

Chippewa River at Benson, US12
STATION ID: H26-037-001
NWS ID: BENM5
USGS ID: 05303500
EquIS ID: S000-385

LOCATION:

Lat: 45.311110°	UTMX: 294241.5	Township: Six Mile Grove					
Long: -95.624894°	UTMY: 5020863.7	PLS:	TWP	RNG	SEC	Q	QQ
			121	40W	1	SE	SE

County: Swift

Drainage area (acres): 813,305

Driving directions: From intersection of MN29 and US12 in south Benson, travel west on US12 1 mile to bridge and gage.

Cooperation: Minnesota Department of Natural Resources (MN DNR) and National Weather Service (NWS).

History: Present gage established by United States Geological Survey (USGS) on 6/25/1998. Station operated as a daily record station 1949-1951. Gage equipment upgraded to Design Analysis equipment by MN DNR on 10/28/2009. A soil temperature probe for Minnesota Department of Agriculture (MDA) was added to the station during the 2010 season. Designation change to limited flood warning gage in 2021.

GAGE: A Design Analysis H-350XL pressure sensor/datalogger and H-355 Gas Purge System are housed in a 2' x 1.5' x 6' Hoffman look-in type shelter. A solar panel, rain gage, GOES antenna, and GOES GPS are connected to a vertical mast attached to the enclosure. The equipment is powered by a 12v deep cycle marine battery charged by a 1.2-amp solar panel through a SunSaver power regulator. Data is collected at 15-minute intervals and sent hourly through an H-222 GOES transmitter at 300 baud within a 10-second window. The H-222 clock is synced to GMT, and the datalogger clock is set to CST (6-hour offset). SDI-12 soil temperature probe is also present.

GOES ID:	55324394	Random Channel:	124
Primary Channel:	38	Azimuth:	232
Transmit Time:	00:39:00	Elevation:	24

CHANNEL AND CONTROL: Control for low to medium flows is the channel and grass covered banks. Cement bridge beam becomes the control at 20.4 ft assumed datum.

DISCHARGE MEASUREMENTS:

High flow: Bridge measurements can be obtained above 8.5 ft stage.

Low flow: A tagline can be obtained 20-25 ft downstream.

Diversions, Impoundments, Additional flow inputs: None

REFERENCE MARKS:

B.M. 1: Brass disk in downstream left bank (southeast) bridge abutment, stamped 7604-M 1972.

Elevation: 25.00 ft assumed datum (1034.04 ft NGVD29; 1034.61 ft NAVD88, surveyed by MnDOT in 2010.) Surveyed on 09/08/2021 by MN DNR

R.M. 1: Three painted saw marks on threads of top the streamward guardrail bolt in right bank end (west) of upstream (north) cement guardrail.

Elevation: 27.36 ft assumed datum (1036.40 ft NGVD29; 1036.97 ft NAVD88). Surveyed on 09/08/2021 by MN DNR

R.M. 2: Wire weight checkbar on upstream (north) side of bridge.

Elevation: 26.21 ft assumed datum (1035.25 ft NGVD29; 1035.82 ft NAVD88). Surveyed on 09/08/2021 by MN DNR

R.M. 3: Painted chiseled square on the gage house concrete pad on the SE corner facing stream (east) and road (south).

Elevation: 24.19 ft assumed datum (1033.23 ft NAVD29; 1033.80 ft NAVD88). Surveyed on 09/08/2021 by MN DNR

Primary Reference: R.M. 2 (26.21 ft assumed datum)

Gage Zero: 1009.04 ft (NGVD29)