



Water-Data Report 2010

473423095053301 Local number WLN04 147N35W02CDCBDD Bemidji 310D

Sand and gravel aquifers (glaciated regions)
Des Moines Outwash
Beltrami County, MN

LOCATION.--Lat 47°34'23.00", long 95°05'34.00" referenced to North American Datum of 1983, in SW ¼ SE ¼ SW ¼ sec.2, T.147 N., R.35 W., Beltrami County, MN, Hydrologic Unit 07010101, northwest of Bemidji.

GROUNDWATER RECORDS

WELL CHARACTERISTICS.--Depth 34.83 ft. Upper casing diameter 2 in; top of first opening 30.08 ft, bottom of last opening 33.08 ft. Well WLN04 was drilled on May 1, 1985 as a water-table observation well. Casing material: 2 inch diameter, schedule 40-PVC. This casing has a stick-up of 2.70 feet above land surface. Hole depth: 110 feet. Total well depth: 37.53 feet. Screen length of 3.00 feet. Tailpipe length: 1.75 feet.

DATUM.--Land-surface datum is 1,422.62 ft above North American Vertical Datum of 1988. Measuring point: Top of PVC casing that rises slightly above shelter floor., 2.70 ft above land-surface datum, May 1, 1985, to present. Water levels are in depth below land surface and feet above sea level. Water levels are accurate to within 0.01 feet below land surface. Water-level elevations are accurate to plus-or-minus 0.056 feet, based on a 2nd-order vertical and horizontal reference point survey, which was completed on October 28, 2010 using a total station and four known NGS benchmarks installed at the site. Water-level differences are accurate to plus-or-minus 0.01 feet.

PERIOD OF RECORD.--Periodic water level measurements from August 13, 1985 to current year. Daily water level measurements from June 15, 1993 to June 30, 2003. Four-hourly water level measurements from Aug. 12, 2003 at 14:00 CDT to Aug. 18, 2003 at 22:00 CDT. Hourly water level measurements from Aug. 19, 2003 at 09:00 CDT to Dec. 15, 2009 at 15:00 CST; and Jan. 12, 2010 at 16:00 CST to present.

GAGE.--Continuous water level is measured with a KPSI submersible pressure transducer; water level is measured monthly by USGS. Data are recorded hourly by a Campbell Scientific, Inc. CR10 data logger. The data logger is housed in a 2ft. x 2ft. aluminum shelter and is mounted on top of the well protection pipe. The gage is powered by a 10W solar panel, mounted approximately 15 feet above shelter on mast. Communication to data logger is via phone line.

COOPERATION.--Well WLN04 is operated by the U.S. Geological Survey.

REMARKS.--Local well ID number: 310D, at crude-oil spill research site near Bemidji. Owner: U.S. Geological Survey.

Station lost power on Dec. 15, 2009 at 15:00 CST, lasting until Jan. 12, 2010 at 13:04 CST. No water level and/or water temperature data were recorded during this period of time. Power loss was due a battery replacement on Dec. 15, 2009 at 08:30 CST. The replacement battery was later determined to be a bad battery (hence the power loss) and is no longer in use.

EXTREMES FOR PERIOD OF RECORD.--Highest recorded water level: 27.54 feet below land surface (1395.08 feet NGVD88) during Jun. 15-16, 2001; Lowest recorded water level: 30.60 feet below land surface (1392.02 feet NGVD88) several times during Mar. 9-13, 2007.

Highest daily-average water level: 27.54 feet below land surface (1395.08 feet NGVD88) during Jun. 15-16, 2001; lowest daily-average water level: 30.60 feet below land surface (1392.03 feet NAVD88) during Mar. 9-13, 2007.

EXTREMES FOR CURRENT YEAR.--Highest recorded water level: 28.69 feet below land surface (1393.93 feet NGVD88) during Sept. 30, 2010 at 21:00 CDT; lowest recorded water level: 30.28 feet below land surface (1392.34 feet NGVD88) on March. 11, 2010 at 05:00 CST.

Highest daily-average water level: 28.70 feet below land surface (1393.92 feet NGVD88) during Sept. 30, 2010; lowest daily-average water level: 30.27 feet below land surface (1392.35 feet NAVD88) on March. 11 & 12, 2010.

