

Republican River at Hwy 47 Bridge, Nebraska 06843400

LOCATION

Latitude and Longitude

40.27388, -100.1661

Road Log

On the downstream, side of Nebraska State Highway 47 Bridge along the left bank at, 0.56 miles south of intersection between US Highway 6 & 34 and State Highway 47, 1.6 miles upstream from Republican River and Medicine Creek confluence.

Equipment Details

Recording Gage

A Sutron "Constant Flow Bubbler" (CFB) is connected to a Sutron "SatLink2 data logger & transmitter." Both instruments are housed in a 24" x 30" x 72", stainless steel cabinet style gage house. The CFB connected to the stream by a single bubble line, with the orifice terminating near the left bank. The bubble line is encased in black, PVC 1 ¼" tubing.

External Gage

The CFB is referenced to a wire weight gage, which is located on the downstream guard rail of the highway bridge.

Bench Mark and Reference Marks

Elevation of 2,248.066 FT. based on NAVD88.

RM #1 – Countersunk 6 inches, capped rebar rod 46 ft. north of gage house; 3.70 ft. north of the north end of the east side highway 47 guard rail; 16.5 ft. east of the Highway 47 center line. Elevation 17.68 ft. March 30, 2023. (2265.746 ft. NAVD 88 June 1, 2016)

RM #2 – Countersunk 6 inches, capped rebar rod 15.70 ft. south of the south end of the Highway 47 west guard rail; 44 ft. east of north/south barbed wire fence; 17 ft. west of Highway 47 center line. Elevation 18.09 ft. March 30, 2023. (2266.146 ft. NAVD 88 June 1, 2016)

RM #3 – Chiseled "X" on top of Department of Roads, orange, concrete right-of-way (ROW) marker. ROW marker is 44.6 ft. west of the south end bridge deck of Highway 47. Elevation 15.84 ft. March 30, 2023. (2263.924 ft. NAVD 88 June 1, 2016)

RM #4 – Chiseled "X" on top of Department of Roads, orange concrete right-of-way (ROW) marker. ROW marker is 51 ft. north of gage house, 50 ft. east of gage house and 68 ft. direct pull northeast of gage house. Elevation 13.20 ft. March 30, 2023. (2261.266 ft. NAVD 88)

RP #1 – Chiseled double slashes “||” on top of east, metal guard rail approximately 80’ south of the north end of the east side Highway 47 guard rail. Elevation 23.06 ft., June 8, 2015.

RP #2 – Chiseled arrow (↑) on upstream, concrete guard rail approximately 75 ft south of the north end of the guard rail. Elevation 22.69 ft. May 31, 2023.

Check Bar – Wire weight located 36 ft. south of the north end of Highway 47 east guardrail. Elevation 21.89 ft. March 30, 2023.

RM #1, RM #2 and RP #1 were destroyed during bridge construction starting April 2023. Wire weight was removed March 30, 2023.

Hydrology

Drainage Area

Approximately 13,550 square miles, of which about 7,860 square miles contributes directly to surface runoff.

Channel and Control

The channel is winding and braided with heavy grass cover and wooded banks. The streambed is composed of shifting sand and silt. The channel gradually curves to the south upstream of the gage and is fairly straight for approximately 750 ft. downstream of the gage.

Control is variable and subject to frequent shifts of moderate magnitude.

Discharge Measurements

Measurements of low and medium stage are made by wading in the vicinity of the gage, at high stages measurements are made from the highway bridge.

Floods

Because proximity of the neighboring gaging site “Republican River at Cambridge 06843500” and lack of information for this site we will take their floods information as valid ones.

Citing from Republican River at Cambridge station...

“Maximum stage known, 17.6 ft. May 31 to June 1, 1935, from information by local resident, discharge about 280,000 cfs. Maximum discharge during period of record occurred June 22, 1947, at a stage of 16.7 ft. (from flood marks), discharge 160,000 cfs on basis of slope-area measurements. A stage of 14.0 ft. occurred June 21, 1948, discharge of 86,000 cfs.”

Extremes for Period of Record

Peak discharge 3810 cubic feet per second May 28, 2023, gage height 11.08 feet;

Minimum daily discharge 0.00 cubic feet per second.

Point of Zero Flow

Variable. Not established yet.

Winter Flow

Wintertime produced normal ice conditions with partial to full ice coverage at times.

Regulation and Diversions

Flow is regulated by upstream flood-control and irrigation reservoirs. Storage began at Bonny Reservoir on July 6, 1950, Swanson Lake near Trenton on May 4, 1953, Enders Reservoir near Enders on Oct. 23, 1950, Hugh Butler Lake near McCook on Sept. 5, 1951 and Harry Strunk Lake near Cambridge on Aug. 8, 1949.

Construction of all major Canal systems providing service to 45,000 acres of land in the Frenchman-Cambridge irrigation district was completed in July 1964. These lands are situated in the Republican River valley. Lands extending above Cambridge are Red Willow (4,932 acres), Meeker-Driftwood (16,476 acres) and Bartley (6,539 acres). Cambridge Canal, 1.3 mi below the gage, diverts water to serve 17,053 acres. In addition, many private water rights divert water with small pumps.

Beginning in 2012 the Frenchman-Cambridge Irrigation district began construction on a lift station, at the Cambridge Diversion Dam, to serve the lower end of the Bartley Canal system.

Accuracy

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

Establishment and History

No other gages operated at this site. 1.8 miles downstream, the gaging station of 06843500 Medicine Creek at Cambridge, NE was established by the USGS and has been in operation since 1947. The Corps of Engineers had sediment samples collected at the highway bridge from 1947 to 1957.

On June 1, 2015 A 24" x 30" x 72" stainless steel, cabinet gage house was installed, together with Sutron Constant Flow Bubbler (CFB) and a Sutron Satlink data transmitter/logger.

On June 8, 2015 a wire weight was installed and the inside gages were set to the surface water reading of the wire weight.

Revision History

Original document created on February 3, 2017

Revised on March 8, 2017 by S. Figuric

Revised on February 11, 2019 by S. Figuric

Streamgage Description
Republican River at Hwy 47 Bridge, Nebraska
06843400

Page 4 of 4

Revised on March 21, 2022 by S. Figuric

Revised October 5, 2023 by D. Gunderson