13	139	102	47	44	36	104	76	182	3.0	163	58	.40
14	139	99	54	42	30	107	76	178	2.7	90	59	.37
15	143	98	60	33	30	113	77	178	2.1	27	43	.37
16	132	96	60	27	30	116	84	172	1.7	27	26	.37
17	129	94	59	28	31	116	91	153	2.2	27	26	.37
18	125	92	51	29	31	116	85	138	17	25	35	.37
19	123	90	44	30	31	116	86	136	27	26	43	.36
20	120	88	44	31	31	115	87	132	26	12	40	.34
21	118	87	44	31	32	113	32	94	25	1.5	33	.55
22	115	86	44	48	33	112	5.9	61	26	1.3	25	9.3
23	115	85	44	63	49	111	4.7	31	27	1.1	25	16
24	114	84	43	63	63	110	4.1	6.5	27	1.1	25	34
25	112	83	44	62	62	109	3.7	63	28	.91	25	49
26	110	82	44	61	53	109	3.2	114	27	.95	25	105
27	108	81	44	60	47	109	2.7	124	27	24	25	173
28	104	75	44	59	47	108	2.3	118	19	45	25	183
29	103	56	45	59	-----	108	2.0	81	16	45	19	179
30	101	45	48	50	-----	108	4.3	48	16	45	9.8	180
31	99	-----	50	44	-----	108	-----	47	-----	44	65	-----
TOTAL	3,711	2,790	1,466	1,580	1,175	2,855	1,958.9	3,727.2	1,208.1	809.36	1,309.8	1,479.55
MEAN	120	93.0	47.3	51.0	42.0	92.1	65.3	120	40.3	26.1	42.3	49.3
MAX	143	111	60	74	63	116	110	199	119	163	83	183
MIN	99	45	43	27	30	30	2.0	6.5	1.7	.91	9.8	.34

CAL YR 1972 TOTAL 21,251.17 MEAN 58.1 MAX 197 MIN .19
WTR YR 1973 TOTAL 24,069.91 MEAN 65.9 MAX 199 MIN .34

04040000 Ontonagon River near Rockland, Mich.

LOCATION.--Lat 46°43'15", long 89°12'25", in NE¼ sec.20, T.50 N., R.39 W., Ontonagon County, on left bank, 50 ft (15 m) downstream from bridge on highway between Rockland and Victoria, 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 mi² (3,470 km²).

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

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

AVERAGE DISCHARGE.--31 years, 1,419 ft³/s (40.19 m³/s), 14.38 in/yr (365 mm/yr).

EXTREMES.--Current year: Maximum discharge, 15,300 ft³/s (433 m³/s) May 10 (gage height, 15.91 ft or 4.849 m); maximum gage height, 16.66 ft (5.078 m) Mar. 10 (backwater from ice); minimum discharge, 324 ft³/s (9.18 m³/s) Sept. 18, 19 (gage height 5.31 ft or 1.618 m).

Period of record: Maximum discharge, 42,000 ft³/s (1,190 m³/s) Aug. 22, 1942 (gage height, 28.6 ft or 8.73 m, from floodmark), from rating curve extended above 14,000 ft³/s (396 m³/s) on basis of slope-area measurement of peak flow; minimum daily, 192 ft³/s (5.44 m³/s) July 28, 29, 1963.

REMARKS.--Records good except those for winter periods, which are fair. Considerable regulation by power plant 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 usable capacity, 50,800 acre-ft or 62.6 km³) in headwaters.

REVISIONS (WATER YEARS).--WSP 1387: 1943, 1946-47. WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,850	1,040	1,300	1,250	1,100	1,200	3,920	3,110	1,350	872	1,120	864
2	1,600	3,490	1,100	1,250	1,050	1,150	3,740	7,810	1,280	1,020	960	881
3	2,200	7,620	950	1,250	1,200	1,200	3,370	6,970	1,240	1,010	815	948
4	4,200	5,130	1,100	1,250	1,050	1,250	3,010	7,010	1,150	900	778	995
5	3,100	4,470	1,200	1,250	1,050	1,250	2,800	8,060	1,240	966	962	741
6	3,120	3,790	1,250	1,200	1,000	1,200	2,370	7,530	1,250	959	800	793
7	3,030	5,190	1,150	1,150	1,100	2,300	2,620	6,350	1,260	910	710	755
8	2,520	6,960	1,050	1,100	1,100	3,000	2,420	8,120	1,290	761	647	639
9	1,730	4,850	1,150	1,150	1,100	3,700	1,970	6,530	1,300	810	1,160	693
10	1,370	3,890	1,100	1,200	1,050	3,400	1,680	11,700	1,280	816	1,330	756
11	1,310	2,890	1,050	1,150	1,000	4,200	1,470	8,580	1,190	914	1,060	697
12	1,340	2,750	1,000	1,150	1,000	5,000	1,550	6,520	1,110	912	815	590
13	1,300	2,550	1,150	1,100	1,000	7,620	1,590	5,190	1,030	967	700	670
14	1,280	2,010	1,150	1,100	950	8,840	1,670	3,880	941	1,000	793	784
15	1,250	1,510	1,150	1,150	1,000	10,400	2,610	3,250	969	871	879	565
16	1,240	1,400	1,150	1,200	1,000	9,480	5,200	3,030	1,060	861	1,010	466
17	1,220	1,160	1,150	1,000	850	6,910	5,630	2,390	1,480	850	912	529
18	1,200	1,210	1,200	1,200	950	4,840	4,830	2,180	1,230	667	660	399
19	1,200	1,190	1,250	1,350	900	3,840	3,970	2,030	1,100	816	681	508
20	1,200	1,050	1,200	1,450	1,000	3,490	3,560	1,950	909	818	889	742
21	1,330	1,030	1,200	1,400	1,000	3,010	3,000	1,850	743	853	750	636
22	1,440	1,040	1,250	1,350	1,000	2,800	2,870	1,620	864	677	771	575
23	1,430	830	1,150	1,300	980	2,920	2,630	1,550	949	817	949	444
24	1,370	950	1,200	1,150	960	3,200	2,280	1,310	941	668	808	525
25	1,320	1,150	1,200	1,150	1,000	4,270	1,610	1,400	996	668	787	496
26	1,290	1,300	1,050	1,150	1,200	5,720	1,310	1,830	1,180	848	667	1,480
27	1,280	1,250	1,150	1,100	1,100	5,750	1,100	2,170	905	710	896	2,180
28	1,250	1,200	1,350	1,050	1,150	6,200	1,110	1,780	1,220	531	721	1,510
29	1,220	1,150	1,300	1,050	-----	6,330	1,070	1,620	1,100	679	789	1,040
30	1,110	1,200	1,250	1,050	-----	5,530	1,050	1,530	851	779	837	1,070
31	1,050	-----	1,250	1,050	-----	4,990	-----	1,440	-----	1,020	971	-----
TOTAL	51,350	75,250	36,150	36,700	28,840	134,990	78,010	130,290	33,408	25,950	26,627	23,971
MEAN	1,656	2,508	1,166	1,184	1,030	4,355	2,600	4,203	1,114	837	859	799
MAX	4,200	7,620	1,350	1,450	1,200	10,400	5,630	11,700	1,480	1,020	1,330	2,180
MIN	1,050	830	950	1,000	850	1,150	1,050	1,310	743	531	647	399

CAL YR 1972 TOTAL 622,058 MEAN 1,700 MAX 12,700 MIN 554
WTR YR 1973 TOTAL 681,536 MEAN 1,867 MAX 11,700 MIN 399

PEAK DISCHARGE (BASE, 9,000 FT³/s)

DATE	TIME	G.H.	DISCHARGE
11-02	2400	13.23	10,000
03-15	1500	13.74	11,000
05-10	1100	15.91	15,300

STREAMS TRIBUTARY TO LAKE SUPERIOR

04040500 Sturgeon River near Sidnaw, Mich.

LOCATION.--Lat 46°35'03", long 88°34'33", in NE¼SE¼ sec.5, T.48 N., R.34 W., Baraga County, 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 mi² (443 km²).

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

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

AVERAGE DISCHARGE.--33 years, 213 ft³/s (6.032 m³/s), 16.92 in/yr (430 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,130 ft³/s (60.3 m³/s) May 10 (gage height, 8.20 ft or 2.499 m); minimum, 32 ft³/s (0.91 m³/s) Sept. 19 (gage height, 3.83 ft or 1.167 m).

Period of record: Maximum discharge, 4,630 ft³/s (131 m³/s) Apr. 24, 1960 (gage height, 11.63 ft or 3.545 m); minimum, 4.6 ft³/s (0.13 m³/s) Oct. 8, 1948; minimum gage height, 3.42 ft (1.042 m) Aug. 30, 1969.

REMARKS.--Records good except those for winter periods, which are fair.

REVISIONS.--WSP 1507: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	575	147	135	120	115	67	1,000	448	145	163	208	264
2	460	328	130	125	115	68	941	934	139	139	178	234
3	460	630	125	120	120	75	842	1,070	130	135	143	173
4	535	585	115	120	120	88	735	1,080	131	119	107	137
5	505	540	110	120	115	85	620	1,210	124	85	88	115
6	496	460	105	115	110	85	550	1,370	115	72	75	97
7	456	585	105	115	105	150	560	1,450	112	64	69	84
8	406	710	100	115	100	360	492	1,790	119	56	70	69
9	346	645	100	115	95	330	428	1,670	169	48	88	61
10	300	570	98	110	90	570	374	1,990	208	51	96	57
11	270	480	98	110	85	854	343	1,900	180	48	91	50
12	249	413	97	110	82	1,180	322	1,620	153	58	79	45
13	228	354	96	110	80	1,180	300	1,320	130	69	78	41
14	205	297	96	110	76	1,300	309	1,030	110	64	108	40
15	192	267	96	110	74	1,530	436	812	92	54	107	39
16	180	252	96	105	72	1,460	860	675	102	46	102	37
17	163	222	95	105	71	1,270	1,270	565	110	40	90	35
18	155	200	95	110	70	1,120	1,290	472	128	37	103	34
19	147	180	95	130	70	941	1,140	410	119	35	119	34
20	141	180	95	160	68	890	1,020	364	103	50	131	34
21	165	173	94	155	68	790	962	315	96	55	159	34
22	188	165	94	145	68	710	908	279	91	49	151	66
23	200	140	94	135	67	665	790	243	84	42	126	92
24	205	161	94	130	67	665	655	215	75	37	108	97
25	198	155	93	125	67	740	525	220	72	35	102	96
26	195	151	93	120	67	836	432	249	124	42	88	98
27	185	145	93	115	66	884	402	243	163	130	79	131
28	180	140	92	115	66	976	315	215	171	139	71	143
29	167	115	94	115	-----	1,080	279	192	169	131	70	133
30	157	137	100	110	-----	1,060	249	171	171	157	78	114
31	149	-----	110	110	-----	1,050	-----	155	-----	205	312	-----
TOTAL	8,461	9,527	3,133	3,710	2,369	23,059	19,349	24,677	3,835	2,455	3,474	2,684
MEAN	273	319	101	120	84.6	744	645	796	128	79.2	112	89.5
MAX	575	710	135	160	120	1,530	1,290	1,990	208	205	312	264
MIN	141	115	92	105	66	67	249	155	72	35	69	34
CFSM	1.60	1.86	.80	.70	.40	4.35	3.77	4.66	.75	.46	.66	.52
IN.	1.84	2.07	.58	.81	.52	5.02	4.21	5.37	.83	.53	.76	.58

CAL YR 1972 TOTAL 99,937 MEAN 273 MAX 2,610 MIN 44 CFSM 1.60 IN 21.74
WTR YR 1973 TOTAL 106,733 MEAN 292 MAX 1,690 MIN 34 CFSM 1.71 IN 23.22

STREAMS TRIBUTARY TO LAKE SUPERIOR

29

04041500 Sturgeon River near Alston, Mich.

LOCATION.--Lat 46°43'35", long 88°39'43", in SE¼ sec.15, T.50 N., R.35 W., Baraga County, 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 mi² (896 km²).

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 Oct. 1, 1963, at datum 40.00 ft (12.192 m) lower.

AVERAGE DISCHARGE.--39 years, (1932-40, 1942-73), 423 ft³/s (11.98 m³/s), 16.60 in/yr (422 mm/yr).

EXTREMES.--Current year: Maximum discharge, 4,260 ft³/s (121 m³/s) may 10 (gage height, 9.49 ft or 2.893 m); minimum, 7.8 ft³/s (0.22 m³/s) Jan. 31 (gage height, 2.57 ft or 0.783 m); minimum daily, 11 ft³/s (0.31 m³/s) Oct. 21, 22.
Period of record: Maximum discharge, 7,360 ft³/s (208 m³/s) Apr. 24, 1960 (gage height, 13.09 ft or 3.990 m, present datum); minimum daily, 1 ft³/s (0.03 m³/s) Aug. 14-19, 1960.

REMARKS.--Records good except those below 15 ft³/s (0.4 m³/s), which are poor. Flow regulated by powerplant at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,090	291	300	281	259	359	1,620	837	388	329	375	297
2	857	388	367	281	246	411	1,090	1,880	393	567	410	287
3	1,090	815	306	287	217	422	1,170	1,770	407	628	420	371
4	741	897	316	281	257	418	1,220	1,540	331	637	410	371
5	708	788	282	280	252	428	956	1,800	309	634	350	370
6	949	966	315	281	249	400	931	2,270	309	513	300	369
7	954	962	270	297	246	590	933	1,950	113	438	250	331
8	640	1,220	286	276	242	1,280	935	2,730	334	457	235	312
9	720	1,090	285	250	242	1,200	736	2,560	336	429	234	266
10	715	835	285	253	251	1,070	652	3,270	349	365	234	239
11	510	791	248	253	243	1,230	648	2,800	383	256	234	213
12	513	676	255	254	257	2,520	647	2,400	312	251	235	200
13	514	644	260	249	255	2,130	649	1,840	297	250	235	180
14	511	666	260	15	255	2,140	515	1,520	332	251	236	102
15	511	669	256	299	241	2,660	647	1,200	291	221	236	101
16	469	669	258	254	248	2,440	472	1,160	331	197	327	102
17	503	545	13	254	230	1,980	2,120	857	335	191	369	103
18	436	516	258	247	219	1,680	1,620	836	216	190	368	115
19	348	601	259	235	213	1,550	1,730	793	320	190	330	150
20	236	581	253	280	179	1,310	1,300	646	325	188	312	152
21	11	358	287	285	172	1,070	1,390	645	315	190	313	153
22	11	303	285	275	197	843	1,270	647	310	191	313	161
23	246	307	283	342	195	836	1,100	646	290	190	313	199
24	249	313	289	356	246	621	918	648	265	190	313	223
25	231	305	284	355	250	625	659	647	265	204	312	234
26	258	306	282	361	334	1,200	699	640	260	364	260	235
27	292	316	227	357	333	1,440	699	464	272	444	238	328
28	295	341	281	336	376	1,490	660	465	408	349	238	370
29	14	347	243	301	-----	1,560	658	467	412	330	239	330
30	293	304	255	231	-----	1,760	654	463	411	340	240	311
31	294	-----	284	209	-----	1,230	-----	449	-----	360	241	-----
TOTAL	15,209	17,810	8,332	8,515	6,904	38,893	29,298	40,840	9,619	10,334	9,120	7,175
MEAN	491	594	269	275	247	1,255	977	1,317	321	333	294	239
MAX	1,090	1,220	367	361	376	2,660	2,120	3,270	412	637	420	371
MIN	11	291	13	15	172	359	472	449	113	188	234	101
CFSM	1.42	1.72	.78	.79	.71	3.63	2.82	3.81	.93	.96	.85	.69
IN.	1.64	1.91	.90	.92	.74	4.18	3.15	4.39	1.03	1.11	.98	.77
CAL YR 1972	TOTAL 184,633	MEAN 504	MAX 3,920	MIN 11	CFSM 1.46	IN 19.85						
WTR YR 1973	TOTAL 202,049	MEAN 554	MAX 3,270	MIN 11	CFSM 1.60	IN 21.72						

STREAMS TRIBUTARY TO LAKE SUPERIOR

04043000 Sturgeon River near Arnheim, Mich.

LOCATION.--Lat 46°55'42", long 88°33'23", in NE 1/4 sec. 1, T. 52 N., R. 34 W., Houghton County, on right bank 0.2 mi (0.3 km) downstream from Otter Lake, 3.5 mi (5.6 km) west of Arnheim, 8.5 mi (13.7 km) northeast of Pelkie, and at mile 11 (18 km).

DRAINAGE AREA.--705 mi² (1,826 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 605.98 ft (184.703 m) above mean tide at New York City (Corps of Engineers bench mark).

AVERAGE DISCHARGE.--31 years, 826 ft³/s (23.39 m³/s), 15.91 in/yr (404 mm/yr).

EXTREMES.--Current year: Maximum discharge, 5,960 ft³/s (169 m³/s) May 11 (gage height, 12.76 ft or 3.889 m); minimum, 293 ft³/s (8.30 m³/s) Sept. 19 (gage height, 0.29 ft or 0.088 m).
Period of record: Maximum discharge, 15,500 ft³/s (439 m³/s) Apr. 20, 1952 (gage height, 14.57 ft or 4.441 m, from graph based on gage readings); minimum, 157 ft³/s (4.45 m³/s) July 30, 31, 1963; minimum gage height, 0.01 ft (0.003 m) Sept. 1, 1970, Sept. 8, 1971.

REMARKS.--Records good. Occasional slight regulation caused by Prickett Dam at mile 45 (72 km).

REVISIONS (WATER YEARS).--WSP 1387: 1943-45 (M), 1950-52. WSP 1507: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,660	414	515	479	520	562	3,130	1,010	786	597	828	467
2	1,580	483	457	494	502	608	2,990	1,790	759	593	861	475
3	1,400	1,080	532	494	492	656	2,660	3,000	728	590	747	468
4	1,520	1,700	530	507	492	695	2,460	3,550	715	689	669	499
5	1,550	1,790	525	500	481	713	2,320	3,550	686	745	639	511
6	1,410	1,690	515	500	475	714	2,060	3,380	646	771	593	511
7	1,430	1,780	505	510	469	817	1,880	3,260	617	755	544	509
8	1,420	2,160	500	510	460	1,410	1,760	3,350	549	691	517	495
9	1,250	2,390	490	500	455	2,140	1,640	3,620	562	655	523	474
10	1,090	2,220	485	470	450	2,520	1,470	4,380	579	639	539	454
11	1,030	1,910	480	455	440	2,620	1,300	5,660	583	605	513	425
12	911	1,670	470	450	430	3,110	1,210	5,680	575	565	482	402
13	834	1,450	460	445	430	3,960	1,160	4,910	560	528	460	382
14	781	1,270	455	435	460	4,650	1,130	4,020	498	495	456	373
15	747	1,150	450	420	470	4,820	1,120	3,270	498	471	452	344
16	720	1,070	445	403	460	4,840	1,490	2,590	530	452	446	323
17	687	1,010	435	434	453	4,520	2,180	2,200	553	434	457	310
18	674	951	415	445	427	4,370	2,690	1,840	566	417	490	302
19	642	875	385	478	420	3,600	2,750	1,590	565	407	515	298
20	592	843	409	510	410	3,290	2,670	1,450	555	396	554	309
21	525	827	419	528	405	2,910	2,410	1,290	554	390	582	318
22	451	734	431	555	405	2,420	2,280	1,180	551	385	556	355
23	378	632	443	596	415	2,080	2,110	1,120	547	382	533	380
24	372	578	449	640	422	1,910	1,850	1,080	536	379	514	397
25	401	557	451	657	432	1,760	1,580	1,070	514	380	499	405
26	416	546	451	670	446	1,940	1,330	1,100	517	394	488	438
27	424	543	446	675	480	2,360	1,190	1,070	527	449	471	667
28	441	542	431	677	524	2,730	1,120	976	520	586	444	806
29	452	519	430	651	-----	3,100	1,050	908	532	638	424	780
30	397	495	456	590	-----	3,320	996	856	574	623	416	704
31	380	-----	471	555	-----	3,360	-----	816	-----	644	442	-----
TOTAL	26,565	33,879	14,336	16,233	12,725	78,505	55,986	75,566	17,482	16,745	16,654	13,581
MEAN	857	1,129	462	524	454	2,532	1,866	2,438	583	540	537	453
MAX	1,660	2,390	532	677	524	4,840	3,130	5,680	786	771	861	806
MIN	372	414	385	403	405	562	996	816	498	379	416	298
CFSM	1.22	1.60	.66	.74	.64	3.59	2.65	3.46	.83	.77	.76	.64
IN.	1.40	1.79	.76	.86	.67	4.14	2.95	3.99	.92	.88	.88	.72

CAL YR 1972 TOTAL 361,145 MEAN 987 MAX 9,220 MIN 316 CFSM 1.40 IN 19.06
WTR YR 1973 TOTAL 378,257 MEAN 1,036 MAX 5,680 MIN 298 CFSM 1.47 IN 19.96

STREAMS TRIBUTARY TO LAKE SUPERIOR

31

04043050 Trap Rock River near Lake Linden, Mich.

LOCATION.--Lat 47°13'43", long 88°23'07", in SE¼ SE¼ sec.20, T.56 N., R.32 W., Houghton County, 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 mi² (72.5 km²).

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.

AVERAGE DISCHARGE.--7 years, 43.7 ft³/s (1.238 m³/s), 21.19 in/yr (538 mm/yr).

EXTREMES.--Current year: Maximum discharge, 410 ft³/s (11.6 m³/s) Apr. 16 (gage height, 6.20 ft or 1.890 m); minimum, 11 ft³/s (0.31 m³/s) Sept. 8-21; minimum gage height, 3.96 ft (1.207 m) Sept. 11-15, 20, 21.

Period of record: Maximum discharge, 1,180 ft³/s (33.4 m³/s) May 2, 1972 (gage height, 9.30 ft or 2.835 m); minimum, 7.0 ft³/s (0.20 m³/s) Sept. 17, 1971 (gage height, 3.86 ft or 1.177 m).

REMARKS.--Records good except those for winter period, which are fair. Small diversions for sprinkler irrigation. Records of water temperature for the current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	14	14	18	19	15	175	77	28	28	32	16
2	18	36	13	19	18	15	147	212	28	24	21	15
3	16	73	18	19	18	16	127	165	28	22	17	14
4	16	47	18	19	17	17	101	147	32	20	15	14
5	16	39	18	18	17	19	96	195	29	19	14	13
6	16	37	16	19	17	23	87	222	27	18	23	12
7	17	66	18	18	16	67	99	172	26	18	40	12
8	16	78	18	18	16	138	82	230	46	18	39	11
9	17	52	18	18	16	182	69	144	57	16	88	11
10	15	42	17	18	15	149	60	252	41	16	54	11
11	15	40	17	18	15	116	58	177	40	16	35	11
12	15	34	17	18	15	235	60	110	32	17	25	11
13	15	29	17	18	15	226	61	89	28	17	20	11
14	15	26	17	18	15	180	77	72	25	16	20	11
15	14	24	17	18	15	169	196	63	25	15	18	11
16	14	24	17	18	15	124	348	74	23	14	18	11
17	14	22	17	19	15	91	230	66	32	14	18	11
18	14	22	17	20	14	80	147	56	34	14	16	11
19	14	21	17	24	14	71	134	50	29	13	19	11
20	14	21	17	28	14	68	125	45	25	13	46	11
21	17	21	17	26	14	66	120	41	26	13	28	11
22	19	20	17	28	14	64	97	37	25	12	21	16
23	17	20	17	26	14	62	72	35	24	12	18	18
24	16	20	16	24	14	62	58	34	23	12	16	17
25	15	20	16	24	14	101	50	54	21	12	14	16
26	16	21	16	23	14	167	47	55	23	12	14	67
27	15	24	17	23	14	168	42	48	23	13	14	85
28	15	23	17	21	15	201	39	41	26	14	14	49
29	15	17	17	20	-----	214	36	35	26	14	13	32
30	14	15	18	20	-----	181	32	32	30	14	13	24
31	14	-----	20	19	-----	179	-----	30	-----	33	17	-----
TOTAL	484	948	526	637	429	3,466	3,072	3,060	882	509	760	574
MEAN	15.6	31.6	17.0	20.5	15.3	112	102	98.7	29.4	16.4	24.5	19.1
MAX	20	78	20	28	19	235	348	252	57	33	88	85
MIN	14	14	13	18	14	15	32	30	21	12	13	11
CFSM	.56	1.13	.61	.73	.55	4.00	3.64	3.53	1.05	.59	.88	.68
IN.	.64	1.26	.70	.85	.57	4.60	4.08	4.07	1.17	.68	1.01	.76

CAL YR 1972 TOTAL 16,545 MEAN 45.2 MAX 1,110 MIN 11 CFSM 1.61 IN 21.98
WTR YR 1973 TOTAL 15,347 MEAN 42.0 MAX 348 MIN 11 CFSM 1.50 IN 20.39

PEAK DISCHARGE (BASE, 380 ft³/s).--Apr. 16 (2100) 410 ft³/s (6.20 ft).

STREAMS TRIBUTARY TO LAKE SUPERIOR

04044400 Carp River near Negaunee, Mich.

LOCATION.--Lat 46°31'29", long 87°34'25", in SE $\frac{1}{4}$ sec.29, T.48 N., R.26 W., Marquette County, 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 mi² (133.1 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 1,320 ft (402 m) from topographic map (nearest 20 ft). Prior to Aug. 24, 1961, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--12 years, 58.8 ft³/s (1.665 m³/s).

EXTREMES.--Current year: Maximum discharge, 285 ft³/s (8.07 m³/s) Apr. 16 (gage height, 4.35 ft or 1.326 m); maximum gage height, 5.04 ft (1.536 m) Jan. 8 (backwater from ice); minimum discharge, 17 ft³/s (0.48 m³/s) Apr. 30, May 1 (gage height 2.36 ft or 0.719 m); minimum daily, 18 ft³/s (0.51 m³/s) Apr. 30.

Period of record: Maximum discharge, 351 ft³/s (9.94 m³/s) June 27, 28, 1968 (gage height, 4.68 ft or 1.426 m); maximum gage height, 5.24 ft (1.597 m) Mar. 2, 1972 (backwater from ice); minimum discharge, 3.7 ft³/s (0.10 m³/s) July 29, 1965; minimum gage height, 1.94 ft (0.591 m) Aug. 1, 1962; minimum daily discharge, 3.9 ft³/s (0.11 m³/s) July 29, 30, 1965.

REMARKS.--Records good except those for winter periods, which are fair. Flow regulated by Deer Lake storage reservoir 5 mi (8 km) above station. Total capacity 22,500 acre-ft (27.7 km³). The city of Ishpeming diverted an average of 2.8 ft³/s (0.08 m³/s) into basin as waste effluent (see sta. 04058200).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	85	87	110	115	111	85	56	68	100	101	113	80
2	78	114	110	115	106	83	91	228	100	97	100	64
3	83	199	110	115	105	85	66	172	100	95	94	61
4	91	137	110	115	104	88	42	76	101	94	86	62
5	85	113	110	115	105	84	44	86	100	93	66	61
6	96	110	110	115	100	82	36	91	99	91	54	58
7	95	111	110	115	100	104	37	71	103	90	51	56
8	86	130	110	115	100	111	30	143	110	88	51	55
9	80	116	110	115	100	40	27	107	127	88	53	54
10	77	104	110	115	100	33	25	116	109	91	52	54
11	76	98	110	115	100	73	24	96	101	90	51	54
12	68	94	110	115	100	79	24	67	98	93	51	55
13	42	91	110	115	98	62	25	49	96	95	52	55
14	28	89	110	115	96	61	34	51	95	90	56	55
15	24	87	110	115	87	81	93	95	94	89	56	56
16	22	86	110	115	70	78	211	96	94	89	54	56
17	21	86	110	114	135	56	170	96	112	88	56	56
18	20	86	110	115	140	58	90	108	116	87	75	55
19	19	85	115	115	120	34	77	110	102	93	68	56
20	30	85	115	115	109	31	72	109	97	91	76	57
21	77	85	115	115	97	28	76	107	96	89	67	57
22	92	85	115	115	95	27	61	105	97	88	59	75
23	101	84	115	113	75	29	39	105	99	86	58	72
24	102	84	115	115	92	32	30	105	104	86	57	64
25	97	84	115	112	90	40	26	105	99	88	56	59
26	99	84	115	110	90	51	24	106	111	111	55	50
27	104	86	115	110	91	49	21	104	115	142	55	57
28	97	111	115	110	86	53	20	104	136	116	54	50
29	91	110	115	110	-----	57	19	102	112	99	53	41
30	89	110	115	110	-----	48	18	100	105	103	62	36
31	88	-----	115	110	-----	43	-----	101	-----	122	102	-----
TOTAL	2,243	3,031	3,475	3,529	2,802	1,865	1,608	3,179	3,128	2,963	1,993	1,721
MEAN	72.4	101	112	114	100	60.2	53.6	103	104	95.6	64.3	57.4
MAX	104	199	115	115	140	111	211	228	136	142	113	80
MIN	19	84	110	110	70	27	18	49	94	86	51	36

CAL YR 1972 TOTAL 25,333 MEAN 69.2 MAX 199 MIN 13
WTR YR 1973 TOTAL 31,537 MEAN 86.4 MAX 228 MIN 18

STREAMS TRIBUTARY TO LAKE SUPERIOR

33

04045500 Tahquamenon River near Tahquamenon Paradise, Mich.

LOCATION.--Lat 46°34'30", long 85°16'10", in NE¼ sec.11, T.48 N., R.8 W., Luce County, 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 mi² (2,046 km²).

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).

AVERAGE DISCHARGE.--20 year, 921 ft³/s (26.08 m³/s), 15.83 in/yr (402 mm/yr).

EXTREMES.--Current year: Maximum daily discharge, 3,000 ft³/s (85.0 m³/s) Mar. 18; minimum discharge, 272 ft³/s (7.70 m³/s) July 26 (gage height, 3.24 ft or 0.988 m).

Period of record: Maximum discharge, 6,990 ft³/s (198 m³/s) May 10, 1960 (gage height 10.26 ft or 3.127 m); minimum, 157 ft³/s (4.45 m³/s) July 26, 1955; minimum gage height, 2.86 ft (0.872 m) July 7, 1963.

REMARKS.--Records good, except those for periods of no gage-height record, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	848	735	583	465	817	417	1,600	1,580	1,030	1,430	767	560
2	849	737	552	470	779	418	1,650	1,770	986	1,480	880	544
3	844	971	513	470	752	435	1,750	2,000	922	1,660	957	507
4	818	1,140	492	475	727	474	1,800	2,160	867	1,720	985	476
5	782	1,220	477	480	702	511	1,850	2,310	801	1,740	1,150	438
6	739	1,270	472	480	675	538	1,850	2,340	744	1,710	1,520	412
7	726	1,270	458	475	651	614	1,800	2,260	701	1,640	1,700	391
8	667	1,330	436	470	631	811	1,750	2,180	705	1,510	1,830	372
9	646	1,390	427	465	606	928	1,600	2,120	906	1,400	1,960	355
10	639	1,400	427	465	582	1,030	1,500	2,080	1,030	1,250	1,970	344
11	596	1,390	424	465	570	1,260	1,400	2,020	1,030	1,130	1,940	319
12	567	1,360	409	459	544	1,630	1,350	1,940	995	1,000	1,870	312
13	566	1,280	401	452	523	1,950	1,250	1,860	930	859	1,780	306
14	538	1,220	396	452	508	2,300	1,150	1,770	856	734	1,660	301
15	544	1,160	397	453	498	2,500	1,050	1,680	780	638	1,560	300
16	510	1,070	401	454	498	2,700	1,050	1,530	718	560	1,440	307
17	492	976	402	455	492	2,900	1,150	1,440	726	489	1,310	314
18	490	882	399	485	466	3,000	1,300	1,360	776	419	1,190	311
19	488	783	404	599	449	2,900	1,550	1,240	801	366	1,060	312
20	490	710	410	701	439	2,770	1,750	1,130	784	345	942	312
21	508	666	417	773	436	2,680	1,950	1,010	724	332	861	321
22	606	643	420	822	432	2,570	2,100	896	714	322	784	358
23	721	594	423	854	430	2,430	2,250	787	719	306	694	408
24	832	574	428	876	425	2,300	2,400	686	694	288	633	446
25	871	570	435	890	425	2,200	2,350	608	655	283	576	444
26	873	573	440	900	421	2,100	2,250	627	614	276	525	441
27	850	586	445	903	420	1,900	2,110	712	723	288	491	475
28	830	618	445	904	416	1,800	1,960	774	971	346	458	536
29	828	586	450	899	-----	1,700	1,840	926	1,170	499	432	548
30	812	585	455	874	-----	1,650	1,690	1,040	1,340	590	463	552
31	773	-----	460	851	-----	1,600	-----	1,050	-----	688	519	-----
TOTAL	21,343	28,289	13,698	19,236	15,314	53,016	51,050	45,886	25,412	26,298	34,907	12,022
MEAN	688	943	442	621	547	1,710	1,702	1,480	847	848	1,126	401
MAX	873	1,400	583	904	817	3,000	2,400	2,340	1,340	1,740	1,970	560
MIN	488	570	396	452	416	417	1,050	608	614	276	432	300
CFSM	.87	1.19	.56	.79	.69	2.16	2.15	1.87	1.07	1.07	1.43	.51
IN.	1.01	1.33	.65	.91	.72	2.50	2.40	2.16	1.20	1.24	1.64	.57
CAL YR 1972	TOTAL 354,921	MEAN 970	MAX 6,500	MIN 294	CFSM 1.23	IN 16.71						
WTR YR 1973	TOTAL 346,471	MEAN 949	MAX 3,000	MIN 276	CFSM 1.20	IN 16.31						

NOTE.--No gage-height record Mar. 14-19, Mar. 25 to Apr. 25.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04046000 Black River near Garnet, Mich.

LOCATION.--Lat 46°07'05", long 85°21'55", in SE $\frac{1}{4}$ sec.13, T.43 N., R.9 W., Mackinac County, 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 mi² (73 km²) approximately.

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

GAGE.--Water-stage recorder. Datum of gage is 629.7 ft (191.933 m) above mean sea level.

AVERAGE DISCHARGE.--22 years, 28.9 ft³/s (0.818 m³/s), 14.02 in/yr (356 mm/yr).

EXTREMES.--Current year: Maximum discharge, 169 ft³/s (4.79 m³/s) Mar. 12 (gage height, 4.40 ft or 1.341 m); minimum daily, 11 ft³/s (0.31 m³/s) Jan 7-10.

Period of record: Maximum discharge, 860 ft³/s (24.4 m³/s) May 7, 1960 (gage height, 8.55 ft or 2.606 m), from rating curve extended above 400 ft³/s (11.3 m³/s); minimum, 4.9 ft³/s (0.14 m³/s) Mar. 11, 1956 (gage height, 2.10 ft or 0.640 m).

REMARKS.--Records fair. Records of water temperatures for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1707: 1959.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	19	17	14	21	13	62	73	35	45	43	17
2	26	25	17	14	21	13	67	149	31	47	54	16
3	23	43	16	14	21	14	66	138	29	60	45	16
4	22	37	15	14	20	16	65	120	28	45	36	16
5	21	34	15	13	19	16	59	95	27	39	83	16
6	20	31	14	12	18	16	56	79	26	43	85	15
7	20	31	13	11	17	25	53	69	25	46	73	15
8	19	39	13	11	17	37	48	86	27	37	69	14
9	18	34	13	11	16	38	44	88	30	32	78	14
10	17	31	13	11	16	44	42	88	27	29	69	14
11	17	29	13	12	15	96	39	77	27	26	62	14
12	17	27	13	12	15	159	40	67	25	25	53	14
13	17	25	13	12	14	142	37	60	23	25	46	14
14	17	24	13	12	14	114	35	53	22	22	40	14
15	17	23	13	12	14	119	35	48	20	21	35	14
16	17	21	13	12	14	110	45	47	19	19	32	14
17	17	21	13	12	14	93	57	46	19	18	28	14
18	16	20	13	14	13	77	52	42	23	17	25	14
19	16	20	13	30	13	69	49	39	21	18	23	14
20	16	19	13	26	13	64	52	37	20	17	24	14
21	23	18	13	30	13	58	141	34	19	16	21	14
22	28	18	13	27	13	55	137	32	18	15	20	17
23	31	17	13	31	13	53	111	30	18	15	19	17
24	29	17	13	29	13	53	89	28	17	14	18	15
25	26	17	13	28	13	56	73	27	17	14	18	14
26	27	18	13	27	13	60	61	40	16	30	17	14
27	24	18	13	27	12	58	53	37	39	38	17	17
28	22	19	13	25	13	56	47	48	37	57	17	16
29	21	18	12	24	-----	58	43	52	58	56	16	15
30	20	18	13	23	-----	60	39	43	55	50	17	15
31	20	-----	14	23	-----	60	-----	38	-----	50	17	-----
TOTAL	652	731	419	573	428	1,902	1,797	1,910	798	986	1,200	447
MEAN	21.0	24.4	13.5	18.5	15.3	61.4	59.9	61.6	26.6	31.8	38.7	14.9
MAX	31	43	17	31	21	159	141	149	58	60	85	17
MIN	16	17	12	11	12	13	35	27	16	14	16	14
CFSM	.75	.87	.48	.66	.55	2.19	2.14	2.20	.95	1.14	1.38	.53
IN.	.87	.97	.56	.76	.57	2.53	2.39	2.54	1.06	1.31	1.59	.59

CAL YR 1972 TOTAL 12,154 MEAN 33.2 MAX 325 MIN 12 CFSM 1.19 IN 16.15
WTR YR 1973 TOTAL 11,843 MEAN 32.4 MAX 159 MIN 11 CFSM 1.16 IN 15.73

PEAK DISCHARGE (BASE, 120 FT³/s)

DATE	TIME	G.H.	DISCHARGE
03-12	2100	4.40	169
04-21	1400	4.36	165
05-02	1300	4.31	159
08-05	1400	3.95	121

STREAMS TRIBUTARY TO LAKE MICHIGAN

35

04056500 Manistique River near Manistique, Mich.

LOCATION.--Lat 46°01'50", long 86°09'40", in SE $\frac{1}{4}$ sec.15, T.42 N., R.15 W., Schoolcraft County, 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 mi² (2,849 km²), approximately.

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

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

AVERAGE DISCHARGE.--35 years, 1,400 ft³/s (39.65 m³/s), 17.28 in/yr (439 mm/yr).

EXTREMES.--Current year: Maximum discharge, 5,980 ft³/s (169 m³/s) Mar. 17 (gage height, 10.27 ft or 3.130 m); minimum, 700 ft³/s (19.8 m³/s) July 24 (gage height, 3.03 ft or 0.924 m).
Period of record: Maximum discharge, 16,900 ft³/s (479 m³/s) May 11, 1960 (gage height, 12.85 ft or 3.917 m); minimum, 288 ft³/s (8.16 m³/s) Oct. 4, 1948; minimum gage height, 1.01 ft (0.308 m) Aug. 23, 1941.

REMARKS.--Records good except those for winter periods and those for periods of no gage-height record, which are fair. Since July 1948, slight regulation by dam on outlet of Manistique Lake.

REVISIONS (WATER YEARS).--WSP 1387: 1940-42 (M), 1943, 1945. WSP 1627, 1727: 1938, 1939.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,310	1,120	980	890	1,200	810	2,880	2,270	1,820	1,210	2,250	981
2	1,310	1,120	960	890	1,200	820	3,010	2,540	1,710	1,220	2,600	1,040
3	1,280	1,230	940	890	1,150	840	3,190	2,990	1,610	1,370	2,800	1,090
4	1,250	1,450	920	890	1,150	860	3,330	3,370	1,560	1,470	3,000	1,110
5	1,210	1,580	900	880	1,100	920	3,400	3,640	1,590	1,320	3,050	1,090
6	1,160	1,610	890	880	1,050	1,200	3,410	3,770	1,580	1,190	2,900	1,060
7	1,110	1,600	880	870	1,050	1,650	3,310	3,790	1,540	1,210	2,700	1,020
8	1,090	1,620	870	870	1,050	2,050	3,130	3,750	1,510	1,430	2,400	982
9	1,080	1,690	860	860	1,000	2,380	2,950	3,700	1,560	1,400	2,200	934
10	1,050	1,720	850	850	990	2,640	2,760	3,700	1,680	1,280	2,000	897
11	1,030	1,690	840	840	970	3,010	2,560	3,710	1,670	1,190	1,800	868
12	1,000	1,640	830	840	960	3,390	2,390	3,750	1,580	1,150	1,700	830
13	963	1,570	830	840	940	3,800	2,210	3,710	1,450	1,150	1,600	798
14	944	1,490	830	840	920	4,200	2,050	3,560	1,330	1,100	1,500	779
15	921	1,410	830	840	900	4,500	1,940	3,310	1,230	1,100	1,400	769
16	905	1,320	820	840	880	5,000	1,950	3,070	1,160	1,050	1,310	762
17	907	1,270	820	850	860	5,400	2,360	2,830	1,110	1,000	1,250	766
18	895	1,240	820	860	850	5,610	2,910	2,600	1,100	950	1,200	766
19	896	1,190	820	900	840	5,170	3,260	2,400	1,110	900	1,120	760
20	897	1,140	820	1,000	830	4,900	3,590	2,210	1,110	850	1,140	750
21	926	1,100	830	1,100	820	4,500	3,910	2,060	1,080	810	1,170	743
22	1,010	1,070	840	1,200	810	4,200	4,180	1,940	1,070	780	1,210	777
23	1,130	988	840	1,250	810	3,900	4,370	1,820	1,080	750	1,240	837
24	1,260	967	850	1,300	810	3,600	4,360	1,700	1,060	710	1,200	863
25	1,350	1,040	860	1,300	810	3,340	4,170	1,600	1,010	750	1,130	856
26	1,370	1,070	870	1,300	800	3,200	3,870	1,570	970	800	1,070	843
27	1,360	1,070	870	1,300	800	3,110	3,470	1,530	887	950	1,030	859
28	1,330	1,100	870	1,300	800	3,030	3,070	1,560	900	1,200	995	889
29	1,270	1,020	880	1,300	-----	2,950	2,730	1,780	982	1,500	959	940
30	1,210	993	880	1,300	-----	2,900	2,430	1,950	1,120	1,750	932	933
31	1,160	-----	880	1,250	-----	2,860	-----	1,930	-----	2,000	925	-----
TOTAL	34,584	39,118	26,780	31,320	26,350	96,740	93,150	84,110	39,169	35,540	51,781	26,592
MEAN	1,116	1,304	864	1,010	941	3,121	3,105	2,713	1,306	1,146	1,670	886
MAX	1,370	1,720	980	1,300	1,200	5,610	4,370	3,790	1,820	2,000	3,050	1,110
MIN	895	967	820	840	800	810	1,940	1,530	887	710	925	743
CFSM	1.01	1.19	.79	.92	.86	2.84	2.82	2.47	1.19	1.04	1.52	.81
IN.	1.17	1.32	.91	1.06	.89	3.27	3.15	2.84	1.32	1.20	1.75	.90

CAL YR 1972 TOTAL 526,253 MEAN 1,438 MAX 9,700 MIN 616 CFSM 1.31 IN 17.80
WTR YR 1973 TOTAL 585,234 MEAN 1,603 MAX 5,610 MIN 710 CFSM 1.46 IN 19.79

NOTE.--No gage-height July 11 to Aug. 15.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04057510 Sturgeon River near Nahma Junction, Mich.

LOCATION.--Lat 45°56'35", long 86°42'20", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.17, T.41 N., R.19 W., Delta County, 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 mi² (474 km²).

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.

AVERAGE DISCHARGE.--7 years, 211 ft³/s (5.976 m³/s), 15.66 in/yr (398 mm/yr).

EXTREMES.--Current year: Maximum daily discharge, 820 ft³/s (23.2 m³/s) Mar. 15; maximum gage height, 8.06 ft (2.457 m) Mar. 15, backwater from ice; minimum discharge, 64 ft³/s (1.81 m³/s) July 24, 25, Sept. 19 (gage height, 3.95 ft or 1.204 m).
Period of record: Maximum discharge, 1,580 ft³/s (44.7 m³/s) Apr. 18, 1971, Apr. 30, 1972 (gage height, 9.85 ft or 3.002 m); minimum, 39 ft³/s (1.10 m³/s) Sept. 20, 1967 (gage height, 3.71 ft or 1.131 m).

REMARKS.--Records good except those for winter periods, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	188	138	115	105	125	88	400	313	243	197	522	74
2	171	159	110	105	120	88	566	587	217	186	608	71
3	156	244	110	105	120	90	620	686	201	195	479	96
4	147	241	105	105	120	92	582	633	273	170	344	121
5	139	224	105	105	115	96	530	565	328	153	256	126
6	138	210	100	105	115	105	480	505	344	139	196	112
7	143	197	100	105	110	140	443	464	315	130	163	99
8	139	216	98	105	110	210	405	530	324	121	146	88
9	131	218	96	100	110	205	366	619	341	111	147	82
10	125	202	96	100	105	200	332	621	338	106	137	76
11	121	188	94	98	105	320	306	634	308	100	125	72
12	116	178	94	96	100	500	290	626	283	103	117	69
13	112	168	94	94	100	650	267	578	243	109	107	67
14	109	157	94	92	98	750	256	508	207	101	105	66
15	106	150	94	92	96	820	255	447	184	93	99	67
16	103	144	94	90	96	769	417	405	169	86	93	67
17	102	139	92	94	94	666	721	376	162	80	105	66
18	101	134	92	105	94	566	685	342	166	76	102	65
19	100	130	92	120	92	531	603	313	166	84	97	66
20	100	125	92	130	90	494	568	289	166	80	146	68
21	127	121	92	140	90	435	638	267	155	74	129	66
22	158	118	92	145	90	403	643	243	170	69	111	90
23	192	103	92	145	88	387	592	225	227	66	101	102
24	238	148	94	150	88	381	518	204	196	64	94	93
25	219	145	94	150	88	383	456	190	165	64	88	87
26	201	133	96	145	88	393	404	197	153	70	86	99
27	185	135	98	140	88	398	357	195	147	109	86	135
28	171	134	100	140	88	393	320	231	157	128	81	137
29	159	126	100	135	-----	396	290	358	172	144	76	127
30	149	120	100	130	-----	395	266	322	201	135	73	115
31	142	-----	105	130	-----	385	-----	278	-----	155	74	-----
TOTAL	4,488	4,845	3,030	3,601	2,823	11,729	13,576	12,751	6,721	3,498	5,093	2,669
MEAN	145	162	97.7	116	101	378	453	411	224	113	164	89.0
MAX	238	244	115	150	125	820	721	686	344	197	608	137
MIN	100	103	92	90	88	88	255	190	147	64	73	65
CFSM	.79	.89	.53	.63	.55	2.07	2.48	2.25	1.22	.62	.90	.49
IN.	.91	.98	.62	.73	.57	2.38	2.76	2.59	1.37	.71	1.04	.54
CAL YR 1972	TOTAL 66,780	MEAN 182	MAX 1,570	MIN 65	CFSM .99	IN 13.57						
WTR YR 1973	TOTAL 74,824	MEAN 205	MAX 820	MIN 64	CFSM 1.12	IN 15.21						

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04057800 Middle Branch Escanaba River at Humboldt, Mich.

LOCATION.--Lat 46°29'57", long 87°53'11", in SW $\frac{1}{4}$ sec.1, T.47 N., R.29 W., Marquette County, 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.--46.2 mi² (119.1 km²).

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

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.

AVERAGE DISCHARGE.--14 years, 61.7 ft³/s (1.747 m³/s), 18.21 in/yr (462 mm/yr).

EXTREMES.--Current year: Maximum discharge, 642 ft³/s (18.2 m³/s) Apr. 17 (gage height, 5.85 ft or 1.783 m); minimum, 11 ft³/s (0.31 m³/s) Sept. 18 (gage height, 1.71 ft or 0.521 m).

Period of record: Maximum discharge, 1,640 ft³/s (46.4 m³/s) Apr. 24, 1960 (gage height, 8.30 ft or 2.530 m, from flood-mark); minimum, 4.5 ft³/s (0.13 m³/s) Aug. 18, 1961, Aug. 11, 1962; minimum gage height, 1.07 ft (0.326 m) Aug. 24, 1960.

REMARKS.--Records good except those for winter periods, which are fair. From July 1960 to June 1972, some diversion 100 ft (30 m) above station by industry for iron ore processing; figures of runoff adjusted. Records of water temperatures for current year are published in Part 2 of this report.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	142	52	44	40	25	20	198	120	54	71	50	65
2	110	84	42	39	25	20	205	313	51	58	39	44
3	114	198	40	37	25	22	202	526	49	50	30	37
4	156	223	38	36	25	30	183	395	51	43	25	38
5	144	169	36	35	25	27	156	308	47	39	22	32
6	173	137	35	35	25	25	146	295	44	35	21	26
7	221	144	34	34	25	57	143	297	45	31	20	22
8	185	174	34	33	24	80	123	423	50	27	21	18
9	135	172	33	33	23	74	108	579	72	25	27	17
10	104	144	32	32	23	72	97	463	61	29	23	16
11	92	126	32	31	22	128	92	495	52	26	21	15
12	85	107	32	31	22	190	89	373	46	31	19	14
13	77	93	32	30	22	217	81	286	39	34	19	13
14	71	82	32	30	22	234	87	222	35	27	30	14
15	66	74	33	30	22	261	138	182	34	23	23	14
16	62	70	34	30	22	299	312	154	32	21	19	17
17	59	65	34	30	21	293	587	137	47	20	19	13
18	55	64	35	38	21	263	434	116	53	20	35	12
19	52	62	36	48	20	232	348	103	44	40	55	13
20	51	58	36	40	20	189	316	92	38	34	150	14
21	59	56	35	35	19	171	318	85	34	26	136	14
22	67	54	34	32	19	152	303	78	31	23	67	48
23	75	52	34	30	20	141	252	72	33	20	49	43
24	76	50	33	29	20	133	195	67	52	19	40	33
25	71	49	32	28	20	140	156	69	51	19	32	33
26	70	50	32	27	20	163	128	81	91	43	29	36
27	72	50	32	26	20	176	109	74	105	105	27	69
28	67	48	32	26	20	191	97	69	139	65	22	65
29	61	47	31	26	-----	200	88	62	115	43	20	45
30	55	45	34	26	-----	205	79	57	86	41	26	34
31	53	-----	39	25	-----	204	-----	57	-----	55	86	-----
TOTAL	2,880	2,799	1,072	1,002	617	4,609	5,770	6,650	1,681	1,143	1,202	874
MEAN	92.9	93.3	34.6	32.3	22.0	149	192	215	56.0	36.9	38.8	29.1
MAX	221	223	44	48	25	299	587	579	139	105	150	69
MIN	51	45	31	25	19	20	79	57	31	19	19	12
CFSM	2.02	2.03	.75	.70	.48	3.24	4.17	4.67	1.22	.80	.84	.63
IN.	2.33	2.26	.87	.81	.50	3.73	4.67	5.38	1.36	.92	.97	.71

CAL YR 1972 TOTAL 29,128 MEAN 79.6 MAX 829 MIN 11 CFMS 1.73 IN 23.56
WTR YR 1973 TOTAL 30,299 MEAN 83.0 MAX 587 MIN 12 CFMS 1.80 IN 24.50

STREAMS TRIBUTARY TO LAKE MICHIGAN

04057811 Greenwood Reservoir near Greenwood, Mich.

LOCATION.--Lat 46°26'32", long 87°48'02", in NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.27, T.47 N., R.28 W., Marquette County, at the downstream side of dam, and 3.7 mi (6.0 km) southwest of Greenwood.

DRAINAGE AREA.--67.4 mi² (174.6 km²)

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.

EXTREMES.--December 1972 to September 1973: Maximum contents during period, 21,220 acre-ft (26.2 hm³) May 10 (elevation 1,513.4 ft or 561.28 m); minimum since first filling, 18,300 acre-ft (22.6 hm³) Aug. 17 (elevation 1,511.0 ft or 460.55 m).

REMARKS.--Records good. The reservoir is formed by an earth/rock-fill main dam and several earth-fill 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 hm³) at spillway elevation 1515 ft (461.8 m). 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 m³) at elevation 1480 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). Above elevation of 1515 ft (461.8 m), water flows over concrete spillway into Middle Branch Escanaba River about 2,000 ft (610 m) below sta no. 04057814.

MONTHEND ELEVATION AND CONTENTS AT 2400, PERIOD DECEMBER 1972 TO SEPTEMBER 1973

Date	Elevation (feet)	Contents (acre- feet)	Change in contents during month	
			(Acre- feet)	Equivalent in ft ³ /s
Nov. 30	—	0	0	0
Dec. 31	1,484.3	960	+960	+15.6
	—	—	—	—
Jan. 31	1,488.6	2,240	+1,280	+20.0
Feb. 28	1,489.3	2,520	+280	+5.0
Mar. 31	1,506.6	13,600	+11,080	+180
Apr. 30	1,512.3	19,860	+6,260	+105
May. 31	1,512.2	19,740	-120	-2.0
June 30	1,512.2	19,740	0	0
July 31	1,511.7	19,140	-600	-9.8
Aug. 31	1,511.6	19,020	-120	-2.0
Sept. 30	1,511.7	19,140	+120	+2.0
Period December 1972 to September 1973	—	—	+19,140	+26.4

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04057813 Greenwood Diversion near Greenwood, Mich.

LOCATION.--Lat 46°26'04", long 87°46'10", in NW 1/4 sec. 35, T. 47 N., R. 28 W., Marquette County, at downstream end of pipe line, 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.

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

GAGE.--Water-stage recorder. 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.

EXTREMES.--Maximum daily discharge during period, 27 ft³/s (0.76 m³/s) July 14-16; no flow Dec. 27 to Jan. 6.

REMARKS.--Records 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 returned to Middle Branch Escanaba River via another Green Creek (tributary to Middle Branch Escanaba River); 27 mi (43 km) below station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				0	.18	.18	.12	.21	.24	16	26	23
2				0	.18	.18	.12	.21	.24	15	25	23
3				0	.18	7.9	.12	.21	.24	15	25	23
4				0	.18	1.4	.12	.21	.24	15	25	22
5				0	.18	6.9	.12	.21	.24	16	26	22
6				0	.18	10	.12	.21	.24	16	26	19
7				.24	.18	6.9	.12	.21	.24	16	26	17
8				2.6	.18	.18	.18	.21	2.5	16	26	16
9				.30	.18	.12	.18	.21	3.9	17	26	16
10				.42	.18	.12	.18	.21	3.9	19	26	16
11				.24	.18	.12	.18	.21	3.9	22	26	14
12				1.9	.18	.12	.18	.21	5.5	25	26	11
13				1.9	.18	.12	.18	.21	8.0	26	26	6.9
14				1.6	3.5	.12	.18	.21	8.7	27	26	3.5
15				1.5	4.8	.12	.18	.21	9.7	27	24	1.9
16				1.6	4.6	.12	.18	.21	10	27	23	1.8
17				1.8	3.4	.12	.18	.21	10	26	23	1.7
18				.78	3.9	.12	.18	.21	12	26	23	1.5
19				.78	5.0	.12	.18	.21	14	26	22	8.2
20				.78	7.3	.12	.18	.21	15	26	22	22
21				.78	10	.12	.18	.21	15	26	22	26
22				.78	12	.12	.18	.21	15	26	22	12
23				.72	13	.12	.18	.21	15	26	22	.36
24				.72	13	.12	.18	.21	15	26	23	.36
25				.30	13	.12	.18	.21	15	26	23	.42
26				.18	14	.12	.18	.24	15	25	23	.42
27			0	.18	15	.12	.18	.24	15	24	24	.48
28			0	.18	16	.12	.18	.24	15	24	24	.48
29			0	.18	-----	.12	.18	.24	16	25	23	.48
30			0	.18	-----	.12	.21	.24	16	26	22	.48
31			0	.18	-----	.12	-----	.24	-----	26	22	-----
TOTAL				20.82	140.84	72.04	5.01	6.69	260.78	699	748	310.98
MEAN				.67	5.03	2.32	.17	.22	8.69	22.5	24.1	10.4
MAX				2.6	16	18	.21	.24	16	27	26	26
MIN				0	.18	.12	.12	.21	.24	15	22	.36

NOTE.--No gage-height record from Apr. 15 to May 15.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04057814 Greenwood Release near Greenwood, Mich.

LOCATION.--Lat 46°26'22", long 87°47'52", in NW¼ SW¼ sec.27, T.47 N., R.28 W., Marquette County, on left bank of outlet of Greenwood Afterbay releasing to the 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 mi² (174.6 km²).

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

GAGE.--Nonrecording gage. Altitude of gage is 1,480 ft (451 m) from topographic map (nearest 10 ft).

EXTREMES.--Current year: Maximum daily discharge, 290 ft³/s (8.21 m³/s) Oct. 1; minimum daily, 10 ft³/s (0.28 m³/s) Dec. 29, 30

REMARKS.--Records fair. Since December 1972, flow from Greenwood Reservoir (see sta 04057811) below spillway elevation 1515 ft (462 m) is completely regulated by the release structure from the afterbay into the Middle Branch Escanaba River. Since January 1973, water diverted immediately above station (see sta 04057813) to Green Creek for iron ore processing and returned to Middle Branch Escanaba River 27 mi (43 km) below station via another Green Creek. During times when reservoir spills, flow bypasses this station and returns to the Middle Branch Escanaba River 0.5 mi (0.8 km) below station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	290	80	60	11	24	21	22	46	43	20	24	23
2	260	95	60	11	24	19	22	46	43	20	24	23
3	240	150	55	11	24	21	22	46	43	18	24	23
4	220	200	55	11	24	22	24	46	43	18	24	25
5	220	220	50	15	24	22	26	46	43	18	24	24
6	230	230	47	15	24	22	29	46	43	16	25	24
7	230	210	45	15	24	22	33	46	43	15	25	24
8	250	210	45	15	24	22	37	46	42	17	26	24
9	260	210	43	15	24	21	39	46	38	18	25	24
10	240	210	42	15	23	25	40	46	37	21	22	23
11	180	200	40	15	23	26	40	45	37	22	22	23
12	150	180	39	15	23	26	40	45	35	25	23	24
13	130	160	38	15	22	26	42	44	34	25	23	24
14	105	130	38	15	22	26	42	44	32	27	22	24
15	90	110	38	15	22	22	43	44	31	30	22	24
16	80	95	37	19	22	21	44	44	30	27	23	24
17	75	90	36	23	22	22	44	38	31	19	23	24
18	70	80	31	24	21	22	46	32	29	19	23	25
19	70	75	19	24	20	19	46	30	28	19	22	24
20	65	70	22	24	19	20	46	26	26	18	22	24
21	65	70	13	24	21	21	46	24	26	17	21	24
22	80	70	12	24	21	21	46	25	26	17	22	25
23	90	65	19	24	20	21	46	25	27	16	22	25
24	100	65	22	23	20	21	46	25	26	19	22	25
25	95	65	26	24	19	21	46	25	28	21	22	25
26	95	65	32	24	19	21	46	24	30	19	22	25
27	85	65	27	24	21	21	46	24	30	18	22	25
28	80	65	12	24	21	21	46	24	31	19	22	25
29	80	65	10	24	-----	22	46	23	31	21	22	24
30	75	60	10	25	-----	22	46	33	23	25	22	24
31	75	-----	11	23	-----	22	-----	43	-----	26	22	-----
TOTAL	4,375	3,660	1,034	586	617	681	1,187	1,147	1,009	630	707	724
MEAN	141	122	33.4	18.9	22.0	22.0	39.6	37.0	33.6	20.3	22.8	24.1
MAX	290	230	60	25	24	26	46	46	43	30	26	25
MIN	65	60	10	11	19	19	22	23	23	15	21	23
CFSM	2.09	1.81	.50	.28	.33	.33	.59	.55	.50	.30	.34	.36
IN,	2.41	2.02	.57	.32	.34	.38	.66	.63	.56	.35	.39	.40

WTR YR 1973 TOTAL 16,357 MEAN 44.8 MAX 290 MIN 10 CFSM .66 IN 9.03

Note.--No gage-height record Oct. 1 to Dec. 28.

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04057820 Middle Branch Escanaba River near Greenwood, Mich.

LOCATION.--Lat 46°25'13", long 87°47'53", NW¼ sec.3, T.46 N., R.28 W., Marquette County, 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 mi² (189.8 km²).

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.

EXTREMES.--Current year: Maximum discharge, 762 ft³/s (21.6 m³/s) May 10 (gage height, 11.99 ft or 3.655 m); minimum daily, 12 ft³/s (0.34 m³/s) Dec. 28, Jan. 2-4, result of construction upstream.
Period of record: Maximum discharge, 1,060 ft³/s (30.0 m³/s) May 5, 1972 (gage height, 13.35 ft or 4.069 m).

REMARKS.--Records 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, diversion 2.3 mi (3.7 km) above station at Greenwood Afterbay to Green Creek (see sta. 04057813) for iron ore processing and returned to Middle Branch Escanaba River 27 mi (43 km) below station via another Green Creek.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	208	83	61	13	26	26	32	176	88	75	52	29
2	284	101	60	12	26	26	35	328	82	48	46	27
3	250	158	59	12	26	26	35	500	80	32	42	28
4	226	209	59	12	26	26	33	580	80	33	40	29
5	226	233	50	14	26	26	34	546	76	35	36	28
6	242	230	48	17	26	26	38	518	72	29	32	28
7	245	220	47	18	26	26	44	480	75	29	29	27
8	257	218	46	18	26	26	44	520	74	28	29	27
9	268	221	45	18	26	26	44	602	77	28	27	27
10	252	218	43	18	26	26	44	702	80	27	26	26
11	170	206	42	18	26	28	44	628	72	26	25	26
12	152	194	40	18	26	30	43	470	68	30	25	26
13	134	170	38	18	26	30	43	408	63	29	27	26
14	104	140	38	18	26	30	43	352	56	29	26	26
15	90	113	38	18	26	28	52	328	52	32	26	26
16	84	94	39	20	26	25	70	280	50	36	26	26
17	78	92	39	24	26	26	152	248	50	33	28	26
18	75	83	32	25	25	26	368	208	50	31	29	26
19	70	76	20	25	21	28	480	184	48	33	48	26
20	68	74	24	25	21	26	460	163	46	32	36	26
21	64	73	15	26	24	28	460	144	43	30	29	26
22	86	71	13	26	26	29	441	128	44	29	27	26
23	92	70	20	26	26	27	400	125	46	27	26	27
24	107	68	23	26	26	28	344	102	44	28	26	28
25	101	69	28	26	26	29	296	112	46	29	26	28
26	98	66	34	26	26	31	248	128	52	39	26	29
27	84	66	29	26	26	31	208	129	57	38	24	30
28	84	66	12	26	26	30	176	123	70	38	24	30
29	82	66	13	26	-----	32	152	97	80	34	25	29
30	78	63	14	26	-----	31	136	93	77	48	29	28
31	76	-----	13	26	-----	30	-----	93	-----	52	30	-----
TOTAL	4,535	3,811	1,082	647	715	863	4,999	9,495	1,898	1,067	947	817
MEAN	146	127	34.9	20.9	25.5	27.8	167	306	63.3	34.4	30.5	27.2
MAX	208	233	61	26	26	32	480	702	88	75	52	30
MIN	64	63	12	12	21	25	32	93	43	26	24	26

WTR YR 1973 TOTAL 30,876 MEAN 84.6 MAX 702 MIN 12

STREAMS TRIBUTARY TO LAKE MICHIGAN

04058000 Middle Branch Escanaba River near Ishpeming, Mich.

LOCATION.--Lat 46°23'40", long 87°45'30", in NW¼SW¼ sec.12, T.46 N., R.28 W., Marquette County, on left bank 0.5 mi (0.8 km) downstream from County Highway 581, 6 mi (10 km) southwest of Ishpeming, and 10 mi (16 km) east of Republic.

DRAINAGE AREA.--128 mi² (332 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 1,389.02 ft (423.373 m) above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.--19 years, 141 ft³/s (3.993 m³/s), 14.96 in/yr (380 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,180 ft³/s (33.4 m³/s) May 10 (gage height, 8.44 ft or 2.573 m); minimum daily, 44 ft³/s (1.25 m³/s) Dec. 29; minimum gage height, 1.65 ft (0.503 m) Sept. 19.

Period of record: Maximum discharge, 2,680 ft³/s (75.9 m³/s) Apr. 25, 1960 (gage height, 12.55 ft or 3.825 m); minimum, 12 ft³/s (0.34 m³/s) Aug. 21-23, 1957; minimum gage height, 1.17 ft (0.357 m) Aug. 22, 23, 1957.

REMARKS.--Records good except those for winter periods, which are fair. Some regulation 6 mi (10 km) above station since December 1972 (see sta 04057814). Since January 1973, some flow diverted 6 mi (10 km) above station for iron ore processing plant (see sta 04057813) and returned 22 mi (35 km) below station by Green Creek. Records of water temperatures for the current year published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	458	127	105	49	56	56	233	277	147	146	121	104
2	385	166	100	48	58	56	258	543	141	121	101	99
3	340	347	98	48	58	56	263	919	134	83	84	91
4	337	455	92	50	58	58	243	1,020	135	79	74	85
5	328	447	88	52	58	58	209	910	129	74	66	81
6	370	399	88	52	56	58	200	781	124	67	60	73
7	406	369	84	52	56	90	201	699	125	61	51	66
8	404	375	80	51	56	163	194	805	131	56	52	61
9	378	375	78	50	56	171	175	1,050	150	52	54	57
10	331	361	76	50	56	165	157	1,160	143	54	53	54
11	274	338	74	50	56	212	148	1,150	136	52	50	52
12	223	309	74	50	56	222	147	1,050	123	56	48	50
13	194	269	74	50	56	248	139	890	108	59	47	53
14	175	240	74	50	56	264	136	732	98	53	55	51
15	160	193	76	50	56	292	163	600	91	50	54	49
16	149	173	78	50	56	310	287	506	89	51	52	49
17	145	167	78	52	55	315	534	435	91	59	52	47
18	137	153	76	58	54	314	727	371	98	55	58	46
19	127	147	56	62	52	265	768	325	97	57	64	47
20	123	145	52	60	51	231	738	288	88	56	153	48
21	130	138	50	58	54	225	718	262	84	52	155	48
22	149	128	50	56	56	216	716	235	83	50	110	68
23	174	125	50	54	56	200	670	214	89	45	88	75
24	200	125	52	55	56	193	592	194	89	45	75	74
25	204	120	54	55	56	195	498	184	85	48	68	74
26	185	120	58	55	56	206	413	203	98	93	65	81
27	170	115	60	55	56	219	346	202	119	90	60	99
28	162	115	46	55	56	221	298	188	146	90	56	95
29	149	110	44	55	-----	224	260	173	160	83	51	84
30	137	110	46	55	-----	230	230	158	171	91	50	75
31	131	-----	50	55	-----	228	-----	153	-----	130	82	-----
TOTAL	7,235	6,761	2,161	1,642	1,562	5,961	10,661	16,677	3,502	2,158	2,209	2,036
MEAN	233	225	69.7	53.0	55.8	192	355	538	117	69.6	71.3	67.9
MAX	458	455	105	62	58	315	768	1,160	171	146	155	104
MIN	123	110	44	48	51	56	136	153	83	45	47	46
CFSM	1.82	1.76	.54	.41	.44	1.50	2.77	4.20	.91	.54	.56	.53
IN.	2.10	1.96	.63	.48	.45	1.73	3.10	4.85	1.02	.63	.64	.59

CAL YR 1972 TOTAL 67,290 MEAN 184 MAX 1,770 MIN 42 CFSM 1.44 IN 19.56
WTR YR 1973 TOTAL 62,565 MEAN 171 MAX 1,160 MIN 44 CFSM 1.34 IN 18.18

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04058100 Middle Branch Escanaba River near Princeton, Mich.

LOCATION.--Lat 46°19'02", long 87°30'07", in NW¼ sec.12, T.45 N., R.26 W., Marquette County, 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 mi² (544 km²).

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).

AVERAGE DISCHARGE.--12 years, 221 ft³/s (6.259 m³/s), 14.29 in/yr (363 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,470 ft³/s (41.6 m³/s) May 11 (gage height, 6.12 ft or 1.865 m); minimum, 5.6 ft³/s (0.16 m³/s) Jan. 14, 15 (gage height, 0.63 ft or 0.192 m); minimum daily, 32 ft³/s (0.91 m³/s) Sept. 11.
Period of record: Maximum discharge, 2,580 ft³/s (73.1 m³/s) May 6, 1972 (gage height, 7.85 ft or 2.393 m); minimum recorded, 2.2 ft³/s (0.062 m³/s) Oct. 5, 1964; minimum daily, 4.1 ft³/s (0.12 m³/s) Feb. 4, 1967.
Flood of Apr. 25 or 26, 1960 reached a stage of 10.5 ft (3.20 m) from floodmark (discharge 3,850 ft³/s or 109 m³/s).

REMARKS.--Records good except those for winter periods, which are fair. Flow regulated by powerplant above station. Since December 1972, additional regulation 27 mi (43 km) above station (see sta 04057814). Since January 1973, some flow diverted by Green Creek 27 mi (43 km) above station (see sta 04057813) by industry for iron ore processing and returned by Green Creek 0.3 mi (0.5 km) below station. Records of chemical analyses for the current year are published in Part 2 of this report

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	671	253	202	95	95	80	402	413	282	407	298	145
2	589	257	205	105	105	80	480	677	278	361	272	213
3	519	358	208	95	105	80	500	1,040	278	291	243	391
4	488	480	150	105	95	95	483	1,230	272	193	157	323
5	473	637	135	105	105	80	433	1,230	203	106	156	148
6	530	618	140	105	105	80	395	1,090	224	114	135	205
7	581	561	140	105	95	140	366	974	225	116	135	160
8	577	552	150	105	80	370	365	1,040	224	116	95	162
9	547	540	140	105	80	440	362	1,170	234	117	96	166
10	505	525	140	105	95	400	347	1,380	232	117	96	96
11	453	499	140	95	95	380	329	1,450	278	117	96	32
12	370	467	140	95	95	310	326	1,370	248	134	97	104
13	314	431	130	80	105	300	297	1,230	233	134	97	140
14	352	402	140	80	105	400	273	1,060	254	132	110	118
15	341	343	105	70	120	622	276	896	235	133	111	114
16	276	307	105	95	120	646	345	766	208	132	111	114
17	275	305	130	80	105	607	570	671	201	122	114	105
18	275	299	120	95	105	542	855	591	165	126	113	114
19	274	297	120	105	105	478	953	522	156	88	114	113
20	208	295	120	95	105	495	969	469	160	113	126	87
21	209	224	105	95	120	423	947	430	161	118	257	86
22	209	222	105	105	105	362	938	406	177	123	382	88
23	245	217	95	95	95	220	908	400	60	123	235	90
24	264	189	95	95	95	419	841	395	106	115	116	117
25	349	186	95	120	80	422	747	390	324	118	118	118
26	348	186	95	95	95	402	644	348	318	103	119	162
27	305	223	95	95	95	399	553	287	243	109	126	163
28	256	193	105	95	80	353	484	289	200	111	130	187
29	256	187	105	105	-----	354	435	308	220	149	130	188
30	256	206	105	95	-----	402	408	305	343	272	130	188
31	336	-----	95	95	-----	396	-----	263	-----	326	121	-----
TOTAL	11,651	10,459	3,955	3,010	2,785	10,777	16,231	23,090	6,742	4,836	4,636	4,437
MEAN	376	349	128	97.1	99.5	348	541	745	225	156	150	148
MAX	671	637	208	120	120	646	969	1,450	343	407	382	391
MIN	208	186	95	70	80	80	273	263	60	88	95	32
CFSM	1.79	1.66	.61	.46	.47	1.66	2.58	3.55	1.07	.74	.71	.70
IN.	2.06	1.85	.70	.53	.49	1.91	2.88	4.09	1.19	.86	.82	.79
CAL YR 1972	TOTAL 109,321.0	MEAN 299	MAX 2,550	MIN 8.0	CFSM 1.42	IN 19.37						
WTR YR 1973	TOTAL 102,609.0	MEAN 281	MAX 1,450	MIN 32	CFSM 1.34	IN 18.18						

STREAMS TRIBUTARY TO LAKE MICHIGAN

04058190 Schweitzer Reservoir near Palmer, Mich.

LOCATION.--Lat 46°25'00", long 87°38'48", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.2, T.46 N., R.27 W., Marquette County, 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 mi² (59.8 km²).

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.

EXTREMES.--Current year: Maximum contents, 5,620 acre-ft (6.93 hm³) May 2, 3 (elevation, 1,338.8 ft or 408.07 m); minimum, 3,780 acre-ft (4.66 hm³) Mar. 6, 7 (elevation, 1,333.1 ft or 406.33 m).

Period of record: Maximum contents recorded, 5,900 acre-ft (7.27 hm³) May 31, 1970 (elevation, 1,339.5 ft or 408.28 m); minimum recorded since first filling, 3,050 acre-ft (3.76 hm³) Apr. 7, 1970 (elevation, 1,330.2 ft or 405.44 m).

REMARKS.--Records good. Reservoir is formed by an earth-fill dam with fixed crest concrete spillway completed in 1963. Usable capacity of reservoir is 5,300 acre-ft (6.53 hm³) at spillway elevation 1,338.00 ft (407.822 m). The dam includes a discharge pipe equipped with valve to control released flow to Schweitzer Creek (see sta 04058200). An average of 20 ft³/s (0.57 m³/s) was diverted from reservoir for iron ore processing and 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 averaged 6.2 ft³/s (0.18 m³/s) for the year. An average of 2.8 ft³/s (0.08 m³/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.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

Date	Elevation (feet)	Contents (acre- feet)	Change in contents during month	
			(Acre- feet)	Equivalent in ft ³ /s
Sept. 30	1,338.1	5,340	--	--
Oct. 31	1,338.0	5,300	-40	-0.7
Nov. 30	1,338.0	5,300	0	0
Dec. 31	1,337.6	5,160	-140	-2.3
Calendar year 1972	--	--	-140	- .2
Jan. 31	1,337.1	4,980	-180	-2.9
Feb. 28	1,333.5	3,900	-1,080	-19.4
Mar. 31	1,338.1	5,340	+1,440	+23.4
Apr. 30	1,338.0	5,300	-40	- .7
May 31	1,337.5	5,120	-180	-2.9
June 30	1,337.9	5,260	+140	+2.4
July 31	1,338.2	5,380	+120	+2.0
Aug. 31	1,338.2	5,380	0	0
Sept. 30	1,338.0	5,300	-80	-1.3
Water year 1972-73	--	--	-40	- .1

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04058200 Schweitzer Creek near Palmer, Mich.

LOCATION.--Lat 46°24'40", long 87°37'27", in SW¼ sec.1, T.46 N., R.27 W., Marquette County, on right bank 10 ft (3 m) upstream from highway bridge, 2.5 mi (4.0 km) southwest of Palmer.

DRAINAGE AREA.--23.6 mi² (61.1 km²).

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.

AVERAGE DISCHARGE.--13 years, 17.2 ft³/s (0.487 m³/s).

EXTREMES.--Current year: Maximum discharge, 270 ft³/s (7.65 m³/s) May 3 (gage height, 4.76 ft or 1.451 m); minimum, 3.8 ft³/s (0.11 m³/s) Dec. 11 (gage height, 2.81 ft or 0.856 m); minimum daily, 4.2 ft³/s (0.12 m³/s) Feb. 23 to Mar. 2.

Period of record: Maximum discharge, 860 ft³/s (24.4 m³/s) May 31, 1970 (gage height, 6.50 ft or 1.981 m); minimum, 0.4 ft³/s (0.011 m³/s) Sept. 6, 1962 (gage height, 1.22 ft or 0.372 m); minimum daily, 1.0 ft³/s (0.028 m³/s) Apr. 9-18, May 5, 6, 1963.

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 2.8 ft³/s (0.08 m³/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 14 ft³/s (0.40 m³/s) was diverted from Schweitzer Reservoir by industry for iron ore processing and returned to the Middle Branch Escanaba River via Green Creek.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	11	6.4	5.0	4.7	4.2	23	24	5.6	5.5	52	34
2	22	28	5.9	4.9	4.7	4.2	50	176	5.5	5.5	38	27
3	21	99	5.7	4.9	4.7	4.4	56	244	5.6	5.3	29	26
4	32	89	5.7	4.9	4.7	4.5	42	156	5.5	5.3	25	28
5	28	64	5.1	4.9	4.7	4.4	29	118	5.8	5.2	25	24
6	51	47	5.1	4.7	4.7	4.3	25	92	5.6	5.3	22	19
7	59	42	5.1	4.7	4.5	6.6	26	78	5.8	5.5	23	15
8	45	52	5.0	4.7	4.5	6.6	21	150	6.1	5.3	25	12
9	27	47	5.0	4.7	4.5	6.6	14	175	7.8	5.3	27	11
10	20	39	5.0	4.7	4.5	6.4	11	168	16	5.2	25	11
11	16	34	4.7	4.7	4.5	12	9.0	160	14	5.1	25	11
12	13	27	5.0	4.7	4.5	9.5	7.4	110	12	5.6	23	8.7
13	12	22	5.0	4.7	4.4	7.5	6.1	73	9.6	5.2	26	6.5
14	11	19	4.9	4.7	4.4	7.7	6.1	53	8.2	5.1	32	5.7
15	8.8	17	5.1	4.8	4.4	9.1	18	40	5.6	5.1	29	5.2
16	9.3	15	4.9	4.8	4.4	7.4	118	33	5.4	5.1	25	5.0
17	7.4	14	4.8	4.7	4.4	6.4	183	26	6.2	5.1	25	5.0
18	5.8	11	4.9	5.2	4.4	5.7	118	20	5.5	5.4	25	4.9
19	5.3	9.5	4.9	5.4	4.4	5.7	81	15	5.4	21	31	5.0
20	5.2	9.7	4.9	4.9	4.4	5.7	67	11	5.4	33	65	4.8
21	6.0	9.9	4.9	4.9	4.3	5.6	65	8.3	5.5	26	51	5.0
22	8.1	9.9	4.9	4.9	4.4	5.7	67	6.9	5.7	25	34	11
23	17	9.3	4.9	4.9	4.2	5.8	56	6.1	5.9	23	28	18
24	21	8.6	4.9	4.9	4.2	6.0	41	5.9	5.5	23	24	9.9
25	21	8.3	4.9	4.8	4.2	6.3	28	6.1	5.8	26	22	7.7
26	22	9.1	4.9	4.8	4.2	6.3	19	5.9	5.6	67	22	8.9
27	21	9.5	4.9	4.8	4.2	6.2	13	5.8	8.6	62	23	20
28	17	8.6	4.9	4.7	4.2	6.1	9.7	5.8	6.6	46	21	20
29	12	7.4	4.9	4.7	-----	6.1	6.5	5.6	6.0	39	20	13
30	10	6.7	5.0	4.7	-----	5.9	5.7	5.5	5.7	48	20	8.4
31	10	-----	5.1	4.7	-----	8.6	-----	5.5	-----	66	34	-----
TOTAL	595.9	783.5	157.3	149.5	124.3	197.5	1,221.5	1,989.4	207.5	600.1	896	390.7
MEAN	19.2	26.1	5.07	4.82	4.44	6.37	40.7	64.2	6.92	19.4	28.9	13.0
MAX	59	99	6.4	5.4	4.7	12	183	244	16	67	65	34
MIN	5.2	6.7	4.7	4.7	4.2	4.2	5.7	5.5	5.4	5.1	20	4.8
CAL YR 1972	TOTAL 7,255.2	MEAN 19.8	MAX 302	MIN 4.3								
WTR YR 1973	TOTAL 7,313.2	MEAN 20.0	MAX 244	MIN 4.2								

STREAMS TRIBUTARY TO LAKE MICHIGAN

04058300 Warner Creek near Palmer, Mich.

LOCATION.--Lat 46°24'09", long 87°32'39", in NW¼ sec.10, T.46 N., R.26 W., Marquette County, 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 mi² (36.8 km²).

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 1971-72.

GAGE.--Water-stage recorder. Altitude of gage is 1,190 ft (363 m) from topographic map (nearest 10 ft). Prior to Aug. 22, 1961, nonrecording gage at present site and datum.

AVERAGE DISCHARGE.--7 years (1962-68), 15.8 ft³/s (0.447 m³/s), 15.11 in/yr (384 mm/yr).
(Current year).--29.7 ft³/s (0.841 m³/s).

EXTREMES.--Current year: Maximum discharge, 228 ft³/s (6.46 m³/s) May 3 (gage height, 5.61 ft or 1.710 m); minimum, 6.6 ft³/s (0.19 m³/s) Sept. 17, 21 (gage height, 1.23 ft or 0.375 m).

Period of record: Maximum discharge, 267 ft³/s (7.56 m³/s) Apr. 14, 1964 (discharge measurement); maximum gage height 5.61 ft (1.710 m) Apr. 14, 1964, May, 3, 1973 (backwater from Schweitzer Creek); minimum discharge, 0.5 ft³/s (0.014 m³/s) Sept. 10, 1961 (gage height, 0.79 ft or 0.241 m).

REMARKS.--Records fair except those for winter periods and those over 25 ft³/s (0.71 m³/s), which are poor. Headwaters are affected by waste effluent and mine pumpage.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	12	12	8.5	8.0	7.0	42	47	18	34	72	15
2	17	21	11	8.5	8.0	7.0	106	152	18	28	34	13
3	16	144	10	8.5	8.0	7.0	114	212	17	23	21	19
4	22	151	9.0	8.5	8.0	7.0	89	147	19	21	17	17
5	18	106	9.0	8.5	8.0	7.5	66	110	21	18	13	14
6	53	65	8.5	8.0	7.5	7.5	51	82	20	18	13	12
7	82	49	8.5	8.0	7.5	10	57	61	21	16	14	9.8
8	49	64	8.5	8.0	7.0	40	41	126	22	15	13	8.5
9	25	58	8.5	8.0	7.0	50	30	154	26	14	15	8.2
10	18	40	8.5	8.0	7.0	78	26	148	19	16	15	7.9
11	17	30	8.0	8.0	7.0	104	25	148	17	14	14	8.7
12	16	23	8.0	8.0	7.0	146	26	123	15	18	12	7.8
13	15	21	8.0	8.0	7.0	109	25	97	14	20	13	7.2
14	15	20	8.0	8.0	7.0	94	28	72	15	17	19	8.4
15	14	18	8.0	8.0	7.0	124	40	59	15	16	15	8.4
16	14	17	8.0	8.0	7.0	136	135	55	14	15	13	7.5
17	15	17	8.0	8.0	7.0	99	171	47	27	11	16	6.8
18	14	17	8.0	8.0	7.0	82	129	38	28	9.5	13	7.8
19	13	16	8.0	10	7.0	59	98	33	21	21	13	7.6
20	13	16	8.0	11	7.0	75	75	30	19	18	65	7.7
21	16	16	8.0	10	7.0	68	73	28	18	16	45	6.7
22	20	15	8.0	9.5	7.0	50	82	26	21	13	18	19
23	26	15	8.0	9.0	7.0	34	72	24	26	11	15	17
24	29	14	8.0	9.0	7.0	36	53	24	25	9.8	16	10
25	26	14	8.0	8.5	7.0	39	31	24	20	13	15	11
26	25	13	8.0	8.5	7.0	47	25	26	24	22	11	14
27	24	13	8.0	8.0	7.0	42	23	25	37	47	9.8	24
28	20	13	8.0	8.0	7.0	43	24	23	132	25	10	21
29	18	13	8.0	8.0	-----	49	22	23	64	16	8.4	14
30	16	12	8.0	8.0	-----	38	20	21	42	50	11	11
31	14	-----	8.5	8.0	-----	35	-----	20	-----	140	20	-----
TOTAL	710	1,043	262.0	262.0	202.0	1,730.0	1,799	2,205	795	725.3	599.2	350.0
MEAN	22.9	34.8	8.45	8.45	7.21	55.8	60.0	71.1	26.5	23.4	19.3	11.7
MAX	82	151	12	11	8.0	146	171	212	132	140	72	24
MIN	13	12	8.0	8.0	7.0	7.0	20	20	14	9.5	8.4	6.7

WTR YR 1973 TOTAL 10,682.5 MEAN 29.3 MAX 212 MIN 6.7 CRSM 2.06 IN 27.99

STREAMS TRIBUTARY TO LAKE MICHIGAN

47

04058400 Goose Lake Outlet near Sands Station, Mich.

LOCATION.--Lat 46°23'36", long 87°29'40", in SE¼ SE¼ sec.12, T.46 N., R.26 W., Marquette County, 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 mi² (97.1 km²).

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).

AVERAGE DISCHARGE.--8 years, 33.9 ft³/s (0.960 m³/s), 12.28 in/yr (312 mm/yr).

EXTREMES.--Current year: Maximum discharge, 300 ft³/s (8.50 m³/s) May 3 (gage height, 5.08 ft or 1.548 m); minimum, 11 ft³/s (0.31 m³/s) Sept. 21 (gage height, 1.57 ft or 0.479 m).

Period of record: Maximum discharge, 458 ft³/s (13.0 m³/s) May 31, 1970 (gage height, 5.89 ft or 1.795 m); minimum, 6.2 ft³/s (0.18 m³/s) Oct. 12, 13, 1966, Oct. 6, 7, 1967; minimum gage height, 1.45 ft (0.442 m) Oct. 12, 13, 1966.

REMARKS.--Records good except those from Feb. 19 to Mar. 14, which are fair. Some mine water pumped into basin at headwaters.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47	27	25	16	17	14	82	71	37	51	50	19
2	43	45	23	17	17	14	101	131	36	46	41	19
3	44	75	22	17	17	14	117	286	34	40	31	24
4	42	85	20	16	16	15	121	248	35	36	27	21
5	37	85	20	16	16	16	109	206	34	34	24	19
6	58	85	21	16	16	17	97	181	33	32	22	18
7	50	83	20	16	15	20	92	162	34	30	21	17
8	50	85	19	15	15	30	85	199	34	27	24	16
9	48	83	19	15	15	41	79	238	40	25	22	15
10	44	80	19	15	14	41	75	242	37	25	20	15
11	41	74	18	14	14	45	69	239	36	23	20	14
12	37	67	18	14	14	70	64	202	35	25	19	13
13	34	62	18	14	14	95	61	158	32	25	19	13
14	31	56	18	14	14	95	62	128	30	22	19	13
15	29	52	18	14	14	112	76	109	29	21	18	13
16	27	46	17	14	14	126	124	99	27	20	19	13
17	25	45	17	14	14	129	223	91	32	19	19	12
18	23	41	17	17	14	125	192	84	30	18	18	12
19	22	38	17	19	14	113	153	78	29	25	23	12
20	21	37	17	17	14	101	131	74	30	21	24	12
21	24	36	17	17	14	99	117	68	30	20	22	12
22	23	33	18	17	14	98	109	63	29	20	22	21
23	36	30	17	17	14	97	101	58	31	19	22	16
24	34	32	17	17	14	97	95	55	30	19	21	15
25	35	30	17	17	14	96	87	52	27	19	20	15
26	37	30	17	17	14	92	79	50	28	23	19	15
27	35	30	17	18	14	89	74	47	40	28	19	20
28	34	28	17	17	14	87	67	45	55	26	18	18
29	33	25	16	17	-----	84	61	43	68	24	17	17
30	31	26	15	17	-----	82	55	41	60	40	20	16
31	29	-----	16	17	-----	79	-----	39	-----	52	26	-----
TOTAL	1,104	1,551	567	498	410	2,233	2,958	3,787	1,062	855	706	475
MEAN	35.6	51.7	18.3	16.1	14.6	72.0	98.6	122	35.4	27.6	22.8	15.8
MAX	58	85	25	19	17	129	223	286	68	52	50	24
MIN	21	25	15	14	14	14	55	39	27	18	17	12
CFSM	.95	1.38	.49	.43	.39	1.92	2.63	3.25	.94	.74	.61	.42
IN.	1.10	1.54	.56	.49	.41	2.22	2.93	3.76	1.05	.85	.70	.47

CAL YR 1972 TOTAL 13,253.9 MEAN 36.2 MAX 396 MIN 8.9 CFSM .97 IN 13.15
WTR YR 1973 TOTAL 16,206.0 MEAN 44.4 MAX 286 MIN 12 CFSM 1.18 IN 16.08

STREAMS TRIBUTARY TO LAKE MICHIGAN

04058500 East Branch Escanaba River at Gwinn, Mich.

LOCATION.--Lat 46°17'10", long 87°26'00", in NE¼ sec.21, T.45 N., R.25 W., Marquette County, on right bank in county park at Gwinn, 1.1 mi (1.8 km) upstream from mouth.

DRAINAGE AREA.--124 mi² (321 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 1,079.2 ft (328.94 m) above mean sea level.

AVERAGE DISCHARGE.--19 years, 105 ft³/s (2.974 m³/s).

EXTREMES.--Current year: Maximum discharge, 1,130 ft³/s (32.0 m³/s) May 3 (gage height, 12.16 ft or 3.706 m); minimum daily, 44 ft³/s (1.25 m³/s) Feb. 19 to Mar. 2, Sept. 18, 20; minimum gage height, 6.91 ft (2.106 m) Sept. 18.

Period of record: Maximum discharge, 2,390 ft³ (67.7 m³/s) June 1, 1970 (gage height, 14.97 ft or 4.563 m); minimum, 19 ft³/s (0.54 m³/s) July 30, Oct. 11, 1963 (gage height, 6.48 ft or 1.975 m).

REMARKS.--Records good except those for winter periods, which are fair. Since August, 1962 some regulation by Schweitzer Reservoir, about 16 mi (26 km) above station (see sta 04058190). An average of 2.8 ft³/s (0.08 m³/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 14 ft³/s (0.47 m³/s) was diverted from Schweitzer Reservoir by industry for iron ore processing and returned to the Middle Branch Escanaba River. Records of chemical analyses for the current year are published in Part 2 of this report.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	175	83	72	54	51	44	300	198	102	153	228	102
2	136	114	70	53	52	44	415	585	100	134	170	97
3	118	334	64	53	53	46	435	1,080	97	122	128	149
4	132	396	58	52	52	50	387	953	104	103	104	125
5	127	337	56	50	51	51	335	707	101	92	92	104
6	185	269	55	50	51	51	300	568	103	84	83	85
7	236	234	54	50	48	72	301	470	107	80	80	75
8	200	262	53	50	46	122	269	624	118	78	84	66
9	157	256	52	50	46	131	229	837	140	72	93	60
10	125	225	51	50	46	128	197	842	124	73	89	56
11	110	199	50	50	46	189	179	845	117	69	83	54
12	101	178	50	50	47	295	174	698	107	71	79	53
13	91	158	50	50	47	299	163	524	97	79	75	50
14	84	143	51	50	47	313	172	402	89	70	91	48
15	81	130	52	50	47	376	239	333	84	66	91	48
16	75	118	52	50	46	423	482	293	79	76	83	47
17	71	113	52	51	46	378	876	265	93	62	92	45
18	68	107	53	54	45	326	763	230	121	55	88	44
19	63	98	54	75	44	306	541	206	103	72	82	45
20	60	94	54	75	44	261	430	186	94	94	151	44
21	65	92	54	67	44	255	395	170	89	90	162	45
22	77	91	54	62	44	239	374	156	93	81	122	90
23	105	90	54	61	44	214	350	146	106	76	99	140
24	144	86	53	56	44	207	306	137	110	72	90	100
25	130	82	53	57	44	219	259	134	96	74	84	70
26	121	80	52	55	44	248	215	135	92	94	80	80
27	115	80	52	55	44	245	186	131	94	170	76	180
28	106	78	51	55	44	240	167	125	235	155	73	180
29	95	76	50	54	-----	260	155	119	242	122	68	120
30	87	74	50	52	-----	240	136	111	184	114	68	90
31	80	-----	54	52	-----	260	-----	107	-----	249	96	-----
TOTAL	3,520	4,677	1,680	1,693	1,307	6,532	9,730	12,317	3,421	3,002	3,084	2,492
MEAN	114	156	54.2	54.6	46.7	211	324	397	114	96.8	99.5	83.1
MAX	236	396	72	75	53	423	876	1,080	242	249	228	180
MIN	60	74	50	50	44	44	136	107	79	55	68	44
CFSM	.92	1.26	.44	.44	.38	1.70	2.61	3.20	.92	.78	.80	.67
IN.	1.06	1.40	.50	.51	.39	1.96	2.92	3.70	1.03	.90	.93	.75
CAL YR 1972	TOTAL 44,557	MEAN 122	MAX 1,310	MIN 35	CFSM .98	IN 13.37						
WTR YR 1973	TOTAL 53,455	MEAN 146	MAX 1,080	MIN 44	CFSM 1.18	IN 16.04						

STREAMS TRIBUTARY TO LAKE MICHIGAN

49

04059000 Escanaba River at Cornell, Mich.

LOCATION.--Lat 45°54'31", long 87°12'49", in NW¼ sec.32, T.41 N., R.23 W., Delta County, on right bank 50 ft (15 m) downstream from highway bridge, 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 mi² (2,253 km²).

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.

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.

AVERAGE DISCHARGE.--32 years, (1903-12, 1950-73), 905 ft³/s (25.60 m³/s), 14.11 in/yr (358 mm/yr).

EXTREMES.--Current year: Maximum discharge, 5,920 ft³/s (168 m³/s) May 4 (gage height, 3.97 ft or 1.21 m); maximum gage height, 5.51 ft (1.679 m) Mar. 14 (backwater from ice); minimum discharge, 233 ft³/s (6.60 m³/s) Sept. 24 (gage height, 1.38 ft (0.421 m)). Period of record: Maximum discharge, 10,500 ft³/s (297 m³/s) May 7, 1960 (gage height, 4.90 ft or 1.494 m); maximum gage height, 6.40 ft (1.951 m) Apr. 9, 1971 (backwater from ice); minimum discharge observed, 90 ft³/s (2.55 m³/s) July 5, 1910 (gage height, 1.5 ft or 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 during periods of ice effect in 1959.

REMARKS.--Records good except those for winter periods, which are fair. Diurnal fluctuation and occasional slight regulation caused by Boney Falls powerplant, 7 mi (11 km) above station, since 1950. 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).

REVISIONS (WATER YEARS).--WSP 1387: 1904.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2,220	781	530	430	460	340	1,880	1,460	955	1,350	1,310	534
2	1,890	828	500	440	450	340	2,680	3,120	958	1,150	1,180	643
3	1,590	1,490	470	440	440	350	3,080	4,970	923	998	975	1,740
4	1,450	1,870	450	450	430	370	3,020	5,430	1,020	845	657	2,020
5	1,350	2,050	410	440	430	410	2,490	4,750	1,090	607	681	1,540
6	1,400	1,910	360	430	420	500	2,300	3,930	1,000	608	514	1,240
7	1,660	1,720	380	420	410	650	2,110	3,410	1,040	505	510	956
8	1,700	1,740	430	410	410	900	1,870	4,300	976	432	480	700
9	1,530	1,760	460	400	400	1,150	1,690	5,480	1,220	356	550	718
10	1,290	1,630	480	390	400	1,050	1,490	5,670	1,220	451	570	662
11	1,110	1,550	480	390	400	1,400	1,400	5,600	1,140	340	540	447
12	1,010	1,420	470	390	390	2,000	1,290	5,130	1,050	460	520	409
13	952	1,190	460	390	390	2,900	1,260	4,320	864	518	500	473
14	821	1,130	460	390	390	3,400	1,150	3,570	741	448	463	597
15	816	1,080	460	390	380	3,200	1,260	2,960	704	408	467	455
16	812	852	450	400	380	3,000	2,220	2,450	634	496	510	305
17	674	885	450	430	380	2,800	3,900	2,220	624	389	616	392
18	708	809	450	480	380	2,500	4,420	1,970	842	396	635	427
19	677	852	450	550	380	2,200	4,000	1,730	718	416	629	327
20	597	927	440	570	370	2,000	3,530	1,590	683	635	732	358
21	564	639	440	560	360	1,800	3,480	1,440	625	561	771	359
22	640	747	430	550	360	1,700	3,420	1,280	592	537	878	386
23	860	560	420	540	350	1,600	3,170	1,240	865	448	757	416
24	1,070	773	410	530	340	1,610	2,840	1,140	724	474	615	490
25	1,200	689	410	520	340	1,970	2,420	1,080	745	428	425	456
26	880	632	420	510	330	1,920	2,110	1,100	1,020	459	483	495
27	1,070	617	420	500	330	1,840	1,830	1,060	887	746	522	708
28	856	600	430	490	330	1,920	1,590	1,100	1,650	997	399	660
29	826	567	430	480	-----	1,890	1,480	1,210	1,710	954	480	734
30	805	550	430	470	-----	1,930	1,270	1,130	1,460	828	413	626
31	752	-----	430	460	-----	1,920	-----	1,040	-----	1,170	472	-----
TOTAL	33,780	32,848	13,710	14,240	10,830	51,560	70,650	86,880	28,680	19,410	19,254	20,273
MEAN	1,090	1,095	442	459	387	1,663	2,355	2,803	956	626	621	676
MAX	2,220	2,050	530	570	460	3,400	4,420	5,670	1,710	1,350	1,310	2,020
MIN	564	550	360	390	330	340	1,150	1,040	592	340	399	305
CFSM	1.25	1.26	.51	.53	.44	1.91	2.71	3.22	1.10	.72	.71	.78
IN.	1.44	1.40	.59	.61	.46	2.20	3.02	3.71	1.23	.83	.82	.87

CAL YR 1972 TOTAL 358,412 MEAN 979 MAX 8,350 MIN 222 CFSM 1.13 IN 15.33
WTR YR 1973 TOTAL 402,115 MEAN 1,102 MAX 5,670 MIN 305 CFSM 1.27 IN 17.19

STREAMS TRIBUTARY TO LAKE MICHIGAN

04059400 Tenmile Creek at Perronville, Mich.

LOCATION.—Lat 45°48'38", long, 87°22'00", in NE¼ sec.3, T.39 N., R.25 W., Menominee County, on left bank, 10 ft (3 m) downstream from county bridge, 700 ft (213 m) upstream from County Road 569 and 1.0 mi (1.6 km) northwest of Perronville.

DRAINAGE AREA.—38.4 mi² (99.5 km²).

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, nonrecording gage at present site and datum.

EXTREMES.—Current year: Maximum discharge, 386 ft³/s (10.9 m³/s) May 10 (gage height, 4.32 ft or 1.317 m); maximum gage height, 5.06 ft (1.542 m) Mar. 15 (backwater from ice); minimum discharge, 1.3 ft³/s (0.037 m³/s) Sept. 19, 21; minimum gage height, 2.09 ft (0.637 m) Sept. 19.

Period of record: Maximum discharge, 488 ft³/s (13.8 m³/s) May 2, 1972; maximum gage height, 5.06 ft (1.542 m) Mar. 15, 1973 (backwater from ice); minimum discharge, 0.09 ft³/s (0.003 m³/s) Aug. 25, 1970 (discharge measurement).

REMARKS.—Records fair.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78	35	19	6.8	17	11	109	87	93	64	22	5.2
2	65	51	18	7.4	16	12	150	185	84	49	18	4.6
3	55	89	16	7.6	16	12	166	238	80	37	14	11
4	47	90	14	7.8	16	13	168	240	139	28	11	12
5	41	81	12	7.8	16	13	141	203	145	22	8.2	11
6	41	73	10	7.6	15	14	130	166	132	18	6.4	8.2
7	44	70	9.0	7.6	15	25	116	159	123	15	5.8	5.2
8	42	91	8.0	7.4	14	90	102	271	127	13	7.0	4.6
9	36	94	7.0	7.4	14	86	87	362	127	11	11	4.0
10	31	90	6.0	7.4	14	82	71	362	102	9.4	10	3.5
11	28	80	5.8	7.4	13	120	67	308	84	8.2	7.0	3.1
12	26	71	5.6	7.4	13	200	64	265	67	11	4.6	2.8
13	24	62	5.6	7.4	13	260	55	216	52	15	5.2	2.6
14	22	55	5.6	7.6	13	280	54	174	42	12	11	2.4
15	20	49	5.6	7.6	12	300	62	145	33	11	11	2.2
16	18	42	5.8	7.6	12	280	147	125	29	8.8	11	2.0
17	17	38	5.8	8.0	12	240	223	107	38	7.6	19	1.9
18	16	35	5.8	9.0	12	200	227	96	42	6.4	51	1.7
19	15	32	5.8	11	11	150	203	84	41	7.6	41	1.3
20	14	30	5.8	13	11	130	183	69	37	8.2	41	1.4
21	17	27	5.8	16	11	110	212	61	31	6.4	26	1.3
22	25	25	5.8	18	11	100	218	52	28	4.6	18	2.3
23	47	23	6.0	19	11	96	205	44	56	4.6	16	2.7
24	70	22	6.0	19	11	96	179	40	58	3.5	14	2.7
25	69	21	6.0	19	11	98	152	38	44	4.0	12	2.5
26	62	22	6.0	19	11	102	129	44	42	4.6	12	8.7
27	55	23	6.2	19	11	103	111	44	56	8.8	11	14
28	49	22	6.2	18	11	111	94	78	159	14	9.4	14
29	43	21	6.2	18	-----	112	80	135	118	18	8.2	11
30	38	20	6.2	17	-----	111	71	124	85	22	6.4	9.4
31	35	-----	6.4	17	-----	107	-----	107	-----	26	5.8	-----
TOTAL	1,190	1,484	243.0	359.8	363	3,664	3,976	4,629	2,294	478.7	454.0	159.3
MEAN	38.4	49.5	7.84	11.6	13.0	118	133	149	76.5	15.4	14.6	5.31
MAX	78	94	19	19	17	300	227	362	159	64	51	14
MIN	14	20	5.6	6.8	11	11	54	38	28	3.5	4.6	1.3
CFSM	1.00	1.29	.20	.30	.34	3.07	3.46	3.88	1.99	.40	.38	.14
IN.	1.15	1.44	.24	.35	.35	3.55	3.85	4.48	2.22	.46	.44	.15

CAL YR 1972 TOTAL 15,017.2 MEAN 41.0 MAX 480 MIN 1.4 CFSM 1.07 IN 14.55
WTR YR 1973 TOTAL 19,294.8 MEAN 52.9 MAX 362 MIN 1.3 CFSM 1.38 IN 18.69

LOCATION.--Lat 45°45'20", long 87°12'05", in SW₄ sec.19, T.39 N., R.23 W., Delta County, on right bank 40 ft (12 m) downstream from county highway bridge, 1.4 mi (2.3 km) downstream from Tennile Creek, and 1.5 mi (2.4 km) north of Hyde.

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.

AVERAGE DISCHARGE.—19 years, 553 ft³/s (15.66 m³/s), 11.23 in/yr (285 mm/yr).

EXTREMES.--Current year: Maximum discharge, 3,050 ft³/s (86.4 m³/s) May 9 (gage height, 5.84 or 1.780 m); maximum gage height, 6.74 ft (2.054 m) Mar. 12 (backwater from ice); minimum discharge, 98 ft³/s (2.78 m³/s) Sept. 21 (gage height, 1.89 ft or 0.576 m).

Period of record: Maximum discharge, 7,590 ft³/s (215 m³/s) May 7, 1960 (gage height, 8.27 ft or 2.521 m); minimum, 21 ft³/s (0.595 m³/s) Sept. 1, 2, 1970 (gage height, 1.34 ft or 0.408 m).

REMARKS.—Records good except those for winter periods, which are fair. Records of water temperatures for the current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,220	379	165	135	215	110	1,040	754	731	523	401	175
2	1,170	456	155	140	205	110	1,340	1,440	685	434	594	292
3	1,080	676	150	140	195	110	1,540	1,950	648	353	594	413
4	938	785	150	140	180	120	1,580	2,040	932	282	512	623
5	769	828	145	135	175	140	1,490	2,100	1,030	236	389	775
6	671	876	145	135	165	200	1,390	2,070	950	198	271	761
7	640	923	145	130	155	540	1,260	1,900	878	173	207	638
8	604	1,050	145	130	145	640	1,100	2,440	873	152	180	497
9	583	985	140	130	135	600	926	2,990	923	131	185	346
10	559	899	140	130	130	580	791	2,820	817	120	214	252
11	509	819	140	130	125	900	708	2,640	725	107	202	206
12	452	742	140	130	120	1,200	667	2,580	641	115	177	178
13	393	657	140	130	115	1,500	604	2,330	561	140	156	158
14	353	578	140	130	115	1,800	564	1,960	479	151	162	144
15	318	505	140	130	110	2,100	578	1,650	417	167	196	133
16	290	445	140	135	110	2,560	1,040	1,400	366	153	212	124
17	266	384	140	150	110	2,270	1,800	1,180	369	130	266	117
18	239	350	135	170	110	2,110	1,900	980	375	112	446	110
19	218	308	135	200	110	1,980	1,920	834	391	110	498	105
20	204	270	135	240	110	1,720	1,970	738	382	115	588	102
21	217	240	135	300	110	1,490	2,100	666	344	160	492	101
22	253	210	130	330	110	1,300	2,010	609	314	217	379	111
23	370	180	130	320	110	1,200	1,800	557	382	201	296	111
24	537	180	130	315	110	1,080	1,590	505	405	172	239	133
25	581	190	130	305	110	1,060	1,420	473	369	164	197	150
26	593	200	130	295	110	1,010	1,250	484	362	179	175	196
27	581	200	130	280	110	972	1,080	496	381	192	161	264
28	535	195	130	270	110	974	905	664	753	239	148	297
29	484	185	130	255	-----	1,000	715	903	706	311	135	299
30	433	175	130	245	-----	1,020	681	840	608	386	126	284
31	399	-----	135	230	-----	1,010	-----	741	-----	418	113	-----
TOTAL	16,459	14,870	4,305	6,035	3,715	33,406	37,815	43,734	17,797	6,541	8,911	8,095
MEAN	531	496	139	195	133	1,078	1,261	1,411	593	211	287	270
MAX	1,220	1,050	165	330	215	2,560	2,100	2,990	1,030	523	594	775
MIN	264	175	130	130	110	110	564	473	314	107	113	101
CFSM	1.14	1.10	.31	.43	.30	2.40	2.80	3.14	1.32	.47	.64	.60
IN.	1.36	1.23	.36	.50	.31	2.76	3.13	3.62	1.47	.54	.74	.67
CAL YR 1972	TOTAL 173,174		MEAN 473	MAX 4,310	MIN 68	CFSM 1.05	IN 14.32					
WTR YR 1973	TOTAL 201,683		MEAN 553	MAX 2,990	MIN 101	CFSM 1.23	IN 16.67					

STREAMS TRIBUTARY TO LAKE MICHIGAN

04060500 Iron River at Caspian, Mich.

LOCATION.--Lat 46°03'31", long 88°37'38", on line between SE $\frac{1}{4}$ and SW $\frac{1}{4}$ sec.1, T.42 N., R.35 W., Iron County, on right bank 10 ft (3 m) downstream from bridge on County Highway 424 in Caspian, 5.0 mi (8.0 km) upstream from mouth.

DRAINAGE AREA.--92.1 mi² (238.5 km²).

PERIOD OF RECORD.--March 1948 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,438.78 ft (438.540 m) above mean sea level. Prior to Sept. 25, 1969, non-recording gage at site 10 ft (3 m) upstream at same datum.

AVERAGE DISCHARGE.--25 years, 86.7 ft³/s (2.455 m³/s).

EXTREMES.--Current year: Maximum discharge, 575 ft³/s (16.3 m³/s) Mar. 15 (gage height, 7.95 ft or 2.423 m); minimum, 64 ft³/s (1.81 m³/s) Dec. 29 (gage height, 4.00 ft or 1.219 m, result of freezeup).

Period of record: Maximum discharge, 1,430 ft³/s (40.5 m³/s) July 2, 1953 (gage height, 10.20 ft or 3.109 m); minimum, 25 ft³/s (0.71 m³/s) Mar. 29, 1969 (gage height, 3.30 ft or 1.006 m, result of freezeup).

REMARKS.--Records good. The average flow includes mine pumpage and sewage plant effluent. Pumpage rates have diminished over the years due to the closing of most mines. Remaining mine pumpage averages about 12 ft³/s (0.3 m³/s).

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	170	115	95	96	88	83	220	194	123	101	151	124
2	149	185	93	96	91	82	253	384	122	99	116	98
3	165	325	93	94	90	86	240	493	124	97	101	93
4	195	288	92	96	90	88	219	386	129	94	97	92
5	177	219	90	93	90	86	193	293	123	92	93	85
6	194	185	91	89	88	86	181	246	118	91	90	79
7	186	196	91	87	88	214	176	244	133	91	90	77
8	170	224	92	86	85	229	161	373	143	88	144	76
9	146	208	91	86	84	165	150	390	132	88	150	77
10	131	183	92	86	83	158	140	380	117	118	115	78
11	130	166	91	87	81	375	134	372	112	104	100	83
12	122	153	88	87	80	472	137	320	111	109	95	83
13	117	142	90	86	80	395	132	276	105	109	94	82
14	114	132	92	87	81	473	131	240	102	99	106	84
15	114	125	92	88	81	558	184	214	106	95	99	83
16	112	118	90	88	81	509	319	202	111	93	94	83
17	105	119	89	92	81	395	412	190	114	91	91	83
18	101	114	88	105	81	322	320	175	110	90	90	84
19	100	113	88	110	80	299	254	168	105	113	88	86
20	100	112	88	100	81	261	239	160	101	104	88	86
21	114	108	89	96	81	234	235	152	101	95	88	86
22	114	102	90	97	83	218	222	146	110	92	87	105
23	129	99	90	98	84	207	193	138	111	91	88	98
24	128	102	90	94	83	199	172	137	118	92	86	92
25	121	100	89	94	82	206	157	173	111	94	87	95
26	127	102	91	92	81	225	148	188	114	92	88	100
27	135	102	90	91	80	233	142	163	109	94	88	121
28	135	100	88	90	82	237	136	148	108	109	84	104
29	124	91	82	100	-----	237	131	136	106	103	80	96
30	119	99	95	95	-----	229	126	128	104	102	81	92
31	115	-----	100	89	-----	214	-----	124	-----	109	153	-----
TOTAL	4,159	4,427	2,810	2,875	2,340	7,775	5,857	7,333	3,433	3,039	3,102	2,705
MEAN	134	148	90.6	92.7	83.6	251	195	237	114	98.0	100	90.2
MAX	195	325	100	110	91	558	412	493	143	118	153	124
MIN	100	91	82	86	80	82	126	124	101	88	80	76

CAL YR 1972 TOTAL 45,437 MEAN 124
WTR YR 1973 TOTAL 49,855 MEAN 137

MAX 792 MIN 56
MAX 558 MIN 76

STREAMS TRIBUTARY TO LAKE MICHIGAN

53

04061000 Brule River near Florence, Wis.

LOCATION.--Lat 45°57'31", long 88°15'57", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.11, T.41 N., R.32 W., Michigan meridian, Iron County, 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 mi² (1,008 km²).

PERIOD OF RECORD.--January 1914 to February 1916, June 1944 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,210 ft (369 m) from topographic map (nearest 10 ft). Prior to Aug. 29, 1944, nonrecording gage at bridge 40 ft (12 m) downstream at same datum.

AVERAGE DISCHARGE.--30 years, (1914-15, 1944-73), 512 ft³/s (14.50 m³/s), 12.57 in/yr (319 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,660 ft³/s (47.0 m³/s) Mar. 16 (gage height, 4.05 ft or 1.234 m); maximum gage height, 7.43 ft (2.265 m) Mar. 13 (backwater from ice); minimum discharge, 295 ft³/s (8.35 m³/s) Sept. 19 (gage height, 2.20 ft or 0.671 m).

Period of record: Maximum discharge, 4,700 ft³/s (133 m³/s) July 2, 1953 (gage height, 6.57 ft or 2.003 m); maximum gage height, 8.27 ft (2.521 m) Dec 26, 1969 (backwater from ice); minimum discharge, 118 ft³/s (3.34 m³/s) Dec. 2, 1963 (discharge measurement); minimum gage height, 1.79 ft (0.546 m) July 24, 1964.

REMARKS.--Records good except those for winter periods, which are fair. Discharge includes some mine pumpage (see sta 04060500).

REVISIONS (WATER YEARS).--WSP 1387: 1914-16. WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	727	436	370	380	330	310	845	681	512	392	429	537
2	622	583	370	375	335	310	945	1,200	503	377	432	467
3	592	1,030	365	370	340	315	932	1,560	503	366	377	431
4	664	1,060	360	365	345	320	872	1,530	560	350	347	428
5	639	901	355	360	340	340	770	1,210	532	343	329	399
6	740	755	350	355	335	400	700	973	505	337	318	362
7	690	722	350	355	330	600	676	891	560	337	317	337
8	593	802	350	350	325	700	650	1,190	640	325	342	322
9	538	767	345	345	320	680	602	1,350	628	323	447	313
10	493	688	345	340	310	660	563	1,310	551	387	404	310
11	490	631	340	330	305	800	542	1,270	500	398	368	307
12	484	585	340	330	310	1,050	542	1,140	476	403	353	305
13	456	545	340	325	315	1,200	518	979	444	455	349	301
14	462	514	345	325	320	1,400	510	851	420	413	387	304
15	427	482	345	330	315	1,590	623	763	413	372	386	304
16	413	463	350	335	310	1,630	1,090	716	481	351	374	303
17	398	461	350	350	305	1,420	1,420	695	473	335	422	300
18	394	449	355	380	300	1,150	1,360	653	480	323	374	300
19	373	427	355	415	300	1,010	1,090	625	458	345	359	300
20	365	434	360	440	305	943	957	608	425	361	353	308
21	403	427	360	415	310	862	938	588	410	336	337	306
22	435	410	360	400	310	802	926	566	435	318	328	356
23	501	330	365	385	310	772	844	547	538	309	329	367
24	548	452	365	370	310	742	748	539	496	311	336	348
25	504	442	370	365	310	749	671	626	451	322	329	343
26	489	414	370	360	310	799	615	792	438	344	334	360
27	509	410	375	350	310	828	575	758	437	346	341	417
28	507	396	380	340	310	853	547	674	440	389	326	416
29	478	390	370	335	-----	887	527	609	422	387	316	376
30	450	380	330	330	-----	873	514	550	409	356	320	360
31	436	-----	370	325	-----	841	-----	517	-----	362	503	-----
TOTAL	15,820	16,786	11,055	11,130	8,875	25,836	23,112	26,961	14,540	11,073	11,266	10,587
MEAN	510	560	357	359	317	833	770	870	485	357	363	353
MAX	740	1,060	380	440	345	1,630	1,420	1,560	640	455	503	537
MIN	365	330	330	325	300	310	510	517	409	309	316	300
CFSM	1.31	1.44	.92	.92	.81	2.14	1.98	2.24	1.25	.92	.93	.91
IN.	1.51	1.61	1.06	1.06	.85	2.47	2.21	2.58	1.39	1.06	1.08	1.01
CAL YR 1972	TOTAL 169,591	MEAN 463	MAX 2,290	MIN 240	CFSM 1.19	IN 16.22						
WTR YR 1973	TOTAL 187,041	MEAN 512	MAX 1,630	MIN 300	CFSM 1.32	IN 17.89						

STREAMS TRIBUTARY TO LAKE MICHIGAN

04061500 Paint River at Crystal Falls, Mich.

LOCATION.--Lat 46°06'21", long 88°20'05", in SE $\frac{1}{4}$ sec.20, T.43 N., R.32 W., Iron County, 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 mi² (1,546 km²).

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

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).

AVERAGE DISCHARGE.--29 years, 595 ft³/s (16.85 m³/s), 13.53 in/yr (344 mm/yr).

EXTREMES.--Current year: Maximum discharge, 3,810 ft³/s (108 m³/s) Mar. 16 (gage height, 5.71 ft or 1.740 m); minimum, 265 ft³/s (7.50 m³/s) Sept. 17, 19 (gage height, 2.25 ft or 0.686 m); minimum daily, 320 ft³/s (9.06 m³/s) Sept. 17, 18.
Period of record: Maximum discharge, 10,900 ft³/s (309 m³/s) Apr. 25, 1960 (gage height, 9.82 ft or 2.993 m); minimum, 7.7 ft³/s (0.22 m³/s) Sept. 17, 1950 (gage height, 0.89 ft or 0.271 m); minimum daily, 81 ft³/s (2.29 m³/s) Nov. 1, 1947.

REMARKS.--Records good. Diurnal fluctuation caused by powerplant immediately above station.

REVISIONS (WATER YEARS).--WSP 1174: 1947-48 (m). WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,450	667	536	474	422	387	2,150	935	717	538	774	802
2	1,270	743	436	468	417	385	2,230	2,210	709	500	845	746
3	1,160	1,610	454	464	422	402	2,210	3,430	699	497	749	675
4	1,300	1,950	414	460	432	418	2,030	3,370	698	462	630	640
5	1,330	1,700	445	455	440	431	1,770	2,800	708	447	522	577
6	1,440	1,490	445	431	425	422	1,570	2,400	685	429	467	507
7	1,490	1,360	432	423	430	1,010	1,440	2,140	657	416	443	453
8	1,310	1,700	437	423	407	1,190	1,340	2,700	692	395	482	417
9	1,060	1,800	469	413	404	1,290	1,190	3,250	721	387	702	395
10	954	1,670	461	414	393	1,140	1,090	3,190	716	431	756	383
11	879	1,510	451	425	388	1,640	1,000	3,330	690	466	668	366
12	837	1,270	436	425	389	2,300	927	3,060	644	510	540	353
13	791	1,130	438	415	392	2,500	876	2,640	572	533	519	340
14	754	972	458	420	394	2,770	841	2,280	516	504	535	341
15	715	889	446	425	397	3,380	919	1,900	499	458	616	333
16	685	779	443	425	386	3,730	1,800	1,600	549	421	593	332
17	647	803	436	435	375	3,350	2,770	1,500	593	401	620	320
18	633	745	439	482	370	2,760	2,870	1,330	615	403	714	320
19	610	697	447	568	383	2,610	2,500	1,190	583	683	720	324
20	580	704	447	587	387	2,320	2,200	1,090	538	801	597	334
21	597	672	450	550	386	2,030	2,070	997	500	621	547	331
22	653	632	446	498	388	1,850	1,930	919	576	523	507	391
23	728	514	453	498	390	1,760	1,760	857	662	456	475	456
24	850	612	443	487	387	1,670	1,570	815	628	415	456	438
25	841	567	443	482	385	1,690	1,380	834	577	405	435	435
26	813	546	438	482	394	1,820	1,190	1,010	595	397	424	465
27	831	633	441	465	384	2,000	1,080	1,020	595	412	414	568
28	808	555	452	445	384	2,170	969	920	576	480	405	650
29	760	415	435	450	-----	2,310	887	849	563	541	384	608
30	718	531	420	425	-----	2,360	831	789	556	471	395	550
31	687	-----	447	422	-----	2,250	-----	747	-----	517	605	-----
TOTAL	28,181	29,866	13,838	14,236	11,151	56,345	47,390	56,102	18,629	14,920	17,539	13,850
MEAN	909	996	446	459	398	1,818	1,580	1,810	621	481	566	462
MAX	1,490	1,950	536	587	440	3,730	2,870	3,430	721	801	845	802
MIN	580	415	414	413	370	385	831	747	499	387	384	320
CFSM	1.52	1.67	.75	.77	.67	3.05	2.65	3.03	1.04	.81	.95	.77
IN.	1.76	1.86	.86	.89	.69	3.51	2.95	3.50	1.16	.93	1.09	.86
CAL YR 1972	TOTAL 285,236		MEAN 779	MAX 6,110	MIN 256	CFSM 1.30	IN 17.77					
WTR YR 1973	TOTAL 322,047		MEAN 882	MAX 3,730	MIN 320	CFSM 1.48	IN 20.07					

STREAMS TRIBUTARY TO LAKE MICHIGAN

55

04062000 Paint River near Alpha, Mich.

LOCATION.--Lat 46°00'40", long 88°15'30", in NW 1/4 sec. 25, T. 42 N., R. 32 W., Iron County, 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 mi² (1,634 km²)

PERIOD OF RECORD.--June 1952 to current year. Monthly discharge only for period October 1953 to September 1960, published in WSP 1727.

