Niobrara River at Wyoming-Nebraska State Line
06454000

LOCATION

Latitude and Longitude

42.65252 -104.0516

Road Log

Sioux County, Nebraska, on right bank 1 mile downstream from Van Tassel Creek on county road "Henry Road" , 0.1 mile downstream from Wyoming-Nebraska State Line, and 2 miles east of Van Tassel, Wyoming. From Harrison, NE travel about 9 miles southwest on U.S. Highway 20, then 0.6 mi south on county road "Henry Road" to gage.

Nearby Features

Many ponded reaches below gage. Very poor site.

Equipment Details

Recording Gage

Sutron CBS unit along with SatLink DCP transmitter. Real-time data accessed through the internet at: https://nednr.nebraska.gov/RealTime

External Gage

R.P. No. 1 Tape down currently used as the base reference for the recorder.

Bench Mark and Reference Marks

4682.70 ft. NGVD29

RM 1 to RM6 and staff gage have been destroyed. ***RM6*** *on culvert was replaced and assigned* ***R.P. No1*** *as its name on new culvert.*

R.P. No. 1 – *(Originally identified as RM No. 6)* **X** in center of upstream edge of culvert. Elevation 4.74 feet above gage datum, from levels dated May 16th, 2019.

Elevation 4.72 feet above gage datum, from levels dated November 2, 2021.

R.P. No. 2 – X in center of downstream edge of CMP culvert. Elevation 5.45 feet, to gage datum; levels dated May 16th, 2019.

Elevation 5.44 feet above gage datum, from levels dated November 2, 2021.

R.M. No. 7 - Bolt in concrete post 25.5 feet south of southeast corner of shelter base. Elevation 8.00 feet, gage datum; levels dated. May 16th, 2019.

Elevation 8.01 feet above gage datum, from levels dated November 2, 2021.

R.M. No. 8 - Bolt in a concrete post 24.5 feet south of southeast corner then 10 feet west. Elevation 7.87 feet, gage datum; levels dated May 16th, 2019.

Elevation 7.87 feet above gage datum, from levels dated November 2, 2021.

R.M. No. 9- X on southeast corner of shelter. Elevation of 8.26 from levels dated May 16th, 2019. **Used as origin.**

Elevation 8.26 feet above gage datum, from levels dated November 2, 2021. **Used as origin.**

Hydrology

Drainage Area

455 square miles, approximate.

Channel and Control

Point of zero flow will vary depending upon amount of sediment that collects in culvert. Open end of culvert will act as control for all stages up to a full pipe until aquatic vegetation causes back water thereby acting as the control.

Discharge Measurements

Wading measurements have become difficult due to very soft streambed conditions and backwater caused from aquatic vegetation. Most measurements computed from taking soundings in the 5 ft. culvert and computing the discharge. High flow measurements will have to be hand lined from county road over culvert.

Floods

Maximum discharge, 2120 cubic feet per second August 16, 1977 *(gage height, 8.28 ft. above previous datum of 4687.70 ft. NGVD29)* from rating curve extended above 63 cubic feet per second on basis of computation for peak flow through culvert and over road flow.

Extremes for Period of Record

10/01/1955 – present.

Peak discharge 2,120 cubic feet per second August 16, 1977, gage height 8.28 feet; minimum daily discharge 0.54 cubic feet per second August 9, 1975.

Point of Zero Flow

Variable due to sediment build up in bottom of culvert.

Winter Flow

Blowing and drifting snow may fill channel causing backwater conditions. Ice forming in stream is a rarity. Heavy moss and aquatic plant growth will develop in the channel during summer months causing considerable backwater conditions.

Regulation and Diversions

This stream is largely spring fed and has a uniform flow pattern. There are diversions for 4,700 acres of irrigated land above gage.

Accuracy

Record considered poor due to measurement conditions. Bi-weekly and event measurements are a necessity to produce good records.

Establishment and History

Gage installation was completed and a graphic water-stage recorder placed into operation on September 23, 1955, by employees of the Department of Water Resources (now Department of Natural Resources) with a gage datum of 4687.70 feet NGVD29.

A digital recorder [15 min punch] replaced the graphic recorder on March 28, 1966.

On October 23, 1991, a Leupold-Stevens A-35 water-stage recorder replaced the digital recorder.

This site was a cooperative site with USGS through September 30, 1993.

The gage site relocated approximately 0.75 mile downstream on September 17, 1996. A 5 feet x 5 feet x 8 feet precut metal shelter was placed on right bank 25 feet upstream from five foot diameter metal culvert with the gage datum being lowered 5 ft. from 4687.70 ft. NGVD29 to 4682.70 ft. NGVD29. A-71 recorder driven by a Fluid Data Systems G2-25 balance beam manometer was base recording instrument. Instruments were referenced to water surface in stream by means of an outside enameled staff attached to a 2x6 timber and bolted to a grader blade and driven in stream near upstream end of culvert.

On October 3, 1997, the balance beam manometer and A-71 recorder removed. A Stevens 420 logger installed on October 3, 1997 and became base recording instrument. Logger connected to stream using a Stevens SDT-10 pressure sensor attached to front edge of metal culvert. Instrument referenced to water using R.P. on upstream end of metal culvert referenced as R.M. No. 6 (Elev. 4.59 feet).

On April 12, 2001, a Stevens AxSys MPU logger with a 0-10 sensor probe replaced Stevens 420 logger.

On February 11, 2010 a land-based phone, line installed and became the base means of telemetry.

On April 27, 2010, an ISCO 4230 Bubbler replaced the Stevens AxSys MPU logger and pressure transducer as the base recorder.

On March 10, 2016, an ISCO 4230 Bubbler removed and replaced with Sutron CBS unit along with SatLink DCP transmitter.

Revision History

Original description prepared by: D. B. Anderson 10/01/1956

Revised by: G. G. Jamison 03/04/1974

Revised by: J. C. Retchless 09/23/1993

Revised by: J.W. Vassos 04/03/1998

Revised by: J. W. Vassos 02/02/1999

Revised by: J.W. Vassos 01/29/2000

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

Revised by: J.C.Retchless 02/12/2003

Revised by: J.W.Vassos 03/01/2005

Revised by: J.W.Vassos 02/17/2005

Revised by: Andrew S. Leisy 10/06/2009

Revised by: Brett S. Schluterbusch 03/19/2010

Revised by: S. Wright 06/11/2013

Revised by: S. Figuric 12/27/2016

Revised by: K. Schwager 02/08/2019

Revised by: T. Stephens 10/24/2019

Revised by: K. Schwager 11/28/2023