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

Northwestern Lake Superior Basin
Baptism-Brule Subbasin

LOCATION.--Lat 48°00′44″, long 89°36′58″ referenced to North American Datum of 1927, in SW ¼ NE ¼ sec.24, T.64 N., R.6 E., Cook County, MN, 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 mi^2.

SURFACE-WATER RECORDS

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 ft^3/s and (or) maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 18	1730	*7,650	*11.48
Apr 26	2100	5,140	9.97
May 4	0000	3,420	8.64
Jun 7	1630	5,770	10.33

Minimum discharge, 120 ft^3/s, Sept. 23, gage height, 2.61 ft.

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DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	477	1,330	e353	e370	e150	e116	e133	1,840	1,010	1,100	452	188
2	511	1,280	352	e350	e150	e120	e133	1,650	960	1,020	425	183
3	1,000	1,200	358	e340	e145	e118	e140	3,000	891	945	405	178
4	947	1,140	e370	e340	e143	e117	e150	3,260	832	881	386	172
5	886	1,090	e382	e350	e138	e116	e155	2,800	811	820	372	169
6	977	1,050	e385	e360	e135	e114	e155	2,360	4,170	781	358	165
7	1,180	1,010	e380	e350	e137	e113	e153	2,120	5,670	754	343	158
8	1,510	960	e365	e330	e135	e112	e152	2,070	4,700	699	329	154
9	2,490	912	e355	e320	e130	e115	e150	1,900	3,650	649	315	149
10	2,340	878	e350	e310	e126	e120	e148	1,720	3,140	631	303	145
11	2,040	856	e348	e300	e120	e123	e147	1,620	2,870	609	293	148
12	1,750	842	e345	e300	e115	e125	e147	1,630	3,010	939	277	155
13	1,530	827	e342	e295	e113	e126	e148	1,630	3,040	1,170	267	150
14	1,390	803	e340	e280	e116	e122	e160	1,660	2,740	1,010	256	156
15	1,290	771	e345	e270	e118	e118	e200	1,640	2,430	1,090	247	153
16	1,260	720	e370	e270	e120	e118	e360	1,530	2,190	1,170	241	149
17	1,490	689	e410	e260	e118	e120	e620	1,470	2,010	1,030	235	145
18	3,730	653	e425	e235	e117	e124	e1,100	1,440	1,840	901	228	140
19	5,740	634	e440	e210	e116	e125	e1,200	1,390	1,670	801	223	137
20	4,920	614	e450	e190	e114	e126	e1,500	1,310	1,530	740	216	133
21	4,130	593	e440	e190	e114	e127	e1,700	1,240	1,430	710	207	128
22	3,310	497	e430	e195	e116	e127	2,680	1,180	1,360	733	199	124
23	2,740	469	e430	e190	e118	e128	3,040	1,110	1,340	710	194	121
24	2,390	480	e430	e180	e120	e130	2,910	1,050	1,260	674	187	133
25	2,170	573	e420	e180	e117	e128	3,340	1,010	1,250	634	182	139
26	1,970	553	e390	e180	e116	e130	4,690	994	1,300	595	176	147
27	1,800	416	e380	e190	e114	e130	4,640	1,030	1,240	564	169	250
28	1,670	393	e380	e200	e113	e132	3,680	1,020	1,230	536	187	409
29	1,570	e375	e390	e195	e113	e135	2,760	954	1,280	518	195	384
30	1,470	e360	e390	e170	---	e136	2,180	937	1,210	489	195	354
31	1,400	---	e385	e150	---	e134	---	995	---	468	194	---
Total	62,078	22,968	11,930	8,050	3,597	3,825	38,671	49,560	62,064	24,371	8,256	5,316
Mean	2,003	766	385	260	124	123	1,289	1,599	2,069	786	266	177
Max	5,740	1,330	450	370	150	136	4,690	3,260	5,670	1,170	452	409
Min	477	360	340	150	113	112	133	937	811	468	169	121
Ac-ft	123,100	45,560	23,660	15,970	7,130	7,590	76,700	98,300	123,100	48,340	16,380	10,540
Cfsm	3.29	1.26	0.63	0.43	0.20	0.20	2.12	2.63	3.40	1.29	0.44	0.29
In.	3.79	1.40	0.73	0.49	0.22	0.23	2.36	3.03	3.79	1.49	0.50	0.32

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 2008, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	366	350	208	151	125	172	1,201	1,570	842	414	235	276
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	41.5	290	138	125	78.0	46.5	36.6
(WY)	(1977)	(1977)	(1977)	(1977)	(1977)	(2007)	(1977)	(1977)	(1977)	(1958)	(1998)	(2006)