GAGE.--Water-stage recorder. Altitude of gage is 1,260 ft (384 m) from topographic map (nearest 10 ft).

AVERAGE DISCHARGE.--21 years, 175 ft³/s (4.956 m³/s).

EXTREMES.--Current year: Maximum discharge, 2,400 ft³/s (68.0 m³/s) May 3 (gage height, 6.50 ft or 1.981 m); minimum daily, 82 ft³/s (2.32 m³/s) Nov. 27; minimum gage height, 2.82 ft (0.860 m) Nov. 17-28, 30, Aug. 11-13.
Period of record: Maximum discharge, 8,050 ft³/s (228 m³/s) July 2, 1953 (gage height, 10.50 ft or 3.200 m); minimum daily, 62 ft³/s (1.76 m³/s) Mar. 22, 1963.

REMARKS.--Records good except those for winter periods, 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.

REVISIONS.--WSP 1727: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	659	95	86	98	98	96	1,310	528	152	88	95	100
2	343	99	87	98	98	96	1,310	1,370	152	89	95	98
3	96	729	88	98	98	96	1,310	2,090	152	89	95	99
4	95	1,180	90	98	98	96	1,290	2,350	153	88	95	99
5	95	1,160	91	97	98	96	956	2,270	158	88	95	97
6	337	922	92	96	98	96	413	1,950	165	91	95	97
7	560	395	93	96	98	96	90	1,770	150	93	95	97
8	557	356	94	95	98	96	88	1,960	90	92	95	97
9	553	419	94	94	98	96	88	2,290	89	93	95	96
10	547	390	95	93	98	96	88	2,260	88	93	95	95
11	300	654	95	92	98	289	88	2,280	88	93	92	95
12	95	1,000	95	92	98	895	88	2,260	88	93	88	97
13	95	795	95	92	97	575	88	2,190	88	93	91	97
14	95	316	95	92	97	569	88	1,900	88	93	95	97
15	95	88	95	93	97	1,110	90	1,380	88	93	97	97
16	111	89	95	94	97	1,700	536	1,110	88	93	99	97
17	124	87	95	95	96	1,580	1,230	953	90	93	109	97
18	95	86	95	97	96	1,030	1,450	663	90	93	102	97
19	95	86	95	98	96	568	1,660	661	90	93	99	97
20	95	86	95	99	96	263	1,610	663	90	94	97	97
21	96	86	95	100	96	165	1,590	656	90	94	97	97
22	95	86	95	100	96	126	1,590	386	94	93	97	97
23	97	85	95	100	96	98	1,580	88	88	96	97	97
24	97	84	95	100	96	97	1,550	88	88	96	97	97
25	97	84	95	100	96	98	1,520	90	88	97	97	98
26	96	84	95	100	96	99	1,530	90	89	98	97	99
27	95	82	95	100	96	347	1,070	90	90	97	97	97
28	95	85	95	100	96	738	370	88	90	97	97	99
29	95	85	95	100	-----	1,150	86	88	88	97	97	97
30	95	84	94	99	-----	1,330	90	139	88	97	98	97
31	95	-----	96	99	-----	1,320	-----	152	-----	96	100	-----
TOTAL	6,095	9,877	2,905	3,005	2,716	15,107	24,847	34,853	3,130	2,893	2,990	2,918
MEAN	197	329	93.7	96.9	97.0	487	828	1,124	104	93.3	96.5	97.3
MAX	659	1,180	96	100	98	1,700	1,660	2,350	165	98	109	100
MIN	95	82	86	92	96	96	86	88	88	88	88	95
CAL YR 1972	TOTAL	98,975	MEAN	270	MAX	5,370	MIN	80				
WTR YR 1973	TOTAL	111,336	MEAN	305	MAX	2,350	MIN	82				

STREAMS TRIBUTARY TO LAKE MICHIGAN

04062200 Peshekee River near Champion, Mich.

LOCATION.--Lat 46°33'25", long 88°00'09", in NW¼ sec.13, T.48 N., R.30 W., Marquette County, on left bank 10 ft (3 m) downstream from bridge on county highway, 0.6 mi (1.0 km) downstream from West Branch, and 3.5 mi (5.6 km) northwest of Champion.

DRAINAGE AREA.--133 mi² (344 km²).

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.

AVERAGE DISCHARGE.--12 years, 218 ft³/s (6.174 m³/s), 22.26 in/yr (565 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,040 ft³/s (57.8 m³/s) May 8 (gage height, 5.92 ft or 1.804 m); maximum gage height, 6.91 ft (2.106 m) Mar. 16 (backwater from ice); minimum discharge, 12 ft³/s (0.34 m³/s) July 25 (gage height, 1.36 ft or 0.415 m).

Period of record: Maximum discharge, 3,610 ft³/s (102 m³/s) May 8, 1965 (gage height, 8.01 ft or 2.441 m); minimum, 4.2 ft³/s (0.12 m³/s) Sept. 10, 1961; minimum gage height, 1.23 ft (0.375 m) Sept. 7, 1969.

REMARKS.--Records fair. Records of water temperatures for the current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	355	109	110	96	95	58	786	355	117	137	76	135
2	298	189	105	94	100	60	736	912	105	117	67	129
3	305	444	100	90	105	64	651	1,170	101	97	55	95
4	391	443	95	88	100	76	557	1,040	105	83	44	85
5	359	410	90	86	95	70	477	1,010	97	70	35	75
6	401	397	88	84	92	66	453	1,110	91	59	30	63
7	401	533	85	82	90	125	435	1,340	88	53	28	49
8	347	740	82	80	85	270	381	1,910	117	45	31	41
9	306	730	80	78	82	265	354	1,780	254	40	40	33
10	259	588	78	78	78	260	306	1,490	183	42	38	29
11	224	473	76	78	75	450	288	1,370	145	37	46	25
12	201	392	74	76	72	650	267	1,190	119	43	40	25
13	180	329	74	76	70	750	242	982	95	48	36	22
14	159	271	78	76	68	800	253	798	80	42	41	19
15	144	247	80	76	66	900	447	646	74	34	38	18
16	132	229	82	78	64	1,050	1,150	538	72	30	35	18
17	120	190	84	85	62	1,000	1,710	455	85	27	40	17
18	110	174	84	100	62	900	1,740	393	97	26	75	16
19	101	170	84	120	62	800	1,640	340	88	40	75	16
20	95	155	86	125	60	650	1,620	298	76	29	145	16
21	107	145	86	125	60	600	1,760	260	70	23	139	16
22	133	140	84	120	60	500	1,630	228	67	19	107	46
23	150	135	84	115	60	480	1,260	200	77	17	82	65
24	158	135	82	110	58	450	890	175	83	15	68	77
25	153	130	82	105	58	501	661	178	75	16	57	72
26	156	125	80	100	58	552	520	198	165	43	52	71
27	159	125	80	98	58	582	431	190	173	65	46	141
28	149	120	78	95	58	649	365	173	208	80	40	149
29	135	115	78	95	-----	736	314	155	168	75	33	119
30	122	115	84	95	-----	771	272	139	149	71	33	91
31	111	-----	95	95	-----	786	-----	125	-----	76	85	-----
TOTAL	6,421	8,498	2,628	2,899	2,053	15,871	22,596	21,148	3,424	1,599	1,757	1,773
MEAN	207	283	84.8	93.5	73.3	512	753	682	114	51.6	56.7	59.1
MAX	401	740	110	125	105	1,050	1,760	1,910	254	137	145	149
MIN	95	109	74	76	58	58	242	125	67	15	28	16
CFSM	1.56	2.13	.64	.70	.55	3.85	5.66	5.13	.86	.39	.43	.44
IN.	1.80	2.38	.74	.81	.57	4.44	6.32	5.92	.96	.45	.49	.50

CAL YR 1972 TOTAL 80,990 MEAN 221 MAX 2,600 MIN 20 CFSM 1.66 IN 22.65
WTR YR 1973 TOTAL 90,667 MEAN 248 MAX 1,910 MIN 15 CFSM 1.86 IN 25.36

PEAK DISCHARGE (BASE, 600 FT³/s)

DATE	TIME	G. H.	DISCHARGE
11-08	2400	4.17	784
03-16	---	---	Unknown
03-31	0100	4.20	800
04-18	0600	5.59	1,790
05-08	1600	5.92	2,040

STREAMS TRIBUTARY TO LAKE MICHIGAN

57

04062230 Michigamme River near Michigamme, Mich.

LOCATION.--Lat 46°28'00", long 88°04'28", in SW¼SW¼ sec.16, T.47 N., R.30 W., Marquette County, on right bank 20 ft (6 m) upstream from Northern Natural Gas Co. pipeline, 0.6 mi (1.0 km) upstream from mouth of 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 mi² (502 km²).

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).

AVERAGE DISCHARGE.--5 years, 310 ft³/s (8.779 m³/s), 21.70 in/yr (551 mm/yr).

EXTREMES.--Current Year: Maximum discharge, 1,750 ft³/s (49.6 m³/s) May 11 (gage height, 6.47 ft or 1.972 m); minimum, 68 ft³/s (1.93 m³/s) Sept. 21 (gage height, 2.79 ft or 0.850 m).
Period of record: Maximum discharge, 2,590 ft³/s (73.3 m³/s) May 7, 8, 1972 (gage height, 7.42 ft or 2.262 m); maximum gage height, 7.54 ft (2.298 m) Apr. 23, 1969; minimum discharge, 36 ft³/s (1.02 m³/s) Sept. 14, 1969 (gage height, 2.39 ft or 0.782 m).

REMARKS.--Records good. Records of chemical analyses for the current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	427	248	255	166	147	116	947	768	334	204	101	118
2	430	262	249	164	154	115	964	840	317	201	99	122
3	441	294	242	163	152	115	965	970	307	197	97	124
4	464	322	234	166	151	115	950	1,050	298	189	95	126
5	480	346	229	165	149	114	903	1,090	283	181	93	121
6	521	365	226	163	147	118	858	1,130	269	170	91	118
7	526	410	220	164	145	134	822	1,200	258	161	90	112
8	533	485	215	159	143	149	780	1,410	254	156	93	107
9	507	567	210	155	141	167	738	1,610	258	146	96	104
10	473	622	204	152	141	188	684	1,710	262	143	95	99
11	455	634	198	151	137	252	625	1,740	262	134	93	96
12	435	620	195	150	134	336	585	1,700	256	128	92	91
13	409	594	196	147	133	429	545	1,620	246	126	92	87
14	389	554	192	144	131	581	510	1,500	237	123	94	84
15	361	508	188	142	131	770	525	1,360	225	116	91	82
16	348	468	186	141	130	926	678	1,240	219	110	88	79
17	333	441	182	139	128	1,050	928	1,120	210	103	87	77
18	318	415	179	137	126	1,110	1,140	1,010	208	101	87	75
19	303	389	176	138	125	1,140	1,300	921	201	109	96	73
20	289	370	173	139	124	1,130	1,430	840	194	107	114	72
21	283	356	171	139	123	1,090	1,540	762	187	101	117	69
22	281	341	169	143	123	1,040	1,640	684	182	97	118	75
23	285	326	166	149	123	989	1,630	610	179	92	120	74
24	279	315	164	150	123	937	1,540	550	179	88	118	74
25	274	305	162	150	121	892	1,400	500	174	88	116	75
26	271	299	161	150	120	865	1,240	470	185	92	114	80
27	269	291	158	150	118	848	1,110	444	193	96	112	87
28	270	283	156	151	117	849	991	420	200	96	107	91
29	265	269	156	151	-----	870	888	388	202	95	106	97
30	258	261	165	149	-----	892	798	365	203	99	107	100
31	253	-----	169	147	-----	920	-----	350	-----	102	118	-----
TOTAL	11,430	11,960	5,946	4,674	3,737	19,247	29,654	30,372	6,982	3,951	3,137	2,789
MEAN	369	399	192	151	133	621	988	980	233	127	101	93.0
MAX	533	634	255	166	154	1,140	1,640	1,740	334	204	120	126
MIN	253	248	156	137	117	114	510	350	174	88	87	69
CFSM	1.90	2.06	.99	.78	.69	3.20	5.09	5.05	1.20	.65	.52	.48
IN.	2.19	2.29	1.14	.90	.72	3.69	5.69	5.82	1.34	.76	.60	.53
CAL YR 1972	TOTAL 115,601	MEAN 316	MAX 2,560	MIN 85	CFSM 1.63	IN 22.17						
WTR YR 1973	TOTAL 133,879	MEAN 367	MAX 1,740	MIN 69	CFSM 1.89	IN 25.67						

STREAMS TRIBUTARY TO LAKE MICHIGAN

04062300 Michigamme River at Republic, Mich.

LOCATION.--Lat 46°23'03", long 87°58'48", in SE¼ sec.18, T.46 N., R.29 W., Marquette County, on left bank 400 ft (122 m) upstream from county highway bridge, 0.3 mi (0.5 km) upstream from Trout Falls Creek, and 0.6 mi (1.0 km) south of Republic.

DRAINAGE AREA.--240 mi² (622 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 1,480 ft (451 m) from topographic map (nearest 10 ft).

AVERAGE DISCHARGE.--12 years, 328 ft³/s (9.289 m³/s).

EXTREMES.--Current year: Maximum discharge, 2,250 ft³/s (63.7 m³/s) May 11 (gage height, 5.74 ft or 1.750 m); minimum, 32 ft³/s (0.91 m³/s) July 19 (gage height, 0.37 ft or 0.113 m).

Period of record: Maximum discharge, 3,950 ft³/s (112 m³/s) May 10, 1965 (gage height, 8.17 ft or 2.490 m); minimum, 7.0 ft³/s (0.20 m³/s) Mar. 26-28, 1964 (gage height, 0.14 ft or 0.043 m); minimum daily, 7.7 ft³/s (0.22 m³/s) Mar. 26-29, 1964.

REMARKS.--Records good except those for winter periods which are fair. Prior to June 1, 1963, diurnal fluctuation caused by power-plant 0.4 mi (0.6 km) above station; powerplant abandoned and only occasional regulation since. Since June 1, 1963, water diverted 0.5 mi (0.8 km) above station for industrial use and returned to river by Gambles Creek, 5 mi (8 km) downstream. Records are not adjusted for diversion.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	462	233	241	130	120	94	1,150	957	395	225	164	237
2	460	235	241	135	120	92	1,100	1,190	373	226	157	215
3	475	362	241	135	125	92	1,200	1,560	337	223	141	185
4	524	469	202	135	125	92	1,190	1,420	340	220	99	176
5	544	445	193	130	125	94	1,100	1,380	338	213	85	147
6	617	418	190	130	120	121	1,040	1,370	317	177	88	97
7	704	451	190	130	120	130	982	1,430	309	150	96	114
8	641	523	185	130	120	174	939	1,780	292	155	96	132
9	574	625	180	125	115	283	870	2,080	294	167	114	123
10	511	670	175	125	115	298	731	2,200	303	172	128	100
11	474	659	170	125	115	324	669	2,220	316	150	118	91
12	466	632	165	125	110	606	670	2,110	311	124	83	85
13	431	595	165	120	110	725	637	1,960	285	112	63	76
14	417	555	165	120	107	819	584	1,780	252	112	93	76
15	395	515	160	120	105	960	588	1,600	251	119	161	76
16	361	471	160	120	105	1,050	805	1,490	251	157	155	76
17	347	454	155	115	105	1,250	1,320	1,320	252	194	128	76
18	326	428	150	115	100	1,350	1,510	1,180	238	118	89	76
19	296	397	150	115	100	1,450	1,600	1,090	201	34	82	69
20	238	375	150	115	100	1,450	1,660	989	189	58	151	60
21	238	365	145	120	100	1,400	1,730	893	204	107	231	61
22	270	365	145	120	100	1,300	1,950	781	211	123	205	63
23	310	348	140	120	100	1,250	1,870	695	193	100	166	73
24	325	323	140	122	95	1,150	1,790	605	193	100	136	97
25	319	304	135	122	95	1,100	1,640	580	207	93	125	110
26	293	305	135	123	95	1,050	1,440	544	246	89	124	111
27	272	290	135	123	95	1,050	1,290	518	237	98	123	112
28	257	277	130	124	95	1,050	1,130	488	229	131	120	110
29	256	276	130	120	-----	1,050	1,040	449	226	128	109	128
30	253	263	130	120	-----	1,100	913	413	226	135	112	135
31	247	-----	130	120	-----	1,150	-----	405	-----	170	147	-----
TOTAL	12,303	12,628	5,123	3,829	3,037	24,104	35,038	37,477	8,016	4,380	3,889	3,287
MEAN	397	421	165	124	108	778	1,168	1,209	267	141	125	110
MAX	704	670	241	135	125	1,450	1,870	2,220	395	226	231	237
MIN	238	233	130	115	95	92	584	405	189	34	63	60

CAL YR 1972 TOTAL 134,855 MEAN 368 MAX 3,410 MIN 86
WTR YR 1973 TOTAL 153,111 MEAN 419 MAX 2,220 MIN 34

NOTE.--No gage-height record Dec. 9 to Jan. 23.

STREAMS TRIBUTARY TO LAKE MICHIGAN

59

04062400 Michigamme River near Witch Lake, Mich.

LOCATION.—Lat 46°14'48", long 88°00'45", in NW¼NW¼ sec.1, T.44 N., R.30 W., Dickinson County, on left bank 20 ft (6 m) up stream 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 mi² (818 km²).

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.

AVERAGE DISCHARGE.—9 years, 537 ft³/s (15.21 m³/s), 19.68 in/yr (500 mm/yr).

EXTREMES.—Current year: Maximum discharge, 2,460 ft³/s (69.7 m³/s) May 11 (gage height, 8.35 ft or 2.545 m); minimum, 94 ft³/s (2.66 m³/s) July 20, 21 (gage height, 2.45 ft or 0.747 m).

Period of record: Maximum discharge, 4,360 ft³/s (123 m³/s) May 11, 1965 (gage height, 11.60 ft or 3.536 m); minimum, 44 ft³/s (1.25 m³/s) Sept. 22, 23, 1971 (gage height, 2.13 ft or 0.649 m).

REMARKS.—Records good except those for winter periods, which are fair. Occasional regulation caused by dam 1.4 mi (23 km) above station. Some flow diverted and returned above station by iron ore processing plant. Records of chemical analyses for the current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	682	348	340	245	230	175	1,320	1,090	523	314	251	280
2	656	399	330	245	230	170	1,350	1,320	504	304	235	315
3	671	562	320	245	230	170	1,380	1,650	454	294	222	257
4	731	740	305	245	230	175	1,360	1,780	449	283	180	254
5	758	726	295	245	225	180	1,280	1,610	445	274	154	231
6	846	637	280	240	220	210	1,220	1,540	431	245	139	174
7	960	668	270	235	220	240	1,160	1,510	418	208	148	153
8	902	728	255	235	215	265	1,100	1,740	421	194	154	176
9	822	828	250	230	210	300	1,050	2,150	417	203	165	177
10	742	892	240	230	210	365	958	2,330	408	222	185	160
11	664	896	230	225	205	524	832	2,440	417	206	184	144
12	648	860	225	220	205	744	833	2,400	411	192	162	140
13	609	828	220	220	200	968	812	2,260	396	173	138	128
14	569	780	220	220	200	1,040	776	2,080	344	166	160	127
15	553	724	220	215	200	1,180	778	1,870	326	164	214	127
16	500	664	220	215	195	1,360	960	1,700	328	176	230	128
17	473	620	220	215	195	1,530	1,360	1,550	335	233	218	128
18	445	592	220	215	190	1,540	1,640	1,400	333	215	183	128
19	420	536	220	210	190	1,560	1,710	1,280	301	156	157	130
20	351	508	220	210	190	1,550	1,800	1,190	258	100	176	118
21	335	476	220	210	190	1,460	1,850	1,090	256	126	279	115
22	364	460	225	220	190	1,400	1,960	1,020	287	163	299	145
23	435	440	225	225	185	1,340	2,030	905	292	155	253	151
24	471	420	230	225	185	1,290	1,990	838	284	144	215	157
25	468	430	230	225	185	1,240	1,860	764	281	146	182	187
26	450	410	235	225	180	1,220	1,670	755	327	166	175	198
27	412	400	235	225	180	1,220	1,480	706	351	169	174	229
28	381	380	240	225	175	1,210	1,350	670	341	201	170	216
29	363	370	240	225	-----	1,230	1,220	628	330	210	162	206
30	354	355	240	225	-----	1,260	1,130	577	323	204	159	218
31	352	-----	240	225	-----	1,280	-----	532	-----	246	217	-----
TOTAL	17,387	17,677	7,660	7,015	5,660	28,396	40,219	43,375	10,991	6,252	5,940	5,297
MEAN	561	589	247	226	202	916	1,341	1,399	366	202	192	177
MAX	960	896	340	245	230	1,560	2,030	2,440	523	314	299	315
MTN	335	348	220	210	175	170	776	532	256	100	138	115
CFSM	1.78	1.86	.78	.72	.64	2.90	4.24	4.43	1.16	.64	.61	.56
IN.	2.05	2.08	.90	.83	.67	3.34	4.73	5.11	1.29	.74	.70	.62

CAI YR 1972 TOTAL 178,171 MEAN 487 MAX 3,910 MIN 144 CFSM 1.54 IN 20.97
WTR YR 1973 TOTAL 195,869 MEAN 537 MAX 2,440 MIN 100 CFSM 1.70 IN 23.06

LOCATION.--Lat 46°06'50", long 88°12'57", in NW¼ sec.20, T.43 N., R.31 W., Iron County, 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.

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

AVERAGE DISCHARGE.--29 years, 707 ft³/s (20.02 m³/s).

EXTREMES.--Current year: Maximum discharge, 4,200 ft³/s (119 m³/s) May 10-12 (gage height, 8.38 ft or 2.554 m); minimum, 99 ft³/s (2.80 m³/s) Sept. 4 (gage height, 1.43 ft or 0.436 m); minimum daily, 118 ft³/s (3.34 m³/s) Sept. 3.
Period of record: Maximum discharge, 7,260 ft³/s (206 m³/s) Apr. 28, 1960 (gage height, 10.73 ft or 3.271 m); minimum daily, 71 ft³/s (2.01 m³/s) Nov. 26, 1950.

REVISIONS.--WSP 1911: Drainage area.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,170	1,200	1,190	672	1,050	1,010	1,270	1,500	1,080	646	649	485
2	1,190	1,240	915	784	1,040	706	1,270	2,640	726	690	646	156
3	1,190	1,260	718	1,120	769	502	1,220	3,240	727	713	642	118
4	1,190	1,270	990	1,060	572	502	1,210	3,190	940	716	640	134
5	1,200	1,260	1,190	1,050	852	803	1,210	2,880	1,120	718	638	302
6	1,250	1,250	1,190	1,050	1,050	1,020	1,200	2,350	1,120	672	634	629
7	1,520	1,250	1,180	1,050	1,050	813	1,200	2,300	895	642	634	622
8	1,730	1,250	1,190	1,050	1,050	881	1,190	3,200	732	637	639	618
9	1,430	1,280	1,200	1,040	1,040	1,220	1,190	3,330	691	630	635	615
10	1,190	1,500	1,200	1,040	1,030	1,230	1,190	3,550	648	642	633	613
11	1,210	1,630	1,200	1,030	1,030	738	1,190	4,190	692	642	631	611
12	1,200	1,620	1,200	1,030	1,020	145	1,180	4,170	723	655	630	608
13	1,030	1,620	1,200	794	1,010	141	1,180	3,880	713	647	676	607
14	734	1,450	1,200	590	1,010	163	1,180	3,050	721	646	714	606
15	729	964	1,200	835	997	199	1,200	2,440	678	642	710	640
16	728	735	1,200	1,050	990	187	1,250	2,120	649	640	712	681
17	723	863	1,200	1,040	733	160	1,250	1,890	651	639	729	679
18	726	958	1,200	800	534	150	1,650	1,660	651	646	733	678
19	721	835	1,190	584	817	147	2,390	1,930	648	658	724	679
20	721	726	1,190	583	1,040	136	2,610	1,870	646	646	714	677
21	670	726	1,190	582	1,040	385	2,620	1,650	644	646	710	667
22	643	852	1,190	840	1,050	709	2,630	1,460	646	646	703	615
23	999	956	1,180	1,060	1,040	709	2,620	1,210	664	642	701	610
24	1,090	1,100	1,180	1,060	1,020	712	2,600	1,200	674	642	699	608
25	745	1,200	1,180	1,060	1,000	720	2,580	1,200	670	628	681	612
26	746	1,200	1,170	1,050	1,030	839	2,600	1,200	669	639	664	616
27	746	941	1,120	1,050	1,050	1,190	2,180	1,200	664	647	682	620
28	739	721	1,170	788	1,030	1,230	1,670	1,190	652	655	692	485
29	734	741	1,170	859	-----	1,260	1,680	1,180	654	650	660	148
30	1,030	725	884	1,060	-----	1,260	1,440	1,170	650	650	665	152
31	1,210	-----	675	1,050	-----	1,260	-----	1,170	-----	649	733	-----
TOTAL	30,934	33,323	35,052	28,711	26,944	21,127	49,850	69,210	22,038	20,261	20,953	15,891
MEAN	998	1,111	1,131	926	962	682	1,662	2,233	735	654	676	530
MAX	1,730	1,630	1,200	1,120	1,050	1,260						

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LOCATION.--Lat 45°57'04", long 88°11'13", in NE¼ sec.16, T.41 N., R.31 W., Michigan meridian, Iron County, 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).

PERIOD OF RECORD.-- January 1914 to current year. Published as "at Twin Falls near Iron Mountain, Mich." 1914-57. Records published for both sites July 1950 to September 1957.

EXTREMES.--Current year: Maximum discharge, 10,400 ft³/s (295 m³/s) May 3 (gage height, 9.81 ft or 2.990 m); minimum, 226 ft³/s (6.40 m³/s) Dec. 5 (gage height, 1.94 ft or 0.591 m); minimum daily, 847 ft³/s (24.0 m³/s) Sept. 23.

Period of record: Maximum discharge, 19,500 ft³/s (552 m³/s) Apr. 26, 1960 (gage height, 14.15 ft or 4.313 m); minimum, 38 ft³/s (1.08 m³/s) Aug. 21, 1962; minimum gage height, 1.18 ft (0.360 m) Aug. 21, 1962, Nov. 4, 1965; minimum daily discharge, 154 ft³/s (4.36 m³/s) Aug. 9, 1965.

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, and by Michigan Reservoir (capacity, 119,950 acre-ft or 148 hm³) and Peavy Pond (capacity, 33,860 acre-ft or 41.7 hm³) on Michigan River, and by many smaller reservoirs above station.

REVISIONS (WATER YEARS).--WSP 1707: 1953 (M). WSP 1911: Drainage area of former site.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4,080	2,370	2,030	1,980	1,670	1,860	4,660	3,880	2,330	1,940	1,860	2,050
2	3,540	2,960	1,670	2,060	1,760	2,000	4,800	6,150	2,440	2,030	1,860	1,690
3	3,510	4,240	1,420	2,000	1,680	1,660	4,810	9,140	2,200	1,770	2,040	1,520
4	3,040	4,470	2,040	1,770	1,600	1,690	4,780	9,150	2,050	1,510	1,830	1,610
5	2,640	4,370	1,850	2,290	1,760	1,900	4,420	7,440	2,230	1,430	1,430	1,600
6	2,990	4,260	2,110	1,970	1,740	2,240	3,860	6,550	2,220	1,550	1,600	2,040
7	3,810	3,840	2,230	1,730	1,990	2,270	3,280	5,450	2,470	1,330	1,590	2,060
8	3,620	3,660	1,940	2,290	1,760	2,400	3,170	7,980	2,240	1,290	1,550	2,050
9	3,550	3,800	2,040	2,160	1,930	2,420	3,270	8,910	2,010	1,550	1,590	1,630
10	3,450	3,640	1,850	2,020	1,970	2,820	3,100	9,100	2,310	1,590	1,780	1,500
11	3,390	3,940	2,250	2,080	1,880	3,770	2,850	9,090	2,330	1,600	2,120	1,550
12	2,920	4,000	2,010	1,910	2,020	4,470	2,770	9,040	2,140	1,680	2,260	1,580
13	2,060	3,550	2,330	1,420	1,750	4,410	2,850	8,700	2,080	1,990	1,900	1,460
14	1,960	3,080	2,230	1,260	1,880	4,360	2,770	6,850	2,050	1,890	1,750	1,220
15	1,620	2,730	2,200	2,080	1,960	5,200	2,890	4,950	2,000	1,490	1,930	973
16	2,180	2,450	2,050	1,730	1,820	6,000	4,060	4,410	1,880	1,600	1,870	1,060
17	2,340	2,080	1,830	1,820	1,360	5,400	5,510	4,270	1,530	1,530	1,870	1,440
18	1,790	2,190	2,160	1,810	1,350	4,570	6,240	4,000	1,780	1,510	2,140	1,440
19	1,730	2,070	2,140	1,840	1,790	4,290	7,200	3,820	1,720	1,700	2,220	1,380
20	1,740	2,140	2,270	1,940	1,640	3,970	6,420	3,770	1,760	1,930	2,250	1,270
21	1,950	2,100	2,110	1,890	1,740	3,610	5,740	3,700	1,910	1,670	2,030	1,390
22	2,020	2,270	2,080	1,800	1,760	3,470	5,650	3,630	1,850	1,760	1,860	1,060
23	2,720	2,000	2,140	1,950	1,770	3,470	5,670	2,910	1,950	1,600	1,620	847
24	3,050	2,180	2,200	1,940	1,860	3,500	5,300	2,770	1,610	1,620	1,670	1,480
25	2,420	2,200	1,840	2,000	1,800	3,460	4,680	3,160	2,010	1,650	1,340	1,400
26	2,120	2,160	2,230	2,070	1,820	3,410	4,670	3,640	2,060	1,440	1,260	1,300
27	2,180	2,330	2,030	1,930	1,980	3,620	4,370	3,270	1,960	1,710	1,580	1,490
28	2,140	2,040	2,060	1,910	2,060	4,070	3,580	3,090	2,180	1,610	1,610	1,730
29	1,930	2,180	2,130	1,880	-----	4,310	2,840	2,980	2,040	1,700	1,600	1,260
30	2,300	1,630	1,840	2,030	-----	4,520	3,000	2,770	2,120	2,030	1,580	1,170
31	2,400	-----	1,970	1,980	-----	4,710	-----	2,820	-----	1,870	1,960</	

STREAMS TRIBUTARY TO LAKE MICHIGAN

04064500 Pine River below Pine River Powerplant, near Florence, Wis.

LOCATION.--Lat 45°50'16", long 88°13'31", in SW¼ sec.22, T.39 N., R.18 E., Florence County, on left bank 60 ft (18 m) upstream from bridge on County Trunk N, 1.9 mi (3.1 km) downstream from powerplant of Wisconsin-Michigan Power Co., 6.0 mi (9.7 km) south of Florence, and 7.0 mi (11.3 km) downstream from Popple River.

DRAINAGE AREA.--528 mi² (1,368 km²).

PERIOD OF RECORD.--October 1923 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,098.84 ft (334.926 m) above mean sea level. Prior to October 1968, record obtained from Pine River powerplant 1.9 mi (3.1 km) upstream with a drainage area of 528 mi² (1,368 km²).

AVERAGE DISCHARGE.--50 years, 431 ft³/s (12.21 m³/s) 11.09 in/yr (282 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,300 ft³/s (65.1 m³/s) May 8, gage height, 6.45 ft (1.966 m); maximum gage height, 7.81 ft (2.380 m) Mar. 23, backwater from ice; minimum daily discharge, 192 ft³/s (5.44 m³/s) Sept. 15.

Period of record: Maximum daily discharge, 4,380 ft³/s (124 m³/s) Apr. 9, 1929; no flow at times during 1924, 1926-27, 1930-31, 1933, 1940.

REMARKS.--Records good except those for winter months, which are fair. Flow regulated by Pine River powerplant 1.9 mi (3.1 km) upstream; pondage is small and monthly discharge is near normal.

REVISIONS.--WSP 1237: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,200	478	340	350	330	310	1,250	960	400	470	523	442
2	1,100	648	260	390	340	290	1,470	1,500	720	456	417	515
3	960	1,100	250	420	330	300	1,460	2,100	680	344	334	577
4	840	1,140	240	340	330	320	1,420	2,230	860	380	317	433
5	900	1,110	290	330	330	330	1,450	2,080	900	350	316	535
6	940	1,050	300	330	330	350	1,240	1,840	740	311	300	462
7	880	1,040	280	340	310	640	1,140	1,780	780	306	263	346
8	800	994	260	360	270	1,000	1,000	2,090	840	304	272	315
9	720	960	300	320	280	920	900	2,150	940	334	302	352
10	645	900	330	290	260	1,000	840	2,210	900	354	311	271
11	647	800	330	340	290	1,300	740	2,150	800	418	290	299
12	623	720	330	320	300	1,500	720	2,100	700	440	337	271
13	575	640	310	310	270	1,500	650	1,900	540	506	245	263
14	555	600	300	300	270	1,900	680	1,600	520	541	313	214
15	521	520	310	290	270	2,100	832	1,380	507	462	266	102
16	503	470	320	300	300	2,100	900	1,210	511	442	239	244
17	467	500	310	340	270	1,900	1,500	1,100	540	334	374	273
18	410	500	330	370	270	1,800	2,040	1,000	500	280	304	223
19	387	460	310	450	270	1,700	1,490	920	700	329	300	223
20	330	450	290	490	270	1,500	1,290	820	520	284	350	250
21	411	410	320	420	270	1,500	1,350	780	530	258	312	221
22	474	330	310	380	270	1,400	1,450	720	580	243	294	266
23	534	340	330	460	270	1,300	1,410	700	600	201	247	333
24	644	390	320	380	270	1,220	1,560	540	540	201	276	338
25	625	460	300	400	270	1,150	1,480	750	640	280	240	451
26	624	490	310	360	270	1,160	1,250	1,000	600	307	270	323
27	627	450	330	360	290	1,210	1,000	1,200	560	324	330	307
28	625	350	330	350	270	1,200	900	1,300	520	322	275	344
29	514	310	330	340	-----	1,210	400	1,200	573	320	220	415
30	576	320	330	330	-----	1,260	320	1,000	470	306	272	312
31	536	-----	330	330	-----	1,240	-----	640	-----	450	431	-----
TOTAL	20,401	18,970	9,530	11,010	9,070	36,840	37,872	43,378	20,061	11,185	3,562	10,552
MEAN	658	612	307	355	289	1,188	1,222	1,399	649	359	111	345
MAX	1,200	1,140	340	420	440	2,100	2,040	2,230	940	541	523	577
MIN	330	310	240	240	260	290	350	540	470	258	201	192
CEFS	1.25	1.20	.52	.57	.55	2.25	2.37	2.65	1.27	.56	.55	.64
TD	1.44	1.34	.57	.74	.57	2.64	2.65	2.95	1.41	.74	.57	.73
CAL YR 1972 TOTAL	192,827	MEAN 545	MAX 4,640	MIN 150	CEFS 1.84	TD 14,000						
WTR YR 1973 TOTAL	236,873	MEAN 644	MAX 2,240	MIN 192	CEFS 1.23	TD 15,600						

NOTE.--No gage-height record Nov. 9 to Dec. 8.

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04065300 West Branch Sturgeon River near Randville, Mich.

LOCATION.--Lat 46°00'45", long 87°58'41", in NE¼ sec.30, T.42 N., R.29 W., Dickinson County, 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 mi² (145.3 km²).

PERIOD OF RECORD.--August 1958 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,170 ft (357 m) from topographic map (nearest 10 ft).

AVERAGE DISCHARGE.--15 years, 43.5 ft³/s (1.232 m³/s), 10.53 in/yr (267 mm/yr).

EXTREMES.--Current year: Maximum discharge, 349 ft³/s (9.88 m³/s) May 3 (gage height, 5.59 ft or 1.704); maximum gage height, 5.67 ft (1.728 m) Mar. 12 (ice jam); minimum discharge, 8.0 ft³/s (0.23 m³/s) Sept. 13, 14; minimum gage height, 1.79 ft (0.546 m) Aug. 5-7, Sept. 13, 14; minimum daily discharge, 8.8 ft³/s (0.25 m³/s) Sept. 14.
Period of record: Maximum discharge, 570 ft³/s (16.1 m³/s) May. 7, 1960 (gage height, 6.40 ft or 1.951 m); minimum, 1.5 ft³/s (0.042 m³/s) July 22, 1964 (gage height, 1.35 ft or 0.411 m); minimum daily, 3.4 ft³/s (0.096 m³/s) July 22, 1964.

REMARKS.--Records fair. Since December 1958, diversion above station for industrial use; figures of runoff adjusted thereafter.
Small diversions for sprinkler irrigation.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	171	34	24	24	26	23	84	71	40	36	26	121
2	117	66	22	24	26	23	109	205	43	31	24	104
3	81	161	21	23	26	24	129	340	41	29	19	65
4	67	214	20	23	26	24	127	277	64	26	15	68
5	58	179	20	23	25	26	112	188	69	23	12	59
6	78	133	19	23	24	29	89	134	70	22	11	40
7	100	108	19	23	24	45	76	108	59	22	11	28
8	87	110	19	23	23	58	65	167	70	19	15	21
9	62	107	19	22	23	80	53	288	75	18	20	17
10	44	93	18	22	23	76	43	300	59	26	17	15
11	42	81	18	22	23	115	39	259	45	27	13	14
12	42	76	18	21	22	150	37	208	40	35	12	11
13	37	62	18	21	22	220	33	170	36	48	14	9.0
14	32	50	18	22	22	250	33	132	30	36	37	8.8
15	28	45	19	22	22	260	51	102	27	26	31	9.9
16	25	41	19	23	22	230	139	84	42	22	26	11
17	22	38	19	24	22	200	269	78	72	18	75	14
18	20	36	20	27	22	160	252	68	74	17	102	14
19	19	34	20	30	22	140	182	61	58	47	74	14
20	18	33	20	31	22	110	143	56	44	51	49	16
21	30	33	20	30	22	92	133	51	37	33	35	18
22	42	32	20	30	22	88	142	46	34	23	26	24
23	73	30	20	28	22	83	138	42	43	18	23	27
24	94	29	20	27	22	81	114	40	50	15	22	24
25	83	28	20	26	22	87	88	47	43	17	20	32
26	71	28	19	26	22	101	67	82	43	21	21	44
27	63	28	19	25	23	105	55	84	47	29	23	60
28	52	28	19	25	23	101	50	72	51	42	20	53
29	46	26	20	25	-----	102	43	67	46	44	17	36
30	37	25	21	25	-----	102	37	52	41	36	19	26
31	33	-----	23	25	-----	92	-----	43	-----	30	78	-----
TOTAL	1,774	1,988	611	765	645	3,277	2,932	3,922	1,493	887	907	1,003.7
MEAN	57.2	66.3	19.7	24.7	23.0	106	97.7	127	49.8	28.6	29.3	33.5
MAX	171	214	24	31	26	260	269	340	75	51	102	121
MIN	18	25	18	21	22	23	33	40	27	15	11	8.8
+	5.2	5.6	5.8	5.8	5.8	5.8	5.7	5.6	5.6	5.5	5.4	5.5
MEAN†	62.4	71.9	25.5	30.5	28.8	112	103	133	55.4	34.1	34.7	39.0
CFSM†	1.11	1.28	.45	.54	.51	2.00	1.84	2.37	.99	.61	.62	.70
IN†	1.28	1.43	.52	.63	.53	2.30	2.05	2.73	1.10	.70	.71	.78

CAL YR 1972 TOTAL 18,419.4 MEAN 50.3 MAX 44.5 MIN 5.9 MEAN† 55.6 CFSM† 0.99 IN† 13.49
WTR YR 1973 TOTAL 20,204.7 MEAN 55.4 MAX 34.0 MIN 8.8 MEAN† 61.0 CFSM† 1.09 IN† 14.76

+ Average monthly diversion, equivalent in cubic feet per second, for industrial use; furnished by Hanna Mining Co.
† Adjusted for diversion.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04065500 Sturgeon River near Foster City, Mich.

LOCATION.--Lat 45°54'30", long 87°45'15", in NW¼ sec.36, T.41 N., R.28 W., Dickinson County, 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 mi² (614 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 966.6 ft (294.620 m) above mean sea level.

AVERAGE DISCHARGE.--19 years, 183 ft³/s (5.183 m³/s), 10.49 in/yr (266 mm/yr), adjusted for diversion.

EXTREMES.--Current year: Maximum discharge, 1,280 ft³/s (36.2 m³/s) May 11 (gage height, 8.04 ft or 2.451 m); maximum gage height, 9.08 ft (2.768 m) Mar. 16 (backwater from ice); minimum discharge, 68 ft³/s (1.93 m³/s) Sept. 19 (gage height, 2.71 ft or 0.826 m).
Period of record: Maximum discharge, 2,570 ft³/s (72.8 m³/s) May 8, 1960 (gage height, 10.35 ft or 3.155 m); minimum, 15 ft³/s (0.42 m³/s) July 24, 1964; minimum gage height, 1.96 ft (0.597 m) Aug. 21, 1970.

REMARKS.--Records good except those for winter periods, which are fair. Since December 1958, diversion above station for industrial use, figures of runoff adjusted thereafter. Small diversion for sprinkler irrigation. Records of water temperatures for the current year are published in Part 2 of this report.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	822	187	105	105	105	90	414	273	254	227	313	213
2	731	214	100	100	105	95	432	548	223	196	303	248
3	612	351	95	100	110	95	470	938	227	169	259	277
4	490	420	90	95	110	95	535	1,100	312	147	216	298
5	396	476	85	95	110	100	555	1,150	379	130	179	296
6	346	502	85	95	110	100	520	1,020	389	115	139	281
7	334	474	85	90	105	150	462	825	363	106	110	249
8	318	444	85	90	105	270	410	885	342	96	113	203
9	299	408	85	90	100	330	361	1,080	338	87	172	149
10	261	376	85	85	100	310	315	1,180	317	86	174	118
11	238	344	85	85	100	400	275	1,270	284	88	158	102
12	210	307	85	80	95	550	257	1,220	255	110	137	92
13	193	272	85	80	95	800	243	1,080	219	145	119	85
14	180	238	85	80	95	1,000	217	882	192	150	168	80
15	163	209	85	85	95	1,200	246	713	168	138	196	75
16	150	180	90	85	95	1,200	430	581	168	118	190	72
17	138	164	90	90	90	1,050	768	494	210	100	202	71
18	134	155	90	95	90	950	888	425	239	86	246	70
19	124	150	90	110	90	800	946	385	239	97	264	69
20	114	149	95	115	90	650	888	351	219	120	260	71
21	128	141	95	115	90	560	830	321	192	137	227	72
22	163	137	90	110	90	472	775	287	168	130	188	85
23	210	125	90	105	90	428	700	258	166	112	149	94
24	277	125	85	105	90	397	622	234	183	97	125	107
25	303	125	85	105	90	382	545	232	180	90	109	125
26	304	125	85	100	90	385	464	258	180	87	104	134
27	286	126	85	100	90	399	399	275	232	116	98	160
28	261	124	85	100	90	408	345	304	278	143	92	174
29	232	120	85	100	-----	418	300	357	278	182	86	172
30	205	110	90	100	-----	422	266	336	255	191	80	149
31	188	-----	100	105	-----	420	-----	291	-----	207	135	-----
TOTAL	8,810	7,278	2,755	2,995	2,715	14,926	14,878	19,553	7,449	4,003	5,311	4,391
MEAN	284	243	88.9	96.6	97.0	481	496	631	248	129	171	146
MAX	822	502	105	115	110	1,200	946	1,270	389	227	313	298
MIN	114	110	85	80	90	90	217	232	166	86	80	69
+	5.2	5.6	5.8	5.8	5.8	5.8	5.7	5.6	5.6	5.5	5.4	5.5
MEAN‡	289	249	94.7	102	103	487	502	637	254	134	176	152
CFSM‡	1.22	1.05	.40	.43	.43	2.05	2.12	2.69	1.07	.57	.74	.64
IN‡	1.41	1.17	.46	.50	.45	2.37	2.36	3.10	1.20	.66	.86	.72
CAL YR 1972	TOTAL 84,999	MEAN 232	MAX 1,960	MIN 47	MEAN‡ 237	CFSM‡ 1.00	IN‡ 13.65					
WTR YR 1973	TOTAL 95,064	MEAN 260	MAX 1,270	MIN 69	MEAN‡ 266	CFSM‡ 1.12	IN‡ 15.24					

+ Average monthly diversion, equivalent in cubic feet per second, for industrial use; furnished by Hanna Mining Co.
‡ Adjusted for diversion.

STREAMS TRIBUTARY TO LAKE MICHIGAN

65

04065600 Pine Creek near Iron Mountain, Mich.

LOCATION.--Lat 45°55'51", long 87°58'18", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.19, T.41 N., R.29 W., Dickinson County, 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 mi² (43.5 km²).

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.

EXTREMES.--Current year: Maximum discharge, 164 ft³/s (4.64 m³/s) Mar. 15 (gage height, 5.10 ft or 1.554 m); minimum, 4.0 ft³/s (0.11 m³/s) July 23 (gage height, 1.79 ft or 0.546 m).

Period of record: Maximum discharge, 164 ft³/s (4.64 m³/s) Mar. 15, 1973 (gage height, 5.10 ft or 1.554 m); maximum gage height, 5.40 ft (1.646 m) Apr. 17, 1972 (ice jam); minimum discharge, 1.8 ft³/s (0.051 m³/s) Aug. 6, 1972 (gage height, 1.54 ft or 0.469 m).

REMARKS.--Records good except those for winter periods, which are fair. Flow includes an average of 5.6 ft³/s (0.16 m³/s) diverted from West Branch Sturgeon River Basin. Some regulation by mine tailings ponds in headwaters. Records of water temperature for the current year are published in Part 2 of this report.

DISCHARGE. IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	69	15	9.0	16	12	9.4	32	35	25	20	13	21
2	54	31	8.4	15	12	9.4	37	84	24	18	11	17
3	44	59	8.0	12	12	10	39	117	24	17	10	16
4	34	62	7.7	10	12	11	45	89	36	15	9.4	16
5	26	48	7.5	8.0	12	11	41	62	35	13	8.2	15
6	28	39	7.4	7.5	12	10	37	51	31	11	7.0	13
7	27	37	7.4	6.8	12	18	39	53	29	10	6.7	12
8	24	37	7.3	6.5	12	35	40	95	30	8.8	7.9	12
9	20	32	7.3	6.3	12	33	36	115	30	8.0	9.5	10
10	17	30	7.3	6.1	11	32	34	111	27	9.5	8.3	9.2
11	17	28	7.3	6.1	11	50	31	97	24	8.8	7.5	8.3
12	16	24	7.3	6.1	11	65	29	80	22	11	6.7	6.6
13	13	19	7.3	6.1	11	90	27	66	19	14	6.9	6.1
14	10	16	7.3	6.1	11	120	24	54	17	12	11	6.0
15	8.6	15	7.2	6.1	11	158	27	46	16	10	11	5.6
16	7.3	14	7.1	6.2	11	135	60	42	19	8.7	9.9	5.2
17	6.6	13	7.2	7.0	10	111	96	40	28	7.9	15	5.2
18	6.7	13	7.7	9.0	10	98	84	36	27	6.9	17	4.5
19	8.2	13	8.6	12	10	71	64	34	23	6.8	16	4.6
20	8.9	12	10	15	10	62	55	32	19	6.6	15	8.2
21	14	12	13	15	9.8	56	58	32	17	6.4	13	8.1
22	18	11	16	14	9.8	44	54	28	17	7.1	11	7.9
23	26	11	15	14	9.7	37	46	23	16	5.3	10	8.2
24	30	11	14	13	9.6	34	40	21	16	5.0	9.5	8.2
25	27	10	14	13	9.4	35	35	25	14	5.2	9.1	10
26	25	10	14	13	9.2	36	30	35	19	6.5	8.9	12
27	23	10	14	13	9.2	36	24	32	32	12	8.7	15
28	20	9.8	13	12	9.4	34	21	31	27	16	7.8	14
29	17	9.5	13	12	-----	33	19	32	23	16	7.1	13
30	16	9.2	16	12	-----	32	17	29	22	13	7.3	13
31	15	-----	18	12	-----	31	-----	26	-----	13	17	-----
TOTAL	676.3	660.5	314.3	316.9	301.1	1,546.8	1,221	1,653	708	328.5	316.4	310.9
MEAN	21.8	22.0	10.1	10.2	10.8	49.9	40.7	53.3	23.6	10.6	10.2	10.4
MAX	69	62	18	16	12	158	96	117	36	20	17	21
MIN	6.6	9.2	7.1	6.1	9.2	9.4	17	21	14	5.0	6.7	4.5

CAL YR 1972 TOTAL 7,815.0 MEAN 21.4 MAX 135 MIN 2.1
WTR YR 1973 TOTAL 8,353.7 MEAN 22.9 MAX 158 MIN 4.5

STREAMS TRIBUTARY TO LAKE MICHIGAN

04066000 Menominee River near Pembine, Wis.

LOCATION.--Lat 45°35'24", long 87°46'34", in sec.21, T.37 N., R.28 W., Michigan meridian, Menominee County, Mich., on left bank 0.1 mi (0.2 km) upstream from Pemene Creek, 4.0 mi (6.4 km) west of Nathan, Mich., 15 mi (24 km) southeast of Pembine, and at mile 65.3 (105.1 km)

DRAINAGE AREA.--3,240 mi² (8,390 km²), approximately.

PERIOD OF RECORD.--October 1949 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.--Water-stage recorder. Altitude of gage is 745 ft (227 m), from river-profile map.

AVERAGE DISCHARGE.--24 years, 3,018 ft³/s (85.47 m³/s).

EXTREMES.--Current year: Maximum daily discharge, 16,000 ft³/s (453 m³/s) May 10; minimum, 1,370 ft³/s (38.8 m³/s) Sept. 17, 18, gage height, 7.15 ft (2.179 m).

Period of record: Maximum discharge, 26,900 ft³/s (762 m³/s) May 8, 1960, gage height, 13.90 ft (4.237 m); minimum, 694 ft³/s (19.7 m³/s) Sept. 3, 1969, gage height, 1.66 ft (0.506 m).

REMARKS.--Records good except those for winter months, which are poor. Flow regulated by powerplants and by Michigamme Reservoir, capacity, 119,950 acre-ft (148 hm³), and Peavy Pond, capacity, 33,860 acre-ft (41.7 hm³), on the Michigamme River, and by many smaller reservoirs above station.

REVISIONS (WATER YEARS).--WSP 1277: 1952.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7,460	3,440	2,180	2,440	3,000	2,300	8,330	7,600	3,470	2,940	3,100	2,780
2	5,600	3,690	2,270	2,500	2,730	2,600	8,530	9,800	3,810	2,570	3,000	2,710
3	5,860	5,020	2,150	2,600	2,440	2,500	9,530	13,000	3,330	2,530	2,800	2,520
4	5,460	6,400	2,200	2,650	2,380	2,300	10,100	14,000	3,320	1,950	2,400	2,200
5	5,230	7,260	2,280	2,670	2,300	2,420	9,400	13,000	3,350	1,940	2,300	2,040
6	5,810	6,210	2,120	2,780	2,400	2,410	8,210	12,000	4,040	2,040	2,200	2,010
7	5,630	6,360	1,940	2,610	2,500	3,400	7,350	11,000	3,380	1,340	2,100	2,030
8	5,700	5,500	3,090	2,690	2,400	4,300	6,530	13,000	3,740	1,750	2,200	2,090
9	4,990	5,800	2,690	2,500	2,400	5,400	6,140	15,000	3,320	1,210	2,200	2,090
10	4,540	5,440	2,190	2,600	2,300	7,180	6,570	16,000	4,060	2,020	2,300	2,410
11	4,500	5,330	2,380	2,500	2,200	8,050	6,910	15,000	3,770	1,990	2,700	2,130
12	4,550	5,220	2,500	2,400	2,300	10,000	5,430	14,000	3,530	2,110	2,600	2,130
13	3,950	4,670	2,700	2,200	2,400	13,000	5,920	13,000	3,230	2,350	2,500	2,140
14	3,300	4,330	2,700	2,100	2,400	14,000	4,750	11,000	2,980	2,540	2,500	2,020
15	2,850	3,750	2,500	2,200	2,300	15,000	4,430	8,400	2,820	2,290	2,400	1,870
16	2,790	3,510	2,400	2,300	2,200	14,000	6,440	7,200	2,670	2,230	2,300	1,530
17	3,260	2,920	2,300	2,570	2,200	13,000	11,800	7,000	2,610	2,100	2,900	1,430
18	2,800	2,780	2,500	2,320	2,100	12,000	12,900	5,800	2,590	1,400	3,100	1,730
19	2,620	2,720	2,600	2,750	2,000	10,000	11,200	6,200	2,850	1,700	3,400	1,930
20	2,710	2,810	2,800	3,100	2,100	8,400	11,200	6,200	2,320	2,100	3,300	1,870
21	2,470	2,790	2,700	3,480	2,200	7,600	11,200	6,200	2,340	2,200	3,300	1,940
22	2,800	2,640	2,700	3,050	2,200	6,400	10,700	6,000	2,700	2,000	2,600	2,040
23	3,400	2,730	2,800	3,270	2,200	6,540	10,100	5,200	2,780	2,100	2,700	1,720
24	4,500	2,650	2,700	3,050	2,200	6,740	10,100	5,000	2,730	2,200	2,500	1,660
25	4,660	2,600	2,600	2,930	2,200	6,420	8,410	5,400	2,330	2,100	2,250	2,000
26	3,740	2,780	2,400	3,030	2,200	6,470	7,170	7,000	2,440	2,100	2,500	2,720
27	3,900	2,750	2,700	2,710	2,200	6,550	7,160	6,800	2,820	2,100	1,700	2,350
28	3,480	2,800	2,600	2,710	2,500	7,240	6,340	7,400	2,990	2,600	1,900	2,230
29	3,330	2,810	2,600	3,170	-----	7,780	4,460	6,200	2,910	2,800	2,220	2,350
30	3,640	2,440	2,900	3,000	-----	7,760	5,400	5,000	2,340	3,000	2,200	2,130
31	3,460	-----	2,650	3,000	-----	6,720	-----	4,870	-----	3,100	2,360	-----
TOTAL	130,410	120,440	74,080	83,400	65,100	231,240	241,070	244,270	94,520	69,110	78,760	64,220
MEAN	4,207	4,015	2,412	2,706	2,325	7,461	8,035	8,170	3,217	2,232	2,541	2,274
MAX	7,460	7,260	3,090	3,480	3,000	15,000	12,900	16,000	4,060	3,100	3,400	2,400
MIN	2,470	2,440	1,940	2,100	2,000	2,300	4,430	4,870	2,610	1,700	1,700	1,430

CAL YR 1972 TOTAL 1,345,030 MEAN 3,675 MAX 12,000 MIN 1,390

WTR YR 1973 TOTAL 1,547,230 MEAN 4,239 MAX 16,000 MIN 1,490

STREAMS TRIBUTARY TO LAKE MICHIGAN

67

04067000 Menominee River below Koss, Mich.

LOCATION.--Lat 45°21'16", long 87°38'55", in sec.9, T.34 N., R.27 W., Michigan meridian, Menominee County, 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 mi² (9,820 km²), 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.

AVERAGE DISCHARGE.--61 years (1907-8, 1913-73), 3,154 ft³/s (89.32 m³/s).

EXTREMES.--Current year: Maximum daily discharge, 17,600 ft³/s (498 m³/s) May 11; minimum daily, 1,690 ft³/s (47.9 m³/s) Sept. 18.
Period of record: Maximum daily discharge, 33,000 ft³/s (935 m³/s) May 10, 1960; minimum daily, 162 ft³/s (4.59 m³/s) Sept. 15, 1931.

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 hm³), and Peavy Pond, capacity, 33,860 acre-ft (41.7 hm³) on Michigamme River, and by many smaller reservoirs above station.

COOPERATION.--Records of daily discharge furnished by Wisconsin Public Service Corp. since 1913.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7,580	4,000	2,710	3,000	3,350	2,780	8,790	5,720	5,130	3,360	3,360	2,690
2	7,550	5,250	1,700	2,760	3,290	2,580	8,500	7,470	4,950	3,360	3,360	2,660
3	7,300	5,330	1,650	3,350	3,100	2,880	8,620	11,000	4,950	3,240	3,360	2,710
4	5,570	6,340	2,020	2,850	2,830	2,810	9,010	14,200	3,950	2,980	3,120	2,680
5	6,100	7,550	2,590	3,120	2,500	2,560	9,680	15,700	4,330	2,660	2,620	3,220
6	5,420	6,220	2,450	2,940	2,520	2,640	8,900	14,300	4,590	2,300	2,590	3,400
7	5,140	7,140	2,500	2,750	2,690	3,080	8,690	13,100	4,470	2,500	2,430	3,130
8	5,560	7,330	2,230	2,570	2,700	4,650	6,300	12,000	4,470	2,220	2,250	3,350
9	5,100	7,080	2,860	2,670	2,650	5,130	6,510	13,800	4,350	2,070	2,480	2,470
10	5,600	7,040	2,930	2,550	2,540	6,040	6,500	16,100	4,820	2,240	2,450	2,970
11	5,530	6,930	2,510	2,820	2,590	7,310	6,550	17,500	4,480	2,500	2,480	2,360
12	5,410	6,840	2,590	2,780	2,490	8,920	5,560	17,000	4,400	2,520	2,940	2,130
13	5,140	6,840	2,990	2,660	2,590	11,400	5,370	16,300	4,030	2,680	3,000	2,420
14	4,270	6,360	3,000	2,500	2,790	14,000	5,190	15,300	3,400	3,080	2,770	2,220
15	2,850	4,500	3,000	2,210	2,680	15,200	4,900	13,800	3,420	2,700	2,720	2,240
16	3,000	4,700	2,880	2,380	2,590	16,100	5,870	9,360	3,170	2,690	2,730	1,730
17	2,860	3,690	2,700	2,500	2,470	15,790	8,150	8,080	3,360	2,560	2,500	1,730
18	3,300	3,360	2,580	2,610	2,470	15,400	10,700	7,730	3,350	2,350	3,240	1,730
19	2,880	3,300	2,900	2,930	2,300	13,400	11,500	7,640	3,410	2,000	3,360	1,770
20	2,460	3,360	2,590	3,120	2,200	10,900	12,800	6,900	3,430	1,900	3,780	2,070
21	2,500	3,300	3,020	3,290	2,400	9,160	12,600	6,930	3,350	2,360	3,720	1,940
22	2,460	3,490	3,050	3,370	2,450	8,700	13,100	6,940	3,720	2,500	3,660	2,100
23	3,120	3,100	3,010	3,730	2,500	7,900	12,200	6,970	3,360	2,200	2,920	2,340
24	4,573	3,150	3,100	3,460	2,500	7,360	11,400	5,740	3,240	2,320	2,900	1,750
25	5,300	3,020	3,100	3,500	2,500	7,120	10,400	5,440	3,360	2,500	2,400	1,920
26	5,430	3,120	2,520	3,360	2,500	7,120	8,740	5,620	3,720	2,420	2,920	2,350
27	4,820	3,370	2,820	3,510	2,400	7,260	8,790	7,750	3,720	2,350	2,480	3,000
28	4,620	3,230	3,000	3,420	2,460	7,150	7,670	7,730	3,480	2,350	2,980	2,640
29	3,490	3,720	2,880	3,360	-----	7,200	5,250	8,140	3,350	2,750	1,900	2,440
30	3,750	3,120	2,880	3,360	-----	7,340	5,420	6,940	3,480	3,000	1,900	2,400
31	4,050	-----	3,120	3,200	-----	8,380	-----	6,090	-----	3,240	2,020	-----
TOTAL	145,350	145,900	84,530	93,300	72,980	247,170	254,580	317,190	117,570	30,110	87,930	73,050
MEAN	4,721	4,863	2,727	3,010	2,505	7,973	8,485	10,230	3,922	2,584	2,936	2,435
MAX	7,580	7,550	3,120	3,350	3,360	16,100	13,100	17,500	5,130	3,360	3,780	3,480
MIN	2,460	3,020	1,700	2,210	2,200	2,560	4,900	5,440	3,170	1,900	1,900	1,690

DAY YEAR 1972 TOTAL 1,447,740 MEAN 3,955 MAX 18,700 MIN 1,350
DAY YEAR 1973 TOTAL 1,720,770 MEAN 4,714 MAX 17,600 MIN 1,690

STREAMS TRIBUTARY TO LAKE MICHIGAN

04096400 St. Joseph River near Burlington, Mich.

LOCATION.--Lat 42°06'10", long 85°02'25", in SW¼ SW¼ sec.20, T.4 S., R.6 W., Calhoun County, 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 mi² (521 km²).

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 920 ft (280 m) revised (from topographic map), nearest 10 ft.

AVERAGE DISCHARGE.--11 years, 149 ft³/s (4.220 m³/s), 10.07 in/yr (256 mm/yr).

EXTREMES.--Current year: Maximum discharge, 553 ft³/s (15.7 m³/s) about Jan. 1 (gage height, 4.48 ft or 1.366 m, from recorded range in stage); minimum, 58 ft³/s (1.64 m³/s) part or all of each day Sept. 14-17; minimum gage height, 1.81 ft (0.552 m) Sept. 15, 16, 17. Period of record: Maximum discharge, 1,000 ft³/s (28.3 m³/s) Feb. 5, 1968 (gage height, 5.51 ft or 1.679 m); minimum, 8.0 ft³/s (0.23 m³/s) Aug. 9, 10, 11, 1964; minimum gage height, 1.67 ft (0.509 m) Aug. 16, 1972.

REMARKS.--Records good except those for periods of no gage height record, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	190	160	227	540	273	190	490	352	520	140	220	85
2	170	160	220	450	273	200	484	346	510	140	270	80
3	152	166	220	406	282	210	458	335	500	140	250	80
4	142	164	220	531	275	230	434	316	480	150	230	75
5	135	162	220	517	271	260	411	297	450	150	210	75
6	129	188	210	468	271	300	390	280	430	150	190	70
7	121	206	200	430	271	343	367	269	410	150	180	70
8	110	201	190	400	266	341	348	282	390	150	170	65
9	110	203	190	390	236	330	337	284	360	150	160	65
10	105	203	200	372	241	324	350	268	330	150	160	60
11	100	203	200	360	228	357	339	254	310	150	150	60
12	100	217	210	350	225	403	328	241	278	140	150	60
13	95	225	220	332	222	384	320	232	259	140	150	60
14	95	225	230	287	233	379	310	225	241	130	150	58
15	95	224	240	268	217	387	302	217	230	130	146	58
16	95	225	240	251	198	382	300	209	220	120	140	58
17	90	230	250	252	190	408	306	201	210	120	140	60
18	90	238	260	293	190	420	298	195	200	120	130	66
19	90	246	260	335	200	437	298	188	200	110	130	64
20	90	251	270	320	210	455	295	184	190	110	130	63
21	90	249	280	291	210	452	289	177	180	110	120	61
22	95	244	280	314	210	446	377	177	170	110	120	63
23	110	243	280	320	210	440	480	190	160	110	120	63
24	144	240	280	306	210	446	455	220	160	110	110	62
25	147	240	280	289	210	452	434	250	150	110	110	61
26	148	240	280	302	205	455	420	280	150	110	105	76
27	147	240	280	302	200	446	400	310	140	110	100	74
28	148	240	280	306	190	431	379	360	140	120	95	70
29	150	240	290	285	-----	458	357	410	140	120	90	97
30	150	230	320	262	-----	500	346	460	140	130	90	142
31	150	-----	450	269	-----	497	-----	500	-----	170	85	-----
TOTAL	3,783	6,503	7,777	10,798	6,417	11,763	11,102	8,509	8,248	4,050	4,601	2,101
MEAN	122	217	251	348	229	379	370	274	275	131	148	70.0
MAX	190	251	450	540	282	500	490	500	520	170	270	142
MIN	90	160	190	251	190	190	289	177	140	110	85	58
CFSM	.61	1.08	1.25	1.73	1.14	1.89	1.84	1.36	1.37	.65	.74	.35
IN.	.70	1.20	1.44	2.00	1.19	2.18	2.05	1.57	1.53	.75	.85	.39

CAL YR 1972 TOTAL 58,986 MEAN 161 MAX 450 MIN 57 CFSM .80 IN 10.92
WTR YR 1973 TOTAL 85,652 MEAN 235 MAX 540 MIN 58 CFSM 1.17 IN 15.85

NOTE.--No gage-height record Dec. 2 to Jan. 2, June 15 to Sept. 13.

STREAMS TRIBUTARY TO LAKE MICHIGAN

69

04096515 Hog Creek near Allen, Mich.

LOCATION.--Lat 41°56'55", long 84°49'40", in NE¼ SE¼ sec.13, T.6 S., R.5 W., Branch County, 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 mi² (126.1 km²).

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

GAGE.--Water-stage recorder. Altitude of gage 1,010 ft (308 m) from topographic map. Prior to May 23, 1970, nonrecording gage at same site and datum.

EXTREMES.--Current year: Maximum discharge, 207 ft³/s (5.86 m³/s) Jan. 2 (gage height, 4.56 ft or 1.390 m); minimum, 3.7 ft³/s (0.10 m³/s) Sept. 27 (gage height, 1.54 ft or 0.469 m).

Period of record: Maximum discharge, 207 ft³/s (5.86 m³/s) Jan. 2, 1973 (gage height, 4.56 ft or 1.390 m); maximum gage height, 5.73 ft (1.747 m) Feb. 20, 1971 (backwater from ice); minimum discharge, 1.2 ft³/s (0.034 m³/s) Aug. 20, 21, 1971, (gage height, 1.35 ft or 0.411 m).

REMARKS.--Records good except those for the winter period, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	37	63	194	60	35	119	69	143	24	49	12
2	40	41	60	195	69	51	116	68	126	23	57	12
3	37	45	59	175	82	76	111	65	114	24	47	11
4	33	46	57	167	87	89	106	61	112	27	36	9.8
5	31	44	55	175	84	93	101	57	115	27	28	9.4
6	29	42	55	162	79	94	95	53	111	25	23	9.1
7	27	42	55	140	75	95	88	50	106	23	20	8.5
8	25	52	55	122	72	97	80	52	95	21	17	7.9
9	23	60	55	104	69	94	78	54	83	19	18	7.8
10	20	63	55	90	65	90	91	52	71	19	28	7.5
11	19	63	60	75	60	97	98	48	61	19	33	7.3
12	19	61	60	67	55	116	96	44	54	18	30	6.9
13	19	60	60	62	50	122	88	42	49	17	26	6.7
14	18	69	70	60	43	121	80	39	45	16	23	6.6
15	17	81	70	58	43	123	73	38	40	15	21	6.5
16	16	91	70	56	42	123	68	36	38	14	20	6.4
17	16	91	65	58	40	126	67	34	35	14	19	6.8
18	16	88	65	69	40	128	67	32	33	13	17	7.8
19	15	84	65	77	38	129	70	31	31	12	17	6.9
20	15	84	65	74	37	133	70	29	29	11	18	6.4
21	15	86	65	77	38	131	69	28	27	11	19	6.0
22	20	87	65	73	38	128	87	29	24	12	17	6.2
23	35	86	65	83	37	125	119	65	23	12	16	6.0
24	43	81	65	92	36	125	128	104	22	16	15	5.5
25	44	77	65	85	35	130	120	107	21	18	15	5.2
26	42	75	65	78	34	136	109	110	22	18	14	5.0
27	40	74	65	77	34	135	97	116	23	17	14	4.2
28	39	73	65	77	33	129	86	123	24	22	13	4.1
29	40	70	69	76	-----	123	76	147	25	27	12	8.0
30	40	66	83	78	-----	120	71	158	26	24	12	12
31	39	-----	145	70	-----	118	-----	154	-----	28	12	-----
TOTAL	874	2,019	2,036	3,046	1,475	3,432	2,724	2,095	1,728	586	706	225.5
MEAN	28.2	67.3	65.7	98.3	52.7	111	90.8	67.6	57.6	18.9	22.8	7.52
MAX	44	91	145	195	87	136	128	158	143	28	57	12
MIN	15	37	55	56	33	35	67	28	21	11	12	4.1
CFSM	.58	1.38	1.35	2.02	1.08	2.28	1.86	1.39	1.18	.39	.47	.15
IN.	.67	1.54	1.56	2.33	1.13	2.62	2.08	1.60	1.32	.45	.54	.17

CAL YR 1972 TOTAL 14,066.9 MEAN 38.4 MAX 145 MIN 8.3 CFSM .79 IN 10.75
WTR YR 1973 TOTAL 20,946.5 MEAN 57.4 MAX 195 MIN 4.1 CFSM 1.18 IN 16.00

STREAMS TRIBUTARY TO LAKE MICHIGAN

04096600 Coldwater River near Hodunk, Mich.

LOCATION.--Lat 42°01'45", long 85°06'25", in NW¼ NE¼ sec.22, T.5 S., R.7 W., Branch County, on upstream 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 mi² (759 km²).

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 900 ft (274 m) from topographic map. Prior to July 26, 1963, nonrecording gage and crest-stage gage at same site and datum.

AVERAGE DISCHARGE.--11 years, 215 ft³/s (6.089 m³/s, 9.96 in/yr (253 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1060 ft³/s (30.0 m³/s) Jan.1 (gage height, 6.88 ft or 2.097 m); maximum gage height, 7.19 ft (2.192 m) Jan. 6 (backwater from ice); minimum discharge, 53 ft³/s (150 m³/s) Sept. 15, 16; minimum gage height, 2.86 ft (0.872 m) Sept. 15, 16, 25.

Period of Record: Maximum discharge, 1,420 ft³/s (40.2 m³/s) Feb. 4, 1968 (gage height, 7.3 ft or 2.23 m); minimum, 6.2 ft³/s (0.18 m³/s) Sept. 26, 1964; minimum gage height, 2.28 ft (0.695 m) Oct. 4-14, 1964.

REMARKS.--Records good except those for the winter period, which are fair. Diurnal fluctuation caused by mills above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	187	196	322	950	372	236	690	460	766	141	258	75
2	177	210	322	953	377	277	664	450	713	144	309	79
3	169	221	332	832	393	372	634	426	665	164	308	80
4	162	226	325	880	419	451	607	401	621	174	263	76
5	157	221	321	890	418	477	579	388	596	174	225	72
6	151	215	325	840	407	470	559	373	602	174	202	69
7	145	215	320	700	397	464	534	359	653	172	184	66
8	142	236	323	600	385	451	501	354	660	172	168	61
9	137	266	322	550	363	443	491	349	607	174	129	60
10	133	281	331	520	339	433	501	337	543	188	159	60
11	131	275	339	500	317	479	524	315	492	186	155	58
12	127	271	314	470	327	554	527	298	458	176	149	56
13	124	273	330	450	309	607	508	281	423	167	143	56
14	122	297	380	431	313	585	487	270	395	165	145	55
15	125	320	400	405	304	576	460	260	372	157	152	54
16	123	337	400	381	280	575	451	243	362	152	143	54
17	117	341	400	369	289	595	442	170	346	146	140	63
18	118	343	400	395	263	593	431	172	324	139	138	67
19	118	346	408	436	270	610	432	165	300	133	130	65
20	120	355	436	446	266	644	430	161	274	132	132	61
21	123	364	438	414	262	672	423	158	255	130	130	59
22	137	372	460	402	255	680	567	157	235	128	123	60
23	169	374	460	431	258	676	720	190	222	125	118	60
24	189	367	452	437	255	672	791	314	222	122	117	58
25	196	360	441	419	251	679	706	419	214	125	113	57
26	194	359	431	415	244	687	633	459	185	125	103	69
27	189	358	420	420	234	683	569	497	136	128	98	65
28	187	351	407	419	232	665	515	600	135	143	95	62
29	194	342	400	406	-----	687	476	641	138	147	91	78
30	199	331	469	381	-----	704	460	784	142	139	93	109
31	200	-----	700	367	-----	702	-----	775	-----	160	96	-----
TOTAL	4,762	9,023	12,128	16,509	8,799	17,399	16,312	11,226	12,056	4,702	4,809	1,964
MEAN	154	301	391	533	314	561	544	362	402	152	155	65.5
MAX	200	374	700	953	419	704	791	784	766	188	309	109
MIN	117	196	314	367	232	236	423	157	135	122	91	54
CFSM	.53	1.03	1.33	1.82	1.07	1.91	1.86	1.24	1.37	.52	.53	.22
IN.	.60	1.15	1.54	2.10	1.12	2.21	2.07	1.43	1.53	.60	.61	.25

CAL YR 1972 TOTAL 79,326 MEAN 217 MAX 700 MIN 58 CFSM .74 IN 10.07
WTR YR 1973 TOTAL 119,689 MEAN 328 MAX 953 MIN 54 CFSM 1.12 IN 15.20

STREAMS TRIBUTARY TO LAKE MICHIGAN

71

04096900 Nottawa Creek near Athens, Mich.

LOCATION.--Lat 42°03'20", long 85°18'30", in NW¼ sec.12, T.5 S., R.9 W., St. Joseph County, 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 mi² (420 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 850 ft (259 m) from topographic map.

AVERAGE DISCHARGE.--7 years, 140 ft³/s (3.965 m³/s) 11.74 in/yr (298 mm/yr).

EXTREMES.--Current year: Maximum discharge, 506 ft³/s (14.3 m³/s) May 31 (gage height, 4.07 ft or 1.241 m); maximum gage height, 4.25 ft (1.295 m) Jan. 2; minimum discharge, 68 ft³/s (1.93 m³/s) Sept. 27; minimum gage height, 0.97 ft (0.296 m) Oct. 20.
Period of record: Maximum discharge, 554 ft³/s (15.7 m³/s) Feb. 22, 1971 (gage height, 4.50 or 1.372 m); maximum gage height, 4.66 ft (1.420 m) Feb. 3, 1968; minimum daily discharge 28 ft³/s (0.79 m³/s) Aug. 24, 25, 1971; minimum gage height, 0.37 ft (0.113m) Oct. 16, 18, 20, 21, Nov. 8, 1971.

REMARKS.--Records fair except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	196	154	176	419	200	139	380	237	501	127	189	105
2	183	163	169	471	219	179	381	253	480	130	211	105
3	161	173	165	463	244	245	371	264	449	153	226	100
4	135	177	159	437	250	307	353	265	417	190	221	100
5	113	172	142	419	247	340	332	256	397	203	205	95
6	101	163	150	377	238	344	311	240	374	196	182	90
7	93	159	150	350	225	332	290	226	357	182	156	90
8	87	182	150	300	208	319	269	225	358	168	136	90
9	81	212	150	288	184	302	254	232	348	154	127	90
10	77	227	150	253	183	282	255	237	326	150	129	90
11	77	224	150	223	180	285	263	231	296	144	131	87
12	78	214	160	212	170	315	266	222	269	141	126	86
13	78	203	160	184	157	329	257	211	242	137	119	83
14	77	204	160	174	147	327	244	201	220	137	111	79
15	76	206	170	172	147	323	230	191	199	133	105	75
16	76	211	170	161	150	319	221	183	184	131	100	76
17	75	207	180	165	140	318	218	173	172	130	95	79
18	74	202	180	213	140	302	221	166	162	127	93	84
19	73	196	190	279	140	303	222	162	154	126	92	85
20	73	195	190	311	135	328	221	158	148	126	99	82
21	78	198	192	306	139	343	224	156	141	125	94	81
22	94	206	195	291	135	344	259	154	135	124	90	82
23	141	208	202	295	137	339	321	175	131	121	90	81
24	182	207	203	293	136	334	354	231	131	119	93	78
25	201	200	200	276	134	332	348	292	130	118	95	73
26	202	197	197	272	127	333	321	318	127	129	100	70
27	189	197	190	268	129	323	290	352	123	128	105	69
28	171	197	179	262	127	308	261	399	122	145	110	70
29	159	193	172	247	-----	319	239	435	126	138	110	84
30	159	184	212	219	-----	349	231	474	128	134	110	109
31	160	-----	329	208	-----	371	-----	499	-----	159	110	-----
TOTAL	3,720	5,831	5,542	8,808	4,768	9,633	8,407	7,818	7,347	4,425	3,960	2,568
MFAN	120	194	179	284	170	311	280	252	245	143	128	85.6
MAX	202	227	329	471	250	371	381	499	501	203	226	109
MIN	73	154	142	161	127	139	218	154	122	118	90	69
CFSM	.74	1.20	1.10	1.75	1.05	1.92	1.73	1.56	1.51	.88	.79	.53
IN.	.85	1.34	1.27	2.02	1.09	2.21	1.93	1.80	1.69	1.02	.91	.59

CAL YR 1972 TOTAL 49,022 MFAN 134 MAX 411 MIN 52 CFSM .83 IN 11.26
WTR YR 1973 TOTAL 72,827 MFAN 200 MAX 501 MIN 69 CFSM 1.23 IN 16.72

STREAMS TRIBUTARY TO LAKE MICHIGAN

04097170 Portage River near Vicksburg, Mich.

LOCATION.--Lat 42°06'53", long 85°29'08", in SW¼ sec.16, T.4 S., R.10 W., Kalamazoo County, 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 mi² (176.6 km²).

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.

AVERAGE DISCHARGE.--14 years, 60.2 ft³/s (1.705 m³/s), 11.99 in/yr (305 mm/yr).

EXTREMES.--Current year: Maximum discharge, 190 ft³/s (5.38 m³/s) Jan. 2 (gage height, 5.22 ft or 1.591 m); maximum gage height, 5.24 ft (1.597 m) Jan. 5 (backwater from ice); minimum discharge, 24 ft³/s (0.68 m³/s) on many days in September; minimum gage height, 3.50 ft (1.067 m) Oct. 20, 21.

Period of record: Maximum discharge, 356 ft³/s (10.1 m³/s) Apr. 7, 1947 (gage height, 5.66 ft or 1.725 m); minimum, 10 ft³/s (0.28 m³/s) on many days during July and August, 1965; minimum gage height, 3.08 ft (0.939 m) July 17, 1946, Aug. 14, 1946, July 30, 31, 1965.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	52	54	157	87	62	126	107	136	45	68	30
2	45	55	54	160	93	74	127	110	125	46	60	30
3	44	57	54	153	100	96	124	109	122	55	52	28
4	42	56	53	140	97	100	121	108	122	59	49	27
5	42	55	52	130	96	100	118	103	121	54	47	27
6	41	53	52	120	93	101	112	97	139	51	45	26
7	40	54	52	110	91	101	109	93	135	48	43	25
8	39	65	52	100	90	102	105	96	117	47	42	25
9	38	66	55	95	87	100	101	97	107	46	42	25
10	36	62	55	95	82	98	109	94	98	46	41	24
11	36	61	55	90	81	102	106	90	91	46	40	24
12	37	60	55	85	78	110	103	86	84	44	39	24
13	37	60	55	80	72	108	99	82	79	43	39	25
14	36	66	60	75	71	108	95	78	73	43	38	25
15	35	66	60	70	73	109	90	74	69	42	37	25
16	34	64	60	71	70	109	87	71	65	41	36	26
17	34	61	60	74	65	115	90	69	63	40	36	27
18	33	60	65	92	65	118	88	66	60	40	35	28
19	32	59	70	102	62	118	87	65	57	40	40	28
20	32	60	71	102	65	121	85	64	55	39	45	28
21	32	61	72	97	66	122	85	61	54	39	45	28
22	37	61	75	101	66	121	126	61	52	38	41	30
23	53	60	74	108	65	120	165	85	50	37	39	31
24	54	58	73	106	65	118	149	99	52	37	39	32
25	51	57	73	104	64	117	140	91	49	37	37	33
26	50	57	72	104	64	116	132	94	48	37	36	34
27	49	58	70	103	64	111	124	91	47	37	35	35
28	50	57	70	104	61	106	115	111	47	39	35	37
29	55	55	69	100	-----	115	108	121	48	38	34	48
30	55	54	90	94	-----	126	105	126	46	37	32	60
31	53	-----	153	89	-----	122	-----	148	-----	46	31	-----
TOTAL	1,300	1,770	2,035	3,211	2,133	3,346	3,331	2,847	2,411	1,337	1,278	895
MEAN	41.9	59.0	65.6	104	76.2	108	111	91.8	80.4	43.1	41.2	29.8
MAX	55	66	153	160	100	126	165	148	139	59	68	60
MIN	32	52	52	70	61	62	85	61	46	37	31	24
CFSM	.61	.87	.96	1.52	1.12	1.58	1.63	1.35	1.18	.63	.60	.44
IN.	.71	.97	1.11	1.75	1.16	1.83	1.82	1.55	1.32	.73	.70	.49

CAL YR 1972 TOTAL 19,419 MEAN 53.1 MAX 153 MIN 19 CFSM .78 IN 10.59
WTR YR 1973 TOTAL 25,894 MEAN 70.9 MAX 165 MIN 24 CFSM 1.04 IN 14.12

STREAMS TRIBUTARY TO LAKE MICHIGAN

73

04097500 St. Joseph River at Three Rivers, Mich.

LOCATION.--Lat 41°56'25", long 85°38'00", in SW¼ SE¼ sec.18, T.6 S., R.11 W., St. Joseph County, 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 mi² (3,496 km²).

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

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).

AVERAGE DISCHARGE.--20 years, 1041 ft³/s (29.48 m³/s), 10.47 in/yr (266 mm/yr).

EXTREMES.--Current year: Maximum discharge, 3,840 ft³/s (109 m³/s) Jan. 3, 4 (gage height, 7.41 ft or 2.259 m); minimum, 303 ft³/s (8.58 m³/s) Sept. 25, 26; minimum gage height, 2.40 ft (0.732 m) Sept. 25; minimum daily discharge, 320 ft³/s (9.06 m³/s) Sept. 25. Period of record: Maximum discharge, 4,910 ft³/s (139 m³/s) Feb. 5, 1968 (gage height, 8.40 ft or 2.560 m); minimum daily, 78 ft³/s (2.21 m³/s) Sept. 12, 1964. Maximum discharge since at least 1918, 8,260 ft³/s (234 m³/s) Apr. 27, 1950 (gage height, 10.6 ft or 3.23 m).

REMARKS.--Records good. Flow regulated by powerplant above station.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,460	1,080	1,530	3,200	1,830	1,350	3,150	2,380	3,630	904	1,660	704
2	1,390	1,110	1,520	3,550	1,880	1,380	3,150	2,490	3,510	872	1,760	678
3	1,320	1,120	1,500	3,670	1,950	1,560	3,080	2,410	3,310	1,250	1,720	689
4	1,270	1,140	1,510	3,790	2,050	1,840	3,000	2,330	3,190	1,380	1,600	623
5	1,040	1,150	1,510	3,500	2,230	2,150	2,840	2,270	3,110	1,410	1,530	612
6	929	1,320	1,530	3,300	2,090	2,330	2,750	2,070	3,020	1,250	1,460	710
7	925	1,290	1,450	3,120	1,830	2,530	2,550	1,860	2,950	1,210	1,250	650
8	923	1,140	1,330	2,940	1,860	2,370	2,420	1,980	2,790	1,160	1,200	650
9	905	1,190	1,400	2,870	1,880	2,300	2,390	1,940	2,770	1,210	1,160	600
10	883	1,430	1,440	2,440	1,840	2,310	2,350	1,840	2,700	1,170	860	600
11	722	1,400	1,420	2,080	1,730	2,150	2,320	1,850	2,550	1,130	890	568
12	775	1,330	1,430	2,070	1,630	2,280	2,210	1,910	2,350	1,150	1,040	530
13	885	1,530	1,510	2,090	1,620	2,470	2,260	1,730	2,050	1,010	1,060	600
14	696	1,580	1,630	1,980	1,610	2,540	2,160	1,630	1,880	830	1,030	634
15	588	1,680	1,810	1,980	1,480	2,620	2,070	1,610	1,820	848	925	623
16	616	1,870	1,750	2,000	1,450	2,490	2,040	1,580	1,710	848	872	612
17	610	1,760	1,510	2,040	1,290	2,550	2,080	1,530	1,600	939	884	618
18	607	1,510	1,860	2,100	1,400	2,640	1,930	1,460	1,560	1,090	728	634
19	726	1,480	1,910	2,220	1,520	2,680	2,110	1,470	1,650	900	800	623
20	863	1,720	1,910	2,300	1,410	2,690	2,090	1,430	1,510	850	946	606
21	673	1,680	1,920	2,290	1,450	2,710	2,050	1,360	1,320	800	1,150	596
22	608	1,590	2,010	2,320	1,500	2,750	2,240	1,350	1,100	750	1,170	618
23	727	1,520	2,000	2,360	1,430	2,750	2,720	1,470	1,110	800	1,050	628
24	832	1,730	1,970	2,330	1,400	2,810	3,290	1,550	1,210	700	884	460
25	1,120	1,810	2,000	2,290	1,390	2,810	3,410	1,780	1,260	662	800	320
26	1,220	1,670	2,000	2,250	1,380	2,700	3,180	1,980	1,230	672	860	480
27	1,170	1,620	1,940	2,190	1,320	2,700	2,970	2,200	1,210	911	866	590
28	1,130	1,610	1,920	2,160	1,300	2,670	2,770	2,600	1,180	1,050	770	590
29	1,130	1,560	1,900	2,120	-----	2,800	2,610	2,900	1,160	1,140	752	623
30	1,120	1,520	2,010	2,240	-----	2,910	2,460	3,270	1,120	1,140	752	645
31	1,100	-----	2,570	2,020	-----	3,040	-----	3,490	-----	1,240	728	-----
TOTAL	28,963	44,140	53,700	77,810	45,750	75,880	76,650	61,720	61,560	31,276	33,157	18,114
MEAN	934	1,471	1,732	2,510	1,634	2,448	2,555	1,991	2,052	1,009	1,070	604
MAX	1,460	1,870	2,570	3,790	2,230	3,040	3,410	3,490	3,630	1,410	1,760	710
MIN	588	1,080	1,330	1,980	1,290	1,350	1,930	1,350	1,100	662	728	320
CFSM	.69	1.09	1.28	1.86	1.21	1.81	1.89	1.47	1.52	.75	.79	.45
IN.	.80	1.22	1.48	2.14	1.26	2.09	2.11	1.70	1.70	.86	.91	.50

CAL YR 1972 TOTAL 426,856 MEAN 1.166 MAX 3.130 MIN 303 CFSM .86 IN 11.76
WTR YR 1973 TOTAL 608,720 MEAN 1.668 MAX 3,790 MIN 320 CFSM 1.24 IN 16.77

STREAMS TRIBUTARY TO LAKE MICHIGAN

04097540 Prairie River near Nottawa, Mich.

LOCATION.--Lat 41°53'18", long 85°24'34", in NW¼ SW¼ sec.6, T.7 S., R.9 W., St. Joseph County, 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 mi² (275 km²).

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 850 ft (259 m) from topographic map.

AVERAGE DISCHARGE.--11 years, 83.2 ft³/s (2.356 m³/s), 10.66 in/yr (271 mm/yr).

EXTREMES.--Current year: Maximum discharge, 283 ft³/s (8.01 m³/s) Jan. 3 (gage height, 4.84 ft or 1.475 m); maximum gage height, 5.04 ft (1.536 m) Jan. 7 (backwater from ice); minimum discharge, 36 ft³/s (1.02 m³/s) Sept. 25; minimum gage height, 2.43 ft (0.741 m) Sept. 15, 16, 24, 25.

Period of record: Maximum discharge, 467 ft³/s (13.2 m³/s) Feb. 4, 1968 (gage height, 5.49 ft or 1.673 m); minimum, 11 ft³/s (0.31 m³/s) Aug. 9, 10, Sept. 8, 9, 10, 1964; minimum gage height, 1.77 ft (0.539 m) Aug. 9, 10, 1964.

REMARKS.--Records good except those for the winter period, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	70	101	240	117	86	201	149	242	73	81	57
2	66	73	99	268	120	93	198	145	237	71	91	55
3	61	74	98	274	123	105	195	140	226	78	99	52
4	57	76	97	280	125	114	190	135	209	96	98	51
5	54	77	97	263	126	123	183	129	204	110	91	49
6	52	76	103	240	125	128	175	123	200	120	81	47
7	49	77	110	220	123	130	167	119	200	120	73	46
8	47	86	103	216	121	130	160	122	197	111	67	45
9	45	92	103	190	117	128	154	121	195	102	63	45
10	44	97	102	180	112	128	154	120	189	98	63	44
11	44	99	105	160	110	137	151	115	174	90	63	43
12	45	98	105	151	113	145	151	111	160	84	63	42
13	45	98	110	160	98	154	149	107	145	77	61	41
14	45	108	110	152	99	165	142	104	133	71	58	40
15	44	111	120	141	102	168	134	102	123	66	56	39
16	44	114	110	130	100	166	131	100	118	61	53	39
17	43	116	120	124	90	179	131	98	114	57	52	40
18	42	117	120	129	83	178	132	96	110	54	50	42
19	42	114	128	140	90	173	134	93	106	52	49	42
20	42	115	130	142	95	174	133	91	102	53	66	41
21	42	115	128	138	96	177	136	89	98	55	69	40
22	47	115	129	139	96	182	193	89	92	57	72	40
23	60	115	132	142	95	187	216	117	88	59	72	39
24	68	114	134	142	93	190	216	146	87	57	78	37
25	75	113	133	140	91	191	214	163	86	55	76	37
26	76	112	133	136	89	193	202	173	84	53	74	38
27	74	111	133	132	86	193	189	170	82	52	69	38
28	72	108	132	131	84	190	173	188	79	59	65	38
29	73	106	130	130	-----	196	161	191	77	61	61	42
30	72	103	150	124	-----	201	155	208	76	63	59	44
31	71	-----	199	120	-----	201	-----	231	-----	73	59	-----
TOTAL	1,711	3,000	3,704	5,274	2,919	4,905	5,020	4,085	4,233	2,288	2,132	1,293
MEAN	55.2	100	119	170	104	158	167	132	141	73.8	68.8	43.1
MAX	76	117	199	280	126	201	216	231	242	120	99	57
MIN	42	70	97	120	83	86	131	89	76	52	49	37
CFSM	.52	.94	1.12	1.60	.98	1.49	1.58	1.25	1.33	.70	.65	.41
IN.	.60	1.05	1.30	1.85	1.02	1.72	1.76	1.43	1.49	.80	.75	.45

CAL YR 1972 TOTAL 29,349 MEAN 80.2 MAX 199 MIN 28 CFSM .76 IN 10.30
WTR YR 1973 TOTAL 40,564 MEAN 111 MAX 280 MIN 37 CFSM 1.05 IN 14.24

75

LOCATION.--Lat 41°42'46", long 85°07'10", in NW 1/4 NW 1/4 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.

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

EXTREMES.--Current year: Maximum discharge, 24 cfs (0.68 cu m/s) June 6, gage height, 4.43 ft (1.350 m); minimum daily discharge, 0.79 cfs (0.022 cu m/s) Sept. 27.

Period of record: Maximum discharge, 26 cfs (0.74 cu m/s) Apr. 20, 1970, gage height, 4.38 ft (1.335 m); maximum gage height, 4.43 ft (1.350 m) June 6, 1973; no flow at times most years.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.6	4.9	11	13	11	8.0	12	17	18	13	8.3	16
2	4.4	5.1	11	13	12	8.0	12	17	18	14	7.2	9.1
3	4.2	5.4	10	13	12	8.3	11	15	19	16	6.1	14
4	4.2	5.6	9.8	14	11	8.3	11	15	20	18	5.8	22
5	4.2	6.0	9.8	14	11	8.7	10	15	22	18	5.5	21
6	4.0	7.0	10	14	11	8.7	9.8	15	23	18	5.0	20
7	3.7	7.0	10	14	11	9.4	9.4	16	24	18	4.8	18
8	3.4	6.2	10	13	11	9.4	9.1	17	23	17	4.4	17
9	3.2	6.2	10	13	11	9.4	9.4	17	23	16	4.0	16
10	3.0	6.5	10	13	11	10	9.8	17	23	15	3.6	15
11	3.3	7.2	9.4	13	11	13	9.4	15	23	15	3.3	14
12	3.8	7.8	11	12	10	13	9.4	15	23	14	3.0	12
13	4.5	7.9	13	12	10	13	9.1	14	23	13	2.7	11
14	5.0	8.6	13	11	11	15	9.1	14	22	13	2.5	9.8
15	5.0	8.9	13	11	11	15	9.1	14	22	13	2.2	8.0
16	4.1	10	13	11	11	14	9.8	12	21	12	2.0	6.5
17	3.5	11	13	11	10	18	9.8	11	20	12	1.8	6.5
18	3.5	12	12	12	9.8	18	10	9.4	19	11	6.5	5.0
19	3.5	13	12	12	9.4	18	12	8.3	18	11	5.8	1.5
20	3.6	14	12	12	9.4	17	12	6.8	18	11	5.8	1.3
21	4.1	14	12	12	9.4	17	13	5.8	17	13	4.7	1.2
22	4.1	14	12	13	9.4	17	15	5.3	16	13	4.0	1.2
23	3.6	14	12	13	9.1	17	17	9.1	15	11	4.5	1.1
24	3.6	14	11	13	9.1	17	15	10	15	11	6.8	1.1
25	4.0	14	11	13	8.7	17	15	10	14	11	8.0	.95
26	4.3	15	11	13	8.7	16	14	9.8	14	11	8.7	.95
27	4.6	15	11	12	8.3	15	13	11	13	11	10	.79
28	5.2	14	11	12	8.0	13	13	13	14	9.4	15	.95
29	5.6	13	11	12	-----	13	14	16	14	9.1	19	1.2
30	5.6	11	12	12	-----	12	15	18	13	8.7	22	1.3
31	5.2	-----	13	11	-----	12	-----	18	-----	9.1	22	-----
TOTAL	128.6	298.3	350.0	387	285.3	408.2	347.2	406.5	567	405.3	215.0	254.44
MEAN	4.15	9.94	11.3	12.5	10.2	13.2	11.6	13.1	18.9	13.1	6.94	8.48
MAX	5.6	15	13	14	12	18	17	18	24	18	22	22
MIN	3.0	4.9	9.4	11	8.0	8.0	9.1	5.3	13	8.7	1.8	.79
CFSM	.24	.57	.65	.71	.58	.75	.66	.75	1.08	.75	.40	.48
IN.	.27	.63	.74	.82	.61	.87	.74	.86	1.21	.86	.46	.54
CAL YR 1972	TOTAL	1,771.51	MEAN	4.84	MAX	17	MIN	0	CFSM	.28	IN	3.77
WTR YR 1973	TOTAL	4,052.84	MEAN	11.1	MAX	24	MIN	.79	CFSM	.63	IN	8.62

STREAMS TRIBUTARY TO LAKE MICHIGAN

04098500 Fawn River near White Pigeon, Mich.

LOCATION.--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 mi (0.5 km) downstream from bridge on county highway, 3.1 mi (5.0 km) east of White Pigeon, and 3.5 mi (5.6 km) upstream from Sherman Mill Creek.

DRAINAGE AREA.--192 mi² (497 km²).

PERIOD OF RECORD.--July 1903 to July 1904 (gage heights and discharge measurements only), October 1957 to current year.

GAGE.--Water-stage recorder. Datum of gage is 805.4 ft (245.486 m) above mean sea level.

AVERAGE DISCHARGE.--16 years, 155 ft³/s (4.390 m³/s), 10.96 in/yr (278 mm/yr).

EXTREMES.--Current year: Maximum discharge, 353 ft³/s (10.0 m³/s) Apr. 1 (gage height, 3.61 ft or 1.100 m); minimum, 73 ft³/s (2.07 m³/s) Sept. 27; minimum gage height, 2.19 ft (0.668 m) Oct. 22.

Period of record: Maximum daily discharge, 600 ft³/s (17.0 m³/s) Jan. 30, 1969; minimum discharge, 26 ft³/s (0.74 m³/s) Aug. 5, 1964; minimum gage height, 1.72 ft (0.524 m) Jan. 10, Sept. 10, 1964.
A daily mean discharge of 750 cfs (21.2 m³/s) occurred Mar. 15, 1904.

REMARKS.--Records good. Small diurnal fluctuation caused by powerplants above station.

REVISIONS.--WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	146	152	198	284	216	189	351	273	326	173	177	142
2	145	143	203	300	234	171	346	272	322	170	198	147
3	135	146	202	311	243	201	337	272	322	174	210	141
4	129	151	201	325	233	188	328	268	315	180	205	134
5	134	155	199	324	238	207	322	264	303	186	199	130
6	122	142	216	310	231	223	315	261	303	199	192	130
7	138	166	213	300	216	218	311	254	305	215	184	125
8	126	175	192	290	224	225	302	236	302	222	170	116
9	119	158	198	270	229	223	293	245	298	211	157	116
10	119	170	198	250	209	218	285	255	295	195	140	115
11	110	178	169	224	196	231	280	252	290	189	138	112
12	122	175	183	243	198	250	278	225	287	186	142	114
13	120	176	207	239	204	248	276	230	281	180	139	105
14	112	193	220	237	217	252	272	222	270	177	145	107
15	112	201	227	248	225	260	268	229	265	163	139	92
16	110	212	207	256	204	262	266	237	260	153	133	96
17	119	207	183	252	174	272	266	214	254	149	126	98
18	108	208	199	262	193	291	266	214	245	153	121	87
19	113	202	222	276	212	289	266	184	230	146	119	87
20	106	203	250	258	214	298	250	207	221	149	131	94
21	101	222	254	256	209	309	254	199	215	163	129	92
22	102	222	251	263	209	317	285	201	211	171	134	85
23	134	220	258	258	202	317	293	218	201	169	141	88
24	149	213	252	249	193	317	298	248	200	167	163	82
25	160	217	240	246	191	320	295	274	196	165	174	78
26	136	225	243	251	191	324	292	289	193	157	179	82
27	139	219	230	238	184	322	289	298	189	145	179	81
28	153	209	224	237	189	324	284	313	186	146	170	85
29	142	217	233	233	-----	331	279	315	182	142	168	98
30	143	205	236	230	-----	337	276	324	179	138	160	119
31	146	-----	261	230	-----	349	-----	326	-----	158	150	-----
TOTAL	3,950	5,682	6,769	8,150	5,878	8,283	8,723	7,819	7,646	5,291	4,912	3,178
MEAN	127	189	218	263	210	267	291	252	255	171	158	106
MAX	160	225	261	325	243	349	351	326	326	222	210	147
MIN	101	142	169	224	174	171	250	184	179	138	119	78
CFSM	.66	.98	1.14	1.37	1.09	1.39	1.52	1.31	1.33	.89	.82	.55
IN.	.77	1.10	1.31	1.58	1.14	1.60	1.69	1.51	1.48	1.03	.95	.62

CAL YR 1972 TOTAL 54,222 MEAN 148 MAX 261 MIN 54 CFSM .77 IN 10.51
WTR YR 1973 TOTAL 76,281 MEAN 209 MAX 351 MIN 78 CFSM 1.09 IN 14.78

STREAMS TRIBUTARY TO LAKE MICHIGAN

77

04099000 St. Joseph River at Mottville, Mich

LOCATION.--Lat 41°48'03", long 85°45'22", in SW¼ sec.6, T.8 S., R.12 W., Michigan meridian, St. Joseph County, 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 mi² (4,833 km²).

PERIOD OF RECORD.--October 1923 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 755.3 ft (230.215 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 (1.3 m) higher.

AVERAGE DISCHARGE.--50 years, 1,508 ft³/s (42.71 m³/s), 10.97 in/yr (279 mm/yr).

EXTREMES.--Current year: Maximum discharge, 5,270 ft³/s (149 m³/s) Jan. 5 (gage height, 6.85 ft or 2.088 m); minimum, 220 ft³/s (6.23 m³/s) Sept. 22 (gage height, 1.12 ft or 0.341 m); minimum daily, 720 ft³/s (20.4 m³/s) Sept. 16, 17.

Period of record: Maximum discharge, 10,700 ft³/s (303 m³/s) Apr. 27, 1950 (gage height, 6.56 ft or 2.00 m, site and datum then in use); minimum daily, 39 ft³/s (1.10 m³/s) Oct. 19, 1963.

REMARKS.--Records good. Flow regulated by powerplants above station.

REVISIONS (WATER YEARS.--WSP 1387: 1930, 1932, 1938, 1940-42, 1945. WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,740	1,410	1,890	3,840	2,580	1,740	3,940	3,250	4,340	1,560	2,050	893
2	1,800	1,290	1,900	4,340	2,510	1,740	3,970	3,230	4,490	1,600	2,320	1,210
3	1,640	1,570	1,860	4,400	2,520	1,760	3,940	3,270	4,150	1,710	2,430	1,190
4	1,650	1,380	1,860	4,700	2,590	2,080	3,860	3,050	3,930	1,660	2,180	1,530
5	1,490	1,370	1,880	4,470	2,700	2,400	3,680	2,990	3,890	2,190	2,130	1,500
6	1,340	1,410	1,970	4,410	2,780	2,540	3,540	2,860	3,830	2,050	2,140	829
7	1,120	1,540	1,960	4,240	2,610	2,730	3,420	2,640	3,730	1,480	2,180	1,500
8	1,160	1,690	1,850	4,160	2,460	2,790	3,230	2,580	3,530	1,810	1,760	799
9	1,190	1,570	1,810	3,840	2,450	2,680	3,120	2,620	3,360	2,010	1,980	873
10	1,560	1,570	1,880	3,630	2,450	2,650	3,080	2,560	3,400	1,740	1,740	1,410
11	979	1,680	1,930	3,360	2,250	2,710	3,080	2,480	3,290	1,890	1,430	1,070
12	965	1,630	1,910	2,990	2,250	2,570	2,940	2,440	3,050	1,740	1,360	1,100
13	1,180	1,700	1,950	3,020	2,190	2,830	2,930	2,450	2,900	1,740	1,740	1,100
14	1,130	1,960	1,990	2,770	2,230	3,050	2,900	2,230	2,550	1,460	1,860	1,500
15	783	1,970	2,170	2,800	2,180	3,060	2,840	2,280	2,430	1,300	1,440	1,220
16	965	2,120	2,220	2,750	1,980	3,110	2,780	2,150	2,440	1,590	1,770	720
17	1,020	2,230	2,120	2,780	1,880	3,100	2,830	2,150	2,270	1,420	1,420	720
18	825	2,040	2,140	2,820	1,870	3,110	2,770	1,970	2,180	1,620	1,270	1,230
19	986	1,920	2,390	2,950	1,920	3,320	2,770	1,940	2,210	1,490	1,110	1,190
20	1,040	2,010	2,490	3,080	2,130	3,250	2,850	1,980	2,210	1,300	1,680	1,170
21	1,100	2,160	2,400	3,020	1,960	3,270	2,820	1,990	2,160	1,240	1,700	1,090
22	800	2,110	2,550	2,990	1,970	3,330	3,180	1,950	1,780	1,220	1,710	797
23	900	2,000	2,600	3,050	2,130	3,340	3,460	2,120	1,550	1,340	1,690	951
24	1,100	2,000	2,570	3,020	1,810	3,500	4,040	2,180	1,630	1,230	1,750	1,180
25	1,300	2,180	2,560	3,000	1,840	3,480	4,430	2,260	2,110	1,080	1,310	986
26	1,420	2,160	2,600	2,980	1,970	3,460	4,290	2,480	1,740	1,200	1,430	727
27	1,380	2,080	2,560	2,930	1,840	3,270	3,970	2,700	1,850	1,470	1,620	1,050
28	1,400	2,160	2,560	2,890	1,820	3,330	3,670	3,190	1,760	1,540	1,680	1,050
29	1,470	2,090	2,650	2,810	-----	3,500	3,520	3,590	1,760	1,550	1,270	1,440
30	1,350	1,910	2,800	2,750	-----	3,710	3,320	3,940	1,500	1,690	1,300	993
31	1,380	-----	3,140	2,810	-----	3,770	-----	4,350	-----	1,920	1,400	-----
TOTAL	38,163	54,910	69,160	103,600	61,870	91,180	101,170	81,870	82,020	48,840	52,850	33,018
MEAN	1,231	1,830	2,231	3,342	2,210	2,941	3,372	2,641	2,734	1,575	1,705	1,101
MAX	1,800	2,230	3,140	4,700	2,780	3,770	4,430	4,350	4,490	2,190	2,430	1,530
MIN	783	1,290	1,810	2,750	1,810	1,740	2,770	1,940	1,500	1,080	1,110	720
CFSM	.66	.98	1.20	1.79	1.18	1.58	1.81	1.42	1.47	.84	.91	.59
IN.	.76	1.09	1.38	2.07	1.23	1.82	2.02	1.63	1.64	.97	1.05	.66
CAL YR 1972	TOTAL 555,770	MEAN 1,518	MAX 3,780	MIN 535	CFSM .81	IN 11.08						
WTP YR 1973	TOTAL 818,651	MEAN 2,243	MAX 4,700	MIN 720	CFSM 1.20	IN 16.32						

STREAMS TRIBUTARY TO LAKE MICHIGAN

04099750 Pigeon River near Scott, Ind.

LOCATION.--Lat 41°44'56", long 85°34'35", in SE 1/4 NW 1/4 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 sq mi (935 sq km), of which 53.9 sq mi (139.6 sq km) does not contribute directly to surface runoff.

PERIOD OF RECORD.--June 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 815.00 ft (248.412 m) above mean sea level.

AVERAGE DISCHARGE.--5 years, 324 cfs (9.18 cu m/s), 12.19 in/yr (310 mm/yr).

EXTREMES.--Current year: Maximum discharge, 934 cfs (26.5 cu m/s) June 8, gage height, 5.21 ft (1.588 m); minimum daily, 151 cfs (4.28 cu m/s) Sept. 28.

Period of record: Maximum discharge, 1,450 cfs (41.1 cu m/s) Feb. 1, 1969, gage height, 6.34 ft (1.932 m); minimum daily, 42 cfs (1.19 cu m/s) Oct. 21, 1971.

REMARKS.--Records good.

REVISIONS.--WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	322	300	482	864	446	328	749	549	703	298	370	238
2	294	329	470	834	471	341	724	546	644	288	375	230
3	240	343	459	755	449	363	711	524	693	330	335	228
4	270	344	448	794	446	380	691	497	708	420	322	215
5	272	326	437	819	471	391	670	472	743	450	320	210
6	270	318	451	731	464	404	645	455	806	432	312	208
7	260	323	454	720	457	414	616	444	872	418	305	202
8	248	366	445	700	459	425	585	450	914	420	290	198
9	235	415	433	670	447	424	567	456	799	425	282	198
10	225	411	430	663	435	436	569	442	720	430	278	199
11	225	397	420	633	428	479	562	425	660	422	265	195
12	235	394	415	616	415	544	546	413	636	405	255	187
13	240	407	415	580	400	572	528	401	609	388	242	180
14	234	470	415	550	396	552	506	397	563	375	232	175
15	225	579	440	500	406	557	488	395	520	370	228	172
16	223	635	470	470	401	574	444	382	495	365	222	168
17	221	604	503	480	374	599	492	368	474	358	218	171
18	220	543	526	445	345	642	495	357	454	350	212	177
19	215	591	534	508	371	661	496	349	432	335	225	176
20	211	618	491	492	363	681	512	343	409	352	285	167
21	211	630	490	461	372	700	526	321	345	348	292	161
22	231	639	496	466	366	706	571	313	349	380	265	160
23	295	629	496	508	357	710	605	388	344	340	250	155
24	354	605	444	515	350	714	644	440	362	315	300	152
25	306	544	445	486	343	723	614	448	358	296	315	153
26	316	576	487	475	337	745	591	424	337	292	288	153
27	302	567	483	479	328	762	579	417	320	285	268	153
28	299	548	475	486	323	745	567	481	312	298	255	151
29	312	522	470	483	-----	749	554	520	315	278	245	166
30	317	488	524	466	-----	752	550	586	312	268	240	185
31	308	-----	712	451	-----	749	-----	658	-----	345	245	-----
TOTAL	4,182	14,551	14,745	14,140	11,350	17,831	17,441	13,651	15,288	11,114	8,536	5,483
MEAN	264	485	476	585	405	575	521	441	543	359	275	183
MAX	356	639	712	864	489	762	749	658	914	450	375	238
MIN	211	300	415	451	323	328	444	313	312	268	212	151
CFSM	.73	1.54	1.32	1.62	1.12	1.58	1.61	1.22	1.50	.99	.76	.51
IN.	.44	1.50	1.52	1.47	1.17	1.44	1.40	1.41	1.68	1.15	.88	.57

CAL YR 1972 TOTAL 102,340 MEAN 280 MAX 712 MIN 44 CFSM .74 IN 10.55
WTR YR 1973 TOTAL 157,326 MEAN 431 MAX 714 MIN 151 CFSM 1.19 IN 16.21

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04100222 North Branch Elkhart River at Cosperville, Ind.

LOCATION.--Lat 41°28'54", long 85°28'32", in NE 1/4 NW 1/4 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 sq mi (368 sq km).

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 880.00 ft (268.224 m) above mean sea level.

EXTREMES.--Current year: Maximum discharge, 422 cfs (12.0 cu m/s) Jan. 4, 5, gage height, 5.98 ft (1.823 m); minimum daily, 26 cfs (0.74 cu m/s) Sept. 22.

Period of record: Maximum discharge, 422 cfs (12.0 cu m/s) Jan. 4, 1972, gage height, 5.98 ft (1.823 m); minimum daily, 2.4 cfs (0.068 cu m/s) Nov. 21, 1971.

REMARKS.--Records good. Flow regulated at times by dam at Waldron Lake.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	233	207	290	397	223	151	368	276	320	96	84	59
2	226	216	279	403	231	155	364	268	313	90	99	58
3	214	226	268	401	239	166	360	256	307	102	88	57
4	211	227	259	415	240	173	358	240	302	123	74	51
5	211	223	249	422	239	181	350	228	316	128	63	48
6	201	218	252	420	232	185	339	215	336	116	57	46
7	194	219	254	400	226	186	334	201	353	103	51	41
8	187	240	249	370	221	187	326	198	355	93	46	40
9	175	258	243	340	230	189	318	196	347	86	43	41
10	167	263	237	320	220	196	310	190	334	79	48	40
11	170	265	232	300	210	215	302	186	320	74	52	39
12	198	263	227	280	195	239	300	182	312	67	59	38
13	197	270	242	265	190	251	292	177	296	60	58	37
14	203	355	310	250	185	258	284	172	276	58	54	36
15	200	390	350	235	190	269	275	164	262	54	51	34
16	197	406	300	220	190	280	272	159	248	51	47	33
17	184	410	260	220	160	318	286	154	233	50	44	34
18	182	408	280	225	160	331	294	150	226	47	42	34
19	175	404	280	240	180	345	305	149	211	44	48	34
20	166	403	281	235	180	356	308	144	198	52	82	31
21	154	397	281	229	181	363	308	141	182	66	105	28
22	163	390	283	237	176	368	334	141	170	62	96	26
23	193	380	281	254	173	368	366	146	159	58	80	27
24	210	369	279	259	170	368	372	152	155	52	83	28
25	215	360	276	256	166	372	366	159	150	49	82	27
26	215	352	274	250	161	387	353	164	142	48	77	30
27	213	342	270	247	155	387	336	173	131	52	70	28
28	212	333	265	250	151	380	315	198	124	57	66	28
29	213	317	261	250	-----	376	299	264	114	53	63	34
30	212	303	308	249	-----	371	288	302	102	48	62	38
31	210	-----	371	250	-----	369	-----	318	-----	64	59	-----
TOTAL	6,111	9,414	8,491	9,089	5,474	8,740	9,682	6,063	7,294	2,182	2,033	1,125
MEAN	197	314	274	293	196	282	323	196	243	70.4	65.6	37.5
MAX	233	410	371	422	240	387	372	318	355	128	105	59
MIN	154	207	227	220	151	151	272	141	102	44	42	26
CFSM	1.34	2.21	1.93	2.06	1.38	1.99	2.27	1.38	1.71	.50	.46	.26
IN.	1.60	2.47	2.22	2.38	1.43	2.29	2.54	1.59	1.91	.57	.53	.29

CAL YR 1972 TOTAL 52,760 MEAN 144 MAX 410 MIN 12 CFSM 1.01 IN 13.82
 WTR YR 1973 TOTAL 75,698 MEAN 207 MAX 422 MIN 26 CFSM 1.46 IN 19.83

STREAMS TRIBUTARY TO LAKE MICHIGAN

04100500 Elkhart River at Goshen, Ind.

LOCATION.--Lat 41°35'36", long 85°50'55", in NE 1/4 NE 1/4 sec.8, T.36 N., R.6 E., Elkhart County, on right bank 20 ft (6 m) downstream from River Avenue bridge at Goshen and 0.5 mile (0.8 km) upstream from Rock Run.

DRAINAGE AREA.--594 sq mi (1,538 sq km).

PERIOD OF RECORD.--April 1931 to current year.

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.

AVERAGE DISCHARGE.--42 years, 500 cfs (14.2 cu m/s), 11.43 in/yr (290 mm/yr).

EXTREMES.--Current year: Maximum discharge, 3,150 cfs (89.2 cu m/s) Dec. 31, gage height, 7.64 ft (2.329 m); minimum daily, 157 cfs (4.45 cu m/s) Sept. 27.

Period of record: Maximum discharge, 5,440 cfs (154 cu m/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 cfs (0.20 cu m/s) Aug. 11, 1964, result of extreme regulation.

REMARKS.--Records good. The flow is regulated by three powerplants upstream from station.

REVISIONS (WATER YEARS).--WSP 1337: 1939(M). WSP 1557: 1954. WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,260	774	923	2,410	915	573	1,330	969	1,270	404	304	276
2	1,010	801	888	2,060	1,040	590	1,420	952	1,050	380	312	288
3	880	944	852	1,680	1,240	627	1,300	921	939	424	316	276
4	813	956	830	1,650	1,190	683	1,180	985	901	452	312	240
5	818	862	804	1,680	1,060	705	1,120	846	945	444	296	222
6	812	817	860	1,480	1,000	751	1,060	818	1,120	424	280	219
7	750	790	960	1,310	965	745	1,010	803	1,300	408	264	212
8	698	848	872	1,200	935	706	968	795	1,170	380	256	202
9	653	1,050	821	1,140	885	668	948	797	998	372	244	202
10	623	991	791	1,040	835	678	962	779	927	360	284	202
11	631	929	896	980	780	833	955	758	903	336	292	196
12	837	901	734	920	740	1,240	932	734	900	316	276	187
13	1,170	905	1,080	880	730	1,100	924	715	883	304	284	184
14	1,050	1,390	1,410	870	725	950	895	710	840	284	256	181
15	886	2,060	1,170	860	745	949	855	683	803	268	252	181
16	831	1,910	947	860	700	951	851	654	770	276	240	175
17	791	1,580	787	840	602	1,020	886	627	752	264	230	181
18	769	1,370	907	855	625	1,180	901	607	727	244	226	187
19	735	1,310	400	870	686	1,310	932	601	685	248	226	175
20	693	1,310	927	1,010	663	1,420	968	594	646	296	264	169
21	678	1,310	963	930	675	1,460	992	575	604	328	276	172
22	700	1,330	1,080	960	674	1,390	1,210	573	573	316	284	169
23	991	1,250	1,090	1,250	651	1,320	1,560	582	548	316	288	169
24	1,420	1,190	1,030	1,260	643	1,250	1,470	561	557	292	324	163
25	1,280	1,120	1,040	1,080	627	1,240	1,250	589	539	284	312	160
26	1,030	1,110	1,060	1,030	614	1,400	1,140	608	503	272	312	172
27	905	1,110	997	1,050	597	1,470	1,080	581	490	264	308	157
28	836	1,070	936	1,100	569	1,270	1,030	692	472	288	304	175
29	825	1,000	904	1,110	-----	1,360	984	769	444	288	292	163
30	835	948	1,280	1,000	-----	1,490	971	913	424	268	284	190
31	804	-----	2,690	945	-----	1,380	-----	1,320	-----	284	280	-----
TOTAL	27,014	33,947	31,229	36,800	22,131	32,703	32,084	23,011	23,684	10,084	8,678	5,845
MEAN	871	1,132	1,007	1,187	790	1,055	1,069	742	789	325	280	195
MAX	1,420	2,060	2,690	2,410	1,260	1,490	1,560	1,320	1,300	452	324	288
MIN	623	774	696	840	569	573	551	561	424	244	226	157
CFSM	1.47	1.91	1.79	2.00	1.33	1.78	1.80	1.25	1.33	.55	.47	.33
IN.	1.69	2.13	1.96	2.36	1.39	2.05	2.01	1.44	1.48	.63	.54	.37

CAL YR 1972 TOTAL 225,462 MEAN 816 MAX 2,690 MIN 136 CFSM 1.04 IN 14.12
 WTR YR 1973 TOTAL 287,210 MEAN 747 MAX 2,410 MIN 167 CFSM 1.32 IN 17.94

PEAK DISCHARGE (BASE, 1,800 CFS).--Nov. 15 (1500) 2,160 cfs (6.04 ft); Dec. 31 (2300) 3,150 cfs (7.64 ft).