CORRECTIONS.--All previously published water elevation data between Oct. 1, 2005 and September 30, 2009 were increased by 2.134 feet, reflecting increased land surface accuracy from a 2nd-order vertical and horizontal reference point survey. The survey was completed on October 28, 2010 using a total station and four known NGS benchmarks installed at the site. This has been corrected in the USGS data base, but will not be republished in this report series. Contact the USGS Minnesota Water-Science Center for all corrected data.

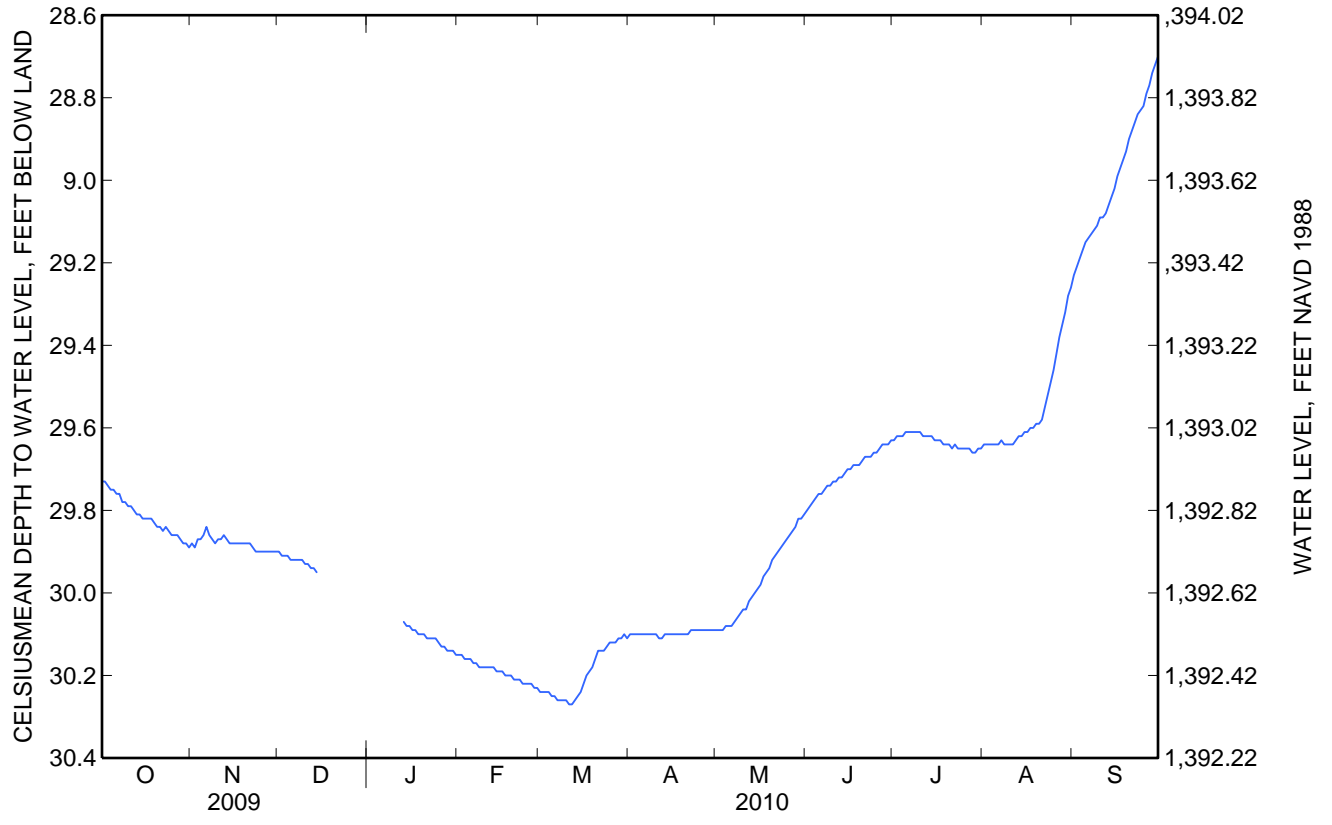
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DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	29.73	29.88	29.90	---	30.15	30.24	30.10	30.09	29.80	29.63	29.64	29.23
2	29.73	29.89	29.91	---	30.15	30.24	30.10	30.09	29.79	29.62	29.64	29.21
3	29.74	29.87	29.91	---	30.16	30.24	30.10	30.09	29.78	29.62	29.64	29.19
4	29.75	29.87	29.91	---	30.16	30.24	30.10	30.08	29.77	29.62	29.64	29.17
5	29.75	29.86	29.92	---	30.16	30.25	30.10	30.08	29.76	29.61	29.64	29.15
6	29.76	29.84	29.92	---	30.17	30.25	30.10	30.08	29.76	29.61	29.64	29.14
7	29.76	29.86	29.92	---	30.17	30.26	30.10	30.07	29.75	29.61	29.63	29.13
8	29.78	29.87	29.92	---	30.18	30.26	30.10	30.06	29.74	29.61	29.64	29.12
9	29.78	29.88	29.92	---	30.18	30.26	30.10	30.05	29.74	29.61	29.64	29.11
10	29.79	29.87	29.93	---	30.18	30.26	30.10	30.04	29.73	29.61	29.64	29.09
11	29.79	29.87	29.93	---	30.18	30.27	30.11	30.04	29.73	29.62	29.64	29.09
12	29.80	29.86	29.94	---	30.18	30.27	30.11	30.02	29.72	29.62	29.63	29.08