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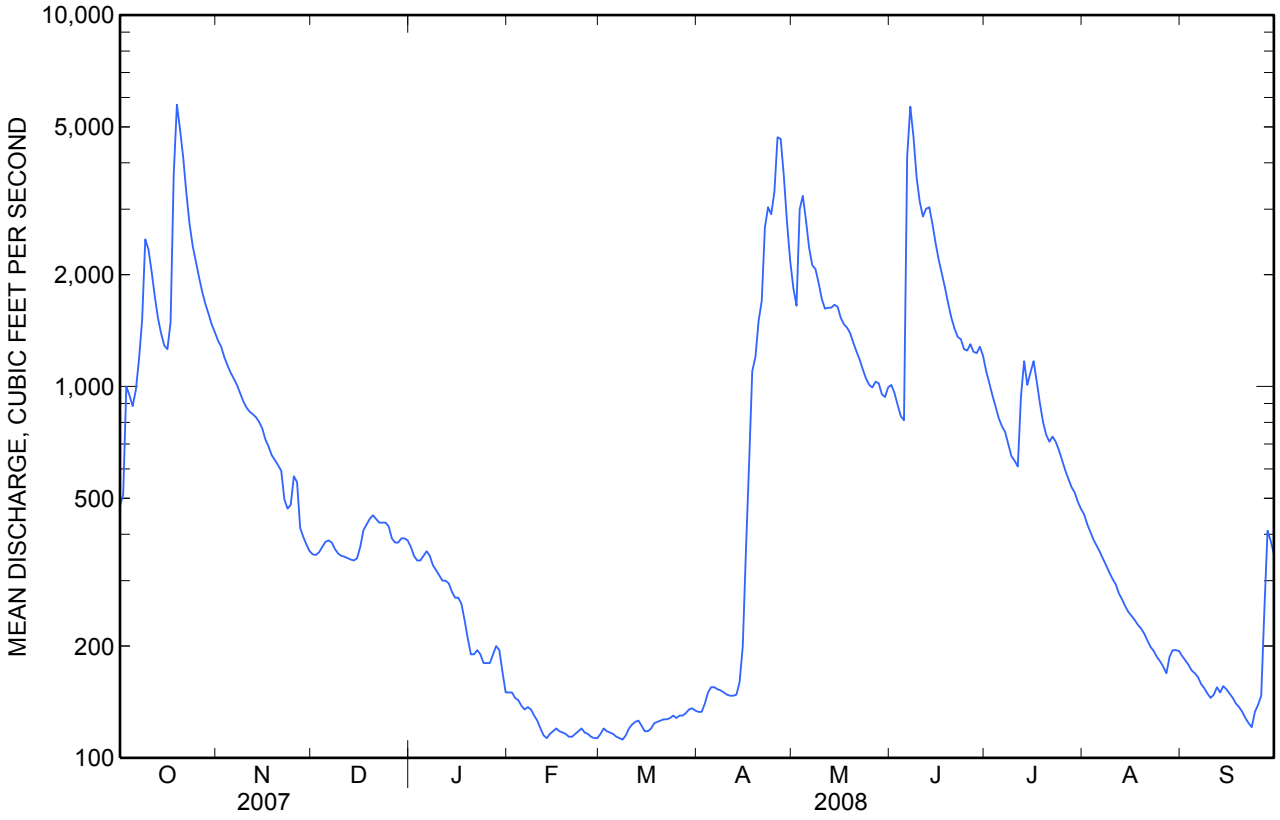
SUMMARY STATISTICS

	Calendar Year 2007		Water Year 2008		Water Years 1921 - 2008	
Annual total	144,527		300,686			
Annual mean	396		822		495	
Highest annual mean					840	1971
Lowest annual mean					138	2007
Highest daily mean	5,740	Oct 19	5,740	Oct 19	10,700	May 5, 1934
Lowest daily mean	11	Feb 18	[a]112	Mar 8	[b]1.0	Jan 15, 1977
Annual seven-day minimum	11	Feb 18	115	Mar 3	1.0	Jan 15, 1977
Maximum peak flow			7,650	Oct 18	[c]11,000	May 5, 1934
Maximum peak stage			11.48	Oct 18	[d]12.37	Sep 24, 1977
Instantaneous low flow			[f]112	Mar 8	[b]1.0	Jan 15, 1977
Annual runoff (ac-ft)	286,700		596,400		358,500	
Annual runoff (cfsm)	0.650		1.35		0.813	
Annual runoff (inches)	8.83		18.37		11.04	
10 percent exceeds	949		2,050		1,270	
50 percent exceeds	202		385		220	
90 percent exceeds	12		124		82	

[a] Estimated, backwater from ice.

[b] Minimum observed, occurred Jan. 15-21, 1977.

[c] Gage height 7.60 ft, site and datum then in use.

[d] At present site and datum, discharge 10,500 ft^3/s.

[f] Estimated minimum daily-mean discharge, backwater from ice.