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04101000 St. Joseph River at Elkhart, Ind.

LOCATION.--Lat 41°41'30", long 85°58'30", in SW 1/4 NE 1/4 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 sq mi (8,728 sq km).

PERIOD OF RECORD.--August 1947 to current year. Gage heights at site 0.8 mile (1.3 km) downstream at different datum for September 1924 to March 1926 are available in the district office.

GAGE.--Water-stage recorder. Datum of gage is 700.00 ft (213.360 m) above mean sea level.

AVERAGE DISCHARGE.--26 years, 3,030 cfs (85.8 cu m/s), 12.21 in/yr (310 mm/yr).

EXTREMES.--Current year: Maximum discharge, 9,400 cfs (266 cu m/s) Jan. 4, gage height, 23.21 ft (7.074 m); minimum daily, 1,160 cfs (32.9 cu m/s) Sept. 17.

Period of record: Maximum discharge, 18,400 cfs (521 cu m/s) Apr. 5, 1950, gage height, 27.82 ft (8.480 m); minimum daily, 336 cfs (9.52 cu m/s) Aug. 5, 1964.

REMARKS.--Records good. The flow is regulated by Elkhart Hydroelectric Plant and by a hydroelectric plant on Elkhart River at Goshen.

REVISIONS.--WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3,610	3,270	4,130	8,880	4,880	3,470	7,320	5,680	7,410	2,830	3,090	1,560
2	3,830	3,050	4,040	8,510	4,940	3,560	7,310	5,550	7,200	2,660	3,200	1,720
3	3,600	3,440	3,490	8,120	5,320	3,630	7,130	5,640	7,000	2,560	3,520	1,850
4	3,290	3,480	3,930	8,500	5,310	4,150	6,900	5,380	6,620	3,280	3,200	2,030
5	3,290	3,260	3,900	7,880	5,210	4,270	6,630	5,140	6,690	3,620	2,960	2,070
6	3,120	3,200	4,110	7,430	5,270	4,770	6,320	5,080	6,710	3,380	3,090	1,480
7	2,740	3,290	4,270	6,770	5,040	4,870	6,120	4,710	6,930	3,040	2,830	1,750
8	2,650	3,570	4,020	6,790	4,880	5,080	5,820	4,580	6,660	2,930	2,740	1,490
9	2,590	3,870	3,820	6,690	4,700	4,860	5,600	4,690	6,290	3,140	2,550	1,320
10	2,760	3,600	3,830	5,940	4,670	4,820	5,610	4,550	6,130	3,070	2,630	1,750
11	2,890	3,630	3,690	5,040	4,480	5,110	5,600	4,390	5,880	2,990	2,140	1,720
12	2,380	3,810	3,960	5,190	4,110	5,570	5,500	4,260	5,670	2,920	2,060	1,510
13	3,040	3,540	4,520	4,980	4,170	5,650	5,310	4,270	5,430	2,860	2,310	1,510
14	3,020	4,790	4,630	5,300	4,200	5,710	5,240	4,160	4,910	2,560	2,410	1,770
15	2,600	5,580	4,840	5,380	4,270	5,720	5,080	3,890	4,610	2,410	2,350	1,710
16	2,530	5,610	4,420	5,220	4,010	5,760	4,970	4,010	4,610	2,420	2,070	1,250
17	2,380	5,510	3,880	5,280	4,010	5,930	5,090	3,720	4,470	2,390	2,350	1,160
18	2,500	4,960	3,910	4,670	3,750	6,070	5,010	3,630	4,070	2,350	1,710	1,630
19	2,270	4,750	4,490	5,450	3,850	6,370	5,040	3,520	4,110	2,450	1,750	1,620
20	2,360	4,750	5,150	5,580	3,570	6,570	5,170	3,540	3,910	2,210	2,240	1,560
21	2,420	4,980	4,950	5,430	3,960	6,590	5,200	3,540	3,800	2,280	2,390	1,440
22	2,630	5,020	5,070	5,440	3,870	6,530	6,080	3,500	3,280	2,170	2,420	1,240
23	3,110	4,810	5,180	5,890	3,980	6,510	6,770	3,600	2,950	2,180	2,350	1,340
24	3,430	4,710	5,070	5,910	3,760	6,470	7,060	3,840	3,150	2,110	2,490	1,900
25	3,460	4,740	5,010	5,590	3,650	6,520	7,170	4,070	3,490	2,210	2,240	1,910
26	3,460	4,740	4,870	5,520	3,760	6,640	7,130	4,330	3,290	1,720	2,170	1,380
27	3,300	4,690	4,720	5,480	3,590	6,560	6,740	4,550	3,350	2,140	2,250	1,460
28	3,360	4,660	4,840	5,490	3,560	6,350	6,360	5,280	3,090	2,180	2,350	1,560
29	3,120	4,560	4,710	5,430	-----	6,670	5,950	5,870	3,030	2,520	1,980	1,670
30	3,300	4,340	5,810	5,200	-----	7,130	5,790	6,430	2,770	2,500	2,010	1,560
31	2,960	-----	7,750	5,140	-----	7,060	-----	7,340	-----	2,630	2,070	-----
TOTAL	92,610	128,250	141,480	188,120	120,770	174,970	181,020	142,740	147,510	80,710	75,920	47,920
MEAN	2,987	4,275	4,564	6,068	4,313	5,644	6,034	4,605	4,917	2,604	2,444	1,597
MAX	3,980	5,610	7,750	8,880	5,320	7,130	7,320	7,340	7,410	3,620	3,520	2,070
MIN	2,270	3,050	3,640	4,670	3,560	3,470	4,470	3,500	2,770	1,720	1,710	1,160
CFSM	.89	1.27	1.35	1.80	1.28	1.67	1.79	1.37	1.46	.77	.73	.47
IN.	1.02	1.42	1.56	2.08	1.33	1.93	2.00	1.58	1.63	.89	.84	.53
CAL YR 1972	TOTAL 1,139,850	MEAN 3,114	MAX 7,750	MIN 1,040	CFSM .92	IN 12.58						
WTY YR 1973	TOTAL 1,522,020	MEAN 4,910	MAX 8,880	MIN 1,160	CFSM 1.24	IN 16.80						

STREAMS TRIBUTARY TO LAKE MICHIGAN

04101500 St. Joseph River at Niles, Mich.

LOCATION.--Lat 41°49'45", long 86°15'35", in SW¼ sec.26, T.7 S., R.17 W., Berrien County, 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, and at mile 44 (71 km).

DRAINAGE AREA.--3,666 mi² (9,495 km²).

PERIOD OF RECORD.--October 1930 to current year. Monthly discharge only for some periods, published in WSP 1307.

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, on 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.

AVERAGE DISCHARGE.--43 years, 3,112 ft³/s (88.13 m³/s), 11.53 in/yr (293 mm/yr).

EXTREMES.--Current year: Maximum discharge, 10,800 ft³/s (306 m³/s) Jan. 1 (gage height, 10.42 ft or 3.176 m); minimum daily, 1,490 ft³/s (42.2 m³/s) Sept. 18.

Period of record: Maximum discharge, 20,200 ft³/s (572 m³/s) Apr. 5, 1950 (gage height, 15.10 ft or 4.602 m, present datum); minimum daily, 420 ft³/s (11.9 m³/s) Aug. 30, 1931.

REMARKS.--Records fair. Flow regulated by powerplants above station.

REVISIONS (WATER YEARS).--WSP 1387: 1931, 1933-36, 1940-43, 1945-46 (M), 1949 (M). WSP 1911: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3,750	2,960	4,140	10,600	5,170	3,830	7,580	5,790	7,480	2,810	3,500	2,000
2	3,960	2,990	4,200	9,850	4,940	3,780	8,480	5,600	7,240	2,720	3,900	2,100
3	3,820	3,580	3,980	8,780	5,340	3,980	7,260	5,400	7,200	3,130	4,200	2,100
4	3,540	3,790	4,000	9,230	5,500	4,220	7,210	5,650	6,480	3,340	3,800	2,500
5	3,750	3,340	4,090	8,920	5,310	4,690	6,850	5,150	6,820	3,190	3,800	2,600
6	3,510	3,320	4,230	7,750	5,360	4,900	6,310	5,060	6,550	3,310	3,800	2,000
7	3,110	3,510	4,880	7,230	5,260	5,090	6,170	5,090	6,530	3,460	3,800	2,000
8	3,000	3,560	4,420	6,730	4,950	5,100	5,940	4,770	6,760	2,460	3,100	1,700
9	3,360	4,140	4,020	7,100	4,860	4,920	5,700	4,640	6,120	3,170	3,400	1,900
10	2,840	3,690	3,850	6,100	4,760	4,970	5,730	4,870	5,790	3,030	2,970	2,300
11	3,350	3,730	3,910	5,430	4,650	5,060	5,510	4,590	5,770	3,060	2,570	1,800
12	2,300	3,730	4,220	5,220	4,210	5,630	5,640	4,510	5,610	3,070	2,450	1,800
13	2,800	3,810	4,650	5,010	4,370	5,730	5,350	4,130	5,270	2,720	2,290	1,800
14	2,800	5,130	5,200	5,190	4,460	5,670	5,340	4,320	5,100	2,840	2,660	2,000
15	2,000	6,300	5,280	5,550	4,490	5,500	5,090	4,030	4,450	2,530	2,850	2,200
16	2,000	5,990	4,600	5,240	4,290	5,720	5,020	4,180	4,280	2,290	2,190	1,950
17	2,300	5,420	4,250	5,270	3,890	5,960	5,200	4,220	4,440	2,660	2,770	1,670
18	2,000	5,170	3,830	5,180	4,310	6,050	5,240	3,980	3,640	2,350	2,140	1,490
19	2,000	4,840	4,530	5,250	4,000	6,430	4,950	3,600	4,260	2,670	2,190	2,000
20	2,200	4,880	5,120	5,570	4,050	6,700	5,180	3,770	4,600	2,510	2,850	2,020
21	2,400	4,900	5,260	5,490	3,910	6,720	5,240	3,680	4,200	2,530	2,960	1,890
22	2,000	5,100	5,240	5,530	4,100	6,670	6,480	3,940	3,720	2,310	3,000	1,590
23	2,200	4,950	5,310	5,910	4,120	6,320	7,350	4,140	3,550	2,350	3,000	1,750
24	2,500	4,620	5,270	6,130	4,190	6,490	7,320	3,420	3,190	2,380	3,000	2,000
25	2,700	4,630	5,120	5,730	3,900	6,490	7,450	4,130	2,750	2,250	2,500	2,310
26	2,700	4,940	4,980	5,640	4,030	6,740	7,050	4,340	3,680	2,210	2,300	2,140
27	2,700	4,660	4,790	5,580	3,930	6,750	6,950	4,310	3,370	1,910	2,700	1,610
28	2,760	4,710	4,880	5,620	3,800	6,230	6,300	4,850	3,680	2,480	2,900	1,730
29	3,680	4,670	4,620	5,510	-----	6,940	6,250	5,970	2,710	2,660	2,200	1,910
30	2,300	4,370	6,180	5,270	-----	7,160	5,800	6,190	3,120	2,380	2,300	2,260
31	2,780	-----	8,920	5,300	-----	7,370	-----	6,820	-----	2,700	2,400	-----
TOTAL	87,110	131,430	147,970	196,910	126,150	177,810	185,940	145,140	148,360	83,480	90,490	59,120
MEAN	2,810	4,381	4,773	6,352	4,505	5,736	6,198	4,682	4,945	2,693	2,919	1,971
MAX	3,960	6,300	8,920	10,600	5,500	7,370	8,480	6,820	7,480	3,460	4,200	2,600
MIN	2,000	2,960	3,830	5,010	3,800	3,780	4,950	3,420	2,710	1,910	2,140	1,490
CFSM	.77	1.20	1.30	1.73	1.23	1.56	1.69	1.28	1.35	.73	.80	.54
IN.	.88	1.33	1.50	2.00	1.28	1.80	1.89	1.47	1.51	.85	.92	.60

CAL YR 1972 TOTAL 1,199,880 MEAN 3,278 MAX 8,920 MIN 1,150 CFSM .89 IN 12.18
WTR YR 1973 TOTAL 1,579,910 MEAN 4,329 MAX 10,600 MIN 1,490 CFSM 1.18 IN 16.03

STREAMS TRIBUTARY TO LAKE MICHIGAN

83

04101800 Dowagiac River at Summerville, Mich.

LOCATION.--Lat 41°54'57", long 86°12'47", in SE¼ sec.30, T.6 S., R.16 W., Cass County, on right bank 30 ft (9 m) upstream from bridge on Indian Lake Road, 0.3 mi (0.5 km) west of Summerville.

DRAINAGE AREA.--255 mi² (660 km²).

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.

AVERAGE DISCHARGE.--13 years, 264 ft³/s (7.476 m³/s), 14.06 in/yr (357 mm/yr).

EXTREMES.--Current year: Maximum discharge, 988 ft³/s (28.0 m³/s) Dec. 31 (gage height, 7.59 ft or 2.313 m); minimum, 154 ft³/s (4.36 m³/s) Sept. 15 (gage height, 3.25 ft or 0.991 m).
Period of record: Maximum discharge, 1,280 ft³/s (36.2 m³/s) June 26, 1968 (gage height, 8.78 ft or 2.676 m); minimum, 86 ft³/s (2.44 m³/s) Sept. 10, 1964; minimum gage height, 2.57 ft (0.783 m) Aug. 8, 9, 1964.

REMARKS.--Records excellent. Flow regulated by millpond and lake-level control dam above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	291	287	302	910	341	293	716	495	604	258	398	189
2	257	319	295	732	392	329	665	527	518	251	359	183
3	236	333	301	606	413	355	538	472	481	281	323	180
4	228	323	293	640	391	358	473	434	473	341	294	179
5	232	309	285	570	372	357	443	402	508	319	271	178
6	219	292	385	495	355	354	417	382	573	295	255	176
7	211	294	381	442	343	342	395	370	535	274	236	171
8	202	359	345	403	338	326	376	381	462	257	223	169
9	194	355	326	382	329	313	386	374	412	268	219	169
10	189	328	314	359	322	313	493	357	374	313	218	169
11	198	329	301	347	309	335	470	340	350	294	207	165
12	218	313	318	344	298	341	458	327	330	246	203	159
13	211	309	481	336	296	326	451	314	312	232	198	157
14	203	367	469	331	306	349	413	310	296	229	191	156
15	195	374	418	331	324	366	384	305	285	224	189	156
16	196	349	370	330	304	342	378	294	284	216	184	157
17	193	325	354	365	274	366	384	285	317	212	185	175
18	188	311	349	475	287	363	370	278	311	205	186	202
19	188	306	341	562	278	378	376	281	292	202	190	191
20	186	312	343	540	287	423	371	284	319	202	235	187
21	191	320	361	474	299	428	378	274	316	203	252	184
22	262	325	380	460	297	417	782	284	291	202	233	194
23	428	318	380	516	296	395	863	493	275	199	225	196
24	429	307	370	496	294	377	662	610	308	195	253	191
25	384	306	366	452	289	361	541	605	297	191	255	188
26	337	325	361	431	282	354	472	618	275	195	235	189
27	306	356	352	416	274	337	423	520	268	202	218	187
28	299	342	341	404	276	321	389	639	292	221	210	192
29	331	322	340	381	-----	391	372	697	287	247	202	223
30	326	308	568	354	-----	564	405	692	272	242	198	257
31	302	-----	961	339	-----	542	-----	705	-----	264	195	-----
TOTAL	7,830	9,723	11,751	14,223	8,866	11,416	14,244	13,349	10,917	7,480	7,240	5,469
MEAN	253	324	379	459	317	368	475	431	364	241	234	182
MAX	429	374	961	910	413	564	863	705	604	341	398	257
MIN	186	287	285	330	274	293	370	274	268	191	184	156
CFSM	.99	1.27	1.49	1.80	1.24	1.44	1.86	1.69	1.43	.95	.92	.71
IN.	1.14	1.42	1.71	2.07	1.29	1.67	2.08	1.95	1.59	1.09	1.06	.80
CAL YR 1972	TOTAL	96,099	MEAN 263	MAX 961	MIN 122	CFSM 1.03	IN 14.02					
WTR YR 1973	TOTAL	122,508	MEAN 336	MAX 961	MIN 156	CFSM 1.32	IN 17.87					

STREAMS TRIBUTARY TO LAKE MICHIGAN

04102500 Paw Paw River at Riverside, Mich.

LOCATION.--Lat 42°11'10", long 86°22'06", in SW¼ SE¼ sec.23, T.3 S., R.18 W., Berrien County, 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 mi² (1,010 km²).

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

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.

AVERAGE DISCHARGE.--22 years, 411 ft³/s (11.64 m³/s), 14.31 in/yr (363 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,100 ft³/s (59.5 m³/s) Jan. 4 (gage height, 9.49 ft or 2.893 m); minimum, 257 ft³/s (7.28 m³/s) Sept. 16 (gage height, 4.29 ft or 1.308 m).

Period of record: Maximum discharge, 2,140 ft³/s (60.6 m³/s) Feb. 6, 1968 (gage height, 9.32 ft or 2.841 m); minimum, 99 ft³/s (2.80 m³/s) July 5, 1964 (gage height, 2.66 ft or 0.811 m).

REMARKS.--Records good. Diurnal fluctuation, principally during low flow, caused by paper mill above station.

REVISIONS.--WSP 1337: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	434	578	536	1,270	649	384	724	774	959	402	439	339
2	418	557	531	1,170	630	405	774	828	966	414	465	331
3	410	547	523	1,560	632	435	783	805	1,020	458	460	317
4	396	541	514	1,980	638	456	812	763	1,090	478	443	310
5	377	522	504	1,990	617	469	846	742	1,110	462	435	303
6	360	504	522	1,800	599	486	851	734	1,090	448	408	293
7	348	517	561	1,600	589	505	830	721	1,040	446	380	287
8	334	547	581	1,400	581	521	775	691	936	434	366	283
9	326	597	551	1,300	567	531	739	660	851	395	355	281
10	316	609	544	1,100	550	533	724	632	786	382	346	279
11	316	577	544	1,000	529	537	735	603	741	381	340	277
12	322	558	575	900	504	544	706	577	691	366	335	276
13	318	555	613	800	479	542	689	555	632	356	326	271
14	313	563	706	705	464	545	675	531	567	383	319	269
15	310	570	717	681	456	561	655	501	511	389	315	266
16	310	574	714	662	447	574	644	471	480	400	311	259
17	308	562	709	622	419	582	637	444	468	390	308	272
18	303	548	723	614	433	583	622	419	448	371	308	289
19	300	537	692	683	400	587	604	408	432	354	313	296
20	299	535	693	755	405	613	582	407	418	343	324	305
21	301	532	681	738	402	636	584	404	402	343	375	305
22	328	531	703	750	403	643	669	400	380	338	431	304
23	418	529	709	814	401	641	816	423	373	334	459	301
24	487	521	695	874	399	639	801	456	422	331	489	308
25	495	513	686	859	394	634	766	498	420	328	508	314
26	490	526	679	838	390	629	782	542	409	332	488	314
27	498	553	673	816	384	613	824	587	391	333	440	307
28	522	574	660	790	379	593	844	660	390	394	417	295
29	578	564	648	760	-----	578	800	800	399	412	389	306
30	631	547	759	716	-----	595	761	893	404	400	360	360
31	615	-----	1,380	679	-----	648	-----	942	-----	409	346	-----
TOTAL	12,181	16,488	20,326	31,226	13,740	17,242	22,054	18,871	19,226	12,006	11,998	8,917
MEAN	393	550	656	1,007	491	556	735	609	641	387	387	297
MAX	631	609	1,380	1,990	649	648	851	942	1,110	478	508	360
MIN	299	504	504	614	379	384	582	400	373	328	308	259
CFSM	1.01	1.41	1.68	2.58	1.26	1.43	1.88	1.56	1.64	.99	.99	.76
IN.	1.16	1.57	1.94	2.98	1.31	1.64	2.10	1.80	1.83	1.15	1.14	.85

CAL YR 1972 TOTAL 171,635 MEAN 469 MAX 1,380 MIN 236 CFSM 1.20 IN 16.37
 WTR. YR 1973 TOTAL 204,275 MEAN 560 MAX 1,990 MIN 259 CFSM 1.44 IN 19.48

STREAMS TRIBUTARY TO LAKE MICHIGAN

85

04102700 Black River near Bangor, Mich.

LOCATION.--Lat 42°21'15", long 86°11'15", in NW¼ sec.28, T.1 S., R.16 W., Van Buren County, 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 mi² (216.5 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 615 ft (187 m) from topographic map.

AVERAGE DISCHARGE.--7 years, 97.5 ft³/s (2.761 m³/s), 15.84 in/yr (402 mm/yr).

EXTREMES.--Current year: Maximum discharge, 880 ft³/s (24.9 m³/s) Dec. 31 (gage height, 11.15 ft or 3.399 m); minimum daily, 30 ft³/s (0.85 m³/s) Sept. 15, 16.

Period of record: Maximum discharge, 880 ft³/s (24.9 m³/s) Dec. 31, 1972 (gage height, 11.15 ft or 3.399 m); minimum, 20 ft³/s (0.57 m³/s) Sept. 28, 1966 (gage height, 1.83 ft or 0.558 m).

REMARKS.--Records good except those for the winter period and those for periods of no gage height record, which are poor. Occasional regulation caused by mills above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	58	95	673	97	60	242	200	324	55	45	45
2	49	67	90	576	115	75	262	300	249	60	45	40
3	45	81	92	494	163	119	343	240	213	62	40	40
4	42	77	89	400	161	152	326	200	233	70	40	35
5	41	70	80	350	143	156	277	160	284	65	35	32
6	39	64	80	300	128	143	236	140	297	60	35	32
7	38	66	80	230	114	130	207	120	269	55	35	32
8	36	138	85	200	106	119	176	150	220	50	35	32
9	35	152	85	160	97	109	148	180	175	44	45	32
10	34	130	85	140	91	97	124	150	140	44	50	32
11	34	115	90	130	82	94	126	120	113	44	45	32
12	35	103	100	120	80	110	159	110	107	44	35	31
13	35	92	120	110	75	131	171	100	84	45	31	32
14	34	101	160	105	69	122	177	95	74	45	31	31
15	33	112	170	100	70	142	160	90	68	45	31	30
16	33	110	130	105	65	176	135	85	62	45	32	30
17	32	97	100	109	65	155	115	85	65	40	35	36
18	33	87	110	208	65	142	104	80	64	40	40	45
19	33	82	120	371	65	139	104	80	60	40	50	40
20	33	86	140	401	65	143	95	80	55	40	80	37
21	35	94	151	307	65	181	103	75	52	40	65	35
22	54	100	173	263	69	200	303	75	50	40	59	39
23	123	101	179	289	69	182	413	100	50	40	51	37
24	123	94	171	275	69	158	316	130	54	40	52	36
25	109	90	162	231	67	141	238	160	50	40	48	35
26	90	104	156	212	65	127	193	110	50	40	44	36
27	74	147	148	180	63	116	160	150	47	40	40	35
28	70	144	139	160	59	107	140	200	62	45	37	36
29	72	123	129	139	-----	97	130	500	69	45	40	51
30	68	104	346	117	-----	92	120	450	60	45	40	96
31	63	-----	830	102	-----	149	-----	383	-----	45	45	-----
TOTAL	1,629	2,989	4,685	7,557	2,442	4,064	5,803	5,098	3,700	1,453	1,336	1,132
MEAN	52.5	99.6	151	244	87.2	131	193	164	123	46.9	43.1	37.7
MAX	123	152	830	673	163	200	413	500	324	70	80	96
MTN	32	58	80	100	59	60	95	75	47	40	31	30
CFSM	.63	1.19	1.81	2.92	1.04	1.57	2.31	1.96	1.47	.56	.52	.45
IN.	.72	1.33	2.08	3.36	1.09	1.81	2.58	2.27	1.65	.65	.59	.50
CAL YR 1972	TOTAL 33,640	MEAN 91.9	MAX 830	MIN 28	CFSM 1.10	IN 14.97						
WTR YR 1973	TOTAL 41,888	MEAN 115	MAX 830	MIN 30	CFSM 1.38	IN 18.64						

PEAK DISCHARGE (BASE, 400 FT³/s)

NOTE.--No gage-height record Apr. 27 to May 30, and June 30 to Aug. 21.

DATE	TIME	G.H.	DISCHARGE
12-31	0900	11.15	880
01-20	0100	7.76	428
04-23	0500	7.60	428
05-29	unknown	unknown	about 520

STREAMS TRIBUTARY TO LAKE MICHIGAN

04102850 South Branch Kalamazoo River near Albion, Mich.

LOCATION.--Lat 42°12'11", long 84°47'39", in SE¼ SE¼ sec.17, T.3 S., R.4 W., Calhoun County, on right bank at downstream side of bridge on F Drive South, 3.6 mi (5.8 km) southwest of Albion.

DRAINAGE AREA.--146 mi² (378 km²).

PERIOD OF RECORD.--October 1971 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 950 ft (290 m) from topographic map.

EXTREMES.--Current year. Maximum discharge, 343 ft³/s (9.72 m³/s) Jan. 1 (gage height, 3.37 ft or 1.027 m); maximum gage height, 3.73 ft (1.137 m) Aug. 2 (backwater from aquatic growth); minimum discharge, 55 ft³/s (1.56 m³/s) Oct. 15-21 (gage height, 1.73 ft or 0.527 m).

Period of record: Maximum discharge, 343 ft³/s (9.72 m³/s) Jan. 1, 1973 (gage height, 3.37 ft or 1.027 m); maximum gage height, 3.73 ft (1.137 m) Aug. 2, 1973 (backwater from aquatic growth); minimum daily discharge, 36 ft³/s (1.02 m³/s) Aug. 16, 1972; minimum gage height, 1.60 ft (0.488 m) Dec. 2, 1971, result of freezeup.

REMARKS.--Records fair except those for period of no gage-height record, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	90	90	105	330	150	108	248	199	293	140	243	92
2	83	96	100	310	150	127	239	203	264	140	273	92
3	76	108	100	300	150	183	230	199	243	150	245	90
4	71	108	100	310	160	222	225	190	229	155	213	89
5	68	103	100	280	170	216	215	178	220	153	175	94
6	70	89	100	240	150	201	204	169	220	145	148	90
7	68	95	100	220	140	190	197	162	218	140	125	89
8	64	100	105	200	130	187	192	169	208	131	113	89
9	61	105	105	190	120	183	190	166	195	124	145	89
10	59	105	110	120	110	178	206	160	182	133	218	89
11	57	110	110	120	105	194	213	153	171	133	232	89
12	59	110	115	130	105	220	210	148	166	124	195	87
13	59	110	115	130	105	220	201	141	160	117	166	85
14	57	110	115	140	105	211	190	138	153	106	152	89
15	57	110	115	140	105	204	180	134	146	103	141	87
16	55	115	115	130	105	203	175	129	140	101	129	83
17	55	115	115	140	105	211	178	127	138	96	122	90
18	55	115	120	150	105	194	173	124	134	89	118	96
19	55	110	120	160	105	195	175	122	129	85	115	92
20	55	110	120	190	117	229	171	120	122	87	155	92
21	57	110	120	180	117	230	168	115	122	90	143	90
22	70	110	120	180	117	225	211	124	120	92	133	94
23	98	110	120	180	115	225	273	187	124	94	125	90
24	110	110	120	190	113	230	280	246	143	90	122	90
25	106	110	125	180	112	248	265	258	145	94	120	90
26	94	105	125	180	110	260	239	280	143	96	117	99
27	85	105	125	170	110	253	220	281	143	105	112	90
28	82	105	125	170	108	241	203	293	145	133	106	94
29	88	105	130	160	-----	252	188	308	145	141	101	125
30	94	105	150	160	-----	260	187	327	143	124	99	150
31	92	-----	210	150	-----	253	-----	325	-----	140	96	-----
TOTAL	2,251	3,189	3,655	5,790	3,394	6,553	6,246	5,875	5,104	3,651	4,697	2,805
MEAN	72.6	106	118	187	121	211	208	190	170	118	152	93.5
MAX	110	115	210	330	170	260	280	327	293	155	273	150
MIN	55	89	100	120	105	108	168	115	120	85	96	83
CFSM	.50	.73	.81	1.28	.83	1.45	1.42	1.30	1.16	.81	1.04	.64
IN.	.57	.81	.93	1.48	.86	1.67	1.59	1.50	1.30	.93	1.20	.71

CAL YR 1972 TOTAL 31,451 MEAN 85.9 MAX 243 MIN 36 CFSM .59 IN 8.01
 WTR YR 1972 TOTAL 53,210 MEAN 146 MAX 330 MIN 55 CFSM 1.00 IN 13.56

NOTE.--No gage-height record Nov. 7 to Feb. 12.

STREAMS TRIBUTARY TO LAKE MICHIGAN

87

04103500 Kalamazoo River at Marshall, Mich.

LOCATION.--Lat 42°15'55", long 84°57'55", on line between secs. 25 and 26, T.2 S., R.6 W., Calhoun County, on left bank at upstream side of bridge on U. S. Highway 27 at Marshall.

DRAINAGE AREA.--449 mi² (1,163 km²).

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.

AVERAGE DISCHARGE.--25 years, 299 ft³/s (8.468 m³/s), 9.04 in/yr (230 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,160 ft³/s (32.9 m³/s) Jan. 2 (gage height, 6.67 ft or 2.033 m); minimum, 44 ft³/s (1.25 m³/s) July 26; minimum gage height, 3.36 ft (1.024 m) Oct. 20; minimum daily discharge, 152 ft³/s (4.30 m³/s) Oct. 7.
Period of record: Maximum discharge, 2,130 ft³/s (60.3 m³/s) Mar. 29, 1950 (gage height, 8.20 ft or 2.499 m); minimum, 12 ft³/s (0.34 m³/s) Aug. 2, 1967; minimum gage height, 3.00 ft (0.914 m) May 16, 1963; minimum daily discharge, 31 ft³/s (0.88 m³/s) Aug. 16, 1964.

REMARKS.--Records good. Diurnal fluctuation caused by powerplant above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	305	410	431	861	371	285	697	491	898	295	536	318
2	290	307	310	823	381	298	696	498	821	317	586	318
3	317	338	292	801	420	457	675	508	761	515	635	314
4	297	328	353	838	441	562	647	500	724	374	599	331
5	205	334	291	720	432	603	620	479	697	450	547	213
6	265	314	311	600	414	604	589	467	685	372	505	395
7	152	280	310	556	404	587	558	466	680	419	411	187
8	253	369	247	496	391	577	529	474	648	347	378	295
9	258	397	408	400	356	557	518	480	597	299	424	315
10	179	254	306	290	353	534	520	482	551	374	529	307
11	180	348	272	343	328	545	536	469	517	421	606	302
12	171	449	343	353	323	604	550	368	496	421	609	247
13	242	328	384	356	325	628	541	314	479	383	562	212
14	257	445	442	352	336	640	522	463	422	323	517	385
15	154	403	443	341	363	632	501	392	309	333	490	186
16	190	344	305	338	332	610	493	346	416	341	360	217
17	247	378	352	389	285	610	491	449	373	397	423	325
18	170	371	376	410	286	599	489	339	440	303	350	310
19	159	348	393	446	305	578	492	296	291	288	328	307
20	159	333	379	494	337	586	488	298	331	302	498	326
21	238	392	277	463	306	634	486	437	447	330	535	306
22	190	297	354	458	311	654	510	307	284	343	491	311
23	313	399	446	477	312	649	576	555	283	383	381	308
24	328	340	416	484	397	648	687	689	391	363	514	308
25	336	343	361	467	352	660	679	756	337	312	328	306
26	329	412	325	448	282	675	641	882	376	259	393	313
27	310	300	303	435	282	677	577	869	289	417	340	227
28	294	361	324	434	283	659	526	903	375	380	365	412
29	291	324	347	424	-----	683	502	934	469	381	335	578
30	295	255	471	403	-----	708	490	938	423	489	336	604
31	387	-----	651	386	-----	697	-----	950	-----	543	394	-----
TOTAL	7,761	10,501	11,223	15,086	9,708	18,440	16,826	16,799	14,810	11,474	14,305	9,483
MEAN	250	350	362	487	347	595	561	542	494	370	461	316
MAX	387	449	651	861	441	708	697	950	898	543	635	604
MIN	152	254	247	290	282	285	486	296	283	259	328	186
CFSM	.56	.78	.81	1.08	.77	1.33	1.25	1.21	1.10	.82	1.03	.70
IN.	.64	.87	.93	1.25	.80	1.53	1.39	1.39	1.23	.95	1.19	.79

CAL YR 1972 TOTAL 108,186 MEAN 296 MAX 723 MIN 49 CFSM .66 IN 8.96
WTR YR 1973 TOTAL 156,416 MEAN 429 MAX 950 MIN 152 CFSM .96 IN 12.96

STREAMS TRIBUTARY TO LAKE MICHIGAN

04105000 Battle Creek at Battle Creek, Mich.

LOCATION.--Lat 42°19'55", long 85°09'15", in NW¼ sec.5, T.2 S., R.7 W., Calhoun County, 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 mi² (624 km²).

PERIOD OF RECORD.--October 1930 to September 1931, October 1932 to July 1933, January 1934 current year. Monthly discharge only for some periods, published in WSP 1307.

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 and datum.

AVERAGE DISCHARGE.--40 years (1930-31, 1934-72) 192 ft³/s (5.437 m³/s), 10.82 in/yr (275 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,540 ft³/s (43.6 m³/s) Jan. 2 (gage height, 2.67 ft or 0.814 m); minimum, 50 ft³/s (1.42 m³/s) Sept. 15 (gage height, 0.58 ft or 0.177 m).
Period of record: Maximum discharge, 3,640 ft³/s (103 m³/s) Apr. 7, 1947 (gage height, 4.48 ft or 1.366 m, from floodmark); minimum, 22 ft³/s (0.62 m³/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.

REMARKS.--Records good. Occasional slight regulation prior to November 1943.

REVISIONS (WATER YEARS).--WSP 1387: 1931, 1944. WSP 1507: 1956.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	244	290	311	920	323	178	802	399	888	513	172	101
2	251	285	304	1,400	317	201	795	384	788	531	167	99
3	244	284	294	1,500	313	267	800	378	694	480	166	96
4	237	286	280	1,400	322	358	777	366	620	414	171	92
5	228	294	270	1,120	329	553	688	354	568	355	169	89
6	208	305	270	900	331	730	613	338	544	313	158	87
7	190	316	211	700	322	714	551	327	520	277	146	82
8	162	330	243	635	268	671	490	327	474	241	137	80
9	150	343	269	509	249	639	448	322	436	205	143	79
10	142	365	278	429	249	597	421	305	397	187	150	78
11	130	398	278	381	232	555	398	305	371	186	155	77
12	122	419	284	344	220	544	388	301	344	225	165	75
13	119	414	298	313	215	562	382	289	278	276	164	75
14	117	404	312	292	209	640	387	272	247	338	152	69
15	113	386	328	274	185	668	386	255	221	326	137	53
16	109	367	333	267	168	724	380	236	202	290	127	53
17	106	354	346	294	168	782	370	219	188	266	119	66
18	104	344	374	357	173	717	358	205	177	248	116	80
19	101	334	372	409	170	631	347	198	171	224	114	87
20	101	329	376	415	170	592	340	193	169	204	125	96
21	102	324	382	446	172	589	338	190	164	194	139	97
22	118	322	382	468	165	614	383	195	155	185	154	100
23	160	322	382	439	176	638	511	268	151	195	159	103
24	193	327	384	412	171	657	852	349	152	216	151	101
25	235	331	388	429	173	662	953	422	143	222	135	101
26	297	333	393	421	167	682	802	536	136	205	125	100
27	338	333	386	402	156	691	658	570	131	181	116	102
28	343	328	379	365	159	671	544	604	188	175	110	105
29	329	323	365	318	-----	656	474	694	237	162	106	160
30	317	316	399	308	-----	639	417	836	354	152	104	197
31	303	-----	519	317	-----	698	-----	949	-----	155	102	-----
TOTAL	5,913	10,106	10,390	17,184	6,272	18,520	16,053	11,586	10,108	8,141	4,354	2,780
MEAN	191	337	335	554	224	597	535	374	337	263	140	92.7
MAX	343	419	519	1,500	331	782	953	949	888	531	172	197
MIN	101	284	211	267	156	178	338	190	131	152	102	53
CFSM	.79	1.40	1.39	2.30	.93	2.48	2.22	1.55	1.40	1.09	.58	.38
IN.	.91	1.56	1.60	2.65	.97	2.86	2.48	1.79	1.56	1.26	.67	.43
CAL YR 1972	TOTAL	84,047	MEAN	230	MAX	996	MIN	66	CFSM	.95	IN	12.97
WTR YR 1973	TOTAL	121,407	MEAN	333	MAX	1,500	MIN	53	CFSM	1.38	IN	18.74

STREAMS TRIBUTARY TO LAKE MICHIGAN

89

04105500 Kalamazoo River near Battle Creek, Mich.

LOCATION.--Lat 42°19'26", long 85°11'51", in SW¼ sec.1, T.2 S., R.8 W., Calhoun County, on left bank 20 ft (6 m) upstream from bridge on Kendall Street in Battle Creek.

DRAINAGE AREA.--824 mi² (2,134 km²).

PERIOD OF RECORD.--July 1937 to current year. Monthly discharge only for some periods, published in WSP 1307.

GAGE.--Water-stage recorder. Altitude of gage is 815 ft (248 m) from topographic map. 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.

AVERAGE DISCHARGE.--36 years, 631 ft³/s (17.87 m³/s), 10.40 in/yr (264 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,710 ft³/s (76.7 m³/s) Jan. 3 (gage height, 6.00 ft or 1.829 m); minimum, 119 ft³/s (3.37 m³/s) Feb. 17 (gage height, 2.74 ft or 0.835 m), result of freezeup.
Period of record: Maximum discharge, 7,290 ft³/s (206 m³/s) Apr. 7, 1947 (gage height, 9.13 ft or 2.783 m, site and datum then in use); minimum, 50 ft³/s (1.42 m³/s) Sept. 22, 1939; site then in use; minimum daily, 86 ft³/s (2.44 m³/s) Aug. 5, 1964.

REMARKS.--Records fair. Diurnal fluctuation, below 1,500 cfs, caused by powerplants above station.

REVISIONS (WATER YEARS).--WSP 924: 1938-39. WSP 1387: 1938, 1945-46, 1948.

DISCHARGE. IN CUBIC FEET PER SECOND. WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	781	884	841	1,880	865	600	1,730	1,190	2,300	985	946	528
2	771	848	890	2,260	908	671	1,810	1,170	2,200	1,060	913	445
3	750	785	749	2,560	920	879	1,750	1,160	2,200	1,220	963	440
4	763	801	811	2,460	949	1,160	1,710	1,160	2,100	1,140	985	377
5	655	763	762	2,190	963	1,370	1,600	1,110	1,900	905	910	457
6	644	821	809	1,970	946	1,550	1,480	1,040	1,800	928	848	493
7	554	817	698	1,800	928	1,560	1,380	1,020	1,700	727	706	463
8	537	888	755	1,500	892	1,500	1,280	1,120	1,600	781	650	286
9	573	981	792	1,410	771	1,430	1,230	1,140	1,500	554	716	474
10	543	916	808	1,070	757	1,360	1,210	1,140	1,400	671	831	451
11	404	860	814	948	722	1,360	1,180	1,140	1,300	655	898	445
12	513	1,030	752	922	695	1,400	1,180	1,070	1,200	784	974	442
13	410	1,040	953	867	669	1,430	1,150	855	1,100	809	940	306
14	475	1,020	1,040	859	688	1,510	1,120	960	1,000	877	856	493
15	458	1,060	1,030	817	690	1,550	1,100	1,060	701	778	801	448
16	366	951	853	795	639	1,550	1,090	817	680	740	679	248
17	478	924	793	839	394	1,620	1,100	872	729	713	527	500
18	385	886	978	974	623	1,570	1,040	899	811	745	742	551
19	369	948	1,050	1,120	603	1,500	1,060	714	676	673	467	525
20	436	889	1,060	1,180	642	1,440	937	697	568	673	893	522
21	329	895	956	1,110	607	1,470	1,000	800	688	634	750	547
22	487	927	944	1,190	600	1,530	1,280	900	626	649	750	570
23	681	808	990	1,210	619	1,560	1,430	1,100	526	658	800	552
24	707	981	1,050	1,160	604	1,580	1,830	1,300	580	722	800	540
25	736	804	958	1,110	710	1,590	2,070	1,600	673	676	700	536
26	797	957	1,010	1,120	573	1,630	1,880	1,800	538	627	650	536
27	835	937	926	1,070	552	1,620	1,630	2,000	604	667	669	557
28	826	851	856	1,030	561	1,600	1,430	2,100	696	832	581	550
29	802	904	839	949	-----	1,670	1,270	2,200	788	618	489	1,290
30	776	777	1,080	895	-----	1,710	1,200	2,200	967	684	477	1,250
31	786	-----	1,460	868	-----	1,680	-----	2,200	-----	912	492	-----
TOTAL	18,627	26,953	28,307	40,133	20,090	44,650	41,157	38,534	34,151	24,097	23,403	15,822
MEAN	601	898	913	1,295	718	1,440	1,372	1,243	1,138	777	755	527
MAX	835	1,060	1,460	2,560	963	1,710	2,070	2,200	2,300	1,220	985	1,290
MIN	329	763	698	795	394	600	937	697	526	554	467	248
CFSM	.73	1.09	1.11	1.57	.87	1.75	1.67	1.51	1.38	.94	.92	.64
IN.	.84	1.22	1.28	1.81	.91	2.02	1.86	1.74	1.54	1.09	1.06	.71
CAL YR 1972	TOTAL 247,500	MEAN 676	MAX 1,910	MIN 202	CFSM .82	IN 11.17						
WTR YR 1973	TOTAL 355,924	MEAN 975	MAX 2,560	MIN 248	CFSM 1.18	IN 16.07						

STREAMS TRIBUTARY TO LAKE MICHIGAN

04105700 Augusta Creek near Augusta, Mich.

LOCATION.--Lat 42°21'12", long 85°21'14", in SW¼ sec.27, T.1 S., R.9 W., Kalamazoo County, 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 mi² (100.8 km²).

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.

AVERAGE DISCHARGE.--9 years, 38.9 ft³/s (1.102 m³/s), 13.58 in/yr (345 mm/yr).

EXTREMES.--Current year: Maximum discharge, 121 ft³/s (3.43 m³/s) Dec. 31 (gage height, 2.34 ft or 0.713 m); minimum, 23 ft³/s (0.65 m³/s) Feb. 17, Sept. 14, 15, 16 (gage height, 0.87 ft or 0.265 m).

Period of record: Maximum discharge, 125 ft³/s (3.54 m³/s) Feb. 3, 1968 (gage height, 2.39 ft or 0.728 m); minimum, 9.5 ft³/s (0.27 m³/s) Dec. 30, 1970, result of freezeup; minimum gage height, 0.65 ft (0.198 m) Jan. 19, 1970.

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	45	44	115	48	46	73	62	80	64	43	28
2	44	51	44	96	55	56	73	66	71	61	41	28
3	42	52	44	78	58	66	69	63	71	63	39	28
4	40	51	43	80	57	69	64	59	70	59	37	28
5	39	48	42	73	55	67	61	55	68	54	35	26
6	38	45	50	60	53	65	58	52	69	50	34	26
7	38	46	46	59	51	64	56	51	65	47	33	25
8	37	54	47	52	48	63	53	59	61	44	33	24
9	35	55	45	49	46	60	54	61	56	43	35	24
10	35	53	44	46	45	59	57	58	52	42	35	25
11	35	53	42	46	41	63	59	54	50	41	34	24
12	34	51	46	46	40	65	61	52	48	40	34	24
13	33	50	57	44	41	64	59	50	42	41	32	24
14	32	53	60	44	44	72	56	48	39	46	31	24
15	32	53	59	45	46	75	53	47	40	43	30	23
16	31	51	53	45	43	71	52	45	42	42	30	24
17	31	50	50	51	40	69	52	44	41	40	30	31
18	30	49	50	67	37	69	51	44	42	39	31	38
19	31	48	47	77	39	71	52	46	41	38	30	36
20	30	49	49	77	42	71	51	47	42	48	38	34
21	33	49	51	68	43	70	53	45	42	50	38	32
22	49	49	51	68	42	69	85	53	41	46	35	37
23	74	48	50	70	43	68	95	74	42	46	34	38
24	78	47	49	67	42	66	86	84	45	42	33	37
25	71	46	48	62	42	65	75	91	43	41	32	36
26	62	47	47	59	41	62	65	93	42	40	31	35
27	54	49	47	57	40	59	59	84	42	38	31	34
28	52	48	46	56	41	56	54	88	65	40	30	35
29	51	46	45	51	-----	61	51	94	75	39	29	62
30	49	45	72	51	-----	66	53	95	72	38	29	69
31	46	-----	111	48	-----	67	-----	89	-----	41	30	-----
TOTAL	1,334	1,481	1,579	1,907	1,263	2,014	1,840	1,953	1,599	1,406	1,037	959
MEAN	43.0	49.4	50.9	61.5	45.1	65.0	61.3	63.0	53.3	45.4	33.5	32.0
MAX	78	55	111	115	58	75	95	95	80	64	43	69
MIN	30	45	42	44	37	46	51	44	39	38	29	23
CFSM	1.11	1.27	1.31	1.58	1.16	1.67	1.58	1.62	1.37	1.17	.86	.82
IN.	1.28	1.42	1.51	1.82	1.21	1.93	1.76	1.87	1.53	1.34	.99	.92

CAL YR 1972 TOTAL 15,964 MEAN 43.6 MAX 111 MIN 23 CFSM 1.12 IN 15.27

WTR YR 1973 TOTAL 18,372 MEAN 50.3 MAX 115 MIN 23 CFSM 1.29 IN 17.57

STREAMS TRIBUTARY TO LAKE MICHIGAN

91

04105800 Gull Creek near Galesburg, Mich.

LOCATION.--Lat 42°18'54", long 85°24'04", in NW¼ sec.7, T.2 S., R.9 W., Kalamazoo County, on right bank 15 ft (5 m) upstream from bridge on 37th Street, and 2.0 mi (3.2 km) northeast of Galesburg.

DRAINAGE AREA.--38.1 mi² (98.7 km²).

PERIOD OF RECORD.--October 1964 to January 1973 (discontinued as a continuous-record station, converted to a crest-stage partial-record station).

GAGE.--Water-stage recorder. Altitude of gage is 820 ft (250 m) from topographic map.

AVERAGE DISCHARGE.--8 years (1964-72), 25.0 ft³/s (0.708 m³/s), 8.91 in/yr (226 mm/yr).

EXTREMES.--Maximum discharge during the period October 1972 to January 1973, 61 ft³/s (1.73 m³/s) Dec. 30 (gage height, 3.30 ft or 1.006 m); maximum gage height, 3.91 ft (1.192 m) Jan. 8 (backwater from ice); minimum discharge, 33 ft³/s (0.93 m³/s) Jan. 13, 29; minimum gage height, 2.98 ft (0.908 m) Dec. 4, 5, 11, Jan. 13.

Period of record: Maximum discharge, 136 ft³/s (3.85 m³/s) July 25, 1970; maximum gage height, 4.73 ft (1.442 m) Dec. 29, 1967 (backwater from ice); minimum discharge, 2.0 ft³/s (0.057 m³/s) Aug. 10, 1966, Aug. 14, 16, 1968; minimum gage height, 2.20 ft (0.671 m) July 15, Aug. 10, 1966.

REMARKS.--Records good except those for the winter period, which are fair. Occasional regulation by many dams upstream.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59	43	37	52								
2	59	46	36	48								
3	58	44	36	48								
4	58	44	36	51								
5	57	44	36	47								
6	57	43	37	47								
7	56	44	37	45								
8	55	48	37	41								
9	54	45	36	38								
10	52	44	36	37								
11	52	44	35	36								
12	51	43	37	35								
13	49	44	44	35								
14	48	46	42	35								
15	46	44	41	37								
16	45	43	40	38								
17	44	43	39	40								
18	43	42	38	44								
19	41	40	36	47								
20	39	41	38	45								
21	40	41	38	43								
22	47	40	38	46								
23	54	39	37	46								
24	52	38	36	44								
25	50	38	36	44								
26	48	39	36	43								
27	46	38	35	43								
28	47	38	35	43								
29	46	37	35	41								
30	44	36	50	40								
31	44	-----	55	39								
TOTAL	1,541	1,259	1,185	1,318								
MEAN	49.7	42.0	38.2	42.5								
MAX	59	48	55	52								
MIN	39	36	35	35								
CFSM	1.30	1.10	1.00	1.12								
IN.	1.50	1.23	1.16	1.29								

CAL YR 1972 TOTAL 11,220.2 MEAN 30.7 MAX 70 MIN 8.5 CFSM .81 IN 10.96

STREAMS TRIBUTARY TO LAKE MICHIGAN

04106000 Kalamazoo River at Comstock, Mich.

LOCATION.--Lat 42°17'05", long 85°30'50", in NE¼ sec.19, T.2 S., R.10 W., Kalamazoo County, 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 mi² (2,620 km²), approximately.

PERIOD OF RECORD.--April to August 1931, October 1932 to current year. Monthly discharge only for some periods, published in WSP 1307.

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.

AVERAGE DISCHARGE.--41 years (1932-73), 820 ft³/s (23.22 m³/s), 11.03 in/yr (280 mm/yr).

EXTREMES.--Current year: Maximum discharge, 3,380 ft³/s (95.7 m³/s) Jan. 4 (gage height, 4.97 ft or 1.515 m); minimum, 390 ft³/s (11.0 m³/s) Sept. 14, 15; minimum gage height, 1.05 ft (0.320 m) Sept. 9, 14.

Period of record: Maximum discharge, 6,910 ft³/s (196 m³/s) Apr. 8, 1947 (gage height, 7.94 ft or 2.420 m); minimum, 119 ft³/s (3.37 m³/s) May 29, 1958 (gage height, 0.09 ft or 0.027 m); minimum daily, 185 ft³/s (5.24 m³/s) Aug. 7, 1934.

REMARKS.--Records good. Flow regulated by powerplants above station. Records of water temperature for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 824: 1933-36. WSP 1387: 1933, 1934 (M), 1935, 1936 (M), 1938 (M), 1940 (M), 1941.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	964	974	1,020	1,970	1,180	832	2,050	1,570	2,940	1,360	1,140	645
2	1,020	1,070	1,060	2,250	1,230	905	2,100	1,590	2,940	1,490	1,260	733
3	895	1,080	1,070	2,420	1,260	1,030	2,150	1,480	2,890	1,470	1,180	658
4	886	1,020	998	3,150	1,270	1,250	2,140	1,460	2,710	1,480	1,110	716
5	891	999	1,000	3,160	1,290	1,460	2,080	1,430	2,500	1,600	1,120	551
6	755	976	1,030	2,640	1,270	1,620	2,000	1,420	2,290	1,340	1,190	566
7	702	991	1,040	2,140	1,260	1,760	1,860	1,420	2,140	1,290	1,120	578
8	577	1,080	838	1,920	1,240	1,860	1,740	1,400	2,100	1,150	985	583
9	681	1,130	917	1,890	1,200	1,790	1,660	1,460	2,020	1,150	996	448
10	638	1,160	1,000	1,630	1,130	1,720	1,530	1,430	1,760	965	1,010	563
11	632	1,140	1,020	1,280	1,060	1,680	1,530	1,360	1,790	956	1,000	559
12	480	1,100	1,030	1,180	902	1,670	1,540	1,330	1,450	988	1,000	548
13	515	1,200	1,110	1,210	949	1,690	1,480	1,290	1,410	1,060	1,140	547
14	559	1,310	1,260	1,230	994	1,770	1,460	1,170	1,340	1,210	1,120	487
15	569	1,280	1,290	1,290	1,010	1,830	1,440	1,200	1,300	1,280	1,050	477
16	616	1,250	1,250	1,310	1,040	1,880	1,440	1,220	1,110	1,180	1,030	562
17	476	1,180	1,000	1,390	826	1,910	1,430	1,040	1,040	1,030	941	572
18	463	1,130	990	1,390	810	2,000	1,430	1,090	1,170	992	706	578
19	483	1,120	1,200	1,430	923	1,970	1,420	1,100	1,090	1,060	856	635
20	518	1,140	1,350	1,530	916	1,910	1,370	1,030	1,090	993	988	650
21	625	1,120	1,330	1,520	942	1,820	1,340	1,020	963	917	854	614
22	618	1,120	1,250	1,500	923	1,810	1,530	1,070	1,010	954	926	624
23	842	1,100	1,220	1,530	901	1,830	1,770	1,320	1,020	909	1,050	620
24	1,020	1,080	1,230	1,540	901	1,840	1,850	1,510	996	845	1,030	688
25	1,000	1,120	1,280	1,500	908	1,860	1,980	1,890	1,060	970	944	655
26	1,040	1,080	1,250	1,460	955	1,880	2,250	2,160	1,070	954	938	640
27	1,070	1,140	1,230	1,450	873	1,870	2,210	2,540	953	907	787	551
28	1,070	1,140	1,190	1,410	810	1,900	1,980	2,670	1,120	886	621	736
29	1,110	1,090	1,170	1,370	-----	1,930	1,770	2,750	1,110	1,040	602	1,110
30	1,070	1,080	1,290	1,270	-----	1,980	1,610	2,820	1,170	1,030	722	1,710
31	970	-----	1,700	1,200	-----	2,020	-----	2,870	-----	965	738	-----
TOTAL	23,755	33,400	35,613	52,160	28,973	53,277	52,140	49,110	47,552	34,421	30,154	19,604
MEAN	766	1,113	1,149	1,683	1,035	1,719	1,738	1,584	1,585	1,110	973	653
MAX	1,110	1,310	1,700	3,160	1,290	2,020	2,250	2,870	2,940	1,600	1,260	1,710
MIN	463	974	838	1,180	810	832	1,340	1,020	953	845	602	448
CFSM	.76	1.10	1.14	1.67	1.02	1.70	1.72	1.57	1.57	1.10	.96	.65
IN.	.87	1.23	1.31	1.92	1.07	1.96	1.92	1.81	1.75	1.27	1.11	.72

CAL YP 1972 TOTAL 338,946 MEAN 926 MAX 2,160 MIN 428 CFSM .92 IN 12.48
WTR YP 1973 TOTAL 460,159 MEAN 1,261 MAX 3,160 MIN 448 CFSM 1.25 IN 16.95

STREAMS TRIBUTARY TO LAKE MICHIGAN

93

04106300 Portage Creek near Kalamazoo, Mich.

LOCATION.--Lat 42°14'46", long 85°34'33", in SE¼ sec.34, T.2 S., R.11 W., Kalamazoo County, on left bank 25 ft (8m) upstream from bridge on Lovers Lane, and 3.0 mi (4.8 km) south of Kalamazoo.

DRAINAGE AREA.--22.4 mi² (58.0 km²).

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.

EXTREMES.--Current year: Maximum discharge, 120 ft³/s (3.40 m³/s) Apr. 22 (gage height, 3.05 ft or 0.930 m); minimum, 27 ft³/s (0.76 m³/s) Dec. 5 (gage height, 1.61 ft or 0.491 m).
Period of record: Maximum discharge, 180 ft³/s (5.10 m³/s) June 25, 1968 (gage height, 3.60 ft or 1.097 m); minimum, 8.0 ft³/s (0.23 m³/s) Jan. 19, 1965 (gage height, 0.88 ft or 0.268 m), result of bridge construction upstream.

REMARKS.--Records good except those for period of no gage-height record, which are fair. Flow includes water which is pumped from ground water sources by industry and discharged into stream two miles above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	40	30	48	38	42	63	58	59	38	50	33
2	36	42	31	41	40	43	57	53	53	48	44	32
3	36	42	30	43	42	45	51	46	62	49	41	32
4	36	40	29	48	45	46	51	44	57	46	36	35
5	36	39	29	41	44	46	51	43	54	44	34	35
6	36	38	38	41	43	46	49	40	53	44	38	35
7	34	37	32	38	40	46	46	46	50	41	38	33
8	33	41	31	38	39	46	44	50	47	39	37	31
9	34	36	29	38	38	46	50	45	46	43	52	32
10	34	34	29	38	40	47	49	46	42	44	42	34
11	37	34	29	38	40	52	47	47	45	39	38	33
12	36	32	36	36	42	57	48	45	45	36	36	34
13	36	36	41	37	41	53	45	43	44	37	38	34
14	34	38	34	35	43	56	47	46	43	38	37	34
15	33	34	32	37	44	58	43	47	42	35	37	32
16	36	31	30	39	43	54	50	47	41	37	38	32
17	34	32	29	42	41	56	47	45	39	37	37	40
18	34	31	30	49	42	56	49	46	44	35	35	38
19	34	30	31	53	42	54	52	48	48	36	33	36
20	33	34	31	46	43	52	50	45	49	36	46	36
21	36	34	31	41	41	50	52	47	44	34	38	35
22	40	33	30	48	39	49	88	52	40	34	37	40
23	50	32	29	48	39	48	67	78	41	36	36	36
24	56	30	29	44	40	47	55	60	43	36	38	36
25	52	30	29	43	40	46	51	72	41	38	36	37
26	48	33	30	43	41	48	49	64	41	38	35	36
27	45	33	31	43	41	45	47	57	41	40	36	39
28	44	31	30	40	41	46	43	71	45	54	36	49
29	43	30	32	40	-----	58	40	62	42	42	35	75
30	42	31	72	40	-----	62	54	77	40	38	35	49
31	41	-----	78	39	-----	53	-----	68	-----	48	36	-----
TOTAL	1,195	1,038	1,052	1,295	1,152	1,553	1,535	1,638	1,381	1,240	1,185	1,113
MEAN	38.5	34.6	33.9	41.8	41.1	50.1	51.2	52.8	46.0	40.0	38.2	37.1
MAX	56	42	78	53	45	62	88	78	62	54	52	75
MIN	33	30	29	35	38	42	40	40	39	34	33	31
CAL YR 1972	TOTAL 13,278		MEAN 36.3		MAX 85		MIN 24					
WTR YR 1973	TOTAL 15,377		MEAN 42.1		MAX 88		MIN 29					

PEAK DISCHARGE (BASE, 85 FT³/S) NOTE.--No gage-height record Feb. 23 to Mar. 25.

DATE	TIME	G.H.	DISCHARGE
12-30	2300	2.93	100
04-22	0900	3.05	120
05-23	0900	2.85	102
05-25	2100	2.84	101
05-30	1300	2.77	95
09-29	1300	3.02	117

STREAMS TRIBUTARY TO LAKE MICHIGAN

04106320 West Fork Portage Creek near Oshtemo, Mich.

LOCATION.--Lat 42°14'07", long 85°38'54", in SE¼ sec.1, T.3 S., R.12 W., Kalamazoo County, on right bank at upstream side of bridge on 12th Street, 2.1 mi (3.4 km) southeast of Oshtemo.

DRAINAGE AREA.--13.0 mi² (33.7 km²).

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).

EXTREMES.--Current year: Maximum discharge, 19 ft³/s (0.54 m³/s) May 31 (gage height, 1.90 ft or 0.579 m); minimum, 7.2 ft³/s (0.20 m³/s) Oct. 17-21, Sept. 14-17; minimum gage height, 1.33 ft (0.405 m) Sept. 14-17.

Period of record: Maximum discharge, 19 ft³/s (0.54 m³/s) May 31, 1973 (gage height, 1.90 ft or 0.579 m); minimum, 4.8 ft³/s (0.14 m³/s) May 28, July 25, 1972; minimum gage height, 1.30 ft (0.396 m) May 28.

REMARKS.--Records good except those for period of no gage-height record, which are fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.3	8.3	8.0	14	7.8	8.7	13	13	16	11	13	8.7
2	8.9	9.1	8.0	13	8.5	9.1	13	14	15	11	13	8.7
3	8.7	8.9	8.0	12	9.1	9.6	12	13	15	12	13	8.9
4	8.5	8.7	7.5	12	8.9	9.6	11	12	15	12	12	8.9
5	8.3	8.3	8.0	11	8.5	9.6	11	12	15	12	11	8.7
6	8.1	8.0	9.0	11	8.3	9.6	10	11	15	11	11	8.7
7	8.1	8.1	9.0	9.8	8.3	9.8	9.8	11	14	11	10	8.5
8	8.0	9.5	8.5	9.4	8.3	9.6	9.6	12	13	11	10	8.3
9	7.6	9.0	8.0	9.1	8.1	9.4	9.8	12	11	11	12	8.1
10	7.4	8.5	8.0	8.9	8.1	9.6	11	12	11	11	12	7.8
11	8.0	8.5	8.0	8.5	8.0	11	11	11	10	10	10	7.6
12	8.1	8.5	8.5	8.5	7.8	12	11	11	9.6	10	11	7.6
13	8.0	8.5	10	8.3	7.8	11	11	11	9.4	10	10	7.6
14	7.8	9.5	9.0	8.5	8.0	12	11	11	9.1	11	9.6	7.4
15	7.6	9.0	8.5	8.5	8.3	12	10	10	8.9	11	9.6	7.2
16	7.6	8.5	8.5	8.7	8.1	11	10	10	9.4	11	9.6	7.2
17	7.2	8.0	8.0	9.1	8.0	12	10	10	9.4	10	9.6	7.6
18	7.2	8.0	8.0	10	7.8	12	10	10	9.3	10	9.4	8.7
19	7.2	8.0	8.0	11	8.1	11	11	10	9.4	10	9.4	9.3
20	7.2	8.5	8.0	11	8.3	11	11	11	10	10	12	8.9
21	7.8	8.0	8.0	11	8.7	11	11	10	10	10	12	8.7
22	9.3	8.0	8.0	10	8.7	10	14	11	9.6	10	12	9.8
23	12	8.0	8.0	10	8.7	10	15	14	10	10	11	10
24	12	7.5	8.0	10	8.5	10	14	15	11	10	12	9.8
25	11	8.0	8.0	9.4	8.3	9.6	12	14	11	10	11	9.6
26	10	8.0	7.6	9.1	8.3	9.3	11	14	11	10	11	9.4
27	9.3	8.0	7.6	8.7	8.5	9.3	11	14	10	10	11	9.4
28	9.1	8.0	7.4	8.7	8.7	9.3	11	16	12	11	10	11
29	9.3	8.0	7.6	8.5	-----	10	10	18	12	12	9.8	14
30	8.9	8.0	10	8.0	-----	12	12	18	12	11	9.4	15
31	8.5	-----	14	7.8	-----	12	-----	18	-----	12	9.1	-----
TOTAL	265.0	250.9	260.7	303.5	232.5	322.1	337.2	389	343.1	332	335.5	271.1
MEAN	8.55	8.36	8.41	9.79	8.30	10.4	11.2	12.5	11.4	10.7	10.8	9.04
MAX	12	9.5	14	14	9.1	12	15	18	16	12	13	15
MIN	7.2	7.5	7.4	7.8	7.8	8.7	9.6	10	8.9	10	9.1	7.2
CFSM	.66	.64	.65	.75	.64	.80	.86	.96	.88	.82	.83	.70
IN.	.76	.72	.75	.87	.67	.92	.96	1.11	.98	.95	.96	.78

WTR YR 1973 TOTAL 3,642.6 MEAN 9.98 MAX 18 MIN 7.2 CFSM .77 IN 10.42

NOTE.--No gage height record Nov. 8 to Dec. 25.

STREAMS TRIBUTARY TO LAKE MICHIGAN

95

04106400 West Fork Portage Creek at Kalamazoo, Mich.

LOCATION.--Lat 42°14'40", long 85°36'50", in NE¼ sec.5, T.3 S., R.11 W., Kalamazoo County, 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 mi² (48.4 km²).

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).

AVERAGE DISCHARGE.--14 years, 9.45 ft³/s (0.268 m³/s), 6.86 in/yr (174 mm/yr).

EXTREMES.--Current year: Maximum discharge, 24 ft³/s (0.68 m³/s) Aug. 23, Sept. 30 (gage height, 2.90 ft or 0.884 m); minimum, 4.1 ft³/s (0.12 m³/s) Aug. 22 (gage height, 2.25 ft or 0.686 m), caused by unusual regulation.

Period of record: Maximum discharge, 39 ft³/s (1.10 m³/s) Dec. 8, 1966; maximum gage height, 3.12 ft (0.951 m) Mar. 20, 1963; minimum discharge, 1.0 ft³/s (0.028 m³/s) Aug. 9, 1964; minimum gage height, 0.88 ft (0.268 m) July 30, 1963, caused by construction.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	9.8	10	18	9.0	10	16	14	21	13	14	10
2	9.8	11	9.8	17	10	11	16	14	18	13	15	9.8
3	8.9	10	9.8	16	10	11	14	14	19	14	15	9.5
4	8.3	10	9.5	15	10	11	13	13	20	14	14	9.9
5	8.1	9.8	9.5	14	10	11	13	13	19	13	13	9.9
6	8.1	9.2	11	13	10	11	12	12	19	13	12	9.9
7	7.8	9.5	11	13	9.8	11	11	11	17	13	12	9.9
8	7.5	11	11	12	9.8	11	10	12	16	13	12	9.9
9	7.3	11	11	11	9.8	11	11	12	14	13	14	9.9
10	7.3	11	11	11	9.5	11	12	12	13	13	14	9.9
11	7.3	11	10	11	9.5	12	12	12	12	12	12	8.6
12	7.5	10	11	10	9.5	13	13	11	11	12	12	8.1
13	7.5	11	12	10	9.5	14	13	11	11	11	15	7.8
14	7.5	11	12	10	9.5	14	13	11	10	13	13	7.8
15	7.5	11	11	11	9.8	14	12	10	9.8	13	13	7.8
16	7.5	11	11	11	9.8	14	12	10	10	13	12	7.3
17	7.0	11	10	12	9.8	14	12	9.8	10	13	12	8.1
18	7.0	10	10	13	9.8	14	12	9.8	9.8	12	11	10
19	7.0	10	10	13	9.8	13	13	10	10	12	11	9.8
20	7.0	10	10	13	9.8	13	13	11	11	12	13	9.5
21	7.5	10	10	13	10	13	13	11	10	12	14	9.2
22	9.8	9.8	10	12	10	12	16	12	9.8	12	12	12
23	13	9.5	10	12	10	12	17	17	10	12	12	12
24	14	9.2	10	11	10	11	16	17	12	12	15	12
25	14	9.5	9.5	11	10	11	15	18	12	12	13	12
26	13	10	10	10	10	10	14	18	11	12	12	12
27	12	11	9.8	10	10	9.8	13	17	11	12	12	12
28	11	10	9.5	9.5	10	9.8	12	18	14	13	11	14
29	11	10	9.5	9.0	-----	11	12	21	14	13	11	18
30	10	9.8	14	8.5	-----	13	13	22	14	13	11	24
31	10	-----	19	8.1	-----	13	-----	23	-----	13	10	-----
TOTAL	281.2	307.1	331.9	368.1	274.7	369.6	394	426.6	398.4	391	392	313.6
MEAN	9.07	10.2	10.7	11.9	9.81	11.9	13.1	13.8	13.3	12.6	12.6	10.5
MAX	14	11	19	18	10	14	17	23	21	14	15	24
MIN	7.0	9.2	9.5	8.1	9.0	9.8	10	9.8	9.8	11	10	7.3
CFSM	.49	.55	.57	.64	.52	.64	.70	.74	.71	.67	.67	.56
IN.	.56	.61	.66	.73	.55	.74	.78	.85	.79	.78	.78	.62

CAL YR 1972 TOTAL 3,505.1 MEAN 9.58 MAX 19 MIN 3.5 CFSM .51 IN 6.97
WTR YR 1973 TOTAL 4,248.2 MEAN 11.6 MAX 24 MIN 7.0 CFSM .62 IN 8.45

STREAMS TRIBUTARY TO LAKE MICHIGAN

04108500 Kalamazoo River near Fennville, Mich.

LOCATION.--Lat 42°35'36", long 85°59'03", in NE¼ sec.5, T.2 N., R.14 W., Allegan County, 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 mi² (4,144 km²), 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.

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).

AVERAGE DISCHARGE.--43 years, 1,343 ft³/s (38.03 m³/s), 11.40 in/yr (290 mm/yr).

EXTREMES.--Current year: Maximum discharge, 4,840 ft³/s (137 m³/s) Dec. 31 (gage height, 12.60 ft or 3.840 m); minimum, 133 ft³/s (3.77 m³/s) July 11 (gage height, 3.66 ft or 1.116 m).

Period of record: Maximum discharge, 17,500 ft³/s (496 m³/s) Apr. 11, 1947 (gage height, 606.76 ft or 184.940 m, site and datum then in use); minimum daily, 73 ft³/s (2.07 m³/s) Aug. 31, 1941.

REMARKS.--Records good. Flow regulated at low and medium stages by powerplants above station and since June 1936, by Calkins Dam and powerplant, 4.0 miles above station.

REVISIONS (WATER YEARS).--WSP 1387: 1929 (M), 1930, 1933, 1934-36 (M), 1938 (M), 1939-40, 1942.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,440	1,910	1,920	4,550	2,150	1,790	3,350	2,540	3,050	1,850	1,260	1,130
2	1,740	1,630	1,690	3,710	2,130	1,800	3,340	2,480	3,490	1,820	1,450	1,130
3	1,880	1,910	1,510	2,990	1,620	1,480	3,150	2,590	3,540	1,190	1,810	1,120
4	1,220	1,990	1,640	3,140	1,500	1,770	2,970	2,340	3,840	1,440	1,390	760
5	1,410	1,670	1,830	3,560	1,830	2,160	2,910	2,290	3,670	2,060	892	1,120
6	1,200	1,700	1,880	3,570	2,240	2,240	2,770	2,280	3,150	2,210	1,070	1,120
7	1,070	1,820	1,890	3,660	2,220	2,250	2,760	2,220	2,850	2,220	1,310	1,120
8	1,250	1,880	2,180	3,540	2,160	2,260	2,810	2,130	2,680	2,070	1,500	688
9	1,440	1,960	1,910	3,400	2,150	2,270	2,730	2,090	2,650	1,830	1,850	859
10	1,430	2,250	1,520	2,990	2,020	2,470	2,540	1,750	2,640	654	1,840	765
11	1,120	2,160	1,620	2,160	1,810	2,800	2,370	2,110	2,510	885	1,830	1,120
12	1,080	1,960	1,710	2,310	1,820	2,650	2,290	2,130	2,180	1,700	1,250	1,120
13	1,080	2,010	1,880	2,320	1,810	2,540	2,310	2,120	2,210	1,710	1,120	1,120
14	1,080	1,960	2,180	2,210	1,490	2,530	2,300	2,110	1,780	1,190	1,130	819
15	825	2,270	2,200	2,170	1,510	2,640	2,300	1,970	1,690	1,140	1,130	804
16	1,080	2,310	2,210	1,860	1,610	2,690	2,290	1,760	1,780	1,460	1,470	860
17	1,090	2,300	2,200	2,130	1,420	2,640	2,260	1,200	1,780	1,760	1,830	624
18	1,090	1,810	2,170	2,190	1,430	2,700	2,260	1,400	1,760	1,760	1,500	1,090
19	1,100	1,610	1,770	2,330	1,420	2,710	1,890	1,750	1,160	1,750	1,150	1,080
20	829	1,830	1,730	2,490	1,430	2,770	2,080	1,760	1,070	1,230	1,150	1,070
21	1,100	2,280	1,850	2,750	1,500	2,970	2,230	1,750	1,380	1,100	1,170	985
22	1,210	2,310	2,210	2,780	1,510	2,950	2,420	1,430	1,740	1,100	1,490	864
23	1,680	1,820	2,310	2,660	1,440	2,670	2,750	1,430	1,740	1,410	1,830	988
24	2,170	1,890	2,270	2,380	1,420	2,510	3,190	2,100	1,190	1,730	1,510	1,200
25	2,210	2,060	1,960	2,430	1,470	2,530	2,700	2,240	1,160	1,200	1,150	1,210
26	1,710	1,650	1,800	2,590	1,560	2,600	2,510	2,340	1,410	1,080	1,140	1,380
27	1,520	1,800	2,170	2,600	1,500	2,600	2,300	2,660	1,390	1,080	1,470	1,170
28	1,560	2,150	2,190	2,510	1,500	2,600	2,460	2,970	1,050	1,080	1,810	1,230
29	1,660	1,820	2,190	2,330	-----	2,520	2,710	3,280	1,530	1,090	1,250	1,360
30	1,900	2,150	2,130	2,290	-----	2,540	2,640	3,510	2,040	1,430	790	1,550
31	2,240	-----	3,480	2,230	-----	3,080	-----	3,280	-----	1,800	1,130	-----
TOTAL	43,414	58,870	62,200	84,830	47,670	76,730	77,590	68,010	64,110	46,029	42,672	31,456
MEAN	1,400	1,962	2,006	2,736	1,703	2,475	2,586	2,194	2,137	1,485	1,377	1,049
MAX	2,240	2,310	3,480	4,550	2,240	3,080	3,350	3,510	3,840	2,220	1,850	1,550
MIN	825	1,610	1,510	1,860	1,420	1,480	1,890	1,200	1,050	654	790	624
CFSM	.88	1.23	1.25	1.71	1.06	1.55	1.62	1.37	1.34	.93	.86	.66
IN.	1.01	1.37	1.45	1.97	1.11	1.78	1.80	1.58	1.49	1.07	.99	.73
CAL YR 1972	TOTAL 569,057	MEAN 1,555	MAX 3,480	MIN 627	CFSM .97	IN 13.23						
WTR YR 1973	TOTAL 703,581	MEAN 1,928	MAX 4,550	MIN 624	CFSM 1.21	IN 16.36						

STREAMS TRIBUTARY TO LAKE MICHIGAN

97

04108600 Rabbit River near Hopkins, Mich.

LOCATION.--Lat 42°38'32", long 85°43'19", in SE¼ sec.16, T.3 N., R.12 W., Allegan County, on left bank at downstream side of bridge on 18th Street, 2.5 mi (4.0 km) northeast of Hopkins.

DRAINAGE AREA.--Area.-71.4 mi² (184.9 km²).

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).

AVERAGE DISCHARGE.--8 years, 51.4 ft³/s (1.456 m³/s), 9.78 in/yr (248 mm/yr).

EXTREMES.--Current year: Maximum discharge, 656 ft³/s (18.6 m³/s) Dec. 31 (gage height, 8.66 ft or 2.640 m); minimum, 19 ft³/s (0.54 m³/s) Sept. 15, 16, 17 (gage height, 2.35 ft or 0.716 m).

Period of record: Maximum discharge, 656 ft³/s (18.6 m³/s) Dec. 31, 1972 (gage height, 8.66 ft or 2.640 m); minimum not determined; minimum daily, 9.2 ft³/s (0.26 m³/s) Aug. 27, 28, 1970, Sept. 18, 1971; minimum gage height, 1.93 ft (0.588 m) Sept. 20, 26, 27, 1966.

REMARKS.--Records fair except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	50	48	291	65	59	264	136	70	32	27	27
2	37	81	46	222	81	102	237	184	61	35	26	25
3	33	88	48	162	104	146	177	142	71	42	25	24
4	30	73	42	188	90	157	135	107	174	42	24	23
5	27	63	39	156	81	140	122	89	245	38	23	23
6	26	56	100	100	73	128	106	76	180	35	22	23
7	25	62	80	80	68	113	93	71	102	33	21	22
8	24	135	65	60	64	100	83	107	75	31	21	22
9	23	115	60	55	60	85	78	105	62	31	32	22
10	22	86	59	55	55	83	86	85	54	32	32	22
11	21	68	63	55	50	94	98	72	49	32	26	21
12	22	59	74	55	50	96	118	65	45	30	24	21
13	22	53	127	54	49	84	109	61	42	29	24	20
14	22	56	117	53	48	152	92	58	39	28	23	20
15	21	60	97	54	47	178	82	55	37	28	22	20
16	22	56	78	54	46	125	78	52	36	27	22	19
17	23	50	70	72	46	102	82	50	34	26	22	23
18	22	47	68	150	46	99	77	48	32	25	23	38
19	23	48	69	278	46	126	74	48	31	25	37	32
20	23	55	74	261	46	155	72	50	30	26	39	28
21	24	61	88	171	46	140	71	47	29	26	36	25
22	47	62	99	141	49	123	160	46	28	26	30	27
23	155	56	93	174	48	107	172	79	27	25	28	30
24	148	49	84	147	48	96	114	83	27	24	28	27
25	119	48	79	118	47	88	89	81	27	25	27	25
26	86	55	77	109	46	81	76	93	27	25	26	29
27	67	84	71	106	47	73	68	79	27	26	25	29
28	60	70	62	101	47	68	63	146	30	27	24	42
29	59	58	62	81	-----	80	60	133	40	27	23	86
30	55	50	294	70	-----	295	64	99	32	25	24	93
31	50	-----	431	60	-----	273	-----	82	-----	27	30	-----
TOTAL	1,382	1,954	2,864	3,733	1,593	3,748	3,200	2,629	1,763	910	816	888
MEAN	44.6	65.1	92.4	120	56.9	121	107	84.8	58.8	29.4	26.3	29.6
MAX	155	135	431	291	104	295	264	184	245	42	39	93
MIN	21	47	39	53	46	59	60	46	27	24	21	19
CFSM	.62	.91	1.29	1.68	.80	1.69	1.50	1.19	.82	.41	.37	.41
IN.	.72	1.02	1.49	1.94	.83	1.95	1.67	1.37	.92	.47	.43	.46

CAL YR 1972 TOTAL 21,761 MEAN 59.5 MAX 440 MIN 13 CFSM .83 IN 11.34
WTR YR 1973 TOTAL 25,480 MEAN 64.8 MAX 431 MIN 19 CFSM .93 IN 13.28

PEAK DISCHARGE (BASE, 300 FT³/S)

DATE	TIME	G.H.	DISCHARGE
12-31	0300	8.66	656
03-30	1200	7.09	330

STREAMS TRIBUTARY TO LAKE MICHIGAN

04108800 Black River near Zeeland, Mich.

LOCATION.--Lat 42°46'40", long 86°01'06", in NW¼ sec.31, T.5 N., R.14 W., Ottawa County, 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 mi² (170.4 km²).

PERIOD OF RECORD.--October 1960 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 595 ft (181 m) from topographic map.

AVERAGE DISCHARGE.--13 years, 55.7 ft³/s (1.577 m³/s), 11.50 in/yr (292 mm/yr).

EXTREMES.--Current year: Maximum discharge, 3,710 ft³/s (105 m³/s) Dec. 30 (gage height, 13.20 ft or 4.023 m); minimum, 2.2 ft³/s (0.062 m³/s) Sept. 10, 11, 12, 13, 14; minimum gage height, 2.00 ft (0.610 m) Sept. 10, 11, 12, 13, 14, 15.

Period of record: Maximum discharge, 3,710 ft³/s (105 m³/s) Dec. 30, 1972 (gage height, 13.20 ft or 4.023 m); minimum, 0.9 ft³/s (0.025 m³/s) Aug. 24, 1962; minimum gage height, 1.79 ft (0.546 m) Sept. 30, Oct. 3, 1969.

REMARKS.--Record good except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	100	48	50	1,140	27	35	536	875	33	9.1	4.3	3.8
2	53	343	47	289	104	175	216	770	26	42	4.2	3.2
3	36	278	52	108	204	357	81	218	47	99	4.0	3.0
4	28	91	45	483	73	279	67	113	162	27	3.8	3.2
5	24	64	34	145	71	178	91	62	219	16	3.6	3.3
6	23	52	33	75	46	173	51	44	89	12	3.7	3.0
7	21	151	32	66	41	124	37	47	45	9.3	3.5	3.0
8	19	428	32	45	38	80	30	395	29	7.9	3.9	2.9
9	17	131	32	32	31	47	27	156	20	7.5	7.2	2.6
10	16	76	33	30	28	51	41	64	16	12	4.4	2.4
11	15	61	38	25	25	135	112	42	14	8.1	3.7	2.4
12	15	51	80	25	23	107	235	33	13	6.7	3.5	2.3
13	14	45	150	23	20	52	106	27	11	6.0	3.5	2.4
14	12	56	110	23	19	550	50	24	9.6	5.4	3.5	2.4
15	11	82	80	23	18	401	37	22	9.1	5.0	3.5	2.5
16	13	87	70	26	18	83	36	20	9.6	4.9	3.2	2.7
17	14	59	60	149	18	61	41	19	9.6	4.7	6.0	9.3
18	14	47	55	373	17	54	30	18	9.1	4.5	9.2	12
19	12	51	50	660	17	167	30	18	8.3	4.4	4.7	5.4
20	11	80	60	275	17	306	30	18	7.9	8.2	33	4.6
21	15	105	70	80	17	147	33	17	7.5	12	23	4.2
22	196	94	100	124	17	92	732	19	6.7	7.2	9.2	5.6
23	1,290	61	80	314	17	68	571	50	7.1	5.5	6.9	5.2
24	840	46	60	120	17	54	82	39	7.1	5.7	6.2	4.4
25	225	45	55	100	17	46	48	31	6.7	5.4	5.3	4.7
26	92	113	55	116	18	37	36	33	6.3	7.3	4.8	4.7
27	63	298	55	96	18	29	29	30	6.3	6.4	4.3	4.5
28	66	113	55	70	20	25	24	637	12	4.9	3.9	23
29	77	61	114	40	-----	63	22	303	20	4.6	3.3	35
30	56	48	734	34	-----	385	63	71	12	4.3	6.0	42
31	44	-----	2,970	30	-----	99	-----	47	-----	4.5	5.4	-----
TOTAL	3,432	3,265	5,491	5,139	996	4,460	3,524	4,262	878.9	367.5	194.7	209.7
MEAN	111	109	177	166	35.6	144	117	137	29.3	11.9	6.28	6.99
MAX	1,290	428	2,970	1,140	204	550	732	875	219	99	33	42
MIN	11	45	32	23	17	25	22	17	6.3	4.3	3.2	2.3
CFSM	1.69	1.66	2.69	2.52	.54	2.19	1.78	2.08	.45	.18	.10	.11
IN.	1.94	1.85	3.10	2.91	.56	2.52	1.99	2.41	.50	.21	.11	.12
CAL YR 1972	TOTAL 34,078.4	MEAN 93.1	MAX 2,970	MIN 5.1	CFSM 1.41	IN 19.27						
WTR YR 1973	TOTAL 32,219.8	MEAN 88.3	MAX 2,970	MIN 2.3	CFSM 1.34	IN 18.22						

PEAK DISCHARGE (BASE, 900 FT³/S)

DATE	TIME	G.H.	DISCHARGE
10-23	1700	11.06	1660
12-30	2400	13.20	3710
04-22	2000	10.52	1260
05-01	2100	10.57	1290

STREAM TRIBUTARY TO LAKE MICHIGAN

99

04109000 Grand River at Jackson, Mich.

LOCATION.--Lat 42°17'05", long 84°24'30", in sec.22, T.2 S., R.1 W., Jackson County, 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 mi² (451 km²).

PERIOD OF RECORD.--April 1935 to current year.

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.

AVERAGE DISCHARGE.--38 years, 116 ft³/s (3.285 m³/s), 9.05 in/yr (230 mm/yr).

EXTREMES.--Current year: Maximum discharge, 809 ft³/s (22.9 m³/s) Aug. 9 (gage height, 13.85 ft or 4.221 m); minimum, 38 ft³/s (1.08 m³/s) Sept. 16 (gage height, 8.39 ft or 2.557 m).

Period of record: Maximum discharge, 1,070 ft³/s (30.3 m³/s) June 25, 1937 (gage height, 13.50 ft or 4.115 m); maximum gage height, 15.44 ft (4.706 m) June 25, 1968; minimum discharge, 9.2 ft³/s (0.26 m³/s) Aug. 22, 1936.

REMARKS.--Records good. Slight regulation by mills above station. Flow includes about 17 ft³/s (0.48 m³/s) as sewage effluent from the city of Jackson which originates from ground water sources.

REVISIONS (WATER YEARS).--WSP 974: 1937 (M). WSP 1387. WSP 1727: 1950 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	169	114	268	166	96	363	205	392	119	180	118
2	68	170	108	280	174	106	350	227	363	136	195	66
3	69	139	98	308	173	125	342	229	363	118	171	55
4	87	93	102	354	166	136	333	197	384	143	116	66
5	88	81	148	328	173	213	322	148	380	180	93	67
6	118	88	177	300	178	240	290	123	372	170	97	65
7	110	112	153	290	183	250	258	134	348	153	93	60
8	59	190	157	276	177	276	237	181	322	146	156	53
9	63	181	155	233	167	267	240	201	273	153	302	46
10	60	114	145	153	163	252	268	204	229	249	254	56
11	54	108	146	127	146	280	266	174	220	198	256	98
12	57	138	164	118	142	288	255	159	209	150	246	57
13	54	163	183	107	101	278	225	145	198	115	239	53
14	51	184	174	97	99	312	199	116	187	143	233	53
15	44	181	171	105	94	312	187	153	152	99	229	49
16	52	176	162	148	84	288	216	152	129	87	190	40
17	52	174	127	153	84	322	225	142	107	87	185	69
18	51	171	160	170	81	336	216	101	111	116	156	65
19	51	167	177	187	93	339	156	90	145	77	128	96
20	50	181	167	187	142	340	134	83	149	123	178	54
21	51	177	123	177	143	369	134	94	110	139	195	55
22	141	177	118	208	136	358	216	162	97	119	167	63
23	169	164	157	229	142	345	255	223	123	77	153	46
24	162	157	159	234	135	369	298	213	115	74	145	55
25	94	157	157	230	128	390	280	218	90	76	101	105
26	82	166	164	225	134	358	266	208	90	92	131	99
27	81	166	167	197	128	342	258	234	88	135	139	66
28	103	163	167	177	89	360	240	288	88	202	92	81
29	149	160	167	181	-----	384	166	294	92	181	83	188
30	169	157	225	176	-----	369	166	417	123	167	81	136
31	170	-----	254	171	-----	346	-----	392	-----	197	88	-----
TOTAL	2,673	4,624	4,846	6,394	3,825	9,046	7,361	5,907	6,049	4,221	5,072	2,180
MEAN	86.2	154	156	206	137	292	245	191	202	136	164	72.7
MAX	170	190	254	354	183	390	363	417	392	249	302	188
MIN	44	81	98	97	81	96	134	83	88	74	81	40
CFSM	.50	.89	.90	1.18	.79	1.68	1.41	1.10	1.16	.78	.94	.42
TN	.57	.99	1.04	1.37	.82	1.93	1.57	1.26	1.29	.90	1.08	.47
CAL YR 1972	TOTAL 43,620	MEAN 119	MAX 365	MIN 35	CFSM .68	TN 9.33						
WTR YR 1973	TOTAL 62,198	MEAN 170	MAX 417	MIN 40	CFSM .98	TN 13.30						

STREAMS TRIBUTARY TO LAKE MICHIGAN

04111000 Grand River near Eaton Rapids, Mich.

LOCATION.--Lat 42°32'05", long 84°37'25", in NE¼ sec.26, T.2 N., R.3 W., Eaton County, 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 Cedar River and at mile 178 (286 km).

DRAINAGE AREA.--661 mi² (1,712 km²).

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.

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).

AVERAGE DISCHARGE.--23 years, 436 ft³/s (12.35 m³/s), 8.96 in/yr (228 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,430 ft³/s (68.8 m³/s) Jan. 1 (gage height, 6.40 ft or 1.951 m); minimum, 55 ft³/s (1.56 m³/s) Sept. 16 (gage height, 1.18 ft or 0.360 m); minimum daily, 90 ft³/s (2.55 m³/s) Sept. 8.
Period of record: Maximum discharge, 3,500 ft³/s (99.1 m³/s) Feb. 21, 1971; maximum gage height, 8.19 ft (2.496 m) June 28, 1968; minimum discharge, 14 ft³/s (0.40 m³/s) Dec. 20, 1962, Oct. 14, 1966; minimum gage height, 0.67 ft (0.204 m) Dec. 20, 1962; minimum daily discharge, 21 ft³/s (0.59 m³/s) Oct. 12, 1964.
Flood of Apr. 4, 1950 reached a stage of 8.15 ft (2.484 m), discharge, 3,860 ft³/s (109 m³/s).

REMARKS.--Records good except those for the winter period, which are fair. Diurnal fluctuation caused by powerplant at Smithville and mills at Eaton Rapids. Records of water temperature for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1707: 1951 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	368	504	616	2,290	700	379	1,880	847	1,720	345	510	245
2	320	573	625	2,100	700	421	1,960	819	1,640	355	498	240
3	349	585	558	1,960	730	638	1,850	786	1,470	460	478	239
4	334	588	559	2,150	780	923	1,670	773	1,460	426	506	228
5	248	591	552	1,880	789	1,080	1,530	767	1,380	470	495	211
6	268	584	508	1,600	766	1,210	1,390	748	1,320	466	446	208
7	305	575	510	1,500	748	1,240	1,300	721	1,300	416	311	203
8	293	653	501	1,300	726	1,220	1,180	729	1,220	408	334	90
9	297	722	548	1,100	654	1,180	1,120	727	1,080	405	264	211
10	282	671	579	1,000	620	1,120	1,100	707	1,010	437	386	196
11	214	704	576	920	600	1,250	1,100	693	924	513	450	191
12	198	716	540	840	580	1,450	1,110	659	836	470	528	139
13	194	699	587	770	560	1,470	1,100	609	765	468	580	146
14	184	705	692	722	560	1,600	1,040	615	709	523	624	143
15	182	691	724	686	520	1,670	968	607	667	503	620	168
16	191	687	714	614	450	1,620	909	597	654	410	595	123
17	189	687	700	568	380	1,510	900	520	577	313	565	191
18	183	693	680	663	310	1,400	881	488	559	311	617	187
19	174	696	664	762	370	1,260	861	552	545	271	574	184
20	172	705	711	820	456	1,340	846	438	415	257	561	185
21	182	709	715	834	375	1,460	822	488	406	282	502	185
22	211	714	728	856	380	1,510	1,030	424	410	344	544	186
23	326	714	726	906	400	1,500	1,220	477	390	341	495	186
24	546	709	717	920	430	1,540	1,160	707	395	332	495	184
25	519	699	708	910	380	1,610	1,130	710	361	291	398	181
26	545	693	712	897	360	1,640	1,080	875	340	230	397	187
27	540	697	708	888	350	1,610	1,000	1,020	317	223	391	186
28	518	678	704	884	360	1,510	925	1,220	365	292	382	241
29	515	664	692	848	-----	1,590	871	1,300	389	346	240	322
30	509	642	909	753	-----	1,740	849	1,460	366	371	242	424
31	449	-----	1,890	680	-----	1,730	-----	1,730	-----	478	250	-----
TOTAL	9,805	19,948	21,353	33,621	15,034	41,421	34,782	23,813	23,990	11,757	14,278	6,010
MEAN	316	665	689	1,085	537	1,336	1,159	768	800	379	461	200
MAX	546	722	1,890	2,290	789	1,740	1,960	1,730	1,720	523	624	424
MIN	172	504	501	568	310	379	822	424	317	223	240	90
CFSM	.48	1.01	1.04	1.64	.81	2.02	1.75	1.16	1.21	.57	.70	.30
IN.	.55	1.12	1.20	1.89	.85	2.33	1.96	1.34	1.35	.66	.80	.34

CAL YR 1972 TOTAL 173,900 MEAN 475 MAX 1,890 MIN 91 CFSM .72 IN 9.79
WTR YR 1973 TOTAL 255,812 MEAN 701 MAX 2,290 MIN 90 CFSM 1.06 IN 14.40

04111500 Deer Creek near Dansville, Mich.

LOCATION.--Lat 42°36'30", long 84°19'15", in E½ sec.33, T.3 N., R.1 E., Ingham County, 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 mi² (42.2 km²).

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

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).

AVERAGE DISCHARGE.--19 years, 9.89 ft³/s (0.280 m³/s), 8.24 in/yr (209 mm/yr).

EXTREMES.--Current year: Maximum discharge, about 440 ft³/s (12.5 m³/s) Dec.31, based on correlation with nearby stations; minimum, 0.31 ft³/s (0.009 m³/s) Sept. 15, 16 (gage height, 2.66 ft or 0.811 m).

Period of record: Maximum discharge, 570 ft³/s (16.1 m³/s) May 13, 1956 (gage height, 8.83 ft or 2.691 m); minimum, 0.06 ft³/s (0.002 m³/s) Jan. 10, 1970, result of freezeup.

REMARKS.--Records good except those for period of no gage-height record, which are fair.

REVISIONS (WATER YEARS).--WSP 1727: 1954 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	9.0	12	140	12	7.8	70	15	32	3.0	3.1	.50
2	8.0	30	11	60	23	23	50	15	23	3.4	2.5	.45
3	6.0	25	11	45	33	92	34	13	23	13	2.2	.40
4	5.0	18	10	70	24	105	30	12	30	6.9	1.8	.38
5	4.5	12	10	45	21	68	25	10	27	5.0	1.6	.39
6	4.2	16	22	25	18	58	22	9.2	25	3.7	1.5	.38
7	4.0	17	16	15	17	57	19	8.8	26	2.9	1.3	.34
8	3.6	50	12	11	15	48	17	14	18	2.4	1.2	.38
9	3.1	31	10	9.0	14	32	16	16	14	2.1	1.7	.42
10	2.8	22	9.0	8.0	12	31	18	14	11	4.3	2.0	.47
11	2.7	19	10	7.0	11	90	20	11	8.4	3.4	1.5	.44
12	2.7	16	15	6.0	9.2	83	25	10	7.1	2.7	1.2	.38
13	2.7	14	50	5.5	8.4	41	19	9.2	6.2	2.4	1.1	.35
14	2.7	19	35	5.0	8.4	96	16	8.3	5.5	4.3	1.0	.35
15	2.6	22	25	4.8	7.5	92	15	7.8	4.9	3.8	1.1	.34
16	2.9	20	16	7.1	6.0	45	14	7.5	5.4	2.7	1.0	.34
17	2.8	18	12	11	6.5	27	17	7.0	5.6	2.1	.97	.71
18	2.7	18	13	23	6.8	26	16	6.7	5.3	1.8	1.1	1.2
19	2.6	25	14	25	6.8	49	16	6.5	4.9	1.6	1.2	.77
20	2.5	35	20	18	6.6	65	16	6.2	4.3	1.7	2.6	.63
21	2.6	38	28	14	6.6	55	14	5.8	3.8	2.1	1.8	.58
22	8.0	35	35	24	6.4	52	84	6.2	3.2	1.9	1.2	.65
23	45	27	34	29	6.4	57	77	15	3.0	1.5	1.2	.62
24	25	20	30	20	6.2	64	34	17	2.9	1.4	1.1	.57
25	15	17	29	17	6.0	62	25	13	2.8	1.7	.92	.50
26	10	21	28	18	6.0	47	19	13	2.7	1.7	.85	.65
27	8.0	25	25	19	6.0	35	16	13	2.6	1.8	.80	.64
28	9.0	18	18	20	6.0	27	13	54	3.8	1.8	.64	1.6
29	18	15	45	16	-----	49	12	52	3.9	1.6	.55	3.7
30	14	13	130	14	-----	68	12	58	3.6	1.5	.53	3.2
31	10	-----	280	11	-----	41	-----	61	-----	2.9	.53	-----
TOTAL	242.7	665.0	1,015.0	742.4	315.8	1,692.8	781	515.2	318.9	93.1	41.79	22.33
MEAN	7.83	22.2	32.7	23.9	11.3	54.6	26.0	16.6	10.6	3.00	1.35	.74
MAX	45	50	280	140	33	105	84	61	32	13	3.1	3.7
MIN	2.5	9.0	9.0	4.8	6.0	7.8	12	5.8	2.6	1.4	.53	.34
CFSM	.48	1.36	2.01	1.47	.69	3.35	1.60	1.02	.65	.18	.08	.05
IN.	.55	1.52	2.32	1.69	.72	3.86	1.78	1.18	.73	.21	.10	.05

CAL YR 1972 TOTAL 5,305.07 MEAN 14.5 MAX 280 MIN .51 CFSM .89 IN 12.11
WTR YR 1973 TOTAL 6,446.02 MEAN 17.7 MAX 280 MIN .34 CFSM 1.09 IN 14.71

PEAK DISCHARGE (BASE, 100 FT³/s)

DATE	TIME	G.H.	DISCHARGE
12-31	unknown	unknown	about 440
01-04	unknown	unknown	about 110
03-03	2200	5.02	134
03-11	1600	5.12	139
03-14	1800	5.08	137
04-22	1800	5.06	136

NOTE.--No gage-height record Nov. 13 to Jan. 15.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04112000 Sloan Creek near Williamston, Mich.

LOCATION.--42°40'33", long 84°21'50", in SE¼ NE¼ sec.1, T.3 N., R.1 W., Ingham County, 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 mi² (24.19 km²).

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 (262.774 m) above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.--19 years, 5.28 ft³/s (0.150 m³/s), 7.68 in/yr (195 mm/yr).

EXTREMES.--Current year: Maximum discharge, 468 ft³/s (13.3 m³/s) Dec.31 (gage height, 6.08 ft or 1.853 m); minimum, 0.10 ft³/s (0.003 m³/s) Sept. 11, 12, 14, 15 (gage height, 1.30 ft or 0.396 m).
Period of record: Maximum discharge, 773 ft³/s (21.9 m³/s) June 25, 1968 (gage height, 7.84 ft or 2.390 m); minimum, 0.01 ft³/s (<0.001 m³/s) Sept. 11, 1954, Jan. 18, 1957 (gage height, 1.10 ft or 0.335 m), caused by unusual regulation; minimum natural discharge, 0.02 ft³/s (0.001 m³/s) July 27, 1965 (gage height, 1.18 ft or 0.360 m).

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	6.4	7.1	76	4.6	3.0	83	6.6	18	2.2	.65	.18
2	3.2	22	6.4	40	9.9	20	41	6.7	11	2.0	.56	.17
3	2.5	18	6.2	28	17	75	27	5.8	10	3.0	.47	.16
4	2.1	14	5.8	50	9.7	64	20	5.2	11	2.3	.41	.15
5	1.9	9.9	5.6	26	8.4	45	15	4.6	10	1.8	.37	.16
6	1.7	7.8	13	15	7.2	42	11	4.2	9.1	1.4	.35	.15
7	1.6	11	9.5	9.5	6.6	41	8.7	4.0	9.9	1.2	.32	.14
8	1.4	41	7.0	7.0	5.9	31	7.5	5.7	7.4	1.1	.29	.15
9	1.2	22	6.1	5.6	5.4	20	6.9	6.0	5.6	.95	.51	.15
10	1.1	14	5.6	4.4	4.7	20	7.8	5.4	4.5	1.4	.50	.14
11	1.0	9.5	5.0	3.8	4.2	68	11	4.6	3.8	1.5	.39	.13
12	1.0	7.9	6.3	3.4	3.9	45	16	4.0	3.4	1.2	.34	.13
13	.98	7.0	30	3.1	3.6	28	9.8	3.6	2.9	1.0	.31	.13
14	1.1	9.2	21	3.0	3.4	57	7.8	3.4	2.4	.96	.30	.12
15	.94	13	16	2.8	3.0	43	7.0	3.2	2.2	.89	.29	.12
16	.92	11	8.9	2.9	2.5	25	7.1	3.0	3.3	.77	.27	.13
17	.88	9.9	7.0	5.0	2.7	15	7.7	2.7	2.8	.68	.27	.35
18	.82	10	7.2	9.3	2.9	13	6.8	2.5	2.4	.61	.28	.38
19	.78	12	7.5	9.8	2.8	28	7.4	2.4	2.1	.57	.27	.26
20	.73	20	9.6	6.7	2.7	41	7.1	2.3	1.9	.60	.64	.22
21	.78	22	14	5.0	2.7	33	6.3	2.1	1.6	.71	.42	.21
22	3.2	20	20	11	2.6	32	60	2.2	1.5	.60	.32	.24
23	37	15	19	15	2.6	32	44	3.9	1.4	.50	.31	.23
24	23	11	17	8.5	2.5	34	23	4.5	1.3	.49	.31	.21
25	13	9.4	17	6.7	2.4	29	15	3.8	1.2	.49	.29	.20
26	8.2	11	17	6.5	2.4	24	9.9	3.7	1.1	.54	.28	.21
27	6.3	14	15	7.0	2.4	16	7.3	4.1	1.2	.61	.25	.19
28	6.4	11	12	7.4	2.4	12	6.2	25	4.2	.49	.22	.52
29	14	8.8	9.2	6.0	-----	51	5.4	26	3.5	.46	.21	.69
30	11	7.7	156	5.1	-----	46	5.1	36	2.9	.42	.21	.55
31	7.6	-----	286	4.4	-----	28	-----	34	-----	.50	.20	-----
TOTAL	160.23	405.5	773.0	393.9	131.1	1,061.0	497.8	231.2	143.6	31.94	10.81	6.77
MEAN	5.17	13.5	24.9	12.7	4.68	34.2	16.6	7.46	4.79	1.03	.35	.23
MAX	37	41	286	76	17	75	83	36	18	3.0	.65	.69
MIN	.73	6.4	5.0	2.8	2.4	3.0	5.1	2.1	1.1	.42	.20	.12
CFSM	.55	1.45	2.67	1.36	.50	3.66	1.78	.80	.51	.11	.04	.02
IN.	.64	1.62	3.08	1.57	.52	4.23	1.98	.92	.57	.13	.04	.03
CAL YR 1972	TOTAL 3,069.54	MEAN 8.39	MAX 286	MIN .25	CFSM .90	IN 12.23						
WTR YR 1973	TOTAL 3,846.85	MEAN 10.5	MAX 286	MIN .12	CFSM 1.12	IN 15.32						

PEAK DISCHARGE (BASE, 120 FT³/s)

DATE	TIME	G.H.	DISCHARGE
12-31	0400	6.08	468
03-11	1200	3.85	126
04-01	0500	4.10	159

04112500 Red Cedar River at East Lansing, Mich.

LOCATION.--Lat 42°43'40", long 84°28'40", in SW¼ sec.18, T.4 N., R.1 W., Ingham County, 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 mi² (919 km²).

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.

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.

AVERAGE DISCHARGE.--43 years, 200 ft³/s (5.664 m³/s), 7.65 in/yr (194 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,510 ft³/s (71.1 m³/s) Jan. 1 (gage height, 8.07 ft or 2.460 m); minimum, 21 ft³/s (0.59 m³/s) Sept. 12-17 (gage height, 3.10 ft or 0.945 m).

Period of record: Maximum discharge, 5,920 ft³/s (168 m³/s) Apr. 7, 1947 (gage height, 11.58 ft or 3.530 m); minimum, 3 ft³/s (0.08 m³/s) July 31, 1931.

Flood of Mar. 24, 1904, reached a stage of 13.4 ft or 4.08 m (discharge, 8,000 ft³/s or 277 m³/s).

REMARKS.--Records good. Occasional regulation at low flow by mill at Williamston, 16 mi (26 km) above station.

REVISIONS (WATER YEARS).--WSP 1307: 1936 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	142	258	315	2,400	295	188	1,220	343	730	132	60	31
2	123	279	299	2,210	299	233	1,430	363	630	123	67	31
3	114	347	283	1,790	395	620	1,360	339	480	135	67	29
4	102	355	264	1,730	448	1,050	1,140	319	480	156	67	28
5	95	335	254	1,540	448	1,160	985	299	480	129	60	26
6	89	303	250	1,190	423	1,080	865	283	435	114	57	26
7	87	291	240	990	399	1,020	740	272	395	100	53	24
8	84	427	255	835	375	995	645	299	395	87	47	23
9	79	540	311	680	303	925	575	331	315	77	62	23
10	77	485	287	485	279	800	555	343	275	89	57	23
11	72	423	250	415	233	855	535	327	240	89	55	23
12	69	395	180	347	230	1,140	535	303	170	84	51	21
13	69	363	335	287	236	1,160	535	279	170	79	49	21
14	67	355	500	254	233	1,080	476	264	135	74	47	21
15	67	363	515	233	219	1,260	435	247	135	69	42	21
16	67	375	419	222	156	1,320	399	233	240	69	40	21
17	65	367	264	240	163	1,150	399	222	205	69	44	36
18	62	355	291	379	191	940	399	216	135	65	42	42
19	62	355	367	515	188	845	387	205	135	62	42	40
20	60	375	387	505	184	915	375	198	135	60	72	36
21	62	415	395	431	180	985	351	184	105	57	67	34
22	102	431	427	448	177	985	458	177	111	57	62	34
23	240	427	462	535	163	980	840	216	100	57	57	34
24	343	399	462	540	163	1,000	875	268	97	57	55	32
25	315	371	462	476	170	1,070	650	272	95	53	49	36
26	275	367	462	435	170	1,110	495	264	95	51	44	44
27	254	379	462	419	163	1,080	415	268	92	57	42	42
28	244	383	444	411	160	990	367	355	135	57	38	65
29	258	367	411	391	-----	945	331	580	146	55	36	77
30	287	335	585	359	-----	1,090	303	580	142	53	34	92
31	283	-----	1,540	327	-----	1,160	-----	630	-----	53	31	-----
TOTAL	4,315	11,220	12,378	22,019	7,043	30,131	19,075	9,479	7,433	2,469	1,596	1,026
MEAN	139	374	399	710	252	972	636	306	248	79.6	51.5	34.2
MAX	343	540	1,540	2,400	448	1,320	1,430	630	730	156	72	82
MIN	60	258	180	222	156	188	303	177	92	51	31	21
CFSM	.39	1.05	1.12	2.00	.71	2.74	1.79	.86	.70	.22	.15	.10
IN.	.45	1.18	1.30	2.31	.74	3.16	2.00	.99	.78	.26	.17	.11
CAL YR 1972	TOTAL 82,633	MEAN 226	MAX 1,540	MIN 34	CFSM .64	IN 8.66						
WTP YR 1973	TOTAL 128,184	MEAN 351	MAX 2,400	MIN 21	CFSM .99	IN 13.43						

STREAMS TRIBUTARY TO LAKE MICHIGAN

04113000 Grand River at Lansing, Mich.

LOCATION.--Lat 42°45'02", long 84°33'19", in NW¼ sec.9, T.4 N., R.2 W., Ingham County, 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 mi² (3,180 km²), 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.

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 (0.74 m) lower.

AVERAGE DISCHARGE.--44 years, 811 ft³/s (22.97 m³/s), 8.95 in/yr (227 mm/yr).

EXTREMES.--Current year: Maximum discharge, 6,160 ft³/s (174 m³/s) Jan. 1 (gage height, 10.84 ft or 3.304 m); minimum, 32 ft³/s (0.91 m³/s) Aug. 10 (gage height, 1.53 ft or 0.466 m); minimum daily, 165 ft³/s (4.67 m³/s) Sept. 16.
Period of record: Maximum discharge, 24,500 ft³/s (694 m³/s) Mar. 26, 1904 (gage height, 18.60 ft or 5.669 m, datum then in use), from rating curve, extended above 15,000 ft³/s (425 m³/s) by logarithmic plotting; minimum, 2.8 ft³/s (0.079 m³/s) Sept. 9, 1963 (gage height, 0.85 ft or 0.259 m); minimum daily, 20 ft³/s (0.57 m³/s) Aug. 25, 1941.
Maximum discharge since at least 1901, that of Mar. 26, 1904.

REMARKS.--Records good. Large diurnal fluctuation at medium and low flows caused by powerplants above station. Records of water temperature for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1174: 1949. WSP 1387: 1901, 1903-4, 1935, 1937, 1942.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	799	1,070	1,220	5,920	1,240	776	3,810	1,470	2,700	524	640	352
2	608	1,190	1,130	5,550	1,220	888	4,190	1,490	2,440	548	533	318
3	511	1,310	1,100	4,700	1,400	1,670	4,010	1,300	2,420	657	604	277
4	555	1,310	971	4,750	1,440	2,670	3,500	1,240	2,110	730	563	327
5	507	1,320	950	3,970	1,470	3,030	3,130	1,230	2,130	566	574	300
6	384	1,180	900	3,030	1,420	3,010	2,820	1,140	1,880	624	554	294
7	472	1,210	825	2,600	1,340	3,000	2,560	1,150	1,890	568	444	244
8	496	1,530	945	2,300	1,280	2,890	2,300	1,250	1,700	445	315	214
9	418	1,740	1,160	2,000	1,050	2,730	2,080	1,210	1,610	468	700	181
10	423	1,610	1,050	1,500	1,050	2,530	2,140	1,220	1,390	640	286	269
11	405	1,530	989	1,310	936	2,670	2,030	1,170	1,250	550	461	282
12	321	1,560	872	1,270	914	3,180	2,130	1,020	1,090	583	612	185
13	339	1,400	1,230	1,260	920	3,290	1,990	990	994	511	620	184
14	318	1,370	1,540	1,270	934	3,390	1,990	923	927	529	687	190
15	309	1,410	1,680	1,130	925	3,590	1,740	917	868	562	702	235
16	327	1,380	1,400	1,050	555	3,590	1,620	917	1,050	500	679	165
17	314	1,380	929	1,090	712	3,410	1,650	795	882	411	893	425
18	280	1,370	1,070	1,340	636	3,010	1,600	795	807	289	666	276
19	289	1,330	1,250	1,710	618	2,820	1,540	758	779	363	679	307
20	322	1,430	1,450	1,640	831	2,820	1,530	731	655	325	868	287
21	313	1,480	1,480	1,550	753	3,030	1,470	670	545	338	569	245
22	624	1,540	1,500	1,680	501	3,130	1,960	729	589	411	673	272
23	993	1,510	1,550	1,880	664	3,170	2,770	822	554	407	621	293
24	1,120	1,480	1,510	1,840	736	3,210	2,750	1,000	531	399	589	199
25	1,160	1,320	1,490	1,740	742	3,330	2,360	1,170	526	387	569	277
26	1,230	1,430	1,530	1,640	606	3,410	2,020	1,110	523	322	485	430
27	1,050	1,390	1,470	1,590	640	3,310	1,720	1,410	437	340	476	269
28	1,120	1,380	1,400	1,560	719	3,050	1,590	1,820	977	309	498	496
29	1,070	1,310	1,400	1,520	-----	3,210	1,400	2,280	614	391	418	411
30	1,040	1,220	2,280	1,250	-----	3,580	1,340	2,250	568	432	264	545
31	968	-----	4,650	1,110	-----	3,550	-----	2,670	-----	457	301	-----
TOTAL	19,085	41,690	42,921	66,750	26,252	90,944	67,740	37,647	35,436	14,586	17,543	8,749
MEAN	616	1,390	1,385	2,153	938	2,934	2,258	1,214	1,181	471	566	292
MAX	1,230	1,740	4,650	5,920	1,470	3,590	4,190	2,670	2,700	730	893	545
MIN	280	1,070	825	1,050	501	776	1,340	670	437	289	264	165
CF5M	.50	1.13	1.13	1.75	.76	2.39	1.84	.99	.96	.38	.46	.24
IN.	.58	1.26	1.30	2.02	.79	2.75	2.05	1.14	1.07	.44	.53	.26

CAL YR 1972 TOTAL 327,932 MEAN 896 MAX 4,650 MIN 178 CF5M .73 IN 9.92
WTR YR 1973 TOTAL 469,343 MEAN 1,286 MAX 5,920 MIN 165 CF5M 1.05 IN 14.19

STREAMS TRIBUTARY TO LAKE MICHIGAN

105

04114000 Grand River at Portland, Mich.

LOCATION.--Lat 42°51'20", long 84°54'45", in NW¼ sec.4, T.5 N., R.5 W., Ionia County, 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 Lookingglass River, and at mile 115 (185 km).

DRAINAGE AREA.--1,385 mi² (3,587 km²).

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.

AVERAGE DISCHARGE.--21 years, 854 ft³/s (24.19 m³/s), 8.37 in/yr (213 mm/yr).

EXTREMES.--Current year: Maximum discharge, 6,940 ft³/s (197 m³/s) Jan. 1 (gage height, 10.62 ft or 3.237 m); minimum, 145 ft³/s (4.11 m³/s) Sept. 14 (gage height, 4.33 ft or 1.320 m); minimum daily, 169 ft³/s (4.79 m³/s) Sept. 10.
Period of record: Maximum discharge, 9,100 ft³/s (258 m³/s) May 13, 1956; maximum gage height 11.77 ft (3.587 m) Feb. 12, 1968 (backwater from ice); minimum discharge, 38 ft³/s (1.08 m³/s) Oct. 10, 1963; minimum daily, 58 ft³/s (1.64 m³/s) Oct. 9, 1963.

REMARKS.--Records good except those for period of no gage height record, which are fair. Slight diurnal fluctuation caused by power-plants above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	887	1,080	1,400	6,730	1,410	864	4,340	1,790	2,990	717	600	377
2	813	1,410	1,370	6,780	1,520	1,020	4,700	1,770	2,810	671	800	354
3	701	1,580	1,270	5,830	1,590	1,730	4,700	1,740	2,610	834	680	336
4	603	1,600	1,220	5,650	1,710	3,090	4,230	1,490	2,710	852	740	322
5	634	1,490	1,130	5,180	1,730	3,540	3,700	1,450	2,350	847	700	331
6	597	1,430	1,100	4,360	1,740	3,640	3,280	1,410	2,320	711	700	358
7	497	1,340	1,050	3,710	1,680	3,530	2,950	1,300	2,140	740	680	304
8	562	1,600	1,140	3,100	1,610	3,430	2,670	1,470	2,050	677	550	282
9	565	1,890	1,160	2,600	1,500	3,180	2,450	1,540	1,820	574	400	295
10	518	1,860	1,330	2,300	1,290	2,960	2,400	1,430	1,640	721	850	169
11	521	1,760	1,210	1,900	1,330	2,900	2,330	1,400	1,460	754	400	318
12	508	1,650	1,110	1,600	1,140	3,450	2,470	1,320	1,310	706	600	278
13	431	1,620	1,330	1,600	1,150	3,640	2,460	1,130	1,170	708	760	291
14	443	1,530	1,680	1,510	1,150	4,040	2,270	1,120	1,050	654	780	189
15	427	1,580	1,900	1,450	1,160	4,280	2,160	1,040	970	674	840	220
16	399	1,550	1,890	1,340	1,120	4,180	1,990	1,030	1,040	736	850	224
17	412	1,510	1,660	1,320	683	3,990	1,900	1,020	1,170	658	880	287
18	410	1,510	1,260	1,590	1,040	3,590	1,900	872	930	490	1,100	505
19	382	1,500	1,350	2,010	834	3,260	1,840	883	865	400	830	372
20	400	1,520	1,520	2,070	830	3,330	1,800	884	827	440	840	331
21	420	1,640	1,670	1,950	982	3,390	1,760	756	683	410	1,050	336
22	505	1,720	1,720	1,920	889	3,610	2,030	776	651	420	750	287
23	1,320	1,710	1,800	2,140	694	3,650	2,970	897	613	500	830	340
24	1,420	1,640	1,770	2,220	786	3,780	3,130	1,070	608	510	770	318
25	1,520	1,580	1,760	2,070	913	3,900	2,830	1,190	601	510	740	261
26	1,370	1,530	1,770	2,000	857	3,910	2,410	1,350	571	480	700	428
27	1,350	1,640	1,780	1,930	771	3,830	2,130	1,310	713	400	600	485
28	1,190	1,590	1,670	1,870	783	3,520	1,870	2,000	802	430	600	336
29	1,280	1,530	1,670	1,830	-----	3,440	1,770	2,610	1,080	400	550	684
30	1,240	1,440	2,100	1,700	-----	4,030	1,580	2,680	810	500	490	540
31	1,220	-----	5,740	1,500	-----	4,080	-----	2,790	-----	550	313	-----
TOTAL	23,545	47,030	50,530	83,760	32,892	104,784	79,020	43,518	41,364	18,674	21,973	10,158
MEAN	760	1,568	1,630	2,702	1,175	3,380	2,634	1,404	1,379	602	709	339
MAX	1,520	1,890	5,740	6,780	1,740	4,280	4,700	2,790	2,990	852	1,100	684
MIN	382	1,080	1,050	1,320	683	864	1,580	756	571	400	313	169
CFSM	.55	1.13	1.18	1.95	.85	2.44	1.90	1.01	1.00	.43	.51	.24
IN.	.63	1.26	1.36	2.25	.88	2.81	2.12	1.17	1.11	.50	.59	.27

CAL YR 1972 TOTAL 401,745 MEAN 1,098 MAX 5,740 MIN 262 CFSM .79 IN 10.79
WTR YR 1973 TOTAL 557,248 MEAN 1,527 MAX 6,780 MIN 169 CFSM 1.10 IN 14.97

NOTE.--No gage-height record July 19 to Aug. 30.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04114500 Lookingglass River near Eagle, Mich.

LOCATION.--Lat 42°49'45", long 84°46'40", in sec.10, T.5 N., R.4 W., Clinton County, 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 mi² (728 km²).

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

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.

AVERAGE DISCHARGE.--29 years, 165 ft³/s (4.673 m³/s), 7.97 in/yr (202 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,610 ft³/s (45.6 m³/s) Dec. 31 (gage height, 5.91 ft or 1.801 m); minimum daily, 30 ft³/s (0.85 m³/s) Sept. 8, 11, 12, 14.

Period of record: Maximum discharge, 2,860 ft³/s (81.0 m³/s) Apr. 5, 1947 (gage height, 7.70 ft or 2.347 m, from graph based on gage readings), from rating curve extended above 1,900 ft³/s (53.8 m³/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 ft³/s (0.28 m³/s) July, 28, 1965 (gage height, 1.01 ft or 0.308 m).

REMARKS.--Records fair except those for the winter period, which are poor. Small intermittent diversion at times into Lake Geneva when discharge is above 50 cfs.