13	29.81	29.87	29.94	30.07	30.18	30.26	30.10	30.01	29.72	29.62	29.62	29.06
14	29.81	29.88	29.95	30.08	30.19	30.25	30.10	30.00	29.71	29.62	29.62	29.04
15	29.82	29.88	---	30.08	30.19	30.24	30.10	29.99	29.70	29.63	29.61	29.02
16	29.82	29.88	---	30.09	30.19	30.22	30.10	29.98	29.70	29.63	29.61	28.99
17	29.82	29.88	---	30.09	30.20	30.20	30.10	29.96	29.69	29.63	29.60	28.97
18	29.82	29.88	---	30.10	30.20	30.19	30.10	29.95	29.69	29.64	29.60	28.95
19	29.83	29.88	---	30.10	30.20	30.18	30.10	29.94	29.69	29.64	29.59	28.93
20	29.84	29.88	---	30.10	30.21	30.16	30.10	29.92	29.68	29.64	29.59	28.90
21	29.84	29.88	---	30.11	30.21	30.14	30.10	29.91	29.67	29.65	29.58	28.88
22	29.85	29.89	---	30.11	30.21	30.14	30.09	29.90	29.67	29.64	29.55	28.86
23	29.84	29.90	---	30.11	30.22	30.14	30.09	29.89	29.67	29.65	29.52	28.84
24	29.85	29.90	---	30.11	30.22	30.13	30.09	29.88	29.66	29.65	29.49	28.83
25	29.86	29.90	---	30.12	30.22	30.12	30.09	29.87	29.66	29.65	29.46	28.82
26	29.86	29.90	---	30.13	30.22	30.12	30.09	29.86	29.65	29.65	29.42	28.79
27	29.86	29.90	---	30.13	30.23	30.12	30.09	29.85	29.64	29.65	29.38	28.77
28	29.87	29.90	---	30.14	30.23	30.11	30.09	29.84	29.64	29.66	29.35	28.74
29	29.88	29.90	---	30.14	---	30.11	30.09	29.82	29.64	29.66	29.32	28.72
30	29.88	29.90	---	30.14	---	30.10	30.09	29.82	29.63	29.65	29.28	28.70
31	29.89	---	---	30.15	---	30.11	---	29.81	---	29.65	29.26	---
Mean	29.81	29.88	---	---	30.19	30.20	30.10	29.97	29.71	29.63	29.55	28.98
Max	29.89	29.90	---	---	30.23	30.27	30.11	30.09	29.80	29.66	29.64	29.23
Min	29.73	29.84	---	---	30.15	30.10	30.09	29.81	29.63	29.61	29.26	28.70

