

STREAMS TRIBUTARY TO LAKE SUPERIOR

04010500 PIGEON RIVER AT MIDDLE FALLS, NEAR GRAND PORTAGE, MN

LOCATION.--Lat 48°00'44", long 89°36'58", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 24, T.64 N., R.6 E., Cook County, Hydrologic Unit 04010101, on the Grand Portage Indian Reservation, on right bank 400 ft upstream from Middle Falls, 2.5 mi upstream from Grand Portage Port of Entry, 3.5 mi upstream from mouth, and 4.7 mi northeast of city of Grand Portage.

DRAINAGE AREA.--609 mi².

PERIOD OF RECORD.--June to October 1921, April to November 1922, March 1923 to current year. Published as "at International Bridge" April 1924 to September 1940; as "below International Bridge" October 1940 to September 1965. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 744:1927-28. WSP 804: 1934(M). WSP 974: Drainage area. WSP 1337:1924(M), 1925, 1926-28(M), 1931(M), 1938(M), 1941(M), 1945-46(M), 1947, 1948(M), 1950(M).

GAGE.--Water-stage recorder. Datum of gage is 787.58 ft above sea level (NGVD of 1929). Prior to Sept. 30, 1940, nonrecording gage at International Bridge, 5.8 mi upstream at datum 102.24 ft higher. Oct. 1, 1940 to Dec. 31, 1975, at present site at datum 2.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,700 ft³/s and maximum (*):

	Time	Discharge (ft ³ /s)	Gage height (ft)	Time	Discharge (ft ³ /s)	Gage height (ft)
	Apr 8 1300	Ice Jam	*8.98	1400	*3,770	8.84
	Apr 10 2300	2,710	7.85			

Minimum discharge, 53 ft³/s, Oct. 14, gage height, 2.20 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78	444	e90	e92	e121	e140	e420	620	1,070	1,060	153	96
2	79	386	e79	e95	e123	e139	e480	592	1,000	832	149	92
3	78	334	e72	e93	e124	e139	e677	563	942	620	146	87
4	80	300	e73	e92	e126	e139	e799	524	898	565	142	84
5	83	269	e75	e91	e129	e138	e1,020	490	1,590	556	136	84
6	80	253	e75	e92	e130	e138	e1,230	819	1,730	537	131	80
7	77	235	e81	e94	e133	e138	e1,470	1,140	1,410	489	131	75
8	71	214	e86	e95	e136	e137	e1,680	1,830	1,350	449	126	71
9	65	202	e87	e96	e136	e136	2,410	2,540	1,240	422	121	68
10	61	190	e88	e95	e138	e136	2,600	3,520	1,130	400	115	66
11	60	e180	e88	e94	e138	e135	2,480	3,340	1,080	380	108	65
12	67	e171	e86	e93	e140	e135	2,150	2,730	1,040	360	107	66
13	59	e160	e84	e91	e140	e135	1,930	2,240	971	345	103	80
14	54	e150	e84	e91	e140	e135	1,810	2,220	1,030	328	97	84
15	54	e140	e85	e88	e140	e135	1,680	2,080	1,270	308	93	82
16	56	e131	e86	e90	e140	e135	1,680	1,870	1,160	294	90	82
17	61	124	e85	e91	e138	e135	1,670	1,640	1,010	279	92	80
18	63	120	e85	e94	e138	e134	1,650	1,460	907	279	130	78
19	70	e121	e85	e96	e137	e132	1,740	1,370	822	268	116	99
20	72	e124	e84	e99	e137	e131	1,570	1,360	770	261	112	146
21	65	e123	e83	e102	e138	e130	1,360	1,290	721	246	110	173
22	59	e122	e83	e104	e138	e130	1,190	1,280	666	231	104	166
23	534	e119	e82	e106	e138	e129	1,050	1,350	620	216	100	144
24	485	e116	e83	e108	e138	e128	954	1,360	583	202	97	125
25	411	e118	e84	e110	e138	e129	892	1,280	540	190	90	117
26	330	e116	e85	e112	e138	e131	819	1,470	506	184	95	109
27	278	e112	e86	e113	e140	e134	784	1,510	479	180	107	101
28	241	e110	e86	e115	e140	e137	746	1,380	451	173	102	96
29	228	e102	e87	e116	---	e145	695	1,270	438	164	102	90
30	460	e100	e90	e118	---	e170	654	1,210	1,060	166	100	86
31	505	---	e91	e120	---	e240	---	1,150	---	163	99	---
TOTAL	4,964	5,386	2,598	3,086	3,792	4,325	40,290	47,498	28,484	11,147	3,504	2,872
MEAN	160	180	83.8	99.5	135	140	1,343	1,532	949	360	113	95.7
MAX	534	444	91	120	140	240	2,600	3,520	1,730	1,060	153	173
MIN	54	100	72	88	121	128	420	490	438	163	90	65
AC-FT	9,850	10,680	5,150	6,120	7,520	8,580	79,920	94,210	56,500	22,110	6,950	5,700
CFSM	0.26	0.29	0.14	0.16	0.22	0.23	2.21	2.52	1.56	0.59	0.19	0.16
IN.	0.30	0.33	0.16	0.19	0.23	0.26	2.46	2.90	1.74	0.68	0.21	0.18

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 2005, BY WATER YEAR (WY)

MEAN	352	349	205	150	125	174	1,207	1,586	837	416	238	280
MAX	2,095	1,461	720	431	300	1,169	2,724	4,016	2,801	1,127	1,029	2,985
(WY)	(1978)	(1971)	(1978)	(1975)	(1969)	(1945)	(2001)	(1950)	(1947)	(1968)	(1950)	(1977)
MIN	17.4	11.4	2.85	2.18	8.02	60.0	290	138	125	78.0	46.5	40.2
(WY)	(1977)	(1977)	(1977)	(1977)	(1977)	(1941)	(1977)	(1977)	(1977)	(1958)	(1998)	(1976)

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SUMMARY STATISTICS	FOR 2004 CALENDAR YEAR		FOR 2005 WATER YEAR		WATER YEARS 1921 - 2005	
ANNUAL TOTAL	167,652		157,946			
ANNUAL MEAN	458		433		496	
HIGHEST ANNUAL MEAN					840 1971	
LOWEST ANNUAL MEAN					158 1958	
HIGHEST DAILY MEAN	3,510	Apr 19	3,520	May 10	10,700	May 5, 1934
LOWEST DAILY MEAN	54	Oct 14	54	Oct 14,15	a1.0	Jan15-21,1977
ANNUAL SEVEN-DAY MINIMUM	59	Oct 10	59	Oct 10	1.0	Jan 15, 1977
MAXIMUM PEAK FLOW			b3,770	May 10	c11,000	May 5, 1934
MAXIMUM PEAK STAGE			d8.98	Apr 8	f12.37	Sep 24, 1977
INSTANTANEOUS LOW FLOW			53	Oct 14	a1.0	Jan 15, 1977
ANNUAL RUNOFF (AC-FT)	332,500		313,300		359,000	
ANNUAL RUNOFF (CFSM)	0.752		0.711		0.814	
ANNUAL RUNOFF (INCHES)	10.24		9.65		11.06	
10 PERCENT EXCEEDS	1,280		1,350		1,270	
50 PERCENT EXCEEDS	170		137		220	
90 PERCENT EXCEEDS	83		81		84	

- a Minimum observed.
- b Gage height 8.89 ft.
- c Gage height 7.60 ft, site and datum then in use.
- d Backwater from ice.
- e Estimated.
- f At present site and datum, discharge 10,500 ft³/s.