REVISIONS (WATER YEARS).--WSP 1387: 1946-47.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	214	243	1,050	330	240	909	406	324	137	53	36
2	68	283	236	961	375	275	917	399	320	167	53	34
3	64	272	229	847	362	497	920	363	355	174	52	33
4	62	256	223	912	343	672	909	342	435	173	52	32
5	59	240	213	850	329	584	911	328	413	159	52	32
6	56	229	210	800	319	563	899	324	513	145	51	32
7	53	239	210	700	313	636	889	320	441	136	47	31
8	49	305	205	550	309	664	871	352	383	122	45	30
9	47	287	205	450	270	672	848	349	346	106	45	31
10	46	269	200	380	250	700	837	325	318	93	45	31
11	45	268	200	330	240	787	803	305	292	90	45	30
12	43	259	170	290	230	910	791	291	264	100	45	30
13	43	261	210	250	230	869	708	281	234	98	50	31
14	42	279	260	240	220	1,070	626	272	204	93	50	30
15	41	286	290	230	200	1,070	564	260	172	84	47	31
16	41	280	290	300	220	975	519	249	182	78	46	31
17	41	273	220	470	240	938	486	234	160	66	44	52
18	41	265	200	499	230	905	456	215	139	62	42	52
19	42	260	220	501	225	937	440	201	128	60	41	51
20	40	266	240	467	220	1,000	416	186	121	59	45	50
21	42	269	250	464	205	1,010	394	172	108	58	51	47
22	76	264	260	498	185	984	493	162	99	58	48	52
23	215	253	260	516	200	970	473	175	92	55	46	46
24	200	241	270	460	210	993	414	168	88	54	46	44
25	176	237	270	430	215	1,000	382	163	82	54	45	42
26	170	245	270	420	215	944	369	167	116	55	43	52
27	174	250	275	410	210	873	363	171	119	56	42	56
28	191	250	275	380	205	803	357	268	160	55	41	56
29	223	250	280	350	-----	795	350	353	140	54	39	56
30	227	243	581	330	-----	866	349	332	130	51	37	61
31	220	-----	1,450	310	-----	824	-----	332	-----	54	36	-----
TOTAL	2,907	7,793	8,915	15,645	7,100	25,026	18,663	8,465	6,878	2,806	1,424	1,222
MEAN	93.8	260	288	505	254	807	622	273	229	90.5	45.9	40.7
MAX	227	305	1,450	1,050	375	1,070	920	406	513	174	53	61
MIN	40	214	170	230	185	240	349	162	82	51	36	30
CFSM	.33	.93	1.02	1.80	.90	2.87	2.21	.97	.81	.32	.16	.14
IN.	.38	1.03	1.18	2.07	.94	3.31	2.47	1.12	.91	.37	.19	.16

CAL YR 1972 TOTAL 76,208 MEAN 208 MAX 1,480 MIN 40 CFSM .74 IN 10.09
WTR YR 1973 TOTAL 106,844 MEAN 293 MAX 1,450 MIN 30 CFSM 1.04 IN 14.14

STREAMS TRIBUTARY TO LAKE MICHIGAN

107

04115000 Maple River at Maple Rapids, Mich.

LOCATION.--Lat 43°06'35", long 84°41'35", in sec.5, T.8 N., R.3 W., Clinton County, 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 mi² (1,124 km²).

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

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.

AVERAGE DISCHARGE.--29 years, 239 ft³/s (6.768 m³/s), 7.48 in/yr (190 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,210 ft³/s (62.6 m³/s) Jan. 1 (gage height, 9.12 ft or 2.780 m); minimum, 20 ft³/s (0.57 m³/s) Sept. 16, 17 (gage height, 2.66 ft or 0.811 m).
Period of record: Maximum daily discharge, 6,500 ft³/s (184 m³/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 ft³/s (0.12 ft/s) Aug. 13, 1965 (gage height, 1.62 ft or 0.494 m).
Flood in March 1904 reached a stage of 13.8 ft (4.21 m), from information by local resident.

REMARKS.--Records good.

REVISIONS (WATER YEAR).--WSP 1707: 1956.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	108	607	363	2,180	568	134	1,110	449	575	187	62	27
2	104	599	354	2,160	542	138	1,220	524	590	211	79	27
3	99	626	338	2,000	528	166	1,240	570	588	236	89	27
4	95	622	321	1,800	511	274	1,240	602	586	251	89	26
5	91	613	304	1,600	492	482	1,200	606	582	255	85	25
6	88	604	304	1,400	471	779	1,160	585	592	253	79	25
7	83	593	305	1,300	454	1,210	1,090	556	598	244	71	24
8	77	614	297	1,100	437	1,430	969	557	589	230	63	24
9	73	640	289	1,000	417	1,470	852	592	568	216	62	23
10	69	644	284	900	388	1,410	744	607	535	200	57	23
11	65	644	278	800	370	1,330	668	598	496	185	53	23
12	62	632	280	680	341	1,330	654	578	463	171	49	23
13	59	617	290	640	310	1,300	651	549	427	156	50	23
14	55	596	297	616	292	1,440	646	514	390	147	49	22
15	53	564	308	597	277	1,650	628	478	352	137	45	21
16	50	535	317	537	267	1,680	599	443	324	126	42	20
17	49	504	326	471	243	1,670	577	412	296	116	39	22
18	48	479	327	522	222	1,470	549	383	270	106	36	25
19	47	457	328	785	206	1,320	523	354	245	99	33	28
20	45	441	331	1,000	196	1,240	494	323	224	93	34	31
21	47	433	338	1,040	186	1,220	469	294	204	88	34	31
22	56	416	349	1,060	178	1,240	465	269	185	81	33	29
23	154	394	363	1,110	168	1,270	513	241	172	75	32	29
24	343	387	380	1,080	160	1,300	537	219	163	68	31	28
25	496	386	399	1,020	153	1,290	538	201	151	64	30	28
26	612	377	419	944	148	1,250	524	215	141	62	29	29
27	691	370	443	872	146	1,170	498	217	138	63	28	33
28	715	368	462	811	138	1,070	466	254	144	61	28	36
29	709	367	476	759	-----	992	441	350	155	61	28	36
30	683	371	552	681	-----	1,000	423	438	169	59	27	35
31	643	-----	1,510	620	-----	1,020	-----	521	-----	58	27	-----
TOTAL	6,569	15,500	11,932	32,085	8,809	34,745	21,688	13,499	10,912	4,359	1,493	803
MEAN	212	517	385	1,035	315	1,121	723	435	364	141	48.2	26.8
MAX	715	644	1,510	2,180	568	1,680	1,240	607	598	255	89	36
MIN	45	367	278	471	138	134	423	201	138	58	27	20
CFSM	.49	1.19	.89	2.38	.73	2.58	1.67	1.00	.84	.32	.11	.06
IN.	.56	1.33	1.02	2.75	.76	2.98	1.86	1.16	.94	.37	.13	.07
CAL YR 1972	TOTAL 120,859	MEAN 330	MAX 2,400	MIN 45	CFSM .76	IN 10.36						
WTR YR 1973	TOTAL 162,394	MEAN 445	MAX 2,180	MIN 20	CFSM 1.03	IN 13.92						

STREAMS TRIBUTARY TO LAKE MICHIGAN

04116000 Grand River at Ionia, Mich.

LOCATION.--Lat 42°58'20", long 85°04'13", in NW¼ sec.30, T.7 N., R.6 W., Ionia County, 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 mi² (7,360 km²), 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.

AVERAGE DISCHARGE.--22 years (1951-73), 1,772 ft³/s (50.18 m³/s) 8.47 in/yr (215 mm/yr).

EXTREMES.--Current year: Maximum discharge, 15,600 ft³/s (442 m³/s) Jan. 2 (gage height, 21.38 ft or 6.517 m); minimum, 207 ft³/s (5.86 m³/s) Sept. 16 (gage height, 6.73 ft or 2.051 m); minimum daily, 356 ft³/s (10.1 m³/s) Sept. 16.
Period of record: Maximum discharge, 21,500 ft³/s (609 m³/s) Apr. 1, 1960 (gage height, 23.43 ft or 7.141 m); minimum, 40 ft³/s (1.13 m³/s) May 13, 1968 (gage height, 5.61 ft or 1.710 m); minimum daily, 115 ft³/s (3.26 m³/s) Aug. 27, 1953.

REMARKS.--Records fair except those for the winter period and those for periods of no gage-height record, which are poor. Diurnal fluctuation below about 5,000 cfs caused by powerplants above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,490	2,930	2,680	13,500	3,000	1,680	8,590	3,810	5,660	1,450	982	623
2	1,460	2,930	2,630	15,000	3,100	1,890	9,400	4,620	5,450	1,590	869	598
3	1,260	3,630	2,530	14,000	3,200	2,660	9,930	4,790	5,200	1,710	1,240	513
4	1,190	3,630	2,280	12,000	3,460	5,460	9,870	4,420	5,520	1,880	1,180	563
5	1,110	3,510	2,100	10,500	3,580	6,890	9,140	3,920	5,680	1,830	940	416
6	1,080	3,280	2,200	9,300	3,450	7,660	8,310	3,700	5,150	1,710	953	669
7	1,020	3,090	2,350	8,000	3,410	8,170	7,370	3,540	5,010	1,500	983	585
8	923	3,290	2,200	7,000	3,250	8,580	6,770	3,670	4,660	1,480	932	550
9	965	3,680	2,200	6,000	3,100	8,570	6,180	4,090	4,230	1,380	996	415
10	932	3,800	2,350	5,300	2,700	8,200	5,720	4,090	3,740	1,290	909	480
11	901	3,660	2,500	4,500	2,450	7,790	5,410	3,830	3,520	1,370	905	384
12	877	3,510	2,300	4,000	2,300	8,020	5,430	3,680	3,010	1,390	780	504
13	844	3,380	2,200	3,700	2,200	8,350	5,550	3,420	2,850	1,170	767	583
14	793	3,280	2,600	3,500	2,100	8,770	5,300	3,130	2,610	1,190	875	501
15	785	3,190	3,300	3,300	2,100	10,100	4,880	2,640	2,210	1,180	983	372
16	760	3,160	3,500	3,000	1,900	10,700	4,650	2,720	2,570	1,250	1,010	356
17	726	3,060	3,400	2,900	1,500	10,400	4,170	2,640	3,080	1,150	1,130	632
18	739	2,990	3,100	2,800	1,850	9,660	4,170	2,600	2,860	1,210	1,010	756
19	735	2,960	2,500	3,500	1,800	8,750	3,970	2,300	2,260	950	1,150	862
20	705	2,950	2,700	3,900	1,700	8,290	3,900	2,220	1,870	790	1,140	651
21	737	3,050	2,900	3,900	1,900	8,320	3,770	2,020	1,980	791	992	677
22	911	3,090	3,100	3,700	1,800	8,380	3,970	2,300	1,600	829	1,370	595
23	2,420	3,120	3,310	3,700	1,500	8,570	5,050	2,660	1,530	668	881	581
24	3,810	3,020	3,240	4,000	1,600	8,510	5,650	2,260	1,530	939	952	589
25	3,700	2,920	3,390	4,200	1,740	8,650	5,620	1,880	1,310	742	918	618
26	3,740	2,830	3,320	4,000	1,700	8,660	5,120	2,590	1,390	829	864	597
27	3,490	2,950	3,130	3,800	1,600	8,490	4,270	3,020	1,480	781	847	847
28	3,260	3,020	3,320	3,700	1,610	8,050	3,900	3,870	1,480	811	753	963
29	3,100	2,910	3,270	3,500	-----	7,480	3,480	5,130	2,030	771	766	535
30	3,130	2,780	4,000	3,300	-----	7,620	3,430	5,640	2,190	717	648	974
31	3,010	-----	7,000	3,100	-----	8,130	-----	5,670	-----	741	672	-----
TOTAL	50,603	95,600	91,600	176,600	65,600	241,450	172,970	106,870	93,660	36,089	29,397	17,989
MEAN	1,632	3,187	2,955	5,697	2,343	7,789	5,766	3,447	3,122	1,164	948	600
MAX	3,810	3,800	7,000	15,000	3,580	10,700	9,930	5,670	5,680	1,880	1,370	974
MIN	705	2,780	2,100	2,800	1,500	1,680	3,430	1,880	1,310	668	648	356
CFSM	.57	1.12	1.04	2.01	.83	2.74	2.03	1.21	1.10	.41	.33	.21
IN.	.66	1.25	1.20	2.31	.86	3.16	2.27	1.40	1.23	.47	.39	.24

CAL YR 1972 TOTAL 869,188 MEAN 2,375 MAX 11,700 MIN 574 CFSM .84 IN 11.39
WTR YR 1973 TOTAL 1,178,428 MEAN 3,229 MAX 15,000 MIN 356 CFSM 1.14 IN 15.44

NOTE.--No gage-height record Dec. 30 to Feb. 3.

STREAMS TRIBUTARY TO LAKE MICHIGAN

109

04116500 Flat River at Smyrna, Mich.

LOCATION.--Lat 43°03'10", long 85°15'50", in NW¼ sec.28, T.8 N., R.8 W., Ionia County, 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 mi² (1,368 km²).

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 (222.361 m) above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.--23 years, 414 ft³/s (11.72 m³/s), 10.65 in/yr (271 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,030 ft³/s (57.5 m³/s) Jan. 2 (gage height, 6.30 ft or 1.920 m, from highwater mark); minimum, 229 ft³/s (6.49 m³/s) Oct. 20 (gage height, 3.46 ft or 1.055 m).

Period of record: Maximum discharge, 3,100 ft³/s (87.8 m³/s) Apr. 22, 1967 (gage height, 7.27 ft or 2.216 m), caused by momentary release of water from storage above station; maximum gage height, 7.75 ft (2.362 m) Jan. 8, 1971 (backwater from ice); minimum discharge, 7.4 ft³/s (0.21 m³/s) Sept. 9, 1953; minimum daily, 70 ft³/s (1.98 m³/s) Sept. 6, 1964.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, which are poor. Diurnal fluctuation caused by powerplants above station prior to September 1956; occasional diurnal fluctuation since.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	473	772	466	1,900	620	500	1,070	882	1,040	749	600	397
2	324	636	458	1,950	630	750	1,130	1,120	1,020	674	616	258
3	383	716	449	1,900	640	950	1,170	1,240	1,030	720	588	248
4	371	690	446	1,700	660	1,050	1,150	1,250	984	641	486	283
5	349	615	438	1,500	660	1,150	1,220	1,130	916	725	464	288
6	279	586	420	1,300	650	1,200	1,090	1,100	971	560	398	258
7	298	652	410	1,100	630	1,200	1,060	1,060	856	566	409	268
8	378	655	410	1,000	600	1,150	927	1,050	840	494	402	251
9	262	666	410	920	560	1,050	920	1,100	704	523	447	261
10	288	671	410	830	530	1,000	987	1,100	753	418	514	313
11	393	684	420	750	500	1,000	746	1,150	657	471	487	241
12	247	701	420	700	500	1,050	983	921	473	349	402	235
13	256	591	420	630	480	1,130	780	1,030	514	429	457	234
14	300	614	450	580	450	1,260	823	901	556	372	321	236
15	267	588	470	530	440	1,340	841	792	335	366	360	237
16	350	581	500	500	420	1,240	802	854	655	313	330	238
17	266	543	510	530	400	1,340	781	706	858	337	352	299
18	280	527	510	750	440	1,230	832	747	932	321	373	407
19	376	508	500	1,100	460	1,110	741	587	841	334	274	433
20	234	431	490	1,400	460	1,090	765	712	845	333	382	274
21	254	547	490	1,400	428	1,050	713	625	774	404	443	302
22	434	499	510	1,300	405	979	916	537	654	336	340	369
23	659	492	530	1,100	424	970	889	699	591	378	412	259
24	779	451	540	1,000	422	978	840	630	627	307	317	297
25	898	474	550	900	420	882	831	526	488	394	375	387
26	997	464	550	830	391	871	773	446	509	389	307	268
27	937	454	540	770	407	776	834	603	492	389	383	275
28	867	496	550	700	418	812	644	790	577	396	366	386
29	955	482	600	660	-----	779	703	932	653	415	321	289
30	711	471	800	630	-----	911	647	992	604	376	256	282
31	768	-----	1,200	620	-----	895	-----	1,070	-----	492	264	-----
TOTAL	14,633	17,257	15,867	31,480	14,045	31,693	26,608	27,282	21,749	13,971	12,446	8,773
MEAN	472	575	512	1,015	502	1,022	887	880	725	451	401	292
MAX	997	772	1,200	1,950	660	1,340	1,220	1,250	1,040	749	616	433
MIN	234	431	410	500	391	500	644	446	335	307	256	234
CFSM	.89	1.09	.97	1.92	.95	1.94	1.68	1.67	1.37	.85	.76	.55
IN.	1.03	1.22	1.12	2.22	.99	2.23	1.87	1.92	1.53	.98	.88	.62

CAL YR 1972 TOTAL 168,778 MEAN 461 MAX 1,200 MIN 148 CFSM .87 IN 11.89
WTR YR 1973 TOTAL 235,804 MEAN 646 MAX 1,950 MIN 234 CFSM 1.22 IN 16.61

NOTE.--No gage-height record Dec. 8 to Feb. 20.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04117000 Quaker Brook near Nashville, Mich.

LOCATION.--Lat 42°33'57", long 85°05'37", in NW¼ sec.13, T.2 N., R.7 W., Barry County, on left bank 150 ft (46 m) upstream from culvert on county road, 500 ft (152 m) upstream from small tributary, and 2.5 mi (4.0 km) south of Nashville.

DRAINAGE AREA.--7.60 mi² (19.68 km²).

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 821.89 ft (250.512 m) above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.--19 years, 6.10 ft³/s (0.173 m³/s), 10.90 in/yr (277 mm/yr).

EXTREMES.--Current year: Maximum discharge, 161 ft³/s (4.56 m³/s) Dec. 31 (gage height, 5.46 ft or 1.664 m); minimum, 3.2 ft³/s (0.091 m³/s) Sept. 6, 7 (gage height, 1.78 ft or 0.543 m).

Period of record: Maximum discharge, 294 ft³/s (8.33 m³/s) Oct. 4, 1954 (gage height, 5.47 ft or 1.667 m), from rating curve extended above 140 ft³/s (3.96 m³/s); minimum, 0.44 ft³/s (0.012 m³/s) Nov. 3, 1966 (gage height, 1.40 ft or 0.427 m, result of snow dam).

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.5	8.4	7.5	31	8.0	8.9	25	20	14	13	11	3.8
2	5.7	16	7.8	16	14	27	19	19	11	10	6.5	3.7
3	5.2	16	8.1	14	16	45	14	12	15	11	5.7	3.6
4	5.1	10	7.3	32	11	27	12	11	18	9.3	4.0	3.5
5	5.5	8.1	7.1	17	9.3	19	12	10	14	7.6	4.7	3.5
6	5.4	7.3	13	11	8.9	17	11	11	14	6.7	4.5	3.4
7	5.1	8.4	11	7.7	8.7	18	9.5	9.5	13	6.2	4.4	3.4
8	4.7	20	7.3	7.0	7.9	15	9.1	19	9.5	5.7	4.4	3.4
9	4.4	14	7.5	6.8	7.0	12	9.1	18	7.8	5.7	7.1	3.6
10	4.3	9.8	7.8	6.7	6.5	12	12	12	7.1	24	6.3	3.5
11	4.3	12	7.3	6.7	6.1	16	14	9.5	6.7	14	4.2	3.5
12	4.4	10	7.8	6.5	5.9	18	18	9.5	6.3	7.5	4.5	3.4
13	4.4	8.8	18	6.6	5.8	12	14	9.1	5.9	6.5	4.4	3.4
14	4.5	11	22	6.8	6.7	25	11	8.8	5.7	6.3	4.4	3.5
15	4.3	11	12	7.2	7.0	24	9.5	8.4	5.5	6.3	4.4	3.5
16	4.4	9.1	9.1	7.9	6.5	14	9.5	8.1	6.1	5.5	4.1	3.5
17	4.2	8.4	9.5	12	6.0	11	11	7.8	7.5	5.2	4.7	7.7
18	4.1	8.8	8.1	25	6.1	14	9.5	7.5	6.7	4.9	4.4	11
19	4.2	9.5	8.4	26	6.7	19	9.8	9.1	6.3	4.9	4.4	5.7
20	4.2	10	9.8	16	7.2	19	9.5	8.4	6.1	5.5	6.9	4.7
21	5.2	11	11	10	7.4	17	9.5	7.5	5.5	6.7	4.9	4.4
22	14	11	12	14	7.1	16	55	10	5.2	5.9	4.3	6.2
23	47	9.8	11	18	7.2	16	30	35	5.4	5.1	4.4	5.6
24	23	8.4	10	12	7.1	18	17	23	6.1	5.4	4.7	4.7
25	13	9.1	10	11	5.9	18	12	16	5.5	5.5	4.3	4.4
26	9.5	9.8	10	11	6.9	16	11	19	5.2	5.4	4.3	5.7
27	7.5	11	9.5	11	6.7	12	9.8	14	15	5.4	4.1	4.9
28	8.1	9.8	8.8	11	6.6	11	8.8	43	92	5.1	3.8	7.1
29	9.8	8.1	8.4	7.9	-----	15	8.4	38	37	5.2	3.7	22
30	8.8	7.5	73	7.0	-----	23	11	22	22	4.9	3.7	21
31	7.5	-----	101	6.6	-----	16	-----	20	-----	9.1	3.0	-----
TOTAL	248.3	312.1	461.1	389.4	217.1	550.9	421.0	475.2	385.1	229.5	152.5	171.3
MEAN	8.01	10.4	14.9	12.6	7.75	17.8	14.0	15.3	12.8	7.40	4.92	5.71
MAX	47	20	101	32	16	45	55	43	92	24	11	22
MIN	4.1	7.3	7.1	6.5	5.8	8.9	8.4	7.5	5.2	4.9	3.7	3.4
CFSM	1.05	1.37	1.96	1.66	1.02	2.34	1.84	2.01	1.68	.97	.65	.75
IN.	1.22	1.53	2.26	1.91	1.06	2.70	2.06	2.33	1.88	1.12	.75	.84

CAL YR 1972 TOTAL 3,587.7 MEAN 9.80 MAX 130 MIN 2.7 CFSM 1.29 IN 17.56
 WTR YR 1973 TOTAL 4,013.5 MEAN 11.0 MAX 101 MIN 3.4 CFSM 1.45 IN 19.65

PEAK DISCHARGE (BASE, 50 FT³/S)

DATE	TIME	G.H.	DISCHARGE
10-23	0800	3.04	57
12-31	0100	5.46	161
03-03	0100	2.97	54
04-22	1300	3.93	90
05-28	0800	2.90	51
06-28	0600	5.15	139

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04117500 Thornapple River near Hastings, Mich.

LOCATION.--Lat 42°36'57", long 85°14'11", in SE¼ sec.27, T.3 N., R.8 W., Barry County, 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 mi² (997 km²).

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.

AVERAGE DISCHARGE.--29 years, 298 ft³/s (8.440 m³/s), 10.51 in/yr (267 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,770 ft³/s (78.4 m³/s) Jan. 3 (gage height, 7.29 ft or 2.222 m); minimum, 73 ft³/s (2.07 m³/s) Sept. 15 (gage height, 2.91 ft or 0.887 m).

Period of record: Maximum discharge, 6,810 ft³/s (193 m³/s) Apr. 7, 1947 (gage height, 10.20 ft or 3.109 m, from graph based on gage readings); minimum 33 ft³/s (0.93 m³/s) Aug. 10, 1964 (gage height, 2.71 ft or 0.826 m).

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	298	485	460	2,190	470	254	1,090	535	1,020	721	155	102
2	294	485	440	2,620	470	294	1,160	530	1,000	725	159	97
3	278	515	420	2,740	505	455	1,190	545	956	695	156	94
4	248	545	405	2,700	530	716	1,190	555	926	623	148	90
5	241	575	381	2,430	540	974	1,120	538	866	561	140	87
6	227	580	370	1,950	535	1,200	1,020	492	836	503	134	87
7	214	565	358	1,510	470	1,330	926	451	800	435	129	85
8	202	575	376	1,240	450	1,350	818	445	758	365	125	82
9	192	580	415	1,060	422	1,270	710	455	704	308	136	80
10	182	590	440	896	390	1,140	644	481	628	286	147	80
11	172	609	450	734	380	1,040	585	487	531	291	150	80
12	169	612	440	602	370	986	580	475	446	292	145	80
13	160	610	460	525	320	944	608	447	369	268	137	78
14	152	602	515	470	340	962	644	411	319	247	130	78
15	150	570	540	430	350	1,040	644	372	282	225	123	76
16	144	540	550	410	330	1,160	620	340	257	208	119	76
17	141	505	550	420	260	1,240	590	317	254	194	117	87
18	138	485	560	525	340	1,200	545	303	280	181	117	120
19	136	470	560	698	330	1,120	515	294	289	173	117	130
20	130	465	550	818	310	1,060	480	290	293	170	127	130
21	133	465	550	806	300	1,020	465	282	282	170	132	117
22	164	475	540	806	273	998	505	279	260	169	128	114
23	282	485	540	794	274	1,010	668	320	239	166	125	117
24	450	500	550	770	270	1,040	842	372	226	159	125	117
25	575	510	560	746	274	1,060	938	485	216	155	122	112
26	644	505	580	716	251	1,080	950	530	213	153	120	109
27	650	500	608	674	240	1,080	902	545	228	148	112	107
28	638	495	594	638	237	1,050	806	585	337	148	109	144
29	596	490	578	580	-----	1,010	698	698	512	147	107	248
30	550	475	649	535	-----	1,020	585	848	652	143	104	303
31	510	-----	1,270	490	-----	1,040	-----	974	-----	147	102	-----
TOTAL	9,060	15,863	16,259	32,523	10,231	31,143	23,038	14,681	14,979	9,176	3,997	3,307
MEAN	292	529	524	1,049	365	1,005	768	474	499	296	129	110
MAX	650	612	1,270	2,740	540	1,350	1,190	974	1,020	725	159	303
MIN	130	465	358	410	237	254	465	279	213	143	102	76
CFSM	.76	1.37	1.36	2.72	.95	2.61	1.99	1.23	1.30	.77	.34	.29
IN.	.88	1.53	1.57	3.14	.99	3.01	2.23	1.42	1.45	.89	.39	.32

CAL YR 1972 TOTAL 160,853 MEAN 439 MAX 2,390 MIN 117 CFMS 1.14 IN 15.54
WTR YR 1973 TOTAL 184,257 MEAN 505 MAX 2,740 MIN 76 CFMS 1.31 IN 17.80

STREAMS TRIBUTARY TO LAKE MICHIGAN

04118000. Thornapple River near Caledonia, Mich.

LOCATION.--Lat 42°48'40", long 85°29'00", in NW¼ sec.22, T.5 N., R.10 W., Kent County, 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 mi² (2,002 km²).

PERIOD OF RECORD.--October 1930 to September 1938, October 1951 to current year. Monthly discharge only for some periods, published in WSP 1307.

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).

AVERAGE DISCHARGE.--30 years, 534 ft³/s (15.12 m³/s), 9.38 in/yr (238 mm/yr).

EXTREMES.--Current year: Maximum discharge, 4,900 ft³/s (139 m³/s) Jan. 3 (gage height, 8.93 ft or 2.722 m); minimum daily, 230 ft³/s (6.51 m³/s) Sept. 11-16.

Period of record: Maximum discharge, 6,290 ft³/s (178 m³/s) May 10, 1956 (gage height, 10.79 ft or 3.289 m); minimum, 1.0 ft³/s (0.028 m³/s) May 28, 1968 (gage height, 1.40 ft or 0.427 m), result of regulation during bridge construction.

Flood of Apr. 7, 1947 reached a stage of 14.4 ft, from information by powerplant operator.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, which are fair. Prior to Dec. 1, 1958, large diurnal fluctuation at low and medium flow caused by powerplant above station; occasional fluctuation since.

REVISIONS (WATER YEARS).--WSP 824: 1931-36. WSP 1307: 1931-37.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	602	960	893	3,850	1,000	636	2,400	1,360	1,610	1,060	409	290
2	586	1,000	870	4,660	978	707	2,540	1,400	1,600	1,080	452	290
3	562	1,070	847	4,850	1,050	1,020	2,460	1,310	1,570	1,150	320	280
4	536	1,070	808	4,660	1,040	1,340	2,350	1,250	1,740	1,110	374	270
5	511	1,070	784	4,170	1,040	1,630	2,220	1,180	1,730	1,050	364	260
6	489	1,070	750	3,510	1,030	1,870	2,080	1,120	1,660	842	352	250
7	471	1,070	720	3,120	996	2,030	1,890	1,060	1,510	828	342	250
8	458	1,160	750	2,590	954	2,140	1,690	1,120	1,380	742	347	240
9	429	1,170	800	2,310	900	2,100	1,440	1,120	1,290	653	445	240
10	395	1,140	830	1,880	839	1,990	1,360	1,080	1,180	625	375	240
11	397	1,130	846	1,520	812	1,880	1,280	1,040	1,060	593	386	230
12	395	1,120	858	1,360	806	1,820	1,290	1,010	933	576	376	230
13	389	1,110	955	1,270	696	1,720	1,300	966	828	564	352	230
14	393	1,110	989	1,160	729	1,830	1,280	913	736	543	330	230
15	381	1,090	1,020	1,040	751	2,060	1,260	859	655	515	320	230
16	378	1,040	1,040	954	712	2,050	1,220	811	622	489	320	230
17	350	1,000	1,030	966	575	2,100	1,190	767	631	471	320	240
18	385	961	1,000	1,260	729	2,100	1,150	728	638	444	330	300
19	338	931	1,000	1,720	707	2,080	1,110	680	643	418	340	340
20	358	918	993	1,860	668	2,080	1,070	679	633	383	360	350
21	362	919	980	1,660	663	2,040	1,040	586	619	425	370	340
22	448	925	1,010	1,590	658	1,990	1,190	629	587	421	370	330
23	883	921	1,020	1,660	652	1,940	1,340	744	559	410	360	330
24	1,020	917	1,030	1,540	652	1,910	1,390	860	534	406	350	330
25	1,100	921	1,050	1,440	646	1,910	1,460	924	512	409	340	320
26	1,140	939	1,060	1,400	641	1,890	1,490	1,050	501	397	330	300
27	1,140	969	1,080	1,360	625	1,840	1,460	1,060	494	391	320	310
28	1,130	960	1,080	1,300	620	1,800	1,370	1,240	635	385	310	400
29	1,110	932	1,060	1,180	-----	1,750	1,270	1,380	829	382	300	500
30	1,070	908	1,450	1,120	-----	2,140	1,200	1,440	988	384	300	550
31	1,010	-----	2,790	1,040	-----	2,270	-----	1,530	-----	402	300	-----
TOTAL	19,216	30,501	31,393	64,000	22,169	56,663	45,790	31,896	28,907	18,548	10,864	8,930
MEAN	620	1,017	1,013	2,065	792	1,828	1,526	1,029	964	598	350	298
MAX	1,140	1,170	2,790	4,850	1,050	2,270	2,540	1,530	1,740	1,150	452	550
MIN	338	908	720	954	575	636	1,040	586	494	382	300	230
CFSM	.80	1.32	1.31	2.67	1.02	2.36	1.97	1.33	1.25	.77	.45	.39
IN.	.92	1.47	1.51	3.08	1.07	2.73	2.20	1.53	1.39	.89	.52	.43

CAL YR 1972 TOTAL 307,352 MEAN 840 MAX 3,420 MIN 279 CFSM 1.09 IN 14.79
WTR YR 1973 TOTAL 368,877 MEAN 1,011 MAX 4,850 MIN 230 CFSM 1.31 IN 17.75

NOTE.--No gage-height record Aug. 15 to Sept. 30.

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04118500 Rogue River near Rockford, Mich.

LOCATION.--Lat 43°05'00", long 85°35'30", in NE¼ sec.15, T.8 N., R.11 W., Kent County, 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 mi² (606 km²).

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.

AVERAGE DISCHARGE.--21 years, 216 ft³/s (6.117 m³/s), 12.54 in/yr (319 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,260 ft³/s (35.7 m³/s) Jan. 2 (gage height, 7.37 ft or 2.246 m); minimum, 107 ft³/s (3.03 m³/s) Sept. 15 (gage height, 3.96 ft or 1.207 m); minimum gage height, 3.96 ft (1.027 m) Sept. 14, 15; minimum daily discharge, 109 ft³/s (3.09 m³/s) Sept. 15.
Period of record: Maximum discharge, 2,640 ft³/s (74.8 m³/s) Mar. 31, 1960 (gage height, 8.59 ft or 2.618 m); minimum, 28 ft³/s (0.79 m³/s) Jan. 22, 1967 (gage height, 3.41 ft or 1.039 m); minimum daily, 49 ft³/s (1.39 m³/s) Aug. 27, 1955.

REMARKS.--Records fair. Some diurnal fluctuation caused by mills above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	214	353	238	1,090	273	280	452	565	535	290	220	156
2	207	372	233	1,140	315	350	482	784	453	323	203	147
3	192	362	225	957	330	500	484	911	435	415	191	138
4	178	374	215	795	321	570	475	750	421	381	183	131
5	168	365	207	659	319	648	448	586	425	363	175	131
6	166	361	190	600	310	714	415	479	428	322	166	130
7	164	393	174	520	290	712	394	429	410	275	158	126
8	161	410	176	450	255	640	367	537	358	229	156	122
9	150	434	172	350	216	574	344	608	315	201	178	123
10	144	434	189	320	220	501	342	626	272	199	220	122
11	140	428	190	300	220	458	337	578	241	183	222	118
12	138	395	190	270	210	477	352	479	215	171	212	115
13	139	358	200	240	200	503	371	412	199	167	184	114
14	142	331	210	221	189	675	361	372	183	163	172	111
15	138	308	217	209	191	778	357	335	173	161	165	109
16	139	288	222	210	180	702	363	310	200	153	160	111
17	138	271	230	234	170	600	361	285	256	150	179	146
18	139	260	230	418	190	506	348	265	259	146	205	177
19	139	251	230	763	187	453	341	270	275	142	229	175
20	139	242	225	944	185	448	332	252	326	147	243	165
21	161	234	230	896	193	436	327	242	292	182	220	146
22	282	230	246	690	179	427	418	234	246	201	206	147
23	552	226	262	589	186	421	467	240	219	206	185	143
24	715	221	280	498	183	395	514	232	220	181	181	136
25	909	219	295	443	180	366	479	246	204	171	175	131
26	789	227	300	420	186	341	406	259	196	219	170	131
27	608	238	300	389	182	317	354	261	182	248	161	129
28	512	238	300	365	190	300	317	500	319	255	151	127
29	441	241	330	310	-----	314	290	720	289	253	145	127
30	397	238	445	300	-----	394	314	810	285	224	141	125
31	373	-----	706	271	-----	382	-----	739	-----	212	156	-----
TOTAL	8,874	9,302	7,857	15,861	6,250	15,182	11,612	14,316	8,831	6,933	5,712	4,009
MEAN	286	310	253	512	223	490	387	462	294	224	184	134
MAX	909	434	706	1,140	330	778	514	911	535	415	243	177
MIN	138	219	172	209	170	280	290	232	173	142	141	109
CF SM	1.22	1.32	1.08	2.19	.95	2.09	1.65	1.97	1.26	.96	.79	.57
IN.	1.41	1.48	1.25	2.52	.99	2.41	1.85	2.28	1.40	1.10	.91	.64

CAL YR 1972 TOTAL 91,818 MEAN 251 MAX 965 MIN 101 CF SM 1.07 IN 14.60
WTR YR 1973 TOTAL 114,739 MEAN 314 MAX 1,140 MIN 109 CF SM 1.34 IN 18.24

04121000 Muskegon River near Merritt, Mich.

LOCATION.--44°20'08", long 84°53'24", in NW¼NW¼ sec.2, T.22 N., R.5 W., Missaukee County, on right bank 35 ft (11 m) upstream from bridge on state highway 55, 0.7 mi (1.1 km) upstream from West Branch, 2.7 mi (4.3 km) east of Merritt, 4.3 mi (6.9 km) downstream from Reedsburg Dam, and at mile 210.8 (399.2 km).

DRAINAGE AREA.--355 mi² (919 km²).

PERIOD OF RECORD.--October 1946 to December 31, 1973 (discontinued as a continuous-record station, converted to crest-stage partial-record station).

GAGE.--Water-stage recorder. Datum of gage is 1,117.82 ft (340.712 m) above mean sea level (levels by Michigan Department of Natural Resources). Prior to July 13, 1949, nonrecording gage at bridge at present datum.

AVERAGE DISCHARGE.--27 years, 230 ft³/s (6.514 m³/s), 8.80 in/yr (224 mm/yr).

EXTREMES.--Current year: Maximum discharge, 746 ft³/s (21.1 m³/s) Mar. 17 (gage height, 7.37 ft or 2.246 m); minimum, 82 ft³/s (2.32 m³/s) Oct. 13, 14.

Period Oct. 1 to Dec. 31, 1973: Maximum discharge, 311 ft³/s (8.81 m³/s) Dec. 7 (gage height, 6.14 ft or 1.871 m); minimum, 130 ft³/s (3.68 m³/s) Oct. 25.

Period of record: Maximum discharge, 1,340 ft³/s (37.9 m³/s) Apr. 8, 1959 (gage height, 8.16 ft or 2.487 m); maximum gage height, 8.25 ft (2.515 m) July 11, 1957; minimum discharge, 26 ft³/s (0.74 m³/s) Aug. 17, 18-20, Sept. 2-5, 12-15, 1958.

REMARKS.--Records good except those for winter periods, which are poor. Occasional regulation by manipulation of stop logs at Reedsburg Dam.

REVISIONS.--WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	115	243	200	330	390	210	508	369	326	182	215	157
2	122	246	195	350	370	205	511	359	303	179	209	153
3	130	278	190	350	400	205	524	366	268	177	201	150
4	136	276	185	340	450	260	535	381	249	171	188	150
5	136	262	180	330	450	350	526	371	236	163	175	160
6	135	252	170	320	430	430	511	353	230	153	166	158
7	131	250	160	310	400	502	524	344	214	144	161	152
8	128	268	150	300	370	565	531	364	195	141	157	147
9	116	275	135	300	350	592	524	398	191	140	161	142
10	104	272	140	300	330	598	524	400	190	136	163	135
11	89	272	150	310	320	597	493	404	174	131	156	132
12	87	244	150	310	300	617	493	396	175	129	154	129
13	86	262	150	310	290	631	493	377	169	135	148	126
14	82	268	150	300	280	672	445	354	156	132	148	124
15	97	248	155	290	270	603	474	334	144	137	145	120
16	89	230	170	280	260	714	474	398	140	139	141	120
17	115	224	180	270	260	732	482	312	138	138	140	121
18	120	223	130	260	250	651	505	303	135	137	141	130
19	122	224	200	330	250	615	520	292	134	138	138	124
20	116	224	200	500	250	610	511	285	131	142	139	126
21	127	221	200	550	240	599	490	274	125	143	135	121
22	152	219	205	550	230	591	468	266	127	140	130	141
23	221	209	210	550	230	556	474	248	128	136	127	154
24	255	210	220	530	220	541	468	207	131	134	130	156
25	278	240	225	520	220	520	450	176	127	135	129	151
26	297	230	230	510	220	526	432	176	128	144	129	155
27	313	220	230	500	210	503	418	174	148	152	131	153
28	324	215	230	480	210	488	394	214	162	152	130	152
29	324	210	240	460	-----	484	366	290	171	151	128	146
30	318	205	250	430	-----	482	359	319	179	153	128	139
31	305	-----	300	400	-----	487	-----	330	-----	178	155	-----
TOTAL	5,212	7,330	5,940	11,900	4,450	14,244	14,467	9,744	5,323	4,562	4,698	4,224
MEAN	168	244	192	374	302	524	482	314	177	147	152	141
MAX	324	253	300	550	450	732	535	404	326	182	215	160
MIN	86	205	135	270	210	205	359	174	125	129	127	120
CFSM	.67	.69	.54	1.08	.85	1.48	1.36	.88	.50	.41	.43	.40
IN.	.55	.77	.62	1.25	.89	1.70	1.52	1.02	.56	.49	.49	.44
CAL YR 1972 TOTAL	80,403	MEAN 220	MAX 992	MIN 49	CFSM .62	IN 2.43						
WTR YR 1973 TOTAL	92,994	MEAN 269	MAX 732	MIN 86	CFSM .76	IN 10.28						

STREAMS TRIBUTARY TO LAKE MICHIGAN
04121000 Muskegon River near Merritt, Mich.

DISCHARGE, IN CURIC FEET PER SECOND, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	134	198	238									
2	135	200	230									
3	138	206	229									
4	143	204	238									
5	152	197	268									
6	149	184	287									
7	147	177	310									
8	145	168	305									
9	143	168	304									
10	141	172	302									
11	138	182	284									
12	134	191	264									
13	144	202	262									
14	155	206	240									
15	161	225	230									
16	163	237	200									
17	158	232	170									
18	157	235	160									
19	154	239	170									
20	157	241	180									
21	151	246	200									
22	148	242	190									
23	146	261	180									
24	144	263	190									
25	138	264	197									
26	141	256	205									
27	144	251	216									
28	167	255	217									
29	187	247	210									
30	192	235	215									
31	191	-----	220									
TOTAL	4,697	6,584	7,111									
MEAN	152	219	229									
MAX	192	264	310									
MTN	134	168	160									
CFSM	.43	.62	.65									
IN.	.49	.69	.75									

CAL YR 1973 TOTAL 98.004 MEAN 269 MAX 732 MIN 120 CFSM .76 IN 10.27

STREAMS TRIBUTARY TO LAKE MICHIGAN

117

04121300 Clam River at Vogel Center, Mich.

LOCATION.--Lat 44°12'02", long 85°03'10", in SW¼ NW¼ sec.21, T.21 N., R.6 W., Missaukee County, 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 mi² (629 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 1,130 ft (344 m) from topographic map.

AVERAGE DISCHARGE.--7 years, 128 ft³/s (3.625 m³/s) 7.15 in/yr (182 mm/yr).

EXTREMES.--Current year: Maximum discharge, 415 ft³/s (11.8 m³/s) Mar. 8 (gage height, 4.40 ft or 1.341 m); minimum, 50 ft³/s (1.42 m³/s) Sept. 12.

Period of record: Maximum discharge, 1,150 ft³/s (32.6 m³/s) Apr. 13, 1971 (gage height, 6.33 ft or 1.929 m); minimum, 29 ft³/s (0.82 m³/s) Nov. 3, 1969, result of freezeup.

REMARKS.--Records good except those for winter periods, which are fair. Some regulation by dams above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	126	101	90	170	144	120	189	135	100	98	123	73
2	114	105	75	157	185	130	208	160	86	90	153	63
3	104	109	85	140	205	149	214	170	81	84	122	58
4	98	109	87	130	214	203	218	155	82	78	91	58
5	92	106	88	120	203	235	208	150	77	77	76	62
6	92	104	83	110	181	265	193	149	76	76	70	63
7	90	107	73	100	165	320	193	146	73	74	67	60
8	90	135	80	95	145	400	206	158	69	73	65	56
9	87	151	85	97	130	368	200	189	68	72	65	55
10	90	139	85	100	125	282	193	206	66	72	64	54
11	88	124	82	100	120	256	182	193	66	71	64	54
12	87	118	80	100	120	279	187	178	68	76	65	53
13	87	110	80	100	115	277	194	166	68	80	67	53
14	84	106	78	98	115	276	201	162	66	79	65	53
15	83	106	85	101	115	328	199	148	65	78	65	54
16	85	104	86	110	115	328	195	140	65	74	62	55
17	82	103	82	125	110	273	195	142	66	70	62	57
18	81	101	84	158	115	223	183	138	69	68	62	62
19	81	101	86	244	115	213	169	133	73	67	63	63
20	81	100	89	309	115	210	150	129	73	66	62	61
21	85	100	89	318	115	207	164	123	70	65	60	60
22	98	99	90	247	110	201	180	117	71	63	59	71
23	166	99	90	238	110	191	177	112	74	61	57	79
24	216	97	90	225	110	187	155	105	80	60	58	72
25	205	99	90	220	115	185	140	100	79	62	58	66
26	164	99	90	201	110	184	134	92	78	70	59	67
27	135	101	90	192	105	179	132	128	78	101	59	67
28	121	99	88	184	110	174	136	154	81	112	58	68
29	116	94	87	159	-----	171	135	205	88	94	56	64
30	111	87	102	145	-----	173	137	186	98	82	57	63
31	107	-----	163	140	-----	175	-----	131	-----	88	65	-----
TOTAL	3,346	3,213	2,732	4,933	3,737	7,162	5,367	4,600	2,254	2,381	2,179	1,844
MEAN	108	107	88.1	159	133	231	179	148	75.1	76.8	70.3	61.5
MAX	216	151	163	318	214	400	218	206	100	112	153	79
MIN	81	87	73	95	105	120	132	92	65	60	56	53
CFSM	.44	.44	.36	.65	.55	.95	.74	.61	.31	.32	.29	.25
IN.	.51	.49	.42	.76	.57	1.10	.82	.70	.35	.36	.33	.28

CAL YR 1972 TOTAL 41,181 MEAN 113 MAX 692 MIN 60 CFSM .47 IN 6.30
WTR YR 1973 TOTAL 43,748 MEAN 120 MAX 400 MIN 53 CFSM .49 IN 6.70

PEAK DISCHARGE (BASE, 350 FT³/S).--Mar. 8 (1600) 415 ft³/s (4.40 ft).

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121500 Muskegon River at Evert, Mich.

LOCATION.--Lat 43°53'57", long 85°15'19", in NW¼ NE¼ sec.3, T.17 N., R.8 W., Osceola County, on right bank 500 ft (152 m) downstream from bridge on U.S. Highway 10 at Evert, 0.4 mi (0.6 km) upstream from Twin Creek, and at mile 123.9 (199.4 km).

DRAINAGE AREA.--1,450 mi² (3,760 km²) approximately.

PERIOD OF RECORD.--October 1930 to September 1931, October 1933 to current year. Monthly discharge only for some periods, published in WSP 1307.

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.

AVERAGE DISCHARGE.--41 years, 976 ft³/s (27.64 m³/s) 9.14 in/yr (232 mm/yr).

EXTREMES.--Current year: Maximum discharge, 4,240 ft³/s (120 m³/s) Mar. 15 (gage height, 10.86 ft or 3.310 m); minimum, 460 ft³/s (13.0 m³/s) Sept. 13.

Period of record: Maximum discharge, 7,750 ft³/s (219 m³/s) Apr. 9, 1959 (gage height, 14.42 ft or 4.395 m) minimum observed, 164 ft³/s (4.64 m³/s) Dec. 20, 1947, result of freezeup.

REMARKS.--Records good except those for winter periods, which are fair. Some regulation by dams above station. Records of water temperature for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1437: 1934, 1947 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	739	1,190	830	1,580	1,600	956	2,130	1,460	1,700	1,020	725	535
2	760	1,220	809	1,500	1,710	982	2,230	1,570	1,640	963	746	535
3	739	1,280	800	1,430	1,900	1,070	2,230	1,560	1,650	928	802	535
4	704	1,260	781	1,400	1,750	1,400	2,240	1,520	1,830	914	795	525
5	684	1,210	750	1,380	1,700	2,050	2,200	1,460	1,750	837	774	515
6	660	1,160	720	1,330	1,600	2,330	2,140	1,390	1,670	760	739	515
7	654	1,170	640	1,330	1,500	2,970	2,120	1,350	1,540	739	690	515
8	642	1,420	560	1,280	1,400	3,310	2,130	1,580	1,360	678	654	510
9	624	1,460	630	1,270	1,350	3,370	2,120	1,850	1,200	642	642	505
10	588	1,440	670	1,280	1,250	3,460	2,070	1,960	1,080	612	666	495
11	570	1,360	680	1,320	1,200	3,570	2,000	2,010	978	594	624	480
12	560	1,270	680	1,350	1,150	3,750	2,000	1,910	914	582	600	475
13	550	1,210	630	1,290	1,100	3,710	2,040	1,760	865	612	582	465
14	540	1,150	690	1,190	1,050	3,930	2,050	1,670	816	618	560	465
15	535	1,080	760	1,150	1,050	4,200	2,020	1,570	753	606	555	470
16	535	1,040	800	1,150	1,000	4,140	1,980	1,480	732	588	540	470
17	530	1,000	830	1,170	870	4,080	2,010	1,430	858	570	545	480
18	525	986	850	1,400	920	3,790	1,960	1,350	816	560	565	510
19	525	963	880	2,300	578	3,420	1,900	1,290	781	555	545	515
20	530	935	910	2,350	986	3,150	1,870	1,220	753	560	555	525
21	565	921	949	2,400	950	2,980	1,830	1,180	704	560	540	520
22	678	886	956	2,500	920	2,810	1,840	1,130	678	550	520	530
23	1,160	865	956	2,500	900	2,630	1,830	1,090	684	535	510	565
24	1,440	844	956	2,450	880	2,470	1,790	1,040	746	530	510	565
25	1,520	837	956	2,400	870	2,320	1,700	1,020	753	530	505	570
26	1,480	830	956	2,300	870	2,220	1,610	1,060	704	550	505	576
27	1,390	851	949	2,200	880	2,130	1,530	1,030	690	618	505	570
28	1,330	865	942	2,100	500	2,630	1,470	1,380	725	642	500	560
29	1,310	865	942	1,950	-----	1,960	1,390	1,560	963	666	495	555
30	1,270	851	966	1,800	-----	1,950	1,360	1,670	1,040	642	495	550
31	1,230	-----	1,420	1,650	-----	1,930	-----	1,710	-----	654	505	-----
TOTAL	25,567	32,439	25,868	52,700	33,234	85,068	57,790	45,260	31,373	20,415	18,494	15,601
MEAN	825	1,081	834	1,700	1,187	2,744	1,926	1,460	1,046	659	597	520
MAX	1,520	1,480	1,420	2,500	1,900	4,200	2,240	2,010	1,830	1,020	802	576
MIN	525	830	560	1,150	870	956	1,360	1,020	678	530	495	465
CFSM	.57	.75	.58	1.17	.82	1.89	1.33	1.01	.72	.45	.41	.36
IN.	.66	.83	.66	1.35	.85	2.18	1.48	1.16	.80	.52	.47	.40

CAL YR 1972 TOTAL 345,465 MEAN 944 MAX 4,640 MIN 350 CFSM .65 IN 8.86
WTR YR 1973 TOTAL 443,809 MEAN 1,216 MAX 4,200 MIN 465 CFSM .84 IN 11.39

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04121900 Little Muskegon River near Morley, Mich.

LOCATION.--Lat 43°30'09", long 85°20'33", in SW¼ SW¼ sec.24, T.13 N., R.9 W., Mecosta County, 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 mi² (357 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 920 ft (280 m) from topographic map.

AVERAGE DISCHARGE.--7 years, 118 ft³/s (3.342 m³/s), 11.61 in/yr (295 mm/yr).

EXTREMES.--Current year: Maximum discharge, 479 ft³/s (13.6 m³/s) Jan. 19 (gage height, 3.84 ft or 1.170 m); maximum gage height, 3.89 ft (1.186 m) Jan. 20; minimum discharge, 52 ft³/s (1.47 m³/s) Sept. 14.

Period of record: Maximum discharge, 698 ft³/s (19.8 m³/s) Dec. 8, 1966 (gage height, 4.73 ft or 1.442 m); minimum, 31 ft³/s (0.88 m³/s) June 3, 1972 (gage height, 1.59 ft or 0.485 m).

REMARKS.--Records good except those for winter periods, which are fair. Some regulation from dams above station. Records of water temperature for current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	112	142	116	280	141	114	269	218	187	118	88	67
2	106	154	112	250	205	120	285	271	171	107	162	65
3	100	162	112	220	239	149	257	239	175	103	153	62
4	98	152	112	200	205	253	233	201	199	96	112	62
5	92	142	108	180	183	337	213	173	199	90	94	67
6	96	134	105	170	171	289	193	151	187	85	89	62
7	102	149	105	160	161	351	185	151	167	81	85	60
8	98	226	110	150	145	381	171	263	151	81	87	64
9	88	232	110	140	135	357	159	283	137	80	99	60
10	86	206	105	140	130	283	169	253	116	80	96	58
11	86	174	105	150	120	271	181	229	111	74	89	58
12	84	142	95	150	115	323	193	199	107	76	85	57
13	94	156	105	150	115	337	197	185	107	78	78	57
14	86	142	110	140	118	333	187	171	101	76	78	55
15	80	134	110	142	122	321	179	159	98	74	80	55
16	82	126	110	140	120	295	187	151	105	72	78	55
17	82	124	115	140	120	261	199	149	103	71	76	64
18	78	126	120	220	120	229	181	143	101	71	76	83
19	78	126	120	426	120	213	173	139	99	71	74	72
20	76	124	115	360	125	227	163	135	96	71	83	69
21	102	122	116	270	120	217	165	133	92	71	83	65
22	179	122	120	260	115	205	225	130	87	67	71	69
23	366	120	122	321	118	195	213	130	85	67	74	69
24	380	118	120	287	116	185	183	128	85	67	76	65
25	330	120	122	239	112	181	161	126	85	74	76	67
26	256	128	120	223	110	173	155	141	83	76	80	78
27	208	132	118	200	115	163	145	139	83	85	85	76
28	192	126	118	190	115	155	137	308	134	76	76	72
29	178	118	116	170	-----	163	132	405	145	74	67	72
30	162	112	172	160	-----	205	145	331	135	74	67	71
31	146	-----	320	150	-----	199	-----	235	-----	76	67	-----
TOTAL	4,305	4,291	3,764	6,378	3,831	7,485	5,635	6,069	3,731	2,462	2,684	1,956
MEAN	139	143	121	206	137	241	188	196	124	79.4	86.6	65.2
MAX	380	232	320	426	239	381	285	405	199	118	162	83
MIN	76	112	95	140	110	114	132	126	83	67	67	55
CFSM	1.01	1.04	.83	1.49	.99	1.75	1.36	1.42	.90	.58	.63	.47
IN.	1.16	1.16	1.01	1.72	1.03	2.02	1.52	1.64	1.01	.66	.72	.53

CAL YR 1972 TOTAL 43,294 MEAN 118 MAX 548 MIN 48 CFSM .86 IN 11.67
 WTR YR 1973 TOTAL 52,551 MEAN 144 MAX 426 MIN 55 CFSM 1.04 IN 14.18

PEAK DISCHARGE (BASE, 400 FT³/s)

DATE	TIME	G.H.	DISCHARGE
10-23	2000	3.52	402
01-19	2000	3.84	479
03-08	0100	3.53	407
05-29	1300	3.68	439

STREAMS TRIBUTARY TO LAKE MICHIGAN

04122000 Muskegon River at Newaygo, Mich.

LOCATION.--Lat 43°25'20", long 85°48'04", in NE¼ NE¼ sec.24, T.12 N., R.13 W., Newaygo County, on left bank near nonoperative power-plant at Newaygo, 600 ft (183 m) downstream from Penoyer Creek and at mile 39.1 (62.9 km).

DRAINAGE AREA.--2,350 mi² (6,090 km²), 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.

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.

AVERAGE DISCHARGE.--51 years (1909-14, 1916-19, 1930-73), 1,928 ft³/s (54.60 m³/s), 11.14 in/yr (283 mm/yr).

EXTREMES.--Current year: Maximum discharge, 6,390 ft³/s (181 m³/s) Mar. 9 (gage height, 10.67 ft or 3.252 m); minimum daily, 993 ft³/s (28.1 m³/s) Sept. 11.

Period of record: Maximum daily discharge, 14,950 ft³/s (423 m³/s) Mar. 25, 1913; minimum, 52 ft³/s (1.47 m³/s) Oct. 2, 1965 (gage height, 5.31 ft or 1.618 m), result of regulation during pipeline repair; minimum daily, 330 ft³/s (9.35 m³/s) Feb. 15, 1914.

REMARKS.--Records good, except those for periods of indefinite stage-discharge relation, which are poor. Flow regulated by power-plants 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.

REVISIONS (WATER YEARS).--WSP 974: 1933, 1935, 1937-38. WSP 1307: 1940 (M). See also PERIOD OF RECORD.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,680	2,680	2,200	4,250	3,330	2,340	3,090	2,900	3,360	2,250	1,320	1,150
2	1,670	2,240	1,900	3,660	3,340	2,660	3,520	3,300	3,260	2,250	1,520	1,020
3	1,530	2,370	2,100	3,660	3,330	2,860	3,370	3,310	2,950	2,260	1,730	1,020
4	1,360	2,370	1,200	3,680	3,330	2,800	3,550	3,190	3,440	1,240	1,660	1,020
5	1,340	2,250	1,450	3,500	3,460	3,810	3,540	2,770	3,660	1,440	1,270	1,060
6	1,340	2,240	1,450	2,900	3,660	4,490	3,550	2,490	3,500	2,040	1,470	1,150
7	1,320	2,540	1,900	1,800	3,640	4,910	3,560	2,390	3,050	2,250	1,710	1,150
8	1,300	2,110	1,450	1,950	3,640	5,610	3,550	2,520	2,400	1,340	1,660	1,150
9	1,290	3,570	1,450	2,230	3,480	6,160	3,440	2,400	1,810	1,220	1,470	1,150
10	1,320	3,300	1,450	2,360	3,110	6,190	3,250	3,420	1,780	1,350	1,710	1,090
11	1,290	2,430	1,100	2,480	2,900	6,120	3,120	3,670	2,180	1,340	1,520	993
12	1,140	1,820	1,860	2,170	2,530	6,150	2,850	3,650	2,280	1,340	1,260	1,010
13	1,500	2,260	1,880	1,800	2,210	6,120	2,970	3,660	1,790	1,340	1,230	1,030
14	1,330	2,890	1,630	1,830	2,210	6,190	2,860	3,440	1,970	1,330	1,030	1,030
15	1,000	2,480	1,500	2,300	2,210	6,170	2,870	2,730	1,870	1,330	1,130	1,030
16	1,150	1,700	1,450	3,070	2,150	6,160	3,040	2,390	1,970	1,540	1,250	1,030
17	1,210	1,650	1,390	3,240	2,170	6,160	3,250	2,190	1,900	1,570	1,260	1,160
18	1,100	1,750	1,270	3,380	1,800	5,920	3,230	1,950	2,390	1,330	1,230	1,640
19	1,210	2,000	1,800	4,470	1,720	5,060	3,240	1,860	2,100	1,330	1,030	1,040
20	1,220	1,960	2,370	5,100	1,820	4,150	3,050	1,950	1,880	1,330	1,340	1,110
21	1,150	2,270	2,370	5,050	2,010	3,880	2,870	2,380	1,970	1,220	1,490	1,170
22	1,230	2,270	1,860	5,050	2,320	3,630	2,820	2,730	1,630	1,070	1,240	1,030
23	2,100	1,850	1,710	5,100	2,460	4,040	2,950	2,080	1,320	1,150	1,150	1,020
24	3,360	1,300	1,820	5,100	2,160	4,210	2,970	2,080	1,100	1,300	1,020	1,070
25	3,400	1,960	1,830	4,870	1,820	3,990	2,870	2,070	1,440	1,310	1,020	1,250
26	3,270	1,500	1,860	4,310	1,820	3,730	2,790	2,250	2,430	1,320	1,010	1,390
27	3,160	1,700	2,210	4,300	2,040	3,250	2,330	2,290	1,540	1,310	1,120	1,680
28	2,660	1,900	2,210	4,310	2,210	3,080	2,030	2,770	1,440	1,220	1,350	1,500
29	1,820	2,000	2,070	3,960	-----	2,840	1,820	3,720	2,070	1,240	1,340	1,220
30	1,400	2,000	1,420	3,320	-----	2,690	2,150	4,110	2,260	1,510	1,240	1,010
31	2,260	-----	2,460	3,320	-----	2,860	-----	3,530	-----	1,740	1,260	-----
TOTAL	51,920	65,340	55,580	108,520	72,880	134,500	90,690	86,060	66,540	45,830	41,040	34,373
MEAN	1,675	2,178	1,793	3,501	2,603	4,466	3,023	2,776	2,211	1,490	1,324	1,146
MAX	3,400	3,570	2,960	5,100	3,660	6,190	3,540	4,110	3,660	2,260	1,730	1,680
MIN	1,000	1,300	1,100	1,800	1,720	2,340	1,820	1,850	1,100	1,070	1,010	993
CEFS	.71	.93	.76	1.44	1.11	1.00	1.29	1.13	.94	.63	.56	.49
IN.	.82	1.03	.88	1.72	1.15	2.10	1.44	1.36	1.05	.73	.65	.54
CAL YR 1972	TOTAL 670,832	MEAN 1,833	MAX 5,160	MIN 600	CEFS 1.78	IN 10.62						
WTR YR 1973	TOTAL 857,313	MEAN 2,340	MAX 6,190	MIN 993	CEFS 1.00	IN 13.57						

NOTE.--Stage-discharge relation indefinite Oct. 12, 13, 15, 16, 21, 30, Nov. 16-18, 24, Nov. 26 to Dec. 11.

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04122100 Bear Creek near Muskegon, Mich.

LOCATION.--Lat $43^{\circ}17'19''$, long $86^{\circ}13'22''$, in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 4, T.10 N., R.16 W., Muskegon County, 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 mi² (38.3 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 610 ft (186 m) from topographic map.

AVERAGE DISCHARGE.--8 years, 14.3 ft³/s (0.405 m³/s), 13.12 in/yr (333 mm/yr).

EXTREMES.--Current year: Maximum discharge, 262 ft³/s (7.42 m³/s) Dec. 31 (gage height, 8.36 ft or 2.548 m); minimum, 2.0 ft³/s (0.057 m³/s) Sept. 3.
Period of record: Maximum discharge, 274 ft³/s (7.76 m³/s) Feb. 10, 1966 (gage height, 8.43 ft or 2.569 m); minimum, 1.0 ft³/s (0.028 m³/s) Aug. 5, 17, 22, 1971.

REMARKS.--Records fair. Some regulation above station at low flows.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.8	19	14	90	15	14	30	48	18	12	4.5	3.4
2	8.9	24	13	40	27	21	34	70	16	14	4.6	3.2
3	8.0	29	12	26	30	43	27	50	24	19	4.5	3.6
4	7.5	23	11	22	22	58	25	34	28	13	4.2	4.2
5	7.5	21	11	19	20	48	25	26	24	10	3.9	4.5
6	7.9	18	11	17	18	44	21	21	21	8.3	3.8	3.7
7	7.9	19	10	15	17	33	19	21	16	7.3	3.4	3.7
8	7.3	32	11	16	15	27	16	70	14	6.5	3.7	3.3
9	6.6	24	11	16	14	23	16	57	13	6.5	4.1	4.2
10	6.6	20	11	16	13	21	18	33	11	7.3	10	3.7
11	6.6	18	10	16	12	28	20	27	9.4	5.7	5.9	3.0
12	7.0	16	10	15	12	36	27	23	9.4	6.0	4.6	3.3
13	6.6	15	10	15	11	29	30	20	8.8	6.2	3.9	3.2
14	6.6	15	10	15	10	37	26	18	8.0	5.7	4.2	3.2
15	6.4	14	11	15	10	40	22	16	7.3	5.4	4.4	2.9
16	7.7	13	11	16	11	28	22	15	9.0	5.0	3.9	3.7
17	7.1	13	11	27	12	21	27	14	9.6	5.0	4.4	5.2
18	7.0	13	12	40	11	22	21	13	8.3	4.6	5.0	5.4
19	7.0	12	12	58	11	24	19	14	8.0	4.5	4.8	4.5
20	7.0	12	15	48	11	26	18	13	8.0	5.2	6.7	4.2
21	13	12	16	29	11	22	29	12	7.3	5.6	5.0	4.1
22	30	12	17	29	11	19	62	12	7.1	4.6	3.9	5.2
23	109	12	17	38	11	18	42	15	7.1	3.9	4.6	4.8
24	80	11	17	29	11	17	25	13	7.3	4.4	5.1	4.2
25	43	12	18	24	11	16	20	14	6.5	4.6	4.4	4.2
26	30	14	19	22	11	16	18	15	6.0	7.3	4.5	4.5
27	24	17	18	21	11	14	16	14	5.9	6.0	3.7	4.1
28	24	16	17	20	11	14	14	48	7.0	5.1	3.8	4.1
29	23	13	15	16	-----	16	14	31	22	5.2	3.7	4.5
30	19	13	65	15	-----	18	22	22	16	5.0	3.3	4.2
31	18	-----	207	13	-----	17	-----	18	-----	5.2	3.6	-----
TOTAL	560.0	502	648	798	390	810	725	817	363.0	214.1	140.1	120.0
MEAN	18.1	16.7	20.9	25.7	13.9	26.1	24.2	26.4	12.1	6.91	4.52	4.00
MAX	109	32	202	90	30	58	62	70	28	19	10	5.4
MIN	6.4	11	10	13	10	14	14	12	5.9	3.9	3.3	2.9
CFSM	1.22	1.13	1.41	1.74	.94	1.76	1.64	1.78	.82	.47	.31	.27
IN.	1.41	1.26	1.63	2.01	.98	2.04	1.82	2.05	.91	.54	.35	.30

CAL YR 1972 TOTAL 4,642.4 MEAN 12.7 MAX 202 MIN 2.9 CFSM .86 IN 11.67
WTR YR 1973 TOTAL 6,087.2 MEAN 16.7 MAX 202 MIN 2.9 CFSM 1.13 IN 15.30

PEAK DISCHARGE (BASE, 100 FT³/S).--Oct. 23 (1600) 137 ft³/s (7.38 ft); Dec. 31 (0500) 262 ft³/s (8.36 ft).

STREAMS TRIBUTARY TO LAKE MICHIGAN

04122200 White River near Whitehall, Mich.

LOCATION.--Lat $43^{\circ}27'51''$, long $86^{\circ}13'57''$, in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 4, T.12 N., R.16 W., Muskegon County, 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 mi² (980 km²), 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.

AVERAGE DISCHARGE.--16 years, 392 ft³/s (11.10 m³/s) 14.01 in/yr (356 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,310 ft³/s (37.1 m³/s) Jan. 2 (gage height, 5.51 ft or 1.679 m); minimum, 222 ft³/s (6.29 m³/s) Sept. 13, 15.
Period of record: Maximum discharge, 3,740 ft³/s (106 m³/s) Apr. 17, 1967 (gage height, 6.76 ft or 2.060 m); minimum, 163 ft³/s (4.62 m³/s) Aug. 18, 19, 1958.

REMARKS.--Records good except those for the winter periods, which are fair. Some regulation from dams above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	328	389	351	1,000	488	478	498	525	607	433	254	237
2	308	384	346	850	490	623	563	638	599	389	268	231
3	285	392	342	750	548	792	639	840	575	362	275	227
4	268	416	333	650	602	802	626	849	539	346	261	230
5	260	415	328	600	575	774	599	798	559	320	256	258
6	262	402	337	550	545	796	581	749	581	302	248	260
7	262	388	330	520	512	774	545	688	597	291	242	243
8	260	394	340	500	485	726	514	669	566	281	239	236
9	255	430	350	480	430	712	492	811	498	276	266	233
10	249	450	350	490	420	729	495	884	446	272	303	230
11	249	446	340	500	420	754	499	793	406	267	283	227
12	250	427	340	510	430	760	512	748	380	266	272	225
13	245	399	350	510	430	865	543	708	368	269	258	224
14	244	375	350	500	430	890	590	650	356	267	249	224
15	242	357	340	490	420	782	588	590	340	266	245	223
16	247	355	340	500	420	718	568	543	347	263	241	224
17	247	348	350	530	420	671	566	511	392	259	238	234
18	247	336	370	600	440	660	599	489	435	255	241	261
19	247	331	400	730	450	640	574	478	457	252	266	262
20	247	329	400	860	460	630	533	478	465	251	294	254
21	264	326	400	1,000	470	616	524	469	409	251	288	248
22	326	327	390	856	475	595	578	452	365	249	262	251
23	449	325	390	806	460	569	750	440	343	246	254	250
24	629	323	390	813	435	540	755	431	330	243	253	246
25	803	322	392	746	420	513	679	425	319	249	252	244
26	729	332	395	671	440	493	625	428	312	263	248	244
27	640	347	402	632	450	473	557	482	308	272	243	249
28	590	364	399	602	445	455	496	563	309	272	238	248
29	543	362	391	566	-----	447	465	628	377	267	234	247
30	471	353	445	532	-----	449	470	668	443	260	230	243
31	418	-----	582	518	-----	462	-----	622	-----	255	235	-----
TOTAL	11,064	11,144	11,563	19,862	13,010	20,188	17,023	19,047	13,028	8,714	7,936	7,213
MEAN	357	371	373	641	465	651	567	614	434	281	256	240
MAX	803	450	582	1,000	602	890	755	884	607	433	303	262
MIN	242	322	328	480	420	447	465	425	308	243	230	223
CFSM	.94	.98	.98	1.69	1.22	1.71	1.49	1.62	1.14	.74	.67	.63
IN.	1.08	1.09	1.13	1.94	1.27	1.98	1.67	1.86	1.28	.85	.78	.71

CAL YR 1972 TOTAL 131,811 MEAN 360 MAX 1,440 MIN 226 CFSM .95 IN 12.90
WTR YR 1973 TOTAL 159,792 MEAN 438 MAX 1,000 MIN 223 CFSM 1.15 IN 15.64

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04122500 Pere Marquette River at Scottville, Mich.

LOCATION.--Lat $43^{\circ}56'42''$, long $86^{\circ}16'43''$, in NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 19, T.18 N., R.16 W., Mason County, 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 mi² (1,836 km²).

PERIOD OF RECORD.--August 1939 to current year. Prior to October 1942, published as "at Custer".

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.

AVERAGE DISCHARGE.--34 years, 634 ft³/s (17.95 m³/s), 12.14 in/yr (308 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,670 ft³/s (47.3 m³/s) Jan. 22 (gage height, 4.68 ft or 1.426 m); maximum gage height, 5.85 ft (1.783 m) Jan. 6; minimum discharge, 368 ft³/s (10.4 m³/s) Sept. 17.
Period of record: Maximum discharge, 2,970 ft³/s (84.1 m³/s) July 1, 1969 (gage height, 6.26 ft or 1.908 m); minimum, 209 ft³/s (5.92 m³/s) Dec. 11, 1962, (discharge measurement); minimum daily, 310 ft³/s (8.78 m³/s) Aug. 9, 10, 1941.

REMARKS.--Records good except those for the winter periods, which are fair. Some regulation above station. Record of water temperatures for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1437: 1941 (M), 1943 (M), 1949 (M), 1950.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	540	612	564	1,000	800	706	787	732	897	666	443	393
2	522	618	565	1,100	889	722	831	798	826	635	441	388
3	495	635	562	1,150	948	789	871	901	794	598	467	384
4	478	656	552	1,100	984	920	909	1,020	774	588	481	386
5	458	672	567	1,000	980	1,030	908	1,050	778	569	458	421
6	447	648	530	900	934	1,130	889	1,020	778	551	436	421
7	443	623	530	850	883	1,240	867	971	759	532	423	407
8	439	635	540	800	800	1,320	841	959	730	518	421	395
9	433	669	560	800	750	1,400	817	975	701	509	454	390
10	425	700	560	800	720	1,440	815	1,060	679	509	488	384
11	423	686	540	810	700	1,360	807	1,120	659	498	502	381
12	421	643	540	820	700	1,220	814	1,110	641	495	474	379
13	419	612	560	820	710	1,180	843	1,050	648	502	447	375
14	419	588	560	810	720	1,360	880	978	650	512	429	373
15	421	572	550	800	720	1,500	890	916	621	499	420	370
16	425	560	540	800	690	1,510	892	860	612	484	413	370
17	401	550	560	840	670	1,520	903	814	632	475	407	377
18	423	543	600	900	690	1,410	921	780	663	472	430	391
19	423	538	640	1,140	720	1,250	921	760	669	475	436	405
20	423	533	650	1,360	720	1,140	879	739	644	477	440	411
21	447	530	640	1,470	730	1,080	882	722	610	475	433	407
22	504	530	640	1,620	730	1,040	900	706	585	464	425	409
23	644	528	640	1,430	720	1,000	928	693	591	453	414	415
24	766	526	646	1,320	700	950	968	682	573	446	412	417
25	853	525	632	1,280	660	905	942	676	570	453	415	405
26	923	533	644	1,220	690	862	874	681	561	460	415	401
27	801	549	653	1,130	700	826	815	697	552	467	409	401
28	799	567	648	1,080	700	795	770	776	560	481	403	403
29	727	574	646	1,020	-----	770	735	821	663	476	393	403
30	676	566	742	956	-----	756	712	898	666	462	390	397
31	649	-----	921	851	-----	756	-----	936	-----	450	393	-----
TOTAL	16,753	17,721	18,709	31,977	21,348	33,867	25,811	26,901	20,076	15,651	13,412	11,859
MEAN	540	501	604	1,032	762	1,092	860	868	669	505	433	395
MAX	923	700	921	1,620	984	1,520	968	1,120	897	666	502	421
MIN	401	525	530	800	660	706	712	676	552	446	390	370
CFSM	.76	.93	.85	1.46	1.07	1.54	1.21	1.22	.94	.71	.61	.56
IN.	.88	.92	.99	1.69	1.12	1.78	1.35	1.41	1.05	.92	.70	.62

CAL YR 1972 TOTAL 223,240 MEAN 610 MAX 1,240 MIN 401 CFSM .86 IN 11.71
WTR YR 1973 TOTAL 254,085 MEAN 626 MAX 1,620 MIN 370 CFSM .99 IN 13.33

LOCATION.--Lat $44^{\circ}07'13''$, long $86^{\circ}16'48''$, in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 24, T.20 N., R.17 W., Mason County, near center span on downstream side of bridge on U.S. Highway 31, 3.4 mi (5.5 km) northwest of Freesoil, and 7 mi (11 km) upstream from Hamlin Lake.

PERIOD OF RECORD.--May 1942 to December 31, 1973 (discontinued as a continuous-record station, converted to a crest-stage partial-record station). Monthly discharge only for some periods, published in WSP 1307.

AVERAGE DISCHARGE.--31 years, 140 ft³/s (3.965 m³/s), 14.97 in/yr (380 mm/yr).

EXTREMES.--Current year: Maximum discharge, 277 ft³/s (7.84 m³/s) Mar. 17 (gage height, 2.61 ft or 0.796 m); minimum, 95 ft³/s (2.69 m³/s) Sept. 13.
Period Oct. 1 to Dec. 31, 1973: Maximum discharge, 152 ft³/s (4.30 m³/s) Dec. 8 (gage height, 1.73 ft or 0.527 m); minimum, 98 ft³/s (2.78 m³/s) Oct. 1.
Period of record: Maximum discharge, 555 ft³/s (15.7 m³/s) Apr. 7, 1959 (gage height, 3.4 ft or 1.04 m, from floodmark); maximum gage height, 3.7 ft (1.13 m) Feb. 16, 1967 (backwater from ice); minimum discharge, 65 ft³/s (1.84 m³/s) Dec. 11, 1962 (discharge measurement); minimum daily discharge, 81 ft³/s (2.29 m³/s) Aug. 14, 1944.

REMARKS.--Records good except those for the winter periods and those for periods of no gage-height record, which are fair.

REVISIONS (WATER YEARS).--WSP 1437: 1946 (M), 1947. WSP 1727: 1953 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	140	134	135	250	140	135	150	148	145	155	110	103
2	136	138	134	190	160	140	154	152	140	138	109	102
3	128	142	133	170	185	166	155	162	145	134	109	100
4	121	140	132	160	185	190	155	165	148	130	109	97
5	114	140	125	155	180	214	154	162	147	120	105	103
6	112	134	120	140	172	226	153	155	144	116	103	108
7	111	135	115	130	160	240	153	154	140	113	103	106
8	110	140	120	140	152	254	153	160	135	110	103	102
9	104	142	120	145	145	252	153	170	133	108	106	100
10	103	142	120	145	138	248	153	177	140	104	108	99
11	101	139	115	145	135	230	156	184	135	104	104	97
12	100	135	110	145	135	216	160	183	127	109	102	96
13	100	133	110	140	130	210	166	175	127	110	101	96
14	100	132	120	140	130	220	166	166	123	116	100	96
15	100	130	120	144	125	250	170	163	119	110	100	96
16	99	128	115	145	125	273	172	158	116	107	99	98
17	99	127	115	161	125	275	173	152	117	106	99	99
18	102	126	120	200	125	240	173	150	119	103	106	99
19	97	125	129	243	125	218	168	147	118	123	115	100
20	98	125	140	266	125	196	171	145	115	134	110	100
21	107	123	148	260	130	186	196	141	113	129	108	101
22	120	123	146	261	130	178	190	140	112	120	106	114
23	164	122	145	245	130	171	186	138	112	116	106	120
24	176	122	145	212	130	166	176	134	111	115	105	107
25	190	123	145	200	130	160	168	135	111	116	104	102
26	190	125	145	189	125	158	155	135	110	120	102	100
27	180	133	145	180	130	155	148	140	108	122	101	101
28	174	136	144	180	135	152	144	160	116	121	100	100
29	160	136	146	179	-----	148	140	170	157	115	97	100
30	140	136	170	155	-----	145	140	163	164	114	101	100
31	133	-----	220	138	-----	146	-----	153	-----	113	103	-----
TOTAL	3,909	3,966	4,147	5,553	3,937	6,158	4,851	4,837	3,847	3,651	3,234	3,042
MEAN	126	132	134	179	141	199	162	156	128	118	104	101
MAX	190	142	220	266	185	275	196	184	164	155	115	120
MIN	97	122	110	130	125	135	140	134	108	103	97	96
CFSM	.99	1.04	1.06	1.41	1.11	1.57	1.28	1.23	1.01	.93	.82	.80
IN.	1.14	1.16	1.21	1.63	1.15	1.80	1.42	1.42	1.13	1.07	.95	.89
CAL YR 1972	TOTAL 49,861		MEAN 136	MAX 296	MIN 97	CFSM 1.07	IN 14.60					
WTR YR 1973	TOTAL 51,132		MEAN 140	MAX 275	MIN 96	CFSM 1.10	IN 14.98					

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04123000 Big Sable River near Freesoil, Mich.--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

[illegible]

CAL YR 1973	TOTAL 50,613	MEAN 139	MAX 275	MIN 96	CFSM 1.09	IN 14.83
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STREAMS TRIBUTARY TO LAKE MICHIGAN

04123500 Manistee River near Grayling, Mich.

LOCATION.--Lat $44^{\circ}41'35''$, long $84^{\circ}50'50''$, in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 31, T.27 N., R.4 W., Crawford County, 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 mi² (412 km²).

PERIOD OF RECORD.--October 1942 to December 31, 1973 (discontinued as a continuous-record station, converted to a crest-stage partial-record station). Monthly discharge only for October 1942, published in WSP 1307.

GAGE.--Water-stage recorder. Datum of gage is 1,120.64 ft (341.571 m) above mean sea level (levels by Michigan Department of Natural Resources).

AVERAGE DISCHARGE.--31 years, 184 ft³/s (5.211 m³/s), 15.72 in/yr (399 mm/yr).

EXTREMES.--Current year: Maximum discharge, 264 ft³/s (7.48 m³/s) Oct. 24 (gage height, 1.15 ft or 0.351 m); minimum, 148 ft³/s (4.19 m³/s) Dec. 17.
 Period Oct. 1 to Dec. 31, 1973: Maximum discharge, 225 ft³/s (6.37 m³/s) Dec. 6 (gage height, 0.92 ft or 0.280 m); minimum, 152 ft³/s (4.30 m³/s) Dec. 17.
 Period of record: Maximum discharge, 388 ft³/s (11.0 m³/s) Apr. 18, 1960 (gage height, 1.88 ft or 0.573 m); maximum gage height, 2.43 ft (0.741 m) Feb. 7, 1967 (backwater from ice); minimum discharge, 114 ft³/s (3.23 m³/s) Jan. 27, 1971, result of freezeup.

REMARKS.--Records good. Records of water temperature for the current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	217	191	188	232	195	186	208	198	193	222	203	177
2	202	195	186	205	208	190	227	208	198	208	214	177
3	193	200	186	200	217	198	234	205	198	205	222	172
4	190	196	185	190	207	200	222	205	203	193	196	172
5	186	195	185	180	198	200	215	200	196	188	186	182
6	186	193	183	175	195	210	210	193	193	188	180	180
7	185	196	177	175	195	230	205	193	191	185	180	174
8	185	205	188	175	191	240	205	188	193	183	180	172
9	183	200	183	175	190	230	202	203	207	182	188	172
10	182	196	183	175	191	240	207	214	196	182	182	170
11	183	195	183	180	185	245	203	208	188	180	178	170
12	185	191	169	180	180	250	205	202	188	185	180	169
13	183	190	185	180	180	241	205	196	186	191	177	167
14	182	190	188	185	180	241	202	193	185	185	177	169
15	182	190	185	185	188	242	202	191	183	182	175	169
16	183	188	169	186	170	234	205	193	182	180	174	170
17	182	188	164	191	170	225	208	195	183	180	180	172
18	183	188	191	207	175	217	202	193	190	178	193	177
19	182	188	200	239	180	215	200	191	188	178	182	174
20	183	186	186	234	180	214	200	188	186	178	185	174
21	188	188	183	214	180	210	202	186	183	177	178	172
22	202	186	183	214	180	207	202	185	183	175	175	234
23	242	186	182	217	186	205	196	185	182	172	174	230
24	256	186	182	210	186	203	193	183	182	172	175	202
25	225	186	180	205	175	203	193	185	180	185	174	188
26	210	188	183	200	170	205	193	214	182	186	175	185
27	203	191	182	198	170	203	193	208	198	207	175	183
28	200	193	180	198	180	203	190	222	219	207	172	180
29	196	188	182	190	-----	205	191	219	229	193	170	180
30	195	186	202	200	-----	207	191	205	239	191	170	178
31	191	-----	241	202	-----	205	-----	193	-----	200	180	-----
TOTAL	6,045	5,739	5,749	6,097	5,202	6,704	6,111	6,142	5,804	5,818	5,650	5,391
MEAN	195	191	185	197	186	216	204	198	193	188	182	180
MAX	256	205	241	239	217	250	234	222	239	222	222	234
MIN	182	186	164	175	170	186	190	183	180	172	170	167
CFSM	1.23	1.20	1.16	1.24	1.17	1.36	1.28	1.25	1.21	1.18	1.14	1.13
IN.	1.41	1.34	1.35	1.43	1.22	1.57	1.43	1.44	1.36	1.36	1.32	1.26

CAL YR 1972 TOTAL 70,508 MEAN 193 MAX 280 MIN 160 CFSM 1.21 IN 16.50
 WTR YR 1973 TOTAL 70,452 MEAN 193 MAX 256 MIN 164 CFSM 1.21 IN 16.48

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04123500 Manistee River near Grayling, Mich.

DISCHARGE, IN CURIC FEET PER SECOND, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	177	200	183									
2	183	205	182									
3	202	195	185									
4	188	188	185									
5	186	188	215									
6	182	186	220									
7	180	185	202									
8	180	185	193									
9	178	185	191									
10	178	185	193									
11	178	183	191									
12	177	185	190									
13	191	188	190									
14	212	191	180									
15	195	193	180									
16	186	196	180									
17	188	191	170									
18	191	188	175									
19	188	191	180									
20	188	191	180									
21	185	191	185									
22	182	193	186									
23	182	188	188									
24	182	186	190									
25	180	185	193									
26	180	185	195									
27	180	188	193									
28	196	188	190									
29	200	188	188									
30	191	186	183									
31	186	-----	180									
TOTAL	5,772	5,683	5,839									
MEAN	186	189	186									
MAX	212	205	220									
MIN	177	183	170									
CFSM	1.17	1.19	1.18									
IN.	1.35	1.33	1.37									

CAL YR 1973 TOTAL 70,213 MEAN 192 MAX 250 MIN 167 CFSM 1.21 IN 16.43

STREAMS TRIBUTARY TO LAKE MICHIGAN

04124000 Manistee River near Sherman, Mich.

LOCATION.--Lat 44°26'11", long 85°41'55", in NE¼ NE¼ sec.36, T.24 N., R.12 W., Wexford County, 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 mi² (2331 km²).

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.

GAGE.--Nonrecording gage. Altitude of gage is 804 ft (245 m) from river-profile map. Prior to Apr. 13, 1934, at various datums.

AVERAGE DISCHARGE.--53 years (1903-15, 1930-31, 1933-73), 1,056 ft³/s (29.91 m³/s) 15.93 in/yr (405 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,070 ft³/s (58.6 m³/s) Mar. 15 (gage height, 13.56 ft or 4.133 m); maximum gage height, 13.70 ft (4.176 m) Jan. 7 (backwater from ice); minimum discharge, 742 ft³/s (21.0 m³/s) Sept. 14.

Period of record: Maximum discharge, 3,570 ft³/s (101 m³/s) Mar. 25, 1913 (gage height, 7.1 ft or 2.16 m), from graph based on gage readings, datum then in use; minimum daily, 540 ft³/s (15.3 m³/s) Feb. 21-23, 1936.

REMARKS.--Records good except those for winter periods, which are fair.

REVISIONS (WATER YEARS).--WSP 1004, 1936 (m). WSP 1307: 1911, 1913-14 (M), 1934 (M), 1936 (M), 1937, 1939-40 (M). WSP 1437: 1911, 1913 (M), 1937.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,300	1,010	931	1,200	1,120	1,070	1,210	1,060	1,230	1,320	970	775
2	1,230	1,000	931	1,100	1,220	1,050	1,260	1,120	1,160	1,320	1,080	778
3	1,130	1,010	925	1,050	1,340	1,100	1,310	1,140	1,120	1,280	1,060	781
4	1,030	1,020	910	1,000	1,330	1,330	1,380	1,140	1,150	1,200	955	802
5	970	1,010	880	970	1,300	1,750	1,380	1,130	1,170	1,120	940	808
6	940	991	916	950	1,230	1,750	1,330	1,100	1,150	1,040	898	796
7	913	994	877	950	1,160	1,530	1,310	1,090	1,090	974	874	784
8	913	1,070	910	970	1,130	1,310	1,290	1,100	1,050	931	859	778
9	895	1,110	940	980	1,070	1,860	1,260	1,130	1,040	910	862	769
10	880	1,080	950	980	1,050	1,820	1,220	1,160	1,080	898	868	754
11	868	1,040	930	980	1,050	1,750	1,190	1,210	1,070	895	865	757
12	865	1,010	880	970	1,050	1,770	1,200	1,210	1,040	895	847	757
13	862	985	960	960	1,000	1,800	1,240	1,170	1,000	901	829	754
14	865	970	950	940	1,000	1,900	1,270	1,140	981	904	823	745
15	856	955	940	920	1,050	2,050	1,280	1,100	970	895	820	745
16	856	946	900	950	1,050	1,980	1,300	1,080	960	883	817	751
17	856	940	860	1,100	1,000	1,860	1,310	1,070	936	856	814	760
18	865	931	970	1,540	1,000	1,680	1,280	1,060	942	844	814	766
19	865	928	1,050	1,840	1,000	1,520	1,260	1,050	950	835	808	784
20	859	925	990	1,860	1,050	1,420	1,230	1,030	950	856	835	793
21	874	922	960	1,660	1,050	1,370	1,270	1,020	946	853	826	796
22	952	916	950	1,510	1,050	1,310	1,270	1,010	928	832	814	907
23	1,260	910	950	1,540	1,050	1,280	1,220	998	922	826	808	961
24	1,570	910	946	1,530	1,050	1,250	1,170	984	918	826	805	979
25	1,560	910	940	1,450	1,050	1,230	1,130	978	914	823	805	967
26	1,500	916	943	1,370	1,000	1,220	1,100	988	900	859	805	922
27	1,400	937	940	1,330	1,000	1,210	1,080	1,010	922	907	811	901
28	1,270	949	937	1,280	1,000	1,190	1,050	1,190	1,180	955	805	877
29	1,160	943	923	1,220	-----	1,170	1,030	1,390	1,230	925	793	862
30	1,100	928	991	1,110	-----	1,180	1,030	1,470	1,310	910	787	844
31	1,040	-----	1,210	1,050	-----	1,200	-----	1,340	-----	937	781	-----
TOTAL	32,504	29,166	29,295	37,260	30,450	45,910	30,860	34,668	31,209	29,410	26,478	24,453
MEAN	1,049	972	945	1,202	1,088	1,461	1,229	1,118	1,040	949	854	815
MAX	1,570	1,110	1,210	1,860	1,340	2,050	1,380	1,470	1,310	1,320	1,080	979
MIN	856	910	860	920	1,000	1,050	1,030	978	900	823	781	745
CFSM	1.17	1.08	1.05	1.34	1.21	1.65	1.37	1.24	1.16	1.05	.95	.91
IN.	1.34	1.21	1.21	1.54	1.26	1.90	1.52	1.43	1.29	1.22	1.09	1.01
CAL YR 1972	TOTAL 371,929	MEAN 1,016	MAX 2,200	MIN 796	CFSM 1.13	IN 15.37						
WTR YR 1973	TOTAL 387,663	MEAN 1,062	MAX 2,050	MIN 745	CFSM 1.18	IN 16.02						

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04125500 Pine River near Hoxeyville, Mich.

LOCATION.--Lat $44^{\circ}12'11''$, long $85^{\circ}47'58''$, in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 20, T.21 N., R.12 W., Wexford County, 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 mi (12.9 km) upstream from mouth.

DRAINAGE AREA.--251 mi² (650 km²).

PERIOD OF RECORD.--July 1952 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 775 ft (236 m) by barometer.

AVERAGE DISCHARGE.--21 years, 281 ft³/s (7.96 m³/s), 15.20 in/yr (386 mm/yr).

EXTREMES.--Current year: Maximum discharge, 741 ft³/s (21.0 m³/s) Jan. 20 (gage height, 4.22 ft or 1.286 m); minimum, 186 ft³/s (5.27 m³/s) Feb. 17.

Period of record: Maximum discharge, 2,440 ft³/s (69.1 m³/s) Aug. 6, 1956 (gage height, 6.82 ft or 2.079 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s); minimum, 161 ft³/s (4.56 m³/s) Feb. 2, 1961.

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	318	254	241	521	273	242	358	282	295	265	237	218
2	285	259	241	370	307	250	385	361	303	249	237	217
3	258	299	238	340	398	285	370	375	282	246	232	217
4	244	315	237	310	363	370	366	355	281	254	226	229
5	234	294	233	300	330	479	361	327	278	237	219	250
6	231	278	239	270	306	460	339	299	272	229	218	251
7	229	280	224	250	291	525	345	287	265	226	219	230
8	231	323	235	260	274	649	368	333	256	225	218	225
9	223	342	241	260	250	610	344	413	258	220	223	223
10	219	308	241	263	240	495	330	423	255	220	222	220
11	218	286	238	261	236	462	319	391	247	218	225	222
12	217	273	239	258	240	529	337	348	246	220	219	219
13	220	264	241	258	247	558	355	323	244	227	216	218
14	224	257	243	250	244	590	355	303	236	227	216	218
15	223	252	241	248	241	674	355	289	232	221	216	219
16	222	248	244	247	214	619	362	281	230	218	214	218
17	220	245	234	258	222	521	391	286	233	215	217	223
18	219	244	247	366	254	436	371	280	252	215	246	234
19	220	243	244	648	244	390	333	269	246	225	243	236
20	220	243	243	706	240	385	321	264	243	233	246	237
21	232	241	244	506	240	370	331	260	237	231	241	240
22	266	239	245	443	241	347	371	262	231	224	228	253
23	434	240	246	484	242	331	360	257	231	216	223	273
24	557	237	246	472	240	320	320	251	234	212	224	252
25	477	237	245	397	242	314	298	246	230	218	225	237
26	374	241	247	364	232	308	284	249	225	228	224	234
27	315	249	246	347	241	299	274	252	236	256	222	239
28	289	250	244	333	241	291	267	322	234	250	221	238
29	242	243	244	309	-----	288	261	418	259	233	217	235
30	270	238	300	280	-----	296	261	363	278	229	216	229
31	260	-----	488	278	-----	342	-----	307	-----	232	219	-----
TOTAL	8,431	7,922	7,779	10,857	7,333	13,035	10,092	9,676	7,549	7,119	6,969	6,954
MEAN	272	264	251	350	262	420	336	312	252	230	225	232
MAX	557	342	488	706	398	674	391	423	303	265	246	273
MIN	217	237	224	247	214	242	261	246	225	212	214	217
CFSM	1.08	1.05	1.00	1.39	1.04	1.67	1.34	1.24	1.00	.92	.90	.92
IN.	1.25	1.17	1.15	1.61	1.09	1.93	1.50	1.43	1.12	1.06	1.03	1.03

CAL YR 1972 TOTAL 99,294 MEAN 271 MAX 885 MIN 192 CFSM 1.08 IN 14.72

WTR YR 1973 TOTAL 103,716 MEAN 284 MAX 706 MIN 212 CFSM 1.13 IN 15.37

PEAK DISCHARGE (BASE, 650 FT³/S).--Jan. 20 (1000) 741 ft³/s (4.22 ft); Mar. 15 (1600) 695 ft³/s (4.08 ft).

STREAMS TRIBUTARY TO LAKE MICHIGAN

04126000 Manistee River near Manistee, Mich.

LOCATION.--Lat 44°16'14", long 86°11'56", in NW¼ NW¼ sec.36, T.22 N., R.16 W., Manistee County, on right bank 6.4 mi (10.3 km) north-east of Manistee, 6.4 mi (10.3 km) south of Onekama, 7.8 mi (12.6 km) upstream from Manistee Lake, and at mile 10.8 (17.4 km).

DRAINAGE AREA.--1,780 mi² (4,610 km²), 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.

AVERAGE DISCHARGE.--22 years, 1,978 ft³/s (56.02 m³/s) 15.09 in/yr (383 mm/yr).

EXTREMES.--Current year: Maximum discharge, 3,910 ft³/s (111 m³/s) Mar. 16 (gage height, 7.52 ft or 2.292 m); maximum gage height, 8.68 ft (2.646 m) Jan. 11; minimum discharge, 1,050 ft³/s (29.7 m³/s) Aug. 31.

Period of record: Maximum discharge, 6,980 ft³/s (198 m³/s) Apr. 15, 1971 (gage height, 8.22 ft or 2.505 m); maximum gage height, 9.15 ft (2.789 m) Feb. 12, 1955 (backwater from ice); minimum daily discharge, 992 ft³/s (28.1 m³/s) Oct. 10, 1966.

REMARKS.--Records good. Flow regulated at all stages by powerplant 21 mi (34 km) above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2,710	2,170	1,960	2,840	2,020	2,090	2,060	2,160	2,960	2,130	1,930	1,620
2	2,430	2,070	1,870	2,880	2,220	2,340	2,080	2,280	2,500	1,940	1,970	1,610
3	2,560	2,090	1,640	2,930	2,180	1,960	2,530	2,470	1,930	2,350	2,010	1,280
4	2,330	2,110	1,600	2,800	2,520	2,040	2,720	2,490	2,030	2,250	1,790	1,300
5	1,950	1,820	1,750	2,580	2,520	2,250	2,710	2,400	2,350	1,900	1,540	1,550
6	1,910	1,880	1,700	2,570	2,480	2,950	2,600	1,880	2,260	1,940	1,490	1,650
7	1,760	2,030	1,650	2,250	2,200	3,240	2,700	1,950	2,090	1,870	1,670	1,700
8	1,590	2,150	1,700	2,000	2,370	3,220	2,380	2,250	2,030	1,670	1,750	1,550
9	1,540	2,220	1,590	1,800	2,190	3,250	2,400	2,440	2,020	1,430	1,760	1,310
10	1,670	2,530	1,470	2,000	2,090	3,430	2,760	2,520	1,930	1,780	1,660	1,300
11	1,800	2,270	1,770	1,900	1,690	3,420	2,450	2,370	1,630	1,640	1,620	1,430
12	1,880	2,150	1,850	1,900	1,780	3,380	2,250	2,560	1,850	1,770	1,490	1,430
13	1,710	1,520	1,840	1,900	1,870	3,440	2,140	1,990	2,140	1,740	1,360	1,490
14	1,680	2,140	1,920	1,800	1,800	3,440	2,310	2,110	1,880	1,770	1,620	1,500
15	1,460	1,940	1,860	1,600	2,090	3,560	2,220	2,290	1,790	1,600	1,630	1,550
16	1,450	1,900	1,770	2,200	2,370	3,780	2,300	2,120	1,740	1,430	1,570	1,380
17	1,780	1,970	1,840	2,700	1,940	3,780	2,530	1,960	1,560	1,560	1,420	1,320
18	1,830	1,870	1,900	2,600	1,590	3,570	2,500	2,200	1,500	1,650	1,600	1,610
19	1,730	1,590	1,900	3,170	1,450	3,190	2,780	2,180	1,850	1,770	1,610	1,660
20	1,730	1,660	1,930	3,450	2,080	2,890	2,780	1,700	1,760	1,630	1,460	1,590
21	1,650	1,860	2,100	3,760	2,050	2,730	2,490	1,800	1,710	1,870	1,810	1,440
22	1,530	1,860	2,080	3,450	2,050	2,550	2,310	2,050	1,650	1,270	1,630	1,510
23	2,120	1,930	2,020	3,330	2,050	2,430	2,620	1,910	1,820	1,510	1,550	1,790
24	2,980	1,880	1,900	3,250	1,990	2,430	2,550	2,000	1,490	1,580	1,580	1,810
25	3,280	1,780	1,870	3,240	1,780	2,120	2,300	1,890	1,510	1,550	1,590	1,710
26	3,300	1,580	1,720	3,130	2,190	2,110	2,230	2,180	1,740	1,650	1,360	1,740
27	3,350	1,760	1,830	2,600	1,740	2,350	2,120	1,750	1,670	1,700	1,310	1,920
28	3,130	2,050	2,020	2,320	1,990	2,300	2,030	1,500	1,760	1,880	1,810	1,890
29	2,660	2,020	1,870	2,300	-----	2,260	1,880	2,560	2,130	1,590	1,480	1,640
30	2,050	2,030	2,010	2,340	-----	2,210	1,770	2,730	2,320	1,660	1,580	1,510
31	2,110	-----	2,410	2,190	-----	2,150	-----	2,870	-----	1,890	1,500	-----
TOTAL	65,660	58,830	57,340	79,780	57,290	86,860	71,500	67,560	57,600	53,970	50,150	46,790
MEAN	2,118	1,961	1,850	2,574	2,046	2,802	2,383	2,179	1,920	1,741	1,618	1,560
MAX	3,350	2,530	2,410	3,760	2,520	3,780	2,780	2,870	2,960	2,350	2,010	1,920
MIN	1,450	1,520	1,470	1,600	1,450	1,960	1,770	1,500	1,490	1,270	1,310	1,280
CFSM	1.19	1.10	1.04	1.45	1.15	1.57	1.74	1.22	1.08	.98	.91	.88
IN.	1.37	1.23	1.20	1.67	1.20	1.82	1.49	1.41	1.20	1.13	1.05	.98

CAL YR 1972 TOTAL 720,990 MEAN 1,970 MAX 4,500 MIN 1,100 CFSM 1.11 IN 15.07
 WTR YR 1973 TOTAL 753,330 MEAN 2,064 MAX 3,780 MIN 1,270 CFSM 1.16 IN 15.74

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04126200 Little Manistee River near Freesoil, Mich.

LOCATION.--Lat $44^{\circ}11'00''$, long $86^{\circ}10'00''$, in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 31, T.21 N., R.15 W., Manistee County, 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 mi² (518 km²).

PERIOD OF RECORD.--October 1956 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 610 ft (186 m) from survey line in vicinity.

AVERAGE DISCHARGE.--17 years, 173 ft³/s (4.899 m³/s) 11.75 in/yr (298 mm/yr).

EXTREMES.--Current year: Maximum discharge, 301 ft³/s (8.52 m³/s) Mar. 17 (gage height, 2.53 ft or 0.771 m), minimum, 123 ft³/s (3.48 m³/s) Feb. 12.

Period of record: Maximum discharge, 575 ft³/s (16.3 m³/s) Apr. 6, 1959 (gage height, 3.70 ft or 1.128 m); minimum, 71 ft³/s (2.01 m³/s) Feb. 11, 1958, result of freezeup.

REMARKS.--Records good. Some regulation above station. Records of water temperature for current year published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	176	157	151	223	170	165	208	193	200	190	143	131
2	163	161	149	199	193	170	210	210	194	176	143	128
3	155	170	147	209	210	182	216	223	192	165	143	125
4	148	174	145	201	210	202	213	222	192	158	140	131
5	145	171	144	180	196	228	210	209	192	157	138	142
6	144	165	144	160	191	241	206	198	187	154	137	141
7	143	165	135	155	184	266	213	193	184	149	137	135
8	142	173	140	155	178	277	211	209	179	148	137	131
9	140	179	147	155	172	281	208	220	182	144	138	130
10	138	174	146	155	168	275	208	226	176	144	140	130
11	138	167	144	155	154	253	208	223	174	143	140	130
12	138	162	141	158	150	251	211	215	176	148	136	129
13	137	158	146	160	164	256	214	205	173	155	130	129
14	137	155	145	162	168	275	216	197	170	149	130	129
15	137	154	143	158	165	291	211	191	165	144	129	129
16	137	152	137	156	141	294	216	190	163	142	127	129
17	136	151	139	163	145	293	219	189	163	138	130	130
18	136	151	148	185	169	259	216	187	162	137	136	133
19	135	150	150	243	170	238	208	185	162	171	138	136
20	135	149	146	270	166	227	204	183	160	182	152	138
21	144	149	146	257	165	221	224	181	157	174	142	136
22	158	148	146	264	164	216	231	179	155	163	137	150
23	208	147	146	237	164	213	225	178	155	150	134	145
24	229	146	146	225	163	208	214	176	155	144	135	143
25	226	147	146	218	163	206	203	174	152	146	134	139
26	201	149	147	205	152	203	195	181	150	158	136	136
27	180	156	146	198	160	202	190	187	157	160	133	136
28	171	158	145	195	165	200	187	208	178	157	131	137
29	166	154	145	186	-----	197	185	219	210	150	131	136
30	161	150	168	178	-----	195	188	216	202	148	131	134
31	158	-----	206	168	-----	200	-----	200	-----	144	136	-----
TOTAL	4,862	4,742	4,574	5,933	4,760	7,185	6,268	6,167	5,217	4,788	4,224	4,028
MEAN	157	158	148	191	170	232	209	199	174	154	136	134
MAX	229	179	206	270	210	294	231	226	210	190	152	150
MTN	135	146	135	155	141	165	185	174	150	137	127	125
CFSM	.79	.79	.74	.96	.85	1.16	1.05	1.00	.87	.77	.68	.67
IN.	.90	.88	.85	1.10	.89	1.34	1.17	1.15	.97	.89	.79	.75

CAL YR 1972 TOTAL 57,700 MEAN 158 MAX 319 MIN 102 CFSM .79 IN 10.73
WTR YR 1973 TOTAL 62,748 MEAN 172 MAX 294 MIN 125 CFSM .86 IN 11.67

STREAMS TRIBUTARY TO LAKE MICHIGAN

04127000 Boardman River near Mayfield, Mich.

LOCATION.--Lat 44°38'18", long 85°31'10", in SE¼ NE¼ sec.21, T.26 N., R.10 W., Grand Traverse County, 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 mi² (578 km²)

GAGE.--Water-stage recorder. Altitude of gage is 760 ft (230 m) by barometer.

PERIOD OF RECORD.--June 1952 to current year.

AVERAGE DISCHARGE.--21 years, 193 ft³/s (5,466 m³/s) 11.75 in/yr (298 mm/yr).

EXTREMES.--Current year: Maximum discharge, 409 ft³/s (11.6 m³/s) Jan. 19 (gage height, 4.59 ft or 1.399 m); minimum, 56 ft³/s (1.59 m³/s) Dec. 11 (gage height, 2.74 ft or 0.835 m); minimum daily, 122 ft³/s (3.46 m³/s) Sept. 15, 16.
Period of record: Maximum discharge, 1,220 ft³/s (34.6 m³/s) Sept. 14, 1961 (gage height, 6.90 ft or 2.103 m); minimum, 30 ft³/s (0.85 m³/s) Jan. 15, 1965 (gage height, 2.53 ft or 0.771 m); minimum daily, 47 ft³/s (1.33 m³/s) Nov. 2, 3, 1963.

REMARKS.--Records good. Flow regulated by powerplant 0.9 mi (1.4 km) above station. Records of water temperature for the current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	244	161	166	184	149	142	194	197	183	226	186	130
2	213	162	149	196	171	161	251	204	155	272	212	129
3	162	162	149	230	182	198	296	228	146	268	235	129
4	161	159	148	227	179	211	245	208	151	147	205	136
5	149	159	149	205	135	215	226	190	159	172	183	145
6	130	162	149	190	198	231	180	184	171	159	161	143
7	130	170	146	171	207	258	181	199	176	147	144	142
8	130	180	149	150	140	260	217	232	176	145	125	142
9	133	172	144	143	170	282	227	196	170	149	141	142
10	162	166	130	149	164	239	223	178	175	150	176	127
11	182	164	130	152	159	299	220	192	174	155	156	132
12	144	164	140	161	151	301	205	203	175	168	144	132
13	129	164	153	187	140	292	205	204	169	163	143	132
14	132	162	151	165	140	316	223	198	140	142	143	129
15	133	162	149	153	140	324	212	194	148	140	143	122
16	133	161	140	139	137	319	242	195	141	143	142	122
17	140	151	153	161	140	341	250	195	152	146	142	129
18	140	140	153	230	142	232	228	187	170	146	142	132
19	140	140	153	323	211	181	221	179	170	145	142	140
20	144	140	153	250	200	216	194	188	156	140	150	152
21	149	140	154	173	170	243	203	184	140	139	153	151
22	159	140	154	198	159	193	250	182	140	137	152	259
23	296	140	158	238	137	193	217	180	143	139	152	279
24	339	140	153	214	137	194	198	129	149	143	151	231
25	215	140	153	177	139	186	194	163	157	144	147	186
26	198	142	150	240	137	193	193	181	174	152	137	169
27	237	159	144	281	139	213	183	175	185	157	130	166
28	194	184	144	215	140	208	157	221	186	160	129	160
29	190	179	144	152	-----	161	191	239	209	159	129	151
30	174	176	165	146	-----	172	204	219	207	170	129	144
31	162	-----	206	145	-----	186	-----	186	-----	187	130	-----
TOTAL	5,344	4,740	4,697	5,950	4,521	7,232	6,436	6,000	4,964	5,050	4,754	4,583
MEAN	172	158	152	192	161	233	215	194	165	163	153	153
MAX	339	184	206	323	211	341	246	239	209	272	235	279
MTN	129	140	130	139	137	182	157	129	140	137	125	122
CFSM	.77	.71	.68	.86	.72	1.06	.96	.97	.74	.73	.69	.69
IN.	.89	.79	.78	.99	.75	1.21	1.17	1.00	.82	.84	.79	.76

CAL YR 1972 TOTAL 64,930 MEAN 177 MAY 470 MTN 120 CFSM .72 IN 10.83
WTR YR 1973 TOTAL 64,281 MEAN 176 MAY 341 MTN 122 CFSM .72 IN 10.72

STREAMS TRIBUTARY TO LAKE MICHIGAN

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04127800 Jordan River near East Jordan, Mich.

LOCATION.--Lat 45°06'09", long 85°05'53", in NW¼ NW¼ sec.7, T.31 N., R.6 W., Antrim County 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 mi² (175 km²).

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.

AVERAGE DISCHARGE.--7 years, 185 ft³/s (5.239 m³/s) 37.16 in/yr (944 mm/yr).

EXTREMES.--Current year: Maximum discharge, 478 ft³/s (13.5 m³/s) June 29 (gage height, 4.81 ft or 1.466 m); minimum, 131 ft³/s (3.71 m³/s) Feb. 16.

Period of record: Maximum discharge, 1,180 ft³/s (33.4 m³/s) Sept. 29, 1972 (gage height, 6.07 ft or 1.850 m); minimum, 109 ft³/s (3.09 m³/s) Mar. 1, 8, 1967, result of freezeup.

REMARKS.--Records good. Records of water temperature for the current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	225	186	194	239	170	188	202	199	179	206	176	171
2	167	205	193	208	235	198	240	212	186	184	179	164
3	186	208	193	197	226	225	219	198	184	178	171	161
4	150	194	190	204	188	230	205	211	185	171	166	171
5	176	190	190	193	176	205	197	191	179	169	165	177
6	184	188	194	180	173	207	194	186	180	166	163	165
7	180	208	190	170	173	311	191	185	174	165	168	163
8	175	229	195	175	169	285	188	196	173	163	171	162
9	173	197	193	175	165	217	188	211	192	163	182	163
10	171	192	194	170	165	206	193	220	173	168	167	163
11	171	189	193	165	165	243	195	196	169	164	167	162
12	172	187	195	165	165	243	202	195	193	186	164	162
13	171	185	195	165	165	207	197	190	174	178	163	162
14	171	184	194	173	169	224	196	186	169	167	174	163
15	174	183	194	171	170	215	197	183	167	165	167	164
16	173	183	197	175	154	203	196	201	168	163	164	168
17	174	185	195	200	155	193	196	201	195	161	162	170
18	179	185	197	290	160	185	187	189	187	160	164	174
19	180	184	194	360	165	185	188	184	176	162	163	173
20	181	183	194	235	172	184	188	181	173	164	177	189
21	197	185	194	195	173	183	218	179	169	162	165	171
22	207	184	193	202	172	183	206	177	169	160	162	322
23	320	183	191	246	172	194	191	176	169	159	169	200
24	248	184	193	200	170	187	186	175	167	160	171	180
25	262	185	193	186	169	189	184	175	165	167	167	173
26	196	189	190	183	165	188	183	206	171	191	166	172
27	190	215	190	183	165	186	183	186	210	193	165	173
28	189	217	190	180	168	186	182	248	241	184	162	171
29	187	194	190	173	-----	187	182	196	396	173	160	169
30	185	191	231	170	-----	188	183	182	272	193	162	168
31	186	-----	344	170	-----	188	-----	178	-----	177	171	-----
TOTAL	5,400	5,772	6,173	6,107	4,834	6,407	5,857	5,993	5,705	5,322	5,193	5,246
MEAN	190	192	199	197	173	207	195	193	190	172	168	175
MAX	320	229	344	360	235	311	240	248	396	206	182	322
MIN	171	183	190	165	154	193	182	175	165	159	160	161
CFSM	2.81	2.84	2.94	2.91	2.56	3.06	2.88	2.86	2.81	2.54	2.49	2.59
IN.	3.25	3.18	3.40	3.36	2.66	3.53	3.22	3.30	3.14	2.93	2.86	2.89

CAL YR 1972 TOTAL 71,020 MEAN 194 MAX 840 MIN 150 CFSM 2.87 IN 39.08

WTR YR 1973 TOTAL 63,509 MEAN 188 MAX 396 MIN 154 CFSM 2.78 IN 37.70

PEAK DISCHARGE (BASE, 400 FT³/S).--June 29 (1400) 478 ft³/s (4.81 ft); Sept. 22 (1100) 415 ft³/s (4.60 ft).

STREAMS TRIBUTARY TO LAKE HURON

04127918 Pine River near Rudyard, Mich.

LOCATION.--Lat 46°11'09", long 84°35'52", in NW¼ sec.30, T.44 N., R.2 W., Chippewa County, on right bank 15 ft (5 m) upstream from county highway bridge, 3.2 mi (5.1 km) south of Rudyard.

DRAINAGE AREA.--184 mi² (477 km²).

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, nonrecording gage at same site and datum.

EXTREMES.--Maximum discharge during period April to September 1972, 3,060 ft³/s (86.7 m³/s) May 3 (gage height, 13.15 ft or 4.008 m); maximum gage height observed, 14.55 ft (4.435 m) Apr. 21 (backwater from ice); minimum discharge, 73 ft³/s (2.07 m³/s) July 28 (gage height, 2.01 ft or 0.613 m).

Current year: Maximum discharge, 2,280 ft³/s (64.6 m³/s) Apr. 21 (gage height, 10.61 ft or 3.234 m); maximum gage height, 15.74 ft (4.798 m) Mar. 20 (backwater from ice); minimum discharge, 62 ft³/s (1.76 m³/s) July 24-26 (gage height, 1.97 ft or 0.600 m).

REMARKS.--Records fair. Discharge measurement made prior to period of record as follows:

Aug. 6, 1963 50.3 ft³/s (1.42 m³/s)

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							145	1,990	225	87	78	95
2							140	2,540	190	87	79	90
3							135	2,830	150	84	100	90
4							130	1,970	133	82	85	90
5							130	1,430	122	80	78	90
6							130	1,430	119	80	75	88
7							130	1,120	113	80	84	87
8							125	794	110	80	94	87
9							125	492	122	81	104	81
10							125	468	116	87	100	79
11							130	420	110	89	89	79
12							150	370	106	108	88	80
13							220	345	112	100	88	83
14							280	325	110	95	84	96
15							360	290	110	100	82	88
16							520	290	106	94	87	82
17							680	255	102	88	119	110
18							800	225	96	87	106	158
19							1,100	205	95	83	93	119
20							1,400	188	108	87	85	106
21							2,100	160	129	91	79	102
22							2,000	150	112	89	95	113
23							1,900	137	101	82	110	104
24							2,260	135	118	82	110	98
25							2,580	122	113	76	110	106
26							2,660	118	107	76	110	330
27							2,600	110	100	75	120	274
28							2,720	110	100	73	105	205
29							2,720	110	91	74	95	385
30							2,400	230	88	75	85	290
31		-----			-----		-----	275	-----	75	80	-----
TOTAL							30,895	19,634	3,514	2,627	2,897	3,885
MEAN							1,030	633	117	84.7	93.5	130
MAX							2,720	2,830	225	108	120	385
MIN							125	110	88	73	75	79
CFSM							5.60	3.44	.64	.46	.51	.71
IN.							6.25	3.97	.71	.53	.59	.79

PEAK DISCHARGE (BASE, 1,200 FT³/s)

DATE	TIME	G.H.	DISCHARGE
04-29	0100	12.15	2,780
05-03	0300	13.15	3,060

STREAMS TRIBUTARY TO LAKE HURON

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04127918 Pine River near Rudyard, Mich.--continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	220	113	135	110	150	78	495	312	200	368	455	102
2	185	174	130	110	140	80	678	1,220	175	630	1,640	98
3	160	590	130	110	130	85	615	910	155	915	1,420	90
4	155	420	125	110	125	90	570	662	150	375	350	88
5	137	333	120	110	120	95	440	468	140	258	500	86
6	125	285	115	105	115	100	372	368	130	208	600	94
7	120	285	110	105	110	140	332	312	118	205	540	104
8	114	538	105	100	105	350	295	508	122	170	450	92
9	104	368	105	100	100	420	262	802	250	138	520	86
10	104	298	105	95	95	380	240	592	228	122	490	84
11	102	250	105	95	90	1,000	215	440	188	114	420	76
12	101	228	100	95	85	1,500	230	355	175	102	350	76
13	101	203	100	95	85	1,300	220	315	150	98	300	74
14	101	173	100	95	80	1,050	208	272	130	96	260	74
15	101	166	100	95	80	1,100	200	240	114	88	235	76
16	101	189	105	95	80	1,000	238	225	365	80	200	84
17	100	138	105	95	80	850	405	245	418	76	180	76
18	100	127	105	105	80	700	350	228	382	71	162	72
19	100	124	105	150	80	600	305	215	310	74	150	72
20	100	117	105	210	80	580	278	200	258	76	202	72
21	106	118	110	225	78	540	1,320	182	182	71	185	72
22	156	109	110	225	78	500	1,400	168	142	66	170	84
23	198	119	110	220	78	470	848	152	118	64	150	122
24	216	114	110	220	78	472	532	138	104	62	130	106
25	180	115	110	210	78	515	405	128	88	62	115	97
26	162	117	110	200	78	550	335	198	80	62	112	135
27	150	136	110	190	78	505	290	230	77	68	112	181
28	137	154	110	180	78	450	258	272	110	158	112	206
29	128	146	110	175	-----	462	225	352	668	290	110	172
30	119	140	110	165	-----	470	202	280	480	278	106	148
31	114	-----	110	155	-----	442	-----	228	-----	708	104	-----
TOTAL	4,097	6,387	3,420	4,350	2,634	16,874	12,763	11,217	6,207	6,153	10,830	2,999
MEAN	132	213	110	140	94.1	544	425	362	207	198	349	100
MAX	220	590	135	225	150	1,500	1,400	1,220	668	915	1,640	206
MIN	100	109	100	95	78	78	200	128	77	62	104	72
CFSM	.72	1.16	.60	.76	.51	2.96	2.31	1.97	1.13	1.08	1.90	.54
IN.	.83	1.29	.69	.88	.53	3.41	2.58	2.27	1.25	1.24	2.19	.61

WTR YR 1973 TOTAL 87,931 MEAN 241 MAX 1,640 MIN 62 CFSM 1.31 IN 17.78

PEAK DISCHARGE (BASE, 1,200 FT³/S)

DATE	TIME	G.H.	DISCHARGE
03-12	--	--	Unknown
04-21	1800	10.61	2,280
05-02	1600	7.10	1,320
07-02	2200	8.10	1,570
08-02	1700	10.40	2,220

STREAMS TRIBUTARY TO LAKE HURON

04128000 Sturgeon River near Wolverine, Mich.

LOCATION.--45°17'56", long 84°36'40", in SE 1/4 sec. 36, T.34 N., R.3 W., Cheboygan County, 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 mi² (440 km²), approximately.

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

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.

AVERAGE DISCHARGE.--31 years, 208 ft³/s (5.891 m³/s) 16.62 in/yr (422 mm/yr).

EXTREMES.--Current year: Maximum discharge, 634 ft³/s (18.0 m³/s) Jan. 19 (gage height, 2.76 ft or 0.841 m); minimum, 107 ft³/s (3.03 m³/s) Feb. 16, result of freezeup.

Period of record: Maximum discharge, 1,290 ft³/s (36.5 m³/s) Sept. 29, 1972 (gage height, 3.72 ft or 1.134 m); minimum, 94 ft³/s (2.66 m³/s) Jan. 19, 1971, result of freezeup, minimum daily, 113 ft³/s (3.20 m³/s) Aug. 6, 1958.