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WATER-QUALITY RECORDS

PERIOD OF RECORD.--

WATER TEMPERATURE: March 20, 2007 at 16:00 CDT to Dec. 15, 2009 at 15:00 CST; and Jan. 12, 2010 at 16:00 CST to present.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: March 21, 2007 to Dec. 14, 2009; and Jan. 13, 2010 to present.

INSTRUMENTATION.--Water temperature was measured with a KPSI submersible pressure transducer accurate to 0.1°C.

COOPERATION.--Well WLN04 is operated by the U.S. Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--

WATER TEMPERATURE: Maximum hourly, 6.4°C many times during Sept. 2010; minimum hourly, 5.3°C, many days in Aug. 2009 and on Sep. 25 2009.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum daily-average, 6.4°C on many days during Sept. 2010; minimum daily-average, 5.3°C on many days in Aug. 2009 and on Sep. 25, 2009.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum hourly, 6.4°C many times during Sept. 2010; minimum hourly, 5.4°C many times during Oct. 2009.

Maximum daily-average, 6.3°C on many days during Sept. 2010; minimum daily-average, 5.5°C on many days during Oct. 2009.

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TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	5.5	5.6	5.8	---	6.0	6.0	6.0	6.1	6.1	6.0	6.0	6.1
2	5.5	5.7	5.8	---	6.0	6.0	6.0	6.1	6.1	6.0	6.0	6.1
3	5.5	5.7	5.8	---	6.0	6.0	6.0	6.0	6.1	6.0	6.0	6.1
4	5.5	5.7	5.8	---	6.0	6.0	6.0	6.0	6.1	6.0	6.0	6.1
5	5.5	5.7	5.8	---	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.1
6	5.5	5.7	5.8	---	6.0	6.1	6.0	6.1	6.0	6.0	6.0	6.1
7	5.5	5.7	5.8	---	6.0	6.1	6.0	6.0	6.0	6.0	6.1	6.1
8	5.5	5.7	5.8	---	6.0	6.1	6.0	6.0	6.0	6.0	6.1	6.1
9	5.5	5.7	5.8	---	6.0	6.1	6.0	6.0	6.0	6.0	6.1	6.1
10	5.5	5.7	5.8	---	6.0	6.1	6.0	6.1	6.0	6.0	6.1	6.1
11	5.5	5.7	5.8	---	6.0	6.1	6.0	6.0	6.0	6.1	6.1	6.1
12	5.5	5.7	5.8	---	6.0	6.1	6.0	6.0	6.0	6.0	6.1	6.2
13	5.5	5.7	5.8	---	6.0	6.1	6.0	6.0	6.0	6.0	6.1	6.2
14	5.5	5.7	5.8	6.0	6.0	6.1	6.0	6.0	6.0	6.0	6.1	6.2
15	5.5	5.7	---	6.0	6.0	6.1	6.0	6.0	6.0	6.0	6.1	6.2
16	5.5	5.7	---	6.0	6.0	6.1	6.0	6.0	6.0	6.0	6.1	6.2
17	5.5	5.7	---	6.0	6.0	6.1	6.0	6.0	6.0	6.0	6.1	6.3
18	5.5	5.7	---	5.9	6.0	6.1	6.0	6.0	6.0	6.0	6.1	6.2
19	5.5	5.7	---	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.1	6.2
20	5.5	5.7	---	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.1	6.2
21	5.5	5.7	---	6.0	6.0	6.1	6.0	6.0	6.0	6.0	6.1	6.2
22	5.5	5.7	---	6.0	6.0	6.1	6.0	6.0	6.0	6.0	6.1	6.2
23	5.6	5.7	---	6.0	6.0	6.1	6.0	6.0	6.0	6.0	6.1	6.3
24	5.5	5.8	---	6.0	6.0	6.0	6.1	6.0	6.0	6.0	6.1	6.3
25	5.6	5.7	---	6.0	6.0	6.0	6.1	6.0	6.0	6.0	6.1	6.3
26	5.5	5.7	---	6.0	6.0	6.0	6.1	6.0	6.0	6.0	6.1	6.3
27	5.6	5.8	---	6.0	6.0	6.0	6.1	6.0	6.0	6.0	6.1	6.3
28	5.6	5.7	---	6.0	6.0	6.1	6.1	6.0	6.0	6.0	6.1	6.3
29	5.6	5.8	---	6.0	---	6.1	6.1	6.1	6.0	6.0	6.1	6.3
30	5.6	5.8	---	6.0	---	6.0	6.1	6.1	6.0	6.0	6.1	6.3
31	5.6	---	---	6.0	---	6.0	---	6.1	---	6.0	6.1	---
Mean	5.5	5.7	---	---	6.0	6.1	6.0	6.0	6.0	6.0	6.1	6.2
Max	5.6	5.8	---	---	6.0	6.1	6.1	6.1	6.1	6.1	6.1	6.3
Min	5.5	5.6	---	---	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.1

