

Medicine Creek above Harry Strunk Lake 06841000

LOCATION

Latitude and Longitude

40.50079 -100.3227

Road Log

The gage is reached by driving south out of Stockville, NE on Wellington St. / County Road 399 for about 2.35 miles then turning east and driving for 0.75 miles. Turn back south and drive for 0.5 miles, then turn east and drive for approximately 1.30 miles to a homestead (*Ambrose Shelly*) driveway. Turn north onto driveway then immediately turn east through wire fence gate located in the southwest corner of pasture. Follow pasture trail for approximately 0.50 miles to gage location. Trail will pass through "cut" in a hill after about 0.40 miles.

Nearby Features

13.5 mi upstream from Medicine Creek Dam. Gage is on the right bank about 0.3 mi downstream from flood-control pool contour lines, about 2.5 mi downstream from top of super-storage pool, 2.5 mi upstream from top of irrigation pool, 3.75 mi southeast of Stockville, NE Frontier County.

Equipment Details

Recording Gage

Since September 13, 2010, the gage consists of a Sutron Constant Flow Bubbler (CFB) and a SatLink II logger/transmitter. Equipment is housed, on the right bank, in a 24 inch x 30 inch x 72 inch stainless steel, cabinet style gage house, which uses the old Lincoln standard well shelter as the base. The orifice is located near the right bank. The bubble line is routed through the abandoned middle intake of the old, Lincoln standard well shelter and is encased in 1¼ inch galvanized pipe near the stream's edge. The equipment powered by a 12-volt wet-cell battery with a solar panel charging system.

Real-time data accessed through the internet at: <https://nednr.nebraska.gov/RealTime>

External Gage

The base gage is a cantilever type chain gage featuring a wire weight box. The chain gage is located about 10 feet upstream from the old intakes and current orifice location.

Benchmark and Reference Marks

Datum of gage is 2,380.987 feet above National Geodetic Vertical Datum of 1929 or 2,382.011 feet North American Vertical Datum of 1988 (NAVD 88).

RM 1: Standard bronze tablet in a concrete post on right bank 22 feet shoreward and 22 feet upstream from gage shelter. Elevation, 29.98 feet, gage datum (levels 6/21/2021).

RM 2: Standard bronze tablet in concrete post on right bank 32 feet shoreward from gage shelter. Elevation, 30.75 feet, gage datum (Origin, levels, 6/21/2021, Origin).

RM 3: Standard bronze tablet in a concrete post on right bank 16 feet shoreward and 34 feet downstream from gage shelter. Elevation, 25.465 feet, gage datum (levels, 6/21/2021).

RM 4: Standard bronze tablet in concrete post on right bank 12 feet stream-ward from gage shelter, on "first bench". Elevation, 13.15 feet, gage datum (levels, 6/21/2021).

USBR Benchmark #R-14-R: Bronze tablet in a concrete post on top of hill and 1,200 feet due south of gage shelter. Elevation, 100.41 feet, gage datum (not used since levels of 2/19/51).

Hydrology

Drainage Area

770 square miles, approximately, of which 530 square miles contributes directly to surface runoff.

Channel and Control

The low water channel meanders somewhat but, in general, is fairly straight for ½ mile above the gage and makes a broad 90° bend to the right in the ½ mile below the gage. The right bank is fairly high and steep for ¼ mile upstream from the gage, as the channel in this reach had, at an earlier date, been straightened. This bank becomes quite high at the gage as the stream passes the point of a high ridge. The left bank is fairly low in the vicinity of the gage with a mud flat 100 to 200 feet wide, which will overflow at medium stages. Banks are overgrown with grasses, weeds and brush. A small dry tributary enters on the left bank opposite the gage and about 50 feet. upstream. The streambed is composed of fairly coarse sand and gravel with silt deposits on the edges in the slower water. Bank full stage is about 18 feet, gage datum.

A concrete weir is located approximately 75 feet below the gage. This weir was uncovered by flood events during the 2006-2007 water years, prior to those dates it had been buried in sand. This weir is the control, when it is not buried, at low gage heights. At medium and high stages, the channel becomes the control. The channel has a defined "first bench" (also noted in **RM #4** description) at this gage height the channel effect becomes noticeably different and is calculated as such thus producing two regressions for the rating curve.

Discharge Measurements

Low to moderate flow measurements may be made by wading in the vicinity of the gage. High-water measurements are made from an old bridge about 1.5 "creek" miles below the gage **when it is accessible**.