REMARKS.--Records good except those for the winter periods, which are fair. Intermittent regulation at low flows from ponds 2.4 mi (3.9 km) above station. Records of water temperature for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1307: 1944 (M), 1948 (M). WSP 1727: 1951 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	400	234	242	370	290	250	271	246	228	271	302	239
2	318	254	234	302	352	275	298	322	239	239	360	203
3	290	282	234	278	390	298	318	287	232	232	287	199
4	270	262	225	282	310	347	318	302	236	212	232	219
5	250	254	220	266	270	322	290	268	228	203	212	246
6	262	250	220	222	266	318	271	253	239	199	199	219
7	266	274	200	215	258	462	260	246	222	193	199	209
8	258	344	220	235	230	552	253	256	228	185	212	199
9	238	298	230	230	230	396	250	342	387	179	318	196
10	230	270	230	230	240	338	260	364	268	187	228	187
11	230	262	226	230	210	401	264	294	228	185	209	185
12	226	250	220	235	220	490	271	271	232	193	236	182
13	222	238	215	240	220	387	275	256	222	209	190	182
14	222	234	220	258	220	382	290	246	206	190	203	182
15	222	226	230	250	220	406	334	239	199	182	203	185
16	222	222	230	246	180	364	338	250	203	179	187	196
17	218	230	220	306	210	322	306	279	215	179	187	193
18	222	238	220	420	225	294	271	253	236	179	250	212
19	226	234	230	608	235	283	250	239	219	212	206	203
20	234	230	230	464	240	271	260	232	209	209	203	236
21	242	230	230	310	242	260	271	225	199	190	193	209
22	274	226	230	340	239	253	271	219	193	185	182	472
23	486	222	230	385	239	256	250	215	193	179	190	401
24	491	222	234	330	236	260	242	209	193	179	203	279
25	330	226	234	298	230	266	242	209	187	190	190	239
26	294	234	238	290	220	268	236	236	185	212	187	228
27	270	266	230	278	220	256	232	236	209	450	187	228
28	266	298	226	278	235	253	225	373	260	382	179	222
29	254	258	226	250	-----	253	222	351	396	260	173	215
30	246	242	274	250	-----	256	222	264	369	316	179	209
31	234	-----	464	260	-----	256	-----	236	-----	387	256	-----
TOTAL	8,413	7,510	7,312	9,156	6,877	9,997	8,071	8,218	7,060	6,947	6,742	6,774
MEAN	271	250	236	295	246	322	264	265	235	224	217	226
MAX	491	344	464	608	390	552	336	373	396	450	360	472
MIN	218	222	200	215	180	250	222	209	185	179	173	182
CFSM	1.59	1.47	1.39	1.74	1.45	1.89	1.58	1.56	1.38	1.32	1.28	1.33
IN.	1.84	1.64	1.60	2.00	1.50	2.19	1.77	1.80	1.54	1.52	1.48	1.48

CAL YR 1972 TOTAL 97,568 MEAN 267 MAX 1,080 MIN 172 CFSM 1.57 IN 21.35
 WTR YR 1973 TOTAL 93,077 MEAN 255 MAX 608 MIN 173 CFSM 1.50 IN 20.37

STREAMS TRIBUTARY TO LAKE HURON

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04128500 Indian River at Indian River, Mich.

LOCATION.--Lat $45^{\circ}24'38''$, long $84^{\circ}37'12''$, in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 24, T.35 N., R.3 W., Cheboygan County, on left bank at Indian River, 500 ft (152 m) downstream from Burt Lake, and 2.3 mi (3.7 km) upstream from Mullett Lake.

DRAINAGE AREA.--583 mi² (1,510 km²).

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

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.

AVERAGE DISCHARGE.--31 years, 558 ft³/s (15.80 m³/s), 13.00 in/yr (330 mm/yr).

EXTREMES.--Current year: Maximum daily discharge, 990 ft³/s (28.0 m³/s) Mar. 17; maximum daily gage height, 4.50 ft (1.372 m) Oct. 4, 5, 8; minimum daily discharge, 242 ft³/s (6.85 m³/s) Sept. 18, 19; minimum daily gage height, 3.75 ft (1.143 m) Sept. 18, 19.

Period of record: Maximum daily discharge, 1,220 ft³/s (34.6 m³/s) May 7, 1972; Maximum daily gage height, 5.58 ft (1.701 m) May 13, 14, 1960; minimum daily discharge, 212 ft³/s (6.00 m³/s) Sept. 2, 1970; minimum daily gage height, 3.34 ft (1.018 m) Oct. 21, 1957.

REMARKS.--Records fair. Seasonal distribution of flow modified by regulation from dam at Cheboygan.

REVISIONS (WATER YEARS).--WSP 1437: 1942 (M), 1945 (M), 1947.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	712	685	675	728	772	572	800	702	760	692	590	420
2	728	690	675	734	811	572	800	740	760	740	626	412
3	740	706	680	740	811	572	820	770	740	780	626	396
4	745	696	670	756	806	581	830	810	740	780	617	396
5	745	706	660	750	800	590	790	780	730	780	626	388
6	756	696	650	750	800	608	780	770	730	750	626	374
7	740	712	640	745	794	617	780	760	711	740	626	348
8	745	745	660	728	784	673	760	780	702	740	626	328
9	718	728	660	728	778	711	760	800	730	730	682	310
10	690	734	670	723	767	730	810	820	730	740	682	295
11	690	728	660	723	756	760	760	830	730	711	664	295
12	696	734	630	718	745	810	770	850	740	682	654	275
13	670	734	650	712	740	850	740	810	730	673	617	260
14	670	734	670	706	728	900	720	740	711	664	654	260
15	655	706	660	701	700	950	702	760	692	644	635	260
16	645	690	640	690	680	970	702	760	673	608	617	256
17	640	685	620	690	680	990	711	760	644	590	599	247
18	630	680	660	701	685	980	711	740	644	572	590	242
19	615	675	680	734	685	970	711	730	644	563	572	242
20	605	675	660	756	685	960	711	720	654	572	572	260
21	605	670	660	756	682	950	730	720	635	554	528	252
22	615	665	696	784	664	920	750	711	626	536	494	290
23	675	650	690	800	654	910	760	711	608	520	477	310
24	690	650	696	806	635	900	750	692	590	494	468	315
25	685	645	685	806	617	890	730	673	572	494	452	322
26	690	655	685	800	599	870	730	682	554	520	444	334
27	696	660	685	806	581	850	730	682	554	617	436	374
28	706	670	675	800	563	830	720	760	563	608	436	388
29	706	660	675	794	-----	820	682	780	654	572	420	396
30	690	660	696	769	-----	810	673	770	682	563	420	396
31	680	-----	723	778	-----	790	-----	760	-----	572	420	-----
TOTAL	21,273	20,724	20,736	23,232	20,002	24,906	22,423	23,373	20,233	19,801	17,496	9,641
MEAN	686	691	667	749	714	803	747	754	674	639	564	321
MAX	756	745	723	806	811	990	830	850	760	780	682	420
MIN	605	645	620	690	563	572	673	673	554	494	420	242
CFSM	1.18	1.19	1.15	1.26	1.22	1.38	1.28	1.29	1.16	1.10	.97	.55
IN.	1.36	1.32	1.32	1.48	1.28	1.59	1.43	1.49	1.29	1.26	1.12	.62

CAL YR 1972 TOTAL 260,561 MEAN 712 MAX 1,220 MIN 395 CFSM 1.22 IN 16.63
 WTR YR 1973 TOTAL 243,840 MEAN 668 MAX 990 MIN 242 CFSM 1.15 IN 15.56

STREAMS TRIBUTARY TO LAKE HURON

04129000 Pigeon River near Vanderbilt, Mich.

LOCATION.--Lat 45°10'15", long 84°26'18", in SE¼ SW¼ sec.9, T.32 N., R.1 W., Otsego County, 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 mi² (160 km²), 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.

AVERAGE DISCHARGE.--23 years, 76.6 ft³/s (2.169 m³/s), 16.51 in/yr (419 mm/yr).

EXTREMES.--Current year: Maximum discharge, 336 ft³/s (9.52 m³/s) Sept. 23 (gage height, 4.66 ft or 1.420 m); minimum, 15 ft³/s (0.42 m³/s) Feb. 11.

Period of record: Maximum discharge, 1,500 ft³/s (42.5 m³/s) May 15, 1957 (gage height, 6.80 ft or 2.073 m, from floodmark), from rating curve extended above 500 ft³/s (14.2 m³/s), result of failure of Lansing Club Dam; minimum, 13 ft³/s (0.37 m³/s) Jan. 8, 1957.

REMARKS.--Records good except those for winter periods and those for periods of no gage-height record, which are fair. Prior to May 16, 1957, and since Apr. 22, 1958, occasional regulation by Lansing Club Dam 3.5 mi (5.6 km) above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	148	75	79	132	85	95	92	68	89	97	89	87
2	85	85	80	107	113	105	101	113	84	96	260	81
3	90	85	71	95	124	120	117	87	74	70	113	60
4	73	83	65	89	102	115	111	93	85	63	96	70
5	81	82	66	102	88	115	106	83	80	59	69	83
6	99	82	65	62	81	140	88	86	71	70	67	63
7	64	105	62	70	88	180	91	80	71	58	69	67
8	74	100	58	72	66	220	89	77	72	53	73	66
9	72	90	65	72	72	180	79	154	117	59	118	58
10	72	83	66	73	75	145	82	183	98	59	70	58
11	75	92	66	74	75	165	79	117	62	58	78	69
12	69	83	67	74	74	180	89	117	78	66	75	50
13	81	82	67	75	73	140	92	89	70	63	62	67
14	67	72	67	77	72	128	83	87	64	63	71	53
15	78	76	68	80	70	142	108	88	63	54	75	73
16	68	74	68	80	65	136	130	88	65	53	69	56
17	74	72	70	83	68	91	111	91	69	57	66	74
18	74	78	70	121	73	98	101	91	76	55	68	68
19	74	75	73	199	75	95	81	94	69	64	67	67
20	78	79	72	167	77	87	94	72	66	58	68	79
21	80	74	71	123	80	87	81	75	71	58	68	67
22	93	74	70	138	82	86	84	77	65	57	56	175
23	173	69	86	96	84	94	83	73	61	51	83	198
24	233	89	71	116	84	89	76	73	62	51	57	106
25	128	62	59	74	85	80	77	76	60	69	59	80
26	112	79	81	107	85	84	75	85	60	64	60	85
27	80	89	68	83	86	86	75	76	77	119	61	74
28	100	91	72	84	90	84	71	151	88	95	60	67
29	72	89	68	69	-----	85	52	133	121	78	60	86
30	80	72	88	72	-----	88	51	100	173	84	73	63
31	75	-----	179	75	-----	91	-----	79	-----	108	102	-----
TOTAL	2,822	2,441	2,278	2,941	2,292	3,631	2,649	2,956	2,361	2,109	2,462	2,350
MEAN	91.0	81.4	73.5	94.9	81.9	117	88.3	95.4	78.7	68.0	79.4	78.3
MAX	233	105	179	199	124	220	130	183	173	119	260	198
MIN	64	62	58	62	65	80	51	68	60	51	56	50
CFSM	1.44	1.29	1.17	1.51	1.30	1.86	1.40	1.51	1.25	1.08	1.26	1.24
IN.	1.67	1.44	1.35	1.74	1.35	2.14	1.56	1.75	1.39	1.25	1.45	1.39

CAL YR 1972 TOTAL 31,214 MEAN 85.3 MAX 335 MIN 49 CFSM 1.35 IN 18.43
WTR YR 1973 TOTAL 31,292 MEAN 85.7 MAX 260 MIN 50 CFSM 1.36 IN 18.48

NOTE.--No gage-height record Oct. 30 to Nov. 9, Feb. 17 to Mar. 13.

STREAMS TRIBUTARY TO LAKE HURON

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04129500 Pigeon River at Afton, Mich.

LOCATION.--Lat 45°22'26", long 84°30'54", in NW¼ NE¼ sec.2, T.34 N., R.2 W., Cheboygan County, 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 mi² (412 km²)

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

GAGE.--Nonrecording gage. Altitude of gage 675 ft (206 m), by barometer. Prior to Oct. 1, 1961, at various sites upstream at present datum.

AVERAGE DISCHARGE.--31 years, 138 ft³/s (3.908 m³/s), 11.79 in/yr (299 mm/yr).

EXTREMES.--Current year: Maximum discharge, 770 ft³/s (21.8 m³/s) Oct. 1 (gage height, 6.25 ft or 1.905 m); minimum, 85 ft³/s (2.41 m³/s) July 24.

Period of record: Maximum discharge, 1,170 ft³/s (33.1 m³/s) Apr. 17, 1960 (gage height, 6.80 ft or 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 ft³/s (1.39 m³/s) Aug. 8, 1958.

REMARKS.--Records good except those for winter periods, which are fair. Occasional regulation by Lansing Club Dam 22 mi (35 km) above station.

REVISIONS (WATER YEARS).--WSP 1437: 1945-46, 1950.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	710	140	130	320	142	180	176	124	155	238	220	146
2	310	140	125	310	208	200	188	173	164	188	220	138
3	202	166	115	220	235	220	210	190	142	173	327	126
4	177	168	115	170	254	240	220	188	151	146	305	115
5	153	164	115	170	230	230	220	171	144	122	190	124
6	153	162	110	140	184	220	202	159	138	118	140	140
7	164	160	105	130	153	260	176	153	138	118	128	110
8	130	202	110	125	145	350	164	148	142	100	132	115
9	136	193	120	130	145	450	159	171	190	100	171	108
10	124	184	125	135	145	309	159	227	212	106	207	106
11	136	168	125	135	150	287	164	284	183	106	155	100
12	138	162	125	135	155	352	171	205	153	102	124	90
13	120	153	120	140	155	374	183	190	128	104	120	104
14	126	142	120	145	150	298	185	164	124	108	124	102
15	122	132	125	145	160	305	202	155	118	110	124	106
16	126	134	125	150	155	298	232	159	114	90	118	102
17	112	130	125	180	130	259	247	166	118	94	108	98
18	120	128	125	240	135	227	217	166	128	94	110	98
19	132	132	125	350	140	197	195	159	134	92	112	102
20	128	130	130	452	145	188	173	153	122	108	116	130
21	138	132	130	360	150	171	181	136	120	114	114	138
22	142	130	130	260	155	169	173	136	118	108	116	164
23	220	124	130	303	160	166	164	128	110	108	102	253
24	357	128	135	263	165	173	155	124	110	90	140	305
25	393	132	135	232	165	171	142	124	108	110	114	190
26	251	132	135	186	170	164	140	138	106	106	108	146
27	208	138	130	195	170	164	138	134	116	148	108	128
28	182	147	130	168	170	159	138	171	128	197	108	120
29	173	153	135	140	-----	161	126	280	185	176	102	122
30	145	140	165	142	-----	161	124	235	238	166	102	124
31	153	-----	254	142	-----	164	-----	181	-----	212	130	-----
TOTAL	5,881	4,446	4,024	6,313	4,621	7,267	5,324	5,292	4,237	3,952	4,495	3,950
MEAN	190	148	130	204	165	234	177	171	141	127	145	132
MAX	710	202	254	452	254	450	247	284	238	238	327	305
MIN	112	124	105	125	130	159	124	124	106	90	102	90
CFSM	1.20	.93	.82	1.28	1.04	1.47	1.11	1.08	.89	.80	.91	.83
IN.	1.38	1.04	.94	1.48	1.08	1.70	1.25	1.24	.99	.92	1.05	.92

CAL YR 1972 TOTAL 62,440 MEAN 171 MAX 734 MIN 88 CFSM 1.08 IN 14.61
WTR YR 1973 TOTAL 59,802 MEAN 164 MAX 710 MIN 90 CFSM 1.03 IN 13.99

04130000 Cheboygan River near Cheboygan, Mich.

LOCATION.--Lat $45^{\circ}34'38''$, long $84^{\circ}29'15''$, in SW $\frac{1}{4}$ sec. 19, T.37 N., R.1 W., Cheboygan County, 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 mi² (2,240 km²).

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.

AVERAGE DISCHARGE.--31 years, 805 ft³/s (22.80 m³/s), 12.64 in/yr (321 mm/yr).

EXTREMES.--Current year: Maximum daily discharge, 1,390 ft³/s (39.4 m³/s) Aug. 11; maximum daily gage height, 2.79 ft (0.850 m) Oct. 3; minimum daily discharge, 330 ft³/s (9.35 m³/s) Sept. 19; minimum daily gage height, 1.45 ft (0.442 m) Mar. 2.
Period of record: Maximum daily discharge, 1,640 ft³/s (46.4 m³/s) May 8, 1959; maximum daily gage height, 3.27 ft (0.997 m) May 13, 14, 1960; minimum daily discharge, 90 ft³/s (2.55 m³/s) Mar. 29, 30, 1958; minimum daily gage height, 1.11 ft (0.338 m) Apr. 9, 10, 1972.

REMARKS.--Records 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	550	1,080	933	937	1,240	1,080	1,190	906	1,040	805	713	700
2	606	1,080	942	949	1,240	1,070	1,200	1,020	1,050	721	871	700
3	793	1,100	949	955	1,250	1,070	1,190	1,070	1,040	683	1,110	714
4	1,180	1,140	954	937	1,250	1,060	1,100	1,140	1,050	894	1,130	677
5	1,340	1,150	963	1,000	1,250	1,070	1,050	1,140	1,050	918	1,080	654
6	1,370	1,160	977	1,000	1,240	1,070	949	1,060	1,050	917	1,150	660
7	1,260	1,150	1,020	1,050	1,240	1,000	877	775	1,040	883	1,250	654
8	1,220	1,150	1,000	1,050	1,240	1,160	828	956	1,030	878	1,240	665
9	1,240	1,190	988	1,050	1,230	1,180	814	974	1,040	882	1,210	664
10	1,100	1,220	988	1,010	1,240	1,180	881	1,090	1,030	913	1,380	622
11	858	1,210	974	1,020	1,230	1,170	870	1,120	1,040	915	1,390	555
12	996	1,230	956	1,020	1,220	1,100	942	1,130	1,040	900	1,370	450
13	1,030	1,260	957	1,010	1,210	1,210	932	1,130	1,050	870	1,230	347
14	1,030	1,250	934	1,010	1,210	1,250	922	1,100	1,040	860	901	334
15	1,030	1,250	953	996	1,220	1,250	914	1,010	1,080	830	870	351
16	1,030	1,240	963	981	1,190	1,270	900	905	1,120	800	773	366
17	1,070	1,230	949	1,030	1,100	1,290	1,030	905	998	758	913	338
18	1,120	1,220	940	1,060	1,100	1,300	1,030	868	951	623	948	340
19	1,130	1,220	940	1,090	1,100	1,300	879	684	779	640	940	330
20	913	1,200	954	1,290	1,100	1,300	548	680	746	675	961	358
21	880	1,140	947	1,290	1,100	1,350	513	683	763	751	1,070	361
22	892	1,140	940	1,290	1,100	1,350	507	693	805	748	1,020	452
23	890	1,150	949	1,270	1,100	1,350	649	701	828	694	936	648
24	890	1,120	951	1,280	1,100	1,350	898	693	832	627	928	602
25	949	1,050	937	1,230	1,090	1,300	760	718	824	621	674	494
26	928	1,060	947	1,270	1,090	1,250	840	829	760	594	666	466
27	928	1,010	941	1,260	1,080	1,200	853	993	564	657	645	470
28	943	925	940	1,280	1,080	1,200	877	1,020	568	838	587	500
29	950	940	947	1,290	-----	1,190	838	1,010	629	839	588	550
30	963	921	984	1,250	-----	1,200	851	1,010	785	739	588	600
31	1,070	-----	937	1,240	-----	1,200	-----	1,050	-----	621	640	-----
TOTAL	31,149	34,186	29,654	34,435	32,840	37,320	26,632	29,063	27,622	24,094	29,772	15,622
MEAN	1,005	1,140	957	1,112	1,173	1,204	888	938	921	777	960	521
MAX	1,370	1,260	1,020	1,290	1,250	1,350	1,200	1,140	1,120	918	1,390	714
MIN	550	921	933	937	1,080	1,000	507	680	564	594	587	330
CFSM	1.16	1.32	1.11	1.29	1.36	1.39	1.03	1.08	1.06	.90	1.11	.60
IN.	1.34	1.47	1.28	1.48	1.41	1.60	1.15	1.25	1.19	1.04	1.28	.67
CAL YR 1972	TOTAL 381,351	MEAN 1,042	MAX 1,000	MIN 550	CFSM 1.20	IN 16.40						
WTR YR 1973	TOTAL 352,439	MEAN 966	MAX 1,390	MIN 330	CFSM 1.12	IN 15.16						

STREAMS TRIBUTARY TO LAKE HURON

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04130500 Black River near Tower, Mich.

LOCATION.--Lat 45°23'33", long 84°20'00", in SE¼ NE¼ sec.29, T.35 N., R.1 E., Cheboygan County, 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 mi² (811 km²).

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.

AVERAGE DISCHARGE.--31 years, 263 ft³/s (7.448 m³/s), 11.41 in/yr (290 mm/yr).

EXTREMES.--Current year: Maximum discharge, 898 ft³/s (25.4 m³/s) Oct. 1 (gage height, 4.44 ft or 1.353 m); maximum gage height, 4.46 ft (1.359 m) Aug. 3; minimum discharge, 5.0 ft³/s (0.14 m³/s) Aug. 29; minimum daily, 111 ft³/s (3.14 m³/s) Aug. 29.
Period of record: Maximum discharge, 2,340 ft³/s (66.3 m³/s) Apr. 17, 1960 (gage height, 7.13 ft or 2.173 m); minimum, 0.60 ft³/s (0.017 m³/s) March 11, 1950; minimum daily, 4.0 ft³/s (0.11 m³/s) Nov. 27, 1949.

REMARKS.--Records good. Flow regulated by powerplant 400 ft (122 m) above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	830	325	371	461	305	293	529	279	478	420	485	349
2	874	261	265	553	439	303	529	326	315	479	586	327
3	796	333	228	347	523	386	529	399	312	446	814	386
4	520	348	222	350	430	430	529	435	324	396	713	302
5	278	394	261	350	525	524	581	341	302	271	496	191
6	304	257	335	429	523	452	627	325	299	219	353	232
7	316	330	190	268	424	555	548	315	312	215	285	240
8	259	351	130	264	314	688	513	323	258	217	257	224
9	239	438	129	199	252	823	403	339	375	207	364	213
10	263	409	224	238	262	803	402	513	419	236	477	191
11	239	410	336	323	306	767	324	513	481	187	296	184
12	240	236	295	304	260	771	311	512	308	196	297	195
13	238	319	195	326	269	769	451	508	267	172	313	176
14	229	318	237	332	260	767	403	486	232	175	181	190
15	234	337	316	331	284	767	525	248	244	185	279	205
16	257	286	299	298	253	740	525	287	234	191	400	155
17	263	264	232	309	227	687	526	367	172	174	258	201
18	221	261	272	434	235	602	529	365	236	163	251	210
19	255	229	231	742	251	524	529	370	289	167	227	199
20	250	268	281	718	283	524	526	289	277	191	257	196
21	231	268	273	653	286	442	524	266	228	235	227	247
22	236	239	284	672	280	325	288	244	236	202	213	270
23	363	292	305	722	244	263	367	229	239	178	227	308
24	507	255	313	722	259	338	333	263	163	206	242	492
25	508	268	310	674	242	428	298	275	220	168	235	499
26	496	261	359	537	244	418	297	205	219	201	221	342
27	637	272	284	311	243	405	280	279	216	378	223	319
28	568	352	289	402	226	402	279	433	236	489	391	333
29	441	345	292	520	-----	415	292	493	288	488	111	316
30	338	308	199	317	-----	408	299	472	356	485	117	202
31	289	-----	552	304	-----	350	-----	477	-----	485	216	-----
TOTAL	11,719	9,234	8,509	13,410	8,649	16,369	13,096	11,176	8,535	8,422	10,012	7,894
MEAN	378	308	274	433	309	528	437	361	285	272	323	263
MAX	874	438	552	742	525	823	627	513	481	489	814	499
MIN	221	229	129	199	226	263	279	205	163	163	111	155
CFSM	1.21	.98	.88	1.38	.99	1.69	1.40	1.15	.91	.87	1.03	.84
IN.	1.39	1.10	1.01	1.59	1.03	1.95	1.56	1.33	1.01	1.00	1.19	.94
CAL YR 1972	TOTAL 121,336	MEAN 332	MAX 1,270	MIN 114	CFSM 1.06	IN 14.42						
WTR YR 1973	TOTAL 127,025	MEAN 348	MAX 874	MIN 111	CFSM 1.11	IN 15.10						

STREAMS TRIBUTARY TO LAKE HURON

04131500 Rainy River near Ocqueoc, Mich.

LOCATION.--Lat $45^{\circ}24'30''$, long $84^{\circ}10'45''$, in NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 22, T.35 N., R.2 E., Presque Isle County, 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 mi² (220 km²), 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.

AVERAGE DISCHARGE.--21 years, 41.2 ft³/s (1.167 m³/s), 6.58 in/yr (167 mm/yr).

EXTREMES.--Current year, Maximum discharge, 272 ft³/s (7.70 m³/s) Mar. 8 (gage height, 3.76 ft or 1.146 m); maximum gage height, 4.22 ft (1.286 m) Jan. 9 (backwater from ice); minimum discharge, 5.5 ft³/s (0.16 m³/s) July 25.

Period of record: Maximum discharge, 946 ft³/s (26.8 m³/s) Apr. 18, 1960 (gage height, 6.33 ft or 1.929 m, from floodmark); minimum, 0.4 ft³/s (0.01 m³/s) Sept. 7, 1955.

REMARKS.--Records good except those for winter periods, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	129	48	37	76	37	24	106	46	48	76	87	18
2	110	50	35	77	89	23	122	60	42	60	172	17
3	92	55	32	75	89	34	148	62	40	76	215	16
4	74	55	30	74	87	69	169	62	42	98	206	16
5	62	52	28	69	80	75	167	58	41	82	172	18
6	53	49	25	60	75	84	153	51	50	63	129	18
7	49	61	25	52	68	152	133	47	63	43	98	15
8	43	77	25	50	64	246	119	50	62	36	86	14
9	35	78	25	48	60	210	106	58	80	29	113	12
10	30	73	27	48	55	174	86	70	83	26	137	11
11	28	68	28	48	50	185	95	74	80	22	126	10
12	27	63	29	49	46	226	112	67	67	20	102	9.1
13	24	57	30	50	43	242	112	62	54	20	84	8.2
14	22	51	30	50	40	220	119	55	42	18	81	7.9
15	20	50	31	52	37	211	140	50	34	14	68	7.5
16	20	50	31	55	35	185	162	55	29	13	58	7.2
17	18	46	31	58	32	156	156	57	26	12	50	7.9
18	18	42	32	75	30	136	140	52	29	10	47	9.9
19	17	39	32	100	28	132	123	48	28	9.5	43	10
20	17	36	32	140	27	137	112	43	26	9.1	38	10
21	17	35	32	170	27	143	105	39	22	8.2	35	10
22	20	32	31	150	27	140	98	35	20	7.5	31	25
23	63	29	29	130	27	115	89	30	17	6.5	28	28
24	101	29	28	115	26	104	80	27	17	5.8	27	22
25	94	28	27	105	26	101	73	25	15	5.8	24	20
26	88	31	26	95	26	98	64	26	12	14	22	18
27	80	36	28	90	25	96	57	26	14	41	20	18
28	68	42	28	85	25	92	52	65	37	49	18	16
29	62	43	35	83	-----	89	46	77	76	50	17	13
30	55	39	52	83	-----	94	42	67	82	78	15	12
31	50	-----	74	85	-----	102	-----	57	-----	87	18	-----
TOTAL	1,586	1,444	985	2,497	1,331	4,095	3,286	1,601	1,278	1,089.4	2,367	424.7
MEAN	51.2	48.1	31.8	80.5	47.5	132	110	51.6	42.6	35.1	76.4	14.2
MAX	129	78	74	170	89	246	169	77	83	98	215	28
MIN	17	28	25	48	25	23	42	25	12	5.8	15	7.2
CFSM	.60	.57	.37	.95	.56	1.55	1.29	.61	.50	.41	.90	.17
IN.	.69	.63	.43	1.09	.58	1.79	1.44	.70	.56	.48	1.04	.19
CAL YR 1972	TOTAL 19,650.1		MEAN 53.7	MAX 612	MIN 2.1	CFSM .63	IN 8.60					
WTR YR 1973	TOTAL 21,984.1		MEAN 60.2	MAX 246	MIN 5.8	CFSM .71	IN 9.62					

STREAMS TRIBUTARY TO LAKE HURON

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04132000 Black River near Cheboygan, Mich.

LOCATION.--Lat $45^{\circ}29'59''$, long $84^{\circ}19'36''$, in NW $\frac{1}{4}$ sec. 21, T.36 N., R.1 E., Cheboygan County, on left bank 0.3 mi (0.5 km) downstream from Black Lake, 5.3 mi (8.5 km) upstream from Alverno Dam, and 12.6 mi (20.3 km) southeast of Cheboygan.

DRAINAGE AREA.--597 mi² (1,546 km²).

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 609.26 ft (185.702 m) above mean sea level. Auxiliary water-stage recorder 3 mi (5 km) downstream from base gage at same datum.

AVERAGE DISCHARGE.--31 years, 449 ft³/s (12.72 m³/s), 10.21 in/yr (259 mm/yr).

EXTREMES.--Current year: Maximum daily discharge, 1,760 ft³/s (49.8 m³/s) Oct. 5; maximum daily gage height, 3.74 ft (1.140 m) Aug. 5; minimum daily discharge, 19 ft³/s (0.54 m³/s) July 24; minimum daily gage height, 1.56 ft (0.475 m) Dec. 12, 15.

Period of record: Maximum daily discharge, 2,700 ft³/s (76.5 m³/s) Apr. 24, 1972; maximum daily gage height, 5.74 ft (1.750 m) Apr. 20, 1960; minimum daily discharge, 11 ft³/s (0.31 m³/s) Aug. 14, 1949; minimum daily gage height, about 1.10 ft (0.335 m) Mar. 1, 1964.

REMARKS.--Records fair above 350 ft³/s (9.91 m³/s) and poor below. Flow regulated by Alverno Dam; prior to Dec. 31, 1965, flow regulated by powerplant at Alverno Dam.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	990	1,220	620	500	800	430	849	520	531	137	886	197
2	1,140	1,200	580	520	840	430	831	440	521	303	1,180	227
3	1,430	1,210	550	520	850	436	847	454	492	486	1,220	211
4	1,750	1,180	530	530	850	445	864	452	466	528	1,220	195
5	1,760	1,160	510	530	840	448	834	381	548	486	1,220	209
6	1,290	1,110	509	530	840	493	881	313	508	459	1,260	208
7	1,290	1,100	493	530	830	513	724	294	450	509	1,310	216
8	1,310	1,220	507	540	800	604	832	314	425	479	1,300	156
9	1,160	1,210	497	540	760	714	847	286	482	479	1,280	136
10	1,000	1,050	499	540	730	770	870	321	476	521	1,190	155
11	850	1,050	486	540	700	831	838	300	518	470	1,060	252
12	750	1,030	469	560	680	886	713	350	529	403	1,060	178
13	700	1,000	482	550	660	970	707	345	529	452	1,010	156
14	700	988	482	570	650	1,020	677	324	488	441	864	156
15	700	976	469	570	650	1,070	670	492	518	431	772	239
16	700	939	491	560	672	1,140	686	597	500	308	742	194
17	680	909	495	550	693	1,220	698	563	454	267	738	195
18	650	860	480	541	652	1,220	698	523	413	245	762	194
19	620	833	491	578	633	1,220	688	555	378	228	729	214
20	550	787	491	668	606	1,160	706	550	406	142	634	195
21	500	754	491	718	589	1,140	715	542	353	57	429	177
22	500	706	480	736	572	1,110	762	517	334	28	373	172
23	490	690	475	778	544	1,060	747	518	350	22	261	204
24	470	675	470	810	510	990	762	508	311	19	170	284
25	450	644	476	818	480	974	730	499	234	70	114	350
26	370	625	465	863	470	945	736	532	98	112	120	542
27	692	605	476	860	450	898	755	527	85	204	116	792
28	989	593	476	860	440	899	768	530	116	213	185	785
29	966	580	454	750	-----	881	736	590	95	198	188	786
30	1,140	583	475	770	-----	857	666	540	80	344	189	768
31	1,240	-----	490	780	-----	848	-----	524	-----	589	168	-----
TOTAL	27,827	27,487	15,364	19,720	18,791	26,622	22,837	14,201	11,688	9,630	22,750	8,743
MEAN	898	916	496	636	671	859	733	458	390	311	734	291
MAX	1,760	1,220	620	863	850	1,220	884	597	548	589	1,310	792
MIN	370	580	454	500	440	430	666	286	80	19	114	136
CFSM	1.50	1.53	.83	1.07	1.12	1.44	1.28	.77	.65	.52	1.23	.49
IN.	1.73	1.71	.96	1.23	1.17	1.66	1.43	.88	.73	.60	1.42	.54

CAL YR 1972 TOTAL 237,003 MEAN 648 MAX 2,700 MIN 215 CFSM 1.09 IN 14.77
 WTR YR 1973 TOTAL 225,710 MEAN 618 MAX 1,760 MIN 19 CFSM 1.04 IN 14.06

STREAMS TRIBUTARY TO LAKE HURON

04133500 Thunder Bay River near Bolton, Mich.

LOCATION.--Lat 45°07'40", long 83°38'30", in NE¼ sec. 36, T.32 N., R.6 E., Alpena County, 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 mi² (1,520 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 671.96 ft (204.813 m) above mean sea level, unadjusted. Prior to Aug. 12, 1945, nonrecording gage at site 500 ft (152 m) downstream at different datum.

AVERAGE DISCHARGE.--28 years, 460 ft³/s (13.03 m³/s).

EXTREMES.--Current year: Maximum discharge, 2,050 ft³/s (58.1 m³/s) Aug. 2 (gage height, 7.32 ft or 2.231 m); minimum, 255 ft³/s (7.22 m³/s) July 19.
Period of record: Maximum discharge, 4,070 ft³/s (115 m³/s) Apr. 13, 1965 (gage height, 9.99 ft or 3.045 m); minimum, 92 ft³/s (2.61 m³/s) Sept. 28, 29, 1955.

REMARKS.--Records good except those for winter periods, which are poor. Regulation by Fletcher Pond on the Upper South Branch Thunder Bay River (usable capacity, 40,170 acre-ft or 49.5 hm³).

REVISIONS (WATER YEARS).--WSP 1437: 1946. WSP 1727: 1947 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	917	502	480	800	580	660	951	446	721	894	790	623
2	850	487	460	950	620	700	1,130	495	571	810	1,860	794
3	718	506	450	1,150	700	750	1,190	539	525	701	1,800	851
4	602	541	460	1,200	750	850	1,170	534	603	574	1,470	713
5	530	545	470	1,150	750	850	1,090	501	740	479	1,140	590
6	491	527	470	1,050	710	900	936	464	720	433	833	519
7	463	515	460	1,000	650	1,050	815	434	600	417	616	473
8	451	537	460	900	560	1,600	734	430	514	379	543	423
9	426	571	470	700	550	1,590	650	460	576	356	495	385
10	408	577	470	600	550	1,350	603	515	592	341	513	364
11	397	566	470	550	560	1,180	590	561	541	325	496	346
12	393	542	460	520	560	1,370	617	542	513	297	447	331
13	384	527	450	520	570	1,480	665	499	489	287	407	329
14	375	501	450	530	570	1,420	713	467	446	291	449	319
15	372	482	450	550	580	1,330	786	440	411	282	458	317
16	370	467	450	600	570	1,270	823	427	386	273	429	320
17	366	453	460	700	550	1,050	797	434	380	266	394	325
18	360	452	460	950	520	727	709	440	384	259	392	338
19	359	456	460	1,300	520	653	626	429	400	262	383	367
20	360	452	460	1,650	520	637	568	416	401	262	370	361
21	362	451	470	1,650	520	670	535	403	400	268	407	345
22	371	450	470	1,500	540	740	519	393	419	264	397	463
23	453	452	470	1,200	550	805	481	382	369	259	387	682
24	657	445	470	1,000	560	865	443	366	385	260	387	858
25	827	440	470	900	590	990	413	361	383	264	389	791
26	894	454	470	800	600	1,070	393	374	372	290	385	639
27	804	499	460	720	620	1,070	378	411	394	383	374	561
28	683	543	460	680	640	995	365	681	515	454	339	522
29	614	564	470	650	-----	913	352	968	681	466	327	474
30	567	500	550	600	-----	873	347	1,150	863	497	324	435
31	530	-----	650	580	-----	885	-----	949	-----	630	406	-----
TOTAL	16,354	15,004	14,630	27,650	16,560	31,293	20,389	15,911	15,294	12,223	18,407	14,858
MEAN	528	500	472	892	591	1,009	680	513	510	394	594	495
MAX	917	577	650	1,650	750	1,600	1,190	1,150	863	894	1,860	858
MIN	359	440	450	520	520	637	347	361	369	259	324	317
CAL YR 1972	TOTAL 196,859		MEAN 538		MAX 3,570		MIN 299					
WTR YR 1973	TOTAL 218,573		MEAN 599		MAX 1,860		MIN 259					

04134000 North Branch Thunder Bay River near Bolton, Mich.

LOCATION.--Lat 45°08'55", long 83°36'35", in SE¼ sec.29, T.32 N., R.7 E., Alpena County, 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 mi² (477 km²).

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.

AVERAGE DISCHARGE.--28 years, 116 ft³/s (3.285 m³/s), 8.56 in/yr (217 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,100 ft³/s (31.2 m³/s) Aug. 4 (gage height, 5.58 ft or 1.701 m); maximum gage height, 6.14 ft (1.871 m) Jan. 22 (backwater from ice); minimum discharge, 24 ft³/s (0.68 m³/s) July 19.

Period of record: Maximum discharge, 2,920 ft³/s (82.7 m³/s) Apr. 13, 1965 (gage height, 7.85 ft or 2.393 m); maximum gage height, 7.98 ft (2.432 m) Mar. 31, 1950 (backwater from ice); minimum discharge, 0.40 ft³/s (0.011 m³/s) Oct. 14, 1955.

REMARKS.--Records good except those for winter periods, which are poor. Occasional regulation during low flow from dams above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	341	138	72	180	165	105	345	73	294	245	229	167
2	493	121	74	190	150	109	384	90	242	277	723	192
3	405	115	76	210	150	130	470	105	188	250	885	236
4	295	115	77	250	155	189	611	119	158	235	1,080	254
5	229	121	79	320	165	208	623	126	149	259	969	214
6	167	127	80	370	170	288	539	121	158	246	701	164
7	124	129	80	410	160	425	443	109	165	178	443	148
8	99	139	81	380	145	635	360	100	157	116	326	131
9	84	151	83	310	130	773	305	98	183	85	269	103
10	75	176	85	250	120	793	261	113	205	68	235	81
11	68	198	85	210	110	682	223	137	254	57	210	69
12	62	196	85	180	100	710	197	153	297	49	191	60
13	58	176	86	160	90	779	212	154	253	45	160	54
14	55	155	86	150	83	789	230	140	184	41	155	48
15	50	133	87	140	78	746	261	120	130	37	145	44
16	48	113	90	140	72	657	296	107	98	34	136	41
17	48	94	91	140	68	475	341	99	79	30	126	41
18	45	92	92	145	65	302	341	95	69	27	110	43
19	44	88	93	160	62	322	302	91	64	27	93	45
20	44	87	95	180	60	310	265	83	75	27	85	48
21	43	87	98	220	58	320	232	74	102	29	76	46
22	43	84	100	280	56	335	201	68	116	32	68	71
23	61	81	105	450	56	324	176	62	107	32	62	102
24	111	78	110	410	56	308	155	57	89	29	57	137
25	173	74	115	350	57	354	135	52	79	30	52	173
26	257	75	120	300	59	418	117	52	70	37	50	189
27	310	82	130	270	65	467	102	54	62	62	48	174
28	282	75	140	250	77	453	89	140	87	93	45	136
29	239	73	155	220	-----	404	79	197	125	115	42	110
30	201	72	160	200	-----	367	73	259	181	120	39	93
31	168	-----	170	180	-----	340	-----	311	-----	155	90	-----
TOTAL	4,722	3,445	3,080	7,605	2,782	13,517	8,368	3,559	4,420	3,067	7,900	3,414
MEAN	152	115	99.4	245	99.4	436	279	115	147	98.9	255	114
MAX	493	198	170	450	170	793	623	311	297	277	1,080	254
MIN	43	72	72	140	56	105	73	52	62	27	39	41
CFSM	.83	.63	.54	1.33	.54	2.37	1.52	.63	.80	.54	1.39	.62
IN.	.95	.70	.62	1.54	.56	2.73	1.69	.72	.89	.62	1.60	.69

CAL YR 1972 TOTAL 57,742 MEAN 158 MAX 2,530 MIN 17 CFSM .86 IN 11.67
WTR YR 1973 TOTAL 65,879 MEAN 180 MAX 1,080 MIN 27 CFSM .98 IN 13.32

PEAK DISCHARGE (BASE, 500 FT³/S)

DATE	TIME	G.H.	DISCHARGE
10-02	0900	4.67	505
03-09	2400	5.32	904
04-04	2000	4.91	646
08-04	0900	5.58	1,100

STREAMS TRIBUTARY TO LAKE HURON

04135500 Au Sable River at Grayling, Mich.

LOCATION.--Lat $44^{\circ}39'35''$, long $84^{\circ}42'45''$, in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 7, T.26 N., R.3 W., Crawford County, 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 mi² (285 km²).

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.

AVERAGE DISCHARGE.--31 years, 74.6 ft³/s (2.113 m³/s), 9.21 in/yr (234 mm/yr).

EXTREMES.--Current year: Maximum discharge, 146 ft³/s (4.13 m³/s) Mar. 15 (gage height, 2.02 ft or 0.616 m); minimum, 54 ft³/s (1.53 m³/s) Sept. 15, 16 (gage height, 1.23 ft or 0.375 m).
Period of record: Maximum discharge, 274 ft³/s (7.76 m³/s) June 2, 1943 (gage height, 3.00 ft or 0.914 m); minimum, 28 ft³/s (0.79 m³/s) Apr. 21, 1946 (gage height, 0.80 ft or 0.244 m).

REMARKS.--Records excellent. Prior to Dec. 31, 1952, diurnal fluctuation caused by powerplant 2.5 mi (4.0 km) above station. Records of water temperature for the current year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	115	61	73	124	88	81	97	81	92	102	70	62
2	102	81	73	107	100	83	108	88	92	96	73	61
3	91	82	71	97	109	86	125	89	91	96	74	59
4	83	84	69	100	108	91	125	89	98	90	70	61
5	80	82	73	96	101	94	115	86	97	82	67	63
6	81	80	75	82	96	94	107	85	92	75	64	61
7	77	81	65	76	95	103	101	83	89	72	62	60
8	74	85	68	83	86	127	97	85	86	69	62	58
9	73	86	75	81	83	133	94	91	95	68	63	57
10	72	84	75	78	86	122	95	92	94	67	68	56
11	71	82	72	76	81	125	94	90	86	66	67	56
12	70	78	70	76	81	138	94	89	83	68	65	56
13	69	77	68	76	81	138	94	86	80	70	62	55
14	66	76	73	77	82	139	94	83	76	69	62	55
15	68	75	74	78	83	144	95	81	75	66	62	55
16	68	73	72	78	73	138	98	80	75	64	61	55
17	68	73	70	83	73	122	97	81	75	62	62	58
18	68	73	70	95	78	116	95	82	75	61	62	60
19	68	73	74	118	80	108	92	81	75	61	62	60
20	68	73	75	128	81	106	91	78	75	61	63	59
21	70	73	75	108	81	103	90	76	73	60	62	58
22	75	73	76	110	81	101	88	76	73	59	61	85
23	103	72	75	119	81	98	85	76	73	58	60	98
24	128	71	75	114	80	96	83	75	76	58	60	92
25	130	71	75	106	76	95	81	76	73	62	60	81
26	114	73	74	101	73	95	81	95	76	68	59	72
27	100	75	73	96	74	95	77	97	94	72	59	68
28	92	75	73	96	80	92	76	107	98	71	58	66
29	86	74	71	84	-----	91	76	121	102	70	57	63
30	84	73	75	81	-----	92	76	110	104	68	56	62
31	82	-----	110	86	-----	94	-----	98	-----	70	61	-----
TOTAL	2,598	2,309	2,287	2,912	2,371	3,340	2,821	2,707	2,543	2,181	1,954	1,912
MEAN	83.8	77.0	73.8	93.9	84.7	108	94.0	87.3	84.8	70.4	63.0	63.7
MAX	130	86	110	126	109	144	125	121	104	102	74	98
MIN	68	71	65	76	73	81	76	75	73	58	56	55
CFSM	.76	.70	.67	.85	.77	.98	.85	.79	.77	.64	.57	.58
IN.	.88	.76	.77	.98	.80	1.13	.95	.92	.86	.74	.66	.65

CAL YR 1972 TOTAL 30,346 MEAN 82.9 MAX 177 MIN 59 CFSM .75 IN 10.26
WTR YR 1973 TOTAL 29,935 MEAN 82.0 MAX 144 MIN 55 CFSM .75 IN 10.12

STREAMS TRIBUTARY TO LAKE HURON

147

04135600 East Branch Au Sable River at Grayling, Mich.

LOCATION.--Lat $44^{\circ}40'08''$, long $84^{\circ}42'20''$, in NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T.26 N., R.3 W., Crawford County, on right bank at south boundary of State Research Center in Grayling and 0.4 mi (0.6 km) upstream from mouth.

DRAINAGE AREA.--76.0 mi² (196.8 km²).

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.

AVERAGE DISCHARGE.--15 years, 44.3 ft³/s (1.255 m³/s), 7.92 in/yr (201 mm/yr).

EXTREMES.--Current year: Maximum discharge, 100 ft³/s (2.83 m³/s) Mar. 14 (gage height, 4.21 ft or 1.283 m); minimum, 24 ft³/s (0.68 m³/s) Dec. 7.

Period of record: Maximum discharge, 201 ft³/s (5.69 m³/s) Apr. 13, 1971 (gage height, 5.19 ft or 1.582 m); minimum, 7.0 ft³/s (0.20 m³/s) Mar. 27, 1965, result of freezeup; minimum daily, 16 ft³/s (0.45 m³/s) Aug. 20, 1964.

REMARKS.--Records good. Occasional regulation by State Research Center above gage.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59	51	43	68	51	44	61	56	52	55	40	42
2	54	52	43	55	61	44	75	60	52	53	42	38
3	50	53	42	57	62	47	79	59	53	58	42	35
4	48	52	37	61	60	50	77	57	58	53	39	37
5	47	51	44	53	57	52	73	55	54	49	37	40
6	46	50	41	46	54	52	69	54	51	47	35	36
7	45	51	30	45	53	66	65	53	50	44	34	35
8	44	55	41	47	47	76	62	57	51	43	33	33
9	43	53	42	46	47	74	60	63	57	41	37	32
10	42	52	41	45	47	72	60	63	53	41	45	31
11	42	50	36	45	42	80	59	61	49	40	40	30
12	41	49	36	44	44	91	59	58	47	43	37	29
13	41	48	37	44	44	90	59	57	46	43	34	29
14	41	47	42	45	46	93	59	55	45	41	34	29
15	41	46	39	46	43	95	59	54	44	40	34	29
16	40	45	40	46	40	89	61	53	44	39	33	30
17	41	45	35	48	39	82	61	54	45	38	33	30
18	40	45	39	55	43	75	58	52	45	37	33	33
19	40	45	40	70	44	73	57	51	44	37	32	32
20	40	45	41	71	45	71	56	51	44	37	35	31
21	42	45	41	57	45	68	56	50	43	37	32	30
22	48	44	42	60	44	66	55	49	42	36	32	61
23	72	44	40	66	45	63	54	48	43	35	32	55
24	75	43	40	64	44	63	53	47	44	35	33	49
25	71	43	40	60	38	62	53	47	41	39	32	44
26	65	44	40	59	40	60	52	54	46	43	33	41
27	60	45	40	58	41	59	51	52	61	45	32	39
28	57	45	41	56	45	57	50	64	58	43	32	38
29	55	44	40	48	-----	57	51	63	59	42	33	36
30	53	43	51	46	-----	57	51	57	58	41	32	36
31	51	-----	71	48	-----	56	-----	53	-----	41	37	-----
TOTAL	1,534	1,425	1,275	1,659	1,311	2,084	1,795	1,707	1,479	1,316	1,089	1,090
MFAN	49.5	47.5	41.1	53.5	46.8	67.2	59.8	55.1	49.3	42.5	35.1	36.3
MAX	75	55	71	71	62	95	79	64	61	58	45	61
MIN	40	43	30	44	38	44	50	47	41	35	32	29
CFSM	.65	.63	.54	.70	.62	.88	.79	.73	.65	.56	.46	.48
IN.	.75	.70	.62	.81	.64	1.02	.88	.84	.72	.64	.53	.53

CAL YR 1972 TOTAL 18,907
WTR YR 1973 TOTAL 17,764

MEAN 51.7 MAX 145 MIN 30 CFSM .68 IN 9.25
MEAN 48.7 MAX 95 MIN 29 CFSM .64 IN 8.70

STREAMS TRIBUTARY TO LAKE HURON

04135700 South Branch Au Sable River near Luzerne, Mich.

LOCATION.--Lat 44°36'53", long 84°27'20", in SE¼ SE¼ sec.29, T.26 N., R.1 W., Crawford County, on right bank 10 ft (3 m) upstream from Smith Bridge, 400 ft (122 m) downstream from highway 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 mi² (1,039 km²).

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1951-66. October 1966 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,070 ft (326 m) from topographic map. Apr. 19, 1951 to Nov. 14, 1966, non-recording gage at same site and datum.

AVERAGE DISCHARGE.--7 years, 288 ft³/s (6.457 m³/s), 7.72 in/yr (196 mm/yr).

EXTREMES.--Current year: Maximum discharge, 546 ft³/s (15.5 m³/s) Mar. 15, 16 (gage height, 5.76 ft or 1.756 m); minimum, 119 ft³/s (3.37 m³/s) Sept. 12-15.

Period of record: Maximum discharge, 932 ft³/s (26.4 m³/s) Apr. 14, 1971 (gage height, 6.83 ft or 2.082 m); maximum gage height, 7.17 ft (2.185 m) Feb. 5, 1970 (backwater from ice); minimum daily discharge, 105 ft³/s (2.97 m³/s) Oct. 7-9, Nov. 3, 1966.

REMARKS.--Records good. Occasional regulation by dams above station. Records for water temperature for the current year are published in Part 2 of this report.

REVISIONS.--WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	226	270	208	290	270	209	367	264	301	228	210	157
2	219	266	202	284	289	214	399	272	284	218	211	152
3	206	267	190	290	312	228	418	270	293	219	210	144
4	192	261	188	290	313	259	424	272	325	207	213	142
5	181	256	201	270	308	294	411	269	319	195	201	144
6	174	252	205	260	297	311	390	263	313	185	180	137
7	169	252	194	240	285	384	375	258	301	178	171	133
8	166	265	190	240	260	473	358	269	281	173	167	130
9	159	263	188	240	250	486	345	281	306	168	180	128
10	156	262	190	240	250	471	339	290	273	164	195	122
11	155	262	193	230	240	460	331	287	248	161	187	122
12	154	257	195	230	240	488	334	270	228	165	174	121
13	153	252	197	230	240	485	335	247	214	169	164	119
14	150	247	188	230	235	510	338	232	202	168	160	119
15	148	241	193	231	232	540	344	218	192	163	157	120
16	149	235	190	230	220	542	344	213	188	158	152	122
17	159	232	194	236	220	522	345	211	214	154	150	128
18	169	228	192	273	220	459	339	206	222	152	150	138
19	175	224	191	363	214	426	331	201	218	150	148	140
20	180	221	191	360	214	420	324	195	207	151	153	134
21	190	219	194	340	215	403	318	189	198	150	154	129
22	210	217	194	320	217	394	310	184	190	147	150	205
23	297	214	196	340	218	389	301	181	184	143	146	208
24	325	211	199	330	215	381	292	175	180	141	146	206
25	336	211	203	320	214	373	285	172	177	143	143	182
26	351	216	206	300	220	366	279	211	177	173	142	168
27	336	219	206	280	219	357	272	218	196	179	141	160
28	316	220	208	270	210	350	266	276	213	175	138	154
29	300	214	208	260	-----	347	260	372	232	167	135	150
30	286	201	232	250	-----	348	256	353	236	165	135	145
31	276	-----	297	250	-----	350	-----	325	-----	190	162	-----
TOTAL	6,663	7,155	6,223	8,517	6,837	12,239	10,030	7,644	7,112	5,299	5,125	4,359
MEAN	215	239	201	275	244	395	334	247	237	171	165	145
MAX	351	270	297	363	313	542	424	372	325	228	213	208
MIN	148	201	188	230	210	209	256	172	177	141	135	119
CFSM	.54	.60	.50	.69	.61	.99	.83	.62	.59	.43	.41	.36
IN.	.62	.66	.58	.79	.63	1.14	.93	.71	.66	.49	.48	.40

CAL YR 1972 TOTAL 80,471 MEAN 220 MAX 737 MIN 126 CFSM .55 IN 7.47
WTP YR 1973 TOTAL 87,203 MEAN 239 MAX 542 MIN 119 CFSM .60 IN 8.09

STREAMS TRIBUTARY TO LAKE HURON

149

04136500 Au Sable River at Mio, Mich.

LOCATION.--Lat $44^{\circ}39'36''$, long $84^{\circ}07'52''$, in NW $\frac{1}{4}$ sec. 7, T.26 N., R.3 E., Oscoda County, on right bank 150 ft (46 m) upstream from bridge on State Highway 33 in Mio, 500 ft (152 m) downstream from Mio powerplant, 9.5 mi (15.3 km) downstream from Big Creek, and 73.0 mi (117.5 km) upstream from mouth.

DRAINAGE AREA.--1,100 mi² (2,850 km²), 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.

AVERAGE DISCHARGE.--21 years, 973 ft³/s (27.56 m³/s), 12.01 in/yr (305 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,970 ft³/s (84.1 m³/s) Dec. 18 (gage height, 5.01 ft or 1.527 m); minimum, 26 ft³/s (0.74 m³/s) July 12; minimum daily, 650 ft³/s (18.4 m³/s) Dec. 13.
Period of record: Maximum discharge, 4,160 ft³/s (118 m³/s) Apr. 13, 1971 (gage height, 6.00 ft or 1.829 m); minimum, 18 ft³/s (0.51 m³/s) Sept. 18, 19, 20, 21, 28, 1962 (gage height, 0.10 ft or 0.030 m); minimum daily, 277 ft³/s (7.84 m³/s) Sept. 24, 1969.

REMARKS.--Records good. Flow regulated at all stages by powerplant 500 ft (152 m) above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,210	1,160	1,010	1,650	1,180	1,090	1,360	1,150	1,210	1,120	1,110	1,060
2	1,110	1,170	981	1,600	1,540	1,040	1,590	1,240	1,120	1,040	1,250	956
3	1,070	1,190	984	1,100	1,560	1,050	1,780	1,220	1,130	1,220	1,240	872
4	1,070	1,210	972	1,300	1,440	1,220	1,670	1,140	1,520	1,210	1,050	870
5	1,030	1,200	978	1,500	1,330	1,360	1,630	1,130	1,490	1,040	983	935
6	977	1,140	1,010	1,150	1,270	1,310	1,590	1,130	1,280	958	953	926
7	976	1,140	920	960	1,250	1,610	1,470	1,070	1,150	925	905	868
8	966	1,180	800	880	1,150	2,010	1,360	1,090	1,140	925	905	852
9	924	1,180	1,000	1,100	1,050	1,890	1,360	1,150	1,240	958	953	827
10	901	1,180	1,100	1,160	1,110	1,680	1,370	1,230	1,300	961	1,130	833
11	903	1,180	1,150	1,160	1,040	1,800	1,360	1,220	1,150	930	1,060	834
12	1,010	1,150	900	1,140	1,020	1,910	1,330	1,140	1,050	765	917	814
13	935	1,110	650	1,120	1,070	2,000	1,330	1,080	965	854	897	810
14	891	1,070	900	1,130	1,190	2,010	1,350	1,040	938	894	896	810
15	891	1,080	1,100	1,160	1,150	2,120	1,460	1,010	920	860	880	819
16	902	1,080	1,050	1,230	1,030	2,020	1,480	984	904	916	874	830
17	906	1,030	960	1,260	1,010	1,920	1,450	1,030	909	861	868	854
18	896	1,030	740	1,330	1,110	1,700	1,320	1,020	953	793	865	917
19	923	1,040	920	1,840	1,170	1,600	1,330	988	982	853	840	919
20	962	1,060	1,100	1,930	1,150	1,460	1,330	959	978	894	860	839
21	1,010	1,060	1,100	1,510	1,110	1,560	1,300	960	947	817	886	864
22	1,600	1,040	1,050	1,740	1,090	1,530	1,300	942	921	810	854	1,170
23	1,800	1,020	980	1,530	1,080	1,450	1,230	905	912	828	838	1,380
24	1,800	990	900	1,590	1,100	1,450	1,180	892	914	818	843	1,360
25	1,680	990	980	1,440	1,060	1,450	1,180	911	915	847	834	1,160
26	1,480	1,030	1,000	1,380	991	1,450	1,180	926	911	999	828	1,080
27	1,340	1,040	1,000	1,360	872	1,450	1,100	1,020	970	1,170	839	1,000
28	1,270	1,070	990	1,320	1,140	1,360	1,000	1,510	1,110	1,040	840	975
29	1,290	1,080	1,000	1,170	-----	1,350	1,010	1,540	1,080	930	839	960
30	1,320	1,060	1,050	1,070	-----	1,450	1,040	1,330	1,070	917	804	936
31	1,240	-----	1,400	1,140	-----	1,450	-----	1,250	-----	1,180	935	-----
TOTAL	35,283	32,960	30,675	40,950	32,263	48,750	40,440	34,207	32,079	29,333	28,776	28,330
MEAN	1,138	1,099	990	1,321	1,152	1,573	1,348	1,103	1,069	946	928	944
MAX	1,800	1,210	1,400	1,930	1,560	2,120	1,780	1,540	1,520	1,220	1,250	1,380
MIN	891	990	650	880	872	1,040	1,000	892	904	765	804	810
CFSM	1.03	1.00	.90	1.20	1.05	1.43	1.23	1.00	.97	.86	.84	.86
IN.	1.19	1.11	1.04	1.38	1.09	1.65	1.37	1.16	1.08	.99	.97	.96

CAL YR 1972 TOTAL 403,757 MEAN 1,103 MAX 2,700 MIN 650 CFSM 1.00 IN 13.65
WTR YR 1973 TOTAL 414,046 MEAN 1,134 MAX 2,120 MIN 650 CFSM 1.03 IN 14.00

04138000 East Branch Au Gres River at McIvor, Mich.

LOCATION.--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 ft (8 m) downstream from bridge on Whittemore Road at McIvor, 0.9 mi (1.4 km) east of National City, 9.3 mi (15.0 km) southwest of Tawas City, and 11.5 mi (18.5 km) upstream from mouth.

DRAINAGE AREA.--84 mi² (218 km²), approximately.

PERIOD OF RECORD.--October 1950 to December 31, 1973 (discontinued as continuous-record station, converted to a crest-stage and low-flow partial-record station). Monthly discharge only for October, November 1950, published in WSP 1727.

GAGE.--Water-stage recorder. Datum of gage is 646.58 ft (197.078 m) above mean sea level. Prior to Aug. 30, 1951, nonrecording gage at bridge at present datum.

AVERAGE DISCHARGE.--23 years, 64.1 ft³/s (1.815 m³/s), 10.36 in/yr (263 mm/yr).

EXTREMES.--Current year: Maximum discharge, 466 ft³/s (13.2 m³/s) May 28 (gage height, 6.34 ft or 1.932 m); maximum gage height, 7.11 ft (2.167 m) Jan. 20; minimum discharge, 23 ft³/s (0.65 m³/s) Dec. 7.

Period Oct. 1 to Dec. 31, 1973: Maximum discharge, 146 ft³/s (4.13 m³/s) Dec. 28 (gage height, 3.75 ft or 1.143 m); maximum gage height, 4.18 ft (1.274 m) Dec. 31; minimum discharge, 37 ft³/s (1.05 m³/s) Oct. 1.

Period of record: Maximum discharge, 1,310 ft³/s (37.1 m³/s) May 20, 1959 (gage height, 8.88 ft or 2.707 m); minimum, 12 ft³/s (0.34 m³/s) Mar. 11, 1969 (discharge measurement); minimum daily, 22 ft³/s (0.62 m³/s) June 20, 21, 26-28, July 6, 7, July 30 to Aug. 1, Sept. 7, 1964.

REMARKS.--Records good except those for winter periods, which are poor. Some intermittent regulation during period 1952-66 at low and medium flow by dam 2.5 mi (4.0 km) above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	39	33	130	94	68	222	96	128	72	81	46
2	43	44	33	115	100	72	282	105	119	67	93	44
3	42	47	34	105	115	80	212	90	130	64	86	42
4	38	42	33	95	105	110	174	83	144	60	81	41
5	38	40	33	75	100	140	151	76	126	59	75	40
6	38	37	33	65	92	160	134	70	117	57	71	39
7	38	40	33	55	88	190	122	71	112	52	68	39
8	38	54	34	52	85	296	112	96	98	50	65	39
9	40	44	34	50	82	230	106	92	92	49	81	38
10	38	41	35	50	80	177	107	90	87	48	76	38
11	39	40	35	50	80	166	105	92	76	47	64	37
12	40	38	35	49	78	206	113	86	74	47	59	36
13	38	37	35	50	74	204	117	80	70	51	56	36
14	38	36	36	50	72	211	117	75	66	47	54	36
15	37	34	36	52	68	294	116	72	63	46	54	36
16	37	35	36	55	66	244	113	71	62	45	52	37
17	38	36	36	60	64	190	105	71	64	43	50	40
18	38	32	36	70	62	165	96	67	71	42	49	49
19	38	32	36	95	60	152	92	65	69	41	49	41
20	37	32	37	190	60	151	90	61	66	41	56	40
21	42	32	37	170	58	158	85	60	59	41	49	38
22	50	31	37	155	58	154	84	58	58	39	46	62
23	118	31	37	140	60	143	79	57	65	39	45	50
24	84	31	38	125	60	143	74	54	77	38	45	44
25	63	31	38	115	62	143	71	52	63	41	45	41
26	54	35	37	110	62	135	69	96	58	67	44	42
27	48	41	37	105	64	129	67	81	63	97	43	41
28	51	38	37	100	66	123	66	372	77	60	42	40
29	49	34	40	100	-----	117	67	311	86	55	41	38
30	43	38	72	95	-----	118	66	189	76	52	40	37
31	41	-----	145	94	-----	110	-----	147	-----	59	50	-----
TOTAL	1,418	1,122	1,248	2,822	2,115	4,979	3,414	3,086	2,516	1,616	1,810	1,227
MEAN	45.7	37.4	40.3	91.0	75.5	161	114	99.5	83.9	52.1	58.4	40.9
MAX	118	54	145	190	115	296	282	372	144	97	93	62
MIN	37	31	33	49	58	68	66	52	58	38	40	36
CFSM	.54	.45	.48	1.08	.90	1.92	1.36	1.18	1.00	.62	.70	.49
IN.	.63	.50	.55	1.25	.94	2.20	1.51	1.37	1.11	.72	.80	.54

CAL YR 1972 TOTAL 21,399 MEAN 58.5 MAX 585 MIN 25 CFSM .70 IN 9.48
WTR YR 1973 TOTAL 27,373 MEAN 75.0 MAX 372 MIN 31 CFSM .89 IN 12.12

PEAK DISCHARGE (BASE, 300 FT³/S)

DATE	TIME	G.H.	DISCHARGE
01-20	0300	7.11	350
03-08	0400	5.51	317
03-15	0900	5.43	304
04-01	2100	5.61	333
05-28	2200	6.34	466

STREAMS TRIBUTARY TO LAKE HURON

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04138000 East Branch AuGres River at McIvor, Mich.

DISCHARGE, IN CURIC FEET PER SECOND, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	72	55									
2	38	63	53									
3	42	56	54									
4	44	54	60									
5	51	54	81									
6	43	55	71									
7	41	55	65									
8	40	56	62									
9	39	57	61									
10	38	57	62									
11	38	59	60									
12	38	62	56									
13	86	65	55									
14	83	67	54									
15	56	73	54									
16	49	91	54									
17	46	63	53									
18	45	49	54									
19	44	47	56									
20	44	46	64									
21	41	72	66									
22	40	74	64									
23	40	59	64									
24	39	58	66									
25	39	60	90									
26	39	56	120									
27	38	55	139									
28	71	63	139									
29	80	62	99									
30	66	57	92									
31	56	-----	84									
TOTAL	1,491	1,817	2,207									
MEAN	48.1	60.6	71.2									
MAX	86	91	139									
MIN	37	46	53									
CFSM	.57	.72	.85									
IN.	.66	.80	.98									

CAL YR 1973 TOTAL 29,100 MEAN 79.7 MAX 372 MIN 36 CFSM .95 IN 12.89

STREAMS TRIBUTARY TO LAKE HURON

04138500 Au Gres River near National City, Mich.

LOCATION.--Lat 44°10'26", long 83°44'36", in NE&NE& sec.31, T.21 N., R.6 E., Iosco County, 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 mi² (438 km²).

PERIOD OF RECORD.--October 1950 to current year. Monthly discharge only October, November, 1950, published in WSP 1727.

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.

AVERAGE DISCHARGE.--23 years, 97.5 ft³/s (2.761 m³/s), 7.83 in/yr (199 mm/yr).

EXTREMES.--Current year: Maximum discharge, 987 ft³/s (28.0 m³/s) May 28 (gage height, 4.98 ft or 1.518 m); maximum gage height, about 6.0 ft (1.83 m) Jan. 20, (backwater from ice); minimum discharge, 15 ft³/s (0.42 m³/s) Sept. 12, 13.

Period of record: Maximum discharge, 2,350 ft³/s (66.6 m³/s) Aug. 16, 1969 (gage height, 8.32 ft or 2.536 m); maximum gage height, 10.5 ft (3.20 m) Feb. 21, 1953 (backwater from ice); minimum discharge, 5.9 ft³/s (0.17 m³/s) Nov. 3, 1966, result of freeze-up.

REMARKS.--Records good except those for winter periods, which are fair.

REVISIONS (WATER YEARS).--WSP 1911: 1959-60.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	67	50	250	140	96	526	127	238	67	304	28
2	29	70	50	220	145	105	562	159	255	60	162	23
3	26	62	50	190	180	130	450	112	305	60	128	22
4	24	71	49	170	160	170	382	97	410	51	100	19
5	24	68	50	150	140	230	325	82	291	39	68	19
6	26	62	50	140	135	310	265	70	258	36	54	17
7	26	62	50	130	125	400	226	65	195	35	44	17
8	24	95	47	115	120	728	200	116	164	34	46	17
9	24	80	49	105	120	471	183	141	126	33	80	16
10	24	73	50	100	115	342	178	118	110	31	75	16
11	26	67	50	98	110	360	181	152	71	31	53	16
12	28	62	51	96	110	472	210	134	77	30	38	16
13	27	57	52	96	105	392	214	114	60	38	33	16
14	28	54	52	96	100	544	198	93	54	34	29	16
15	28	53	54	98	96	681	174	75	47	31	27	17
16	34	46	54	105	94	458	154	67	46	31	24	17
17	35	47	54	120	90	335	152	67	51	26	23	17
18	43	49	55	140	86	260	128	62	53	23	21	27
19	38	53	55	200	84	270	114	57	50	22	21	20
20	43	51	56	280	82	322	114	56	44	22	27	18
21	49	50	56	250	80	338	114	56	39	22	27	17
22	65	47	57	220	82	325	124	56	38	20	21	34
23	171	44	58	200	82	306	116	56	40	19	22	30
24	122	43	58	185	84	298	110	51	44	18	21	21
25	87	43	53	180	86	279	95	47	47	19	21	19
26	78	49	58	165	88	260	77	95	54	28	19	21
27	71	67	58	155	90	231	68	99	56	62	19	20
28	71	65	59	145	94	205	82	781	100	30	18	21
29	84	56	62	140	-----	210	78	800	100	27	17	19
30	78	50	75	135	-----	236	70	516	80	31	17	18
31	70	-----	200	135	-----	224	-----	315	-----	50	26	-----
TOTAL	1,531	1,783	1,827	4,809	3,023	9,988	5,870	4,836	3,503	1,060	1,585	594
MEAN	49.4	59.4	58.9	155	108	322	196	156	117	34.2	51.1	19.8
MAX	171	55	200	280	180	728	562	800	410	67	304	34
MIN	24	43	47	96	80	96	68	47	38	18	17	16
CFSM	.29	.35	.35	.92	.64	1.91	1.16	.92	.69	.20	.30	.12
IN.	.34	.39	.35	1.06	.67	2.20	1.29	1.06	.77	.23	.35	.13

CAL YR 1972 TOTAL 31,830 MEAN 87.0 MAX 1,450 MIN 16 CFSM .51 IN 7.01
WTR YR 1973 TOTAL 40,409 MEAN 111 MAX 800 MIN 16 CFSM .66 IN 8.89

PEAK DISCHARGE (BASE, 600 FT³/S)

DATE	TIME	G.H.	DISCHARGE
03-08	0200	4.33	819
03-15	0030	4.26	798
04-01	1630	3.89	692
05-28	1130	4.98	987

STREAMS TRIBUTARY TO LAKE HURON

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04140500 Rifle River at Selkirk, Mich.

LOCATION.--Lat 44°18'48", long 84°04'10", in SE¼ NE¼ sec.9, T.22 N., R.3 W., Ogemaw County, 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 mi² (303 km²).

PERIOD OF RECORD.--September 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 828.47 ft (252.518 m) above mean sea level.

AVERAGE DISCHARGE.--23 years, 144 ft³/s (4.078 m³/s), 16.71 in/yr (424 mm/yr).

EXTREMES.--Current year: Maximum discharge, 742 ft³/s (21.0 m³/s) Mar. 8, (gage height, 3.47 ft or 1.058 m); maximum gage height, 4.39 ft (1.338 m) Jan. 12 (backwater from ice); minimum discharge, 72 ft³/s (2.04 m³/s) July 24.
Period of record: Maximum discharge, 2,760 ft³/s (78.2 m³/s) May 20, 1959 (gage height, 6.76 ft or 2.060 m); minimum, 55 ft³/s (1.56 m³/s) Aug. 19, 1958.

REMARKS.--Records good except those for winter periods, which are fair. Some regulation from dams above station. Records of water temperature for the current year are published in Part 2 of this report.

REVISIONS.--WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	161	131	120	347	205	140	274	175	210	126	333	108
2	153	142	118	310	204	142	364	228	225	118	374	101
3	139	156	115	260	234	164	392	198	255	113	243	99
4	128	144	115	210	243	300	336	178	382	106	172	95
5	126	142	110	180	222	368	290	170	306	106	144	92
6	123	131	110	150	198	374	246	158	231	106	128	90
7	123	136	110	140	186	510	228	156	204	103	118	88
8	115	164	110	125	180	706	207	207	181	99	115	86
9	113	164	110	125	170	515	201	222	164	97	115	86
10	110	144	115	125	170	360	195	195	150	95	110	86
11	113	139	115	125	160	388	195	178	139	92	103	82
12	113	139	115	125	155	575	213	178	133	97	97	82
13	110	131	115	130	150	468	210	167	128	103	95	84
14	115	126	115	130	145	492	198	158	123	99	92	84
15	115	118	120	130	140	650	192	150	118	97	92	84
16	113	115	120	140	140	464	186	147	115	95	90	92
17	110	115	120	150	135	316	195	147	115	90	90	97
18	113	115	120	201	130	262	175	142	115	88	88	115
19	115	115	125	388	125	262	170	142	118	84	90	99
20	115	115	130	370	125	284	164	136	113	84	108	95
21	123	115	131	340	125	271	158	133	110	84	99	92
22	158	115	128	320	125	258	158	128	108	82	92	147
23	294	113	125	392	125	252	150	126	108	80	92	136
24	343	110	125	347	130	255	142	123	118	74	92	113
25	246	118	126	278	130	249	133	120	113	84	92	108
26	166	133	128	258	135	240	131	144	106	92	92	108
27	156	150	126	252	140	228	128	144	120	115	92	99
28	158	150	128	222	140	213	126	409	123	92	90	97
29	167	151	126	210	-----	213	123	635	131	88	88	95
30	150	123	161	200	-----	228	126	382	131	95	88	92
31	139	-----	306	200	-----	231	-----	249	-----	180	115	-----
TOTAL	4,543	3,960	3,946	6,880	4,517	10,378	6,006	6,025	4,693	3,064	3,829	2,932
MEAN	147	132	127	222	161	335	200	194	156	98.8	124	97.7
MAX	343	164	306	392	284	706	392	635	382	180	374	147
MIN	110	110	110	125	125	140	123	120	106	74	88	82
CFSM	1.26	1.13	1.09	1.90	1.38	2.86	1.71	1.66	1.33	.84	1.06	.84
IN.	1.44	1.26	1.25	2.19	1.44	3.30	1.91	1.92	1.49	.97	1.22	.93

CAL YR 1972 TOTAL 54,296 MEAN 148 MAX 1,070 MIN 78 CFSM 1.27 IN 17.26
WTR YR 1973 TOTAL 60,773 MEAN 167 MAX 706 MIN 74 CFSM 1.43 IN 19.32

PEAK DISCHARGE (BASE, 500 FT³/S)

DATE	TIME	G.H.	DISCHARGE
03-08	0100	3.47	742
03-15	0700	3.35	675
05-29	0700	3.35	695

04141000 South Branch Shepards Creek near Selkirk, Mich.

LOCATION.--Lat 44°18'28", long 84°05'13", in SE¼ SE¼ sec.8, T.22 N., R.3 E., Ogemaw County, 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 mi² (2.98 km²).

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

GAGE.--Water-stage recorder and V notch sharp-crested weir. Altitude of gage is 845 ft (258 m) by barometer.

AVERAGE DISCHARGE.--22 years, 0.54 ft³/s (0.0153 m³/s), 6.38 in/yr (162 mm/yr).

EXTREMES.--Current year: Maximum discharge, 153 ft³/s (4.33 m³/s) May 28 (gage height, 4.42 ft or 1.347 m); minimum, 0.03 ft³/s (0.001 m³/s) Aug. 29, Sept. 6, 7, 8, 11, 12, 13.

Period of record: Maximum discharge, 181 ft³/s (5.13 m³/s) Apr. 3, 1956 (gage height, 4.42 ft or 1.347 m), from rating curve extended above 40 ft³/s (1.13 m³/s); no flow at times each year, except 1956, and 1967-72.

REMARKS.--Records fair.

REVISIONS (WATER YEARS).--WSP 1557: 1952 (M), 1954 (M), 1955 (P). WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.22	.23	.22	5.3	.28	.22	3.4	.66	.69	.28	1.3	.06
2	.20	.31	.19	3.3	4.9	.20	3.5	.73	1.0	.23	.61	.06
3	.18	.38	.19	2.0	2.0	4.5	2.2	.53	2.5	.19	.37	.04
4	.15	.28	.18	1.3	1.1	12	1.7	.38	3.6	.16	.28	.04
5	.15	.23	.19	.87	.85	5.1	1.1	.29	1.1	.16	.22	.04
6	.15	.22	.20	.73	.61	6.3	.64	.26	.73	.13	.20	.04
7	.16	.33	.18	.66	.40	10	.50	.28	.50	.12	.15	.04
8	.14	.80	.14	.35	.37	4.2	.40	.83	.35	.10	.14	.04
9	.14	.40	.14	.26	.32	1.9	.35	.69	.29	.10	.13	.04
10	.13	.29	.15	.19	.29	1.6	.35	.45	.24	.09	.12	.04
11	.14	.26	.16	.18	.26	8.2	.38	.37	.23	.08	.10	.04
12	.14	.24	.16	.18	.22	5.8	.98	.33	.23	.10	.09	.04
13	.13	.23	.18	.16	.18	2.2	.80	.28	.19	.10	.07	.04
14	.12	.22	.18	.22	.18	10	.66	.26	.18	.08	.06	.04
15	.12	.22	.18	.22	.20	3.6	.58	.24	.16	.09	.06	.04
16	.12	.20	.18	.22	.20	1.6	.50	.26	.19	.07	.06	.04
17	.12	.20	.18	.29	.18	.80	.50	.24	.40	.06	.06	.12
18	.12	.20	.19	3.8	.18	.50	.37	.24	.33	.06	.05	.19
19	.12	.22	.20	14	.18	.58	.35	.23	.29	.06	.07	.12
20	.14	.22	.20	4.1	.18	1.8	.35	.23	.24	.06	.19	.11
21	.20	.22	.22	1.6	.20	1.5	.31	.20	.22	.08	.10	.10
22	.57	.22	.23	5.2	.23	1.3	.31	.20	.20	.06	.07	.33
23	1.7	.22	.23	6.7	.20	1.1	.28	.16	.28	.09	.08	.18
24	.87	.22	.24	2.0	.20	1.0	.24	.16	.56	.09	.08	.14
25	.42	.22	.24	1.1	.19	.87	.24	.19	.31	.13	.07	.13
26	.33	.24	.26	1.0	.22	.66	.23	.29	.23	.30	.07	.16
27	.26	.29	.26	.95	.22	.50	.23	.37	.31	.28	.06	.12
28	.37	.28	.26	.87	.22	.40	.23	22	.40	.20	.05	.12
29	.35	.22	.26	.50	-----	.47	.22	16	.40	.15	.04	.10
30	.26	.20	1.1	.40	-----	.66	.23	2.0	.33	.20	.04	.09
31	.24	-----	3.5	.31	-----	.64	-----	.98	-----	1.5	.08	-----
TOTAL	8.48	8.61	10.39	58.96	14.76	90.26	22.13	50.33	16.68	5.40	5.07	2.69
MEAN	.27	.27	.34	1.90	.53	2.91	.74	1.62	.56	.17	.16	.090
MAX	1.7	.80	3.5	14	4.9	12	3.5	22	3.6	1.5	1.3	.33
MIN	.12	.20	.14	.16	.18	.22	.22	.16	.16	.06	.04	.04
CFSM	.23	.23	.30	1.65	.46	2.53	.64	1.41	.49	.15	.14	.08
IN.	.27	.26	.34	1.91	.48	2.92	.72	1.63	.54	.17	.16	.09
CAL YR 1972	TOTAL 200.67	MEAN .55	MAX 20	MIN .03	CFSM .48	IN 6.50						
WTR YR 1973	TOTAL 293.14	MEAN .80	MAX 22	MIN .04	CFSM .70	IN 9.48						

PEAK DISCHARGE (BASE, 20 FT³/S)

DATE	TIME	G.H.	DISCHARGE
03-11	1900	3.19	36
03-14	0930	3.33	42
05-28	2200	4.42	153

04142000 Rifle River near Sterling, Mich.

LOCATION.--Lat 44°04'21", long 84°01'12", in NE¼ SW¼ sec.5, T.19 N., R.4 E., Arenac County, on left bank 30 ft (9 m) downstream from bridge on Old-M70, 2.8 mi (4.5 km) north of Sterling, and 20 mi (32 km) upstream from mouth.

DRAINAGE AREA.--320 mi² (830 km²), approximately.

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.

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.

AVERAGE DISCHARGE.--37 years, 307 ft³/s (8.694 m³/s), 13.03 in/yr (331 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,980 ft³/s (56.1 m³/s) May 29 (gage height, 7.53 ft or 2.295 m); maximum gage height, 8.86 ft (2.701 m) Mar. 7 (backwater from ice); minimum discharge, 135 ft³/s (3.82 m³/s) Sept. 12, 13 (gage height, 1.46 ft or 0.445 m). Period of record: Maximum discharge, 5,340 ft³/s (151 m³/s) Mar. 28, 1950 (gage height, 13.74 ft or 4.188 m), from rating curve extended above 3,800 ft³/s (108 m³/s); minimum, 75 ft³/s (2.12 m³/s) Nov. 22, 1964, result of freezeup.

REMARKS.--Records good except those for winter periods, which are fair. Occasional regulation from dams above station.

REVISIONS (WATER YEARS).--WSP 1437: 1937 (M), 1939-40 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	264	248	230	860	510	360	822	360	591	261	538	194
2	240	257	220	800	540	370	993	549	606	238	626	167
3	224	301	210	620	660	420	1,040	516	669	221	481	159
4	205	291	210	520	580	620	937	422	996	205	339	153
5	196	276	205	420	520	820	802	375	860	193	273	150
6	192	263	205	370	480	920	672	337	638	184	240	145
7	191	261	210	340	460	1,200	621	315	526	177	216	142
8	189	336	210	330	460	1,700	559	417	447	170	205	141
9	181	360	210	310	450	1,360	507	543	390	165	243	141
10	176	311	215	300	440	1,010	500	463	349	161	219	142
11	174	290	220	300	430	966	487	428	311	158	198	139
12	177	274	220	300	420	1,410	525	393	289	160	184	137
13	174	263	220	310	400	1,250	560	367	273	179	175	136
14	174	249	220	310	380	1,270	515	335	252	175	169	139
15	174	255	220	330	370	1,660	456	312	237	167	167	150
16	173	234	220	350	350	1,350	432	299	236	161	163	163
17	167	241	230	390	340	978	427	307	247	156	162	174
18	160	249	230	450	330	714	394	295	255	152	159	204
19	153	251	230	780	330	684	367	283	251	150	158	190
20	154	246	240	1,100	320	755	360	274	240	151	179	172
21	168	241	240	920	320	750	347	260	228	151	187	164
22	216	237	240	850	320	703	351	249	218	145	162	213
23	464	230	240	760	320	660	333	238	219	144	157	266
24	648	229	240	720	320	656	304	227	233	142	159	210
25	539	243	240	660	330	628	286	222	226	148	159	192
26	373	265	240	620	330	509	273	278	218	180	157	193
27	305	298	240	580	340	556	266	289	259	229	157	188
28	200	290	240	550	350	507	253	1,080	289	195	153	178
29	315	260	250	520	-----	507	247	1,720	288	174	145	173
30	297	240	350	510	-----	555	257	1,500	277	170	144	168
31	262	-----	620	500	-----	569	-----	811	-----	214	169	-----
TOTAL	7,609	7,989	7,515	16,680	11,400	26,506	14,893	14,464	11,128	5,476	6,843	5,083
MEAN	245	266	242	538	407	855	496	467	371	177	221	169
MAX	648	360	620	1,100	660	1,700	1,040	1,720	996	261	626	266
MIN	154	229	205	300	320	360	247	222	218	142	144	136
CFSM	.77	.63	.76	1.69	1.27	2.67	1.55	1.46	1.16	.55	.69	.53
IN.	.98	.93	.87	1.94	1.33	3.08	1.73	1.68	1.29	.64	.80	.59

CAI YR 1972 TOTAL 109,349 MEAN 299 MAX 2,320 MIN 136 CFSM .93 IN 12.71
WTP YR 1973 TOTAL 135,586 MEAN 371 MAX 1,720 MIN 126 CFSM 1.16 IN 15.76

PEAK DISCHARGE (BASE, 1,600 FT³/S)

DATE	TIME	G.H.	DISCHARGE
03-08	0900	6.99	1,770
03-15	0400	6.87	1,720
05-29	1900	7.53	1,980

STREAMS TRIBUTARY TO LAKE HURON

04143500 North Branch Kawkawlin River near Kawkawlin, Mich.

LOCATION.--Lat 43°40'05", long 83°58'13", in SE¼ SE¼ sec.27, T.15 N., R.4 E., Bay County, 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 mi² (262 km²).

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.

AVERAGE DISCHARGE.--22 years, 56.2 ft³/s (1.592 m³/s), 7.56 in/yr (192 mm/yr).

EXTREMES.--Current year: Maximum discharge, 840 ft³/s (23.8 m³/s) Jan. 22 (gage height, 8.98 ft or 2.737 m); maximum gage height, 9.06 ft (2.761 m) Jan. 4 (backwater from ice); no flow at times.

Period of record: Maximum discharge, 1,540 ft³/s (43.6 m³/s) Apr. 1, 1960, Apr. 13, 1965; maximum gage height, 10.33 ft (3.149 m) Apr. 13, 1965; no flow at times in each year.

REMARKS.--Records fair except those for winter periods, which are poor. Some diversion above station for irrigation. Some regulation from dams above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	88	22	410	58	20	378	87	306	46	8.8	
2	0	81	23	600	62	22	536	104	296	42	43	
3	0	83	23	700	66	25	662	176	268	70	26	
4	0	78	23	790	70	60	573	295	290	85	12	
5	0	71	22	500	74	140	447	286	338	74	8.2	
6	0	62	31	350	78	230	376	224	354	57	5.8	
7	0	59	38	250	85	310	332	171	361	45	3.8	
8	0	77	26	200	72	520	277	150	318	35	2.0	
9	0	81	24	160	60	460	224	145	248	28	1.2	
10	0	78	24	130	52	370	197	141	180	22	.80	
11	0	73	24	100	44	380	177	236	133	18	.03	
12	0	70	24	85	41	380	175	288	94	13	0	
13	0	80	25	75	37	380	178	258	66	10	0	
14	0	80	25	64	33	370	194	207	47	8.2	0	
15	0	70	25	56	30	340	223	164	34	6.4	0	
16	0	59	25	52	28	310	215	131	27	4.2	0	
17	0	51	25	52	26	290	186	106	22	3.4	0	
18	0	45	25	80	25	250	156	83	18	2.8	0	
19	0	40	26	210	23	220	131	68	15	1.5	0	
20	0	35	26	280	22	230	114	55	13	.90	0	
21	0	32	27	630	21	266	104	49	9.4	.80	0	
22	.32	30	29	810	20	298	102	43	7.3	.70	0	
23	57	26	30	620	20	337	98	38	6.6	.10	0	
24	70	24	32	480	19	342	90	32	10	0	0	
25	57	23	35	320	19	326	89	29	13	0	0	
26	99	24	38	210	19	302	86	26	12	0	0	
27	165	27	41	140	19	268	82	24	11	0	0	
28	180	27	44	100	19	228	71	69	32	0	0	
29	163	24	48	90	-----	194	60	62	51	0	0	
30	137	23	54	78	-----	209	53	110	54	0	0	
31	110	-----	230	66	-----	198	-----	272	-----	0	0	-----
TOTAL	1,038.32	1,621	1,114	8,688	1,142	8,275	6,586	4,129	3,634.3	574.00	111.63	0
MEAN	33.5	54.0	35.9	280	40.8	267	220	133	121	18.5	3.60	0
MAX	180	88	230	810	85	520	662	295	361	85	43	0
MIN	0	23	22	52	19	20	53	24	6.6	0	0	0
CFSM	.33	.53	.36	2.77	.40	2.64	2.18	1.32	1.20	.18	.04	0
IN.	.38	.60	.41	3.20	.42	3.05	2.43	1.52	1.34	.21	.04	0

CAL YR 1972 TOTAL 17,243.49 MEAN 47.1 MAX 490 MIN 0 CFSM .47 IN 6.35
WTR YR 1973 TOTAL 36,913.25 MEAN 101 MAX 810 MIN 0 CFSM 1.00 IN 13.60

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LOCATION.--Lat 42°48'56", long 83°48'08", in SW¼ sec.19, T.5 N., R.6 E., Genesee County, on right bank at upstream side of bridge on Hogan Road, 1.0 mi (1.6 km) west of Linden.

EXTREMES.--Current year: Maximum discharge, 309 ft³/s (8.75 m³/s) Jan. 6 (gage height, 6.32 ft or 1.926 m); minimum, 8.1 ft³/s (0.23 m³/s) Sept. 11, 12 (gage height, 3.21 ft or 0.978 m).
Period of record: Maximum discharge, 309 ft³/s (8.75 m³/s) Jan. 6, 1973 (gage height, 6.32 ft or 1.926 m); minimum, 0.74 ft³/s (0.021 m³/s) May 22, 23, 1971; minimum gage height, 2.82 ft (0.860 m) Aug. 2, 1971.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	95	71	183	78	52	226	91	81	57	18	10
2	38	96	70	200	94	55	234	89	86	58	18	11
3	38	103	68	238	96	66	234	71	90	61	19	10
4	37	101	67	263	94	79	229	47	94	78	19	10
5	37	87	62	281	93	92	220	83	107	88	20	10
6	37	91	56	289	87	101	206	83	105	90	20	9.8
7	36	96	55	255	87	117	195	80	98	89	21	9.3
8	35	94	52	220	88	127	181	79	89	75	21	9.1
9	34	96	52	200	85	144	171	80	80	74	27	8.8
10	31	66	52	160	78	150	156	82	75	73	35	8.6
11	27	97	52	130	70	164	154	84	55	67	34	8.3
12	27	83	54	110	68	180	150	95	28	57	33	8.3
13	26	83	55	90	68	180	136	106	37	53	33	8.8
14	26	93	61	70	69	194	129	108	39	56	32	9.1
15	26	93	64	54	69	220	118	107	38	57	32	9.2
16	26	90	66	50	68	222	112	102	47	57	31	9.5
17	25	88	70	55	64	249	101	90	51	51	31	10
18	25	84	72	65	60	252	109	88	41	37	30	14
19	24	76	78	70	58	255	109	88	41	18	29	14
20	15	60	76	81	54	255	104	86	41	21	32	15
21	15	69	77	96	46	248	91	67	40	24	31	16
22	19	74	78	104	58	239	93	50	41	29	30	21
23	32	73	78	105	62	227	96	72	41	29	30	30
24	36	72	78	104	56	214	94	59	42	29	30	30
25	46	71	80	103	46	212	94	57	41	30	29	30
26	56	71	80	106	48	211	93	57	43	29	29	29
27	59	71	82	105	50	212	91	58	48	28	28	29
28	73	72	82	106	51	210	90	63	51	27	27	29
29	91	71	81	105	-----	211	90	66	56	24	27	27
30	97	71	100	103	-----	216	90	69	57	21	21	23
31	96	-----	152	95	-----	216	-----	73	-----	18	10	-----
TOTAL	1,228	2,487	2,221	4,196	1,945	5,570	4,196	2,430	1,783	1,505	827	466.8
MEAN	39.6	82.9	71.6	135	69.5	180	140	78.4	59.4	48.5	26.7	15.6
MAX	97	103	152	289	96	255	234	108	107	90	35	30
MIN	15	60	52	50	46	52	90	47	28	18	10	8.3
CFSM	.49	1.02	.88	1.66	.86	2.22	1.72	.97	.73	.60	.33	.19
IN.	.56	1.14	1.02	1.92	.89	2.55	1.92	1.11	.82	.69	.38	.21
CAL YR 1972	TOTAL	18,876.2	MEAN	51.6	MAX	169	MIN	4.2	CFSM	.64	IN	8.65
WTR YR 1973	TOTAL	28,854.8	MEAN	79.1	MAX	289	MIN	8.3	CFSM	.97	IN	13.22

04144000 Shiawassee River at Byron, Mich.

LOCATION.--Lat 42°49'25", long 83°56'45", in NE¼ NE¼ sec.23, T.5 N., R.4 E., Shiawassee County, on 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.--386 mi² (953 km²).

PERIOD OF RECORD.--October 1947 to current year. Monthly discharge only for some periods, published in WSP 1307.

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.

AVERAGE DISCHARGE.--26 years, 241 ft³/s (6.825 m³/s), 8.89 in/yr (226 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,980 ft³/s (56.1 m³/s) Dec. 31 (gage height, 11.00 ft or 3.353 m, from highwater mark); minimum, 50 ft³/s (1.42 m³/s) Sept. 10, 11 (gage height, 4.19 ft or 1.277 m).
Period of record: Maximum discharge, 2,900 ft³/s (82.1 m³/s) Apr. 1, 1960; maximum gage height, 12.58 ft (3.834 m) May 15, 1956, Apr. 1, 1960; minimum discharge, 19 ft³/s (0.54 m³/s); Aug. 16, 1965; minimum gage height, 3.55 ft (1.082 m) Sept. 16, 1960.

REMARKS.--Records good except those for period of no gage-height record, which are fair. Low flow slightly regulated at times by mills above station. Records of water temperature for the current year are published in Part 2 of this report.

REVISIONS.--WSP 1144: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	135	372	328	1,700	399	240	1,250	303	631	200	100	80
2	118	360	318	1,400	394	263	1,250	383	613	270	101	77
3	111	368	314	1,200	429	371	1,250	446	573	287	97	71
4	104	372	295	1,300	464	493	1,210	446	506	264	91	67
5	104	376	290	1,400	451	590	1,140	421	466	247	87	69
6	102	370	280	1,200	454	737	1,040	393	416	243	82	69
7	100	374	260	1,000	435	814	951	374	366	237	82	68
8	98	384	250	900	414	885	868	382	342	197	80	61
9	91	384	250	800	374	942	793	399	334	157	92	56
10	93	406	260	700	350	960	762	433	336	152	117	52
11	94	438	260	500	300	973	714	437	305	130	147	51
12	91	422	270	450	310	973	662	408	272	126	171	52
13	88	396	330	400	320	1,010	594	364	239	125	157	53
14	85	390	404	360	333	1,150	535	340	208	120	132	53
15	83	370	407	340	329	1,160	479	332	160	115	102	53
16	79	366	340	344	292	1,180	411	325	127	109	98	53
17	83	362	320	353	230	1,280	399	316	115	109	96	55
18	83	360	330	433	250	1,240	381	272	106	108	89	63
19	83	356	383	522	290	1,140	379	221	111	101	87	68
20	82	354	373	530	290	1,090	413	202	114	100	92	66
21	110	354	382	486	280	1,080	443	178	107	97	95	63
22	144	360	393	499	270	1,110	497	179	96	92	95	66
23	235	372	404	484	270	1,130	548	176	94	87	92	67
24	324	378	399	508	260	1,090	583	197	94	88	88	66
25	464	376	400	509	260	1,050	580	241	87	92	86	72
26	488	372	402	480	250	1,050	488	250	88	92	84	77
27	441	364	398	455	240	1,090	408	243	99	96	79	78
28	404	362	393	448	230	1,100	333	302	109	96	81	81
29	349	356	516	424	-----	1,170	310	414	122	92	86	88
30	328	340	833	374	-----	1,230	291	531	143	87	85	96
31	348	-----	1,900	393	-----	1,200	-----	615	-----	92	84	-----
TOTAL	5,542	11,214	12,682	20,892	9,168	29,791	19,962	10,523	7,379	4,408	3,055	1,991
MEAN	179	374	409	674	327	961	665	339	246	142	98.5	66.4
MAX	488	438	1,900	1,700	464	1,280	1,250	615	631	287	171	96
MIN	79	340	250	340	230	240	291	176	87	87	79	51
CFSM	.49	1.02	1.11	1.83	.89	2.61	1.81	.92	.67	.39	.27	.18
IN.	.56	1.13	1.28	2.11	.93	3.01	2.02	1.06	.75	.45	.31	.20

CAL YR 1972 TOTAL 86,465 MEAN 236 MAX 1,900 MIN 52 CFSM .64 IN 8.74
WTR YR 1973 TOTAL 136,607 MEAN 374 MAX 1,900 MIN 51 CFSM 1.02 IN 13.81

NOTE.--No gage-height record Dec. 31 to Jan. 10.

04144500 Shiawassee River at Owosso, Mich.

LOCATION.--Lat 43°00'54", long 84°10'52", in SW¼ sec.12, T.7 N., R.2 E., Shiawassee County, on right bank on grounds of sewage-treatment plant, 1.5 mi (2.4 km) north of Owosso.

DRAINAGE AREA.--538 mi² (1,393 km²).

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.

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.

AVERAGE DISCHARGE.--42 years, 315 ft³/s (8.921 m³/s), 7.95 in/yr (202 mm/yr).

EXTREMES.--Current year: Maximum discharge, 4,080 ft³/s (116 m³/s) Dec. 31 (gage height, 8.32 ft or 2.536 m); minimum, 21 ft³/s (0.59 m³/s) July 17 (gage height, 2.03 ft or 0.619 m).

Period of record: Maximum discharge, 6,240 ft³/s (177 m³/s) Apr. 6, 1947 (gage height, 10.35 ft or 3.155 m); minimum, 0.2 ft³/s (0.006 m³/s) July 27, 1934 (gage height, 1.12 ft or 0.341 m); minimum daily, 2.0 ft³/s (0.057 m³/s) July 28, 1934.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, which are fair. Flow regulated below about 800 cfs by powerplant at Shiawassee town prior to February 1953; occasional regulation at low stages since.

REVISIONS (WATER YEARS).--WSP 1307: 1949 (M). WSP 1337: 1932, 1934, 1936-38, 1944.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	190	500	460	2,750	501	277	2,580	568	811	226	168	95
2	170	600	450	2,250	509	327	2,190	536	760	264	171	96
3	160	720	440	2,300	526	883	1,860	550	792	349	164	89
4	150	650	410	2,750	549	1,420	1,650	564	860	332	147	84
5	150	570	380	2,500	575	1,230	1,500	546	687	311	132	74
6	140	550	360	1,990	554	1,240	1,350	510	616	294	121	71
7	140	580	350	1,600	544	1,340	1,220	477	546	291	114	72
8	140	750	350	1,300	519	1,320	1,100	503	474	284	102	72
9	130	850	340	1,100	410	1,220	1,010	523	429	259	93	72
10	130	750	340	800	370	1,220	986	526	400	250	114	62
11	130	650	350	600	356	1,530	966	539	387	233	145	55
12	130	600	363	550	369	1,700	965	532	360	209	196	50
13	125	570	415	480	370	1,400	869	494	335	199	223	49
14	120	550	632	430	370	2,010	772	451	299	192	214	51
15	115	530	670	450	350	2,220	679	423	276	225	185	50
16	115	520	580	472	265	1,750	618	413	236	164	141	50
17	115	500	497	480	231	1,540	585	402	203	140	116	94
18	115	500	482	630	308	1,440	551	389	188	164	115	85
19	120	500	517	753	374	1,450	542	347	177	158	110	65
20	140	500	586	738	349	1,540	529	310	173	169	134	68
21	170	500	588	625	329	1,530	549	292	177	153	121	69
22	250	510	615	768	316	1,520	689	271	171	148	122	75
23	700	520	647	807	315	1,580	936	283	154	138	122	68
24	900	520	659	723	305	1,700	852	278	176	145	116	67
25	900	530	667	686	314	1,850	793	296	160	164	113	75
26	650	520	676	650	293	1,780	709	332	186	165	107	77
27	600	510	667	615	275	1,690	607	348	165	164	103	84
28	580	500	639	594	272	1,530	513	536	312	149	141	84
29	570	500	601	534	-----	1,610	435	640	282	143	90	87
30	530	480	1,290	456	-----	1,990	427	712	238	137	62	91
31	530	-----	3,760	451	-----	1,810	-----	795	-----	133	80	-----
TOTAL	9,105	17,030	19,781	31,832	10,818	45,647	29,032	14,386	11,030	6,352	4,082	2,181
MEAN	294	568	638	1,027	386	1,472	968	464	368	205	132	72.7
MAX	900	850	3,760	2,750	575	2,220	2,580	795	860	349	223	96
MIN	115	480	340	430	231	277	427	271	154	133	62	49
CFSM	.55	1.06	1.19	1.91	.72	2.74	1.80	.86	.68	.38	.25	.14
IN.	.63	1.18	1.37	2.20	.75	3.16	2.01	.99	.76	.44	.28	.15
CAL YR 1972	TOTAL 138,247	MEAN 378	MAX 3,760	MIN 82	CFSM .70	IN 9.56						
WTR YR 1973	TOTAL 201,276	MEAN 551	MAX 3,760	MIN 49	CFSM 1.02	IN 13.92						

PEAK DISCHARGE (BASE, 1,500 ³FT/S)

NOTE.--No gage-height record Oct. 1 to Dec. 7.

DATE	TIME	G.H.	DISCHARGE
12-31	1200	8.32	4,080
01-04	1200	7.03	2,820
03-14	2100	6.65	2,500
03-25	0500	5.92	1,900
04-01	1300	7.06	2,870

STREAMS TRIBUTARY TO LAKE HURON

04145000 Shiawassee River near Fergus, Mich.

LOCATION.--Lat 43°15'17", long 84°06'20", in sec.22, T.10 N., R.3 E., Saginaw County, 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 mi² (1,650 km²).

PERIOD OF RECORD.--October 1939 to current year. Monthly discharge only for some periods, published in WSP 1307.

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.

AVERAGE DISCHARGE.--34 years, 400 ft³/s (11.33 m³/s), 8.53 in/yr (217 mm/yr).

EXTREMES.--Current year: Maximum discharge, 5,300 ft³/s (150 m³/s) Dec. 31; maximum gage height 14.89 ft (4.538 m) backwater from ice; minimum discharge, 56 ft³/s (1.59 m³/s) Sept. 14-16 (gage height, 2.03 ft or 0.619 m).

Period of record: Maximum discharge, 7,500 ft³/s (212 m³/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 ft³/s (0.76 m³/s) Aug. 8, 1966; minimum gage height, 1.83 ft (0.558 m) Sept. 13, 14, 1971.

REMARKS.--Records good except those for the winter period, which are fair. Some regulation at low stage by powerplant above Owosso prior to February 1953; occasional regulation at low stages since.

REVISIONS (WATER YEARS).--WSP 1337: 1940 (M), 1941-42, 1943 (M), 1944, 1945 (M), 1946, 1947 (M), 1948, 1950. WSP 1627: 1952, 1954 (M), 1957.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	263	580	596	4,000	550	350	2,900	752	944	323	129	69
2	243	696	571	2,740	580	450	3,480	872	912	289	163	79
3	277	1,010	554	2,850	599	800	2,620	731	892	292	163	84
4	237	808	527	3,240	610	1,300	2,220	745	1,580	310	152	80
5	209	706	505	3,600	630	2,000	1,970	714	1,100	360	133	81
6	185	657	500	3,000	633	1,800	1,820	672	860	340	122	72
7	169	633	480	2,100	610	1,700	1,610	628	792	320	113	72
8	173	1,080	500	1,700	605	1,700	1,450	648	633	290	108	70
9	169	1,170	550	1,300	550	1,690	1,320	696	554	275	103	72
10	152	904	600	1,000	500	1,580	1,260	675	502	259	102	70
11	147	784	570	800	450	1,840	1,250	669	470	245	104	66
12	148	762	530	700	420	2,480	1,310	663	450	221	125	61
13	142	728	700	600	410	1,980	1,210	630	420	200	160	59
14	136	706	850	550	400	2,490	1,070	577	380	190	185	56
15	132	696	900	550	380	3,380	952	540	337	183	174	56
16	126	669	850	570	350	2,580	860	516	312	203	155	56
17	129	633	700	600	320	2,070	788	502	273	160	128	62
18	127	610	650	670	330	1,760	759	489	233	131	113	104
19	122	602	660	800	370	1,740	728	462	215	152	112	93
20	123	622	700	900	410	2,010	720	412	213	157	112	79
21	127	682	770	900	400	2,180	710	371	205	157	122	75
22	152	689	800	800	380	2,130	784	347	202	144	111	74
23	550	675	820	900	370	2,160	1,160	330	193	137	107	81
24	1,260	651	830	950	370	2,230	1,200	340	190	136	109	77
25	972	630	840	900	360	2,330	1,060	332	191	140	107	74
26	880	633	850	850	360	2,280	996	356	185	148	103	81
27	860	728	850	800	350	2,130	860	385	352	148	98	89
28	800	756	900	730	340	1,950	731	522	335	149	103	86
29	800	678	1,000	680	-----	1,860	625	808	580	136	116	90
30	780	625	1,600	630	-----	2,300	582	836	395	129	85	92
31	645	-----	5,000	550	-----	2,300	-----	892	-----	129	76	-----
TOTAL	11,235	21,803	26,753	40,960	12,637	59,550	39,005	18,112	14,900	6,453	3,793	2,260
MEAN	362	727	863	1,321	451	1,921	1,300	584	497	208	122	75.3
MAX	1,260	1,170	5,000	4,000	633	3,380	3,480	892	1,580	360	185	104
MIN	122	580	480	550	320	350	582	330	185	129	76	56
CFSM	.57	1.14	1.35	2.07	.71	3.02	2.04	.92	.78	.33	.19	.12
IN.	.66	1.27	1.56	2.39	.74	3.48	2.28	1.06	.87	.38	.22	.13

CAL YR 1972 TOTAL 182,826 MEAN 500 MAX 5,000 MIN 98 CFSM .78 IN 10.68
WTR YR 1973 TOTAL 257,461 MEAN 705 MAX 5,000 MIN 56 CFSM 1.11 IN 15.04

STREAMS TRIBUTARY TO LAKE HURON

161

04146000 Farmers Creek near Lapeer, Mich.

LOCATION.--Lat 43°02'41", long 83°20'14", in sec.6, T.7 N., R.10 E., Lapeer County, 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 mi² (143.0 km²).

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

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.

AVERAGE DISCHARGE.--41 years, 28.6 ft³/s (0.810 m³/s), 7.04 in/yr (179 mm/yr).

EXTREMES.--Current year: Maximum discharge, 632 ft³/s (17.9 m³/s) Jan. 2 (gage height, 18.45 ft or 5.624 m); minimum, 1.5 ft³/s (0.042 m³/s) Sept. 14, 15 (gage height, 15.00 ft or 4.572 m).
Period of record: Maximum discharge, 1,280 ft³/s (36.2 m³/s) Apr. 6, 1947 (gage height, 19.87 ft or 6.056 m, from floodmark), from rating curve extended above 660 ft³/s (18.7 m³/s) on basis of contracted-opening measurement of peak flow; minimum not determined.

REMARKS.--Records good except those for the winter period, which are fair. Prior to 1941, occasional regulation by dam above station.

REVISIONS (WATER YEARS).--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 Mich. 1971: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	46	35	454	47	27	203	44	58	69	19	4.3
2	14	47	33	593	56	34	197	45	56	68	20	4.0
3	13	45	32	467	59	45	195	47	54	58	18	3.7
4	12	43	31	340	66	68	177	51	58	50	15	3.7
5	11	42	30	270	78	92	155	50	61	40	13	3.5
6	10	40	35	200	75	119	135	47	75	33	12	3.2
7	9.9	39	34	150	69	135	117	44	71	28	11	2.8
8	9.6	40	37	130	61	145	101	50	64	24	9.9	2.4
9	9.4	38	37	110	55	145	88	68	54	20	10	2.2
10	8.7	38	35	97	45	137	80	77	46	18	13	2.1
11	8.0	38	35	74	40	135	72	102	37	16	12	2.1
12	8.0	38	35	53	36	139	66	114	35	15	11	1.9
13	7.6	38	43	43	34	179	64	104	32	14	9.4	1.7
14	7.3	37	45	37	32	219	59	88	28	13	8.7	1.7
15	7.3	35	51	35	30	221	58	72	25	12	8.0	1.7
16	7.3	34	51	35	28	235	54	59	21	10	7.3	1.7
17	7.0	33	53	40	28	239	52	51	19	9.4	6.6	2.8
18	6.6	33	57	54	28	209	47	45	18	8.7	6.2	5.6
19	6.2	33	57	66	28	187	44	40	17	8.4	5.9	5.6
20	6.2	33	58	75	28	159	41	35	16	8.7	6.2	6.2
21	7.0	33	56	80	28	143	39	32	16	9.4	6.2	6.2
22	12	33	57	82	27	137	46	30	15	8.7	5.9	5.9
23	26	34	57	80	27	135	53	28	15	8.0	5.4	6.2
24	26	35	57	78	27	129	56	26	16	7.6	5.1	5.9
25	38	35	56	75	26	125	62	26	15	7.6	4.8	5.9
26	56	36	57	70	26	133	61	25	16	7.6	4.6	5.9
27	66	37	57	68	26	151	54	25	20	7.6	4.8	5.9
28	64	37	56	64	26	167	50	32	29	7.6	4.8	5.9
29	59	40	56	57	-----	175	44	36	45	7.6	4.8	5.9
30	53	37	96	55	-----	177	41	46	58	8.4	4.6	5.6
31	48	-----	202	50	-----	179	-----	57	-----	10	4.3	-----
TOTAL	642.4	1,127	1,631	4,082	1,136	4,520	2,511	1,596	1,090	613.3	277.5	122.2
MEAN	20.7	37.6	52.6	132	40.6	146	83.7	51.5	36.3	19.8	8.95	4.07
MAX	66	47	202	593	78	239	203	114	75	69	20	6.2
MIN	6.2	33	30	35	26	27	39	25	15	7.6	4.3	1.7
CFSM	.38	.68	.95	2.39	.74	2.64	1.52	.93	.66	.36	.16	.07
IN.	.43	.76	1.10	2.75	.77	3.05	1.69	1.08	.73	.41	.19	.08

CAL YR 1972 TOTAL 11,197.7 MEAN 30.6 MAX 223 MIN 2.8 CFSM .55 IN 7.55
WTR YR 1973 TOTAL 19,348.4 MEAN 53.0 MAX 593 MIN 1.7 CFSM .96 IN 13.04

PEAK DISCHARGE (BASE, 160 FT³/S)

DATE	TIME	G.H.	DISCHARGE
01-02	1300	18.45	632
03-17	0800	16.90	245
04-01	1500	16.71	207

STREAMS TRIBUTARY TO LAKE HURON

04147000 Holloway Reservoir near Otisville, Mich.

LOCATION.--Lat 43°07'15", long 83°29'45", in NW¼ sec.11, T.8 N., R.8 E., Genesee County, in gatehouse on right side of Holloway Dam on Flint River, 3.5 mi (5.6 km) southeast of Otisville.

DRAINAGE AREA.--526 mi² (1,362 km²).

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

GAGE.--Water-stage recorder. Datum of gage is at mean sea level (levels by city of Flint).

EXTREMES.--Current year: Maximum contents, 806,000,000 cu ft (22.8 hm³) May 14, elevation, 755.40 ft (230.25 m); minimum, 172,000,000 cu ft (4.87 hm³) Feb. 23, elevation, 744.60 ft (226.95 m).

Period of record: Maximum contents, 996,000,000 cu ft (28.2 hm³) Mar. 8, 1956, elevation, 757.4 ft (230.86 m); minimum, reservoir empty at times during October, November, 1954, January, February, 1955, October, 1971.

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 hm³) 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.

REVISIONS.--WSP 2111: Drainage area.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

Date	Elevation (feet)	Contents (millions of cubic feet)	Change in contents during month	
			Millions of cubic feet	Equivalent in cfs
Sept. 30	751.47	501	--	--
Oct. 31	751.31	492	-9	-3.4
Nov. 30	751.53	505	+13	+5.0
Dec. 31	746.83	255	-250	-93.3
Calendar year 1972	--	--	-163	-5.2
Jan. 31	745.54	204	-51	-19.0
Feb. 28	745.00	184	-20	-8.3
Mar. 31	749.72	396	+212	+79.2
Apr. 30	751.82	524	+128	+49.4
May 31	755.35	802	+278	+104
June 30	755.17	785	-17	-6.6
July 31	754.67	741	-44	-16.4
Aug. 31	753.12	617	-124	-46.3
Sept. 30	750.64	451	-166	-64.0
Water year 1972-73	--	--	-50	-1.6

STREAMS TRIBUTARY TO LAKE HURON

163

04147500 Flint River near Otisville, Mich.

LOCATION.--Lat 43°06'40", long 83°31'10", in SE¼ sec.9, T.8 N., R.8 E., Genesee County, 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 Power-Cullen drain, and 3.8 mi (6.1 km) south of Otisville.

DRAINAGE AREA.--531 mi² (1,375 km²).

PERIOD OF RECORD.--October 1952 to current year.

GAGE.--Water-stage recorder. Datum of gage is 721.39 ft (219.880 m) above mean sea level.

AVERAGE DISCHARGE.--21 years, 269 ft³/s (7.62 m³/s), 6.88 in/yr (175 mm/yr), adjusted for storage since 1954.

EXTREMES.--Current year: Maximum discharge, 3,230 ft³/s (91.5 m³/s) Jan. 4 (gage height, 12.90 ft or 3.932 m); minimum, 11 ft³/s (0.31 m³/s) Jan. 1 (gage height, 2.17 ft or 0.661m).

Period of record: Maximum discharge, 6,150 ft³/s (174 m³/s) Apr. 1, 1960 (gage height, 14.97 ft or 4.563 m); minimum, 2.1 ft³/s (0.059 m³/s) Oct. 11, 12, 1971 (gage height, 1.57 ft or 0.479 m).

REMARKS.--Records good. Flow regulated by Holloway Reservoir 1.5 mi (2.4 km) above station (see preceding page).

REVISIONS.--WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	153	365	436	347	604	183	1,750	548	707	554	103	145
2	150	366	568	1,250	586	197	1,830	541	716	513	103	145
3	209	387	503	1,960	599	261	1,900	500	644	477	111	145
4	213	384	572	2,890	626	420	1,960	446	653	425	134	134
5	130	372	705	2,950	655	593	1,980	290	728	380	147	123
6	100	359	657	2,350	664	723	1,960	168	800	357	146	107
7	84	346	600	1,990	659	850	1,900	166	788	354	136	85
8	62	354	544	1,550	636	864	1,800	173	628	352	125	84
9	60	361	495	1,570	568	659	1,400	179	460	270	118	84
10	58	366	455	1,310	503	825	1,030	202	470	155	156	84
11	50	337	416	1,070	443	852	1,020	547	435	134	183	84
12	52	326	382	1,040	321	1,100	963	1,020	405	102	181	84
13	47	324	357	1,020	261	1,350	874	1,080	370	103	181	84
14	46	317	528	1,000	273	1,410	869	972	280	104	181	84
15	42	255	690	980	273	1,170	864	857	163	104	180	84
16	35	251	593	911	246	1,780	609	755	174	104	167	109
17	41	238	490	684	222	1,880	201	676	187	104	147	134
18	40	226	258	609	216	1,900	199	604	165	104	147	154
19	37	223	135	650	212	1,880	198	547	167	104	147	185
20	34	220	307	703	207	1,880	192	492	166	105	147	184
21	43	223	404	724	205	1,890	194	345	151	105	146	183
22	80	235	395	771	203	1,820	199	185	137	104	145	181
23	227	218	398	833	200	1,750	199	203	139	104	145	181
24	377	226	411	915	199	1,680	277	218	142	103	145	180
25	434	240	424	986	198	1,630	388	222	144	102	145	179
26	451	244	444	960	196	1,600	448	214	147	102	145	178
27	453	242	546	931	190	1,590	548	241	148	102	145	177
28	455	253	602	891	184	1,590	545	252	178	102	145	142
29	460	265	566	813	-----	1,610	541	372	265	102	145	85
30	426	260	648	588	-----	1,670	540	527	417	102	145	85
31	401	-----	297	499	-----	1,680	-----	671	-----	103	145	-----
TOTAL	5,450	8,783	14,826	35,745	10,349	39,287	27,378	14,213	10,974	6,036	4,536	3,893
MEAN	176	293	478	1,153	370	1,267	913	458	366	195	146	130
MAX	460	387	705	2,950	664	1,900	1,980	1,080	800	554	183	185
MIN	34	218	135	347	184	183	192	166	137	102	103	84
MEAN+	172	298	385	1,134	361	1,347	962	562	359	178	100	65.8
CFSM+	.32	.56	.73	2.14	.68	2.54	1.81	1.06	.68	.34	.19	.12
IN+	.37	.63	.84	2.46	.71	2.92	2.02	1.22	.75	.39	.22	.14

CAL YR 1972 TOTAL 103,682 MEAN 283 MAX 2,130 MIN 21 MEAN+ 279 CFSM+ .53 IN+ 7.12
WTR YR 1973 TOTAL 181,470 MEAN 497 MAX 2,950 MIN 34 MEAN+ 496 CFSM+ .93 IN+ 12.67

+ Adjusted for change in contents in Holloway Reservoir.

STREAMS TRIBUTARY TO LAKE HURON

04147990 Butternut Creek near Genesee, Mich.

LOCATION.--Lat 43°08'09", long 83°35'57", in NE¼ NE¼ sec.2, T.8 N., R.7 E., Genesee County, 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 mi² (89.4 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 730 ft (223 m) revised (from topographic map), nearest 10 ft. Prior to June 11, 1970, nonrecording gage at same site and datum.

EXTREMES.--Maximum discharge, 289 ft³/s (8.18 m³/s) Dec. 31 (gage height, 8.68 ft or 2.646 m); minimum, 2.9 ft³/s (0.082 m³/s) Sept. 15, 16, 17 (gage height, 1.75 ft or 0.533 m).

Period of record: Maximum discharge, 289 ft³/s (8.18 m³/s) Dec. 31, 1972 (gage height, 8.68 ft or 2.646 m); minimum, 1.2 ft³/s (0.034 m³/s) Dec. 1, 1971, result of freezeup; minimum gage height, 1.56 ft (0.475 m) Aug. 8, 9, 1971.

