

North Platte River near Sutherland, Nebraska 06691000

LOCATION

Latitude and Longitude

41.20721, -101.1176

Road Log

Located on right bank 200 feet south and 75 feet upstream of right end of bridge on N Prairie Trace Rd, 2.5 miles upstream from Birdwood Creek and 3.5 miles north of Sutherland on N Prairie Trace Rd.

Equipment Details

Recording Gage

Sutron CBS Bubbler Flow meter and Satlink DCP equipment are housed in a metal “look-in” type cube shelter and connected to the stream with a sand point or open-end orifice, depending on conditions.

External Gage

Recording gage is referenced to an outside Chain-Gage located approximately 15 ft. downstream from the orifice line.

Bench Mark and Reference Marks

PRESENT GAGE DATUM: 2921.600 FT NGVD29 / **2922.836 FT NAVD88**

ELEVATIONS:

RM. No 1, R.M.No2, R.M.No3, R.M.No5, R.M.No6 has been destroyed.

R.M. No. 4: Top of pipe two feet above ground, 42 feet east and 15 feet north of shelter hasp.

Elevation of 9.84 ft. from levels dated July 19, 2018.

R.M. No. 7: T notched in 3 inch angle iron stake 2 foot east of shelter base.

Elevation of 6.84 ft. from levels dated July 19, 2018. **(Origin)**

R.M. No. 8: < mark on east side of pipe 5 ft. east and 12 ft. south of shelter post.

Elevation of 7.85 ft. from levels dated July 19, 2018..

(AR2426)BM 15-21: Established April 15, 2013 with an elevation of 2937.209 ft. NAVD88/2935.969 ft. NGVD29 (14.373 ft. above Gage Datum) by the DNR Survey Crew a 2 inch aluminum cap set on top of a 5.0 ft. steel rebar and driven to a depth of 0.2 ft. below

the ground surface located 31.3 ft. south from the south end of the west (upstream) concrete bridge railing and 12.6 ft. west from the centerline of the paved county road.

Elevation not shot during survey dated April 25, 2013, April 12, 2016 or July 19, 2018.

Chain-Gage: Approximately 15 ft. downstream from orifice line as the base reference gage. Elevation held on 2.36 ft., found 2.36 ft. from levels dated April 12, 2016

Hydrology

Drainage Area

29,800 square miles, approximately, of which about 26,120 square miles contribute directly to surface runoff.

Channel and Control

The streambed is composed of fine sand and silt subject to moderate shifting. There is no well defined sectional control. Channel control will prevail for stages up to 5.0 feet. During bank overflow the county bridge below the gage will serve as the control. The flow is in one channel and approaches the gage at a slight angle. Numerous sandbars will form during times of extremely low flow causing the flow to meander.

Discharge Measurements

Low and medium flows can be measured by wading in vicinity of gage. High flows can be hand lined and craned from the county Highway Bridge. Accuracy and results from hand line or craning measurements should be considered no better than poor. In recent years high flows have been measured from county bridge 6 miles downstream near Hershey. Flow in Birdwood Creek has to be subtracted and flow in the Suburban canal has to be added to measured flow to calculate flow passing this gage during measurement.

Floods

Maximum discharge, 20,300 cfs June 29, 1917 from discharge graph based on daily gage readings, from curve extended above 16,000 cfs. Years 1917, 1933, 1936-67 produced high flows.

Extremes for Period of Record

Maximum discharge 20,300 cubic feet per second June 29, 1917, from discharge graph based on daily gage readings, from rating curve extended above 16,000 cubic feet per second;

no flow July 24 - 28, 30, 31, 1931, August 7, 1934, July 20 - 28, 1940.

Point of Zero Flow

Variable due to sand movement. 2 channels split before base gage.

Regulation and Diversions

Flow regulated by Lake MacConaughy Reservoir and Nebraska Public Power District diversion dam approximately 27 miles upstream. There are several canal diversions

between the reservoir and this gage diverting for the purpose of irrigation. The nearest upstream diversion is the Paxton-Hershey Canal, which diverts about 1.5 mile upstream.

Accuracy

Good record can be obtained with frequent measurements when stage is varying due to releases from reservoir if it is possible to obtain wading measurements. Otherwise results should only be considered poor for times when handline or craning measurements have to be made or flow is below 50 cfs due to orifice line becoming isolated.

Establishment and History

Established May 16, 1917 by Nebraska State Engineer by installing a vertical staff gage on upstream side of bridge piling on north end of bridge on public road between Sections 3 & 4, T. 14 N., R. 33 W. Daily record for period May 16, 1917 to October 31, 1917.

The Geological Survey assumed operation of the gage from July to September 1931 at the staff gage location on upstream side of bridge piling. It is not known to what datum this gage was referenced.

On April 25, 1936 the Geological Survey resumed operation of this gage by installing a continuous recorder in a galvanized pipe well on the downstream side of the fourth pier from the left bank. No reference to a change of datum could be found.

The gage was moved to the first pier from left bank on July 17, 1942 at no change in datum.

On October 6, 1971 the gage was relocated to left bank 80 feet downstream from bridge on county road, 2.5 mi upstream from Birdwood Creek at no change in datum.

Datum was lowered 1.00 foot on October 10, 1984.

On March 10, 1994 the gage was moved to present site on the right bank 200 feet south and 75 feet west from right end of bridge on county road.

On April 16, 2004 the 48-inch CMP shelter was replaced with a metal look-in type shelter mounted on a steel post with base set in concrete at same location.

On October 11, 2012 the Cube shelter was moved back ESE approximately 10 ft. from the river bank due to erosion.

On April 15, 2013 DNR Survey Crew established a surveyed Gage Datum of 2921.60 FT NGVD29 / 2922.836 FT NAVD88. Previous Gage Datum was documented as 2920 FT NGVD29 acquired from topographic map Hershey West Quadrangle, 7.5-minute series, U.S. Department of Interior, Geological Survey.

On April 25, 2013 a Chain-Gage was installed approximately 15 ft. downstream of orifice line and became the base reference gage replacing the staff gage as the base reference gage.

March 1, 2016 the ISCO Bubbler Flow meter and phone service was removed and Sutron CBS Bubbler Flow meter and Satlink DCP equipment installed.

Revision History

Original Description prepared by: Unknown

Revised by: C.V.Burns 08/27/1952

Revised by: J.W.Vassos 01/04/1990

Revised by: J.W.Vassos 03/28/1994

Revised by: J.W.Vassos 10/17/1996

Revised by: J.W.Vassos 01/11/2001

Revised by: J.W.Vassos 11/07/2002

Revised by: J.W.Vassos 10/29/2003

Revised by: J.W.Vassos 10/25/2004

Revised by: Andrew Leisy 08/01/2011

Revised by: S.Wright 04/30/2014

Revised by: K. Schwager 03/01/2019

Reformatted by: S. Figuric 03/07/2019