

Frenchman Creek Near Imperial, Nebraska 06831500

LOCATION

Latitude and Longitude

40.43172, -101.6269

Road Log

On right bank, 0.2 miles downstream from the bridge on 333 Ave. 1 mile East and 5.35 miles south of Imperial, NE Chase County

Nearby Features

5.8 miles upstream of Enders Dam.

Equipment Details

Recording Gage

The stilling well is connected to the river by two 3" intake pipes. A-35 graphic water-stage recorder (scale 1:6), Data Collection Platform (DCP) equipped with a shaft encoder. The shaft encoder is connected to the graphic recorder by a sprocket chain and operates from the same float. The graphic recorder is driven by a float attached to a graduated, steel tape, which is set to agree with the inside gage. A Sutron Satlink Logger is the main recorder. Gages are housed in a Lincoln Standard 48-inch corrugated iron stilling well and shelter.

External Gage

Gage consists of weighted steel tape and adjustable reference point on instrument shelf support inside the gage house.

Bench Mark and Reference Marks

Stilling Well Elevations

Datum of gage is 3134.418 ft. above National Geodetic Vertical Datum of 1929, or 3134.812 (NAVD88) as of 05/27/2014.

The following elevations are given in feet above gage datum:

Top of conical roof of shelter	17.0 ft
Top of culvert pipe in shelter	15.7 ft
Top of instrument shelf	11.6 ft

Reference point	11.52 ft
Well door sill	9.30 ft.
Top of floor in shelter	9.10 ft
Top of concrete floor in well	-0.300 ft.

The well is connected to the River by two 3 inch galvanized iron intake pipes, each equipped with a flushing device. The following elevations are given in feet above gage datum:

Center line upper intake pipe (well end)	1.10 ft.
Center line upper intake pipe (stream end)	1.20 ft.
Center line lower intake pipe (well end)	0.100 ft.
Center line lower intake pipe (stream end)	0.400 ft.

RMs 1-6 were destroyed or abandoned.

RM 7: A standard brass tablet in a steel reinforced concrete post 42 feet downstream and 19 feet right from centerline of gage. Elevation is 9.17 ft., gage datum (Origin for levels 07/19/2021.)

RM 8: A standard brass tablet in a steel reinforced concrete post 110 ft. right of gage. Elevation is 13.03 ft. (levels 07/19/2021), gage datum.

RM 9: A standard brass tablet in a steel reinforced concrete post (mushroom shaped) 30 ft. upstream (North) and 10 ft. shoreward (West) of the well gage. Elevation is 7.88 ft. (levels 07/19/2021), gage datum.

RM 10: A chiseled "X" in the top of an angle iron support for the metal guard rail on the newer county road bridge. The angle iron is located on the right downstream side of the bridge and is painted orange. Elevation is 17.68 ft. (levels 08/14/2007), gage datum.

R.P. 1: An adjustable R.P. located on the front of the instrument shelf. Elevation is 11.52 ft. (levels 07/19/2021), gage datum. An inverted graduated weighted steel tape (length = 11.52 ft) is used to read water surface elevations directly.

R.P. 2: The top edge of the angle iron supporting the gage floor directly beneath the weight tape. Elevation is 9.16 ft. (levels 07/19/2021), gage datum.

Hydrology

Drainage Area

~880 sq. mi. of which about 720 sq mi. contributes directly to surface runoff.

Channel and Control

The channel is straight for about 75 ft above and below the gage. The streambed is composed of pieces of limestone mixed with gravel resting on a bed of hardpan. The right bank has a large growth of willows, while the left bank is steep and fairly clean. Bank full stage occurs at about 7.3 ft. on left bank and 9.0 ft. on right bank. The control is a rock riffle about 20ft. below the gage. This will be the control for all but high stages.

Discharge Measurements

Low and medium stage measurements are made by wading at the gage. High stage measurements are made from county bridge a quarter mile upstream from gage.

Floods

Flood of June 7, 1940 reached a stage of 12.4 ft (March 1941 to Sept. 1958 gage datum) from flood marks, discharge not determined. Floods of June 14, 1943, gage height 7.00 ft, and May 21, 1951, gage height 6.69 ft., discharge 1860 cfs. Flood of June 18, 1958, reached a stage of 5.01 ft (old datum), discharge 1070 cfs. This flood was tied into gage datum at the present site by high watermarks and reached a stage of approximately 6.1 ft, present datum. Flood of March 22, 1960, reached a stage of 8.43 ft., present datum, discharge 2,340 cfs. Flood of June 16-17 1997, reached a stage of 5.88 ft., discharge 1290 cfs. A flood on June 12, 2007 reached a stage of 10.01 ft, discharge 2212 cfs.

Extremes for Period of Record

Peak discharge: 3,780 cfs June 12, 2007. Gage height 10.01 ft.
Minimum daily discharge: 1.38 cubic feet per second October 23, 2019.

Point of Zero Flow

Variable, about 0.08ft on August 6, 2018

Winter Flow

Ice effect will occur only during periods of extreme cold weather.

Regulation and Diversions

No regulations. Natural flow was affected by regulation at low flow from power plants above station until 1974. No diversions, but, impoundments made in Kilpatrick Reservoir, at Champion Mill recreation area and in Lake Imperial.

Accuracy

Records of stage are good and measuring conditions are usually good. Open water records are good and ice affected records should be considered fair to poor

Establishment and History

Established Jan. 1, 1924 by Nebraska Department of Roads and Irrigation.

Jan. 1, 1924 to Dec. 31, 1930 a chain gage on the downstream side of a bridge 0.2 mile above present site at a different datum. Daily figures of discharge were published in the Biennial Hydrographic reports of the Nebraska Department of Roads and Irrigation.

Nov. 14, 1940 to March 6, 1941 a chain gage was established by Nebraska Department of Roads and Irrigation at the site 0.25 mile below present site and 0.45 mile below the original gage.

March 6, 1941 to Sept. 17, 1958 recording gage was established by the U.S. Geological Survey at the same site as the above chain gage at a datum 4.35 ft. below present datum.

On Aug. 29, 1944, the well and shelter were lowered 0.90 ft, but the datum was not changed.

On Sept. 17, 1958 the gage was moved 0.25 mile upstream.

Sept. 17, 1958 to present; current gage and datum at a site 0.20 mile below county bridge and 0.25 mile above previous location.

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

On April 9, 2008 a Sutron 8200 recorder was replaced with a Sutron Satlink data recorder.

September 11, 2017 an enameled staff plate was installed

Revision History

Original description prepared 12/17/1940 by R. Follansbe and K.S. Essex.

Revised: 03/07/1941 by C.J. Osborne

Revised 12/14/1942 by E.R. Leason

Revised 06/10/1948 by L.F. Hanks

Revised 04/16/1959 by V.F. Pearce and E.K. Steele

Revised 04/28/1967 by M.M. Gilbert

Revised 05/27/1977 by M.M. Gilbert

Revised 06/14/1988 by R.B. Swanson

Revised 02/05/1995 by B. D. Edgerton

Revised 12/11/2002 by D. Gunderson

Revised 04/06/2006 by D. Gunderson

Revised 03/14/2008 by D. Gunderson

Revised 12/10/2008 by D. Gunderson

Revised 09/22/2015 by D. Gunderson

Revised 11/21/2017 by D. Gunderson

Revised 12/10/2020 by S. Figuric

Revised 11/01/2021 by D. Gunderson