REMARKS.--Records good except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.9	26	17	213	20	11	162	23	38	16	14	4.0
2	6.6	67	16	189	25	53	159	36	28	13	21	3.8
3	6.2	58	15	168	34	130	118	35	27	11	20	3.7
4	5.9	38	13	173	30	130	97	30	39	9.5	14	3.7
5	5.7	33	13	136	27	89	81	26	30	8.5	9.8	3.6
6	5.6	29	17	100	25	94	68	23	25	7.7	7.7	3.7
7	6.0	28	17	80	23	106	60	20	24	7.2	6.7	3.5
8	6.0	48	17	60	22	97	52	24	19	6.7	6.2	3.5
9	5.9	39	16	45	21	69	46	56	15	6.1	5.8	3.5
10	5.7	31	14	37	19	65	43	63	12	5.9	5.7	3.5
11	5.7	27	14	27	18	116	44	58	10	5.8	5.3	3.5
12	5.8	24	15	23	16	101	50	50	9.5	5.9	5.3	3.4
13	5.7	22	20	20	15	70	44	43	9.0	5.8	5.0	3.3
14	5.6	21	25	18	13	144	38	37	8.3	6.1	4.8	3.4
15	5.5	21	27	18	11	163	34	32	7.7	6.0	4.7	3.2
16	5.5	18	28	18	11	101	31	27	7.2	5.9	4.6	2.9
17	5.5	17	28	19	11	75	36	24	7.2	5.7	4.7	4.7
18	5.6	17	26	25	11	68	34	21	7.2	5.4	4.6	5.9
19	5.7	18	26	35	11	74	31	19	7.2	5.3	4.3	4.3
20	5.8	21	25	36	11	91	29	17	6.8	5.4	4.6	4.2
21	6.6	21	25	32	10	99	26	15	6.7	6.8	5.1	3.4
22	17	20	27	46	10	105	27	14	6.4	6.8	5.1	3.3
23	111	19	32	45	10	103	36	13	6.2	6.1	4.8	3.2
24	79	17	32	40	10	131	31	12	6.6	5.5	4.7	4.5
25	47	17	32	33	9.8	175	26	12	6.4	5.8	4.7	4.7
26	39	20	31	32	9.8	176	23	11	6.6	5.6	4.5	4.7
27	33	31	31	33	9.8	144	20	10	7.4	5.7	4.4	4.1
28	29	26	30	34	10	105	18	16	18	5.7	4.1	4.0
29	50	21	30	32	-----	123	16	88	24	5.7	4.2	3.9
30	40	18	120	26	-----	187	16	67	19	5.7	4.1	3.8
31	30	-----	261	23	-----	129	-----	49	-----	5.5	4.0	-----
TOTAL	598.5	813	1,040	1,816	453.4	3,324	1,496	971	444.4	213.8	208.5	114.9
MEAN	19.3	27.1	33.5	58.6	16.2	107	49.9	31.3	14.8	6.90	6.73	3.83
MAX	111	67	261	213	34	187	162	88	39	16	21	5.9
MIN	5.5	17	13	18	9.8	11	16	10	6.2	5.3	4.0	2.9
CFSM	.56	.79	.97	1.70	.47	3.10	1.45	.91	.43	.20	.20	.11
IN.	.65	.88	1.12	1.96	.49	3.58	1.61	1.05	.48	.23	.22	.12
CAL YR 1972	TOTAL 7,565.1	MEAN 20.7	MAX 261	MIN 2.5	CFSM .60	IN 8.16						
WTR YR 1973	TOTAL 11,493.5	MEAN 31.5	MAX 261	MIN 2.9	CFSM .91	IN 12.39						

PEAK DISCHARGE (BASE, 120 FT³/S)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
10-23	1500	5.88	142	03-14	2300	7.25	210
12-31	0600	8.68	289	03-24	2400	7.13	202
03-03	2300	6.94	195	03-30	0800	7.18	204
03-07	2100	5.58	127	04-01	1700	6.93	192
03-11	1900	6.50	173	05-29	1500	6.18	150

04148140 Kearsley Creek near Davison, Mich.

LOCATION.--Lat 43°02'01", long 83°34'53", in NE¼ sec.12, T.7 N., R.7 E., Genesee County, 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 mi² (258.0 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 760 ft (232 m) from topographic map.

AVERAGE DISCHARGE.--8 years, 61.6 ft³/s (1.745 m³/s), 8.40 in/yr (213 mm/yr).

EXTREMES.--Current year: Maximum discharge, 644 ft³/s (18.2 m³/s) Dec. 31 (gage height, 10.10 ft or 3.078 m); minimum, 6.2 ft³/s (0.18 m³/s) Sept. 16; minimum gage height, 3.10 ft (0.945 m) Sept. 13.
Period of record: Maximum discharge, 707 ft³/s (20.0 m³/s) Feb. 2, 1968 (gage height, 10.29 ft or 3.136 m); minimum, 2.7 ft³/s (0.076 m³/s) July 9, 1966; minimum gage height, 2.69 ft (0.820 m) Sept. 12, 1969.

REMARKS.--Records good except those for the winter period, which are poor. Some diurnal fluctuation caused by small dams, and occasional diversion for sprinkler irrigation above station.

REVISIONS.--WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	80	62	585	85	59	469	97	94	103	35	11
2	23	106	60	533	100	116	469	90	84	118	57	12
3	25	111	59	567	110	202	395	84	90	122	34	11
4	29	95	54	509	120	217	344	98	118	95	26	11
5	28	85	52	450	130	215	277	93	92	75	22	11
6	22	65	69	350	111	280	246	79	138	63	19	9.6
7	21	63	63	300	104	298	182	69	118	44	17	9.1
8	21	95	62	250	101	311	150	115	75	44	16	8.5
9	22	115	62	200	95	281	116	243	68	36	16	8.0
10	22	108	60	150	90	278	135	191	53	30	17	8.7
11	22	102	57	120	75	330	155	208	46	23	28	8.3
12	22	95	59	90	65	342	151	267	47	22	35	8.3
13	22	70	119	80	60	286	141	141	44	26	19	7.5
14	22	68	116	70	55	435	130	114	40	29	16	7.2
15	23	69	104	65	50	485	102	100	37	19	17	7.1
16	25	64	102	60	50	390	96	83	23	18	17	6.6
17	31	60	100	65	50	362	92	77	18	20	15	14
18	34	48	99	80	50	364	82	71	19	20	14	17
19	33	44	93	100	50	381	75	65	30	18	14	16
20	34	55	94	110	50	348	62	56	38	25	17	21
21	37	68	90	120	50	283	58	50	34	22	17	19
22	51	74	103	120	48	260	105	47	31	19	15	18
23	138	74	112	120	47	269	137	47	28	18	14	16
24	105	69	111	123	46	336	119	46	26	17	14	14
25	108	63	112	126	46	381	127	44	25	17	13	13
26	127	60	116	125	46	386	115	45	30	18	12	13
27	103	75	112	111	46	394	94	47	36	19	11	13
28	88	82	105	99	46	353	83	68	57	18	12	13
29	91	80	95	98	-----	372	75	78	84	15	12	14
30	77	74	319	95	-----	456	73	86	90	16	12	14
31	71	-----	640	90	-----	345	-----	100	-----	19	12	-----
TOTAL	1,501	2,317	3,461	5,961	1,976	9,815	4,855	2,999	1,713	1,148	595	359.9
MEAN	48.4	77.2	112	192	70.6	317	162	96.7	57.1	37.0	19.2	12.0
MAX	138	115	640	585	130	485	469	267	138	122	57	21
MIN	21	44	52	60	46	59	58	44	18	15	11	6.6
CFSM	.49	.78	1.12	1.93	.71	3.18	1.63	.97	.57	.37	.19	.12
IN.	.56	.87	1.29	2.23	.74	3.67	1.81	1.12	.64	.43	.22	.13

CAL YR 1972 TOTAL 23,130.7 MEAN 63.2 MAX 640 MIN 7.9 CFSM .63 IN 8.64
WTR YR 1973 TOTAL 36,700.9 MEAN 101 MAX 640 MIN 6.6 CFSM 1.01 IN 13.71

PEAK DISCHARGE (BASE, 250 FT³/s)

DATE	TIME	G.H.	DISCHARGE
12-31	0600	10.10	644
03-11	2000	8.20	403
03-14	2000	9.51	564
03-30	0600	8.86	502
04-01	1200	8.98	518
05-09	0300	7.07	296
05-12	0700	7.18	308

STREAMS TRIBUTARY TO LAKE HURON

04148160 Gilkey Creek near Flint, Mich.

LOCATION.--Lat 43°01'27", long 83°37'32", in NE¼ SW¼ sec.10, T.7 N., R.7 E., Genesee County, on right bank 25 ft (8 m) downstream from bridge 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 mi² (16.29 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 750 ft (229 m) from topographic map (nearest 10 ft).

EXTREMES.--Current year: Maximum discharge, 272 ft³/s (7.70 m³/s) Dec. 31 (gage height, 7.66 ft or 2.335 m); no flow Sept. 4-16.
Period of record: Maximum discharge, 272 ft³/s (7.70 m³/s) Dec. 31, 1972 (gage height, 7.66 ft or 2.355 m); no flow on many days during 1970 and 1973.

REMARKS.--Records poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	3.1	6.2	36	3.5	2.5	64	12	1.8	.80	2.4	.02
2	1.2	18	5.2	17	7.6	26	29	5.9	1.5	.60	11	.01
3	1.1	9.8	4.7	14	13	40	17	4.1	7.6	.80	.93	.01
4	1.1	5.2	4.3	30	6.2	32	12	3.4	12	.49	.24	0
5	1.1	4.1	4.0	11	5.5	20	8.7	2.7	4.0	.42	.16	0
6	1.4	3.6	21	7.1	4.7	20	6.7	2.4	2.7	.39	.14	0
7	1.8	5.8	11	4.9	4.5	28	5.5	2.4	2.3	.35	.12	0
8	1.4	20	5.5	4.0	4.1	23	4.6	16	1.6	.31	.11	0
9	1.1	9.6	4.5	3.2	3.5	12	4.1	26	1.2	.28	.28	0
10	1.0	5.8	4.0	2.7	3.1	15	6.5	11	.93	.60	.39	0
11	1.1	5.0	3.5	2.4	2.8	42	5.7	6.1	.86	.42	.14	0
12	1.1	4.1	4.5	2.2	2.6	29	5.8	4.1	1.8	.28	.11	0
13	1.1	3.9	15	2.1	2.4	14	4.3	3.2	.86	.24	.08	0
14	1.2	6.5	12	2.0	2.2	75	3.6	2.7	.53	.21	.08	0
15	1.2	6.1	9.5	2.0	2.1	38	3.3	2.4	.46	.21	.08	0
16	1.2	5.0	7.5	2.5	2.0	17	3.7	2.2	.46	.15	.06	0
17	1.2	4.4	6.0	4.3	1.9	12	3.5	1.9	.46	.14	.39	3.7
18	1.1	4.1	5.0	6.4	1.8	15	3.1	1.7	.46	.12	.35	2.7
19	1.1	4.5	5.5	5.4	1.8	22	2.9	1.5	.42	.12	.12	.28
20	1.1	8.5	7.5	3.7	1.8	32	2.6	1.4	.39	.28	3.6	.16
21	3.1	11	10	3.1	1.7	31	2.4	1.2	.35	.60	.60	.14
22	19	8.7	14	12	1.7	30	20	1.1	.31	.16	.14	.31
23	53	6.7	14	8.1	1.7	34	12	1.4	.28	.11	.10	.24
24	16	5.2	13	4.9	1.6	43	5.7	1.2	1.8	.11	.08	.10
25	6.5	5.1	12	4.3	1.6	41	3.9	1.0	.53	.11	.08	.10
26	4.4	11	11	4.1	1.6	34	3.1	1.0	1.1	.14	.06	.35
27	3.3	19	10	4.5	1.6	20	2.7	1.9	2.8	.16	.05	.06
28	3.3	11	9.0	5.1	1.6	12	2.4	7.1	7.9	.12	.04	.05
29	9.6	7.0	8.0	4.7	-----	32	2.1	3.6	3.4	.10	.04	.04
30	5.8	5.8	108	3.6	-----	47	2.3	2.4	1.1	.17	.03	.03
31	3.8	-----	218	3.2	-----	20	-----	2.2	-----	.46	.02	-----
TOTAL	151.8	227.6	573.4	220.5	90.2	858.5	253.2	137.2	61.90	9.45	22.06	8.30
MEAN	4.90	7.59	18.5	7.11	3.22	27.7	8.44	4.43	2.06	.30	.71	.28
MAX	53	20	218	36	13	75	64	26	12	.80	11	3.7
MTN	1.0	3.1	3.5	2.0	1.6	2.5	2.1	1.0	.28	.10	.02	0
CFSM	.78	1.21	2.94	1.13	.51	4.40	1.34	.70	.33	.05	.11	.04
IN.	.90	1.35	3.39	1.30	.53	5.08	1.50	.81	.37	.06	.13	.05
CAL YR 1972	TOTAL 2,085.00		MEAN 5.70	MAX 218	MIN .02	CFSM .91	IN 12.33					
WTR YR 1973	TOTAL 2,614.11		MEAN 7.16	MAX 218	MIN 0	CFSM 1.14	IN 15.46					

PEAK DISCHARGE (BASE, 40 FT³/S)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
10-23	0800	3.57	71	03-14	1600	4.72	120
12-31	0600	7.66	272	03-24	2100	3.11	60
01-04	0100	2.58	44	03-29	2400	3.69	79
03-03	1900	2.84	52	04-01	0700	4.27	102
03-11	1400	3.35	68	05-08	2300	2.79	51

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LOCATION.--Lat 42°49'39", long 83°37'42", in SW¼ sec.15, T.5 N., R.7 E., Oakland County, on right bank 25 ft (8 m) downstream from bridge on Elliott Road and 2.4 mi (3.9 km) north of Holly.

PERIOD OF RECORD.--January 1956 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 905 ft (276 m) from topographic map.

AVERAGE DISCHARGE.--17 years, 7.17 ft³/s (0.203 m³/s), 8.11 in/yr (206 mm/yr).

EXTREMES.--Current year: Maximum discharge, 84 ft³/s (2.38 m³/s) Dec. 31 (gage height, 3.54 ft or 1.079 m); minimum, 0.57 ft³/s (0.016 m³/s) Sept. 15, 16; minimum gage height, 1.55 ft (0.472 m) Sept. 8-10.

Period of record: Maximum discharge, 91 ft³/s (2.58 m³/s) Feb. 4, 1968 (gage height, 3.69 ft or 1.125 m); minimum, 0.10 ft³/s (0.003 m³/s) on many days in 1963, 1964, and 1965.

REMARKS.--Records good except those for the winter period, which are poor.

REVISIONS.--WSP 2111: Drainage area.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	13	11	83	10	6.1	46	14	14	6.7	3.8	1.4
2	4.2	14	10	78	15	9.3	43	16	13	6.2	3.8	1.3
3	3.8	13	10	71	21	17	40	15	13	6.4	3.2	1.2
4	3.6	13	9.5	65	20	26	35	14	16	6.1	2.6	1.0
5	3.2	12	9.3	54	18	28	30	12	15	5.5	2.3	.83
6	3.0	11	11	40	16	30	26	11	13	4.9	2.0	.83
7	3.0	11	11	27	14	32	23	10	12	4.5	1.7	.76
8	2.8	15	11	27	13	33	20	20	10	3.8	1.6	.69
9	2.5	15	11	20	12	30	18	40	8.7	3.2	3.2	.63
10	2.2	14	10	17	10	29	19	35	7.4	3.8	4.6	.69
11	2.0	13	9.8	12	10	39	19	29	6.5	3.6	3.8	.73
12	2.0	12	11	11	9.0	45	19	24	5.7	3.2	3.0	.64
13	1.9	11	17	10	8.7	42	18	19	5.1	3.0	2.5	.63
14	1.7	13	19	9.4	7.6	50	16	16	4.6	3.8	2.2	.66
15	1.7	14	18	8.7	7.4	54	14	14	4.1	3.4	1.8	.61
16	1.7	14	15	8.3	7.0	49	13	12	3.9	3.0	1.6	.72
17	1.6	13	15	9.9	7.0	45	13	11	3.7	2.8	1.5	1.3
18	1.5	12	15	15	7.0	43	12	9.8	3.5	2.5	1.4	2.0
19	1.5	12	14	20	6.3	41	12	9.1	3.3	2.3	1.4	1.9
20	1.4	13	14	19	6.3	43	11	8.4	3.4	2.2	2.6	1.8
21	1.9	14	15	16	6.8	37	11	8.0	3.3	2.5	2.6	1.5
22	6.1	14	16	19	7.0	34	18	8.2	3.0	2.3	2.2	1.5
23	21	13	16	22	6.7	32	23	8.9	2.8	2.0	2.0	1.4
24	23	12	16	20	6.6	33	21	9.4	2.9	1.9	1.9	1.3
25	21	12	16	17	6.5	37	17	8.8	2.7	2.0	1.7	1.2
26	18	12	17	16	6.5	40	15	8.2	3.4	2.0	1.6	1.3
27	14	13	16	15	6.0	40	13	8.1	6.0	2.0	1.5	1.3
28	14	13	16	15	6.0	36	11	14	6.8	1.9	1.6	1.2
29	17	12	15	14	-----	38	10	18	7.6	1.7	1.5	1.2
30	16	11	35	12	-----	43	10	17	7.4	1.6	1.4	1.2
31	14	-----	81	11	-----	40	-----	17	-----	2.2	1.4	-----
TOTAL	216.1	384	510.6	782.3	277.4	1,101.4	596	464.9	211.8	103.0	70.0	33.42
MEAN	6.97	12.8	16.5	25.2	9.91	35.5	19.9	15.0	7.06	3.32	2.26	1.11
MAX	23	15	81	83	21	54	46	40	16	6.7	4.6	2.0
MIN	1.4	11	9.3	8.3	6.0	6.1	10	8.0	2.7	1.6	1.4	.61
CFSM	.58	1.07	1.38	2.10	.83	2.96	1.66	1.25	.59	.28	.19	.09
IN.	.67	1.19	1.58	2.43	.86	3.41	1.85	1.44	.66	.32	.22	.10
CAL YR 1972	TOTAL 3,322.80	MEAN 9.08	MAX 81	MIN 1.4	CFSM .76	IN 10.30						
WTR YR 1973	TOTAL 4,750.92	MEAN 13.0	MAX 83	MIN .61	CFSM 1.08	IN 14.73				</		

STREAMS TRIBUTARY TO LAKE HURON

04148300 Swartz Creek at Flint, Mich.

LOCATION.--Lat 42°59'16", long 83°43'57", in NW¼ sec.26, T.7 N., R.6 E., Genesee County, 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 mi² (298 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 730 ft (222 m) from topographic map. Prior to Sept. 4, 1970, nonrecording gage at same site and datum.

EXTREMES.--Current year: Maximum discharge, 1,030 ft³/s (29.2 m³/s) Dec. 31 (gage height, 8.30 ft or 2.530 m); minimum, 0.98 ft³/s (0.028 m³/s) Sept. 15 (gage height, 1.46 ft or 0.445 m).
Period of record: Maximum discharge, 1,030 ft³/s (29.2 m³/s) Dec. 31, 1972 (gage height, 8.30 ft or 2.530 m); maximum gage height, 8.40 ft (2.560 m) Feb. 20, 1971 (backwater from ice); minimum discharge, 0.98 ft³/s (0.028 m³/s) Sept. 15, 1973; minimum gage height, 1.16 ft (0.354 m) Aug. 19, 1971.

REMARKS.--Records good except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	85	88	742	90	75	550	139	100	34	18	3.1
2	31	150	82	650	133	158	526	128	89	32	16	2.8
3	30	152	79	600	163	419	384	112	146	31	11	2.4
4	25	114	74	500	138	465	327	103	175	27	7.9	2.4
5	23	99	71	450	132	348	282	97	114	25	6.2	2.5
6	23	90	85	320	124	330	245	92	97	23	7.3	2.5
7	22	92	85	220	119	350	217	91	90	22	5.3	2.8
8	20	201	91	190	114	345	191	113	80	21	5.2	2.3
9	19	169	79	160	100	257	175	153	73	19	14	2.3
10	17	122	69	130	90	261	191	136	66	25	15	2.0
11	16	104	72	100	85	445	188	115	64	19	11	1.7
12	16	95	76	90	75	456	184	106	63	17	7.0	1.6
13	14	90	138	80	70	312	159	104	61	16	6.3	1.2
14	14	100	154	75	65	577	144	102	51	15	5.9	1.2
15	13	108	136	70	60	649	134	98	48	13	5.8	1.2
16	13	106	106	90	60	500	137	98	46	11	5.4	1.3
17	12	99	110	120	60	450	141	95	43	10	6.0	33
18	11	94	110	144	60	430	128	91	40	9.6	6.1	13
19	10	92	104	158	55	400	121	85	38	9.5	5.0	6.0
20	10	102	99	130	55	400	115	81	35	11	24	3.8
21	25	116	110	118	55	370	110	79	32	10	10	3.2
22	93	119	142	200	60	340	268	74	29	8.4	6.5	5.6
23	296	115	158	195	60	320	292	76	27	6.5	5.6	3.3
24	210	106	158	150	60	350	178	74	39	9.1	5.7	3.0
25	127	99	156	130	55	400	145	71	28	17	8.4	8.6
26	92	99	164	128	50	400	126	69	27	15	4.7	16
27	78	111	163	130	50	400	117	80	37	9.0	4.3	5.7
28	78	115	150	120	50	350	108	198	57	7.0	4.6	4.1
29	117	105	128	116	-----	400	103	199	48	5.2	4.3	3.7
30	110	94	469	100	-----	430	103	127	39	5.3	3.7	3.4
31	93	-----	984	95	-----	400	-----	119	-----	13	3.3	-----
TOTAL	1,691	3,343	4,690	6,501	2,288	11,787	6,089	3,305	1,882	495.6	249.5	145.7
MEAN	54.5	111	151	210	81.7	380	203	107	62.7	16.0	8.05	4.86
MAX	296	201	984	742	163	649	550	199	175	34	24	33
MIN	10	85	69	70	50	75	103	69	27	5.2	3.3	1.2
CFSM	.47	.97	1.31	1.83	.71	3.30	1.77	.93	.55	.14	.07	.04
IN.	.55	1.08	1.52	2.10	.74	3.81	1.97	1.07	.61	.16	.08	.05
CAL YR 1972	TOTAL 29,090.7	MEAN 79.5	MAX 984	MIN 5.6	CFSM .69	IN 9.41						
WTR YR 1973	TOTAL 42,466.8	MEAN 116	MAX 984	MIN 1.2	CFSM 1.01	IN 13.74						

PEAK DISCHARGE (BASE, 450 FT³/S)

DATE	TIME	G.H.	DISCHARGE
12-31	0800	8.30	1030
03-03	2400	5.92	568
03-11	1900	6.09	598
03-14	1800	6.84	738
04-01	unknown	unknown	about 710

04148440 Thread Creek near Flint, Mich.

LOCATION.--Lat 42°58'30", long 83°38'09", in SE¼ SE¼ sec.28, T.7 N., R.7 E., Genesee County, 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 mi² (144.0 km²).

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.

EXTREMES.--Current year: Maximum discharge, 490 ft³/s (13.9 m³/s) Dec. 31 (gage height, 5.90 ft or 1.798 m, from highwater mark); minimum daily, 1.0 ft³/s (0.028 m³/s) Sept. 13-15.
Period of record: Maximum discharge, 601 ft³/s (17.0 m³/s) Mar. 14, 1971 (gage height, 6.27 ft or 1.911 m); no flow Aug. 7, 8, 10, 1971; minimum gage height, 0.45 ft (0.137 m) Aug. 8, 10, 1971.

REMARKS.--Records poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	40	38	300	38	27	236	58	40	33	21	2.5
2	14	60	36	270	61	70	200	49	32	29	18	2.3
3	13	70	33	240	74	150	174	50	40	27	11	2.0
4	12	60	30	230	78	160	146	50	41	21	9.2	2.0
5	11	50	27	220	74	130	122	46	40	19	7.7	2.0
6	11	45	43	200	65	118	105	40	38	16	6.0	2.1
7	10	42	30	160	58	133	91	36	34	14	4.7	2.3
8	9.0	70	30	130	50	138	79	65	29	12	4.5	1.8
9	9.0	90	30	100	45	120	71	100	23	11	7.5	1.8
10	8.0	65	30	80	41	113	75	113	19	10	10	1.5
11	8.0	55	30	65	38	150	67	126	16	9.2	7.0	1.4
12	7.0	47	38	50	35	176	67	109	17	8.3	5.5	1.3
13	7.0	40	60	47	33	172	64	82	14	8.0	5.5	1.0
14	6.0	40	65	45	30	163	60	65	11	7.5	5.0	1.0
15	6.0	45	60	42	29	218	54	53	10	6.5	5.0	1.0
16	6.0	45	45	46	29	183	52	45	8.0	5.5	4.5	1.1
17	5.5	45	45	55	29	156	49	39	12	5.0	5.0	8.5
18	5.0	40	45	80	28	142	42	35	11	5.0	6.6	11
19	5.0	40	45	80	27	148	40	30	11	5.5	3.8	6.0
20	4.5	45	42	70	27	159	38	27	10	5.5	13	3.1
21	15	48	45	60	27	158	38	25	9.5	5.2	9.0	2.6
22	35	50	58	90	29	148	90	24	9.0	5.0	6.5	4.5
23	130	50	65	71	29	145	85	23	8.3	5.2	4.6	3.0
24	110	45	65	65	29	164	83	22	17	5.5	4.8	2.5
25	80	45	65	60	26	186	77	21	10	6.0	7.0	5.5
26	58	45	70	59	24	202	64	20	19	6.0	3.8	13
27	37	45	70	52	24	200	54	25	24	6.0	3.5	7.0
28	37	50	65	52	25	175	44	70	45	5.5	3.7	3.3
29	50	45	55	44	-----	177	38	70	31	5.3	3.3	3.0
30	55	40	120	43	-----	212	37	55	34	5.0	3.0	2.8
31	47	-----	400	40	-----	188	-----	48	-----	4.9	2.7	-----
TOTAL	826.0	1,497	1,880	3,146	1,102	4,781	2,442	1,621	662.8	317.6	212.4	102.9
MEAN	26.6	49.9	60.6	101	39.4	154	81.4	52.3	22.1	10.2	6.85	3.43
MAX	130	90	400	300	78	218	236	126	45	33	21	13
MTN	4.5	40	27	40	24	27	37	20	8.0	4.9	2.7	1.0
CFSM	.48	.90	1.09	1.82	.71	2.77	1.46	.94	.40	.18	.12	.06
IN.	.55	1.00	1.26	2.10	.74	3.20	1.63	1.08	.44	.21	.14	.07
CAL YR 1972	TOTAL 12,500.0	MEAN 34.2	MAX 400	MIN 3.5	CFSM .62	IN 8.36						
WTR YR 1973	TOTAL 18,590.7	MEAN 50.9	MAX 400	MIN 1.0	CFSM .92	IN 12.44						

PEAK DISCHARGE (BASE, 200 FT³/S)

NOTE.--No gage-height record Oct. 1 to Dec. 4, Dec. 8 to Jan. 10.

DATE	TIME	G.H.	DISCHARGE
12-31	unknown	5.90	490
03-14	1600	5.35	288
04-01	1000	5.32	313

STREAMS TRIBUTARY TO LAKE HURON

04148500 Flint River near Flint, Mich.

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 Pinnie Creek, 1.8 mi (2.9 km) downstream from Flint, and 5.0 mi (8.0 km) downstream from Swartz Creek.

DRAINAGE AREA.--954 mi² (2,471 km²).

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.

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).

AVERAGE DISCHARGE.--41 years, 1,041 ft³/s (29.48 m³/s), 7.76 in/yr (197 mm/yr); adjusted for storage since 1954.

EXTREMES.--Current year: Maximum discharge, 8,320 ft³/s (236 m³/s) Dec. 31 (gage height, 13.14 ft or 4.005 m); minimum, 86 ft³/s (2.44 m³/s) July 17 (gage height, 2.54 ft or 0.774 m).

Period of record: Maximum discharge, 14,900 ft³/s (422 m³/s) Apr. 6, 1947 (gage height, 16.35 ft or 4.983 m); minimum, 9.0 ft³/s (0.25 m³/s) Aug. 7, 1934.

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 ft³/s (1.42 m³/s) as sewage effluent which originates outside the basin.

REVISIONS (WATER YEARS).--WSP 954: 1941. WSP 1337: 1933-34 (M), 1935-37. WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	292	782	651	5,100	953	550	4,510	1,130	1,190	795	334	281
2	302	1,000	878	2,920	1,030	803	4,420	1,130	1,150	828	505	239
3	298	1,030	871	3,180	1,170	1,540	3,820	1,060	1,180	857	319	166
4	374	895	818	4,890	1,130	1,960	3,460	904	1,560	719	266	225
5	313	810	935	4,870	1,180	1,820	3,140	751	1,350	645	260	246
6	269	755	1,170	4,010	1,240	1,880	2,930	546	1,270	602	309	222
7	253	727	1,030	3,060	1,210	2,040	2,800	549	1,260	595	264	211
8	197	964	926	2,460	1,110	2,360	2,710	831	1,210	543	232	139
9	182	919	880	1,990	996	2,280	2,510	1,160	788	455	258	150
10	167	854	823	1,820	901	2,390	1,760	1,110	797	365	267	157
11	162	807	758	1,600	820	2,890	1,540	991	792	296	287	163
12	160	755	732	1,430	783	3,240	1,590	1,480	727	278	305	161
13	160	731	1,060	1,200	635	2,740	1,530	1,730	579	139	309	161
14	156	812	1,070	1,310	634	3,910	1,440	1,610	542	196	306	161
15	148	726	1,210	1,270	632	4,030	1,370	1,460	400	189	297	161
16	144	671	1,130	1,320	563	3,470	1,320	1,180	360	306	288	154
17	165	579	955	1,220	487	3,520	963	1,090	363	103	283	392
18	183	567	873	1,190	494	3,280	599	988	404	177	303	461
19	173	573	672	1,230	504	3,360	615	832	307	193	264	293
20	157	652	638	1,210	526	3,590	602	850	330	303	471	326
21	211	694	877	1,140	523	3,580	593	814	334	272	325	303
22	552	741	1,010	1,490	487	3,420	948	476	298	207	279	331
23	1,480	691	1,060	1,600	484	3,350	1,160	445	281	200	263	326
24	1,210	646	1,060	1,500	478	3,480	935	465	433	198	218	315
25	981	654	1,060	1,510	470	3,970	794	477	356	213	246	379
26	909	681	1,110	1,510	482	4,000	778	486	338	226	244	367
27	897	796	1,130	1,470	460	3,710	933	539	433	207	288	362
28	912	767	1,190	1,450	475	3,160	1,040	1,290	690	193	234	292
29	1,020	706	1,170	1,330	-----	3,340	1,040	1,260	583	184	300	210
30	943	668	2,620	1,140	-----	4,190	757	1,050	637	187	244	195
31	852	-----	7,320	814	-----	3,820	-----	1,140	-----	206	239	-----
TOTAL	14,222	22,653	37,687	62,234	20,857	91,673	52,607	29,824	20,942	10,877	9,007	7,549
MEAN	459	755	1,216	2,008	745	2,957	1,754	962	698	351	291	252
MAX	1,480	1,030	7,320	5,100	1,240	4,190	4,510	1,730	1,560	857	505	461
MIN	144	567	638	814	460	550	593	445	281	103	218	139
MEAN+	455	760	1,122	1,989	737	3,036	1,803	1,066	691	334	244	188
CFSM+	.48	.80	1.18	2.08	.77	3.18	1.89	1.12	.72	.35	.26	.20
IN+	.55	.89	1.36	2.40	.80	3.67	2.11	1.29	.81	.40	.30	.22

CAL YR 1972 TOTAL 240,936 MEAN 658 MAX 7,320 MIN 144 MEAN+ 655 CFSM+ .69 IN+ 9.32
WTR YR 1973 TOTAL 380,132 MEAN 1,041 MAX 7,320 MIN 103 MEAN+ 1,040 CFSM+ 1.09 IN+ 14.80

+ Adjusted for change in contents in Holloway Reservoir.

STREAMS TRIBUTARY TO LAKE HURON

171

04148720 Brent Run near Montrose, Mich.

LOCATION.--Lat 43°10'12", long 83°50'03", in SE¼ NE¼ sec.23, T.9 N., R.5 E., Genesee County, 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 mi² (47.4 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 655 ft (199.6 m) from topographic map (nearest 5 ft). Prior to Aug. 26, 1970, non-recording gage at same site and datum.

EXTREMES.--Current year: Maximum discharge, 730 cfs (20.7 m³/s) Dec. 31 (gage height, 6.34 ft or 1.932 m); minimum, 2.1 cfs (0.059 m³/s) Sept. 5 (gage height, 1.06 ft or 0.323 m).

Period of record: Maximum discharge, 730 cfs (20.7 m³/s) Dec. 31, 1972; maximum gage height, 7.08 ft (2.158 m) Mar. 15, 1971 (backwater from ice); minimum discharge, 2.1 cfs (0.059 m³/s) Sept. 5, 1973; minimum gage height, 1.01 ft (0.308 m) Aug. 9, 17, 1971.

REMARKS.--Records fair except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FER	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.8	9.0	8.2	183	9.3	8.0	132	24	13	7.8	12	4.2
2	5.7	15	8.2	53	10	20	122	32	12	6.3	26	3.9
3	5.0	39	7.9	64	12	154	44	15	18	6.6	16	3.3
4	5.7	13	7.2	58	11	166	26	12	61	7.3	7.6	3.2
5	6.1	10	6.5	80	8.9	50	21	11	26	5.6	5.6	2.7
6	6.0	8.7	12	40	9.0	46	18	9.8	20	4.9	4.9	3.3
7	6.5	8.7	11	20	9.3	42	16	9.3	16	5.0	5.0	3.6
8	8.5	25	10	15	9.0	56	14	19	12	4.9	4.8	3.5
9	7.0	28	9.2	12	8.5	27	13	33	10	4.4	5.2	3.7
10	6.4	12	8.7	11	8.5	23	15	20	9.0	4.6	6.3	3.4
11	6.0	10	7.9	9.9	8.5	39	25	14	8.2	8.1	5.7	3.1
12	6.0	9.1	8.2	10	8.5	99	21	12	8.2	5.3	4.8	3.2
13	6.0	7.7	17	10	8.0	32	16	11	9.7	4.6	4.2	3.5
14	6.0	8.0	28	10	8.0	69	13	9.7	8.0	4.5	4.0	3.7
15	6.0	12	19	10	8.0	245	12	8.9	6.7	4.3	4.5	3.4
16	6.0	9.3	17	10	7.8	51	11	9.7	7.1	4.3	4.6	3.7
17	6.0	8.3	14	18	7.6	30	18	9.2	6.7	4.0	4.5	4.4
18	6.0	7.7	12	27	7.4	24	13	8.7	6.2	4.1	11	24
19	6.0	6.9	11	24	7.2	27	13	9.0	6.2	4.4	8.6	8.3
20	6.0	7.5	11	17	7.2	51	14	9.0	6.0	5.9	7.3	5.2
21	7.0	9.6	12	12	7.0	58	13	8.5	5.8	28	16	6.6
22	20	8.4	13	30	7.0	56	15	8.0	5.5	8.3	6.5	5.6
23	70	8.6	15	56	7.0	63	34	8.8	6.5	5.5	5.6	7.3
24	104	7.8	15	16	7.0	84	15	9.7	6.7	4.6	5.2	6.0
25	16	6.8	15	12	7.0	111	12	9.1	9.2	4.7	5.1	4.3
26	11	8.0	15	11	7.0	85	11	9.3	5.8	4.9	4.8	6.4
27	9.0	14	15	11	7.0	61	11	9.1	8.2	7.2	4.1	7.2
28	9.1	15	14	11	7.0	31	11	39	10	5.4	3.8	4.8
29	19	9.8	12	11	-----	35	9.7	67	21	4.4	4.2	4.5
30	20	8.5	59	10	-----	87	9.7	35	11	4.1	4.3	4.4
31	10	-----	559	9.5	-----	50	-----	17	-----	5.3	4.2	-----
TOTAL	418.8	351.4	978.0	871.4	229.7	1,980.0	718.4	506.8	359.7	189.3	216.4	154.4
MFAN	13.5	11.7	31.5	28.1	8.20	63.9	23.9	16.3	12.0	6.11	6.98	5.15
MAX	104	39	559	183	12	245	132	67	61	28	26	24
MTN	5.0	6.8	6.5	9.5	7.0	8.0	9.7	8.0	5.5	4.0	3.8	2.7
CFSM	.74	.64	1.72	1.54	.45	3.49	1.31	.89	.66	.33	.38	.28
IN.	.85	.71	1.99	1.77	.47	4.02	1.46	1.03	.73	.38	.44	.31

CAL YR 1972 TOTAL 5,786.5 MEAN 15.8 MAX 559 MIN 3.5 CFSM .86 IN 11.76
WTR YR 1973 TOTAL 6,974.3 MEAN 19.1 MAX 559 MIN 2.7 CFSM 1.04 IN 14.18

PEAK DISCHARGE (BASE, 80 FT³/S)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
10-24	0400	3.47	170	03-25	1500	3.17	152
12-31	0700	6.34	730	03-30	2000	2.85	115
01-23	0400	2.99	123	04-01	2100	3.96	263
03-04	1500	3.55	203	05-29	2100	2.53	83
03-12	0800	3.16	153	06-04	1900	2.62	92
03-15	0300	4.75	404				

STREAMS TRIBUTARY TO LAKE HURON

04149000 Flint River near Fosters, Mich.

LOCATION.--Lat 43°18'30", long 83°57'13", in SE¼ SE¼ sec.35, T.11 N., R.4 E., Saginaw County, 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 mi² (3,080 km²), 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.

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.

AVERAGE DISCHARGE.--34 years, 687 ft³/s (19.46 m³/s), 7.85 in/yr (199 mm/yr).

EXTREMES.--Current year: Maximum discharge, 9,700 ft³/s (275 m³/s) Dec. 31, based on correlation with nearby stations; minimum daily, 141 ft³/s (3.99 m³/s) Sept. 9.

Period of record: Maximum discharge, 19,000 ft³/s (538 m³/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 ft³/s (0.76 m³/s) Aug. 6, 1941.

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.

REMARKS.--Records fair. Some regulation by reservoirs above Flint.

REVISIONS (WATER YEARS).--WSP 954: 1941. WSP 1337: 1940, 1942, 1943-44 (M), 1945, 1946-47 (M), 1948-50. WSP 2111: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	332	933	746	6,000	933	563	5,200	1,180	1,290	743	298	258
2	376	1,010	833	3,500	997	783	5,690	1,600	1,380	818	489	319
3	387	1,500	958	3,500	1,130	1,780	4,750	1,490	1,290	906	522	226
4	387	1,220	870	5,000	1,180	3,040	4,180	1,220	1,990	830	416	188
5	410	997	908	5,500	1,150	2,780	3,880	1,200	1,890	743	372	266
6	376	908	1,130	5,000	1,170	2,690	3,550	958	1,590	678	391	254
7	365	833	1,100	3,700	1,230	2,690	3,280	720	1,830	642	326	234
8	332	1,130	1,000	3,100	1,170	3,140	3,090	780	1,400	618	324	234
9	290	1,390	1,000	2,300	1,020	3,110	2,900	1,230	1,150	594	313	141
10	250	1,080	900	2,100	960	2,830	2,450	1,250	1,010	568	322	184
11	220	984	750	1,900	920	3,100	1,860	1,210	936	532	300	175
12	202	920	800	1,700	920	4,600	1,900	1,250	848	435	332	175
13	202	870	1,400	1,400	850	4,120	1,830	1,430	886	292	330	164
14	211	958	1,300	1,500	800	4,080	1,620	1,740	786	157	352	182
15	211	946	1,200	1,500	800	5,910	1,510	1,540	637	192	352	164
16	182	808	1,200	1,500	750	4,800	1,400	1,350	529	260	332	192
17	192	733	1,200	1,400	650	4,420	1,470	1,060	481	376	317	190
18	211	659	1,100	1,400	600	4,080	813	1,010	432	181	328	597
19	220	696	900	1,400	600	3,900	830	966	387	238	328	396
20	220	733	800	1,400	650	4,260	798	916	515	266	369	319
21	230	808	1,000	1,340	650	4,550	798	866	539	350	508	319
22	479	846	1,100	1,580	600	4,500	860	790	410	339	358	298
23	1,430	808	1,200	2,260	600	4,550	974	582	376	264	305	339
24	2,240	746	1,300	1,980	600	4,650	1,070	582	387	254	292	328
25	1,470	758	1,300	1,740	580	5,000	1,060	582	421	254	262	339
26	1,070	746	1,300	1,740	551	5,050	1,020	654	539	282	282	394
27	958	908	1,300	1,660	599	4,850	908	766	597	252	290	405
28	933	971	1,400	1,640	563	4,200	870	979	537	262	270	394
29	1,100	858	1,500	1,540	-----	3,900	946	2,150	818	250	280	274
30	1,230	783	2,500	1,410	-----	4,800	933	2,010	730	230	288	284
31	1,020	-----	8,500	1,100	-----	4,750	-----	1,400	-----	228	268	-----
TOTAL	17,746	27,540	42,495	72,790	23,223	117,476	62,440	35,461	26,611	13,034	10,516	8,232
MEAN	572	918	1,371	2,346	829	3,790	2,081	1,144	887	420	339	274
MAX	2,240	1,500	8,500	6,000	1,230	5,910	5,690	2,150	1,990	906	522	597
MIN	182	659	746	1,100	551	563	798	582	376	157	262	141

CAL YR 1972 TOTAL 289,511 MEAN 791 MAX 8,500 MIN 182
WTR YR 1973 TOTAL 457,564 MEAN 1,254 MAX 8,500 MIN 141

NOTE.--No gage-height record Dec. 28 to Jan. 14.

STREAMS TRIBUTARY TO LAKE HURON

173

04149500 Flint River near Alicia, Mich.

LOCATION.--Lat 43°18'40", long 84°02'00", in SE¼ sec.31, T.11 N., R.4 E., Saginaw County, 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.

EXTREMES.--Current year: Maximum gage height, 11.80 ft (3.597 m) Jan. 2; minimum, 3.13 ft (0.954 m) Oct. 16.

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.

REMARKS.--Records represent stages in the Shiawassee Flats area.

MEAN GAGE HEIGHT, IN FEET, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.50	5.32	4.68	11.31	5.51	4.51	9.25	5.46	6.92	5.94		5.38
2	4.82	5.32	4.91	11.76	5.33	4.77	9.94	5.71	6.61	5.68		5.38
3	4.67	5.64	5.10	11.66	5.50	5.46	10.07	5.86	6.35	5.71		5.39
4	4.79	5.61	5.18	11.22	5.54	6.44	9.99	6.18	6.60	5.72		5.20
5	4.83	5.37	4.95	10.87	5.63		9.58	6.10	6.94	5.75		5.23
6	4.91	5.14	4.69	10.71	5.44		8.95	5.74	6.83	5.63		5.34
7	5.17	5.11	5.15		5.37		8.43	5.42	6.78	5.39		5.51
8	4.58	5.62	5.05		5.47		8.29	5.42	6.44	5.47	5.31	5.62
9	5.26	6.15	4.95		5.25	9.34	8.04	5.83	6.08	5.75	5.29	5.60
10	4.82	5.98	5.09		5.20	9.19	7.84	6.22	5.80		5.36	5.12
11	4.37	5.70	4.70	7.48	4.94	8.87	7.07	6.36	5.54		5.38	5.37
12	4.92	5.48	4.87	7.06	4.78	9.01	6.86	6.32	5.74		5.64	5.51
13	4.60	5.62	4.92	6.64	4.80	9.10	6.80	6.37	5.82		5.61	5.54
14	4.57	7.07	5.41	6.23	4.89	9.28	6.57	6.22	5.72		5.71	5.58
15	4.62	6.05	5.38	6.12	5.18	10.04	6.24	6.03	5.47		5.88	5.18
16	3.73	5.07	5.39	5.82	5.16	10.35	5.72	5.57	5.82		5.63	5.41
17	4.96	4.86	5.24	5.87		10.57	5.56	5.80	5.77		5.55	5.54
18	4.73	4.78	4.88	6.26		10.11	5.57	5.65	5.51		5.59	5.68
19	4.72	4.88	5.11	6.94	4.56	9.35	5.45	5.62	5.45		5.52	4.77
20	4.09	4.95	5.27	7.61	4.79	8.87	5.32	5.57	5.41		5.59	5.42
21	4.17	4.97	5.13	7.90	4.82	8.81	5.22	5.44	5.39		6.15	5.13
22	4.51	5.15	5.18	7.77	4.81	8.86	5.09	5.50	5.53		5.83	4.70
23	5.70	4.61	5.12	7.80	4.67	8.88	5.62	5.56	5.54		5.39	5.23
24	6.79	4.47	5.12	7.97	4.71	8.92	5.92	5.66	5.60		5.56	5.31
25	6.56	4.60	5.18	7.82	4.70	9.01	5.84	5.43	5.50		5.45	4.92
26	6.11	4.68	5.19	7.45	4.63	9.25	5.77	5.35	5.33		5.39	4.97
27	5.82	4.33	5.28	7.11	4.64	9.18	6.02	5.71	5.36		5.28	5.03
28	5.64	4.58	5.58	6.87	4.53	8.83	5.83	5.80	5.63		5.38	5.22
29	5.76	4.80	5.61	6.66		8.45	5.48	6.62	5.79		5.31	5.35
30	5.61	4.61	5.76	5.94	-----	8.44	5.38	7.08	5.95		5.35	5.28
31	5.47	-----	8.90	5.94	-----	8.63	-----	7.16	-----		5.38	-----

STREAMS TRIBUTARY TO LAKE HURON

04150000 South Branch Cass River near Cass City, Mich.

LOCATION.--Lat 43°34'01", long 83°06'43", in SW¼ NW¼ sec.7, T.13 N., R.12 E., Sanilac County, 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 mi² (650 km²).

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.

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.

AVERAGE DISCHARGE.--25 years, 119 ft³/s (3,370 m³/s), 6.44 in/yr (164 mm/yr).

EXTREMES.--Current year: Maximum discharge, 4,170 ft³/s (118 m³/s) Apr. 2 (gage height, 11.96 ft or 3.645 m); maximum gage height, 14.14 ft (4.310 m) Jan. 1 (backwater from ice); minimum discharge, 4.6 ft³/s (0.13 m³/s) Sept. 15. .86 ft or 4,529 m); minimum, 0.2 ft³/s (0.006 m³/s) Sept. 20-23, 1955, Aug. 19, 20, 1958.

REMARKS.--Records good except those for winter periods, which are poor.

REVISIONS (WATER YEARS).--WSP 1337: 1949-50. WSP 1707: 1951-53, 1959.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.3	35	33	2,800	110	37	1,470	117	259	296	20	6.7
2	7.8	35	32	2,200	130	41	3,410	222	541	191	107	6.8
3	7.5	42	30	1,600	420	55	1,250	169	558	136	339	6.4
4	7.0	67	28	1,200	270	160	795	130	826	101	181	6.2
5	6.6	57	25	950	190	650	508	109	442	77	94	6.2
6	6.6	46	27	800	130	1,100	358	88	277	59	53	6.3
7	6.6	39	27	680	100	1,050	368	74	263	45	35	6.1
8	6.2	39	27	600	80	850	292	205	209	37	26	5.7
9	5.3	58	27	500	70	600	211	1,170	138	31	21	5.2
10	5.2	70	27	400	60	480	187	555	102	27	20	5.4
11	5.2	60	28	320	54	560	228	274	81	24	22	5.1
12	5.2	50	29	270	47	940	437	258	70	21	19	5.1
13	5.0	42	30	220	43	740	308	210	61	22	16	5.0
14	5.1	37	33	190	41	880	200	151	52	21	14	4.9
15	5.1	33	34	170	41	1,220	157	119	44	20	13	4.8
16	5.0	30	36	160	40	400	134	100	39	19	12	5.2
17	5.0	28	38	160	40	180	146	88	37	17	11	6.0
18	5.0	26	40	230	39	200	126	78	37	16	10	11
19	5.0	24	42	980	38	220	112	69	36	15	10	17
20	5.2	24	43	750	38	230	104	61	34	14	10	15
21	5.7	24	46	540	38	270	95	56	30	17	10	10
22	8.7	24	49	620	37	422	94	53	28	24	9.6	10
23	26	25	52	700	37	572	111	51	27	17	9.5	11
24	70	26	56	450	37	997	111	51	30	14	9.1	10
25	81	26	58	350	36	1,700	89	48	53	18	8.7	9.3
26	60	28	62	280	36	1,340	76	50	50	27	8.8	8.9
27	43	36	66	240	35	1,120	67	51	59	19	8.6	8.4
28	32	36	74	220	35	580	62	158	606	20	7.7	8.4
29	29	35	82	230	-----	601	58	1,270	1,170	21	7.4	8.1
30	31	34	110	200	-----	1,980	56	707	607	17	7.1	7.7
31	38	-----	380	120	-----	1,080	-----	329	-----	16	6.8	-----
TOTAL	542.3	1,136	1,671	19,130	2,272	21,255	11,620	7,071	6,766	1,399	1,126.3	231.9
MEAN	17.5	37.9	53.9	617	81.1	686	387	228	226	45.1	36.3	7.73
MAX	81	70	380	2,800	420	1,980	3,410	1,270	1,170	296	339	17
MIN	5.0	24	25	120	35	37	56	48	27	14	6.8	4.8
CFSM	.07	.15	.21	2.46	.32	2.73	1.54	.91	.90	.18	.14	.03
IN.	.08	.17	.25	2.84	.34	3.15	1.72	1.05	1.00	.21	.17	.03

CAL YR 1972 TOTAL 31,337.5 MEAN 85.6 MAX 3,500 MIN 5.0 CFSM .34 IN 4.64
WTR YR 1973 TOTAL 74,220.5 MEAN 203 MAX 3,410 MIN 4.8 CFSM .81 IN 11.00

PEAK DISCHARGE (BASE, 1,100 FT³/S)

DATE	TIME	G.H.	DISCHARGE
01-01	0500	14.14	3,000
01-19	1300	9.42	1,250
03-15	0200	12.05	2,100
04-02	1100	11.96	4,170
05-09	1100	7.42	1,310
05-29	1500	8.01	1,560

STREAMS TRIBUTARY TO LAKE HURON

175

04150500 Cass River at Cass City, Mich.

LOCATION.--Lat 43°35'03", long 83°10'34", in NE¼ NE¼ sec.4, T.13 N., R.11 E., Tuscola County, on left bank 600 ft (183 m) downstream from bridge on Cemetery 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 mi² (960 km²), approximately.

PERIOD OF RECORD.--October 1947 to current year. Monthly discharge only for some periods, published in WSP 1307.

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.

AVERAGE DISCHARGE.--26 years, 194 ft³/s (5.494 m³/s), 7.12 in/yr (181 mm/yr).

EXTREMES.--Current year: Maximum discharge, 4,870 ft³/s (138 m³/s) Apr. 2 (gage height, 12.57 ft or 3.831 m); maximum gage height, 13.81 ft (4.209 m) Jan. 1 (backwater from ice); minimum discharge, 5.6 ft³/s (0.16 m³/s) Sept. 15, 16.

Period of record: Maximum discharge, 8,460 ft³/s (240 m³/s) Mar. 20, 1948 (gage height, 15.80 ft or 4.816 m, from graph based on gage readings); minimum, 0.50 ft³/s (0.014 m³/s) Sept. 26, 1948.

REMARKS.--Records good except those for winter periods, which are poor.

REVISIONS (WATER YEARS).--WSP 1337: 1949-50. WSP 1727: 1948 (M), 1950.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	54	60	3,300	200	76	2,060	204	593	590	27	9.7
2	11	53	56	2,600	240	88	4,120	377	786	386	38	9.4
3	11	55	52	2,100	560	130	2,150	335	836	254	316	8.8
4	10	77	49	1,600	400	400	1,480	302	1,140	176	173	8.2
5	9.8	74	46	1,300	310	1,300	1,040	259	751	128	95	7.8
6	9.8	64	44	1,000	240	1,800	769	206	539	98	61	7.9
7	9.7	57	43	840	200	2,100	723	174	502	80	44	7.5
8	9.5	60	43	740	160	1,800	585	269	408	65	34	7.3
9	8.5	70	44	620	130	1,300	460	1,500	289	53	29	6.7
10	7.8	84	45	500	110	1,050	408	1,000	223	44	25	6.4
11	7.9	77	46	400	100	1,100	425	763	171	39	26	6.2
12	8.2	69	47	340	95	1,200	673	641	135	34	24	6.1
13	8.0	61	50	280	90	1,300	566	496	111	34	21	6.0
14	8.2	55	53	230	88	1,300	455	357	91	32	19	6.0
15	8.3	49	54	200	86	2,250	405	277	76	30	17	6.0
16	8.1	46	58	190	84	1,900	340	220	66	28	16	6.0
17	8.2	42	62	220	82	1,300	316	188	61	25	15	7.7
18	8.0	40	66	500	80	840	271	164	59	23	14	11
19	8.0	39	68	1,150	80	410	243	144	56	22	14	15
20	8.0	38	72	1,000	78	480	228	126	54	21	14	17
21	9.6	38	76	640	78	605	208	114	49	21	13	13
22	15	39	78	700	76	695	201	100	46	26	13	13
23	42	40	86	860	74	873	210	94	46	23	13	12
24	8.3	41	94	740	74	1,390	206	89	55	19	13	12
25	11.3	41	98	580	72	2,210	176	83	77	19	12	11
26	88	45	105	460	72	2,050	157	82	73	31	12	11
27	74	56	110	420	72	1,900	141	85	75	24	12	11
28	63	71	130	340	72	1,250	128	157	735	23	11	9.7
29	57	66	170	290	-----	1,160	118	1,430	1,540	27	11	10
30	55	62	260	240	-----	2,500	113	1,080	959	22	10	9.2
31	57	-----	1,500	220	-----	1,820	-----	691	-----	21	9.7	-----
TOTAL	836.6	1,663	3,765	24,600	4,003	38,577	19,375	12,007	10,602	2,418	1,151.7	278.6
MEAN	27.0	55.4	121	794	143	1,244	646	387	353	78.0	37.2	9.29
MAX	113	84	1,500	3,300	560	2,500	4,120	1,500	1,540	590	316	17
MIN	7.8	38	43	190	72	76	113	82	46	19	9.7	6.0
CFSM	.07	.15	.33	2.15	.39	3.36	1.75	1.05	.95	.21	.10	.03
IN.	.08	.17	.38	2.47	.40	3.88	1.95	1.21	1.07	.24	.12	.03

CAL YR 1972 TOTAL 58,140.9 MEAN 159 MAX 4,520 MIN 7.8 CFSM .43 IN 5.85
WTR YR 1973 TOTAL 119,276.9 MEAN 327 MAX 4,120 MIN 6.0 CFSM .88 IN 11.99

PEAK DISCHARGE (BASE, 1,400 FT³/S)

DATE	TIME	G.H.	DISCHARGE
01-01	0900	13.81	4,700
01-19	1100	9.21	1,450
03-06	1500	10.18	2,100
03-15	0400	12.50	3,050
03-25	1200	9.88	2,460
04-02	1300	12.57	4,870
05-09	1300	8.76	1,660
05-29	1600	9.00	1,770
06-29	1000	8.83	1,650

04150800 Cass River at Wahjamega, Mich.

LOCATION.--Lat 43°27'02", long 83°26'29", in NW¼ NW¼ sec.20, T.12 N., R.9 E., Tuscola County, on right bank 90 ft (27 m) upstream from bridge on Chambers Road, on grounds of Caro State Hospital 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 mi² (1,650 km²).

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.

AVERAGE DISCHARGE.--5 years, 377 ft³/s (10.68 m³/s), 8.04 in/yr (204 mm/yr).

EXTREMES.--Current year: Maximum discharge, 6,280 ft³/s (178 m³/s) Apr. 2 (gage height, 15.58 ft or 4.749 m); minimum, 26 ft³/s (0.74 m³/s) Sept. 17 (gage height, 2.91 ft or 0.887 m).

Period of record: Maximum discharge, 7,610 ft³/s (216 m³/s) Mar. 16, 1971 (gage height, 16.91 ft or 5.154 m); minimum, 22 ft³/s (0.62 m³/s) part or all of each day Sept. 22, 1969, Aug. 9, 10, 16-22, 1971.

REMARKS.--Records good except those for winter periods, which are fair. Some regulation by dam at Michigan Sugar Co., 1.9 mi (3.1 km) above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47	182	180	5,600	410	180	2,860	437	1,200	1,150	120	33
2	49	190	148	4,500	507	196	5,300	941	1,460	745	152	31
3	46	222	160	4,000	1,210	343	4,740	804	1,720	515	192	31
4	44	214	138	3,100	1,220	1,880	2,720	671	1,990	365	292	30
5	41	222	142	2,600	720	3,030	2,070	590	1,670	282	194	30
6	41	200	160	2,000	580	3,220	1,480	485	1,200	232	144	29
7	45	190	150	1,400	450	3,680	1,340	402	1,180	198	112	29
8	49	216	140	1,000	370	3,650	1,160	453	899	174	92	28
9	52	224	135	860	310	2,840	927	2,270	644	152	82	28
10	45	222	135	700	280	1,980	818	2,460	476	136	74	27
11	42	218	140	600	260	1,880	712	1,560	372	124	64	27
12	42	200	150	490	230	2,930	1,150	1,320	308	110	62	27
13	40	188	160	420	210	2,790	1,210	1,110	258	110	57	27
14	39	170	175	330	210	2,240	934	818	220	106	52	27
15	38	154	190	300	210	5,130	798	638	198	104	49	27
16	38	146	200	292	210	3,690	692	527	180	92	45	27
17	38	138	210	322	200	2,110	650	446	164	84	44	29
18	35	136	220	865	200	1,080	611	392	162	78	42	32
19	36	132	230	2,290	190	924	539	352	156	72	40	39
20	36	128	230	2,520	190	1,030	506	315	152	72	40	45
21	42	130	240	1,710	188	1,210	467	280	142	72	40	44
22	82	132	260	1,360	180	1,330	461	260	134	68	39	46
23	275	130	280	2,100	180	1,470	515	246	134	68	39	46
24	365	132	300	1,830	180	2,130	485	232	168	62	39	42
25	310	134	310	1,100	170	3,280	416	216	170	60	39	40
26	265	144	320	800	170	3,650	365	212	178	82	39	40
27	220	174	340	700	170	3,480	328	218	202	96	38	42
28	196	190	400	580	170	2,530	292	378	698	84	36	39
29	202	184	700	500	-----	2,080	270	1,730	2,920	78	35	40
30	208	174	2,000	470	-----	3,200	265	2,650	2,110	74	34	38
31	192	-----	5,000	430	-----	3,790	-----	1,400	-----	72	33	-----
TOTAL	3,200	5,228	13,543	45,769	9,575	72,953	35,081	24,813	21,465	5,717	2,360	1,020
MEAN	103	174	437	1,476	342	2,353	1,169	800	716	184	76.1	34.0
MAX	365	224	5,000	5,600	1,220	5,130	5,300	2,650	2,920	1,150	292	46
MIN	35	128	135	292	170	180	265	212	134	60	33	27
CFSM	.16	.27	.69	2.32	.54	3.69	1.84	1.26	1.12	.29	.12	.05
IN.	.19	.31	.79	2.67	.50	4.26	2.05	1.45	1.25	.33	.14	.06

CAL YR 1972 TOTAL 118,956 MEAN 325 MAX 6,040 MIN 35 CFSM .51 IN 6.95
WTR YR 1973 TOTAL 240,724 MEAN 660 MAX 5,600 MIN 27 CFSM 1.04 IN 14.06

PEAK DISCHARGE (BASE, 2,400 FT³/S)

DATE	TIME	G.H.	DISCHARGE
01-01	unknown	--	6,000
01-20	0200	10.55	2,840
03-15	1700	15.33	6,030
03-26	0030	12.20	3,820
04-02	2300	15.58	6,280
05-09	2200	11.15	3,190
05-30	0400	11.14	3,180
06-29	1700	11.21	3,230

04151500 Cass River at Frankenmuth, Mich.

LOCATION.--Lat 43°19'40", long 83°44'53", in NW¼ SE¼ sec.27, T.11 N., R.6 E., Saginaw County, 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 mi² (2,196 km²).

PERIOD OF RECORD.--February 1908 to March 1909, July 1935 to September 1936, June 1939 to current year.

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.

AVERAGE DISCHARGE.--35 years (1935-36, 1939-73), 463 ft³/s (13.11 m³/s), 7.41 in/yr (188 mm/yr).

EXTREMES.--Current year: Maximum discharge, 7,200 ft³/s (204 m³/s) Jan. 2 (gage height, 20.31 ft or 6.190 m); minimum, 37 ft³/s (1.05 m³/s) Sept. 13, 17.

Period of record: Maximum discharge, 17,700 ft³/s (501 m³/s) Mar. 18, 1942 (gage height, 20.88 ft or 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 ft³/s (0.042 m³/s) Aug. 6, 1944.

REMARKS.--Records good except those for winter periods, which are fair. Occasional regulation by dams above station. Prior to 1950, regulation at low and medium flows by mill above station.

REVISIONS (WATER YEARS).--WSP 1307: 1936 (M), 1940 (M). WSP 1727: 1952. WSP 1911: 1952.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	94	331	286	6,000	560	240	4,460	643	1,550	1,680	169	54
2	96	388	267	7,000	580	260	5,550	1,210	1,600	1,100	248	52
3	93	512	248	6,000	700	400	6,660	1,220	1,910	750	271	49
4	85	456	237	5,000	1,400	1,500	4,100	986	2,180	536	333	47
5	79	410	227	4,000	1,000	3,300	2,820	849	2,180	400	314	45
6	78	380	230	3,500	800	3,700	2,100	715	1,790	317	223	41
7	80	355	230	2,900	680	4,200	1,810	602	1,860	264	172	43
8	87	436	220	2,200	600	4,370	1,610	633	1,390	228	141	41
9	82	468	229	1,700	500	3,890	1,340	1,640	1,000	203	125	41
10	81	415	232	1,400	430	2,670	1,180	3,190	706	178	115	39
11	77	383	229	1,100	360	2,410	1,170	2,150	545	165	105	40
12	75	348	250	900	320	3,130	1,410	1,640	432	148	95	39
13	74	324	260	750	310	3,680	1,660	1,470	367	142	91	39
14	71	300	290	640	300	3,130	1,390	1,170	311	143	85	40
15	68	269	310	560	290	5,210	1,140	917	267	135	82	39
16	65	251	330	520	280	5,930	993	736	242	126	79	38
17	65	237	350	520	280	3,130	908	633	223	117	73	48
18	65	229	370	700	270	1,830	877	555	211	110	74	79
19	64	222	370	2,000	260	1,430	792	492	207	106	70	69
20	62	224	380	3,200	260	1,580	723	438	198	113	71	69
21	68	230	400	2,500	260	1,780	671	389	186	128	75	70
22	122	235	430	2,100	250	1,920	669	354	174	118	71	69
23	754	229	460	2,500	240	2,060	800	332	168	106	65	70
24	1,080	224	480	3,000	240	2,650	746	315	214	104	63	66
25	767	224	500	1,600	240	3,950	649	293	227	99	62	64
26	579	240	520	1,300	230	4,980	562	279	225	96	63	66
27	440	306	540	1,100	230	4,690	497	284	329	120	61	65
28	365	348	560	960	230	3,690	440	489	553	125	62	61
29	413	330	570	800	---	2,860	392	1,310	2,330	115	57	60
30	440	290	1,100	680	---	3,880	387	3,250	2,860	105	56	58
31	382	---	3,500	620	---	5,030	---	2,240	---	131	54	---
TOTAL	6,951	9,594	14,605	67,750	12,100	93,480	48,506	31,424	26,435	8,208	3,625	1,601
MEAN	224	320	471	2,185	432	3,015	1,617	1,014	881	265	117	53.4
MAX	1,080	512	3,500	7,000	1,400	5,930	6,660	3,250	2,860	1,680	333	79
MIN	62	222	220	520	230	240	387	279	168	96	54	38
CFSM	.26	.38	.56	2.58	.51	3.56	1.91	1.20	1.04	.31	.14	.06
IN.	.30	.42	.64	2.97	.53	4.10	2.13	1.38	1.16	.36	.16	.07
CAL YR 1972	TOTAL 166,041	MEAN 454	MAX 7,110	MIN 62	CFSM .54	IN 7.28						
WTR YR 1973	TOTAL 324,279	MEAN 888	MAX 7,000	MIN 38	CFSM 1.05	IN 14.23						

PEAK DISCHARGE (BASE, 3,500 FT³/S)

DATE	TIME	G.H.	DISCHARGE
01-02	0700	20.31	7,200
03-07	1200	15.48	4,580
03-16	0400	17.93	6,830
04-03	1000	18.13	7,060
05-30	1300	13.87	3,520

STREAMS TRIBUTARY TO LAKE HURON

04152500 Tobacco River at Beaverton, Mich.

LOCATION.--Lat $43^{\circ}52'43''$, long $84^{\circ}28'18''$, in NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 7, T.17 N., R.1 W., Gladwin County, on left bank 15 ft (5 m) downstream from bridge on Glidden Road, 1 mi (1.6 km) downstream from dam at Beaverton, and 2 mi (3.2 km) upstream from Venison Creek.

DRAINAGE AREA.--487 mi² (1,261 km²).

PERIOD OF RECORD.--July 1948 to current year.

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).

AVERAGE DISCHARGE.--25 years, 370 ft³/s (10.48 m³/s), 10.32 in/yr (262 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,800 ft³/s (79.3 m³/s) Jan. 19 (gage height, 7.86 ft or 2.396 m); minimum, 20 ft³/s (0.57 m³/s) Sept. 14 (gage height, 0.90 ft or 0.274 m).
Period of record: Maximum discharge, 7,680 ft³/s (217 m³/s) July 9, 1957 (gage height, 12.95 ft or 3.947 m); minimum, 5.6 ft³/s (0.16 m³/s) July 12, 13, 14, 1959, Aug. 21, 1961; minimum daily, 5.9 ft³/s (0.17 m³/s) July 12, 13, 1959.

REMARKS.--Records good except those for winter periods, which are fair. Prior to Feb. 21, 1961, regulation at all stages by powerplant 1 mi (1.6 km) above station; occasional regulation since.

REVISIONS (WATER YEARS).--WSP 1307: 1948 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	264	323	283	1,850	420	323	1,230	545	750	486	473	191
2	261	403	268	1,320	620	335	1,360	1,090	561	401	896	187
3	255	473	265	1,000	958	484	1,220	616	580	330	411	184
4	255	513	248	800	854	916	947	690	959	388	375	177
5	249	471	250	660	652	1,730	911	554	824	345	344	176
6	238	419	257	560	604	1,860	689	324	612	261	182	175
7	244	395	183	460	533	1,990	673	363	528	252	159	170
8	241	691	185	400	400	2,370	764	733	379	256	204	171
9	227	916	200	350	340	2,070	722	1,100	458	248	328	174
10	217	691	210	330	340	1,190	632	907	408	239	461	232
11	212	565	210	330	330	1,100	611	897	313	223	486	127
12	213	394	210	340	320	1,710	702	676	305	221	487	152
13	214	358	210	350	320	1,850	738	566	288	232	298	165
14	212	354	210	361	322	1,650	697	334	286	245	213	107
15	212	338	220	349	330	2,000	643	498	283	242	211	48
16	213	323	230	342	340	1,720	597	400	275	237	210	50
17	212	312	240	340	330	1,160	514	306	270	229	205	57
18	208	303	250	507	330	761	486	394	301	220	202	65
19	208	298	271	1,940	306	738	509	387	384	213	201	86
20	219	294	281	2,050	320	939	514	359	338	216	210	95
21	232	291	286	1,270	330	868	544	299	292	217	202	190
22	271	289	293	1,240	340	820	545	297	281	213	196	233
23	894	285	299	1,840	330	772	553	358	275	206	193	219
24	1,260	276	305	1,470	320	724	509	274	284	201	197	221
25	1,050	273	316	1,070	310	690	375	265	301	203	200	288
26	592	285	321	899	310	528	241	636	256	217	202	217
27	509	305	325	869	310	570	266	988	835	315	198	208
28	492	353	323	780	320	557	316	1,640	988	366	195	209
29	535	303	318	450	-----	559	327	1,990	770	306	189	207
30	485	287	407	430	-----	651	436	1,810	681	221	184	209
31	430	-----	1,450	430	-----	735	-----	899	-----	269	185	-----
TOTAL	11,324	11,781	9,324	25,387	11,548	34,250	19,271	21,195	14,074	8,218	8,697	4,990
MEAN	365	393	301	810	412	1,115	642	684	460	265	281	166
MAX	1,260	916	1,450	2,050	958	2,370	1,360	1,990	988	486	896	288
MIN	208	273	183	330	306	323	241	265	256	201	159	48
CFSM	.75	.81	.62	1.68	.85	2.27	1.32	1.40	.96	.54	.58	.34
IN.	.86	.90	.71	1.94	.88	2.62	1.47	1.62	1.08	.63	.66	.38

CAL YR 1972 TOTAL 142,762 MEAN 390 MAX 3,300 MIN 148 CFSM .80 IN 10.91
WTR YR 1973 TOTAL 180,050 MEAN 493 MAX 2,370 MIN 48 CFSM 1.01 IN 13.75

04154000 Chippewa River near Mount Pleasant, Mich.

LOCATION.--Lat 43°37'32", long 84°42'28", in NW¼ NW¼ sec.8, T.14 N., R.3 W., Isabella County, 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 mi² (1,077 km²).

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.

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.

AVERAGE DISCHARGE.--42 years, 295 ft³/s (8.354 m³/s), 9.63 in/yr (245 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,890 ft³/s (53.5 m³/s) May 29 (gage height, 8.07 ft or 2.460 m); minimum, 150 ft³/s (4.25 m³/s) Sept. 14.

Period of record: Maximum discharge, 4,960 ft³/s (140 m³/s) Mar. 8, 1946 (gage height, 12.78 ft or 3.895 m); minimum, 12 ft³/s (0.34 m³/s) Aug. 18, 1945; minimum daily, 19 ft³/s (0.54 m³/s) Aug. 16, 1936; minimum gage height, 2.70 ft (0.822 m) Oct. 8, 1966.

REMARKS.--Records good except those for winter periods, which are fair. Diurnal fluctuation below 750 ft³/s (21.2 m³/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 outlet.

REVISIONS (WATER YEARS).--WSP 744: Drainage area. WSP 1337: 1931, 1933-40, 1945, 1948-49.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	298	401	342	1,030	430	336	895	507	876	488	373	180
2	298	404	335	720	420	343	1,180	672	760	414	451	179
3	328	447	329	660	480	397	954	597	701	369	410	176
4	342	434	322	600	430	731	894	524	813	336	337	173
5	336	423	320	560	390	1,200	810	471	750	311	294	172
6	333	400	332	520	360	980	722	431	685	281	268	171
7	329	393	320	500	340	974	679	408	617	269	246	164
8	324	625	320	470	330	1,090	605	564	539	259	223	160
9	315	656	315	450	320	953	560	764	473	242	262	161
10	304	533	310	440	310	1,000	561	705	430	231	249	160
11	301	487	310	410	300	1,060	565	715	404	223	239	160
12	298	458	310	380	290	1,210	607	679	370	209	229	157
13	291	438	310	360	290	1,190	638	627	351	212	220	157
14	288	417	310	350	300	1,150	609	562	317	211	212	155
15	284	401	310	350	305	1,390	589	502	302	211	208	155
16	282	389	310	360	310	1,220	570	465	299	207	202	161
17	272	378	310	370	320	1,120	564	434	305	199	193	168
18	266	371	310	400	320	990	523	414	310	195	186	186
19	265	367	310	1,410	320	923	518	403	283	192	191	186
20	265	364	310	1,490	320	922	514	390	275	190	213	184
21	277	358	310	935	320	876	491	376	263	189	217	180
22	338	358	316	887	320	821	525	358	255	187	208	182
23	707	351	310	1,260	325	766	540	361	251	183	206	185
24	934	345	309	1,040	325	714	501	336	335	175	205	184
25	687	344	312	860	325	665	466	332	374	202	202	180
26	562	355	316	740	330	621	426	581	361	225	205	182
27	506	361	316	660	330	580	375	530	337	269	203	189
28	481	359	313	620	340	538	357	888	370	236	197	186
29	489	349	312	540	-----	520	355	1,770	532	223	192	181
30	461	343	388	480	-----	671	358	1,600	502	214	187	180
31	422	-----	869	460	-----	670	-----	1,110	-----	239	184	-----
TOTAL	11,883	12,309	10,416	20,312	9,500	26,621	17,951	19,076	13,440	7,591	7,412	5,194
MEAN	383	410	336	655	339	859	598	615	448	245	239	173
MAX	934	656	869	1,490	480	1,390	1,180	1,770	876	488	451	189
MIN	265	343	309	350	290	336	355	332	251	175	184	155
CFSM	.92	.99	.81	1.57	.81	2.06	1.44	1.48	1.08	.59	.57	.42
IN.	1.06	1.10	.93	1.82	.85	2.38	1.61	1.71	1.20	.68	.66	.46

C&L YR 1972 TOTAL 129,755 MEAN 355 MAX 2,180 MIN 128 CFSM .85 IN 11.60
WTR YR 1973 TOTAL 161,705 MEAN 443 MAX 1,770 MIN 155 CFSM 1.06 IN 14.46

PEAK DISCHARGE (BASE, 1,000 FT³/S)

DATE	TIME	G.H.	DISCHARGE
01-01	0500	5.86	1,070
01-19	2300	7.61	1,700
01-23	1500	6.55	1,310
03-05	1400	6.67	1,350
03-15	1000	6.92	1,440
04-02	0500	6.47	1,280
05-29	2000	8.07	1,890

STREAMS TRIBUTARY TO LAKE HURON

04155000 Pine River at Alma, Mich.

LOCATION.--Lat 43°22'46", long 84°39'20", SW¼ SE¼ sec.34, T.12 N., R.3 W., Gratiot County, on right bank 270 ft (82 m) downstream from Superior Street Bridge on grounds of Municipal Water Works in Alma, 0.6 mi (1.0 km) downstream from municipal reservoir, and 38 mi (61 km) upstream from mouth.

DRAINAGE AREA.--288 mi² (746 km²).

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.

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.

AVERAGE DISCHARGE.--43 years, 206 ft³/s (5.834 m³/s), 9.71 in/yr (247 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,540 ft³/s (43.6 m³/s) Jan. 22 (gage height, 6.88 ft or 2.097 m); minimum, 37 ft³/s (1.05 m³/s) June 11 (gage height, 0.89 ft or 0.271 m).

Period of record: Maximum discharge, 4,400 ft³/s (125 m³/s) Mar. 19, 1948 (gage height, 10.81 ft or 3.295 m); minimum daily, 0.40 ft³/s (0.011 m³/s) Sept. 6, 1964, caused by closing dam during construction of water works.

REMARKS.--Records good except those for winter periods, which are fair. 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 ft³/s (0.07 m³/s) diverted above station for municipal and industrial use; sewage effluent is returned below station.

REVISIONS (WATER YEARS).--WSP 744: Drainage area. WSP 1307: 1945 (M). WSP 1337: 1931, 1932-34 (M), 1936, 1939, 1945, 1949.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	147	361	244	1,090	383	234	1,120	629	726	303	351	90
2	144	354	207	837	410	251	1,150	722	610	306	370	78
3	151	341	210	808	433	329	1,110	737	511	274	351	75
4	139	329	179	963	412	586	1,070	755	509	234	369	86
5	134	319	183	887	424	808	891	643	509	205	324	81
6	127	307	232	676	422	828	761	542	692	180	272	70
7	126	312	196	559	402	1,140	676	484	541	153	206	66
8	136	335	167	477	330	1,150	605	550	725	148	177	73
9	139	338	159	419	250	1,000	551	608	491	131	151	74
10	119	338	186	388	210	963	544	616	415	136	166	74
11	114	355	200	349	190	915	524	646	172	130	188	67
12	125	366	210	315	180	968	542	590	280	126	168	72
13	114	352	210	288	180	826	591	522	296	130	150	69
14	121	329	210	281	190	1,070	599	467	272	124	133	66
15	143	297	220	244	190	1,140	602	421	250	122	115	75
16	118	271	230	280	200	940	585	385	245	118	107	74
17	108	251	230	301	200	896	549	359	246	115	107	95
18	111	239	240	602	200	697	517	332	258	108	96	109
19	108	224	247	1,350	205	705	502	314	252	98	106	130
20	107	219	264	1,000	205	745	487	307	211	109	140	135
21	129	212	273	928	205	737	466	287	200	109	139	121
22	193	219	280	1,320	205	729	548	289	185	116	141	112
23	365	219	294	1,360	205	710	568	294	177	116	139	95
24	457	207	305	909	205	678	532	292	165	101	121	89
25	484	210	316	945	210	637	500	295	169	96	124	101
26	567	216	314	778	210	597	457	252	189	131	120	127
27	598	218	326	697	210	553	410	319	188	198	113	154
28	540	226	317	631	221	512	373	411	203	213	105	134
29	488	236	314	543	-----	503	344	466	213	196	102	122
30	434	238	438	455	-----	636	338	575	251	179	95	108
31	389	-----	1,100	416	-----	700	-----	749	-----	197	94	-----
TOTAL	7,175	8,438	8,495	21,086	7,287	23,205	18,552	14,858	10,160	4,902	5,340	2,822
MEAN	231	281	274	680	240	740	618	479	339	158	172	94.1
MAX	598	366	1,100	1,360	433	1,150	1,130	755	726	306	370	154
MIN	107	207	159	244	180	234	338	252	165	96	94	66
CFSM	.80	.98	.95	2.36	.90	2.50	2.15	1.66	1.19	.55	.60	.33
IN.	.93	1.09	1.10	2.72	.94	3.00	2.40	1.92	1.31	.63	.69	.36

CAL YR 1972 TOTAL 91,286 MEAN 240 MAX 1,460 MIN 63 CFSM .96 IN 11.79
WTR YR 1973 TOTAL 132,320 MEAN 363 MAX 1,360 MIN 66 CFSM 1.26 IN 17.09

04155500 Pine River near Midland, Mich.

LOCATION.--Lat 43°33'52", long 84°22'09", in SW¼ NW¼ sec.4, T.13 N., R.1 E., Midland County, 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 mi² (1,010 km²), approximately.

PERIOD OF RECORD.--May 1934 to September 1938, February 1948 to current year.

GAGE.--Water-stage recorder. Datum of gage is 623.94 ft (190.177 m) above mean sea level. Prior to Sept. 30, 1938, nonrecording gages at same site, at datum 5.55 ft (1.692m) lower. Feb. 3, 1948 to Dec. 13, 1951, nonrecording gage at present site and datum.

AVERAGE DISCHARGE.--29 years, 286 ft³/s (8.100 m³/s), 9.96 in.yr (253 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,180 ft³/s (61.7 m³/s) Dec. 31 (gage height, 6.59 ft or 2.009 m); maximum gage height, 7.25 ft (2.210 m) Feb. 15 (backwater from ice); minimum discharge, 20 ft³/s (0.57 m³/s) Sept. 5, 6, 13.
Period of record: Maximum discharge, 6,360 ft³/s (180 m³/s) Mar. 20, 1948 (gage height, 10.00 ft or 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.

REMARKS.--Records fair except those for winter periods, which are poor. Regulation at low and medium stages by powerplant at St. Louis. Some diversion above station for irrigation.

REVISIONS (WATER YEARS).--WSP 1207: Drainage area. WSP 1307: 1955 (M). WSP 1337: 1936-38, 1948-49.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	445	665	299	1,990	440	280	1,340	670	867	296	460	111
2	280	654	306	1,700	430	300	1,760	1,240	784	348	676	78
3	396	671	173	1,410	440	390	1,450	976	660	368	646	104
4	280	630	220	1,070	440	560	1,350	895	655	320	502	90
5	384	550	220	960	450	900	1,170	870	736	280	459	38
6	348	540	220	860	440	1,300	971	705	780	199	374	51
7	336	480	230	800	410	1,540	864	595	879	228	339	62
8	296	598	230	700	380	1,680	743	671	685	155	253	101
9	250	635	230	600	320	1,400	682	937	650	154	230	33
10	288	587	240	540	270	1,290	633	840	553	140	177	26
11	374	568	250	470	200	1,270	617	789	481	126	176	50
12	309	542	260	420	180	1,620	694	787	261	142	214	106
13	216	533	270	370	200	1,320	729	688	284	115	194	31
14	310	513	270	320	220	1,320	741	583	360	143	160	54
15	260	458	280	300	230	1,850	712	515	312	124	167	66
16	109	393	290	310	240	1,420	671	485	324	121	119	36
17	449	362	300	340	240	1,080	631	404	300	116	128	77
18	229	339	310	450	250	986	588	404	316	112	89	89
19	229	287	310	1,600	250	798	562	379	300	121	109	150
20	260	260	320	1,500	260	1,020	552	329	340	81	94	166
21	251	275	330	1,200	260	1,100	534	356	280	109	78	180
22	269	227	340	1,150	260	1,110	583	332	304	115	181	173
23	800	245	350	1,500	260	1,100	705	352	253	79	164	159
24	1,490	228	360	1,200	260	1,050	646	355	280	123	176	133
25	1,240	242	370	1,000	270	979	589	381	217	119	154	144
26	1,070	215	380	900	270	879	540	386	292	89	109	103
27	1,080	248	400	800	270	796	481	306	316	130	127	198
28	1,110	263	410	700	270	689	407	605	340	217	135	203
29	1,010	258	420	620	-----	673	386	635	332	179	120	154
30	868	284	460	540	-----	951	383	622	324	242	112	187
31	758	-----	1,500	480	-----	1,140	-----	779	-----	217	69	-----
TOTAL	15,994	12,750	10,548	26,800	8,410	32,791	22,714	18,871	13,465	5,308	6,991	3,153
MEAN	516	425	340	865	300	1,058	757	609	449	171	226	105
MAX	1,490	671	1,500	1,990	450	1,850	1,760	1,240	879	368	676	203
MIN	109	215	173	300	180	280	383	306	217	79	69	26
CFSM	1.32	1.09	.87	2.22	.77	2.71	1.94	1.56	1.15	.44	.58	.27
IN.	1.53	1.22	1.01	2.56	.80	3.13	2.17	1.80	1.28	.51	.67	.30

CAL YR 1972 TOTAL 141,909 MEAN 388 MAX 2,100 MIN 73 CFSM .99 IN 13.54
WTR YR 1973 TOTAL 177,795 MEAN 487 MAX 1,990 MIN 26 CFSM 1.25 IN 16.96

PEAK DISCHARGE (BASE, 1,200 FT³/S)

DATE	TIME	G.H.	DISCHARGE
10-24	1500	6.43	1,570
12-31	2000	6.59	2,180
01-19	2100	6.45	1,800
03-08	1000	5.50	1,740
03-15	0700	5.79	1,970
03-20	2200	4.93	1,280
04-02	0200	5.70	1,900
05-02	0300	5.18	1,380
06-08	2000	5.07	1,200

04156000 Tittabawassee River at Midland, Mich.

LOCATION.--Lat 43°35'43", long 84°14'08", in NW¼ NE¼ sec.28, T.14 N., R.2 E., Midland County, 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 mi² (6,200 km²) 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.

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.

AVERAGE DISCHARGE.--37 years, 1,603 ft³/s (45.40 m³/s), 9.07 in/yr (230 mm/yr).

EXTREMES.--Current year: Maximum discharge, 12,300 ft³/s (348 m³/s) Jan. 20 (gage height, 22.42 ft or 6.834 m); minimum, 256 ft³/s (7.25 m³/s) Sept. 13 (gage height, 9.69 ft or 2.954 m); minimum daily, 321 ft³/s (9.09 m³/s) Sept. 16.
Period of record: Maximum discharge, 34,000 ft³/s (963 m³/s) Mar. 21, 1948 (gage height, 29.50 ft or 8.992 m); minimum, 39 ft³/s (1.10 m³/s) Oct. 12, 1942; minimum daily, 111 ft³/s (3.14 m³/s) Aug. 21, 1949; minimum gage height, 9.04 ft (2.755 m) Aug. 19, 1954, caused by bridge construction above station.
Maximum stage known since at least 1907, 29.7 ft (9.05 m) Mar. 28, 1916, from information by U.S. Weather Bureau (discharge, 34,800 ft³/s or 986 m³/s).

REMARKS.--Records good. 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 ft³/s (113 m³/s) regulated by dam 2,000 ft (610 m) above station; fixed-crest dam since.

REVISIONS (WATER YEARS).--WSP 1045: 1945. WSP 1144: 1948.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	575	2,800	1,840	10,000	3,610	2,100	5,970	3,120	5,160	1,910	1,610	415
2	824	2,520	1,150	10,100	3,200	2,100	8,720	5,670	4,390	1,950	3,480	385
3	1,020	2,790	785	8,120	4,380	1,420	8,190	5,850	4,330	2,130	3,560	388
4	1,080	2,210	1,220	7,100	2,880	2,340	7,200	4,850	4,590	823	1,550	504
5	902	1,550	1,400	6,560	2,560	5,960	6,320	2,940	4,980	1,600	876	547
6	860	1,950	1,400	5,540	2,910	9,420	5,340	2,080	4,940	1,630	994	457
7	625	2,580	1,140	4,410	2,800	10,300	4,960	2,670	4,680	920	893	455
8	565	2,960	1,110	3,480	3,420	11,400	4,570	3,630	4,040	584	721	362
9	785	3,780	978	2,710	3,160	10,200	4,290	5,760	2,370	734	630	334
10	795	4,230	755	2,260	1,420	7,900	4,150	5,750	1,430	935	705	523
11	818	3,850	895	2,690	695	6,710	4,220	5,190	1,770	995	538	438
12	685	2,280	1,140	2,790	1,250	9,290	4,550	4,830	1,670	649	529	438
13	635	2,060	1,840	1,880	1,770	9,290	4,830	4,390	1,800	527	1,030	435
14	555	2,100	1,630	1,030	1,680	8,560	4,690	3,360	1,610	513	964	427
15	530	1,800	1,590	1,420	1,840	11,300	3,150	2,800	1,450	514	771	333
16	715	1,680	1,140	2,310	1,170	10,200	3,310	2,530	799	751	748	321
17	755	1,570	730	2,470	745	7,570	3,200	2,660	669	478	680	478
18	785	1,220	1,230	3,410	605	6,670	2,600	2,210	1,110	700	455	495
19	630	867	1,730	8,000	685	5,360	2,640	1,310	1,060	573	393	534
20	735	1,430	2,260	11,800	1,400	5,860	3,140	1,060	1,090	659	698	529
21	595	1,890	2,350	9,590	2,000	6,760	3,730	1,980	1,170	425	696	556
22	650	1,860	2,100	7,700	1,860	6,560	2,340	1,850	1,200	424	578	518
23	2,360	1,210	1,590	9,810	1,580	6,240	2,760	1,390	623	658	565	485
24	5,840	1,420	1,120	10,200	1,110	5,800	3,140	1,440	799	639	560	594
25	6,230	1,180	1,210	7,740	740	5,450	3,030	1,290	1,380	662	481	552
26	5,000	760	1,940	6,120	1,140	5,070	2,850	1,070	1,250	720	436	901
27	4,420	1,510	2,370	5,690	1,580	4,620	2,680	1,520	1,770	791	699	748
28	3,990	1,480	2,640	5,220	1,810	4,230	1,640	4,450	3,990	573	560	602
29	2,510	2,000	2,590	4,460	-----	4,170	1,160	8,750	2,990	550	515	459
30	2,580	2,110	2,580	4,080	-----	5,250	1,670	9,250	3,840	837	523	405
31	2,760	-----	6,830	3,800	-----	6,400	-----	6,780	-----	916	469	-----
TOTAL	51,809	61,647	53,283	172,490	54,000	204,500	121,030	112,430	73,950	26,830	27,907	14,618
MEAN	1,671	2,055	1,719	5,564	1,929	6,597	4,034	3,627	2,465	865	900	487
MAX	6,230	4,230	6,830	11,800	4,380	11,400	8,720	9,250	5,160	2,130	3,560	901
MIN	530	760	730	1,030	605	1,420	1,160	1,060	623	424	393	321
+	58.5	49.6	50.9	54.7	48.1	61.8	64.1	65.3	66.2	68.2	72.2	64.3
MEAN†	1,730	2,105	1,770	5,619	1,977	6,659	4,098	3,692	2,531	933	972	551
CFSM†	.72	.88	.74	2.34	.82	2.77	1.71	1.54	1.05	.39	.40	.23
IN†	.83	.98	.85	2.70	.86	3.20	1.91	1.77	1.18	.45	.47	.26

CAL YP 1972 TOTAL 658,514 MEAN 1,799 MAX 9,960 MIN 282 MEAN† 1,865 CFSM† .78 IN† 10.58
WTR YP 1973 TOTAL 974,494 MEAN 2,670 MAX 11,800 MIN 321 MEAN† 2,730 CFSM† 1.14 IN† 15.44

PEAK DISCHARGE (BASE, 7,000 FT³/S)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE	†
01-02	0100	20.99	10,500	03-15	1830	21.93	11,600	†Diversion in cubic feet per second, for industrial use, furnished by Dow Chemical Co.
01-20	1200	22.42	12,300	04-02	1800	19.66	9,020	
01-24	0200	21.42	11,000	05-30	0430	20.11	9,470	‡Adjusted for diversion by Dow Chemical Co.
03-08	1730	21.92	11,600					

STREAMS TRIBUTARY TO LAKE HURON

183

04157000 Saginaw River at Saginaw, Mich.

LOCATION.--Lat 43°24'46", long 83°57'47", in NW¼ SE¼ sec.26, T.12 N., R.4 E., Saginaw County, 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 20.0 mi (32.2 km) upstream from mouth.

DRAINAGE AREA.--6,060 mi² (15,700 km²), approximately.

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, nonrecording gage at site 1.9 mi (3.1 km) downstream at same datum. Auxiliary water-stage recorder on right bank at Essexville 17 mi (27 km) downstream.

EXTREMES.--Current year: Maximum daily discharge, 31,700 ft³/s (898 m³/s) Jan. 4 (gage height, 18.71 ft or 5.703 m); maximum daily gage height, 19.24 ft (5.864 m) Jan. 3.
Period of record: Maximum discharge, 68,000 ft³/s (1,930 m³/s) Mar. 39, 1904 (gage height, 24.9 ft or 7.6 m, site then in use).

REMARKS.--Records fair. Considerable diversion through metropolitan area of Saginaw.

COOPERATION.--Auxiliary gage-height record furnished by U.S. Lake Survey.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

JAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				22,400			19,700					
2				28,800			21,400					
3				31,300			23,400					
4				31,700			23,500					
5				26,600		12,500	22,500					
6				24,900		16,900	18,700					
7				24,400		20,000	14,600					
8				23,900		20,900	14,200					
9				22,100		22,300	11,000					
10				19,000		22,200	14,100					
11				14,200		20,300	11,400					
12				13,100		18,600						
13				12,200		20,000						
14						21,200						
15						23,700						
16						24,300						
17						23,000						
18						24,000						
19				12,400		20,500						
20				15,800		17,200						
21				18,200		17,300						
22				17,200		17,800						
23				15,700		17,800						
24				17,500		17,400						
25				17,200		17,000						
26				15,100		18,000						
27				13,200		19,100						
28				12,000		18,000						
29				11,900		15,800						
30						15,900		11,700				
31			15,500			15,500		12,600				

STREAMS TRIBUTARY TO LAKE HURON

04158500 Pigeon River near Owendale, Mich.

LOCATION.--Lat 43°45'49", long 83°14'46", in SW¼ SE¼ sec.36, T.16 N., R.10 E., Huron County, 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) north-east of Owendale.

DRAINAGE AREA.--55 mi² (140 km²), 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.

AVERAGE DISCHARGE.--21 years, 59.9 ft³/s (0.833 m³/s), 7.26 in/yr (184 mm/yr).

EXTREMES.--Current year: Maximum discharge, 970 ft³/s (27.5 m³/s) Mar. 15 (gage height, 8.25 ft or 2.515 m); maximum gage height, 10.42 ft (3.176 m) Jan. 1 (backwater from ice); minimum discharge, 2.0 ft³/s (0.057 m³/s) Sept. 12, 13, 21.
Period of record: Maximum discharge, 2,550 ft³/s (72.2 m³/s) Mar. 25, 1954 (gage height, 10.75 ft or 3.277 m), from rating curve extended above 1,200 ft³/s (34.0 m³/s), site and datum then in use; minimum, 0.1 ft³/s (0.003 m³/s) July 31, Aug. 1, 1964.

REMARKS.--Records good except those for winter periods, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	16	20	520	40	19	447	55	64	36	25	4.4
2	4.0	15	17	430	50	23	614	88	64	28	28	4.4
3	3.6	20	18	370	105	39	297	63	96	23	17	4.4
4	3.6	20	16	300	60	100	233	49	186	19	12	4.0
5	3.6	16	16	210	50	350	142	44	102	17	9.0	4.0
6	3.2	14	16	150	40	380	96	38	68	14	8.0	3.6
7	3.2	14	17	110	34	410	102	33	128	12	7.0	3.6
8	3.2	21	16	86	29	320	87	44	74	11	6.5	3.2
9	2.4	25	16	72	26	227	64	172	47	10	5.6	3.2
10	4.0	24	15	64	23	157	58	124	36	9.0	5.6	3.2
11	4.0	21	16	54	21	214	62	65	30	8.5	5.6	2.8
12	4.0	19	17	50	20	418	123	50	26	8.5	4.8	2.4
13	4.0	17	18	44	20	230	200	42	24	9.5	4.8	2.4
14	3.6	16	19	39	19	397	112	36	20	9.5	4.8	2.8
15	3.2	14	20	37	18	706	78	32	19	8.5	4.4	2.8
16	3.2	14	22	35	18	247	62	29	17	8.0	4.4	3.2
17	3.2	14	23	42	17	170	55	28	17	7.5	4.4	4.0
18	4.0	13	23	150	17	120	49	25	17	7.0	4.4	6.0
19	4.4	12	24	190	16	91	45	24	17	7.0	4.4	4.4
20	4.8	12	25	170	16	97	43	22	16	7.5	4.8	3.2
21	6.5	13	26	120	16	125	41	20	15	8.0	4.4	2.4
22	13	12	27	160	16	122	42	19	14	7.5	4.0	2.4
23	56	12	28	140	16	156	43	18	14	7.0	4.0	3.6
24	97	12	29	100	16	304	38	17	25	6.0	4.4	3.2
25	43	12	30	84	16	517	34	17	21	7.0	4.4	2.4
26	25	15	32	68	17	476	31	17	15	8.5	4.4	2.4
27	20	28	34	60	17	422	29	17	16	17	4.4	2.4
28	17	32	35	50	18	208	27	31	23	17	4.0	2.4
29	17	26	38	45	-----	193	25	228	127	11	3.6	2.4
30	20	24	40	43	-----	468	25	309	57	9.0	3.6	2.4
31	17	-----	190	41	-----	306	-----	91	-----	11	4.0	-----
TOTAL	404.3	523	683	4,034	771	8,012	3,304	1,847	1,395	369.5	215.7	98.0
MEAN	13.0	17.4	28.5	130	27.5	258	110	59.6	46.5	11.9	6.96	3.27
MAX	97	32	190	520	105	706	614	309	186	36	28	6.0
MIN	2.4	12	15	35	16	19	25	17	14	6.0	3.6	2.4
CFSM	.24	.32	.52	2.36	.50	4.69	2.00	1.08	.85	.22	.13	.06
IN.	.27	.39	.60	2.73	.52	5.42	2.23	1.25	.94	.25	.15	.07

CAL YR 1972 TOTAL 10,688.4 MEAN 29.2 MAX 530 MIN 2.4 CFSM .53 IN 7.23
WTR YR 1973 TOTAL 21,856.5 MEAN 59.9 MAX 706 MIN 2.4 CFSM 1.09 IN 14.78

PEAK DISCHARGE (BASE, 500 FT³/S)

DATE	TIME	G.H.	DISCHARGE
01-01	unknown	10.42	about 650
03-15	0400	8.25	970
03-25	1330	6.56	562
04-01	2330	7.24	698

STREAMS TRIBUTARY TO ST. CLAIR RIVER

185

04159500 Black River near Fargo, Mich.

LOCATION.--Lat 43°05'32", long 82°37'05", in NW¼ sec.32, T.8 N., R.16 E., St. Clair County, 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 mi² (1,243 km²).

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

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.

AVERAGE DISCHARGE.--29 years, 268 ft³/s (7,590 m³/s), 7.58 in/yr (193 mm/yr).

EXTREMES.--Current year: Maximum discharge, 9,060 ft³/s (257 m³/s) Jan. 1 (gage height, 13.98 ft or 4.261 m); minimum daily, 13 ft³/s (0.368 m³/s) Oct. 6, 9-19.

Period of record: Maximum discharge, 14,400 ft³/s (408 m³/s) Apr. 5, 1947 (gage height, 16.06 ft or 4.895 m, from floodmark, from rating curve extended above 9,500 ft³/s (269 m³/s); maximum gage height observed, 18.05 ft (5.502 m) Feb. 20, 1951 (backwater from ice); minimum discharge observed, 1.8 ft³/s (0.051 m³/s) Sept. 18, 19, 1946.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, which are poor.

REVISIONS (WATER YEARS).--WSP 1307: 1950 (M), WSP 1627: 1956-58. WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	67	95	7,800	230	110	1,700	145	254	762	247	27
2	16	78	79	6,000	352	400	1,400	260	361	415	972	25
3	14	107	76	4,500	1,160	800	1,000	300	597	285	1,480	25
4	19	111	64	3,500	1,000	1,300	800	244	611	215	1,150	24
5	14	82	74	2,300	700	1,500	650	206	664	170	597	21
6	13	71	95	1,400	500	2,200	550	176	442	137	340	22
7	14	79	97	700	400	3,200	450	151	332	111	237	24
8	14	124	95	550	350	3,120	380	143	295	90	170	24
9	13	153	90	400	300	2,260	330	240	221	76	133	20
10	13	126	81	320	250	1,310	310	555	163	69	116	19
11	13	100	84	240	210	1,900	330	460	127	63	105	21
12	13	88	103	200	170	3,340	330	346	120	58	93	22
13	13	84	107	170	150	2,640	320	302	102	56	81	21
14	13	84	135	150	130	3,130	300	256	87	54	68	20
15	13	81	199	140	130	3,360	260	215	75	50	60	18
16	13	82	170	140	120	1,420	220	186	69	47	45	18
17	13	69	140	150	120	475	200	163	81	44	39	19
18	13	65	120	200	120	318	200	149	88	41	42	27
19	13	81	110	600	110	409	201	139	76	39	40	32
20	14	145	116	650	110	586	191	126	71	56	40	34
21	15	151	118	550	110	678	180	116	65	55	40	34
22	20	120	137	450	110	872	180	109	62	49	36	30
23	100	96	176	702	110	1,300	224	103	58	43	34	28
24	250	82	228	928	110	1,600	244	96	68	42	33	23
25	151	79	263	594	110	1,900	204	95	137	40	33	28
26	116	155	282	412	110	2,200	174	93	120	49	31	26
27	82	275	300	349	110	1,800	149	92	172	67	30	24
28	62	221	300	300	110	1,400	135	100	421	68	30	22
29	55	153	278	270	-----	1,000	124	170	1,440	58	32	21
30	64	112	288	240	-----	1,400	120	445	1,650	50	30	20
31	72	-----	4,410	220	-----	2,000	-----	328	-----	53	28	-----
TOTAL	1,264	3,321	8,910	35,125	7,492	50,028	11,856	6,509	9,029	3,412	6,412	719
MFAN	40.8	111	287	1,133	268	1,614	395	210	301	110	207	24.0
MAX	250	275	4,410	7,800	1,160	3,360	1,700	555	1,650	762	1,480	34
MTN	13	65	64	140	110	110	120	92	58	39	28	18
CFSM	.09	.23	.60	2.36	.56	3.36	.82	.44	.63	.23	.43	.05
IN.	.10	.26	.69	2.72	.58	3.88	.92	.50	.70	.26	.50	.06
CAL YR 1972	TOTAL	72,594	MEAN	198	MAX	4,410	MIN	12	CFSM	.41	IN	5.63
WTR YR 1973	TOTAL	144,077	MEAN	395	MAX	7,800	MIN	13	CFSM	.82	IN	11.17

PEAK DISCHARGE (BASE, 3,500 FT³/s)

NOTE.--No gage-height record Feb. 4 to Mar. 7.

DATE	TIME	G.H.	DISCHARGE
01-01	0300	13.98	9,060
03-15	0400	10.70	4,600

STREAMS TRIBUTARY TO ST. CLAIR RIVER

04159900 Mill Creek near Avoca, Mich.

LOCATION.--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 mi (0.3 km) upstream from Gleason Drain, and 2.3 mi (3.7 km) west of Avoca.

DRAINAGE AREA.--169 mi² (438 km²).

PERIOD OF RECORD.--April 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is 711.31 ft (216.807 m) above mean sea level.

AVERAGE DISCHARGE.--10 years, 83.8 ft³/s (2.373 m³/s), 6.73 in/yr (171 mm/yr).

EXTREMES.--Current year: Maximum discharge, 3,880 ft³/s (110 m³/s) Dec. 31 (gage height, 8.28 ft or 2.524 m, from highwater mark); minimum, 3.3 ft³/s (0.093 m³/s) Sept. 16 (gage height, 0.74 ft or 0.226 m).

Period of record: Maximum discharge, 3,880 ft³/s (110 m³/s) Dec. 31, 1972; maximum gage height, 8.36 ft (2.548 m) Feb. 2, 1968 (backwater from ice); minimum discharge, 0.8 ft³/s (0.023 m³/s) Aug. 9, 10, 11, 1964; minimum gage height, 0.56 ft (0.171 m) July 28, 1965.

REMARKS.--Records good except those for the winter period, which are poor.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.6	58	78	2,380	100	45	947	59	83	81	37	5.9
2	8.1	77	65	1,800	190	80	1,620	95	77	67	469	6.8
3	7.7	73	63	1,300	500	150	1,010	120	74	54	482	6.2
4	8.6	75	53	900	400	450	674	113	109	44	219	5.3
5	9.4	79	50	650	350	600	491	97	166	36	110	5.3
6	6.5	73	91	450	220	700	363	83	150	30	67	5.0
7	5.0	71	75	280	180	775	288	74	156	27	44	4.7
8	4.5	97	85	200	150	789	228	73	132	30	32	4.7
9	5.3	102	78	150	130	608	180	92	98	27	26	4.7
10	5.3	103	65	120	110	494	152	218	74	22	30	4.7
11	5.6	97	80	100	90	725	144	235	58	18	33	4.5
12	7.1	88	90	90	80	1,170	139	196	50	16	25	4.7
13	8.6	80	100	75	65	1,000	138	151	42	15	20	4.7
14	9.8	84	140	60	60	992	124	125	43	17	17	4.5
15	15	86	170	55	55	1,340	106	107	42	18	15	4.0
16	18	84	150	58	50	1,060	98	96	36	15	14	3.5
17	16	81	120	65	50	751	94	85	33	13	12	4.7
18	15	82	100	100	50	434	85	78	27	13	12	7.4
19	15	86	90	200	48	365	80	75	25	12	11	7.1
20	14	102	85	260	48	345	77	74	24	14	11	8.1
21	13	114	90	200	48	371	73	71	22	20	9.8	9.4
22	18	113	100	220	48	400	76	74	20	17	9.4	11
23	56	108	130	300	48	398	112	70	19	17	9.8	9.0
24	47	104	160	305	48	549	139	63	19	18	9.4	8.1
25	59	88	200	200	48	838	118	64	18	17	9.0	8.1
26	67	92	230	170	47	913	94	50	18	17	8.6	7.1
27	56	114	230	150	47	862	78	48	25	16	7.7	6.8
28	47	109	220	130	46	696	70	52	37	15	7.4	6.5
29	53	97	210	120	-----	570	63	70	98	13	7.4	6.5
30	50	86	300	100	-----	928	55	77	87	12	7.1	6.2
31	50	-----	2,540	95	-----	1,190	-----	84	-----	12	6.2	-----
TOTAL	709.1	2,703	6,238	11,283	3,306	20,588	7,916	2,969	1,862	743	1,777.8	185.2
MEAN	22.9	90.1	201	364	118	664	264	95.8	62.1	24.0	57.3	6.17
MAX	67	114	2,540	2,380	500	1,340	1,620	235	166	81	482	11
MTN	4.5	58	50	55	46	45	55	48	18	12	6.2	3.5
CFSM	.14	.53	1.19	2.15	.70	3.93	1.56	.57	.37	.14	.34	.04
IN.	.16	.59	1.37	2.48	.73	4.53	1.74	.65	.41	.16	.39	.04
CAL YR 1972	TOTAL	30,459.3	MEAN	83.2	MAX	2,540	MIN	4.5	CFSM	.49	IN	6.70
WTR YR 1973	TOTAL	60,280.1	MEAN	165	MAX	2,540	MIN	3.5	CFSM	.98	IN	13.27

PEAK DISCHARGE (BASE, 900 FT³/S)

DATE	TIME	G.H.	DISCHARGE
12-31	1030	8.28	3,880
03-12	1600	6.38	1,250
03-15	1000	6.58	1,400
03-25	2300	5.61	928
03-31	0400	6.29	1,290
04-02	1300	6.88	1,750

STREAMS TRIBUTARY TO ST. CLAIR RIVER

187

04160570 North Branch Belle River at Imlay City, Mich.

LOCATION.--Lat 43°01'49", long 83°04'02", in SW¼ NW¼ sec.16, T.7 N., R.12 E., Lapeer County, 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 mi² (46.6 km²).

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).

AVERAGE DISCHARGE.--8 years, 10.7 ft³/s (0.303 m³/s), 8.07 in/yr (205 mm/yr).

EXTREMES.--Current year: Maximum discharge, 186 ft³/s (5.27 m³/s) Dec. 31 (gage height, 7.59 ft or 2.313 m); minimum, 0.49 ft³/s (0.014 m³/s) Sept. 11; minimum gage height, 3.13 ft (0.954 m) Sept. 12.

Period of record: Maximum discharge, 212 ft³/s (6.00 m³/s) Feb. 2, 1968 (gage height, 8.12 ft or 2.475 m); minimum, 0.06 ft³/s (0.002 m³/s) July 25, 26, 27, 1966, Aug. 15, 1967; minimum gage height, 2.96 ft (0.902 m) July 25, 26, 27, 1966.

REMARKS.--Records fair except those for the winter period, which are poor. Some diversion by pumping for sprinkler irrigation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	7.0	5.9	177	6.2	3.0	87	21	18	14	3.1	1.4
2	3.2	15	5.5	135	41	6.0	63	21	23	9.9	4.5	1.1
3	2.8	20	4.5	76	77	34	47	17	24	9.4	4.2	.94
4	2.6	14	4.1	78	41	39	38	14	49	7.4	3.6	.96
5	2.5	9.8	4.0	58	29	41	31	11	37	5.6	2.8	1.1
6	2.5	7.4	15	40	19	56	26	10	32	4.4	2.4	1.0
7	2.5	7.8	22	30	16	59	22	9.2	23	3.5	2.1	.85
8	2.1	18	14	19	12	56	19	14	16	2.8	2.2	.72
9	2.0	16	8.5	13	9.0	36	16	29	10	2.5	3.1	.68
10	1.6	12	5.4	11	7.0	40	19	29	7.3	2.5	3.7	.68
11	1.8	9.0	7.5	9.2	6.0	97	21	19	6.3	2.4	2.6	.66
12	2.0	7.0	10	8.0	4.3	145	22	14	28	2.1	2.2	.69
13	2.0	5.9	29	7.0	3.3	80	18	12	21	2.1	1.8	.70
14	2.0	7.4	31	6.0	2.9	113	16	11	14	1.9	1.7	.75
15	1.8	8.5	26	5.2	3.0	123	14	9.4	9.6	1.9	1.7	.79
16	2.0	7.4	21	4.6	3.0	68	14	8.6	7.1	1.8	1.6	.78
17	2.0	6.3	17	7.1	3.0	39	13	8.0	6.0	1.7	1.4	4.7
18	1.8	5.9	15	38	3.0	40	13	7.5	5.9	1.5	1.4	8.9
19	1.8	7.0	13	52	3.0	38	12	7.3	5.6	1.4	1.1	4.2
20	1.8	11	13	34	3.0	32	12	6.8	5.3	3.2	1.9	3.6
21	3.2	15	12	20	3.0	41	12	6.2	4.8	5.7	2.0	3.1
22	14	13	12	30	3.0	43	25	5.9	4.2	3.8	2.0	3.1
23	48	9.8	14	42	3.0	46	29	6.4	3.6	3.0	2.1	3.3
24	38	7.8	17	24	3.0	60	20	6.1	5.3	2.6	2.1	2.9
25	20	6.6	19	19	3.0	79	16	5.9	4.4	2.5	2.1	2.6
26	10	8.1	20	18	3.0	75	12	7.7	5.8	2.4	2.0	2.9
27	5.5	13	20	15	3.0	60	11	9.9	19	2.6	2.4	2.6
28	5.2	12	17	13	3.0	45	9.6	26	22	2.3	2.2	2.6
29	13	9.8	14	12	-----	62	8.7	25	27	2.0	2.1	2.6
30	12	6.6	53	10	-----	138	9.4	20	19	2.0	2.2	2.4
31	9.8	-----	172	8.0	-----	82	-----	18	-----	2.2	1.7	-----
TOTAL	223.3	304.1	641.4	1,019.1	315.7	1,876.0	675.7	415.9	463.2	113.1	72.0	63.30
MFAN	7.20	10.1	20.7	32.9	11.3	60.5	22.5	13.4	15.4	3.65	2.32	2.11
MAX	48	20	172	177	77	145	87	29	49	14	4.5	8.9
MIN	1.6	5.9	4.0	4.6	2.9	3.0	8.7	5.9	3.6	1.4	1.1	.66
CFSM	.40	.56	1.15	1.83	.63	3.36	1.25	.74	.86	.20	.13	.12
IN.	.46	.63	1.33	2.11	.65	3.88	1.40	.86	.96	.23	.15	.13
CAL YR 1972	TOTAL 4,363.40	MEAN 11.9	MAX 172	MIN 1.2	CFSM .66	IN 9.02						
WTR YR 1973	TOTAL 6,182.80	MEAN 16.9	MAX 177	MIN .66	CFSM .94	IN 12.78						

PEAK DISCHARGE (BASE, 60 FT³/S)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
12-31	2200	7.59	186	03-14	2000	6.78	151
02-03	0100	5.76	109	03-25	0200	5.13	82
03-05	2300	4.92	68	03-30	0500	6.66	150
03-07	2200	5.11	77	04-01	0900	5.41	97
03-12	0200	7.13	165				

STREAMS TRIBUTARY TO ST. CLAIR RIVER

04160600 Belle River at Memphis, Mich.

LOCATION.--Lat 42°54'03", long 82°46'09", in NW¼ SE¼ sec.35, T.6 N., R.14 E., St. Clair County, on right bank, at downstream side of bridge on State Highway 19 at Memphis.

DRAINAGE AREA.--151 mi² (391 km²).

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 720 ft (219 m) from topographic map (nearest 5 ft).

AVERAGE DISCHARGE.--11 years, 75.9 ft³/s (2.149 m³/s), 6.83 in/yr (173 mm/yr).

EXTREMES.--Current year: Maximum discharge, 3,020 ft³/s (85.5 m³/s) Dec. 31 (gage height, 8.12 ft or 2.475 m); minimum, 5.8 ft³/s (0.16 m³/s) Sept. 12 (gage height, 1.25 ft or 0.381 m).

Period of record: Maximum discharge, 4,070 ft³/s (115 m³/s) Feb. 2, 1968; maximum gage height, 8.88 ft (2.707 m) Feb. 1, 1968 (backwater from ice); minimum discharge, 3.1 ft³/s (0.088 m³/s) Mar. 10, 1964 (gage height, 1.19 ft or 0.363 m).

Flood of April 1947 reached a stage of about 9 ft (2.7 m), from information by local residents.

REMARKS.--Records good except those for the winter period, which are poor.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	110	85	1,720	90	42	691	58	114	96	22	8.0
2	19	125	76	1,150	227	128	686	115	106	66	59	8.0
3	18	227	67	1,150	414	270	475	125	118	50	75	7.9
4	17	182	61	1,030	398	424	322	99	183	38	34	7.7
5	16	130	55	770	251	523	251	83	329	35	21	7.6
6	15	103	106	436	186	687	208	71	345	30	17	7.2
7	15	89	184	250	159	687	179	65	244	25	15	7.1
8	15	174	158	170	143	714	154	67	172	22	14	6.7
9	15	241	118	140	117	580	134	135	112	19	14	6.5
10	15	169	86	110	100	454	128	218	79	18	14	6.4
11	14	133	71	95	85	771	135	226	58	17	17	6.3
12	14	118	114	80	70	1,100	136	151	46	17	16	6.1
13	14	99	158	70	65	868	128	114	55	17	14	6.2
14	15	119	225	55	55	987	115	91	51	18	13	6.2
15	16	172	251	50	50	1,300	95	77	35	18	12	6.6
16	16	164	211	52	45	934	78	71	28	18	11	6.5
17	16	131	136	60	45	665	83	66	25	16	11	7.7
18	16	115	135	100	45	319	80	61	25	15	11	11
19	15	125	135	170	43	222	75	58	26	14	12	17
20	16	165	139	250	43	287	72	55	24	16	13	14
21	17	222	145	190	43	366	69	54	23	18	12	12
22	22	198	173	170	43	378	75	49	21	21	12	10
23	150	158	215	348	43	381	157	40	20	18	11	10
24	347	121	250	303	43	513	154	43	19	16	11	10
25	258	100	261	189	43	767	114	45	19	15	10	9.6
26	154	99	263	151	43	823	92	43	26	16	10	9.2
27	110	135	253	130	42	757	78	50	47	17	9.7	9.2
28	88	154	233	110	41	551	70	73	111	16	9.2	9.2
29	131	127	202	100	-----	412	62	126	183	16	9.0	10
30	208	98	415	90	-----	712	48	127	150	14	8.6	10
31	151	-----	2,170	85	-----	827	-----	122	-----	14	8.0	-----
TOTAL	1,951	4,303	7,151	9,774	2,972	18,449	5,144	2,778	2,794	746	525.5	259.9
MEAN	62.9	143	231	315	106	595	171	89.6	93.1	24.1	17.0	8.66
MAX	347	241	2,170	1,720	414	1,300	691	226	345	96	75	17
MTN	14	89	55	50	41	42	48	40	19	14	8.0	6.1
CFSM	.42	.95	1.53	2.09	.70	3.94	1.13	.59	.62	.16	.11	.06
IN.	.48	1.06	1.76	2.41	.73	4.55	1.27	.68	.69	.18	.13	.06
CAL YR 1972	TOTAL 36,146.0	MEAN 98.8	MAX 2,170	MIN 11	CFSM .65	IN 8.90						
WTR YR 1973	TOTAL 56,847.4	MEAN 156	MAX 2,170	MIN 6.1	CFSM 1.03	IN 14.00						

PEAK DISCHARGE (BASE, 600 FT³/S)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
12-31	1300	8.12	3,020	03-25	2000	5.46	858
03-05	2100	5.16	804	03-30	2200	5.87	969
03-12	0600	6.39	1,220	06-05	2300	4.92	642
03-15	0400	6.87	1,480				

04160800 Sashabaw Creek near Drayton Plains, Mich.

LOCATION.--Lat 42°43'12", long 83°21'13", in SE¼ sec.26, T.4 N., R.9 E., Oakland County, 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 mi² (54.1 km²).

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

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).

AVERAGE DISCHARGE.--14 years, 10.6 ft³/s (0.300 m³/s), 6.89 in/yr (175 mm/yr).

EXTREMES.--Current year: Maximum discharge, 99 ft³/s (2.80 m³/s) Dec. 31 (gage height, 4.13 ft or 1.259 m); minimum, 1.6 ft³/s (0.045 m³/s) Sept. 12 (gage height, 2.13 ft or 0.649 m).

Period of record.--Maximum discharge, 138 ft³/s (3.91 m³/s) June 26, 1968 (gage height, 4.22 ft or 1.286 m); maximum gage height, 4.23 ft (1.289 m) Feb. 2, 1968; minimum discharge, 0.2 ft³/s (0.006 m³/s) on many days during 1961, 1963, 1964, 1965, 1966; minimum gage height, 1.59 ft (0.485 m) Aug. 1, 2, 1960.

REMARKS.--Records poor.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	12	12	77	21	15	59	21	22	19	13	3.8
2	3.3	15	11	67	25	19	50	20	20	17	14	3.5
3	3.1	16	11	57	29	30	45	19	21	20	12	3.2
4	3.1	14	11	60	28	37	42	19	26	20	6.8	3.0
5	2.9	14	11	57	27	37	39	18	25	17	6.7	2.9
6	2.9	12	15	45	26	39	35	17	45	14	6.4	2.9
7	2.9	14	14	37	24	42	33	16	34	12	6.3	3.0
8	2.9	19	13	30	23	43	30	21	29	11	6.1	2.9
9	2.6	19	12	23	21	37	28	35	25	10	6.6	2.9
10	2.5	17	12	20	20	35	29	33	20	11	11	2.9
11	3.0	15	12	18	19	45	29	28	17	10	11	2.8
12	3.2	14	13	17	18	52	28	25	16	9.7	8.3	1.8
13	3.2	13	19	16	17	45	26	22	14	8.9	7.5	1.8
14	3.2	16	21	16	16	51	24	20	13	8.3	7.0	2.0
15	3.0	16	20	16	15	54	23	19	12	7.7	6.5	1.8
16	3.2	15	19	16	15	48	23	18	12	7.3	6.0	1.9
17	3.0	15	19	16	15	52	25	17	13	5.6	5.5	2.6
18	3.0	15	19	20	15	53	24	16	13	5.2	5.0	4.7
19	2.7	15	19	36	15	47	23	15	12	5.7	4.7	3.0
20	2.6	17	19	35	15	48	21	15	12	6.2	4.3	2.9
21	2.7	19	19	32	15	46	21	13	12	7.4	3.7	2.8
22	7.0	17	19	35	15	44	28	14	11	7.7	3.4	2.8
23	27	15	19	41	15	43	32	17	11	7.3	3.6	2.7
24	21	13	20	35	15	44	27	18	12	7.0	4.0	2.6
25	15	13	20	31	15	47	25	16	11	6.8	4.2	2.7
26	13	13	20	28	15	46	23	16	15	7.3	4.2	3.2
27	11	14	20	27	15	44	21	16	20	8.4	3.9	2.8
28	11	14	19	25	15	40	21	25	30	8.7	3.5	2.8
29	16	12	19	23	-----	41	21	27	26	8.9	3.3	3.7
30	15	12	26	21	-----	48	20	25	22	8.5	3.6	3.4
31	13	-----	92	20	-----	45	-----	24	-----	9.8	3.8	-----
TOTAL	212.0	445	595	997	524	1,317	875	625	571	313.4	195.9	85.8
MEAN	6.84	14.8	19.2	32.2	18.7	42.5	29.2	20.2	19.0	10.1	6.32	2.86
MAX	27	19	92	77	29	54	59	35	45	20	14	4.7
MTN	2.5	12	11	16	15	15	20	13	11	5.2	3.3	1.8
CFSM	.33	.71	.92	1.54	.89	2.03	1.40	.97	.91	.48	.30	.14
IN.	.38	.79	1.06	1.77	.93	2.34	1.56	1.11	1.02	.56	.35	.15

CAL YR 1972 TOTAL 3,663.0 MEAN 10.0 MAX 92 MIN 1.7 CFSM .48 IN 6.52
WTR YR 1973 TOTAL 6,756.1 MEAN 18.5 MAX 92 MIN 1.8 CFSM .89 IN 12.03

PEAK DISCHARGE (BASE, 45 FT³/S)

DATE	TIME	G.H.	DISCHARGE
12-31	1500	4.13	99
03-07	2300	3.43	45
03-11	2300	3.62	58
03-17	2200	3.75	70
04-01	1200	3.67	63
06-06	1000	3.38	46

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04160900 Clinton River near Drayton Plains, Mich.