Floods

Greatest flood known occurred on June 21-22, 1947, gage height 24.40 feet, from high-water mark, discharge of about 120,000 cubic feet per second, based on slope-area measurement at Cambridge.

Extremes for Period of Record

Peak discharge 16,900 cubic feet per second May 30, 2007, gage height 20.84 feet; minimum daily discharge 7.1 cubic feet per second August 8, 2002.

Point of Zero Flow

2.57 feet. On the low point of the weir. Point of Zero Flow estimated on August 4, 2017 at 3.78 feet.

Winter Flow

Stage discharge relation will be affected by ice. At times, ice jams will form in the stream below the gage.

Regulation and Diversions

None.

Accuracy

Records of stage are generally good. Open water records are good and ice-affected records are poor.

Establishment and History

No other gage has been operated at this site. Sediment records were collected at this site from 1951 to 1958. A non-recording gage (April 25, 1951 to August 21, 1951) and recording gage (August 21, 1951 to Sept. 30, 1958) were operated on Medicine Creek at Maywood. Maywood is 18 mi northwest of Stockville, NE.

During this same period gages were operated on upstream tributaries to Medicine Creek:

Dry Creek near Curtis March 27, 1951 to Sept. 30, 1958

Fox Creek at Curtis March 27, 1951 to Sept. 30, 1958

Brushy Creek near Maywood April 25, 1951 to Sept. 30, 1958

These stations were established for use in the Inter-Agency Medicine Creek Watershed Investigation. Participating agencies were USGS, USWB, USSCS, Agricultural Research Project (Univ. of Nebraska), and USBR.

Established Jan. 18, 1950 by U.S. Geological Survey. This gage operated: as a well gage from Jan. 18, 1950, to July 22, 1986.

A Sta-Com Manometer from July 22, 1986, to June 3, 1996.

The cableway was condemned and removed from operation on March 23, 1994.

On Sept. 30, 1994, the gage was discontinued by the U.S.G.S. On Oct. 1, 1994, Nebraska's Department of Water Resources began operating the gage.

Model G2 Fluid Data Gage from June 3, 1996, to Nov. 21, 1997.

Water Log Series H-350 Lite pressure transducer and a Stevens Data Logger equipped with OrbComm Satellite Communicator from Nov. 21, 1997, to April 12, 1999.

A chain gage was installed on Oct. 16, 2003 at the site and is the new base gage. On April 8, 2004 a new Crest Stage Gage was installed because the support for the old Crest Stage Gage was rotted and unstable. The new Crest Stage Gage was placed in the same location as the old one. Floods during the 2007 and 2008 water years destroyed both staff gages and the crest stage gage, neither has been replaced

Sutron 8200 DCP with satellite transmitter from April 12, 1999 to April 9, 2008.

A Water Log Series H-350 Lite pressure transducer and a Sutron SatLink Logger was the gage from April 9, 2008 until September 13, 2010.

On September 13, 2010 the pressure transducer and Nitrogen bubbler system was removed. At this time a Constant Flow Bubbler and a SatLink II logger/transmitter were installed.

May 16, 2012 a new cantilever style chain gage with a wire weight box was installed.

N-CORPE, the Nebraska Cooperative Republican Platte Enhancement project, which is an interlocal agency formed in the fall of 2012 by four Natural Resources Districts to increase stream flows in the Republican and Platte Rivers. The agency purchased land in Lincoln County, Nebraska that has been retired from irrigation so that, that ground water can be transported via pipelines and tributaries to the Republican River to supplement surface water. The main waterway for these supplemental flows is Medicine Creek. This action will affect flows at various times at this site.

October 20 – 21, 2016 the Lincoln Standard Well shelter was replaced with a 24" x 30" x 72" stainless steel, cabinet style gage house.

Revision History

Original description prepared 02-13-1951 by G.L. Whitaker

Revised 05-15-1967 by M.M. Gilbert

Revised 06-03-1977 by M.M. Gilbert

Revised 01-29-1988 by B.D. Edgerton

Revised 06-12-1996 by B.D. Edgerton

Revised 03-21-2001 by J.A. Marburger

Revised 03-02-2004 by D.L. Gunderson

Revised 12-13-2004 by D.L. Gunderson

Revised 03-07-2007 by D.L. Gunderson

Revised 02-09-2009 by D. Gunderson

Revised 02-14-2011 by D. Gunderson

Revised 04-24-2013 by D. Gunderson

Revised 09-09-2015 by D. Gunderson

Revised 12-16-2016 by D. Gunderson

Revised 02/01/2019 by J. A. Marburger

Revised 11/24/2021 by D. Gunderson