LOCATION.--Lat 42°39'37", long 83°23'25", in NE¼ sec.21, T.3 N., R.9 E., Oakland County, 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 mi² (205.1 km²).

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

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.

AVERAGE DISCHARGE.--14 years, 45.8 ft³/s (1.297 m³/s), 7.85 in/yr (199 mm/yr).

EXTREMES.--Current year: Maximum discharge, 173 ft³/s (4.90 m³/s) Mar. 17 (gage height, 4.26 ft or 1.298 m); minimum, 6.4 ft³/s (0.18 m³/s) Sept. 21 (gage height, 1.83 ft or 0.558 m).

Period of record: Maximum discharge, 175 ft³/s (4.96 m³/s) June 30, 1968 (gage height, 4.65 ft or 1.417 m); minimum, 2.4 ft³/s (0.068 m³/s) May 31, 1961; minimum gage height, 1.23 ft (0.375 m) Jan. 4, 1961.

REMARKS.--Records good. Some regulation and occasional diversion for lake level control at many lakes above station. Records of water temperatures for the current year are published in Part 2 of this report.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	68	60	103	109	76	168	86	77	77	36	38
2	32	74	60	111	110	79	169	88	80	81	53	37
3	32	78	59	119	108	81	166	89	86	87	71	37
4	30	80	60	131	105	82	162	83	88	88	73	34
5	31	78	58	136	110	87	158	79	94	94	73	33
6	31	75	62	139	107	92	157	77	102	99	70	29
7	31	76	62	141	106	98	155	78	103	102	65	23
8	29	80	63	139	107	103	152	87	105	102	46	22
9	28	79	62	135	106	112	152	91	103	98	40	21
10	27	78	60	130	103	119	149	93	102	93	37	20
11	25	76	58	125	101	130	147	90	100	81	40	19
12	25	73	66	119	96	134	146	89	101	67	40	18
13	24	77	74	114	105	139	145	91	100	49	49	14
14	23	87	72	107	96	151	137	92	99	53	53	14
15	22	84	72	102	94	152	134	92	97	45	52	14
16	21	83	73	98	93	158	134	94	90	37	50	13
17	21	81	72	95	94	169	133	94	88	29	49	14
18	21	77	74	93	91	171	131	93	83	25	48	14
19	20	75	74	95	87	170	125	91	80	25	48	13
20	19	75	73	96	84	169	117	86	79	26	49	13
21	20	76	73	99	80	168	104	82	67	24	48	13
22	28	75	69	107	80	168	105	80	56	23	48	11
23	40	73	72	110	80	168	112	82	47	26	49	10
24	37	69	72	105	82	166	98	78	42	25	47	10
25	38	70	72	113	82	165	95	75	39	19	46	9.5
26	41	69	73	112	80	162	90	68	39	22	45	11
27	48	71	72	101	77	158	85	65	51	27	43	10
28	50	68	71	114	77	157	82	68	63	16	43	11
29	60	66	72	114	-----	155	83	70	70	16	39	12
30	62	65	84	112	-----	155	85	71	74	15	38	10
31	66	-----	98	111	-----	158	-----	72	-----	27	39	-----
TOTAL	1,015	2,256	2,142	3,526	2,650	4,252	3,876	2,574	2,405	1,598	1,527	547.5
MEAN	32.7	75.2	69.1	114	94.6	137	129	83.0	80.2	51.5	49.3	18.3
MAX	66	87	98	141	110	171	169	94	105	102	73	38
MIN	19	65	58	93	77	76	82	65	39	15	36	9.5
CFSM	.41	.95	.87	1.44	1.19	1.73	1.63	1.05	1.01	.65	.62	.23
IN.	.48	1.06	1.01	1.66	1.24	2.00	1.82	1.21	1.13	.75	.72	.26

CAL YR 1972 TOTAL 17,530.0 MEAN 47.9 MAX 99 MIN 17 CFSM .60 IN 8.23
WTR YR 1973 TOTAL 28,368.5 MEAN 77.7 MAX 171 MIN 9.5 CFSM .98 IN 13.32

STREAMS TRIBUTARY TO LAKE ST. CLAIR

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04161000 Clinton River at Auburn Heights, Mich.

LOCATION.--Lat 42°38'00", long 83°13'28", in NW¼ sec.36, T.3 N., R.10 E. Oakland County, on right bank 30 ft (9 m) upstream from bridge on State Highway 59, at Auburn Heights, and 2.8 mi (4.5 km) upstream from Galloway Creek.

DRAINAGE AREA.--123 mi² (319 km²).

PERIOD OF RECORD.--May 1935 to June 1939 and February to September 1940 (published as "at Pontiac"), October 1956 to current year.

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.

AVERAGE DISCHARGE.--20 years (1935-38, 1956-73) 90.2 ft³/s (2.554 m³/s), 9.96 in/yr (253 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,080 ft³/s (30.6 m³/s) June 26 (gage height, 4.33 ft or 1.320 m); minimum, 38 ft³/s (1.08 m³/s) Oct. 20, 21; minimum gage height, 1.13 ft (0.344 m) Sept. 17.
Period of record: Maximum discharge, 1,400 ft³/s (39.6 m³/s) June 25, 1968 (gage height, 4.88 ft or 1.487 m); minimum observed, 4.8 ft³/s (0.14 m³/s) Sept. 4, 1936, site then in use.

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.

REVISIONS (WATER YEARS).--WSP 1307: 1937 (M). WSP 1507: Drainage area at former site.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	84	150	134	241	200	165	300	178	182	168	150	87
2	82	194	133	208	270	176	274	214	171	197	130	80
3	57	163	128	230	220	168	267	191	198	185	110	74
4	50	155	128	323	210	159	263	175	247	133	105	78
5	73	143	131	222	200	172	259	166	245	122	100	77
6	93	141	205	221	200	174	262	156	281	119	95	72
7	94	182	132	214	198	194	256	156	216	116	95	66
8	86	203	133	212	198	183	239	233	204	115	90	62
9	86	163	136	221	202	172	234	212	191	120	110	54
10	85	158	131	224	196	169	264	184	179	133	200	50
11	84	167	130	228	192	316	245	175	178	121	140	56
12	85	164	150	225	192	219	246	164	197	123	120	52
13	85	174	233	222	190	192	246	154	175	153	100	50
14	65	223	188	215	178	388	240	155	135	336	95	49
15	46	199	184	216	169	285	230	157	132	184	90	48
16	46	179	156	216	167	251	234	164	134	165	85	45
17	45	175	129	216	166	246	239	164	223	144	80	42
18	43	169	143	217	161	248	226	146	144	134	75	66
19	43	165	171	216	166	283	217	131	143	126	80	53
20	43	180	186	206	171	295	209	124	191	117	86	51
21	57	169	186	197	173	276	203	124	185	120	76	48
22	140	164	191	331	170	280	278	97	191	95	75	51
23	256	157	186	253	169	295	219	98	179	85	76	46
24	87	156	177	223	170	306	203	100	162	85	80	47
25	110	142	171	217	158	296	193	117	156	80	83	55
26	146	155	171	212	154	297	178	132	380	150	80	54
27	156	156	168	208	159	282	167	141	310	150	84	50
28	167	139	162	208	160	273	165	193	314	120	90	67
29	212	134	159	201	-----	288	163	149	219	100	90	78
30	160	129	389	205	-----	335	166	176	188	90	92	53
31	155	-----	468	200	-----	280	-----	181	-----	200	88	-----
TOTAL	3,021	4,948	5,489	6,948	5,159	7,663	6,885	4,907	6,050	4,286	3,050	1,814
MFAN	97.5	165	177	224	184	247	230	158	202	138	98.4	60.5
MAX	256	223	468	331	270	388	300	233	380	336	200	87
MIN	43	129	128	197	154	159	163	97	132	80	75	45
CFSM	.79	1.34	1.44	1.82	1.50	2.01	1.87	1.28	1.64	1.12	.80	.49
IN.	.91	1.50	1.66	2.10	1.56	2.32	2.08	1.48	1.83	1.30	.92	.55

CAL YR 1972 TOTAL 42,061 MFAN 115 MAX 468 MIN 35 CFSM .94 IN 12.72
WTR YR 1973 TOTAL 60,220 MFAN 165 MAX 468 MIN 43 CFSM 1.34 IN 18.21

PEAK DISCHARGE (BASE, 460 FT³/S, REVISED)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
12-30	1900	3.81	825	06-05	2300	3.62	720
01-04	0100	3.07	490	06-17	0600	3.33	588
01-22	0700	3.09	510	06-26	1900	4.33	1,080
03-11	1100	3.38	615	06-28	1100	3.39	620
03-14	1100	3.25	558	07-14	0300	3.63	740

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04161100 Galloway Creek near Auburn Heights, Mich.

LOCATION.--Lat 42°40'02", long 83°12'02", in SE¼ sec.18, T.3 N., R.11 E., Oakland County, 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 mi² (46.4 km²).

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

GAGE.--Water-stage recorder. Concrete control since Aug. 20, 1960. Altitude of gage is 830 ft (253 m) from topographic map (nearest 10 ft).

AVERAGE DISCHARGE.--14 years, 8.88 ft³/s (0.251 m³/s), 6.74 in/yr (171 mm/yr).

EXTREMES.--Current year: Maximum discharge, 131 ft³/s (3.71 m³/s) June 26 (gage height, 5.17 ft or 1.576 m); minimum, 0.84 ft³/s (0.024 m³/s) Sept. 12 (gage height, 1.74 ft or 0.530 m).

Period of record: Maximum discharge, 368 ft³/s (10.4 m³/s) June 25, on several days during July and August, 1964; minimum gage height, 0.82 ft (0.250 m) Aug. 1, 1960.

REMARKS.--Records fair except those for the winter period, which are poor.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	16	14	91	21	14	45	8.0	18	35	6.5	1.1
2	3.7	27	13	81	25	30	40	17	13	25	5.4	1.1
3	3.4	24	13	73	30	42	33	24	17	33	4.0	1.0
4	3.1	19	11	74	24	41	29	18	33	23	3.2	1.1
5	2.9	15	11	67	19	42	24	14	33	16	3.5	1.1
6	2.8	13	30	35	16	45	20	11	60	12	2.1	1.4
7	2.8	19	23	25	15	47	18	9.6	43	8.7	1.9	1.5
8	2.6	34	17	19	14	46	16	20	29	6.9	1.8	1.5
9	2.0	26	14	16	13	37	15	33	19	5.5	3.5	1.3
10	1.9	20	14	14	12	32	19	28	13	5.9	1.8	1.1
11	2.0	18	14	13	11	64	18	19	9.8	5.2	8.1	1.0
12	1.9	15	15	12	9.9	64	17	15	8.4	4.6	5.1	1.5
13	1.8	15	62	11	9.2	50	15	12	6.9	4.0	3.6	1.4
14	1.8	31	50	11	9.1	68	13	11	5.2	20	2.8	1.1
15	1.6	29	35	11	9.1	67	11	9.2	4.3	9.2	3.0	1.1
16	1.8	23	25	13	9.6	53	11	8.1	4.3	6.3	2.4	1.0
17	1.5	19	22	19	9.6	47	13	7.2	44	4.2	2.1	1.1
18	1.4	18	22	26	8.9	42	11	6.3	26	3.2	2.0	2.7
19	1.3	18	21	31	9.9	44	11	5.6	14	2.7	2.8	1.5
20	1.2	24	21	25	11	50	9.9	5.1	14	2.7	3.1	1.5
21	2.1	24	23	30	10	49	9.4	4.5	11	4.0	2.5	1.4
22	17	22	27	58	9.5	47	26	5.0	7.0	3.5	2.0	1.6
23	66	19	32	50	8.5	46	26	9.2	5.1	2.3	1.8	1.4
24	54	17	32	36	7.8	51	19	9.1	4.1	2.1	1.7	1.4
25	34	15	29	33	7.2	54	15	8.0	3.2	3.5	1.5	1.7
26	21	20	29	26	7.2	52	12	8.0	38	7.5	1.4	1.5
27	16	23	27	26	7.2	47	10	11	86	5.4	1.3	1.2
28	15	20	23	25	7.2	39	8.7	34	93	6.6	1.3	1.4
29	35	17	20	24	-----	37	7.5	35	76	5.4	1.2	2.5
30	26	15	64	23	-----	50	7.4	28	52	4.0	1.2	1.6
31	19	-----	108	22	-----	45	-----	23	-----	7.6	1.3	-----
TOTAL	351.1	615	861	1,020	350.9	1,442	529.9	455.9	790.3	285.0	102.1	41.8
MEAN	11.3	20.5	27.8	32.9	12.5	46.5	17.7	14.7	26.3	9.19	3.29	1.39
MAX	66	34	108	91	30	68	45	35	93	35	18	2.7
MTN	1.2	13	11	11	7.2	14	7.4	4.5	3.2	2.1	1.2	1.0
CFSM	.63	1.15	1.55	1.84	.70	2.60	.99	.82	1.47	.51	.18	.08
IN.	.73	1.28	1.79	2.12	.73	3.00	1.10	.95	1.64	.59	.21	.09
CAL YR 1972	TOTAL 4,465.22	MEAN 12.2	MAX 108	MTN .87	CFSM .68	IN 9.28						
WTR YR 1973	TOTAL 6,845.00	MEAN 18.8	MAX 108	MIN 1.0	CFSM 1.05	IN 14.23						

PEAK DISCHARGE (BASE, 90 FT³/S)

DATE	TIME	G.H.	DISCHARGE
12-31	0300	4.91	114
06-26	2200	5.17	131
06-28	1900	5.07	120

04161500 Paint Creek near Lake Orion, Mich.

LOCATION.--Lat 42°46'03", long 83°13'12", in NE¼ sec.13, T.4 N., R.10 E., Oakland County, on left bank 100 ft (30 m) upstream from railroad bridge, 1.6 mi (2.6 km) southeast of Lake Orion, and 2.8 mi (4.5 km) upstream from Trout Creek.

DRAINAGE AREA.--38.5 mi² (99.7 km²).

PERIOD OF RECORD.--September 1955 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 940 ft (287 m) from topographic map (nearest 10 ft).

AVERAGE DISCHARGE.--18 years, 23.1 ft³/s (0.654 m³/s), 8.15 in/yr (207 mm/yr).

EXTREMES.--Current year: Maximum discharge, 280 ft³/s (7.93 m³/s) Dec. 31 (gage height, 3.7 ft or 1.13 m, from highwater mark); minimum, 3.8 ft³/s (0.11 m³/s) Oct. 11 (gage height, 1.73 ft or 0.527 m).

Period of record: Maximum discharge, 359 ft³/s (10.2 m³/s) Feb. 4, 1968 (gage height, 3.50 ft or 1.067 m); maximum gage height, 4.43 ft (1.350 m) Sept. 22, 1971, caused by construction downstream; minimum discharge, 1.2 ft³/s (0.034 m³/s) June 28, July 13, 14, 15, 1959.

REMARKS.--Records poor. Occasional regulation by Lake Orion.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	30	30	180	47	22	95	35	40	70	35	11
2	9.6	34	29	120	47	24	90	38	37	55	45	9.6
3	9.1	33	28	130	47	23	85	40	45	50	35	9.6
4	8.6	30	27	150	47	22	75	40	52	50	30	16
5	8.6	29	30	120	51	28	70	38	65	40	27	7.6
6	9.1	27	35	110	51	39	65	35	60	35	25	6.7
7	8.6	32	40	100	51	52	60	35	65	32	25	5.9
8	7.2	32	35	90	53	64	55	40	60	30	25	5.6
9	5.0	31	31	85	49	71	55	50	55	26	30	5.3
10	4.4	30	28	78	44	76	55	50	50	26	40	5.3
11	4.2	29	28	63	42	75	52	45	45	25	30	24
12	4.2	29	35	59	39	120	50	40	38	23	25	56
13	4.4	29	40	53	37	100	50	40	35	23	22	58
14	4.2	35	45	42	35	130	47	37	30	22	20	59
15	4.0	35	40	39	35	140	45	35	26	22	20	53
16	12	33	37	36	34	120	45	35	24	21	18	51
17	15	30	37	36	34	110	48	35	23	21	17	54
18	12	30	35	36	33	100	48	38	24	21	17	51
19	11	31	35	37	32	95	48	37	25	20	17	46
20	9.6	33	32	43	29	93	47	35	25	19	17	42
21	11	32	34	48	29	90	45	33	25	18	17	42
22	20	31	35	66	28	85	50	33	25	18	16	37
23	34	30	35	69	28	80	52	34	23	16	15	34
24	31	30	35	69	26	80	50	34	23	15	14	32
25	28	30	35	68	25	85	45	33	23	16	13	33
26	25	31	35	62	24	85	40	35	30	18	12	30
27	23	32	35	59	24	85	37	40	45	20	12	29
28	24	33	35	58	23	85	35	50	60	18	12	29
29	34	32	32	58	-----	85	33	50	100	17	11	29
30	32	31	80	55	-----	110	33	45	90	16	11	27
31	32	-----	250	49	-----	100	-----	45	-----	20	11	-----
TOTAL	454.8	934	1,318	2,268	1,044	2,474	1,605	1,210	1,268	823	664	898.6
MFAN	14.7	31.1	42.5	73.2	37.3	79.8	53.5	39.0	42.3	26.5	21.4	30.0
MAX	34	35	250	180	53	140	95	50	100	70	45	59
MIN	4.0	27	27	36	23	22	33	33	23	15	11	5.3
CFSM	.38	.81	1.10	1.90	.97	2.07	1.39	1.01	1.10	.69	.56	.78
IN.	.44	.90	1.27	2.19	1.01	2.39	1.55	1.17	1.23	.80	.64	.87

CAL YR 1972 TOTAL 8,873.9 MEAN 24.2 MAX 250 MIN 2.3 CFSM .63 IN 8.57
WTR YR 1973 TOTAL 14,961.4 MEAN 41.0 MAX 250 MIN 4.0 CFSM 1.06 IN 14.46

PEAK DISCHARGE (BASE, 90 FT³/S)

NOTE.--No gage-height record Nov. 14 to Jan. 9, Mar. 12 to Aug. 30.

DATE	TIME	G.H.	DISCHARGE
12-31	unknown	3.7	280
03-15	unknown	unknown	about 150
03-30	unknown	unknown	about 120
06-29	unknown	unknown	about 110

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04161540 Paint Creek at Rochester, Mich.

LOCATION.--Lat 42°41'18", long 83°08'35", in NW¼ SE¼ sec.10, T.3 N., R.11 E., Oakland County, 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 mi² (183.6 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 755.11 ft (230.158 m) above mean sea level.

AVERAGE DISCHARGE.--14 years, 45.2 ft³/s (1.280 m³/s), 8.66 in/yr (220 mm/yr).

EXTREMES.--Current year: Maximum discharge, 490 ft³/s (13.9 m³/s) Dec. 31 (gage height, 4.85 ft or 1.478 m); minimum daily, 15 ft³/s (0.42 m³/s) Sept. 8-10; minimum gage height, 1.90 ft (0.579 m) Sept. 1, 2.
Period of record: Maximum discharge, 918 ft³/s (26.0 m³/s) Feb. 1, 1968; maximum gage height, 5.95 ft (1.814 m) Feb. 10, 1965 (backwater from ice); minimum discharge, 3.9 ft³/s (0.11 m³/s) Aug. 3, 1966; minimum gage height, 1.26 ft (0.384 m) Sept. 16, 1960.

REMARKS.--Records fair except those for the winter period which are poor. Occasional regulation by Lake Orion.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	55	63	310	79	58	184	68	79	103	65	18
2	21	69	59	205	100	91	173	80	73	92	80	18
3	19	66	56	223	103	116	168	88	85	102	65	17
4	19	59	54	300	92	112	162	79	104	96	58	17
5	19	55	53	245	90	118	151	73	100	84	50	16
6	20	52	84	200	87	131	139	70	149	76	45	16
7	22	59	77	150	86	141	129	68	139	68	43	16
8	20	78	70	130	85	147	120	85	123	62	43	15
9	18	69	61	110	81	136	112	103	107	55	50	15
10	17	61	57	95	76	133	118	96	92	56	70	15
11	18	57	56	85	74	235	112	90	82	56	55	19
12	19	52	184	80	70	217	106	87	73	50	45	69
13	20	52	99	75	63	190	99	86	66	47	40	74
14	21	71	88	70	63	275	94	83	56	55	36	75
15	19	70	81	68	62	268	90	80	38	48	34	72
16	21	62	78	66	60	210	88	75	37	44	32	66
17	28	57	75	69	60	212	93	70	45	37	31	69
18	26	54	70	90	60	208	85	64	48	35	30	77
19	26	53	68	109	60	190	80	60	49	34	30	65
20	25	61	67	99	58	183	77	57	52	35	32	57
21	28	62	69	89	58	163	76	53	53	41	30	54
22	55	60	75	150	57	153	103	51	47	37	27	52
23	128	56	78	146	57	151	104	60	44	26	25	49
24	92	54	77	118	55	169	90	59	49	25	24	45
25	69	52	76	106	54	187	82	56	45	28	22	43
26	57	62	77	101	54	187	75	57	98	36	22	43
27	50	68	74	98	57	181	69	61	135	36	21	41
28	50	62	70	101	60	169	66	97	175	33	21	40
29	76	73	67	93	-----	170	62	99	175	29	20	43
30	68	67	115	89	-----	208	62	90	123	27	20	41
31	60	-----	389	79	-----	180	-----	86	-----	57	19	-----
TOTAL	1,154	1,828	2,667	3,949	1,961	5,289	3,169	2,331	2,541	1,610	1,185	1,257
MEAN	37.2	60.9	86.0	127	70.0	171	106	75.2	84.7	51.9	38.2	41.9
MAX	128	78	389	310	103	275	184	103	175	103	80	77
MIN	17	52	53	66	54	58	62	51	37	25	19	15
CFSM	.52	.86	1.21	1.79	.99	2.41	1.50	1.06	1.19	.73	.54	.59
IN.	.61	.96	1.40	2.07	1.03	2.78	1.66	1.22	1.33	.84	.62	.66

CAL YR 1972 TOTAL 17,395 MEAN 47.5 MAX 389 MIN 10 CFSM .67 IN 9.13
WTR YR 1973 TOTAL 28,941 MEAN 79.3 MAX 389 MIN 15 CFSM 1.12 IN 15.18

PEAK DISCHARGE (BASE, 200 FT³/s)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
12-12	1400	4.15	292	03-14	1800	4.32	335
12-31	2000	4.85	490	03-30	0500	3.86	221
01-04	1100	4.28	325	06-28	2100	4.00	255
03-11	2000	4.22	310				

STREAMS TRIBUTARY TO LAKE ST. CLAIR

195

04161580 Stony Creek near Romeo, Mich.

LOCATION.--Lat 42°48'03", long 83°05'25", in SW¼ sec.31, T.5 N., R.12 E., Macomb County, 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 mi² (66.3 km²).

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.

AVERAGE DISCHARGE.--9 years, 14.9 ft³/s (0.422 m³/s), 7.90 in/yr (201 mm/yr).

EXTREMES.--Current year: Maximum discharge, 163 ft³/s (4.62 m³/s) Jan. 2 (gage height, 3.97 ft or 1.210 m); minimum, 3.1 ft³/s (0.088 m³/s) Oct. 9, 10, 17 (gage height, 1.48 ft or 0.451 m).
Period of record: Maximum discharge, 229 ft³/s (6.49 m³/s) Feb. 1, 1968 (gage height, 4.53 ft or 1.381 m); maximum gage height, 4.56 ft (1.390 m) Feb. 10, 1965; minimum discharge, 0.92 ft³/s (0.026 m³/s) Oct. 5, 9, 1967; minimum gage height, 1.28 ft (0.390 m) July 27, 28, 1965.

REMARKS.--Records good except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.5	12	17	124	18	16	73	17	18	29	11	5.6
2	5.5	18	17	149	24	17	67	18	16	24	8.6	5.2
3	5.1	22	17	131	30	20	62	19	23	24	11	5.2
4	4.9	22	17	104	27	30	57	16	31	22	8.8	5.0
5	4.9	19	17	96	26	40	55	14	32	21	6.9	5.6
6	4.7	17	25	80	23	45	50	12	57	23	6.8	5.4
7	4.6	18	20	60	23	55	45	12	54	24	6.5	4.8
8	3.8	25	18	45	28	50	40	19	47	20	6.4	4.5
9	3.3	21	17	35	25	45	37	26	39	16	7.5	6.3
10	3.2	21	17	30	23	50	38	23	29	12	9.1	5.0
11	3.3	21	17	25	22	65	38	20	20	10	7.6	4.6
12	3.3	19	20	20	20	80	35	18	17	8.1	6.9	4.4
13	3.3	18	30	19	19	60	32	16	21	6.9	5.6	4.4
14	3.4	21	26	19	18	75	28	14	14	8.0	5.2	4.5
15	3.3	20	25	19	18	90	26	14	11	7.6	5.0	4.5
16	3.4	17	24	19	17	75	26	12	9.6	6.3	4.9	4.9
17	3.3	20	23	19	16	55	28	13	13	5.4	5.0	6.5
18	3.4	21	22	31	16	52	26	17	11	4.9	8.5	9.3
19	3.5	20	23	48	16	50	25	16	9.2	4.7	5.9	6.7
20	3.4	21	25	39	17	50	24	14	8.4	5.0	6.3	6.0
21	4.6	22	24	40	17	60	23	9.5	8.2	6.4	5.7	5.4
22	14	21	24	42	17	54	31	10	9.6	5.8	5.1	5.3
23	37	19	24	51	16	51	35	14	9.1	4.9	4.9	5.1
24	28	18	25	40	16	69	30	21	9.1	4.5	8.5	4.7
25	18	17	25	35	16	77	27	19	7.9	4.6	7.6	4.4
26	14	18	25	32	16	79	23	19	13	6.2	7.4	5.0
27	17	20	24	30	16	77	16	19	37	7.1	8.7	4.7
28	17	20	24	28	16	68	13	28	44	6.2	7.3	4.8
29	24	18	22	27	-----	65	13	28	62	6.2	6.6	5.2
30	19	17	39	24	-----	81	14	22	41	5.8	6.3	5.0
31	15	-----	96	19	-----	76	-----	21	-----	9.3	6.0	-----
TOTAL	287.7	583	769	1,480	556	1,777	1,037	540.5	721.1	348.9	217.6	158.0
MEAN	9.28	19.4	24.8	47.7	19.9	57.3	34.6	17.4	24.0	11.3	7.02	5.27
MAX	37	25	96	149	30	90	73	28	62	29	11	9.3
MIN	3.2	12	17	19	16	16	13	9.5	7.9	4.5	4.9	4.4
CFSM	.36	.76	.97	1.86	.78	2.24	1.35	.68	.94	.44	.27	.21
IN.	.42	.85	1.12	2.15	.81	2.58	1.51	.79	1.05	.51	.32	.23
CAL YR 1972	TOTAL 5,203.0 MEAN 14.2 MAX 96 MIN 2.9 CFSM .55 IN 7.56											
WTP YR 1973	TOTAL 8,475.8 MEAN 23.2 MAX 149 MIN 3.2 CFSM .91 IN 12.32											

PEAK DISCHARGE (BASE, 100 FT³/S)

DATE	TIME	G.H.	DISCHARGE
01-02	1700	3.97	163
03-15	unknown	unknown	about 100

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04161790 Stony Lake near Washington, Mich.

LOCATION.--Lat 42°42'58", long 83°05'58", in SE¼ sec.31, T.4 N., R.12 E., Macomb County, 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 mi² (176.1 km²).

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.

EXTREMES.--Current year: Maximum contents 5,451 acre-ft (6.72 hm³) Mar. 31 to Apr. 3, elevation 803.1 ft (244.78 m); minimum, 2,023 acre-ft (2.49 hm³) Oct. 18-21, elevation 795.5 ft (242.47 m).

Period of record: Maximum contents, 5,451 acre-ft (6.72 hm³) Mar. 31 to Apr. 3, 1973, elevation 803.1 ft (244.78 m); minimum recorded, 1,758 acre-ft (2.17 hm³) Nov. 21, 1967, elevation, 794.7 ft (242.22 m).

REMARKS.--Reservoir is formed by an earth-fill dam with concrete spillway completed in 1962. The spillway section includes a drum gage 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). The reservoir began filling February 1963. Lake is used for recreational purposes.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

Date	Elevation (feet)	Contents (Acre-feet)	Change in contents during month	
			(Acre-feet)	Equivalent in cfs
Sept. 30	795.9	2,164	-	-
Oct. 31	798.6	3,251	+1,087	+17.7
Nov. 30	799.8	3,804	+553	+9.3
Dec. 31	800.0	3,900	+96	+1.6
Calendar year 1972	-	-	-98	-1.1
Jan. 31	799.2	3,522	-378	-6.1
Feb. 28	799.2	3,522	0	0
Mar. 31	803.1	5,451	+1,929	+31.4
Apr. 30	802.4	5,094	-357	-6.0
May 31	802.4	5,094	0	0
June 30	802.7	5,247	+153	+2.6
July 31	802.1	4,941	-306	-5.0
Aug. 31	802.0	4,890	-51	-0.8
Sept. 30	802.0	4,890	0	0
Water year 1972-73	-	-	+2,726	+3.8

STREAMS TRIBUTARY TO LAKE ST. CLAIR

197

04161800 Stony Creek near Washington, Mich.

LOCATION.--Lat 42°42'55", long 83°05'31", in SW¼ sec.31, T.4 N., R.12 E., Macomb County, 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 mi² (176.6 km²).

PERIOD OF RECORD.--July 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is 772.59 ft (235.485 m) above mean sea level (levels by Huron-Clinton Metropolitan Authority).

AVERAGE DISCHARGE.--15 years, 35.9 ft³/s (1.017 m³/s), 7.15 in/yr (182 mm/yr), adjusted for storage since 1963.

EXTREMES.--Current year: Maximum discharge, 281 ft³/s (7.96 m³/s) Jan. 2 (gage height, 5.07 ft or 1.545 m); minimum daily 7.5 ft³/s (0.21 m³/s) Oct. 24.

Period of record: Maximum discharge, 427 ft³/s (12.1 m³/s) Feb. 2, 1968 (gage height, 5.86 ft or 1.786 m); maximum gage height, 6.71 ft (2.045 m) Mar. 6, 1959 (backwater from ice); minimum discharge, 0.9 ft³/s (0.025 m³/s) July 10, 1963; minimum gage height, 1.84 ft (0.561 m) July 31, 1964; minimum daily discharge, 1.3 ft³/s (0.037 m³/s) July 31, Aug. 1, 1964.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. Occasional diurnal fluctuation caused by mills above station prior to February 1963; occasional regulation by Stony Lake since (see sta 04161790).

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	18	39	256	61	39	200	49	73	80	41	16
2	20	39	42	272	70	43	190	54	68	70	56	15
3	20	49	43	244	77	58	170	67	60	68	48	15
4	20	53	42	228	79	75	160	69	70	64	39	15
5	19	52	41	238	77	91	150	64	81	62	32	16
6	19	50	54	201	72	117	140	57	150	68	27	15
7	19	51	52	141	69	133	130	52	150	74	24	14
8	19	67	55	112	69	113	120	60	140	60	22	13
9	19	63	54	96	63	62	110	74	110	50	28	18
10	20	60	54	78	62	98	100	81	90	40	40	15
11	20	60	50	64	58	124	100	79	65	35	35	13
12	20	56	57	52	53	161	95	72	45	30	30	13
13	20	60	72	50	51	70	90	64	55	26	26	13
14	20	77	76	51	50	148	80	60	45	30	24	13
15	19	62	79	51	50	188	75	56	40	27	21	13
16	19	60	75	52	46	31	70	51	35	24	18	15
17	20	56	65	62	42	84	75	49	45	22	19	20
18	12	53	63	83	42	123	72	45	35	21	24	27
19	9.8	55	65	95	42	134	68	43	32	20	23	23
20	9.8	58	67	92	44	141	65	45	30	21	23	20
21	9.8	59	67	102	46	137	62	44	28	23	22	18
22	9.8	59	69	125	45	135	75	39	33	21	15	16
23	9.3	55	70	124	44	132	95	44	32	19	14	15
24	7.5	52	72	113	44	131	90	48	31	18	15	14
25	7.7	51	71	102	44	151	80	46	28	18	15	13
26	8.2	58	73	94	45	172	73	50	35	21	17	15
27	8.2	59	73	88	42	165	67	56	90	23	18	16
28	8.4	57	69	83	39	161	54	67	120	24	18	15
29	8.4	34	66	74	-----	160	48	80	150	23	18	18
30	11	28	72	68	-----	210	49	83	120	20	18	15
31	9.3	-----	135	61	-----	210	-----	81	-----	28	17	-----
TOTAL	462.2	1,611	1,982	3,552	1,526	3,797	2,953	1,829	2,086	1,130	787	477
MFAN	14.9	53.7	63.9	115	54.5	122	98.4	59.0	69.5	36.5	25.4	15.9
MAX	20	77	135	272	79	210	200	83	150	80	56	27
MIN	7.5	18	39	50	39	31	48	39	28	18	14	13
MEAN+	32.6	63.0	65.5	109	54.5	153	92.4	59.0	72.1	31.5	24.6	15.9
CFSM+	.48	.92	.96	1.60	.80	2.24	1.35	.87	1.06	.46	.36	.23
IN+	.55	1.03	1.11	1.84	.83	2.59	1.51	1.00	1.18	.53	.42	.26

CAL YR 1972 TOTAL 15,883.2 MEAN 43.4 MAX 169 MIN 7.5 MEAN+ 43.3 CFSM+ .63 IN+ 8.64
WTR YR 1973 TOTAL 22,192.2 MEAN 60.8 MAX 272 MIN 7.5 MEAN+ 64.6 CFSM+ .95 IN+ 12.86

+ Adjusted for change in contents in Stony Lake.

NOTE.--No gage height record June 6 to July 17.

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04162900 Big Beaver Creek near Warren, Mich.

LOCATION.--Lat 42°32'31", long 83°02'52", in NW¼SW¼ sec.33, T.2 N., R.12 E., Macomb County, 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 mi² (60.9 km²).

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 benchmark). Prior to Aug. 26, 1960 nonrecording gage and crest-stage gage at same site and datum.

AVERAGE DISCHARGE.--15 years, 13.8 ft³/s (0.391 m³/s), 7.97 in/yr (202 mm/yr).

EXTREMES.--Current year: Maximum discharge, 634 ft³/s (18.0 m³/s) June 27 (gage height, 11.17 ft or 3.405 m); minimum, 2.0 ft³/s (0.057 m³/s) July 23 (gage height, 4.88 ft or 1.487 m).
Period of record: Maximum discharge, 1,240 ft³/s (35.1 m³/s) June 26, 1968 (gage height, 14.45 ft or 4.404 m); minimum, no flow on several days in June and July 1962, caused by unusual regulation above gage; minimum natural discharge, 0.1 ft³/s (0.003 m³/s) several days each year in 1959-62.

REMARKS.--Records poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.5	15	17	64	16	25	61	13	43	27	50	9.9
2	5.3	35	16	34	41	44	44	13	33	23	64	8.9
3	4.4	25	17	28	38	36	34	18	88	36	16	8.6
4	4.0	17	15	137	23	31	30	13	114	20	10	8.7
5	3.6	15	15	35	22	59	28	13	62	14	7.9	8.4
6	3.5	14	74	25	18	75	25	12	40	14	7.5	8.3
7	3.3	30	35	16	19	70	23	13	43	11	7.9	7.9
8	2.6	98	18	12	19	59	20	24	35	8.6	8.8	7.7
9	2.5	31	17	11	16	38	20	39	30	7.1	21	7.8
10	3.8	20	16	10	14	34	29	30	27	7.8	100	7.5
11	5.1	17	15	9.5	13	266	23	24	25	7.5	106	7.4
12	3.6	15	22	9.0	13	119	21	19	37	6.1	18	7.1
13	3.4	16	127	9.0	12	56	17	18	29	6.3	15	7.7
14	3.9	98	55	9.0	12	324	16	19	24	6.2	13	7.1
15	3.2	68	34	9.0	12	200	14	18	22	5.7	11	6.7
16	3.7	31	27	9.0	12	100	15	19	22	3.4	11	6.5
17	4.7	26	28	11	12	65	17	19	61	3.1	12	8.4
18	4.1	20	21	16	12	60	14	20	30	2.5	16	12
19	4.4	21	22	18	12	65	13	21	24	2.4	23	7.3
20	4.4	45	35	16	12	95	12	19	20	3.0	18	6.4
21	5.5	33	45	20	12	75	10	19	22	5.4	14	6.2
22	38	23	53	73	12	65	69	21	19	3.0	12	5.9
23	228	18	58	64	12	65	39	34	19	2.3	12	5.7
24	50	15	52	30	12	70	17	29	16	2.6	14	5.7
25	30	15	43	22	12	62	13	26	14	2.7	13	5.6
26	22	48	43	20	12	51	11	27	81	115	11	6.8
27	17	75	33	20	13	40	9.8	28	409	86	11	5.7
28	20	32	26	22	14	33	9.5	59	119	24	11	9.7
29	40	23	23	21	-----	39	9.7	67	139	13	9.9	19
30	25	20	199	17	-----	144	11	56	42	9.7	10	10
31	17	-----	364	14	-----	49	-----	51	-----	11	10	-----
TOTAL	573.5	959	1,565	810.5	447	2,514	675.0	801	1,689	489.4	664.0	240.6
MEAN	18.5	32.0	50.5	26.1	16.0	81.1	22.5	25.8	56.3	15.8	21.4	8.02
MAX	228	98	364	137	41	324	69	67	409	115	106	19
MIN	2.5	14	15	9.0	12	25	9.5	12	14	2.3	7.5	5.6
CFSM	.79	1.36	2.15	1.11	.68	3.45	.96	1.10	2.40	.67	.91	.34
IN.	.91	1.52	2.48	1.28	.71	3.98	1.07	1.27	2.67	.77	1.05	.38
CAL YR 1972 TOTAL	6,771.7											
MEAN	18.5											
MAX	364											
MIN	1.3											
CFSM	.79											
IN	10.72											
WTR YR 1973 TOTAL	11,428.0											
MEAN	31.3											
MAX	409											
MIN	2.3											
CFSM	1.33											
IN	12.09											

PEAK DISCHARGE (BASE, 300 FT³/S)

DATE	TIME	G.H.	DISCHARGE
10-23	unknown	unknown	about 300
12-31	0300	11.03	578
03-11	1700	10.35	514
03-14	1800	10.34	523
06-27	0700	11.17	634
08-10	2400	9.27	303

STREAMS TRIBUTARY TO LAKE ST. CLAIR

199

04163400 Plum Brook at Utica, Mich.

LOCATION.--Lat 42°36'05", long 83°04'27", in SE¼ NE¼ sec.7, T.2 N., R.12 E., Macomb County, on left bank at upstream side of bridge on Ryan Road, 1.0 mi (1.6 km) southwest of Utica.

DRAINAGE AREA.--16.5 mi² (42.7 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 625 ft (190 m) from topographic map (nearest 5 ft).

AVERAGE DISCHARGE.--8 years, 12.0 ft³/s (0.340 m³/s), 9.88 in/yr (251 mm/yr).

EXTREMES.--Current year: Maximum discharge, 400 ft³/s (11.3m³/s) Dec. 31, on basis of correlation with nearby stations; minimum daily, 0.70 ft³/s (0.020 m³/s) July 23.

Period of record: Maximum discharge, 1,160 ft³/s (32.9 m³/s) June 26, 1968 (gage height, 10.36 ft or 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.

REMARKS.--Records poor. Occasional diversion for sprinkler irrigation.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.3	14	14	72	10	15	45	8.5	19	15	24	1.8
2	4.8	36	13	33	31	35	35	10	17	9.9	41	1.7
3	4.0	30	13	32	30	30	28	14	23	20	15	1.7
4	3.5	19	11	96	19	28	24	9.9	41	11	8.9	1.6
5	3.2	14	11	42	16	45	22	8.2	27	8.6	4.6	1.5
6	3.1	12	43	25	15	61	18	7.1	20	6.2	3.6	1.5
7	3.0	22	30	15	15	59	17	6.9	19	5.6	3.5	1.5
8	2.9	67	20	10	14	55	14	15	15	6.6	2.6	1.4
9	2.6	33	14	7.0	13	37	13	26	10	5.9	9.4	1.4
10	2.3	20	13	6.0	11	35	22	18	7.8	5.9	45	1.3
11	2.5	18	13	5.5	9.7	166	19	13	6.8	5.4	29	1.3
12	2.6	15	12	5.3	8.5	84	15	10	16	4.8	11	1.3
13	2.6	16	88	5.3	9.3	41	14	8.7	11	5.1	6.9	1.3
14	2.6	72	52	5.3	9.5	176	15	8.3	12	21	5.8	1.3
15	2.3	47	33	5.3	9.6	92	15	8.0	6.0	8.7	5.1	1.3
16	2.6	29	25	7.4	8.0	45	13	7.3	5.5	6.1	3.3	1.4
17	2.6	24	20	13	8.2	42	11	6.8	21	5.8	3.3	1.7
18	2.9	20	19	13	8.0	45	10	6.6	11	4.6	4.5	2.4
19	3.5	21	14	17	8.2	52	9.6	6.3	7.1	4.9	9.8	1.3
20	3.4	33	20	13	9.0	69	9.1	6.8	6.9	4.6	6.3	1.3
21	4.1	29	23	13	10	62	8.2	5.9	6.2	4.4	4.7	1.1
22	29	22	33	50	10	58	31	6.3	4.8	2.4	4.1	1.4
23	185	18	43	47	10	55	28	14	4.3	7.0	2.5	1.4
24	50	14	43	24	9.0	56	16	13	3.5	1.0	2.0	1.0
25	29	13	40	17	9.0	52	12	9.2	3.2	1.7	2.4	1.2
26	16	30	39	16	9.5	43	9.2	13	27	37	2.4	1.5
27	12	49	33	16	9.5	34	7.9	15	119	21	2.2	1.5
28	12	28	29	17	10	27	7.5	35	76	10	2.1	2.6
29	44	19	25	16	-----	31	6.9	42	66	5.6	2.0	3.8
30	27	16	112	12	-----	82	7.1	29	29	3.2	1.9	1.8
31	17	-----	270	10	-----	39	-----	25	-----	4.8	1.0	-----
TOTAL	488.4	800	1,168	666.1	340.0	1,751	502.5	412.8	641.1	256.90	271.7	47.3
MEAN	15.8	26.7	37.7	21.5	12.1	56.5	16.8	13.3	21.4	8.29	8.76	1.58
MAX	185	72	270	96	31	176	45	42	119	37	45	3.8
MTN	2.3	12	11	5.3	8.0	15	6.9	5.9	3.2	7.0	1.9	1.0
CFSM	.96	1.62	2.28	1.30	.73	3.42	1.02	.81	1.30	.50	.53	.10
IN.	1.10	1.80	2.63	1.50	.77	3.95	1.13	.93	1.45	.58	.61	.11

CAL YR 1972 TOTAL 5,166.19 MEAN 14.1 MAX 270 MIN .50 CFSM .85 IN 11.65
 WTR YR 1973 TOTAL 7,345.80 MEAN 20.1 MAX 270 MIN .70 CFSM 1.22 IN 16.56

PEAK DISCHARGE (BASE, 200 FT³/S)

NOTE.--No gage-height record Dec. 31.

DATE	TIME	G.H.	DISCHARGE
10-23	0800	6.71	237
12-31	unknown	unknown	400
03-11	1700	7.39	298
03-14	1600	7.04	264
06-27	0300	6.58	226

04164000 Clinton River near Fraser, Mich.

LOCATION.--Lat 42°34'40", long 82°57'00", in NW¼ sec.20, T.2 N., R.13 E., Macomb County, on left bank 800 ft (244 m) downstream from bridge on Garfield Road, 2.8 mi (4.5 km) north of Fraser, and 4 mi (6 km) upstream from North Branch.

DRAINAGE AREA.--444 mi² (1,150 km²).

PERIOD OF RECORD.--May 1947 to current year.

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.

AVERAGE DISCHARGE.--26 years, 347 ft³/s (9.827 m³/s), 10.61 in/yr (269 mm/yr).

EXTREMES.--Current year: Maximum discharge, 4,370 ft³/s (124 m³/s) June 26 (gage height, 15.76 ft or 4.804 m); minimum, 136 ft³/s (3.85 m³/s) Sept. 10 (gage height, 5.31 ft or 1.618 m).
 Period of record: Maximum discharge, 8,000 ft³/s (277 m³/s) May 11, 1948 (gage height, 19.5 ft or 5.94 m, from graph based on gage readings), from rating curve extended above 4,000 ft³/s (113 m³/s); minimum, 47 ft³/s (1.33 m³/s) Sept. 6, 1955; minimum gage height, 4.29 ft (1.308 m) Sept. 7, 1954.
 Flood of April 5 or 6, 1947 reached a stage of 20 ft (6.1 m), from floodmarks (discharge, 9,000 ft³/s or 255 m³/s, from rating curve extended above 4,000 ft³/s or 113 m³/s).

REMARKS.--Records good.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	284	427	443	2,280	496	400	1,220	452	568	753	1,530	197
2	238	669	427	1,540	707	540	1,050	495	490	632	911	181
3	227	676	415	1,070	774	651	902	618	654	908	457	169
4	203	526	395	1,950	611	600	843	504	846	585	356	176
5	191	455	401	1,470	568	776	786	449	806	472	292	190
6	220	421	1,020	978	532	1,050	730	408	756	430	261	177
7	235	513	676	754	515	891	697	388	845	387	245	170
8	218	1,140	493	675	515	1,000	651	544	717	346	238	159
9	209	702	466	639	483	725	614	789	609	329	467	148
10	217	555	436	552	469	680	773	656	517	356	1,280	149
11	222	512	407	520	420	1,770	680	564	462	340	1,130	153
12	229	468	458	497	407	1,930	628	492	523	338	445	164
13	223	480	1,570	481	416	1,120	595	439	452	325	355	183
14	210	969	954	483	417	1,870	574	413	388	474	322	195
15	174	1,090	718	454	394	2,160	540	410	325	459	294	192
16	164	712	629	463	367	1,360	520	404	313	347	274	169
17	177	592	503	470	366	1,060	562	393	613	327	259	200
18	176	542	485	521	351	966	537	394	482	304	275	207
19	166	523	511	572	358	1,180	524	344	382	289	332	206
20	160	713	614	575	383	1,520	504	316	369	302	269	187
21	177	657	676	522	395	1,330	473	306	425	318	246	181
22	536	570	736	1,040	382	1,090	1,160	316	373	243	213	178
23	2,000	511	772	1,190	374	1,010	1,020	457	367	219	205	170
24	1,180	459	736	808	366	1,030	650	380	327	219	201	165
25	509	450	673	667	353	1,040	562	332	311	211	207	172
26	436	716	663	627	344	1,030	513	384	802	745	193	198
27	403	891	634	602	349	962	469	388	2,800	741	197	178
28	415	631	557	597	361	881	427	698	1,840	458	208	261
29	770	519	509	571	-----	902	398	771	2,180	292	209	499
30	590	445	1,340	537	-----	1,750	392	679	1,150	227	201	254
31	484	-----	2,530	513	-----	1,210	-----	674	-----	333	207	-----
TOTAL	11,643	18,534	21,847	24,618	12,473	34,484	19,994	14,857	21,692	12,709	12,279	5,908
MEAN	376	618	705	794	445	1,112	666	479	723	410	396	197
MAX	2,000	1,140	2,530	2,280	774	2,160	1,220	789	2,800	908	1,530	499
MTN	160	421	395	454	344	400	392	306	311	211	193	148
CFSM	.85	1.39	1.59	1.79	1.00	2.50	1.50	1.08	1.63	.92	.89	.44
IN.	.98	1.55	1.83	2.06	1.05	2.89	1.68	1.24	1.82	1.06	1.03	.49
CAL YR 1972	TOTAL 158,437	MEAN 433	MAX 2,530	MIN 108	CFSM .98	IN 13.27						
WTR YR 1973	TOTAL 211,038	MEAN 578	MAX 2,800	MIN 148	CFSM 1.30	IN 17.68						

PEAK DISCHARGE (BASE, 2,000 FT³/s)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
10-23	1300	13.59	2,290	06-26	2400	15.76	4,370
12-31	0200	14.33	2,650	08-01	0800	13.60	2,390
03-11	1500	14.29	2,770	08-10	2100	13.72	2,450
03-14	1900	14.36	2,830	01-04	0500	13.30	2,150
03-30	0500	13.11	2,060	06-28	2400	14.68	3,200

STREAMS TRIBUTARY TO LAKE ST. CLAIR

201

04164100 East Pond Creek at Romeo, Mich.

LOCATION.--Lat 42°49'21", long 83°01'13", in NE¼ SE¼ sec.27, T.5 N., R.12 E., Macomb County, 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 mi² (56.5 km²).

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).

AVERAGE DISCHARGE.--15 years, 13.2 ft³/s (0.374 m³/s), 8.22 in/yr (209 mm/yr).

EXTREMES.--Current year: Maximum discharge, 161 ft³/s (4.56 m³/s) Dec. 31; maximum gage height, 3.47 ft (1.058 m) Jan. 7 (backwater from ice); minimum discharge, 3.0 ft³/s (0.085 m³/s) Sept. 14, 15, 16; minimum gage height, 1.00 ft (0.305 m) Sept. 8, 14, 15, 16.
Period of record: Maximum discharge, 358 ft³/s (10.1 m³/s) Feb. 10, 1965 (gage height, 4.48 ft or 1.366 m); maximum gage height, 4.56 ft (1.390 m) Mar. 12, 1962 (backwater from ice); minimum discharge, 0.8 ft³/s (0.023 m³/s) July 30, 31, 1964, Aug. 6, 7, 1965; minimum gage height, 0.71 ft (0.216 m) July 21, 1959.

REMARKS.--Records fair except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.0	22	21	134	22	16	67	24	24	30	21	4.0
2	6.4	26	21	119	31	20	62	26	22	25	31	3.8
3	5.4	27	20	107	32	30	56	29	25	26	15	3.8
4	5.0	23	20	94	29	35	51	25	29	23	12	3.8
5	4.7	21	20	79	29	41	46	23	34	20	9.7	3.7
6	4.7	19	30	65	28	52	42	21	69	18	8.1	3.6
7	5.0	20	25	50	27	56	39	20	42	16	9.4	3.3
8	4.7	29	22	40	26	58	36	27	34	14	8.8	3.4
9	4.2	24	21	32	23	52	34	36	32	11	9.7	3.6
10	4.1	21	20	26	21	50	36	32	30	12	14	3.7
11	4.2	21	20	22	20	76	35	28	27	11	11	3.7
12	4.3	20	25	19	19	83	33	26	23	10	9.3	3.6
13	4.2	19	35	18	17	66	31	24	20	9.9	8.5	3.5
14	4.2	25	32	18	16	90	29	23	18	11	7.3	3.2
15	4.3	25	29	18	14	95	28	22	16	11	6.9	3.1
16	4.6	22	27	18	14	78	27	22	15	9.4	6.3	3.0
17	4.2	20	27	19	14	72	28	23	16	12	6.2	4.2
18	4.4	21	29	28	14	64	27	23	15	9.9	6.3	8.6
19	4.3	23	28	33	14	64	26	22	14	8.3	5.6	6.7
20	4.3	26	24	28	14	61	26	21	14	7.7	6.5	5.0
21	5.8	26	23	28	14	56	25	19	13	9.2	6.0	4.8
22	17	26	24	43	14	53	31	18	11	8.0	5.5	4.5
23	55	23	25	47	14	51	33	19	9.7	7.4	5.0	4.1
24	45	22	25	36	14	54	29	19	12	7.2	4.7	4.1
25	32	21	24	33	14	57	26	18	10	8.3	4.6	4.1
26	30	22	25	32	14	57	25	22	18	10	4.4	4.4
27	28	24	24	30	14	59	24	22	57	11	4.5	4.4
28	26	24	23	31	14	55	23	31	49	8.1	4.3	4.4
29	36	22	22	27	-----	55	22	29	61	7.9	4.2	4.6
30	31	21	45	24	-----	77	22	27	38	7.5	4.0	4.8
31	24	-----	149	22	-----	67	-----	27	-----	11	4.0	-----
TOTAL	425.0	685	905	1,320	536	1,800	1,019	748	797.7	390.8	263.8	125.5
MFAN	13.7	22.8	29.2	42.6	19.1	58.1	34.0	24.1	26.6	12.6	8.51	4.18
MAX	55	29	149	134	32	95	67	36	69	30	31	8.6
MIN	4.1	19	20	18	14	16	22	18	9.7	7.2	4.0	3.0
CFSM	.63	1.05	1.34	1.95	.88	2.67	1.56	1.11	1.22	.58	.39	.19
IN.	.73	1.17	1.54	2.25	.91	3.07	1.74	1.28	1.36	.67	.45	.21

CAL YR 1972 TOTAL 5,878.7 MEAN 16.1 MAX 149 MIN 2.2 CFSM .74 TN 10.03
WTR YR 1973 TOTAL 9,015.8 MEAN 24.7 MAX 149 MIN 3.0 CFSM 1.13 TN 15.38

PEAK DISCHARGE (BASE, 80 FT³/s)

DATE	TIME	G.H.	DISCHARGE
12-31	1300	3.15	161
03-11	1700	2.44	99
03-14	1700	2.57	112
03-30	0600	2.28	83
06-06	0400	2.34	85

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04164300 East Branch Coon Creek at Armada, Mich.

LOCATION.--Lat 42°50'45", long 82°53'06", in NE¼ sec.23, T.5 N., R.13 E., Macomb County, on right bank 10 ft (3 m) downstream from bridge on Prospect Street in Armada.

DRAINAGE AREA.--13.0 mi² (33.7 km²).

PERIOD OF RECORD.--October 1958 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 735 ft (224.0 m) from topographic map (nearest 5 ft).

AVERAGE DISCHARGE.--15 years, 5.66 ft³/s (0.160 m³/s), 5.91 in/yr (150 mm/yr).

EXTREMES.--Current year: Maximum discharge, 594 ft³/s (16.8 m³/s) Dec. 31 (gage height, 5.55 ft or 1.692 m); minimum daily, 0.07 ft³/s (0.002 m³/s) Sept. 11-17.

Period of record: Maximum discharge, 751 ft³/s (21.3 m³/s) Apr. 17, 1967 (gage height, 6.14 ft or 1.871 m); no flow Jan. 25 to Feb. 10, 1961, result of freezeup.

REMARKS.--Records fair except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.41	4.5	5.2	136	4.4	2.0	52	2.3	3.7	9.9	1.2	.11
2	.37	11	4.4	64	46	14	35	2.6	5.1	5.1	2.9	.10
3	.32	17	4.3	35	53	31	19	3.3	7.3	3.9	5.1	.10
4	.29	10	3.5	53	16	42	14	2.7	13	2.9	2.7	.09
5	.26	5.9	3.6	23	11	67	10	2.4	43	2.4	1.4	.09
6	.25	4.4	25	7.9	7.6	102	8.0	2.0	119	2.0	.83	.08
7	.25	5.2	40	7.0	6.7	93	6.6	1.8	24	1.6	.62	.08
8	.23	33	16	5.5	5.5	73	5.6	2.7	11	1.3	.44	.08
9	.18	24	7.8	4.2	4.7	30	4.8	4.4	5.7	1.1	.68	.08
10	.17	12	5.2	3.0	3.9	46	5.6	9.1	3.8	1.1	.83	.08
11	.17	9.2	4.3	2.8	3.5	208	5.6	4.7	2.8	.71	.62	.07
12	.20	7.4	4.3	2.6	3.1	109	4.9	3.2	2.3	.65	.44	.07
13	.20	6.0	19	2.5	2.8	35	4.3	2.5	1.8	.65	.34	.07
14	.20	23	28	2.4	2.6	191	3.8	2.2	1.5	.70	.29	.07
15	.20	29	26	2.4	2.4	122	3.4	2.0	1.2	.70	.24	.07
16	.18	20	11	2.3	2.3	36	3.3	1.8	1.1	.54	.20	.07
17	.44	12	9.0	2.9	2.2	13	3.4	1.7	1.0	.48	.20	.07
18	.49	9.4	7.4	7.8	2.1	3.0	3.2	1.6	1.0	.39	.20	.10
19	.61	12	9.1	12	2.1	10	2.9	1.5	1.0	.35	.20	.14
20	.69	23	11	6.6	2.0	24	2.7	1.4	.95	.48	.29	.15
21	.80	27	17	4.5	2.0	33	2.5	1.3	.87	.62	.17	.22
22	1.7	16	26	24	2.0	35	4.9	1.2	.85	.62	.17	.27
23	16	9.9	37	35	2.0	40	6.5	1.3	.80	.39	.19	.17
24	19	6.5	41	12	2.0	69	4.4	1.3	.75	.34	.16	.17
25	11	5.3	38	6.8	2.0	108	3.3	1.2	.75	.34	.16	.18
26	5.7	7.3	38	6.2	2.0	82	2.6	1.3	6.4	.91	.16	.20
27	3.7	15	34	6.8	2.0	54	2.3	1.4	21	1.1	.14	.17
28	3.2	13	28	7.7	2.0	27	2.2	2.8	30	.62	.12	.16
29	11	7.6	18	5.4	-----	27	1.9	4.4	64	.44	.12	.16
30	11	5.3	125	4.7	-----	119	1.8	3.9	26	.39	.12	.17
31	7.0	-----	460	3.9	-----	36	-----	4.6	-----	.56	.11	-----
TOTAL	96.21	390.9	1,106.1	499.9	199.9	1,881.0	230.5	80.6	401.67	43.28	21.34	3.44
MEAN	3.10	13.0	35.7	16.1	7.14	60.7	7.68	2.60	13.4	1.40	.69	.12
MAX	19	33	460	136	53	208	52	9.1	119	9.9	5.1	.27
MIN	.17	4.4	3.5	2.3	2.0	2.0	1.8	1.2	.75	.34	.11	.07
CFSM	.24	1.00	2.75	1.24	.55	4.67	.59	.20	1.03	.11	.05	.009
IN.	.28	1.12	3.17	1.43	.57	5.38	.66	.23	1.15	.12	.06	.01
CAL YR 1972	TOTAL	3,135.97	MEAN	8.57	MAX	460	MIN	.16	CFSM	.66	IN	8.97
WTR YR 1973	TOTAL	4,955.04	MEAN	13.6	MAX	460	MIN	.07	CFSM	1.05	IN	14.18

PEAK DISCHARGE (BASE, 100 FT³/S)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
12-31	0700	5.55	594	03-24	2400	3.19	148
03-05	2400	3.63	215	03-26	2300	2.78	100
03-07	2200	3.04	129	03-30	0700	3.57	205
03-11	1400	4.82	432	06-06	0300	3.84	248
03-14	1600	4.67	402				

04164500 North Branch Clinton River near Mount Clemens, Mich.

LOCATION.--Lat 42°37'45", long 82°53'25", in SW¼ sec.35, T.3 N., R.13 E., Macomb County, 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 mi² (515 km²).

PERIOD OF RECORD.--May 1947 to current year.

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.

AVERAGE DISCHARGE.--26 years, 112 ft³/s (3.172 m³/s), 7.64 in/yr (194 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,200 ft³/s (62.3 m³/s) Jan. 1 (based on correlation with nearby stations); minimum 4.1 ft³/s (0.12 m³/s) Sept. 14, 15 (gage height, 4.03 ft or 1.228 m).

Period of record: Maximum discharge, 6,700 ft³/s (190 m³/s) Feb. 2, 1968 (gage height, 18.62 ft or 5.675 m); minimum, 0.2 ft³/s (0.006 m³/s) Sept. 13, 14, 1954, July 30, 1965; minimum gage height, 3.12 ft (0.951 m) Sept. 13, 14, 1954.

Flood of Apr. 5 or 6, 1947, reached a stage of 20.0 ft (6.10 m), from floodmark.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, which are poor. Some regulation at times by mill above station.

REVISIONS (WATER YEARS).--WSP 1437: 1948. WSP 1557: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	170	183	2,000	95	47	724	74	140	544	49	4.8
2	26	220	165	1,000	152	143	592	88	107	232	81	3.2
3	24	280	149	600	385	319	533	121	91	157	104	4.6
4	23	250	131	1,000	486	429	405	144	140	114	61	7.4
5	21	200	120	1,000	329	489	318	109	249	91	43	7.2
6	20	160	350	750	209	754	254	88	263	72	33	6.5
7	20	99	300	550	160	965	208	75	458	59	27	6.7
8	19	160	250	400	143	860	181	76	584	50	23	5.5
9	18	439	210	300	123	789	155	136	301	43	24	5.4
10	18	390	190	240	100	710	154	200	132	38	57	5.7
11	16	286	160	182	85	722	174	174	96	37	60	5.1
12	16	232	150	100	70	1,440	176	131	79	34	34	5.6
13	16	204	550	61	59	1,170	150	101	65	32	28	4.6
14	16	296	500	56	55	784	126	86	55	46	23	4.5
15	16	437	400	54	51	1,190	111	77	46	33	21	5.0
16	16	427	340	54	41	1,150	103	71	41	35	14	5.3
17	16	336	270	58	31	706	101	68	39	28	17	5.3
18	16	264	200	86	44	435	105	65	40	25	16	5.1
19	16	229	185	156	42	331	100	62	40	22	15	1.0
20	15	260	253	198	43	428	95	59	38	21	15	1.0
21	17	290	287	187	40	547	90	56	39	22	17	1.0
22	100	260	320	147	40	590	107	52	34	25	17	1.3
23	650	230	380	328	40	543	202	53	32	25	15	1.2
24	550	200	420	396	40	555	217	56	30	21	15	1.1
25	400	180	420	305	40	713	140	58	32	20	14	1.0
26	200	250	420	173	40	848	110	54	48	26	13	1.0
27	160	400	350	145	40	743	93	64	373	37	12	1.0
28	150	320	310	143	40	623	83	75	580	35	12	1.0
29	300	273	270	128	-----	452	76	119	675	29	9.4	1.0
30	270	220	500	100	-----	519	71	159	757	24	8.7	1.1
31	230	-----	1,500	95	-----	817	-----	139	-----	21	7.9	-----
TOTAL	3,401	7,962	10,233	10,992	3,023	20,811	5,964	2,800	5,614	2,012	896.0	262.5
MEAN	110	265	330	355	108	671	199	93.2	187	64.9	28.9	8.75
MAX	650	439	1,500	2,000	486	1,440	724	200	757	548	104	19
MIN	15	99	120	54	31	47	71	52	30	20	7.9	4.5
CFSM	.55	1.33	1.66	1.78	.54	3.37	1.00	.47	.94	.33	.15	.34
IN.	.64	1.49	1.91	2.05	.57	3.89	1.11	.54	1.05	.38	.17	.35

CAL YR 1972 TOTAL 50,774.0 MEAN 139 MAX 1,500 MIN 11 CFSM .70 IN 9.49
 WTR YR 1973 TOTAL 74,066.5 MEAN 203 MAX 2,000 MIN 4.5 CFSM 1.32 IN 13.34

PEAK DISCHARGE (BASE, 1,200 FT³/S)

NOTE.--No gage-height record Dec. 22 to Jan. 9.

DATE	TIME	G.H.	DISCHARGE
01-01	unknown	unknown	about 2,200
03-12	1500	13.48	1,640
03-16	0800	12.76	1,320

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04164800 Middle Branch Clinton River at Macomb, Mich.

LOCATION.--Lat 42°42'23", long 82°57'33", in SW¼ sec.5, T.3 N., R.13 E., Macomb County, 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 mi² (106.2 km²).

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.

AVERAGE DISCHARGE.--10 years, 22.9 ft³/s (0.649 m³/s), 7.58 in/yr (193 mm/yr).

EXTREMES.--Current year: Maximum discharge, 979 ft³/s (27.7 m³/s) Dec. 31 (gage height, 12.82 ft or 3.908 m); minimum daily, 3.2 ft³/s (0.091 m³/s) Sept. 12.

Period of record: Maximum discharge, 1,580 ft³/s (44.7 m³/s) June 26, 1968; maximum gage height, 16.16 ft (4.926 m) Mar. 12, 1962 (backwater from ice); minimum discharge, 0.10 ft³/s (0.003 m³/s) July 22, 1971; minimum gage height, 4.68 ft (1.426 m) July 11, 1964.

REMARKS.--Records good except those for the winter period, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	26	37	180	35	50	106	24	42	44	45	4.9
2	9.0	57	33	77	70	80	80	30	36	37	112	4.5
3	7.6	44	33	62	84	88	64	37	54	45	30	4.2
4	7.2	33	28	244	51	84	56	29	103	33	20	4.0
5	7.2	27	28	84	45	144	50	25	72	26	14	4.0
6	7.2	23	97	65	40	175	44	21	106	22	12	3.9
7	7.2	38	60	52	40	147	41	20	75	18	9.8	3.9
8	6.7	98	40	46	38	136	37	45	57	14	8.0	3.9
9	5.5	52	31	41	36	85	37	64	37	11	19	3.8
10	5.5	41	31	38	33	81	53	44	27	11	35	3.7
11	5.5	41	30	34	31	432	49	33	22	14	19	3.5
12	5.8	33	30	31	29	211	41	28	20	11	14	3.2
13	5.5	34	149	30	28	99	35	25	18	9.4	11	3.3
14	5.8	114	97	28	26	360	31	25	16	20	9.0	3.4
15	5.5	73	71	28	25	209	30	23	13	13	8.0	3.5
16	5.1	53	49	30	25	100	29	23	12	8.5	6.2	3.5
17	5.1	42	47	35	25	82	30	22	15	7.2	6.2	4.3
18	4.8	37	46	38	25	80	27	20	16	6.2	9.4	8.0
19	4.8	37	46	37	25	109	26	20	16	6.2	7.2	4.8
20	4.8	57	50	28	25	151	25	19	15	6.2	8.0	4.5
21	7.5	49	63	30	25	131	24	17	18	10	6.7	4.2
22	37	39	81	110	25	115	55	18	14	9.0	5.1	4.2
23	189	32	92	97	25	128	54	27	12	6.7	5.8	4.2
24	58	30	93	53	25	165	35	26	14	6.2	5.8	4.2
25	34	29	85	42	25	170	28	23	10	6.2	6.2	4.2
26	28	51	88	39	25	139	24	36	114	13	6.2	4.5
27	23	83	72	41	25	101	22	34	280	14	5.8	4.8
28	23	57	58	45	25	76	20	72	294	10	5.8	4.5
29	72	40	48	40	-----	74	19	92	207	8.5	5.1	5.5
30	42	37	301	35	-----	264	19	65	72	6.7	5.1	5.8
31	30	-----	803	35	-----	107	-----	62	-----	16	5.1	-----
TOTAL	670.3	1,407	2,817	1,775	936	4,373	1,191	1,049	1,807	469.0	465.5	128.9
MFAN	21.6	46.9	90.9	57.3	33.4	141	39.7	33.8	60.2	15.1	15.0	4.30
MAX	189	114	803	244	84	432	106	92	294	45	112	8.0
MIN	4.8	23	28	28	25	50	19	17	10	6.2	5.1	3.2
CFSM	.53	1.14	2.22	1.40	.81	3.44	.97	.82	1.47	.37	.37	.10
IN.	.61	1.28	2.56	1.61	.85	3.97	1.08	.95	1.64	.43	.42	.12

CAL YR 1972 TOTAL 10,812.5 MEAN 29.5 MAX 803 MIN 3.5 CFSM .72 IN 9.81
WTR YR 1973 TOTAL 17,088.7 MEAN 46.8 MAX 803 MIN 3.2 CFSM 1.14 IN 15.50

PEAK DISCHARGE (BASE, 300 FT³/S)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
10-23	0900	8.31	320	03-14	1800	10.73	670
12-31	0900	12.82	979	03-30	0600	8.94	416
01-04	0700	8.67	373	06-27	0100	11.10	726
03-05	2300	8.40	345	06-28	1600	10.10	575
03-11	1600	11.97	864	08-02	0100	8.46	346

04165500 Clinton River at Mount Clemens, Mich.

LOCATION.--Lat 42°35'45", long 82°54'35", Macomb County, 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 mi² (1,901 km²).

PERIOD OF RECORD.--May 1934 to current year.

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.

AVERAGE DISCHARGE.--39 years, 495 ft³/s (14.02 m³/s), 9.16 in/yr (233 mm/yr).

EXTREMES.--Current year: Maximum discharge, 5,390 ft³/s (153 m³/s) Dec. 31 (gage height, 11.69 ft or 3.563 m); minimum daily, 170 ft³/s (4.81 m³/s) Sept. 9, 10; minimum gage height, 4.29 ft (1.308 m) Oct. 1.
Period of record: Maximum discharge, 21,200 ft³/s (600 m³/s) Apr. 6, 1947 (gage height, 23.55 ft or 7.178 m, from floodmark); minimum not determined; minimum gage height, 2.72 ft (0.829 m) Nov. 29, 1963.

REMARKS.--Records fair.

REVISIONS (WATER YEARS).--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).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	340	622	668	4,800	700	700	2,430	600	800	1,330	1,700	220
2	300	897	623	2,700	1,100	875	2,010	650	700	808	1,040	200
3	260	1,070	596	1,800	1,300	1,180	1,720	800	900	1,050	491	190
4	250	837	580	3,300	1,200	1,230	1,400	700	1,100	637	450	200
5	240	689	580	2,500	1,000	1,510	1,280	600	1,150	620	350	210
6	260	599	1,420	1,700	847	2,100	1,140	560	1,110	550	320	200
7	280	667	1,190	1,300	834	2,100	1,020	520	1,390	480	300	190
8	260	1,500	847	1,200	822	2,000	902	723	1,410	430	300	185
9	250	1,200	776	1,000	736	1,700	1,040	1,140	971	410	500	170
10	260	1,010	671	850	687	1,500	1,190	950	629	430	1,400	170
11	260	836	650	750	676	3,000	967	800	620	410	1,200	180
12	270	725	700	660	626	3,800	973	700	660	400	384	180
13	260	694	2,130	620	607	2,500	754	600	580	400	400	200
14	250	1,420	1,760	600	571	3,000	738	560	480	550	370	210
15	210	1,820	1,410	592	539	3,700	701	540	410	530	340	200
16	200	1,290	1,250	596	436	2,800	706	520	390	480	310	190
17	210	1,020	894	588	450	2,000	694	520	700	380	300	210
18	210	1,000	804	700	450	1,500	711	500	560	350	330	220
19	200	900	822	800	480	1,900	667	450	480	320	370	220
20	190	1,070	950	850	468	2,260	686	430	450	350	300	210
21	220	1,080	1,110	800	509	2,100	604	420	500	370	290	200
22	1,000	954	1,310	1,460	480	1,980	1,290	430	450	400	250	190
23	3,000	822	1,300	1,970	470	1,870	1,590	550	420	270	240	180
24	1,500	708	1,300	1,610	450	1,960	1,040	500	400	270	240	180
25	800	664	1,300	1,320	450	2,180	834	450	380	260	240	190
26	700	999	1,200	978	450	2,330	709	500	1,000	800	230	210
27	700	1,100	1,100	850	450	2,090	620	600	3,410	850	230	200
28	750	1,000	1,000	850	500	1,750	560	900	2,420	800	240	300
29	1,200	905	900	800	-----	1,540	640	1,000	3,270	350	240	500
30	981	716	1,930	700	-----	2,940	620	950	2,030	270	230	266
31	770	-----	4,930	700	-----	2,540	-----	900	-----	460	230	-----
TOTAL	16,581	28,814	36,701	39,944	18,288	64,635	30,236	20,063	29,770	16,015	13,915	6,371
MEAN	535	960	1,184	1,289	653	2,085	1,008	647	992	517	449	212
MAX	3,000	1,820	4,930	4,800	1,300	3,800	2,430	1,140	3,410	1,330	1,700	500
MTN	190	599	580	588	436	700	560	420	380	260	230	170
CFSM	.73	1.31	1.61	1.76	.89	2.84	1.37	.88	1.35	.70	.61	.29
IN.	.84	1.46	1.86	2.02	.93	3.28	1.53	1.02	1.51	.81	.71	.32

CAL YR 1972 TOTAL 230,443 MEAN 630 MAX 4,930 MTN 130 CFSM .86 IN 11.68
WTR YR 1973 TOTAL 321,333 MEAN 880 MAX 4,930 MIN 170 CFSM 1.20 IN 16.29

PEAK DISCHARGE (BASE, 3,000 FT³/S)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
10-23	unknown	unknown	about 3,400	03-15	unknown	unknown	about 4,200
12-31	1400	11.69	5,390	03-30	1100	9.46	3,230
01-04	unknown	unknown	about 3,750	06-27	0600	10.56	3,910
03-12	unknown	unknown	about 4,300	06-29	0500	10.53	3,860

STREAMS TRIBUTARY TO DETROIT RIVER

04166000 River Rouge at Birmingham, Mich.

LOCATION.--Lat 42°32'45", long 83°13'25", in NW¼ sec.36, T.2 N., R.10 E., Oakland County, on left bank in Birmingham, 25 ft (8 m) downstream from mouth of Quarton Lake outlet, and 100 ft upstream from bridge on West Maple Road.

DRAINAGE AREA.--33.3 mi² (86.2 km²). Prior to water year 1971, drainage area 36.9 mi² (95.6 km²). An area of 3.6 mi² (9.3 km²) non-contributing since then.

PERIOD OF RECORD.--June 1950 to current year.

GAGE.--Water-stage recorder. Concrete control since July 27, 1962. Datum of gage is 715.94 ft (218.218 m) above mean sea level.

AVERAGE DISCHARGE.--20 years (1951-70) 15.3 ft³/s (0.433 m³/s), 5.63 in/yr (143 mm/yr).

EXTREMES.--Current year: Maximum discharge, 474 ft³/s (13.4 m³/s) June 26 (gage height, 4.76 ft or 1.451 m); minimum, 3.8 ft³/s (0.11 m³/s). Sept. 12, 13, 14 (gage height, 1.57 ft or 0.479 m).

Period of record: Maximum discharge, 1,390 ft³/s (39.4 m³/s) June 26, 1968 (gage height, 8.70 ft or 2.652 m); minimum, 0.10 ft³/s (0.003 m³/s) Aug. 8, 9, 1963; minimum gage height, 1.02 ft (0.311 m) Oct. 12, 1961.

REMARKS.--Records good. Occasional regulation by Quarton Lake above station.

REVISIONS (WATER YEARS).--WSP 1387: 1951-52 (M), WSP 1557: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	19	27	119	19	21	78	18	27	47	27	6.5
2	11	43	25	65	42	42	59	23	21	40	19	6.0
3	9.1	31	24	60	38	47	50	30	41	60	15	5.5
4	9.2	22	22	144	26	39	47	21	55	36	13	5.1
5	8.7	19	22	66	23	50	43	19	38	28	11	4.8
6	8.5	17	75	42	20	58	39	17	54	26	9.6	5.2
7	8.5	34	36	33	19	59	37	17	37	24	8.9	4.7
8	8.3	60	28	27	21	58	33	35	30	22	8.4	5.1
9	7.4	32	26	25	18	42	33	49	23	20	38	5.0
10	6.9	25	24	23	16	39	42	30	19	20	108	4.9
11	7.0	23	22	22	14	153	38	26	17	17	39	4.6
12	7.0	20	34	20	14	98	33	23	47	15	21	4.0
13	7.1	25	88	20	13	60	30	22	22	14	15	4.2
14	7.0	68	52	18	14	199	28	20	17	51	12	4.3
15	6.5	54	41	15	15	115	25	19	15	25	28	4.5
16	6.7	40	33	15	13	71	21	19	15	18	14	4.4
17	6.5	35	27	16	12	75	22	18	72	17	12	6.9
18	5.8	32	26	18	12	65	21	17	33	15	10	8.4
19	5.9	33	28	24	12	69	20	17	24	14	9.4	6.5
20	5.8	46	33	20	14	80	18	16	26	15	13	5.6
21	8.8	40	36	16	15	71	17	17	23	19	11	5.2
22	54	33	42	93	14	64	55	19	17	16	9.5	5.4
23	179	29	45	70	15	64	42	33	16	12	9.5	5.0
24	59	27	43	37	14	74	27	27	15	12	9.1	4.9
25	36	26	41	26	13	74	21	21	14	11	8.3	5.1
26	26	44	42	24	13	68	19	22	116	171	7.9	5.6
27	21	52	37	23	13	58	17	27	205	50	7.4	5.2
28	24	37	32	26	13	51	16	63	183	39	7.2	11
29	52	30	31	22	-----	56	15	47	151	23	6.8	17
30	29	27	145	18	-----	94	16	36	74	16	6.6	12
31	22	-----	300	16	-----	63	-----	33	-----	20	6.6	-----
TOTAL	666.7	1,023	1,487	1,163	485	2,177	962	801	1,447	913	521.2	182.6
MFAN	21.5	34.1	48.0	37.5	17.3	70.2	32.1	25.8	48.2	29.5	16.8	6.09
MAX	179	68	300	144	42	199	78	63	205	171	108	17
MIN	5.8	17	22	15	12	21	15	16	14	11	6.6	4.0
CFSM	.65	1.02	1.44	1.13	.52	2.11	.96	.77	1.45	.89	.50	.18
IN.	.74	1.14	1.66	1.30	.54	2.43	1.07	.89	1.62	1.02	.58	.20

CAL YR 1972 TOTAL 7,102.7 MEAN 19.4 MAX 300 MIN 3.4 CFSM .58 IN 7.93
WTR YR 1973 TOTAL 11,828.5 MEAN 32.4 MAX 300 MIN 4.0 CFSM .97 IN 13.21

PEAK DISCHARGE (BASE, 180 FT³/s)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
10-23	0600	3.62	248	06-26	2300	4.76	474
12-31	0500	4.33	379	06-28	2000	4.12	338
01-04	0700	3.26	188	07-26	1000	4.08	330
03-11	1300	3.57	240	08-10	1400	3.76	273
03-14	1300	3.77	275				

04166100 River Rouge at Southfield, Mich.

LOCATION.--Lat 42°26'52", long 83°17'52", in SW¼ sec.32, T.1 N., R.10 E., Oakland County, on right bank at downstream side of bridge on Beech Road at Southfield, 4.2 mi (6.8 m) east of Farmington.

DRAINAGE AREA.--87.9 mi² (227.7 km²).

PERIOD OF RECORD.--April 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is 609.62 ft (185.812 m) above mean sea level (city of Southfield benchmark). Prior to Sept. 30, 1958, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--15 years, 50.8 ft³/s (1.439 m³/s), 7.85 in/yr (199 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,530 ft³/s (43.3 m³/s) June 27 (gage height, 12.17 ft or 3.709 m); minimum, 13 ft³/s (0.37 m³/s) Sept. 25; minimum gage height, 2.84 ft (0.866 m) Sept. 15, 16.
Period of record: Maximum discharge, 4,900 ft³/s (139 m³/s) June 26, 1968 (gage height, 19.04 ft or 5.803 m); minimum, 0.1 ft³/s (0.003 m³/s) Aug. 2, 1964 (gage height, 1.15 ft or 0.351 m).

REMARKS.--Records fair except those for the winter period, which are poor.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	52	49	55	452	53	83	232	55	100	112	90	21
2	40	281	52	172	118	163	153	59	82	86	49	20
3	35	104	52	133	123	193	119	86	201	153	41	18
4	32	69	44	550	81	144	107	66	262	87	34	17
5	31	54	44	185	71	153	99	59	152	66	20	16
6	31	47	249	110	63	199	96	54	239	54	26	16
7	31	102	100	80	62	176	153	51	187	48	24	16
8	30	297	70	70	64	190	95	96	115	42	23	15
9	27	100	60	62	55	124	86	198	89	37	43	15
10	26	66	52	58	50	114	116	99	72	36	278	15
11	26	57	45	54	43	442	106	80	63	34	291	16
12	28	48	55	50	41	501	91	71	82	29	70	16
13	28	53	406	47	40	172	81	65	79	45	51	15
14	28	282	164	44	42	401	76	62	59	44	43	16
15	28	203	106	42	44	590	72	61	51	75	36	15
16	28	107	88	42	35	212	68	58	55	40	40	15
17	29	77	75	46	36	201	75	59	170	35	30	18
18	28	78	70	63	36	182	67	56	109	29	32	34
19	27	78	89	70	36	209	65	54	77	25	40	21
20	27	144	98	58	41	294	61	53	66	26	55	18
21	31	113	109	48	45	259	57	51	75	47	38	15
22	151	87	134	273	42	217	257	54	55	39	29	15
23	656	70	144	258	44	196	176	115	48	28	27	15
24	235	63	133	111	40	235	92	103	45	23	26	14
25	97	58	120	81	40	237	73	74	41	22	25	16
26	72	136	119	74	40	193	65	79	136	146	24	26
27	58	170	103	72	40	151	57	77	1,110	199	23	19
28	57	96	86	84	40	120	54	184	599	70	22	55
29	188	66	74	75	-----	125	50	207	710	47	20	154
30	92	56	376	60	-----	350	50	153	193	31	22	68
31	59	-----	970	50	-----	163	-----	150	-----	39	22	-----
TOTAL	2,308	3,211	4,342	3,574	1,465	6,989	2,949	2,689	5,322	1,794	1,612	750
MFAN	74.5	107	140	115	52.3	225	98.3	86.7	177	57.9	52.0	25.0
MAX	656	297	970	550	123	590	257	207	1,110	199	291	154
MIN	26	47	44	42	35	83	50	51	41	22	20	14
CFSM	.85	1.22	1.59	1.31	.60	2.56	1.12	.99	2.01	.66	.59	.29
IN.	.98	1.36	1.84	1.51	.62	2.96	1.25	1.14	2.25	.76	.68	.32
CAL YR 1972	TOTAL 25,312	MFAN 69.2	MAX 970	MIN 12	CFSM .79	IN 10.71						
WTR YR 1973	TOTAL 37,005	MFAN 101	MAX 1,110	MIN 14	CFSM 1.15	IN 15.66						

PEAK DISCHARGE (BASE, 500 FT³/S)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
10-23	1500	9.95	752	04-22	1900	8.69	503
12-13	0800	9.19	538	06-03	2400	8.57	548
12-31	0700	11.34	1,100	06-27	0600	12.17	1,530
01-04	0800	9.80	672	06-28	2100	10.85	1,080
03-11	2100	9.98	825	08-11	0500	9.22	634
03-15	0200	10.06	848				

STREAMS TRIBUTARY TO DETROIT RIVER

04166200 Evans Ditch at Southfield, Mich.

LOCATION.--Lat 42°27'28", long 83°16'03", in SE¼ sec.28, T.1 N., R.10 E., Oakland County, on right bank at Southfield, 20 ft (6 m) upstream from bridge on Nine-Mile Road, 1.6 mi (2.6 km) upstream from mouth, and 5.5 mi (8.8 km) east of Farmington.

DRAINAGE AREA.--9.49 mi² (24.58 km²).

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).

AVERAGE DISCHARGE.--15 years, 7.47 ft³/s (0.212 m³/s), 10.69 in/yr (272 mm/yr).

EXTREMES.--Current year: Maximum discharge, 670 ft³/s (19.0 m³/s) June 26 (gage height, 11.25 ft or 3.429 m); minimum daily, 1.6 ft³/s (0.045 m³/s) Sept. 16, 22.

Period of record: Maximum discharge, 903 ft³/s (25.6 m³/s) June 25, 1968 (gage height, 12.95 ft or 3.947 m), from rating curve extended above 410 ft³/s (11.6 m³/s); minimum, 0.01 ft³/s (<0.001 m³/s) Oct. 3, 1967; minimum gage height, 5.08 ft (1.548 m) Sept. 13, 1966.

REMARKS.--Records poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	5.0	6.5	6.0	6.0	9.0	25	4.0	4.9	10	61	2.6
2	3.0	25	6.0	25	20	15	15	5.0	3.5	9.0	7.3	2.2
3	2.6	10	5.5	20	10	21	12	8.0	60	50	4.5	2.4
4	2.3	7.0	5.5	70	8.0	15	10	5.0	19	10	3.8	2.4
5	2.1	5.5	5.5	30	6.5	15	9.0	4.0	8.4	7.0	2.9	2.4
6	2.0	4.5	25	10	5.8	20	9.0	3.5	28	5.5	2.9	2.2
7	1.9	9.0	10	7.5	5.5	17	15	3.0	15	5.0	2.9	2.4
8	1.8	40	8.0	6.0	5.5	19	10	9.0	5.8	4.5	2.6	2.2
9	1.8	10	6.5	5.0	5.0	14	8.5	20	4.9	4.1	62	2.2
10	1.7	6.7	5.5	4.1	4.5	11	11	5.0	4.1	3.7	94	2.2
11	1.7	5.5	5.5	4.0	4.0	40	10	3.5	3.8	3.4	13	2.2
12	1.7	5.0	8.0	4.0	4.0	40	9.0	3.3	11	3.1	5.8	2.2
13	1.7	5.0	50	4.0	4.0	20	8.0	3.1	4.5	2.8	4.5	1.8
14	1.7	45	20	4.0	4.0	35	7.5	3.0	3.5	2.5	5.3	1.8
15	1.7	25	15	4.0	4.0	70	7.0	2.8	3.8	2.2	2.9	2.5
16	1.7	15	12	4.5	3.5	25	6.5	2.7	17	2.2	3.2	1.6
17	1.7	10	10	5.5	3.5	20	8.0	2.6	61	2.4	9.8	15
18	1.7	9.0	10	6.5	3.5	18	6.5	2.5	7.3	2.6	11	4.9
19	1.7	10	12	8.5	3.8	20	6.0	2.5	5.3	3.0	16	2.0
20	1.7	25	14	7.0	4.1	30	5.5	2.5	4.9	8.2	30	2.4
21	1.7	15	16	6.0	4.2	20	5.5	2.5	4.5	5.6	4.9	2.0
22	15	10	17	60	4.2	19	30	2.5	4.1	2.6	3.5	1.6
23	100	8.0	17	40	4.2	19	10	30	4.1	2.6	2.9	1.8
24	20	7.0	17	20	4.0	20	6.6	4.1	4.5	3.7	2.9	2.0
25	10	7.5	15	10	3.9	25	5.5	3.8	3.8	3.5	2.9	13
26	7.0	10	14	7.5	3.9	20	5.0	3.8	114	106	2.9	5.3
27	5.5	30	13	7.0	3.9	15	4.5	13	106	19	2.9	2.6
28	6.0	10	11	8.0	5.0	12	4.0	39	128	38	4.1	43
29	35	8.0	10	7.0	-----	12	3.5	28	29	4.9	6.8	81
30	8.0	7.0	40	6.0	-----	40	3.5	20	13	4.1	16	3.5
31	5.5	-----	200	5.0	-----	15	-----	6.8	-----	17	4.3	-----
TOTAL	253.4	389.7	610.5	466.1	148.5	691.0	276.6	248.5	686.7	348.2	399.5	215.4
MEAN	8.17	13.0	19.7	15.0	5.30	22.3	9.22	8.02	22.9	11.2	12.9	7.18
MAX	100	45	200	70	20	70	30	39	128	106	94	41
MIN	1.7	4.5	5.5	4.0	3.5	9.0	3.5	2.5	3.5	2.2	2.6	1.6
CFSM	.86	1.37	2.08	1.58	.56	2.35	.97	.85	2.41	1.18	1.36	.76
IN	.94	1.53	2.39	1.83	.58	2.71	1.08	.97	2.69	1.36	1.57	.84

CAL YR 1972 TOTAL 3.093.7 MEAN 8.45 MAX 200 MIN 1.1 CFSM .89 IN 12.13

WTC YR 1973 TOTAL 4.734.1 MEAN 13.0 MAX 200 MIN 1.6 CFSM 1.37 IN 18.56

PEAK DISCHARGE (BASE, 200 FT³/S)

NOTE.--No gage-height record Oct. 1 to May 23.

DATE	TIME	G.H.	DISCHARGE
10-23	unknown	unknown	unknown
12-31	unknown	7.83	256
06-03	1800	7.81	247
06-17	0800	8.19	289
06-26	2100	11.25	670
06-28	1400	9.13	399
07-26	2200	7.67	218
08-09	2100	7.88	240
08-10	1800	9.13	383

STREAMS TRIBUTARY TO DETROIT RIVER

209

04166300 Upper River Rouge at Farmington, Mich.

LOCATION.--Lat 42°27'52", long 83°22'11", in NW¼ sec.27, T.1 N., R.9 E., Oakland County, on left bank 800 ft (244 m) downstream from bridge on Shiawassee Road at Farmington.

DRAINAGE AREA.--17.5 mi² (45.3 km²).

PERIOD OF RECORD.--March 1958 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 690.4 ft (210.43 m) above mean sea level.

AVERAGE DISCHARGE.--15 years, 9.98 ft³/s (0.283 m³/s), 7.74 in/yr (197 mm/yr).

EXTREMES.--Current year: Maximum discharge, 252 ft³/s (7.14 m³/s) Dec. 30 (gage height, 4.79 ft or 1.460 m); minimum, 1.8 ft³/s (0.051 m³/s) Sept. 14, 15, 16; minimum gage height, 2.80 ft (0.853 m) Feb. 27.
Period of record: Maximum discharge, 1,500 ft³/s (42.5 m³/s) June 25, 1968 (gage height, 8.70 ft or 2.652 m); minimum, 0.07 ft³/s (0.002 m³/s) Aug. 30, 1966, result of regulation; minimum daily, 0.32 ft³/s (0.009 m³/s) Aug. 10, 1964, Aug. 29, 1966.

REMARKS.--Records good except those for the winter period, which are fair.

REVISIONS (WATER YEARS).--WSP 1912: 1959 (M), 1960 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.7	9.1	12	83	13	16	51	12	19	12	12	3.5
2	4.0	22	11	42	26	34	41	16	14	16	7.2	2.9
3	3.5	16	11	36	29	44	34	19	42	25	5.6	2.6
4	3.2	13	9.7	83	20	38	30	16	50	15	4.8	2.4
5	3.1	10	9.5	38	17	38	26	14	38	10	4.0	2.5
6	3.0	9.3	33	21	15	40	23	11	123	8.4	3.6	2.5
7	3.0	19	18	18	14	41	21	11	48	7.1	3.2	2.2
8	2.8	37	15	15	12	40	19	27	30	6.4	3.1	2.2
9	2.6	23	13	12	11	31	19	39	21	5.5	19	2.2
10	2.5	17	12	10	10	30	24	23	15	6.5	46	2.1
11	2.5	14	10	9.2	9.5	91	22	18	12	5.8	14	2.2
12	2.6	12	13	8.1	9.8	75	20	15	11	5.6	8.2	3.0
13	2.7	13	43	7.8	8.9	44	18	13	10	4.7	6.2	3.5
14	2.6	34	31	7.8	9.2	88	16	12	9.0	4.4	5.4	2.2
15	2.6	27	24	7.8	9.1	81	15	12	7.6	3.9	4.6	2.1
16	2.7	20	16	8.0	8.5	47	16	10	11	3.7	4.1	2.1
17	2.3	17	15	10	8.0	40	16	9.7	36	3.4	3.9	3.7
18	2.3	15	16	18	8.0	34	15	9.1	16	3.0	4.5	4.7
19	2.3	15	15	21	8.5	52	14	8.2	12	3.1	4.2	2.9
20	2.3	22	18	15	9.0	58	13	7.8	15	4.5	8.8	2.6
21	3.0	19	22	12	9.4	52	13	7.3	12	5.8	5.3	2.5
22	21	17	26	52	8.5	48	47	8.8	8.9	4.1	4.3	2.6
23	65	14	27	43	8.8	48	38	21	7.6	3.2	3.8	2.6
24	24	12	26	23	9.2	55	24	18	7.4	3.2	3.9	2.3
25	15	12	24	18	8.5	60	19	12	6.2	3.5	3.7	2.6
26	11	19	24	17	8.5	53	16	12	37	14	3.2	3.5
27	8.7	23	21	17	8.5	45	14	18	35	9.9	3.1	2.6
28	9.1	17	19	20	8.5	36	12	34	44	9.1	2.7	13
29	24	14	17	14	-----	37	11	26	24	6.2	2.7	27
30	14	12	89	13	-----	56	11	34	16	4.6	2.7	10
31	11	-----	188	11	-----	40	-----	27	-----	11	3.1	-----
TOTAL	263.1	523.4	828.2	710.7	325.4	1,492	658	520.9	737.7	228.6	210.9	122.8
MFAN	8.49	17.4	26.7	22.9	11.6	48.1	21.9	16.8	24.6	7.37	6.80	4.09
MAX	65	37	188	83	29	91	51	39	123	25	46	27
MIN	2.3	9.1	9.5	7.8	8.0	16	11	7.3	6.2	3.0	2.7	2.1
CFSM	.49	.99	1.53	1.31	.66	2.75	1.25	.96	1.41	.42	.39	.23
IN.	.56	1.11	1.76	1.51	.69	3.17	1.40	1.11	1.57	.49	.45	.26

CAL YR 1972 TOTAL 4,229.9 MEAN 11.6 MAX 188 MIN 1.9 CFSM .66 IN 8.99
WTR YR 1973 TOTAL 6,621.7 MEAN 18.1 MAX 188 MIN 2.1 CFSM 1.03 IN 14.08

PEAK DISCHARGE (BASE, 80 FT³/S)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
10-23	1000	3.88	92	04-22	1300	3.79	82
12-30	2200	4.79	252	06-03	1700	3.87	92
01-04	0300	4.02	117	06-06	0500	4.53	203
03-11	2200	4.13	145	06-26	2100	3.98	108
03-14	1900	4.07	134	08-10	1600	3.92	98

STREAMS TRIBUTARY TO DETROIT RIVER

04166500 River Rouge at Detroit, Mich.

LOCATION.--Lat 42°22'20", long 83°15'20", in SW¼ sec.27, T.1 S., R.10 E., Wayne County, 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 mi² (484 km²).

PERIOD OF RECORD.--October 1930 to current year. Monthly discharge only for some periods, published in WSP 1307.

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.

AVERAGE DISCHARGE.--43 years 108 ft³/s (3.059 m³/s), 7.84 in/yr (199 mm/yr).

EXTREMES.--Current year: Maximum discharge, 2,300 ft³/s (65.1 m³/s) June 27 (based on correlation with nearby station); minimum daily, 23 ft³/s (0.65 m³/s) Sept. 8-16.

Period of record: Maximum discharge, 13,000 ft³/s (368 m³/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 ft³/s (0.051 m³/s) Aug. 1, 2, 1964 (gage height, 3.00 ft or 0.914 m).

REMARKS.--Records good except those for the winter period and those for periods of no gage-height record, which are poor.

REVISIONS (WATER YEARS).--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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	71	123	126	1,000	118	140	457	103	182	200	150	29
2	52	288	122	400	214	270	348	115	141	150	90	28
3	44	252	120	350	239	306	270	155	248	200	70	27
4	40	165	106	1,000	164	252	250	120	416	150	55	26
5	38	140	101	400	141	275	222	102	283	110	45	25
6	36	126	372	250	123	368	196	93	357	95	40	24
7	35	191	235	200	118	313	166	87	352	80	35	24
8	34	553	155	150	122	350	175	202	206	70	35	23
9	30	272	132	140	101	241	164	344	158	65	70	23
10	29	192	117	130	90	222	239	185	131	60	430	23
11	26	164	105	120	85	772	202	140	109	55	450	23
12	28	142	128	110	80	1,000	170	119	151	50	150	23
13	27	149	606	100	75	368	149	108	164	75	85	23
14	27	449	335	95	80	776	135	104	100	75	74	23
15	27	424	211	85	85	1,030	129	98	87	120	65	23
16	29	246	163	85	75	427	118	94	168	65	85	23
17	28	198	141	90	70	411	139	92	252	49	45	35
18	27	177	188	100	70	384	118	89	192	51	50	55
19	26	173	156	142	70	500	113	85	128	56	60	45
20	26	267	170	114	75	657	108	83	110	428	85	30
21	38	222	193	82	85	561	102	80	125	245	65	29
22	244	177	234	434	80	471	628	96	91	168	50	29
23	869	150	250	465	85	400	418	222	80	87	45	28
24	488	135	233	221	80	450	189	186	75	66	40	29
25	188	128	214	153	75	460	144	123	70	213	38	30
26	146	234	209	138	75	398	123	124	300	265	37	55
27	122	319	190	133	75	331	108	151	1,900	91	36	33
28	126	207	154	149	75	271	99	332	1,000	73	35	98
29	320	155	134	120	-----	301	92	362	1,200	63	34	375
30	213	133	485	100	-----	682	91	295	600	50	33	158
31	143	-----	1,600	90	-----	367	-----	286	-----	60	31	-----
TOTAL	3,577	6,551	7,685	7,146	2,825	13,754	5,862	4,775	9,376	3,585	2,613	1,419
MEAN	115	218	248	231	101	444	195	154	313	116	84.3	47.3
MAX	869	553	1,600	1,000	239	1,030	628	362	1,900	428	450	375
MIN	26	123	101	82	70	140	91	80	70	49	31	23
CFSM	.62	1.17	1.33	1.24	.54	2.37	1.04	.82	1.67	.62	.45	.25
IN.	.71	1.30	1.53	1.42	.56	2.74	1.17	.95	1.87	.71	.52	.28

CAL YR 1972 TOTAL 46,519 MEAN 127 MAX 1,600 MIN 19 CFSM .68 IN 9.25
WTR YR 1973 TOTAL 69,168 MEAN 190 MAX 1,900 MIN 23 CFSM 1.02 IN 13.76

PEAK DISCHARGE (BASE, 1,200 FT³/S)

NOTE.--No gage-height record June 23 to July 16, July 31 to Sept. 19.

DATE	TIME	G.H.	DISCHARGE
12-31	unknown	unknown	about 1,900
01-04	unknown	unknown	about 1,250
03-12	0100	11.72	1,390
03-15	0200	11.28	1,280
06-27	unknown	unknown	about 2,300
06-29	unknown	unknown	about 1,500

STREAMS TRIBUTARY TO DETROIT RIVER

211

04167000 Middle River Rouge near Garden City, Mich.

LOCATION.--Lat 42°20'55", long 83°18'45", in W½ sec.6, T.2 S., R.10 E., Wayne County, 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 mi² (258.7 km²).

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.

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.

AVERAGE DISCHARGE.--29 years 64.4 ft³/s (1.824 m³/s), 8.75 in/yr (222 mm/yr).

EXTREMES.--Current year: Maximum discharge, 619 ft³/s (17.5 m³/s) Dec. 31 (gage height, 7.17 ft or 2.185 m); minimum, 8.4 ft³/s (0.24 m³/s) Oct. 18 (gage height, 1.68 ft or 0.512 m).

Period of record: Maximum discharge, 2,330 ft³/s (66.0 m³/s) June 26, 1968; maximum gage height, 10.50 ft (3.200 m) May 10, 1948; minimum discharge, 0.9 ft³/s (0.025 m³/s) Aug. 16, 1956.

REMARKS.--Records good except those for the winter period, which are poor. Occasional regulation by reservoirs above station since 1956.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	25	48	535	68	57	268	59	126	67	234	31
2	22	120	50	316	119	118	213	69	92	109	78	27
3	21	57	45	223	141	169	164	73	128	163	52	25
4	19	43	41	401	120	170	152	68	135	89	42	24
5	20	29	43	256	98	192	131	59	162	68	36	24
6	18	22	189	156	86	229	114	51	144	55	33	24
7	17	88	100	100	81	228	102	49	143	47	32	22
8	15	172	75	85	70	227	87	144	104	40	34	21
9	13	84	67	70	60	189	100	162	78	35	164	21
10	12	59	59	60	55	156	130	150	61	75	214	21
11	13	49	51	50	50	431	108	106	52	48	131	21
12	13	34	112	45	45	432	94	78	51	36	79	20
13	12	50	275	43	43	286	82	64	45	35	56	20
14	12	211	160	42	51	386	71	57	44	32	47	20
15	11	146	126	41	52	398	64	54	40	31	42	20
16	10	90	102	40	45	277	63	51	72	29	39	19
17	11	70	91	38	45	246	71	47	56	28	37	30
18	9.4	58	79	50	45	216	66	43	42	28	34	37
19	9.6	58	77	72	45	271	63	42	42	27	33	26
20	9.2	90	92	71	45	323	60	40	47	121	83	23
21	24	74	102	56	50	303	58	38	45	86	49	21
22	156	67	118	223	49	275	345	47	42	37	35	21
23	250	57	132	229	42	243	262	109	35	31	32	21
24	107	48	133	156	41	255	174	85	37	29	30	19
25	60	47	133	107	39	274	115	70	31	30	29	27
26	37	101	131	91	38	263	88	65	171	128	27	35
27	28	104	117	87	38	226	73	105	272	85	27	23
28	38	77	99	98	38	183	63	171	345	205	27	61
29	125	63	88	88	-----	208	53	249	173	58	27	159
30	53	54	278	71	-----	325	51	231	90	41	29	78
31	34	-----	579	63	-----	219	-----	177	-----	83	38	-----
TOTAL	1,207.2	2,247	3,792	3,963	1,699	7,775	3,485	2,813	2,905	1,976	1,850	941
MFAN	38.9	74.9	122	128	60.7	251	116	90.7	96.8	63.7	59.7	31.4
MAX	250	211	579	535	141	432	345	249	345	205	234	159
MIN	9.2	22	41	38	38	57	51	38	31	27	27	19
CFSM	.39	.75	1.22	1.28	.61	2.51	1.16	.91	.97	.64	.60	.31
IN.	.45	.84	1.41	1.48	.63	2.90	1.30	1.05	1.08	.74	.69	.35

CAL YR 1972 TOTAL 21,073.8 MEAN 57.6 MAX 579 MIN 5.9 CFSM .58 IN 7.85
WTR YR 1973 TOTAL 34,653.2 MEAN 94.9 MAX 579 MIN 9.2 CFSM .95 IN 12.90

PEAK DISCHARGE (BASE, 700 FT³/S).--No peak above base.

STREAMS TRIBUTARY TO DETROIT RIVER

04168000 Lower River Rouge at Inkster, Mich.

LOCATION.--Lat 42°18'00", long 83°18'00", in S½ sec.19, T.2 S., R.10 E., Wayne County, 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 mi² (215.5 km²).

PERIOD OF RECORD.--June 1947 to current year.

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.

AVERAGE DISCHARGE.--26 years, 48.0 ft³/s (1.359 m³/s), 7.83 in/yr (199 mm/yr).

EXTREMES.--Current year: Maximum discharge, 865 ft³/s (24.5 m³/s) Mar. 12 (gage height, 8.66 ft or 2.640 m); minimum, 1.6 ft³/s (0.045 m³/s) Oct. 18 (gage height, 2.77 ft or 0.844 m).

Period of record: Maximum discharge, 3,600 ft³/s (102 m³/s) June 26, 1968 (gage height, 13.62 ft or 4.151 m); minimum, 0.2 ft³/s (0.006 m³/s) Sept. 13, 1955, Jan. 23, 1961.

REMARKS.--Records fair except those for the winter period, which are poor.

REVISIONS (WATER YEARS).--WSP 1174: 1948 (M), WSP 1437: 1949. WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	8.6	38	390	47	33	242	29	105	52	236	6.0
2	8.4	57	37	140	118	113	169	46	64	69	154	5.1
3	6.0	51	35	114	179	175	109	38	123	157	52	4.4
4	5.0	30	30	426	108	160	92	31	154	72	31	4.1
5	4.6	22	43	210	86	175	81	26	125	40	21	4.4
6	4.2	15	182	70	70	311	64	22	80	29	16	3.7
7	4.4	48	100	50	64	228	54	22	58	22	14	3.5
8	4.1	138	58	40	61	249	47	75	41	16	12	3.7
9	4.1	78	41	33	46	135	60	110	28	11	171	3.7
10	3.7	36	31	30	40	121	91	66	21	30	215	3.5
11	3.3	28	28	23	30	465	94	46	17	18	94	3.5
12	3.3	23	100	17	27	663	64	39	15	14	40	3.7
13	2.8	31	250	16	25	221	50	30	13	9.0	26	3.9
14	3.0	173	150	15	24	309	42	26	11	8.1	20	3.9
15	3.5	194	110	15	23	481	38	25	9.0	6.8	16	3.5
16	4.4	79	80	15	22	205	39	24	21	5.9	14	3.9
17	3.0	55	65	17	21	199	38	21	15	5.0	12	11
18	1.9	48	45	27	19	182	35	20	11	4.7	11	7.3
19	2.4	48	59	44	22	281	33	17	11	4.4	9.4	4.4
20	3.5	77	73	39	28	413	32	16	12	165	37	3.7
21	10	76	104	31	28	375	30	15	11	85	17	3.5
22	50	53	143	171	28	308	288	32	9.8	29	10	3.5
23	99	44	168	270	28	243	373	65	9.2	15	8.2	3.7
24	48	37	166	123	24	264	128	72	10	11	7.8	3.5
25	20	35	165	75	20	240	77	46	7.5	12	7.0	3.0
26	9.5	68	149	75	21	185	56	35	111	50	6.3	3.9
27	5.8	128	116	73	21	142	44	56	151	39	6.0	3.5
28	9.0	81	83	91	23	95	37	144	263	399	5.4	32
29	48	52	69	60	-----	127	30	299	308	150	4.7	193
30	34	40	242	40	-----	389	27	234	95	49	4.4	57
31	16	-----	724	41	-----	207	-----	259	-----	92	4.7	-----
TOTAL	437.9	1,853.6	3,684	2,781	1,253	7,694	2,564	1,986	1,909.5	1,669.9	1,282.9	397.5
MEAN	14.1	61.8	119	89.7	44.8	248	85.5	64.1	63.7	53.9	41.4	13.3
MAX	99	194	724	426	179	663	373	299	308	399	236	193
MIN	1.9	8.6	28	15	19	33	27	15	7.5	4.4	4.4	3.0
CFSM	.17	.74	1.43	1.08	.54	2.98	1.03	.77	.77	.65	.50	.16
TN	.20	.83	1.55	1.24	.56	3.44	1.15	.89	.85	.75	.57	.18

CAL YR 1972 TOTAL 16,292.7 MEAN 44.5 MAX 725 MIN 1.5 CFSM .53 TN 7.28
 WTR YR 1973 TOTAL 27,513.3 MEAN 75.4 MAX 724 MIN 1.9 CFSM .91 TN 12.30

PEAK DISCHARGE (BASE, 900 FT³/S).--No peak above base.

04169500 Huron River at Commerce, Mich.

LOCATION.--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 ft (3 m) upstream from Hayes Creek, and 0.2 mi (0.3 km) east of Commerce. Records include flow of Hayes Creek.

DRAINAGE AREA.--57.3 mi² (148.4 km²), includes that of Hayes Creek.

PERIOD OF RECORD.--March 1946 to current year.

GAGE.--Nonrecording gage. Datum of gage is 910.00 ft (277.368 m) above mean sea level.

AVERAGE DISCHARGE.--27 years, 36.3 ft³/s (1.028 m³/s), 8.60 in/yr (218 mm/yr).

EXTREMES.--Current year: Maximum discharge, 117 ft³/s (3.31 m³/s) Mar. 31 (gage height, 2.24 ft or 0.683 m); minimum, 9.0 ft³/s (0.25 m³/s) Sept. 13, 14, 15, 16 (gage height, 0.45 ft or 0.137 m).

Period of record: Maximum discharge, 266 ft³/s (7.53 m³/s) Apr. 7, 1947 (gage height, 2.98 ft or 0.908 m, from graph based on gage readings); maximum gage height, 3.10 ft (0.945 m) May 12, 1948, from graph based on gage readings (backwater from debris); minimum discharge, 3.3 ft³/s (0.093 m³/s) Nov. 1, 1971; minimum gage height, 0.52 ft (0.158 m) July 16, 1962.

REMARKS.--Records fair. Some regulation by dams operated for lake-level control at outlets of Pontiac, Oxbow, and Union Lakes.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	39	45	98	79	55	115	69	65	52	27	18
2	26	40	45	96	80	57	113	70	65	53	26	18
3	26	38	45	98	80	57	110	70	71	57	27	18
4	23	38	44	105	78	56	107	68	68	64	28	17
5	21	38	47	99	78	59	104	65	66	61	26	15
6	20	37	52	95	75	60	104	66	84	55	25	14
7	18	41	52	91	71	64	104	64	83	50	24	12
8	18	42	52	87	69	66	104	83	82	45	24	12
9	17	44	52	88	66	69	102	83	79	43	26	12
10	18	42	52	86	64	88	102	79	78	40	25	11
11	18	41	55	82	61	86	98	75	77	39	25	10
12	17	41	59	80	61	79	95	71	76	38	26	9.8
13	18	44	61	78	60	76	92	70	70	38	26	9.2
14	18	47	59	77	59	90	88	67	64	52	26	9.0
15	18	48	58	75	58	96	84	65	60	47	25	9.0
16	18	49	56	72	57	96	85	64	55	43	24	9.2
17	18	49	57	72	56	106	84	62	51	37	24	12
18	18	49	56	72	55	110	82	59	45	33	22	13
19	18	49	56	72	55	105	80	57	42	29	22	13
20	19	48	56	72	54	105	76	58	37	33	22	12
21	34	48	57	74	54	107	72	58	31	40	22	12
22	53	48	56	76	53	105	82	58	29	34	23	11
23	59	48	57	78	53	105	80	63	26	31	23	11
24	52	48	57	78	53	106	79	72	26	26	22	11
25	53	48	59	79	51	109	77	68	27	20	23	10
26	57	48	60	79	51	113	76	66	28	23	22	11
27	59	48	58	79	52	114	73	70	30	20	22	11
28	61	47	58	83	52	114	71	70	34	18	21	12
29	53	46	58	81	-----	116	70	67	40	17	20	14
30	40	45	72	79	-----	116	70	69	42	18	18	16
31	41	-----	89	80	-----	117	-----	66	-----	18	18	-----
TOTAL	958	1,338	1,740	2,561	1,735	2,802	2,679	2,092	1,631	1,174	734	372.2
MEAN	30.9	44.6	56.1	82.6	62.0	90.4	89.3	67.5	54.4	37.9	23.7	12.4
MAX	61	49	89	105	80	117	115	83	84	64	28	18
MIN	17	37	44	72	51	55	70	57	26	17	18	9.0
CFSM	.54	.78	.98	1.44	1.08	1.58	1.56	1.18	.95	.66	.41	.22
IN.	.62	.87	1.13	1.66	1.13	1.82	1.74	1.36	1.06	.76	.48	.24
CAL YR 1972	TOTAL 11,847.6	MEAN 32.4	MAX 89	MIN 9.2	CFSM .57	IN 7.69						
WTR YR 1973	TOTAL 19,816.2	MEAN 54.3	MAX 117	MIN 9.0	CFSM .95	IN 12.86						

STREAMS TRIBUTARY TO LAKE ERIE

04170000 Huron River at Milford, Mich.

LOCATION.--Lat 42°34'44", long 83°37'36", in NE¼ sec.16, T.2 N., R.7 E., Oakland County, 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 mi² (342 km²).

PERIOD OF RECORD.--September 1948 to current year.

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 (73.2 m) upstream at same datum.

AVERAGE DISCHARGE.--25 years, 93.2 ft³/s (2.639 m³/s), 9.59 in/yr (244 mm/yr).

EXTREMES.--Current year: Maximum discharge, 289 ft³/s (8.18 m³/s) Mar. 17 (gage height, 6.65 ft or 2.027 m); minimum, 6.2 ft³/s (0.18 m³/s) Sept. 4 (gage height, 3.91 ft or 1.192 m).

Period of record: Maximum discharge, 645 ft³/s (18.3 m³/s) Apr. 5, 1950; maximum gage height, 8.26 ft (2.518 m) June 28, 1968; minimum daily discharge, 5.2 ft³/s (0.15 m³/s) Oct. 21, 1971.

REMARKS.--Records good. Flow below about 300 cfs regulated by powerplant 1.5 mi (2.4 km) above station prior to May 20, 1957; occasional regulation for lake level control since.

REVISIONS (WATER YEARS).--WSP 1337: 1952 (m). WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	88	122	108	264	156	116	266	142	183	167	70	54
2	85	127	107	261	172	132	266	137	176	156	68	53
3	84	120	104	244	181	144	266	139	177	166	67	54
4	80	118	101	258	178	153	261	145	183	163	67	29
5	72	111	99	254	170	160	254	142	207	152	68	33
6	70	111	116	240	159	172	238	139	223	94	66	48
7	66	111	116	222	156	183	228	134	230	90	56	48
8	62	129	114	204	153	191	212	152	235	99	52	45
9	59	133	109	189	149	189	205	185	225	89	90	44
10	58	123	108	182	146	182	201	195	211	94	163	42
11	57	114	104	174	139	201	199	184	188	95	152	40
12	54	109	111	166	132	235	198	178	177	98	113	37
13	53	109	140	163	130	243	191	170	202	100	112	30
14	52	126	145	156	130	260	185	162	190	129	74	27
15	52	132	142	145	129	276	181	153	161	127	66	27
16	52	130	132	141	123	278	183	142	137	117	61	25
17	52	126	126	143	122	285	191	133	149	122	52	38
18	57	120	124	157	119	278	189	121	124	117	53	56
19	55	119	124	174	118	279	184	115	118	89	55	55
20	51	121	128	168	121	282	178	112	126	77	77	54
21	54	122	130	154	122	279	171	112	118	71	78	54
22	90	120	131	165	121	273	180	112	69	69	76	54
23	152	115	134	180	122	266	199	129	74	70	71	57
24	164	111	132	174	119	263	193	135	102	55	64	55
25	156	110	131	164	118	266	178	136	96	62	64	53
26	139	114	132	162	116	270	165	140	94	72	63	55
27	123	120	132	160	111	272	154	143	95	67	59	50
28	121	119	129	163	110	265	144	170	127	74	52	63
29	132	115	129	159	-----	262	144	186	154	69	52	87
30	127	110	151	159	-----	268	141	192	168	59	54	94
31	126	-----	227	159	-----	269	-----	187	-----	66	56	-----
TOTAL	2,643	3,567	3,916	5,704	3,822	7,192	5,945	4,622	4,719	3,095	2,271	1,451
MEAN	85.3	119	126	184	137	232	198	149	157	99.8	73.3	48.7
MAX	164	133	227	264	181	285	266	195	235	183	163	94
MIN	51	109	99	141	110	116	141	112	69	55	52	25
CFSM	.65	.90	.95	1.39	1.04	1.76	1.50	1.13	1.19	.76	.56	.37
IN.	.74	1.01	1.10	1.61	1.08	2.03	1.68	1.30	1.33	.87	.64	.41

CAL YR 1972 TOTAL 31.055 MEAN 84.8 MAX 227 MIN 29 CFSM .64 IN 8.75
WTR YR 1973 TOTAL 48.957 MEAN 134 MAX 285 MIN 25 CFSM 1.02 IN 13.80

STREAMS TRIBUTARY TO LAKE ERIE

215

04170500 Huron River near New Hudson, Mich.

LOCATION.--Lat 42°30'45", long 83°40'35", in NE¼ sec.1, T.1 N., R.6 E., Livingston County, 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 mi² (383 km²).

PERIOD OF RECORD.--August 1948 to current year.

GAGE.--Water-stage recorder. Datum of gage is 868.00 ft (264.566 m) above mean sea level.

AVERAGE DISCHARGE.--25 years, 106 ft³/s (3.002 m³/s), 9.73 in/yr (247 mm/yr).

EXTREMES.--Current year: Maximum discharge, 354 ft³/s (10.0 m³/s) Mar. 17; maximum gage height, 3.42 ft (1.042) July 2; minimum daily discharge, 37 ft³/s (1.05 m³/s) Sept. 15, 16.

Period of record: Maximum discharge, 1,080 ft³/s (3.06 m³/s) Dec. 29, 1950 (gage height, 5.05 ft or 1.539 m), from rating curve extended above 600 ft³/s (17.0 m³/s) by logarithmic plotting; minimum, 2.6 ft³/s (0.074 m³/s) May 27, 1963 (gage height, 0.53 ft or 0.162 m).

REMARKS.--Records fair. Occasional regulation by Kent Lake.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	81	178	184	260	175	142	290	136	164	218	86	68
2	80	153	210	277	184	152	177	139	164	213	79	67
3	77	140	170	275	194	166	99	141	171	224	74	69
4	76	131	175	286	197	180	106	108	177	222	69	65
5	70	149	218	282	196	193	175	83	195	213	65	45
6	69	166	185	270	185	201	157	106	215	181	66	45
7	64	144	164	257	179	210	150	118	221	131	62	46
8	56	148	154	241	178	230	187	139	230	119	53	44
9	50	142	148	227	173	240	202	163	230	117	94	52
10	47	137	145	212	169	250	207	174	221	108	160	47
11	46	183	138	202	165	260	211	172	208	104	169	46
12	49	204	143	193	159	280	216	168	211	94	159	43
13	45	167	162	186	153	300	165	160	214	92	139	40
14	46	171	165	181	156	300	107	151	227	118	126	38
15	41	146	168	174	155	300	145	146	224	132	100	37
16	41	143	167	168	150	314	167	136	227	131	82	37
17	43	138	157	166	146	341	195	126	218	124	68	42
18	44	182	152	172	142	325	201	115	211	127	61	56
19	45	198	147	184	141	313	204	106	195	114	57	62
20	43	167	149	188	141	308	200	97	195	106	83	66
21	49	149	149	182	151	303	191	92	194	98	84	66
22	81	144	149	188	146	296	205	94	175	79	80	67
23	130	133	150	196	153	291	214	113	138	69	78	69
24	145	185	152	197	158	284	215	116	145	61	76	69
25	143	208	150	191	144	291	208	109	146	48	74	68
26	135	173	153	185	143	293	194	112	142	62	74	86
27	128	154	151	183	141	288	179	116	152	64	75	128
28	125	166	149	186	137	287	149	139	184	71	72	112
29	133	208	150	181	-----	288	107	156	213	69	64	125
30	125	171	171	178	-----	292	118	167	218	61	63	119
31	165	-----	222	178	-----	295	-----	164	-----	83	65	-----
TOTAL	2,472	4,878	5,047	6,446	4,511	8,218	5,341	4,062	5,825	3,653	2,656	1,929
MEAN	79.7	163	163	208	161	265	178	131	194	118	85.7	64.3
MAX	165	208	222	286	197	341	290	174	230	224	169	128
MIN	41	131	138	166	137	142	99	83	138	48	53	37
CFSM	.54	1.10	1.10	1.41	1.09	1.79	1.20	.89	1.31	.80	.58	.43
IN.	.62	1.23	1.27	1.62	1.13	2.07	1.34	1.02	1.46	.92	.67	.48

CAL YR 1972 TOTAL 34,723 MEAN 94.9 MAX 222 MIN 20 CFSM .64 IN 8.73
WTR YR 1973 TOTAL 55,038 MEAN 151 MAX 341 MIN 37 CFSM 1.02 IN 13.83

STREAMS TRIBUTARY TO LAKE ERIE

04172000 Huron River near Hamburg, Mich.

LOCATION.--Lat 42°27'55", long 83°48'00", in sec.24, T.1 N., R.5 E., Livingston County, 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 mi² (798 km²).

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

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.

AVERAGE DISCHARGE.--22 years, 198 ft³/s (5,607 m³/s), 8.73 in/yr (222 mm/yr).

EXTREMES.--Current year: Maximum discharge, 780 ft³/s (22.1 m³/s) Mar. 18 (gage height, 6.36 ft or 1.939 m); maximum gage height, 6.37 ft (1.942 m) Jan. 4; minimum discharge, 69 ft³/s (1.95 m³/s) Sept. 16, 17; minimum gage height, 3.61 ft (1.100 m) Oct. 18, 19, 20, 21.
Period of record: Maximum discharge, 1,560 ft³/s (44.2 m³/s) May 15, 1956; maximum gage height, 8.46 ft (2.579 m) June 30, 1968; minimum discharge, 32 ft³/s (0.91 m³/s) July 2, 3, 1965; minimum gage height, 3.16 ft (0.963 m) Aug. 1-3, 1964.

REMARKS.--Records good except those for the winter period and those for period of no gage-height record, which are poor. Occasional regulation by Kent Lake, 11 mi (18 km) above station.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	142	246	298	473	340	232	642	274	374	296	194	123
2	139	275	291	625	350	243	642	278	374	298	201	119
3	139	280	302	695	370	269	610	281	374	315	196	114
4	137	267	295	717	370	304	521	279	386	319	186	111
5	134	249	279	704	370	334	450	254	395	316	175	107
6	128	243	307	600	360	368	432	230	412	307	166	99
7	125	257	312	550	344	400	430	228	425	289	158	92
8	118	272	306	500	337	432	405	252	426	258	150	88
9	107	273	284	450	326	455	396	300	426	226	178	87
10	101	269	262	440	313	473	409	336	410	210	264	88
11	97	265	249	390	301	499	417	368	412	194	292	88
12	98	270	248	370	289	534	416	379	399	182	303	85
13	94	299	272	360	278	569	411	370	381	175	296	84
14	93	321	286	350	271	621	396	355	368	172	277	83
15	91	316	295	340	271	674	339	335	354	180	252	80
16	87	303	303	320	265	710	316	319	350	192	224	75
17	85	288	300	320	270	752	325	302	354	196	196	76
18	84	273	300	330	260	776	333	283	339	194	176	89
19	83	278	300	350	260	761	344	266	321	193	160	97
20	82	305	306	350	253	736	350	249	300	191	161	103
21	85	311	288	350	246	707	349	234	283	191	167	105
22	109	298	283	350	244	687	366	223	271	182	167	107
23	184	280	283	370	245	676	385	238	254	169	164	108
24	242	264	286	380	244	668	395	261	232	160	161	109
25	264	270	288	370	240	661	402	268	215	153	157	109
26	266	304	294	360	240	660	399	272	205	151	150	112
27	257	314	295	350	235	657	385	273	213	158	146	121
28	246	298	294	350	232	655	363	292	235	162	141	143
29	246	284	293	340	-----	648	328	317	263	167	136	169
30	245	296	317	340	-----	646	287	337	286	165	130	189
31	238	-----	391	340	-----	637	-----	360	-----	175	126	-----
TOTAL	4,546	8,468	9,107	13,134	8,124	17,444	12,243	9,013	10,037	6,536	5,850	3,160
MEAN	147	282	294	424	290	563	408	291	335	211	189	105
MAX	266	321	391	717	370	776	642	379	426	319	303	189
MIN	82	243	248	320	232	232	287	223	205	151	126	75
CFSM	.48	.92	.95	1.38	.94	1.83	1.32	.94	1.09	.69	.61	.34
IN.	.55	1.02	1.10	1.59	.98	2.11	1.48	1.09	1.21	.79	.71	.38

CAL YR 1972 TOTAL 64,928 MEAN 177 MAX 391 MIN 81 CFSM .57 IN 7.84
WTP YR 1973 TOTAL 107,662 MEAN 295 MAX 776 MIN 75 CFSM .96 IN 13.00

NOTE.--No gage-height record Jan. 7 to Feb. 6.

STREAMS TRIBUTARY TO LAKE ERIE

217

04173500 Mill Creek near Dexter, Mich.

LOCATION.--Lat 42°18'00", long 83°53'55", in SW¼ sec.18, T.2 S., R.5 E., Washtenaw County, 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 mi² (332 km²).

PERIOD OF RECORD.--February 1952 to current year.

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.

AVERAGE DISCHARGE.--21 years, 72.8 ft³/s (2.062 m³/s), 7.72 in/yr (196 mm/yr).

EXTREMES.--Current year: Maximum discharge, 675 ft³/s (19.1 m³/s) Dec. 31 (gage height, 10.26 ft or 3.127 m); minimum, 21 ft³/s (0.59 m³/s) Oct. 10, 15, 17, 18; minimum gage height, 5.60 ft (1.707 m) Oct. 10, 18, Sept. 15, 16, 17.
Period of record: Maximum discharge, 1,500 cfs (42.5 m³/s) June 26, 1968 (gage height, 12.95 ft or 3.947 m); minimum, 7.3 ft³/s (0.21 m³/s) Dec. 13, 1963; minimum gage height, 4.94 ft (1.506 m) Dec. 13, 1963. Feb. 22, 1964.

REMARKS.--Records good except those for the winter period, which are poor.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	57	90	550	74	74	326	81	246	127	148	44
2	31	78	85	344	136	160	292	87	179	124	127	40
3	28	88	84	223	174	273	236	92	174	375	102	37
4	26	73	79	308	130	257	200	85	248	269	80	35
5	26	62	78	239	118	230	180	76	222	179	65	34
6	25	55	118	180	105	240	160	68	189	127	57	33
7	26	56	196	140	98	254	150	64	216	100	51	32
8	24	133	131	120	89	271	130	100	161	83	46	31
9	22	124	100	100	106	212	120	163	124	71	99	31
10	22	98	98	90	95	193	200	121	103	95	385	31
11	22	97	90	75	80	321	190	97	90	98	290	30
12	23	88	101	68	71	426	160	85	79	77	242	28
13	23	84	191	53	65	289	130	80	72	67	154	28
14	22	143	178	52	60	279	110	76	65	58	96	28
15	21	161	155	53	55	324	100	73	60	54	79	28
16	22	131	107	54	52	250	100	69	59	50	67	27
17	21	112	110	62	50	187	100	65	120	47	60	29
18	21	102	110	110	50	154	100	63	107	44	67	34
19	22	99	115	140	50	251	100	60	91	42	60	32
20	22	118	112	113	50	344	103	58	81	58	108	30
21	23	132	125	87	50	344	93	55	76	106	109	29
22	38	130	142	139	50	310	276	60	66	85	77	31
23	104	120	153	175	50	300	356	221	60	63	63	30
24	89	105	155	131	50	335	208	297	60	53	58	29
25	67	102	155	111	50	389	140	198	57	50	53	29
26	54	105	155	109	50	375	110	247	56	52	49	30
27	47	115	145	109	50	342	93	207	108	74	46	29
28	45	110	133	116	50	261	82	283	185	204	43	43
29	79	100	123	105	-----	241	73	321	229	176	41	127
30	79	93	252	100	-----	245	73	314	168	110	39	152
31	65	-----	627	90	-----	237	-----	352	-----	105	45	-----
TOTAL	1,173	3,071	4,493	4,346	2,108	8,368	4,691	4,218	3,751	3,223	3,006	1,171
MEAN	37.8	102	145	140	75.3	270	156	136	125	104	97.0	39.0
MAX	104	161	627	550	174	426	356	352	248	375	385	152
MIN	21	55	78	52	50	74	73	55	56	42	39	27
CFSM	.30	.80	1.13	1.09	.59	2.11	1.22	1.06	.98	.81	.76	.30
IN.	.34	.89	1.31	1.26	.61	2.43	1.36	1.23	1.09	.94	.87	.34
CAL YR 1972	TOTAL 27,890	MEAN 76.2	MAX 627	MIN 16	CFSM .60	IN 8.11						
WTR YR 1973	TOTAL 43,619	MEAN 120	MAX 627	MIN 21	CFSM .94	IN 12.68						

PEAK DISCHARGE (BASE, 500 FT³/S).--Dec. 31 (1500) 675 ft³/s (10.26 ft).

STREAMS TRIBUTARY TO LAKE ERIE

04174500 Huron River at Ann Arbor, Mich.

LOCATION.--Lat 42°17'10", long 83°44'00", in NW¼ sec.28, T.2 S., R.6 E., Washtenaw County, 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 mi² (1,888 km²).

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.

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.

AVERAGE DISCHARGE.--69 years, 442 ft³/s (12.52 m³/s), 8.23 in/yr (209 mm/yr), adjusted for diversion since 1955.

EXTREMES.--Current year: Maximum discharge, 3,540 ft³/s (100 m³/s) Nov. 9 (gage height, 15.95 ft or 4.862 m, from high-water mark); minimum, 7.4 ft³/s (0.21 m³/s) May 15; minimum gage height, 11.37 ft (3.466 m) Nov. 8; minimum daily discharge, 62 ft³/s (1.76 m³/s) Sept. 15.

Period of record: Maximum daily discharge, 5,840 ft³/s (165 m³/s) Mar. 14, 1918; minimum daily, 4 ft³/s (0.11 m³/s) Aug. 2, Sept. 11, 1931 (plant leakage), but may be doubtful due to change in leakage.

REMARKS.--Records good. 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. Records of chemical analyses for the current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 874: 1938. WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	205	307	569	1,720	744	435	1,600	742	962	609	571	184
2	313	607	553	1,490	728	427	1,520	932	1,140	714	421	159
3	224	603	524	1,410	868	734	1,550	622	1,010	977	286	311
4	78	560	542	1,760	764	884	1,440	610	1,100	1,040	402	249
5	107	550	514	1,830	760	865	1,380	598	999	1,070	403	192
6	226	540	648	1,490	763	947	1,230	474	1,060	788	276	173
7	278	529	581	1,200	737	1,090	844	549	1,070	596	254	162
8	279	555	667	1,080	735	1,130	797	719	965	643	240	168
9	275	739	423	1,180	680	1,090	1,090	1,050	862	514	510	166
10	266	295	530	1,090	693	988	1,050	779	717	668	1,190	100
11	247	744	499	937	630	1,300	1,070	728	812	273	846	181
12	166	506	503	838	573	1,710	1,030	768	618	380	866	258
13	65	422	693	686	579	1,480	951	981	687	472	771	170
14	74	862	690	719	558	1,450	928	715	509	451	535	85
15	141	708	618	668	563	1,730	771	545	558	433	516	62
16	159	725	632	669	494	1,550	658	738	560	341	477	75
17	142	713	501	578	512	1,460	907	690	563	378	437	161
18	161	667	587	663	518	1,430	851	591	654	415	386	153
19	171	633	565	684	464	1,680	792	497	515	330	396	266
20	169	580	633	727	324	1,830	775	531	416	437	444	183
21	184	658	645	739	358	1,730	761	575	511	523	453	162
22	270	655	627	903	358	1,610	1,120	512	548	519	376	316
23	259	649	682	881	369	1,660	1,370	653	380	312	358	244
24	660	614	678	859	422	1,690	1,090	913	303	317	327	225
25	508	555	678	818	433	1,770	1,070	763	477	312	344	320
26	511	509	682	843	400	1,700	897	832	450	281	351	194
27	399	575	680	785	393	1,490	879	931	580	453	298	145
28	524	668	676	865	423	1,650	863	1,000	693	608	246	249
29	576	637	637	750	-----	1,540	691	1,120	724	603	266	558
30	578	603	893	720	-----	1,530	461	1,150	743	360	260	367
31	559	-----	1,520	757	-----	1,420	-----	1,100	-----	486	259	-----
TOTAL	8,774	18,058	19,870	30,339	15,843	42,000	30,436	23,458	21,186	16,303	13,765	6,238
MEAN	283	602	641	979	566	1,355	1,015	757	706	526	444	208
MAX	660	862	1,520	1,830	868	1,830	1,600	1,150	1,140	1,070	1,190	558
MIN	65	295	423	578	324	427	461	474	303	273	240	62
MEAN+	302	624	661	999	586	1,375	1,033	774	727	548	466	234
CFSM+	.41	.86	.91	1.37	.80	1.89	1.42	1.06	1.00	.75	.64	.32
IN+	.48	.96	1.05	1.58	.84	2.17	1.58	1.22	1.11	.87	.74	.36

CAL YR 1972 TOTAL 147,866 MEAN 404 MAX 1,520 MIN 22 MEAN+ 424 CFSM+ .58 IN+ 7.91
WTR YR 1973 TOTAL 246,270 MEAN 675 MAX 1,830 MIN 62 MEAN+ 695 CFSM+ .95 IN+ 12.95

+ Adjusted for diversion for municipal supply; record furnished by City of Ann Arbor.

STREAMS TRIBUTARY TO LAKE ERIE

219

04175340 (revised) Stony Creek at Oakville, Mich.

LOCATION.--Lat 42°05'05", long 83°34'43", in SE¼ SE¼ sec.34, T.4 S., R.7 E., Washtenaw County, at left 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 mi² (176.1 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 645 ft (197 m) revised, from topographic map (nearest 5 ft). Prior to July 31, 1970, nonrecording gage at same site and datum.

EXTREMES.--Current year: Maximum discharge, 540 ft³/s (15.3 m³/s) Mar. 12 (gage height, 7.56 ft or 2.304 m); minimum, 8.6 ft³/s (0.24 m³/s) Sept. 25; minimum gage height, 1.51 ft (0.460 m) Sept. 12, 14.

Period of record: Maximum discharge, 540 ft³/s (15.3 m³/s) Mar. 12, 1973 (gage height, 7.56 ft or 2.304 m); maximum gage height, 8.31 ft (2.533 m) Feb. 20, 1971 (backwater from ice); minimum discharge, 2.7 ft³/s (0.076 m³/s) Aug. 24, 1971 (gage height, 1.00 ft or 0.305 m).

REMARKS.--Records fair except those for the winter period and those for period of no gage-height record, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	37	60	250	48	30	116	30	77	50	78	11
2	15	64	55	150	77	109	96	31	57	50	45	11
3	13	93	52	110	98	132	79	41	59	271	20	10
4	13	69	50	280	74	118	74	35	86	174	22	10
5	13	60	48	180	69	124	69	30	105	69	10	10
6	13	50	100	80	62	190	60	27	68	48	17	9.9
7	13	70	110	60	59	150	55	26	60	37	15	9.7
8	13	130	60	50	55	152	50	37	45	29	15	9.5
9	13	100	55	40	50	96	50	77	36	26	15	9.7
10	13	75	50	30	45	121	89	62	29	24	44	9.5
11	13	65	48	25	40	269	69	89	26	24	26	9.4
12	13	60	60	24	35	478	58	56	25	20	18	9.1
13	14	70	150	23	31	195	50	47	29	19	16	9.2
14	14	130	120	23	29	198	45	41	25	17	15	9.1
15	15	170	90	23	27	443	41	37	22	16	14	9.1
16	15	103	70	24	26	189	40	33	21	14	13	9.2
17	15	88	65	28	25	163	45	31	80	14	13	9.2
18	15	81	60	35	25	138	41	28	55	13	13	11
19	16	70	60	44	25	199	42	27	41	13	12	9.9
20	16	60	65	37	25	330	40	26	32	15	10	9.4
21	17	70	72	40	25	306	36	24	27	44	20	9.2
22	23	100	79	76	25	242	88	28	24	24	14	9.6
23	63	90	99	143	25	187	135	119	20	18	13	9.4
24	58	80	100	78	25	186	66	202	21	16	13	9.0
25	38	80	100	61	25	162	50	94	20	16	13	9.0
26	30	80	100	59	25	145	42	72	29	30	12	10
27	27	90	95	63	25	108	36	68	203	49	12	9.9
28	28	80	85	71	25	84	32	153	144	40	12	12
29	46	75	80	65	-----	85	29	141	171	36	11	25
30	52	70	150	57	-----	201	29	122	74	21	11	41
31	41	-----	400	53	-----	134	-----	141	-----	42	11	-----
TOTAL	706	2,460	2,788	2,282	1,125	5,664	1,751	1,975	1,711	1,279	599	339.0
MEAN	22.8	82.0	89.9	73.6	40.2	183	58.4	63.7	57.0	41.3	19.3	11.3
MAX	63	170	400	280	98	478	135	202	203	271	78	41
MTN	13	37	48	23	25	30	29	24	20	13	11	9.0
CFSM	.34	1.21	1.32	1.08	.59	2.69	.86	.94	.84	.61	.25	.17
TN	.39	1.35	1.53	1.25	.62	3.10	.96	1.08	.94	.70	.33	.19

CAL YR 1972 TOTAL 14,937.5 MEAN 40.8 MAX 408 MTN 5.9 CFSM .60 TN 8.17
 WTR YR 1973 TOTAL 22,679.0 MEAN 62.1 MAX 478 MTN 9.0 CFSM .91 TN 12.41

PEAK DISCHARGE (BASE, 300 FT³/S)

NOTE.--No gage-height record Nov. 19 to Dec. 20.

DATE	TIME	G.H.	DISCHARGE
12-31	unknown	7.08	418
01-04	1900	6.93	382
03-12	0100	7.56	540
03-15	0500	7.43	505
03-21	0600	6.85	364
07-03	1900	7.12	412

STREAMS TRIBUTARY TO LAKE ERIE

04175600 River Raisin near Manchester, Mich.

LOCATION.--Lat 42°10'05", long 84°04'34", in NE¼ SE¼ sec.33, T.3 S., R.3 E., Washtenaw County, 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 mi² (342 km²).

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.

EXTREMES.--Current year: Maximum discharge, 324 ft³/s (9.18 m³/s) Mar. 16 (gage height, 5.21 ft or 1.588 m); maximum gage height, 5.56 ft (1.695 m) Jan. 7 (backwater from ice); minimum daily discharge, 15 ft³/s (0.42 m³/s) Oct. 20.

Period of record: Maximum discharge, about 350 ft³/s (9.91 m³/s) Feb. 20, 1971 (gage height, 6.1 ft or 1.86 m, from floodmark, backwater from ice); minimum, 4.5 ft³/s (0.052 m³/s) Nov. 29, 1971; minimum gage height, 1.33 ft (0.405 m) Sept. 13, 1971.

REMARKS.--Records good except those for the winter period and those for periods of no gage-height record, which are poor. Occasional regulation by many dams above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	85	83	133	244	115	80	264	164	293	108	106	45
2	80	83	130	248	120	100	267	172	275	123	106	42
3	71	105	126	220	180	150	261	185	262	260	98	40
4	69	109	123	236	170	190	252	170	267	280	87	35
5	66	104	119	233	160	190	243	164	261	243	77	33
6	68	97	115	223	150	190	230	153	256	207	70	33
7	65	94	131	200	130	190	217	155	260	178	64	33
8	64	106	148	180	120	200	214	167	244	155	59	33
9	57	141	142	160	115	190	204	174	225	133	56	33
10	52	148	125	150	100	190	218	166	206	123	60	33
11	46	137	121	140	95	200	221	158	189	120	80	30
12	47	138	118	130	90	300	214	152	174	109	85	30
13	48	142	131	130	90	270	202	142	175	101	80	30
14	44	142	155	120	85	250	191	130	170	90	70	30
15	47	167	160	120	80	253	176	129	160	81	60	23
16	30	179	150	123	80	297	181	120	148	74	55	27
17	43	176	140	118	80	300	204	118	139	68	53	28
18	48	169	140	133	75	266	217	103	137	64	55	28
19	38	164	140	154	75	274	214	100	138	61	55	28
20	15	161	138	155	75	290	206	96	133	64	73	23
21	33	165	134	130	75	289	194	93	128	87	86	23
22	45	169	136	150	75	281	226	97	117	75	77	22
23	58	167	136	220	75	277	259	156	105	67	68	23
24	105	162	137	210	75	281	254	212	103	67	58	24
25	96	156	137	180	75	290	237	213	98	67	55	23
26	85	150	138	160	75	289	219	217	97	68	50	24
27	78	150	137	150	75	282	202	219	120	72	45	24
28	73	153	133	140	75	275	179	236	126	79	28	26
29	80	149	130	140	-----	264	172	280	130	101	35	53
30	91	142	152	130	-----	264	155	293	121	89	40	93
31	87	-----	227	120	-----	257	-----	297	-----	88	40	-----
TOTAL	1,914	4,208	4,282	5,147	2,785	7,419	6,493	5,231	5,257	3,502	2,031	972
MEAN	61.7	140	138	166	99.5	239	216	169	175	113	65.5	32.4
MAX	105	179	227	248	180	300	267	297	293	280	106	93
MIN	15	83	115	118	75	80	155	93	97	61	28	22
CFSM	.47	1.06	1.05	1.26	.75	1.81	1.64	1.28	1.33	.86	.50	.25
IN.	.54	1.19	1.21	1.45	.78	2.09	1.83	1.47	1.48	.99	.57	.27
CAL YR 1972	TOTAL 31,950	MEAN 87.3	MAX 270	MIN 15	CFSM .66	IN 9.00						
WTR YR 1973	TOTAL 49,241	MEAN 135	MAX 300	MIN 15	CFSM 1.02	IN 13.88						

PEAK DISCHARGE (BASE, 280 FT³/s)

NOTE.--No gage-height record Jan. 21 to Mar. 14.

DATE	TIME	G.H.	DISCHARGE
01-02	1300	5.09	288
03-12	unknown	unknown	about 320
03-16	1400	5.21	324
05-30	1400	5.08	305
07-03	1800	5.01	295

STREAMS TRIBUTARY TO LAKE ERIE

221

04175700 River Raisin near Tecumseh, Mich.

LOCATION.--Lat 41°56'35", long 83°56'45", in NE¼ sec.21, T.6 S., R.4 E., Lenawee County, 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 mi² (692 km²).

PERIOD OF RECORD.--September 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 707.0 ft (215.494 m) above mean sea level.

AVERAGE DISCHARGE.--17 years, 169 ft³/s (4.786 m³/s), 8.60 in/yr (218 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,180 ft³/s (33.4 m³/s) June 29 (gage height, 9.84 ft or 2.999 m); minimum, 57 ft³/s (1.61 m³/s) Sept. 15 (gage height, 3.93 ft or 1.198 m).
Period of record: Maximum discharge, 2,920 ft³/s (82.7 m³/s) June 26, 1968 (gage height, 12.66 ft or 3.859 m); minimum, 6.4 ft³/s (0.18 m³/s) Aug. 26, 1964 (gage height, 2.57 ft or 0.783 m); minimum daily, 8.3 ft³/s (0.24 m³/s) Oct. 30, 1965.

REMARKS.--Records fair except those for the winter period, which are poor. Diurnal fluctuation caused by powerplant 5.5 mi (8.8 km) above station prior to June 27, 1968.

REVISIONS.--WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	180	149	223	699	216	147	542	271	626	459	365	117
2	150	198	213	568	239	261	543	272	543	411	341	107
3	142	259	206	449	339	401	509	300	514	745	243	100
4	133	212	200	498	341	425	489	309	509	706	221	93
5	127	189	195	530	302	423	465	289	500	648	199	84
6	123	170	282	461	265	419	433	264	477	558	180	88
7	121	166	357	400	249	414	408	236	463	457	160	88
8	117	366	289	350	242	452	382	258	467	383	149	86
9	111	407	257	320	218	419	366	412	431	326	144	85
10	107	312	244	290	208	412	453	371	384	287	152	84
11	84	287	217	270	188	493	445	331	342	258	193	82
12	97	263	198	250	176	690	410	282	319	237	202	80
13	95	249	337	240	170	574	380	255	390	221	188	78
14	96	403	422	230	160	531	351	244	358	202	172	76
15	95	524	353	210	160	619	327	229	299	186	147	59
16	92	431	309	200	150	556	309	215	280	164	141	68
17	92	365	265	196	150	554	319	210	355	124	130	72
18	83	328	260	209	150	599	325	203	367	147	125	77
19	89	308	256	264	150	604	342	195	293	141	117	77
20	94	341	282	271	150	614	359	191	265	144	137	76
21	95	375	286	240	150	631	344	151	261	167	153	75
22	103	348	293	285	146	627	379	162	244	177	141	78
23	162	319	310	422	148	621	556	313	216	166	148	82
24	189	304	320	395	150	625	518	530	217	148	142	71
25	184	287	347	330	147	642	461	519	200	147	133	76
26	171	272	341	301	146	644	421	463	244	208	127	79
27	152	281	319	282	136	628	377	441	665	270	105	78
28	141	270	288	275	132	569	341	523	648	215	67	78
29	151	249	263	272	-----	533	302	563	1,010	193	99	107
30	162	233	301	253	-----	551	280	596	620	188	100	152
31	157	-----	618	231	-----	531	-----	697	-----	212	105	-----
TOTAL	3,895	8,865	9,051	10,191	5,378	16,209	12,136	10,295	12,507	8,895	5,026	2,553
MFAN	126	296	292	329	192	523	405	332	417	287	162	85.1
MAX	189	524	618	699	341	690	556	697	1,010	745	365	152
MTN	83	149	195	196	132	147	280	151	200	124	67	59
CFSM	.47	1.11	1.09	1.23	.72	1.96	1.52	1.24	1.56	1.07	.61	.32
IN.	.54	1.24	1.26	1.42	.75	2.26	1.69	1.43	1.74	1.24	.70	.36

CAL YR 1972 TOTAL 65,807 MEAN 180 MAX 691 MIN 57 CFSM .67 IN 9.17
WTR YR 1973 TOTAL 105,001 MEAN 288 MAX 1,010 MIN 59 CFSM 1.08 IN 14.63

PEAK DISCHARGE (BASE, 700 FT³/S)

DATE	TIME	G.H.	DISCHARGE
12-31	2400	9.06	730
03-12	0400	9.02	721
05-31	0400	8.76	703
06-29	1200	9.84	1,180
07-03	0400	8.83	776

STREAMS TRIBUTARY TO LAKE ERIE

04176000 River Raisin near Adrian, Mich.

LOCATION.--Lat 41°54'15", long 83°58'50", in NW¼ sec.5, T.7 S., R.4 E., Lenawee County, 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 mi² (1,199 km²).

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.

GAGE.--Water-stage recorder. Datum of gage is 693.2 ft (211.29 m) above mean sea level.

AVERAGE DISCHARGE.--20 years, 295 ft³/s (8.354 m³/s), 8.65 in/yr (220 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,620 ft³/s (45.9 m³/s) June 29 (gage height, 10.90 ft or 3.322 m); minimum, 67 ft³/s (1.90 m³/s) Sept. 15, 16; minimum gage height, 2.60 ft (0.792 m) Sept. 15.

Period of record: Maximum discharge, 5,580 ft³/s (158 m³/s) Apr. 30, 1956 (gage height, 14.87 ft or 4.532 m), from rating curve extended above 4,000 ft³/s (113 m³/s) by logarithmic plotting; minimum, 18 ft³/s (0.51 m³/s) Aug. 10, 1964 (gage height, 1.33 ft or 0.405 m); minimum daily, 25 ft³/s (0.71 m³/s) Oct. 26, 1965.

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.

REVISIONS.--See PERIOD OF RECORD. WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	304	252	411	1,310	424	297	904	385	1,020	962	441	143
2	284	329	389	1,310	483	465	909	377	827	649	479	130
3	261	471	372	1,170	665	730	858	394	691	1,170	395	122
4	209	487	363	1,070	742	930	775	400	645	1,280	302	117
5	210	397	354	1,210	628	973	727	401	647	1,190	256	105
6	241	327	458	1,010	558	915	677	382	614	995	227	105
7	188	299	612	718	516	864	635	359	588	682	208	105
8	191	506	625	650	450	910	597	388	571	523	193	103
9	185	695	534	600	410	906	575	515	549	436	193	100
10	175	673	466	550	380	812	672	575	494	383	216	99
11	147	552	413	500	360	956	752	539	440	347	229	99
12	156	501	384	450	350	1,290	689	452	413	315	238	96
13	152	475	553	420	340	1,300	617	397	475	291	224	91
14	150	653	738	400	330	1,280	567	368	455	266	208	90
15	145	956	758	380	320	1,270	530	347	397	247	189	74
16	142	1,100	623	369	310	1,280	505	328	364	228	172	72
17	142	1,010	504	353	300	1,180	503	315	375	178	169	81
18	131	804	450	374	290	1,090	501	304	421	193	161	94
19	132	689	450	442	290	1,150	509	294	370	189	150	93
20	139	707	460	485	290	1,220	518	284	338	194	173	92
21	139	782	510	453	280	1,300	517	261	324	227	181	90
22	158	816	555	523	280	1,330	539	240	332	221	177	93
23	233	756	613	775	280	1,280	721	469	316	213	167	97
24	336	653	647	860	270	1,230	873	792	331	194	170	87
25	357	608	709	677	270	1,220	742	983	309	187	161	91
26	314	575	736	560	270	1,230	621	908	357	228	154	99
27	267	576	695	535	270	1,190	547	796	796	277	148	97
28	241	570	623	535	265	1,070	492	903	1,090	258	100	97
29	245	537	560	528	-----	920	443	1,010	1,440	226	106	133
30	261	466	588	458	-----	898	412	1,070	1,460	215	136	167
31	267	-----	1,010	437	-----	919	-----	1,110	-----	265	115	-----
TOTAL	6,502	18,222	17,163	20,112	10,621	32,405	18,927	16,346	17,449	13,229	6,438	3,062
MEAN	210	607	554	649	379	1,045	631	527	582	427	208	102
MAX	357	1,100	1,010	1,310	742	1,330	909	1,110	1,460	1,280	479	167
MIN	131	252	354	353	265	297	412	240	309	178	100	72
CFSM	.45	1.31	1.20	1.40	.82	2.26	1.36	1.14	1.26	.92	.45	.22
IN.	.52	1.46	1.38	1.62	.85	2.60	1.52	1.31	1.40	1.06	.52	.25

CAL YR 1972 TOTAL 118,687 MEAN 324 MAX 1,290 MIN 62 CFSM .70 IN 9.54
WTR YR 1973 TOTAL 180,476 MEAN 494 MAX 1,460 MIN 72 CFSM 1.07 IN 14.50

PEAK DISCHARGE (BASE, 1,400 FT³/S).--June 29 (2300) 1,620 ft³/s (10.90 ft).

04176400 Saline River near Saline, Mich.

LOCATION.--Lat 42°07'50", long 83°46'35", in SW¼ sec.18 (revised), T.4 S., R.5 E., Washtenaw County, 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 mi² (245.0 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 710 ft (216 m), revised, from topographic map (nearest 10 ft).

AVERAGE DISCHARGE.--8 years, 61.2 ft³/s (1.733 m³/s), 8.79 in/yr (223 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,060 ft³/s (30.0 m³/s) June 28 (gage height, 10.84 ft or 3.304 m); minimum daily, 15 ft³/s (0.42 m³/s) Sept. 11-13; minimum gage height, 3.56 ft (1.085 m) Sept. 11.
Period of record: Maximum discharge, 3,990 ft³/s (113 m³/s) June 26, 1968 (gage height, 13.37 ft or 4.075 m); minimum, 5.4 ft³/s (0.15 m³/s) Oct. 9, 12, 1966; minimum gage height, 3.26 ft (0.994 m) July 24, 1966.

REMARKS.--Records good except those for winter period and those for period of no gage-height record, which are poor. 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	40	57	382	52	50	238	51	143	150	221	19
2	25	50	51	210	137	176	188	52	107	130	115	19
3	23	60	48	158	156	235	141	53	110	600	72	18
4	22	50	46	350	100	191	122	50	132	400	52	17
5	21	45	44	215	86	187	109	45	108	200	40	16
6	21	40	135	140	73	215	94	41	90	100	35	17
7	20	39	162	110	67	217	84	39	77	60	31	17
8	19	90	99	80	50	230	76	68	63	45	28	16
9	18	85	75	70	41	143	73	192	53	40	39	16
10	18	70	66	55	39	135	126	118	46	50	95	17
11	18	65	57	45	37	357	119	90	42	50	52	15
12	19	62	61	40	35	415	93	74	42	45	37	15
13	19	60	229	38	33	207	77	64	42	34	31	15
14	18	100	189	37	31	279	68	57	38	31	29	18
15	17	110	130	37	30	383	63	51	34	29	27	16
16	17	90	88	37	29	201	61	47	51	27	24	16
17	17	80	75	36	28	186	64	43	236	25	22	18
18	17	75	70	47	27	160	60	40	119	24	22	18
19	18	70	68	65	27	232	64	37	80	23	21	18
20	18	60	71	61	26	295	62	34	64	41	42	18
21	19	55	86	47	26	279	56	33	54	53	28	20
22	30	90	112	147	25	261	240	43	43	37	24	19
23	75	80	135	180	25	269	295	186	41	30	22	17
24	60	75	144	108	24	317	152	231	38	28	23	18
25	50	70	161	79	24	329	109	120	34	31	21	18
26	40	75	158	74	23	300	87	118	209	50	21	19
27	35	80	130	74	23	250	73	132	278	58	21	18
28	33	74	104	82	23	169	63	278	852	73	21	24
29	55	66	89	67	-----	154	55	274	539	52	21	77
30	55	59	210	60	-----	208	53	248	240	36	20	45
31	50	-----	687	55	-----	157	-----	239	-----	71	20	-----
TOTAL	895	2,065	3,837	3,186	1,297	7,187	3,165	3,148	4,005	2,623	1,277	614
MFAN	28.9	68.8	124	103	46.3	232	106	102	134	84.6	41.2	20.5
MAX	75	110	687	382	156	415	295	278	852	600	221	77
MTN	17	39	44	36	23	50	53	33	34	23	20	15
CFSM	.31	.73	1.31	1.09	.49	2.45	1.12	1.08	1.42	.89	.44	.22
IN.	.35	.81	1.51	1.25	.51	2.83	1.24	1.24	1.57	1.03	.50	.24

CAL YR 1972 TOTAL 18,635.2 MEAN 50.9 MAX 687 MIN 6.6 CFSM .54 IN 7.33
WTR YR 1973 TOTAL 33,299.0 MEAN 91.2 MAX 852 MIN 15 CFSM .96 IN 13.09

PEAK DISCHARGE (BASE, 380 FT³/S)

NOTE.--No gage-height record Oct. 1 to Nov. 27.

DATE	TIME	G.H.	DISCHARGE
12-31	1300	10.26	790
01-04	1400	8.22	409
03-12	0100	9.79	634
03-15	0100	9.09	508
03-25	0400	8.05	382
04-22	2400	8.52	444
06-28	1500	10.84	1,060
07-03	unknown	unknown	about 780

04176500 River Raisin near Monroe, Mich.

LOCATION.--Lat 41°57'38", long 83°31'52", Monroe County, 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 mi² (2,699 km²).

PERIOD OF RECORD.--September 1937 to current year. Published as "Raisin River at Monroe" 1937-52 and as "River Raisin at Monroe" 1952-53.

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.

AVERAGE DISCHARGE.--36 years, 681 ft³/s (19.29 m³/s), 8.88 in/yr (226 mm/yr).

EXTREMES.--Current year: Maximum discharge, 5,960 ft³/s (169 m³/s) July 3 (gage height, 7.74 ft or 2.359 m); minimum, 103 ft³/s (2.92 m³/s) Sept. 9 (gage height, 2.12 ft or 0.646 m).

Period of record: Maximum discharge, 12,900 ft³/s (365 m³/s) May 19, 1945, Mar. 29, 1950; maximum gage height, 10.7 ft (3.261 m) Feb. 1, 1949 (backwater from ice), site and datum then in use; minimum discharge, about 2 ft³/s (0.06 m³/s) Sept. 4, 1938, Sept. 19, 20, 1941, site then in use.

REMARKS.--Records good except those for the winter period, which are fair. Diurnal fluctuation caused by powerplants above station prior to June 27, 1968.

REVISIONS (WATER YEARS).--WSP 954: 1938-40 (m), 1941. WSP 1437: 1939, 1948. WSP 2112: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,060	544	987	2,780	878	490	2,110	694	1,980	2,390	676	168
2	946	963	869	2,670	976	850	2,040	652	1,830	2,390	736	172
3	746	1,570	790	2,720	1,310	1,710	1,890	628	1,610	5,140	864	176
4	599	1,380	737	3,190	1,470	2,160	1,730	634	1,430	4,020	793	182
5	518	1,290	707	2,810	1,580	2,450	1,510	628	1,260	2,770	651	173
6	442	1,070	1,280	2,330	1,490	2,730	1,340	622	1,200	2,360	530	177
7	397	892	1,650	1,800	1,290	2,590	1,200	610	1,220	1,960	448	161
8	394	2,000	1,540	1,500	1,160	2,540	1,090	610	1,070	1,650	390	141
9	332	2,050	1,440	1,200	900	2,180	998	724	955	1,220	369	119
10	296	1,850	1,190	1,100	800	2,280	1,220	948	857	906	420	130
11	282	1,750	924	1,000	700	3,030	1,260	1,230	778	748	410	141
12	257	1,470	809	900	650	4,030	1,290	1,040	718	640	385	142
13	230	1,200	1,250	800	600	3,270	1,230	899	802	565	360	137
14	211	2,300	1,510	750	570	3,550	1,050	784	694	500	380	130
15	200	2,990	1,590	736	540	4,180	941	706	676	450	363	124
16	200	2,710	1,460	682	520	3,460	871	652	640	405	328	120
17	188	2,670	1,130	634	500	3,260	857	605	1,600	370	303	121
18	178	2,500	1,060	616	500	2,810	790	580	1,240	333	272	111
19	172	2,190	948	682	500	2,780	796	550	906	291	251	110
20	161	1,980	947	694	490	3,190	802	530	724	291	258	116
21	156	1,820	1,020	748	480	3,430	802	505	628	311	259	128
22	185	1,680	1,180	885	470	3,480	844	505	560	338	267	133
23	567	1,590	1,370	1,420	470	3,400	1,140	724	500	346	269	128
24	783	1,460	1,550	1,490	470	3,300	1,250	1,530	495	342	262	125
25	745	1,290	1,810	1,550	470	3,110	1,360	1,630	480	338	252	130
26	723	1,200	1,830	1,430	470	2,920	1,260	1,690	480	328	245	138
27	639	1,270	1,780	1,260	470	2,680	1,100	1,670	1,200	385	237	130
28	562	1,230	1,620	1,200	470	2,410	948	1,860	1,290	405	223	133
29	560	1,160	1,410	1,100	-----	2,190	814	1,870	1,950	425	213	174
30	593	1,080	1,460	1,000	-----	2,220	736	2,000	2,120	425	186	240
31	562	-----	2,960	941	-----	2,050	-----	2,260	-----	485	152	-----
TOTAL	13,884	49,149	40,808	42,618	21,194	84,730	35,269	30,570	31,893	33,527	11,752	4,310
MFAN	448	1,638	1,316	1,375	757	2,733	1,176	986	1,063	1,082	379	144
MAX	1,060	2,990	2,960	3,190	1,580	4,180	2,110	2,260	2,120	5,140	864	240
MIN	156	544	707	616	470	490	736	505	480	291	152	110
CFSM	.43	1.57	1.26	1.32	.73	2.62	1.13	.95	1.02	1.04	.36	.14
IN.	.50	1.75	1.46	1.52	.76	3.02	1.26	1.09	1.14	1.20	.42	.15

CAL YP 1972 TOTAL 262,724 MEAN 718 MAX 3,580 MIN 110 CFSM .69 IN 9.38
WTR YR 1973 TOTAL 399,704 MEAN 1,095 MAX 5,140 MIN 110 CFSM 1.05 IN 14.27

PEAK DISCHARGE (BASE, 3,500 FT³/S)

DATE	TIME	G.H.	DISCHARGE
03-12	0400	6.81	4,440
03-15	0500	6.81	4,440
03-21	0500	6.23	3,550
07-03	1600	7.74	5,960

STREAMS TRIBUTARY TO LAKE ERIE

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04184500 Bean Creek at Powers, Ohio

LOCATION.--Lat 41°40'39", long 84°13'56", in NE¼ sec.24, T.9 S., R.1 E., Fulton County, 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 mi² (534 km²).

PERIOD OF RECORD.--October 1940 to current year.

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.

AVERAGE DISCHARGE.--33 years, 159 ft³/s (4.503 m³/s), 10.48 in/yr (266.2 mm/yr).

EXTREMES.--Current year: Maximum discharge, 1,240 ft³/s (35.1 m³/s) Mar. 12, gage height, 8.36 ft (2.548 m); minimum, 14 ft³/s (0.40 m³/s) Sept. 16, 17.
Period of record: Maximum discharge, 4,250 ft³/s (120 m³/s) Apr. 29, 1956, gage height, 13.82 ft (4.212 m); minimum, 5.0 ft³/s (0.14 m³/s) Aug. 9, 1964.

REMARKS.--Records good. Water-quality records for current year are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1307: 1948 (M). WSP 1912: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	147	92	188	1,020	178	120	448	145	320	241	252	21
2	119	195	173	818	297	312	463	152	434	183	185	23
3	99	356	169	596	492	641	420	176	461	264	110	13
4	85	255	166	791	386	723	362	176	375	504	83	19
5	80	195	156	688	315	636	320	161	337	405	65	17
6	76	157	310	552	270	583	243	144	304	269	50	17
7	72	144	359	456	249	534	255	132	400	186	53	16
8	67	441	275	370	210	578	231	140	367	144	48	16
9	60	450	247	240	160	455	220	290	273	110	43	15
10	55	325	203	240	150	439	383	263	228	102	72	15
11	52	311	170	190	140	778	354	237	192	94	76	16
12	51	297	161	150	130	1,160	304	188	167	64	55	16
13	49	255	366	140	120	854	252	160	178	74	41	15
14	47	826	421	130	120	675	226	141	162	66	37	15
15	44	1,030	366	120	110	811	200	128	137	58	36	15
16	44	672	397	120	100	642	145	119	121	50	33	14
17	42	510	235	120	94	616	193	111	110	47	31	15
18	40	413	210	150	94	641	222	101	102	43	29	17
19	39	356	200	236	100	659	227	94	95	41	28	17
20	38	393	220	240	110	740	221	90	39	43	31	17
21	37	428	289	186	110	728	208	86	77	47	31	16
22	36	395	333	299	110	681	237	83	71	46	29	15
23	71	337	355	534	110	650	484	162	67	43	26	15
24	155	290	370	323	110	635	418	454	68	41	25	16
25	136	252	409	284	100	644	333	462	70	40	25	16
26	115	240	377	241	95	707	256	513	74	40	24	15
27	98	249	344	244	90	644	221	634	420	41	23	15
28	88	241	308	266	85	535	188	652	313	39	22	17
29	91	217	278	247	-----	463	162	730	455	36	21	20
30	108	195	357	200	-----	497	143	948	354	35	20	26
31	101	-----	660	192	-----	448	-----	1,000	-----	47	21	-----
TOTAL	2,344	10,504	9,262	10,501	4,630	19,229	8,463	8,862	7,535	3,463	1,642	517
MEAN	75.6	350	299	339	165	620	282	286	251	112	53.4	17.2
MAX	155	1,030	660	1,020	492	1,160	484	1,000	320	504	252	23
MIN	37	92	156	120	85	120	148	83	57	35	20	16
CFS4	.37	1.70	1.45	1.65	.83	3.01	1.47	1.39	1.22	.54	.26	.08
IN.	.42	1.90	1.67	1.90	.84	3.47	1.53	1.60	1.36	.63	.30	.09

CAL YR 1972 TOTAL 59,687 MEAN 163 MAX 1,030 MIN 19 CFS4 .79 IN 10.78
WTE YR 1973 TOTAL 86,953 MEAN 238 MAX 1,160 MIN 14 CFS4 1.16 IN 15.70

As the number of streams in 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 streamflow 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 on these partial-record stations are usable in low-flow 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 time 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. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of the 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 1973

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake Superior						
*04032150	Presque Isle River near Connorville, Mich.	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.	358	1972-73	04-12-73 06-20-73	a 676 251
04044545	Mud Creek near Kawbawgam Village, Mich.	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	11-09-72 04-04-73 07-19-73	a51.6 a122 b1.5
04044583	Cherry Creek near Harvey, Mich.	Lat 46°28'07", long 87°21'53", in NE¼ SE¼ sec.13, T.47 N., R.25 W., Marquette County, 0.5 mile above County Highway 551, 2.0 miles south of Harvey.	4.53	1966-70 1971-73	10-30-72 05-22-73	17.6 19.6
*04044813	Two Hearted River near Paradise, Mich.	Lat 46°41'57", long 85°25'19", in NW¼ SW¼ sec.27, T.50 N., R.9 W., Luce County, at footbridge in state forest campground, 0.4 mile upstream from mouth, 18 miles northwest of Paradise.	201	1972-73	11-27-72 03-21-73 05-03-73 07-31-73 09-13-73	a 219 a 473 a 714 271 174
*04045538	West Branch Waiska River near Brimley, Mich.	Lat 46°21'18", long 84°35'35", in SW¼ NW¼ sec.29, T.46 N., R.2 W., Chippewa County, just downstream of confluence with McMahan Creek at bridge on County road, 2 miles upstream from mouth, 3.5 miles south of Brimley.	40.7	1972-73	10-11-72 11-28-72 02-13-73 03-27-73 05-02-73 08-01-73 08-27-73 09-14-73	21.2 a43.0 23.8 a124 a277 70.4 22.5 14.0
*04045559	East Branch Waiska River near Brimley, Mich.	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 miles upstream from mouth, 4.7 miles east of Brimley.	30.1	1972-73	11-28-72 02-13-73 03-27-73 05-02-73 08-01-73 09-24-73	14.6 5.78 a70.9 a333 18.3 3.18
Streams tributary to Lake Michigan						
04057580	Whitefish River near Rapid River, Mich.	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 north-east of Rapid River.	284	1973	08-29-73 09-12-73	100 159
04058120	Green Creek near Palmer, Mich.	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 1970-73	11-10-72 12-04-72 12-27-72 01-22-73 03-05-73 04-02-73 05-16-73 06-14-73 07-17-73 08-27-73	a28.6 a3.05 a17.9 a18.9 a21.2 a34.9 a6.78 a2.47 a2.40 a1.94
04058250	Warner Creek tributary near Palmer, Mich.	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	1972-73	11-09-72 12-04-72 01-22-73 04-04-73 05-16-73 07-31-73 08-30-73	a9.86 1.76 b4 a16.8 a14.6 a14.8 2.12

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Discharge measurements made at low-flow partial-record stations during water year 1973.--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
Stream tributary to Lake Michigan.--Continued						
04059042	Portage Creek at Escanaba, Mich.	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	08-29-73 09-12-73	12.6 6.58
04059750	Big Cedar River near Cedar River, Mich.	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	08-29-73 09-12-73	99.7 38.3
04059757	Big Brook near Ingalls, Mich.	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	10-17-72 01-17-73 04-18-73 08-29-73	2.71 8.01 82.2 8.59
04062210	Spurr River at Three Lakes, Mich.	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	1971-73	01-03-73 04-24-73 09-12-73	14.4 76.8 12.4
04065393	East Branch Sturgeon River below Skunk Creek near Felch, Mich.	Lat 46°01'34", long 87°49'56", in NW¼ NE¼ sec.20, T.42 N., R.28 W., Dickinson County, 50 ft. downstream from Skunk Creek, 2.2 miles north of Felch.	61.8	1972-73	10-19-72 11-14-72 03-28-73 05-09-73 09-11-73	29.6 57.3 119 a365 25.4
04065397	East Branch Sturgeon River at Hardwood, Mich.	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	1972-73	10-19-72 11-14-72 03-28-73 05-09-73 09-11-73	42.9 101 178 a411 39.0
04065550	Pine Creek near Randville, Mich.	Lat 45°58'02", long 88°00'28", in SW¼ NW¼ sec.12, T.41 N., R.30 W., Dickinson County. 0.4 mile upstream from Groveland Mine Outlet, 2.7 miles southeast of Randville.	1.53	1971-73	11-13-72 01-10-73 03-21-73 05-17-73 07-11-73	1.32 1.03 6.34 4.16 .76
04065560	Groveland Mine Outlet near Randville, Mich.	Lat 45°58'27", long 88°00'10", in SW¼ SE¼ sec.1, T.41 N., R.30 W., Dickinson County, at over-flow weir, 0.5 mile upstream from mouth, 2.9 miles southeast of Randville.	3.40	1971-73	11-13-72 01-10-73 03-21-73 05-17-73 07-11-73	a1.78 a0 a15.3 a11.5 a3.01
04065570	Pine Creek near Merriman, Mich.	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	1971-73	11-13-72 01-09-73 03-21-73 05-16-73 07-10-73	a8.34 3.55 a46.6 a26.5 6.45
04065580	Mounty's Creek near Merriman, Mich.	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	1971-73	11-13-72 01-09-73 03-21-73 05-16-73 07-10-73	5.68 1.36 10.7 7.69 1.71
04065590	Steel Creek near Merriman, Mich.	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 north-east of Merriman.	3.52	1971-73	11-13-72 01-09-73 03-21-73 05-16-73 07-10-73	3.48 2.48 9.53 5.47 2.27

Discharge measurements made at low-flow partial-record stations during water year 1973.--Continued

Discharge measurements made at low-flow partial-record stations during water year 1975--Continued					Measurements	
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Date	Discharge (cfs)
Streams tributary to Lake Michigan.--Continued						
04066615	Little Shakey Creek near Daggett, Mich.	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	10-26-72 01-17-73 04-18-73 08-29-73	12.2 6.68 64.8 9.27
04096517	Hog Creek tributary near Allen, Mich.	Lat 41°57'33", long 84°49'33", in SW¼ SW¼ sec.7, T.6 S., R.4 W., Hillsdale County, at Squires Rd., 0.3 mile upstream from mouth, 3.0 miles west of Allen.	2.61	1969-73	07-10-73 09-10-73	.34 0
04120550	"The Cut" near Prudenville, Mich.	Lat 44°21'47", long 84°40'48", in NW¼ NE¼ sec.28, T.23 N., R.3 W., Roscommon County, 1.4 miles downstream from Higgins Lake, 4.7 miles north of Prudenville.	90.0	1971-73	10-13-72 11-13-72 04-09-73 05-07-73 06-21-73	32.4 118 153 101 94.4
04120690	Spring Brook near Prudenville, Mich.	Lat 44°18'37", long 84°38'12", NE¼ SE¼ sec.11, T.22 N., R.3 W., Roscommon County, 1.1 miles northeast of Prudenville.	1.31	1971-73	10-13-72 11-13-72 04-09-73 05-07-73 06-21-73	0.22 0.25 1.36 0.20 0.72
04120740	Denton Creek at Prudenville, Mich.	Lat 44°17'08", long 84°38'07", in SE¼ NE¼ sec.14, T.22 N., R.3 W., Roscommon County, 200 ft downstream from Lake James control structure and 0.9 mile east of Prudenville.	47.3	1971-73	10-13-72 11-13-72 04-09-73 05-07-73 06-21-73	5.41 a21.8 39.7 19.0 6.77
04120780	Knappen Creek at Prudenville, Mich.	Lat 44°17'58", long 84°39'02", in SW¼ NW¼ sec.14, T.22 N., R.3 W., Roscommon County, at M55 highway culvert, 150 ft upstream from mouth, at Prudenville.	4.60	1971-73	10-13-72 11-13-72 04-09-73 05-07-73 06-21-73	1.70 4.37 7.72 4.76 1.96
04120900	Muskegon River near Houghton Lake Heights, Mich.	Lat 44°24'16", long 84°47'27", in NW¼ NW¼ sec.10, T.23 N., R.4 W., Roscommon County, on right bank at upstream side of bridge on Old 27, 5.4 miles north of Houghton Lake Heights.	222	1971-73	10-13-72 11-13-72 04-09-73 05-07-73 06-21-73	39.8 131 a331 277 84.1
04121920	Tamarack Creek at Howard City, Mich.	Lat 43°24'03", long 84°28'06", in NW¼ SE¼ sec.26, T.12 N., R.10 W., Montcalm County, on upstream side of bridge on highway U.S. 131 in Howard City.	85.4	1973	02-12-73 03-19-73 04-17-73 05-23-73 07-09-73 08-13-73	95.9 a144 a125 79.0 45.9 39.4
04122300	Pere Marquette River near Baldwin, Mich.	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 M37, 2.7 miles south of Baldwin.	167	1973	03-06-73 03-20-73 04-25-73 05-25-73 07-11-73 08-14-73	a292 a231 a176 148 118 113
04127700	Elk River at Elk Rapids, Mich.	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 non-operative powerplant in Elk Rapids, 500 ft upstream from mouth.	513	1973	03-01-73 03-15-73 04-12-73 05-16-73 06-18-73 07-25-73 08-20-73	a655 a835 a961 a549 a484 a501 a406
Streams tributary to Lake Huron						
04137800	Tawas River at Tawas City, Mich.	Lat 44°16'39", long 83°30'53", in NE¼ NW¼ sec.30, T.22 N., R.8 E., Iosco County, on right downstream side of bridge on State Highway M55 in Tawas City.	156	1973	02-21-73 03-27-73 04-24-73 07-17-73	77.5 228 152 47.5

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Discharge measurements made at low-flow partial-record stations during water year 1973.--Continued

Discharge measurements made at low-flow partial-record stations during water year 1973.--Continued						
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake Huron.--Continued						
04143200	Pine River near Standish, Mich.	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	03-27-73 04-24-73	131 47.3
04145930	South Branch Flint River near Lapeer, Mich.	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	05-31-73 07-04-73 08-09-73 09-12-73	a88.2 50.0 13.3 7.98
Streams tributary to St. Clair River						
04159300	Black River near Croswell, Mich.	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	1956-73	10-25-72 12-07-72 07-05-73 08-09-73 09-12-73	a93.6 38.9 147 91.7 13.6
Streams tributary to Lake St. Clair						
04161585	Stony Creek near Goodison, Mich.	Lat 42°45'49", long 83°04'28", in SW¼ sec.17, T.4 N., R.12 E., at Inwood Rd., Macomb County, 5.2 miles northeast of Goodison.	34.6	1972-73	06-05-73 07-18-73 08-16-73 09-20-73	a49.7 13.5 a20.2 10.8
Streams tributary to Lake Erie						
*04173250	Mill Creek near Lima Center, Mich.	Lat 42°15'56", long 83°56'45", in NE¼ sec.34, T.2 S., R.4 E., Washtenaw County, at Guenther Rd., 2.2 miles south of Lima Center.	47.3	1967-73	03-15-73 03-22-73 06-13-73 07-11-73 09-20-73	a119 107 24.8 a34.0 13.5
04176390	Saline River at Saline Mich.	Lat 42°09'35", long 83°47'01", in SE¼ sec.1, T.4 S., R.5 E., Washtenaw County, at Monroe St., in Saline.	77.6	1965-73	06-13-73 07-12-73	a30.2 a35.5
04176420	Saline River at Milan, Mich.	Lat 42°04'38", long 83°40'37", in SW¼ sec.1, T.5 S., R.6 E., Washtenaw County, at U.S. Highway 23, at southeast edge of Milan.	113	1966-73	06-08-73 07-12-73	a89.1 a61.8

* Also a crest-stage station.

† Operated as a continuous record station.

a Not base flow.

b Field estimate.

c Since 1970, affected by diversion for industrial use.

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 1973

Station number	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Streams tributary to Lake Superior							
*04032150	Presque Isle River near Connorville, Mich.	Lat 46°41'46", long 89°58'26", in SE1/4 sec.30, T.50 N., R.45 W., Gogebic County, at bridge on South Boundary Road, 1.0 mile upstream from mouth and 10 miles north of Connorville.	358	1972-73	03-16-73	8.41	3,590
04039500	South Branch Ontonagon River at Ewen, Mich.	Lat 46°31'58", long 89°16'37", in NW1/4 sec.26, T.48 N., R.40 W., Ontonagon County, on piers of old State Highway 28 bridge in Ewen.	348	1939-41, 1942-71†, 1972-73	03-10-73	14.68	3,840
04041000	Perch River near Sidnaw, Mich.	Lat 46°31'06", long 88°39'48", in NE1/4 sec.34, T.48 N., R.35 W., Baraga County, at State Highway 28, 2.5 miles east of Sidnaw.	63.1	1913-15†, 1957-73	05-10-73	9.65	540
04042500	Otter River near Elo, Mich.	Lat 46°50'09", long 88°38'12", in NE1/4NE1/4 sec.8, T.51 N., R.34 W., Houghton County, 50 ft up-stream from highway bridge, 1.6 miles north of Pelkie, 2.5 miles south of Elo, and 5.5 miles up-stream from Otter Lake.	162	1943-72†, 1973	05-10-73	8.55	2,730
04044200	Carp Creek at Ishpeming, Mich.	Lat 46°29'11", long 87°41'21", in NW1/4 sec.9, T.47 N., R.27 W., Marquette County, at bridge on Highway 41A at Ishpeming.	16.5	1970-73	05-09-73	6.93	182
*04044813	Two Hearted River near Paradise,	Lat 46°41'57", long 85°25'19", in NW1/4SW1/4 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	03-17-73	7.05	885
*04045538	West Branch Waiska River near Brimley, Mich.	Lat 46°21'18", long 84°35'35", in SW1/4NW1/4 sec.29, T.46 N., R.2 W., Chippewa County, at bridge on county road, 3.2 miles up-stream from mouth and 3.5 miles south of Brimley.	40.7	1973	07-30-73	7.72	768
*04045559	East Branch Waiska River near Brimley, Mich.	Lat 46°25'07", long 84°28'24", in NW1/4NE1/4 sec.6, T.46 N., R.1 W., Chippewa County, at bridge on county road, 4.0 miles up-stream from mouth and 4.7 miles east of Brimley.	31.9	1973	07-30-73	a9.40	603
Streams tributary to Lake Michigan							
04049500	Manistique River at Germfask, Mich.	Lat 46°14'00", long 85°55'40", in SE1/4 sec.4, T.44 N., R.13 W., Schoolcraft County, 600 ft up-stream from bridge on State Highway 77, 1.0 mile south of Germfask.	341	1938-70†, 1971-73	03-18-73	4.93	1,120
04055000	Manistique River near Blaney, Mich.	Lat 46°05'05", long 86°03'35", in SE1/4 sec.28, T.43 N., R.14 W., Schoolcraft County, 40 ft down-stream from logging bridge, 0.5 mile downstream from Duck Creek, 7 miles southwest of Blaney.	704	1938-70†, 1971-73	03-18-73	17.32	3,940

See footnotes at end of table, p. 235.

Annual maximum discharge at crest-stage partial-record stations during water year 1973--Continued

Station number	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Streams tributary to Lake Michigan--Continued							
04057000	Indian River near Manistique, Mich.	Lat 45°59'30", long 86°17'15", in NE1/4 sec.34, T.42 N., R.16 W., Schoolcraft County, near outlet of Indian Lake, 2.4 miles north-west of Manistique.	302	1938-71#, 1972-73	05-10-73	5.02	731
04057900	Black River near Republic, Mich.	Lat 46°25'08", long 87°53'21", in NE1/4 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#, 1970-73	05-10-73	3.98	335
04096020	Galien River near Union Pier, Mich.	Lat 41°49'39", long 86°39'21", in NE1/4 sec.32, T.7 S., R.20 W., Berrien County, on downstream side of bridge on Union Pier Rd., 1.5 miles east of Union Pier.	86.1	b1973	04-23-73	9.54	1,280
04097060	Little Portage Creek near Fulton, Mich.	Lat 42°05'19", long 85°23'29", in SW1/4 sec.29, T.4 S., R.9 W., Kalamazoo County, at bridge on 38th St., 2.8 miles southwest of Fulton.	27.0	1965-67#, 1972-73	12-31-72	5.86	225
04097370	Flowerfield Creek at Flowerfield, Mich.	Lat 42°03'50", long 85°39'44", in SW1/4 sec.1, T.5 S., R.12 W., St. Joseph County, at Flowerfield Rd., at Flowerfield.	42.6	1964-73	12-31-72	1.70	74
04124500	East Branch Pine River near Tustin, Mich.	Lat 44°06'09", long 85°31'02", in NE1/4NW1/4 sec.28, T.20 N., R.10 W., Osceola County, 75 ft downstream from highway bridge, 3.0 miles west of Tustin.	c63	1953-63#, 1964-73	01-20-73	4.48	354
Streams tributary to Lake Huron							
04132500	Thunder Bay River near Hillman, Mich.	Lat 45°00'30", long 83°58'21", in NE1/4SE1/4 sec.8, T.30 N., R.4 E., Montmorency County, on left bank 25 ft upstream from bridge on State Highway 32, 5.2 miles southwest of Hillman.	232	1946-72#, 1973	05-28-73	d7.41	592
04138600	Gamble Creek at Lupton, Mich.	Lat 44°25'26", long 84°01'32", in SW1/4SW1/4 sec.36, T.24 N., R.3 E., Ogemaw County, at culvert on Lupton Rd., 0.5 mile south of Lupton.	9.47	1953-56, 1959-73	05-28-73	4.11	88
04138700	Bixby Creek near Rose City, Mich.	Lat 44°26'06", long 84°07'16", in NE1/4NW1/4 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	1953-73	05-28-73	3.56	72
04138800	Houghton Creek at Rose City, Mich.	Lat 44°25'17", long 84°06'34", in NE1/4NE1/4 sec.6, T.23 N., R.3 E., Ogemaw County, at bridge on Rose City Rd., 0.3 mile east of Rose City.	13.3	1953-73	05-28-73	2.42	220
04138900	Wilkins Creek near Rose City, Mich.	Lat 44°24'18", long 84°06'59", in NE1/4NW1/4 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	1953-73	03-08-73	2.90	126
04139000	Houghton Creek near Lupton, Mich.	Lat 44°23'45", long 84°02'50", in SE1/4SE1/4 sec.10, T.23 N., R.3 E., Ogemaw County, 2.7 miles southwest of Lupton.	29.7	1950-72#, 1973	05-28-73	4.85	245
04139500	Rifle River at "The Ranch" near Lupton, Mich.	Lat 44°23'36", long 84°02'18", in SE1/4SW1/4 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#, 1972-73	03-08-73	9.15	346

Annual maximum discharge at crest-stage partial-record stations during water year 1973--Continued

Station number	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Streams tributary to Lake Huron--Continued							
04140000	Prior Creek near Selkirk, Mich.	Lat 44°20'06", long 84°04'06", in SE1/4SE1/4 sec.33, T.23 N., R.3 E., Ogemaw County, on right bank 20 ft upstream from culverts on Peters Rd., 1.5 miles north of Selkirk.	21.4	1950-72, 1973	03-08-73	4.90	152
04140200	Klacking Creek near Selkirk, Mich.	Lat 44°20'05", long 84°08'46", in NE1/4NE1/4 sec.2, T.22 N., R.2 E., Ogemaw County, at bridge on Campbell Rd., 4.0 miles north-west of Selkirk.	7.51	1953-73	05-28-73	2.16	106
04141100	Shepards Creek near Selkirk, Mich.	Lat 44°18'27", long 84°05'05", in SE1/4SE1/4 sec.8, T.22 N., R.3 E., Ogemaw County, at bridge on Bettelyon Rd., 1.1 miles south-west of Selkirk.	4.44	1953-73	05-28-73	4.88	838
04144180	Jones Creek near Gaines, Mich.	Lat 42°53'02", long 83°52'27", in SE1/4 sec.28, T.6 N., R.5 E., Genesee County, at bridge on Baldwin Rd., 1.7 miles north-east of Gaines.	7.60	1970-73	12-31-72	6.14	94
04144200	Porter Drain near Gaines, Mich.	Lat 42°53'26", long 83°50'59", in SE1/4 sec.27, T.6 N., R.5 E., Genesee County, at bridge on Seymour Rd., 3.2 miles east of Gaines.	4.68	1970-73	12-31-72	4.55	75
04144220	Jones Creek at Duffield, Mich.	Lat 42°54'45", long 83°54'27", in SW1/4 sec.17, T.6 N., R.5 E., Genesee County, at bridge on Grand Blanc Rd., 1.0 mile south of Duffield.	23.4	1970-73	12-31-72	6.70	260
04147800	Powers-Cullen Drain near Genesee, Mich.	Lat 43°05'33", long 83°33'31", in SE1/4 sec.18, T.8 N., R.8 E., Genesee County, at bridge on Coldwater Rd., 3.3 miles south-east of Genesee.	9.17	1970-73	12-31-72	4.65	310
04147900	Lefler-Scothan Drain near Otisville, Mich.	Lat 43°08'11", long 83°32'27", in NE1/4 sec.5, T.8 N., R.8 E., Genesee County, at bridge on Frances Rd., 2.2 miles south of Otisville.	4.90	1970-73	12-31-72	4.60	128
04148120	Kearsley Creek near Atlas, Mich.	Lat 42°57'15", long 83°32'42", in NE1/4 sec.5, T.6 N., R.8 E., Genesee County, at bridge on Jordan Rd., 1.2 miles north of Atlas.	55.7	1970-73	12-31-72	7.25	350
04148139	Black Creek near Davison, Mich.	Lat 43°01'28", long 83°33'24", in SE1/4 sec.7, T.7 N., R.8 E., Genesee County, at bridge on Irish Rd., 2.0 miles west of Davison.	22.8	1970-73	12-31-72	5.66	202
04148144	Chipmunk Creek near Genesee, Mich.	Lat 43°04'01", long 83°36'59", in SE1/4 sec.27, T.8 N., R.7 E., Genesee County, at bridge on Genesee Rd., 3.1 miles south of Genesee.	5.50	1970-73	12-31-72	3.81	178
04148255	Swartz Creek near Grand Blanc, Mich.	Lat 42°53'09", long 83°41'29", in SE1/4 sec.25, T.6 N., R.6 E., Genesee County, at bridge on Baldwin Rd., 4.1 miles south-west of Grand Blanc.	36.0	1970-73	12-31-72	5.41	185
04148260	Swartz Creek near Swartz Creek, Mich.	Lat 42°58'22", long 83°45'43", in SW1/4 sec.28, T.7 N., R.6 E., Genesee County, at bridge on Bristol Rd., 3.9 miles east of Swartz Creek.	67.2	1970-73	12-31-72	--	e500

Annual maximum discharge at crest-stage partial-record stations during water year 1973--Continued

Station number	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Streams tributary to Lake Huron--Continued							
04148265	Kimball Drain near Swartz Creek, Mich.	Lat 42°55'15", long 83°49'51", in NE1/4 sec.14, T.6 N., R.5 E., Genesee County, at bridge on Morrish Rd., 2.4 miles south of Swartz Creek.	10.6	1970-73	12-31-72	8.51	265
04148270	West Branch Swartz Creek near Swartz Mich.	Lat 42°58'22", long 83°46'08", in SW1/4 sec.28, T.7 N., R.6 E., Genesee County, at bridge on Bristol Rd., 3.2 miles east of Swartz Creek.	40.8	1970-73	12-31-72	10.56	588
04148410	Thread Creek near Goodrich, Mich.	Lat 42°53'19", long 83°32'10", in SE1/4 sec.29, T.6 N., R.8 E., Genesee County, at bridge on Baldwin Rd., 2.4 miles south-west of Goodrich.	28.5	1970-73	12-31-72	6.87	290
04148610	Cole Creek near Flushing, Mich.	Lat 43°02'44", long 83°51'06", in SW1/4 sec.35, T.8 N., R.5 E., Genesee County, at bridge on Potter Rd., 1.2 miles south of Flushing.	8.51	1970-73	12-31-72	6.43	193
04148620	Freeman Drain near Montrose, Mich.	Lat 43°07'04", long 83°53'37", in SE1/4 sec.5, T.8 N., R.5 E., Genesee County, at bridge on Mt. Morris Rd., 4.0 miles south of Montrose.	8.21	1970-73	12-31-72	6.71	219
04148640	Armstrong Creek near Montrose, Mich.	Lat 43°08'04", long 83°50'03", in SE1/4 sec.35, T.9 N., R.5 E., Genesee County, at bridge on Morrish Rd., 4.1 miles southeast of Montrose.	11.0	1970-73	12-31-72	6.01	247
04148740	Central-Stadler Drain near Montrose, Mich.	Lat 43°09'46", long 83°50'14", in SE1/4 sec.23, T.9 N., R.5 E., Genesee County, at bridge on Wilson Rd., 3.1 miles east of Montrose.	14.2	1970-73	12-31-72	6.67	210
04148800	Pine Run near Montrose, Mich.	Lat 43°12'42", long 83°48'54", in SE1/4 sec.1, T.9 N., R.5 E., Genesee County, at bridge on Elms Rd., 4.7 miles northeast of Montrose.	27.8	1970-73	12-31-72	9.55	730
04148900	Silver Creek near Clio, Mich.	Lat 43°12'54", long 83°45'55", in NW1/4 sec.4, T.9 N., R.6 E., Genesee County, at bridge on Weir Rd., 3.0 miles northwest of Clio.	4.01	1970-73	12-31-72	3.38	78
04149300	Mistequay Creek near Flushing, Mich.	Lat 43°01'31", long 83°54'41", in NE1/4 sec.7, T.7 N., R.5 E., Genesee County, at bridge on Duffield Rd., 3.7 miles south-west of Flushing.	17.4	1970-73	12-31-72	10.32	760
04151000	Cass River at Vassar, Mich.	Lat 43°22'15", long 83°34'52", in NW1/4SW1/4 sec.7, T.11 N., R.8 E., Tuscola County, at bridge on State Highway 15, in Vassar.	700	1949-70#, 1971-73	04-03-73	f13.18	6,780
04153500	Salt River near North Bradley, Mich.	Lat 43°42'10", long 84°28'14", in NE1/4SE1/4 sec.7, T.15 N., R.1 W., Midland County, at bridge on North Saginaw Rd., 1.1 miles southeast of North Bradley.	138	1935-71#, 1972-73	01-01-73	g13.85	2,600
04154500	Chippewa River near Midland, Mich.	Lat 43°35'40", long 84°22'10", in NE1/4NE1/4 sec.24, T.14 N., R.1 W., Midland County, on upstream side of bridge on Meridian Rd., 6.5 miles southwest of Midland.	597	1947-72#, 1973	05-29-73	h e3,320	

Annual maximum discharge at crest-stage partial-record stations during water year 1973--Continued

Station number	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Streams tributary to Lake St. Clair							
04161760	West Branch Stony Creek near Washington, Mich.	Lat 42°43'53", long 83°06'02", in SE1/4 sec.25, T.4 N., R.11 E., Oakland County, at bridge on Huron-Clinton Metropolitan Park Rd., and 3.4 miles west of Washington.	22.5	1965-73	01-02-73	3.50	190
04164010	North Branch Clinton River at Almont, Mich.	Lat 42°54'59", long 83°02'42", in NE1/4 sec.28, T.6 N., R.12 E., Lapeer County, at bridge on State Highway 53, at Almont.	9.56	1959-62, 1963-68†, 1969-73	12-31-72	5.43	321
04164050	North Branch Clinton River near Romeo, Mich.	Lat 42°49'11", long 82°58'35", in NW1/4 sec.31, T.5 N., R.13 E., Macomb County, at bridge on 33-Mile Rd., 2.2 miles northeast of Romeo.	49.7	1959-64, 1965-69†, 1970-73	12-31-72	4.30	1,400
04164150	North Branch Clinton River near Meade, Mich.	Lat 42°43'50", long 82°54'23", in NE1/4 sec.34, T.4 N., R.13 E., Macomb County, on left bank at bridge on 27-Mile Rd., 1.9 miles northwest of Meade.	89.6	1959-67, 1968-72†, 1973	01-01-73	6.76	1,820
04164200	Coon Creek near Armada, Mich.	Lat 42°47'41", long 82°52'58", in SW1/4 sec.1, T.4 N., R.13 E., Macomb County, at bridge on North Rd., 3.4 miles south of Armada.	10.0	1959-65, 1966-70†, 1971-73	12-31-72	5.57	302
04164250	Tupper Brook at Ray Center, Mich.	Lat 42°45'42", long 82°54'04", in NW1/4 sec.23, T.4 N., R.13 E., Macomb County, at bridge on 29-Mile Rd., at Ray Center	8.62	1959, 1960-64†, 1965-73	12-31-72	4.77	90
04164350	Highbank Creek near Armada, Mich.	Lat 42°48'24", long 82°51'08", in NW1/4 sec.6, T.4 N., R.14 E., Macomb County, at bridge on 32-Mile Rd., 3.0 miles southeast of Armada.	14.9	1959-65, 1966-70†, 1971-73	12-31-72	15.61	940
04164360	East Branch Coon Creek near New Haven, Mich.	Lat 42°45'46", long 82°50'57", in NW1/4 sec.19, T.4 N., R.14 E., Macomb County, at bridge on 29-Mile Rd., 3.4 miles northwest of New Haven.	36.1	1959-67, 1967-72†, 1973	12-31-72	7.94	1,460
04164400	Deer Creek near Meade, Mich.	Lat 42°42'39", long 82°51'32", in NW1/4 sec.6, T.3 N., R.14 E., Macomb County, at bridge on 25-1/2 Mile Rd., 0.9 mile southeast of Meade.	12.7	1959-60, 1961-65†, 1966-73	12-31-72	7.40	473
04164450	McBride Drain near Macomb, Mich.	Lat 42°41'14", long 82°55'14", in NE1/4NE1/4 sec.16, T.3 N., R.13 E., Macomb County, at bridge on 24-Mile Rd., 2.2 miles south-east of Macomb.	5.79	1960-64†, 1965-73	12-31-72	8.58	155
04164600	Middle Branch Clinton River near Macomb, Mich.	Lat 42°42'03", long 82°59'44", in SE1/4 sec.2, T.3 N., R.12 E., Macomb County, at bridge on Schoenherr Rd., 2.0 miles west of Macomb.	22.2	1959-64, 1965-69†, 1971-73	12-31-72	19.60	537
04165200	Gloede Ditch near Waldenburg, Mich.	Lat 42°37'39", long 82°57'10", in SW1/4 sec.32, T.3 N., R.13 E., Macomb County, 2.2 miles south of Waldenburg.	16.0	1959, 1960-64†, 1965-73	12-31-72	16.61	349
Streams tributary to Detroit River							
04168660	Frank and Poet Drain at Trenton, Mich.	Lat 42°09'19", long 83°12'22", in NW1/4 sec.13, T.4 S., R.10 E., Wayne County, at bridge on King Rd., at Trenton.	19.3 (revised)	1972-73	03-12-73	7.71	205

Annual maximum discharge at crest-stage partial-record stations during water year 1973--Continued

Station number	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Streams tributary to Lake Erie							
04172500	Portage River near Pinckney, Mich.	Lat 42°25'40", long 83°57'35", in SW1/4 sec.34, T.1 N., R.4 E., Livingston County, at bridge on Tiplady Rd., 2.0 miles upstream from Little Portage Lake, and 2.2 miles southwest of Pinckney.	79.1	1945-71#, 1972-73	10-29-72	4.3	226
04173000	Huron River near Dexter, Mich.	Lat 42°23'10", long 83°54'40", in S1/2 sec.13, T.1 S., R.4 E., Washtenaw County, at bridge on North Territorial Rd., 0.5 mile east of Hudson Mills, 2 miles downstream from Portage Lake Outlet, and 4 miles north of Dexter.	522	1946-72#, 1973	01-04-73	5.52	1,520
04173250	Mill Creek near Lima Center, Mich.	Lat 42°15'56", long 83°56'45", in NE1/4 sec.34, T.2 S., R.4 E., Washtenaw County, at Guenther Rd., 2.0 miles upstream from North Fork Mill Creek, and 2.2 miles south of Lima Center.	47.3	1973	12-31-73	8.18	330

* Also a low-flow partial-record station.

† Operated as a continuous-record gaging station.

a Maximum gage height, 12.17 ft Mar. 11, 1973 (backwater from ice).

b Period of record, Feb. 27 to Sept. 30, 1973.

c Approximately.

d Maximum gage height, 8.56 ft Jan. 20, 1973 (backwater from ice).

e Computed on basis of correlation with other stations.

f Maximum gage height, 15.35 ft Jan. 2, 1973 (backwater from ice).

g Maximum gage height, 14.48 ft Jan. 19, 1973 (backwater from ice).

h Maximum gage height, 10.27 ft Jan. 21, 1973 (backwater from ice).

i Maximum gage height, 9.90 ft June 26, 1973 (affected by backwater)

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Measurements at miscellaneous sites

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 1973

Discharge measurements made at miscellaneous sites during water year 1973						
Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake Superior						
Montreal River	Lake Superior	Lat 46°30'26", long 90°13'47", in SE1/4SW1/4 sec.31, T.48 N., R.47 W., Michigan meridian, Gogebic County, 0.2 mile upstream from Spring Creek and 4.2 miles north-west of Ironwood, Mich.	80.6	1970,1971	6-20-73	*29.2
Mud Creek	Chocolay River	Lat 46°27'50", long 87°11'46", in SW1/4 sec.16, T.47 N., R.23 W., Marquette County, at bridge on County Road 480, 2.8 miles east of Mangum, Mich.	a13	1972	11- 7-72 4- 4-73 7-19-73	37.1 111 *.75
Cherry Creek	do	Lat 46°28'00", long 87°17'52", in SW1/4 sec.13, T.47 N., R.25 W., Marquette County, 2 1/4 miles southwest of Harvey, Mich.	.61	1963,1964	5-22-73	*9.80
do	do	Lat 46°28'09", long 87°21'25", in NE1/4SW1/4 sec.18, T.47 N., R.24 W., Marquette County, at culvert on County Road 551, 1 1/2 miles south of Harvey, Mich.	5.05		5-22-73	22.8
Sucker River	Lake Superior	Lat 46°39'59", long 85°54'50", in SW1/4SE1/4 sec.3, T.49 N., R.13 W., Alger County, 900 ft downstream from Grand Marais Creek, 3.4 miles east of Grand Marais, Mich.	a105		5- 2-73	234
Betsy River	do	Lat 46°42'40", long 85°03'55", in SW1/4SW1/4 sec.21, T.50 N., R.6 W., Chippewa County, at Shelldrake Dam, 2.8 miles northwest of Shelldrake, Mich.	a68		5- 2-73	84
Streams tributary to Lake Michigan						
Fishdam River	Lake Michigan	Lat 46°02'29", long 86°34'46", in NW1/4NE1/4 sec.17, T.42 N., R.18 W., Delta County, at bridge on County Road 442, 10 miles north of Isabella, Mich.	a7		10-19-72	*5.96
do	do	Lat 46°01'00", long 86°33'38", in SW1/4SE1/4 sec.21, T.42 N., R.18 W., Delta County, at culvert on U.S.F.S. Road 2410, 100 ft downstream from Onion Creek, 8.5 miles northeast of Isabella, Mich.	a13		10-19-72	*9.39
East Branch Whitefish River	Whitefish River	Lat 46°14'16", long 86°51'26", in NE1/4SW1/4 sec.6, T.44 N., R.20 W., Alger County, at culvert on county road, 6.2 miles northeast of Trenary, Mich.	a2		10-19-72	*12.8
do	do	Lat 46°10'51", long 86°52'24", in SW1/4NW1/4 sec.25, T.44 N., R.21 W., Alger County, at bridge 0.6 mile downstream from Dexter Creek, 4.4 miles southeast of Trenary, Mich.	a30		10-19-72	*39.2

See footnotes at end of table, p. 246.

Discharge measurements made at miscellaneous sites during water year 1973--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake Michigan--Continued						
Bills Creek	Whitefish River	Lat 45°57'09", long 86°55'28", in SE1/4NW1/4 sec.15, T.41 N., R.21 W., Delta County, 0.4 mile upstream from mouth, 2.7 miles northeast of Rapid River, Mich.	a23		9-12-73	*6.14
Walton River	Big Cedar River	Lat 45°25'44", long 87°26'24", in NE1/4 sec.18, T.35 N., R.25 W., Menominee County, 500 ft below dam, 4.2 miles west of Cedar River, Mich.	a60	1970	10-16-72 1-17-73	*19.2 *16.8
Dober Mine Pond Outlet	Iron River	Lat 46°02'08", long 88°38'08", in NE1/4NW1/4 sec.1, T.42 N., R.35 W., Iron County, at mouth, at Stambaugh, Mich.			11-21-72 1-25-73 9-14-73	*.20 *.28 *.23
Peshekee River	Lake Michigamme	Lat 46°34'55", long 87°59'51", in SE1/4 sec.1, T.48 N., R.30 W., Marquette County, 0.2 mile downstream from Dishno Creek, 5 miles north of Champion, Mich.	66.5	1961-68†	4-26-73	212
Beaver Lake Inlet	Beaver Lake	Lat 46°22'34", long 87°56'05", in NW1/4NE1/4 sec.21, T.46 N., R.29 W., Marquette County, 50 ft upstream from Beaver Lake, 3.0 miles south- east of Republic, Mich.		1972	6- 4-73	*.98
Beaver Lake Outlet	Horseshoe Lake	Lat 46°22'22", long 87°56'08", in SW1/4NE1/4 sec.21, T.46 N., R.29 W., Marquette County, 200 ft downstream from Beaver Lake, 3.2 miles south- east of Republic, Mich.		1972	6- 4-73	*1.32
Horseshoe Lake Outlet	Gambles Creek	Lat 46°21'56", long 87°56'20", in SW1/4SE1/4 sec.21, T.46 N., R.29 W., Marquette County, at bridge, 0.2 mile downstream from Horseshoe Lake, 3.4 miles southeast of Republic, Mich.		1972	6- 4-73	*2.13
Skunk Creek	East Branch Sturgeon River	Lat 46°01'51", long 87°49'46", in SE1/4SE1/4 sec.17, T.42 N., R.28 W., Dickinson County, at bridge 0.3 mile upstream from mouth, 2.2 miles north of Felch, Mich.	14.5		5- 9-73	104
East Branch Sturgeon River	Sturgeon River	Lat 45°57'57", long 87°44'30", in NW1/4 sec.7, T.41 N., R.27 W., Dickinson County, at bridge on County Road 569, at Foster City, Mich.	106	1969, 1970,1972	10-19-72 11-14-72 5- 9-73	*55.1 114 519
Sauk River	Coldwater River	Lat 41°56'19", long 84°55'55", in NE1/4NW1/4 sec.19, T.6 S., R.5 W., Branch County, at bridge on Fremont Road, 2.5 miles east of Coldwater, Mich.			6-12-73	*76.9
do	do	Lat 41°55'28", long 84°58'16", in NE1/4NW1/4 sec.26, T.6 S., R.6 W., Branch County, at bridge on Willow- brook Road, 1.0 mile southeast of Coldwater, Mich.			6-14-73	*83.6
Nottawa Creek	St. Joseph River	Lat 42°06'57", long 85°10'40", in NE1/4NE1/4 sec.24, T.4 S., R.8 W., Calhoun County, at bridge on Six Mile Road, 3 miles northeast of Athens, Mich.			7-25-73	*b54.8
Farmers Creek	do	Lat 41°59'10", long 86°19'35", in SW1/4SE1/4 sec.31, T.5 S., R.17 W., Berrien County, upstream of the Michigan Tube outfall, 1.4 miles west of Eau Claire, Mich.			5-25-73	b4.70
do	do	Lat 41°58'49", long 86°19'59", in SE1/4NW1/4 sec.6, T.6 S., R.17 W., Berrien County, at Hipps Hollow Road, 1.7 miles west of Eau Claire, Mich.		1967	5-25-73	b25.1

Discharge measurements made at miscellaneous sites during water year 1973--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake Michigan--Continued						
Pine Creek	Paw Paw River	Lat 42°11'58", long 86°10'48", in NE1/4NW1/4 sec.21, T.3 S., R.16 W., Van Buren County, 0.3 mile east of 66th Street, at Pere Marquette Railroad bridge, 0.8 mile southwest of Hartford, Mich.			5-10-73	*b5.77
Haven and Max Lake Drain	Black River	Lat 42°22'25", long 85°59'11", in NE1/4NW1/4 sec.19, T.1 S., R.14 W., Van Buren County, at 45th Street, 1.6 miles southwest of Bloomingdale, Mich.			8- 3-73	*2.54
do	do	Lat 42°22'08", long 86°00'01", in SW1/4NE1/4 sec.24, T.1 S., R.15 W., Van Buren County, at 46 1/2 Street, below Great Bear Lake, 2.4 miles southwest of Bloomingdale, Mich.			8- 3-73	*2.98
Black River	Lake Michigan	Lat 42°18'58", long 86°06'47", in NE1/4NE1/4 sec.12, T.2 S., R.16 W., Van Buren County, at 2nd Street bridge, below Mill Pond dam, at Bangor, Mich.			5-10-73	*b71.6
South Branch Kalamazoo River	Kalamazoo River	Lat 42°08'15", long 84°44'40", in SE1/4NW1/4 sec.11, T.4 S., R.4 W., Calhoun County, at 28 1/2 Mile Road, 3.5 miles east of Homer, Mich.			7-25-73 8-15-73	b63.8 *b36.2
Wanandoger Creek	do	Lat 42°23'48", long 85°07'57", in NW1/4SW1/4 sec.9, T.1 S., R.7 W., Calhoun County, at State Highway M-78, 4.2 miles north of Battle Creek, Mich.			7-25-73	b23.7
Gull Creek	do	Lat 42°22'08", long 85°24'13", in NW1/4SE1/4 sec.19, T.1 S., R.9 W., Kalamazoo County, at DE Avenue, 0.6 mile south of Yorkville, Mich.	28.9	1964, 1966-67	4-23-73	37.4
Grand River	Lake Michigan	Lat 42°05'22", long 84°25'19", in SW1/4SW1/4 sec.27, T.4 S., R.1 W., Jackson County, at Sutfin Road, 1.3 miles southwest of Liberty, Mich.			1-13-73	*b9.42
Sycamore Creek	Red Cedar River	Lat 42°38'25", long 84°28'55", in NW1/4NW1/4 sec.19, T.3 N., R.1 W., Ingham County, at Holt Road, 1.7 miles east of Holt, Mich.			8-28-73	*b11.4
Plaster Creek	Grand River	Lat 42°56'54", long 85°41'54", in NE1/4SW1/4 sec.35, T.7 N., R.12 W., Kent County, at Market Avenue bridge, at Grand Rapids, Mich.			7-30-73	*b25.4
Black Creek	Mona Lake	Lat 43°11'50", long 86°11'11", in NE1/4SE1/4 sec.3, T.9 N., R.16 W., Muskegon County, at bridge on Black Creek Road, 3.8 miles southeast of Muskegon, Mich.		1952,1970	7-30-73	*b44.4
do	do	Lat 43°11'16", long 86°12'20", in NE1/4NE1/4 sec.9, T.9 N., R.16 W., Muskegon County, at south lane of highway US-31, at Norton Shores, Mich.	61.6		8-30-73	*45.6
Little Black Creek	do	Lat 43°11'31", long 86°14'18", in SE1/4SW1/4 sec.5, T.9 N., R.16 W., Muskegon County, at culvert on Merrian Street, in Muskegon Heights, Mich.	6.00		8-30-73	*5.80

Discharge measurements made at miscellaneous sites during water year 1973--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake Michigan--Continued						
Big Creek	Higgins Lake	Lat 44°29'52", long 84°46'44", in NW1/4SE1/4 sec.3, T.24 N., R.4 W., Roscommon County, at culvert on county road, 3.1 miles northwest of Lyon Manor, Mich.	10.5		12-18-72	*1.80
Higgins Lake Outlet	Houghton Lake	Lat 44°25'59", long 84°40'12", in NW1/4NW1/4 sec.34, T.24 N., R.3 W., Roscommon County, at highway culverts, 5.9 miles southwest of Roscommon, Mich.	49.2	1942-50†	12-18-72	*57.8
Unnamed tributary	do	Lat 44°22'24", long 84°41'49", in SE1/4NE1/4 sec.20, T.23 N., R.3 W., Roscommon County, at culverts on County Road 100, 450 ft upstream from mouth, and 5.7 miles north of Prudenville, Mich.		1971-72	10-13-72	* .005
	11-13-72				* .14	
					4- 9-73	*1.38
					5- 7-73	* .68
do	do	Lat 44°20'57", long 84°40'54", in SW1/4SE1/4 sec.28, T.23 N., R.3 W., Roscommon County, at culvert at McDonald Drive, 3.8 miles north of Prudenville, Mich.			4- 9-73	* .01
do	do	Lat 44°20'28", long 84°40'23", in NE1/4SE1/4 sec.33, T.23 N., R.3 W., Roscommon County, at culvert on Oneida Road, 3.1 miles north of Prudenville, Mich.			4- 9-73	* .03
do	do	Lat 44°20'19", long 84°39'45", in NW1/4SE1/4 sec.34, T.23 N., R.3 W., Roscommon County, at public fishing site, 20 ft upstream from mouth, and 2.8 miles north of Prudenville, Mich.		1971-72	11-13-72	* .14
					4- 9-73	* .34
					5- 7-73	* .20
					6-21-73	* .02
do	do	Lat 44°19'33", long 84°38'08", in NE1/4SE1/4 sec.2, T.22 N., R.3 W., Roscommon County, at culvert on County Road 100, at Harvey Marine, 2.1 miles north of Prudenville, Mich.		1971-72	11-13-72	*4.77
					4- 9-73	*26.3
					5- 7-73	*4.31
do	do	Lat 44°19'15", long 84°38'00", in SE1/4SE1/4 sec.2, T.22 N., R.3 W., Roscommon County, just above mouth, 300 ft below culvert on County Road 100, 1.8 miles north of Prudenville, Mich.		1971-72	10-13-72	* .005
					11-13-72	* .14
					4- 9-73	* .06
					5- 7-73	* .08
do	do	Lat 44°19'10", long 84°37'57", in NE1/4NE1/4 sec.11, T.22 N., R.3 W., Roscommon County, at culvert at Silver Drive, 1.8 miles north of Prudenville, Mich.			11-13-72	* .01
					4- 9-73	* .01
					5- 7-73	* .001
do	do	Lat 44°17'54", long 84°39'33", in SW1/4NE1/4 sec.15, T.22 N., R.3 W., Roscommon County, at culvert on State Highway M-55, at 7th Street in Prudenville, Mich.		1972	10-13-72	* .04
					11-13-72	* .43
					4- 9-73	* .06
					5- 7-73	* .27
					6-21-73	* .08
do	do	Lat 44°17'55", long 84°40'23", in SE1/4NE1/4 sec.16, T.22 N., R.3 W., Roscommon County, at culvert on State Highway M-55, 1.1 miles west of Prudenville, Mich.		1971-72	10-13-72	* .01
					11-13-72	* .07
					4- 9-73	*2.48
					5- 7-73	*1.60
					6-21-73	* .48
do	do	Lat 44°17'56", long 84°40'48", in SW1/4NE1/4 sec.16, T.22 N., R.3 W., Roscommon County, at culvert on State Highway M-55 1.4 miles west of Prudenville, Mich.		1971-72	11-13-72	* .01
					4- 9-73	* .04
					5- 7-73	* .02
					6-21-73	* .001

Discharge measurements made at miscellaneous sites during water year 1973--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake Michigan--Continued						
Unnamed tributary	Houghton Lake	Lat 44°17'56", long 84°41'02", in SE1/4NW1/4 sec.16, T.22 N., R.3 W., Roscommon County, at culvert on State Highway M-55, 1.6 miles west of Prudenville, Mich.		1971-72	11-13-72 4- 9-73 5- 7-73 6-21-73	* .04 * .02 * .03 * .01
do	do	Lat 44°17'56", long 84°41'20", in SW1/4NW1/4 sec.16, T.22 N., R.3 W., Roscommon County, at culvert on State Highway M-55, 1.9 miles west of Prudenville, Mich.		1971-72	10-13-72 11-13-72 4- 9-73 5- 7-73 6-21-73	* .02 * .07 * .10 * .18 * .04
do	do	Lat 44°17'56", long 84°41'31", in SW1/4NW1/4 sec.16, T.22 N., R.3 W., Roscommon County, at culvert on State Highway M-55, 1,200 ft west of Chippewa Trail, and 2.0 miles west of Prudenville, Mich.		1972	11-13-72 4- 9-73 5- 7-73	* .03 * .01 * .01
do	do	Lat 44°17'54", long 84°42'44", in NW1/4SW1/4 sec.17, T.22 N., R.3 W., Roscommon County, at culvert on State Highway M-55 at Spartan Plaza, 3.0 miles west of Prudenville, Mich.		1972	11-13-72 4- 9-73 5- 7-73 6-21-73	* .02 * .01 * .005 * .01
do	do	Lat 44°17'59", long 84°44'26", in SW1/4NE1/4 sec.13, T.22 N., R.4 W., Roscommon County, at culvert on State Highway M-55, 1.6 miles southeast of Houghton Lake, Mich.		1971-72	11-13-72 4- 3-73 5- 7-73 6-21-73	* .01 * .01 * .005 * .005
do	do	Lat 44°20'47", long 84°47'39", in SE1/4NE1/4 sec.33, T.23 N., R.4 W., Roscommon County, at culvert at Peters Road, 1.7 miles north of Houghton Lake Heights, Mich.			5- 7-73	* .01
do	do	Lat 44°22'28", long 84°43'04", in NE1/4NE1/4 sec.19, T.23 N., R.3 W., Roscommon County, 20 ft upstream from mouth, 300 ft downstream from culverts on County Road 300, and 6.2 miles north of Prudenville, Mich.		1971-72	11-13-72 4- 9-73 5- 7-73 6-21-73	* .03 * .15 * .02 * .02
do	do	Lat 44°22'28", long 84°43'32", in NE1/4NW1/4 sec.19, T.23 N., R.3 W., Roscommon County, 10 ft upstream from mouth, 300 ft downstream from culvert on County Road 300, 6.4 miles north of Prudenville, Mich.		1971-72	11-13-72 4- 9-74 5- 7-73	* .07 * .24 * .04
do	do	Lat 44°22'33", long 84°44'08", in NW1/4NW1/4 sec.19, T.23 N., R.3 W., Roscommon County, at culverts on County Road 300, 5.2 miles north- east of Houghton Lake Heights, Mich.		1971-72	10-13-72 11-13-72 4- 9-73 5- 7-73	* .04 * .22 * .29 * .04
do	do	Lat 44°23'18", long 84°45'08", in SW1/4NW1/4 sec.13, T.23 N., R.4 W., Roscommon County, 10 ft upstream from mouth, 4.4 miles north of Houghton Lake Heights, Mich.		1971-72	10-13-72 11-13-72 4- 9-73 5- 7-73	* .001 * .05 * 1.28 * .03
do	do	Lat 44°23'19", long 84°45'08", in SW1/4NW1/4 sec.13, T.23 N., R.4 W., Roscommon County, 10 ft upstream from mouth, 4.4 miles north of Houghton Lake Heights, Mich.		1971-72	11-13-72	* .08
do	do	Lat 44°23'37", long 84°45'12", in SW1/4SW1/4 sec.12, T.23 N., R.4 W., Roscommon County, at culvert on county road, 4.7 miles north of Houghton Lake Heights, Mich.		1971-72	10-13-72 11-13-73 4- 9-73 5- 7-73 6-21-73	* .02 * .17 * .22 * .09 * .03

Discharge measurements made at miscellaneous sites during water year 1973--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake Michigan--Continued						
Sucker Creek	Houghton Lake	Lat 44°24'06", long 84°45'47", in SW1/4NE1/4 sec.11, T.23 N., R.4 W., Roscommon County, at culvert on county road, 5.1 miles north of Houghton Lake Heights, Mich.		1971-72	10-13-72 11-13-72 4- 9-73 5- 7-73 6-21-73	* .11 *2.21 *4.21 *1.42 * .23
Unnamed tributary	do	Lat 44°24'07", long 84°45'56", in SE1/4NW1/4 sec.11, T.23 N., R.4 W., Roscommon County, at culverts on county road, 0.1 mile east of DNR campground, 700 ft upstream from mouth, 5.2 miles north of Houghton Lake Heights, Mich.		1971-72	11-13-72 4- 9-73 5- 7-73	* .03 * .12 * .03
do	do	Lat 44°24'06", long 84°46'11", in SE1/4NW1/4 sec.11, T.23 N., R.4 W., Roscommon County, at culvert on county road, at campground, 600 ft upstream from mouth, 5.2 miles north of Houghton Lake Heights, Mich.		1971-72	10-13-72 11-13-72 4- 9-73 5- 7-73	* .22 * .13 *1.30 * .11
do	do	Lat 44°24'04", long 84°46'28", in SW1/4NW1/4 sec.11, T.23 N., R.4 W., Roscommon County, at culvert on county road at west end of campground, 5.1 miles north of Houghton Lake Heights, Mich.		1972	4- 9-73 5- 7-73	* .01 * .001
do	Muskegon River	Lat 44°24'11", long 84°47'09", in SE1/4NW1/4 sec.10, T.23 N., R.4 W., Roscommon County, at three culverts on county road, 700 ft upstream from mouth, 5.3 miles north of Houghton Lake Heights, Mich.		1971-72	10-13-72 11-13-72 4- 9-73 5- 7-73 6-21-73	* .60 *2.52 *2.06 *1.25 * .02
do	do	Lat 44°24'15", long 84°47'11", in NE1/4NW1/4 sec.10, T.23 N., R.4 W., Roscommon County, at culvert on county road, 600 ft upstream from mouth, 5.4 miles north of Houghton Lake Heights, Mich.		1972	10-13-72 11-13-72 4- 9-73 5- 7-73 6-21-73	* .01 * .09 * .23 * .19 * .02
do	do	Lat 44°23'35", long 84°47'49", in NE1/4NE1/4 sec.16, T.23 N., R.4 W., Roscommon County, at culvert at DNR pumping station, on Old 27, 4.8 miles north of Houghton Lake Heights, Mich.		1972	10-13-72 11-13-72 4- 9-73	* .02 * .02 * .04
do	do	Lat 44°22'17", long 84°48'25", in NE1/4SW1/4 sec.21, T.23 N., R.4 W., Roscommon County, at upstream side of culvert of north lane of U.S. 27, 3.5 miles north of Houghton Lake Heights, Mich.		1971-72	10-13-72 11-13-72 4- 9-73 5- 7-73 6-21-73	* .05 * .10 *1.74 * .89 * .12
do	do	Lat 44°21'54", long 84°47'59", in NW1/4NE1/4 sec.28, T.23 N., R.4 W., Roscommon County, at DNR pumping station on Old 27, 2.8 miles north of Houghton Lake Heights, Mich.		1971-72	10-13-72 11-13-72 4- 9-73	12.1 * .02 * .05
Clam River	do	Lat 44°15'11", long 85°24'37", in SE1/4SW1/4 sec.33, T.22 N., R.9 W., Wexford County, at bridge on Lake Street, in Cadillac, Mich.		1970	5-11-73	b58.8
Daisy Creek	Fremont Lake	Lat 44°28'20", long 85°56'48", in NW1/4SE1/4 sec.35, T.13 N., R.14 W., Newaygo County, at culvert on roadway, in Fremont, Mich.	13.0		8-30-73	*3.09
do	do	Lat 43°27'36", long 85°57'33", in SW1/4NW1/4 sec.2, T.12 N., R.14 W., Newaygo County, at culverts on county road, 1.0 mile southwest of Fremont, Mich.			8-30-73	*6.57

Discharge measurements made at miscellaneous sites during the water year 1973--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake Michigan--Continued						
Fremont Lake Outlet	Brooks Creek	Lat 43°26'36", long 85°58'33", in NW1/4SW1/4 sec.10, T.12 N., R.14 W., Newaygo County, just below lake control structure, 2.4 miles south- west of Fremont, Mich.	20.3	1945-49	8-30-73	*6.10
Byerson Creek	Muskegon Lake	Lat 43°14'27", long 86°14'18", in SE1/4NW1/4 sec.20, T.10 N., R.16 W., Muskegon County, at culverts on Wood Street, in Muskegon, Mich.	7.59		8-30-73	*4.30
Ruddiman Creek	do	Lat 43°12'38", long 86°16'36", in NE1/4SW1/4 sec.36, T.10 N., R.17 W., Muskegon County, at culvert on Glenside Blvd., in Muskegon, Mich.	3.37	1967	8-30-73	*5.88
Green Creek	do	Lat 43°15'51", long 86°18'31", in NW1/4NE1/4 sec.15, T.10 N., R.17 W., Muskegon County, at culvert on Fenner Road, in North Muskegon, Mich.	11.7		8-30-73	*.96
North Branch Pentwater River	Pentwater River	Lat 43°45'46", long 86°23'37", in SW1/4SW1/4 sec.19, T.16 N., R.17 W., Oceana County, at bridge on U.S. highway 31 (Business Route), 2.3 miles southeast of Pentwater, Mich.			7-30-73	*b36.7
Pine River	Manistee River	Lat 44°03'46", long 85°32'56", in SW1/4SE1/4 sec.6, T.19 N., R.10 W., Osceola County, 15 ft downstream from highway bridge, 5.0 miles northwest of LeRoy, Mich.	118	1953-63† 1964, 1968, 1969	7- 5-73	b57.2
Betsie River	Lake Michigan	Lat 44°36'02", long 86°05'57", in NE1/4NE1/4 sec.3, T.25 N., R.15 W., Benzie County, at bridge on U.S. highway 31, 1.2 miles south of Benzonia, Mich.			7-30-73	*b189
Crystal Lake Outlet	Betsie River	Lat 44°37'56", long 86°08'41", in NW1/4NE1/4 sec.29, T.26 N., R.15 W., Benzie County, at bridge on State Highway M-115, 2.5 miles west of Benzonia, Mich.		1944-51	7-30-73	b19.8
Monroe Creek	Lake Charlevoix	Lat 45°10'44", long 85°09'51", in SE1/4SE1/4 sec.9, T.32 N., R.7 W., Charlevoix County, at culvert on State Highway M-66, 2.5 miles northwest of East Jordan, Mich.	9.73	1972	1-16-73	*9.83
Boyne River	do	Lat 45°11'48", long 45°57'26", in NW1/4SW1/4 sec.5, T.32 N., R.5 W., Charlevoix County, at highway bridge on Dam Road, 2.8 miles southeast of Boyne City, Mich.			7-31-73	b105
do	do	Lat 44°12'51", long 85°00'47", in SE1/4NW1/4 sec.35, T.33 N., R.6 W., Charlevoix County, at bridge on North East Street, in Boyne City, Mich.	69.9		1-16-73	*112
Porter Creek	do	Lat 45°13'06", long 85°04'22", in NW1/4 sec.32, T.33 N., R.6 W., Charlevoix County, at culvert on county road, at Advance, Mich.	17.4		1-16-73	*17.2
Horton Creek	do	Lat 44°17'19", long 85°05'11", in NW1/4NE1/4 sec.6, T.33 N., R.6 W., Charlevoix County, at culvert on county road, 0.5 mile north of Horton Bay, Mich.	11.8		1-16-73	*17.5
Loeb Creek	do	Lat 44°16'48", long 85°13'56", in SE1/4SW1/4 sec.1, T.33 N., R.8 W., Charlevoix County, at culvert on State Highway M-66, 2.4 miles south of Charlevoix, Mich.	5.69		1-16-73	*5.34

Discharge measurements made at miscellaneous sites during the water year 1973--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake Huron						
Ocqueoc River	Lake Huron	Lat 45°28'50", long 84°06'41", in SE1/4SE1/4 sec.19, T.36 N., R.3 E., Presque Isle County, at highway bridge, 5.1 miles north of Ocqueoc, Mich.			9-13-73	b86.0
North Branch Au Sable River	Au Sable River	Lat 44°57'28", long 84°40'07", in NE1/4NE1/4 sec.33, T.30 N., R.3 W., Otsego County, at end of lake control conduit, 5.0 miles south of Gaylord, Mich.			12-22-72	18.2
					12-22-72	15.5
					12-22-72	11.9
					1-17-73	14.7
					3- 1-73	14.0
					3-27-73	13.2
					4-30-73	13.0
					5-30-73	4.61
					6-28-73	1.56
		9-11-73	.82			
do	do	Lat 44°43'00", long 84°25'11", in NW1/4SE1/4 sec.22, T.27 N., R.1 W., Crawford County, on left bank 200 ft above Kelloggs Bridge, 6.8 miles southeast of Lovells, Mich.	a140	1951, 1953-69, 1971c	1-17-73	*183
Big Creek	do	Lat 44°42'57", long 84°24'33", in SW1/4 sec.23, T.27 N., R.1 W., Crawford County, at highway bridge, 7 miles southeast of Lovells, Mich.	a180	1951-69c	1-17-73	*89.2
Van Etten Creek	do	Lat 44°26'49", long 83°20'21", in SW1/4NW1/4 sec.27, T.24 N., R.9 E., Iosco County, at Detroit and Mackinaw railroad bridge, 2.0 miles northwest of Oscoda, Mich.			9-14-73	*b26.4
Tawas River	Lake Huron	Lat 44°17'00", long 83°30'17", in SE1/4SE1/4 sec.19, T.22 N., R.8 E., Iosco County, at highway bridge on Monument Road, at East Tawas, Mich.		1972	9-14-73	*b36.8
East Branch Au Gres River	do	Lat 44°08'28", long 83°38'34", in SW1/4SW1/4 sec.9, T.20 N., R.7 E., Arenac County, at channel dredge at Turner Road, 0.25 mile east of Edmonds Road, 5.2 miles southwest of Alabaster, Mich.			7-14-73	b37.9
North Branch Pine River	Pine River	Lat 43°59'08", long 83°53'18", in NE1/4SE1/4 sec.5, T.18 N., R.5 E., Arenac County, 200 ft upstream from South Branch, 3.6 miles east of Standish, Mich.			9-20-73	b4.61
South Branch Shiawassee River	Shiawassee River	Lat 42°36'59", long 83°57'53", in SE1/4SW1/4 sec.27, T.3 N., R.4 E., Livingston County, on Grand River Avenue, 1.2 miles west of Howell, Mich.			8-15-73	*b9.09
South Branch Flint River	Flint River	Lat 43°04'44", long 83°18'25", in NE1/4SE1/4 sec.29, T.8 N., R.10 E., Lapeer County, at bridge on Saginaw Road, 1.6 miles north of Lapeer, Mich.			9-21-73	*b35.2
Mistequay Creek	do	Lat 43°13'11", long 83°59'20", in NW1/4NW1/4 sec.3, T.9 N., R.4 E., Saginaw County, at Lincoln Road, 3.0 miles north of Layton Corners, Mich.			5-21-73 7-24-73	*b3.23 *b6.57
Sebewaing River (State Drain)	Lake Huron	Lat 43°42'43", long 83°25'40", in SE1/4SE1/4 sec.16, T.15 N., R.9 E., Huron County, at bridge on Rescue Road, 1.4 miles southeast of Sebewaing, Mich.	a62	1940-54†	7-31-73	b1.80

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at miscellaneous sites during the water year 1973--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake Huron--Continued						
East Fork Sebewaing River (Columbia Drain)	Sebewaing River	Lat 43°43'38", long 83°23'46", in SE1/4SE1/4 sec.10, T.15 N., R.9 E., Huron County, at bridge on Gettel Road, 2.5 miles east of Sebewaing, Mich.	a38	1940-54#	7-31-73	b .54
Pigeon River	Lake Huron	Lat 43°55'03", long 83°14'36", in SE1/4SE1/4 sec.1, T.17 N., R.10 E., Huron County, at bridge on Limerick Road, 2.1 miles southeast of Caseville, Mich.			5-21-73	b4.76
Pinnebog River	do	Lat 43°55'14", long 83°07'32", in NE1/4NE1/4 sec.12, T.17 N., R.11 E., Huron County, at bridge on Limerick Road, 1.5 miles southwest of Pinnebog, Mich.			9-29-73	*b2.37
Streams tributary to St. Clair River						
Black River	St. Clair River	Lat 42°59'40", long 82°26'42", in NE1/4NE1/4 sec.4, T.6 N., R.17 E., St. Clair County, on westbound bridge, I-94 expressway, at Port Huron, Mich.			8-17-73	b572
Pine River	do	Lat 42°52'17", long 82°33'28", in NW1/4NW1/4 sec.15, T.5 N., R.16 E., St. Clair County, at Mitchell Road, 2.2 miles east of Rattle Run, Mich.			8-15-73	*b5.93
Streams tributary to Lake St. Clair						
Swan Creek	Lake St. Clair	Lat 42°42'30", long 82°39'07", in SE1/4SE1/4 sec.3, T.3 N., R.15 E., St. Clair County, at Arnold Road, 2.1 miles northeast of Fairhaven, Mich.	14.3	1972	7-19-73	* .04
Salt River	do	Lat 42°42'35", long 82°46'12", in SE1/4 sec.2, T.3 N., R.14 E., Macomb County, at bridge on I-94 expressway, 0.5 mile northwest of New Baltimore, Mich.			7-19-73	* .89
Unnamed tributary	Stony Creek Lake Reservoir	Lat 42°44'02", long 83°05'14", in NE1/4SW1/4 sec.30, T.4 N., R.12 E., Macomb County, on Huron-Clinton Metropolitan Park Road, 2.7 miles west of Washington, Mich.			8-16-73	* .11
Twin Lakes Outlet	do	Lat 42°43'57", long 83°05'54", in SE1/4 sec.25, T.4 N., R.11 E., Oakland County, on Huron-Clinton Metropolitan Park Road, 3.2 miles west of Washington, Mich.	3.63	1965-72c	8-16-73	*1.21
Mount Vernon Drain	do	Lat 42°44'01", long 83°05'29", in SW1/4 sec.30, T.4 N., R.12 E., Macomb County, on Huron-Clinton Metropolitan Park Road, 3.0 miles west of Washington, Mich.	1.87	1965-72c	8-16-73	* .41
Stony Creek	Clinton River	Lat 42°42'25", long 83°06'11", in SW1/4NE1/4 sec.1, T.3 N., R.11 E., Oakland County, on Winkler Mill Road, 2.1 miles northeast of Rochester, Mich.	68.4		8-16-73	*18.5
Red Run	do	Lat 42°32'14", long 83°00'22", in SW1/4SW1/4 sec.34, T.2 N., R.12 E., Macomb County, at bridge on 14 Mile Road, at Warren, Mich.			8-22-73 9-28-73	b73.7 b257

Discharge measurements made at miscellaneous sites during the water year 1973--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake St. Clair--Continued						
Plum Brook	Red Run	Lat 42°34'22", long 82°59'16", in NW1/4SW1/4 sec.24, T.2 N., R.12 E., Macomb County, at Schoenherr Road, 1.5 miles northwest of Cady, Mich.			8-22-73	*b13.2
Harrington Drain	Clinton River	Lat 42°34'07", long 82°55'47", in SW1/4SW1/4 sec.21, T.2 N., R.13 E., Macomb County, on Metropolitan Parkway, 1.0 mile southwest of Mount Clemens, Mich.	15.9	1961, 1969	8-22-73	*b.88
Streams tributary to Detroit River						
Ecorse River	Detroit River	Lat 42°16'08", long 83°10'54", in Private Claim 51, T.3 S., R.11 E., Wayne County, at Dix Road, Lincoln Park, Mich.	16.5	1971-72	7-19-73 8-15-73	*.74 *b1.80
South Branch Ecorse River	Ecorse River	Lat 42°13'41", long 83°12'26", in NW1/4NW1/4 sec.24, T.3 S., R.10 E., Wayne County, at Moran Road, Lincoln Park, Mich.	all		7-19-73 8-15-73	*.88 *b1.62
Frank and Poet Drain	Detroit River	Lat 42°07'36", long 83°12'11", in SW1/4SW1/4 sec.24, T.4 S., R.10 E., Wayne County, at Van Horn Road, Trenton, Mich.	17.4	1971-72	7-19-73	*.62
Marsh Creek	Brownstone Creek	Lat 42°06'42", long 83°13'22", in SW1/4SW1/4 sec.26, T.4 S., R.10 E., Wayne County, at Vreeland Road, 1.5 miles northwest of Gibraltar, Mich.	26.4	1971-72	7-19-73	*.61
Streams tributary to Lake Erie						
Chilson Creek	Huron River	Lat 42°30'22", long 83°51'40", in SE1/4NW1/4 sec.4, T.1 N., R.5 E., Livingston County, at Bishop Lake Road, 3.8 miles southwest of Brighton, Mich.			8-17-73 8-29-73 9- 6-73	*b3.84 *b2.08 *b1.56
do	do	Lat 42°29'52", long 83°51'33", in NW1/4NE1/4 sec.9, T.1 N., R.5 E., Livingston County, at Chilson Road, 1.4 miles north of Pettysville, Mich.			8-17-73 8-29-73 9- 6-73	*b4.97 *b2.99 *b3.01
do	do	Lat 42°29'10", long 83°51'40", in SE1/4SW1/4 sec.9, T.1 N., R.5 E., Livingston County, 300 ft downstream from Ann Arbor Railroad bridge, .6 mile north of Pettysville, Mich.			8-17-73 8-29-73 9- 6-73 9-14-73	*b6.00 *b3.03 *b2.86 *b2.15
do	do	Lat 42°28'40", long 83°51'56", in SW1/4NW1/4 sec.16, T.1 N., R.5 E., Livingston County, 300 ft below Luetz Mill Pond dam, at Pettysville, Mich.			8-29-73 9- 6-73	*b1.90 *b2.83
Swan Creek	Lake Erie	Lat 42°04'22", long 83°22'52", in SE1/4NE1/4 sec.8, T.5 S., R.9 E., Monroe County, at Grafton Road, 1.0 mile northeast of Carleton, Mich.	35.0	1971-72	7-16-73	*1.65
North Branch Swan Creek	Swan Creek	Lat 42°04'45", long 83°22'08", in SW1/4SE1/4 sec.4, T.5 S., R.9 E., Monroe County, at Newburg Road, 1.7 miles northeast of Carleton, Mich.	21.1	1971-72	7-16-73	*.63
Little Swan Creek	do	Lat 42°02'28", long 83°20'45", in NE1/4SE1/4 sec.22, T.5 S., R.9 E., Monroe County, at Sweitzer Road, 2.6 miles southeast of Carleton, Mich.	11.8	1971-72	7-16-73	*.12

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at miscellaneous sites during the water year 1973--Continued

Stream	Tributary to	Location	Drainage area (sq.mi.)	Measured previously (water year)	Measurements	
					Date	Discharge (cfs)
Streams tributary to Lake Erie--Continued						
Stony Creek	Lake Erie	Lat 41°57'50", long 83°20'22", in NE1/4NE1/4 sec.22, T.6 S., R.9 E., Monroe County, at Mental Road, 3.2 miles southwest of Newport, Mich.	121	1971-72	7-16-73	*17.8
Sandy Creek	do	Lat 41°56'28", long 83°21'19", in Private Claim 449, T.6 S., R.9 E., Monroe County, below Pen Central and Detroit and Toledo Shore Line Railroad bridges, 1.8 miles east of Golfcrest, Mich.			7-16-73	*1.33
Black Creek	River Raisin	Lat 41°47'38", long 84°00'06", in SW1/4NW1/4 sec.7, T.8 S., R.4 E., Lenawee County, at Treat Highway, 2.0 miles east of Jasper, Mich.			7-27-73	b6.90
Saline River	do	Lat 42°04'50", long 83°40'47", in NE1/4NE1/4 sec.2, T.5 S., R.6 E., Monroe County, at sewage treatment plant, below Norfolk and Western Railroad, at Milan, Mich.			9- 5-73	b17.1
Plum Creek	Lake Erie	Lat 41°54'08", long 83°23'35", in Private Claim 500, T.7 S., R.9 E., Monroe County, at Kentucky Avenue, at Monroe, Mich.	32.1	1971-72	7-16-73	*4.39
North Branch Otter Creek	Otter Creek	Lat 41°53'39", long 83°33'13", in NE1/4NE1/4 sec.11, T.7 S., R.7 E., Monroe County, at Geiger Road, 1.5 miles southeast of Ida, Mich.	8.83	1971-72	7-16-73	* .36
South Branch Otter Creek	do	Lat 41°51'41", long 83°30'46", in SE1/4NE1/4 sec.19, T.7 S., R.8 E., Monroe County, at Strasburg Road, 3.2 miles west of LaSalle, Mich.	8.80	1971-72	7-16-73	* .37
Otter Creek	Lake Erie	Lat 41°52'01", long 83°27'13", in Private Claim 47, T.7 S., R.8 E., Monroe County, at State Highway 25, at LaSalle, Mich.	51.0	1971-72	7-16-73	*5.36
Little Lake Creek	do	Lat 41°46'23", long 83°29'28", in SE1/4NE1/4 sec.20, T.8 S., R.8 E., Monroe County, at Suder Road, 1.4 miles south of Erie, Mich.	11.5	1971-72	7-16-73	*1.55
Halfway Creek	do	Lat 41°44'07", long 83°36'18", in SW1/4SW1/4 sec.33, T.8 S., R.7 E., Monroe County, at Smith Road, 2.3 miles southeast of Lambertville, Mich.	34.2	1967, 1971-72	7-16-73	*3.23
North Branch Tenmile Creek	Tenmile Creek	Lat 41°44'02", long 83°41'20", in SE1/4SE1/4 sec.34, T.8 S., R.6 E., Monroe County, at Hicker Road, 3.6 miles southwest of Lambertville, Mich.	33.5	1971-72	7-16-73	* .90
East Branch St. Joseph River	St. Joseph River	Lat 41°42'35", long 84°29'28", in SW1/4SW1/4 sec.1, T.9 S., R.2 W., Hillsdale County, at Territorial Road, 4.0 miles southwest of Waldron, Mich.			7-25-73	b21.9

* Base flow.

‡ Operated as a continuous-record gaging station.

a Approximately.

b Discharge measurement made by employees of Michigan Department of Natural Resources.

c Operated as a low-flow partial-record station.

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