



Water-Data Report 2009

473423095053301 Local number WLN04 147N35W02CDCBDD Bemidji 310D

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

LOCATION.--Lat 47°34'23", long 95°05'33" referenced to North American Datum of 1927, 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 1,420.49 ft above National Geodetic Vertical Datum of 1929. Measuring point: PVC pipe on floor of shelter, 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 5 feet, based on the elevation of the land surface from the USGS topographic map. 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 the 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

EXTREMES FOR PERIOD OF RECORD.--Highest recorded water level: 27.77 feet below land surface (1392.72 feet NGVD29) during Jun. 15-16, 2001; Lowest recorded water level: 30.83 feet below land surface (1389.66 feet NGVD29) several times during Mar. 9-13, 2007.

Highest daily-average water level: 27.77 feet below land surface (1392.72 feet NGVD29) during Jun. 15-16, 2001; lowest daily-average water level: 30.82 feet below land surface (1389.67 feet NAVD29) during Mar. 9-13, 2007.

EXTREMES FOR CURRENT YEAR.--Highest recorded water level: 28.76 feet below land surface (1391.27 feet NGVD29) during May 31, 2009 at 10:00 CDT; lowest recorded water level: 29.82 feet below land surface (1390.19 feet NGVD29) on Oct. 6, 2008 at 19:00 CDT.

Highest daily water level: 28.79 feet below land surface (1389.16 feet NGVD29) during Jun. 8, 2009; lowest daily water level: 29.82 feet below land surface (1390.19 feet NAVD29) on Oct. 6, 2008.

CORRECTIONS.--All previously published monthly water levels are in error. These have been corrected in the USGS data base, but will not be republished in this report series. Some daily data were previously published to 3 decimal places, which is beyond the accuracy of the pressure transducer. These data have been rounded to 2 decimal places but will not be republished in this report series. Contact the USGS Minnesota Water-Science Center for all corrected data.

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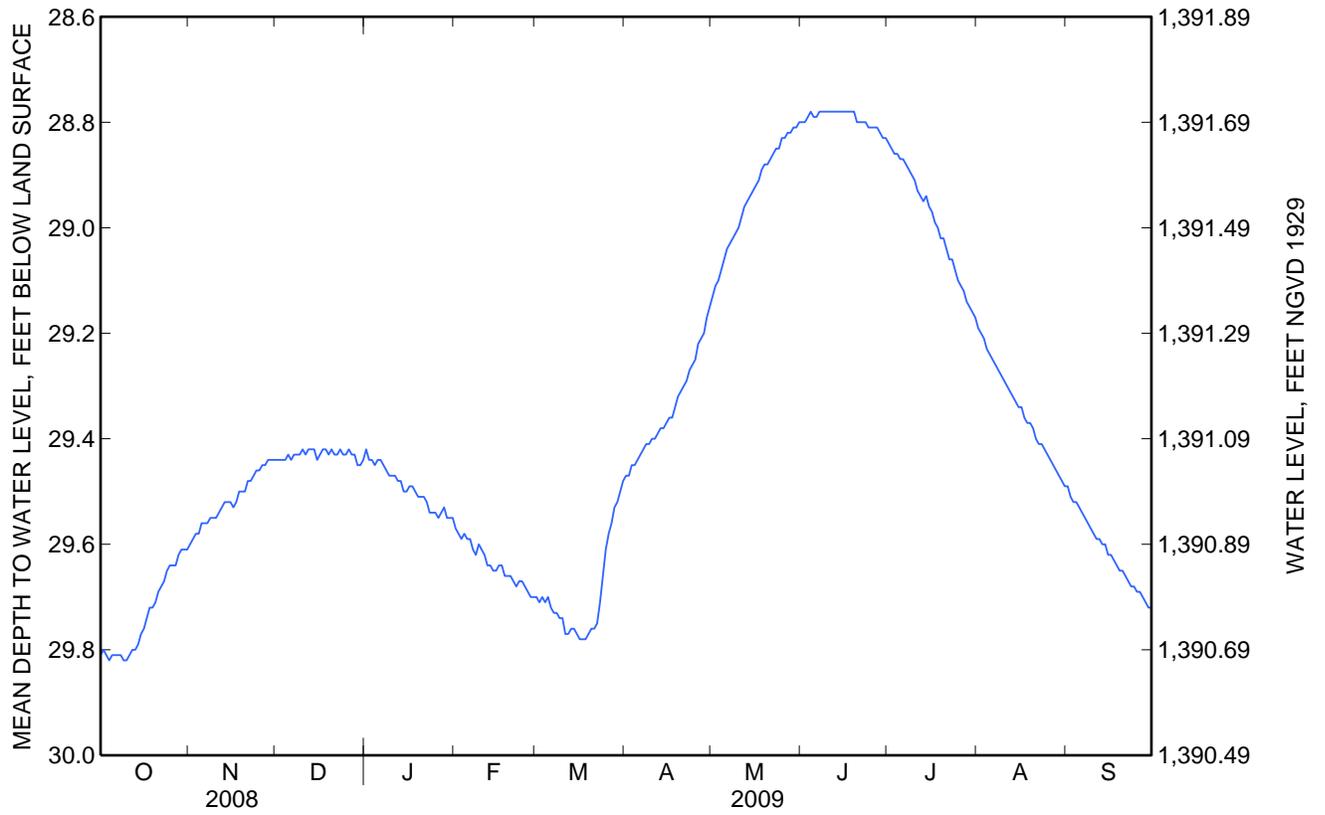
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**DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE
WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009
DAILY MEAN VALUES**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	29.81	29.60	29.44	29.42	29.57	29.70	29.47	29.13	28.80	28.84	29.19	29.49
2	29.80	29.59	29.44	29.44	29.58	29.71	29.47	29.11	28.80	28.85	29.20	29.51
3	29.81	29.58	29.44	29.44	29.59	29.70	29.45	29.10	28.79	28.86	29.21	29.52
4	29.82	29.58	29.44	29.45	29.58	29.71	29.45	29.08	28.78	28.86	29.23	29.52
5	29.81	29.56	29.43	29.44	29.59	29.70	29.44	29.06	28.79	28.87	29.24	29.53
6	29.81	29.56	29.44	29.44	29.59	29.72	29.43	29.04	28.79	28.87	29.25	29.54
7	29.81	29.56	29.43	29.45	29.61	29.73	29.42	29.03	28.78	28.88	29.26	29.55
8	29.81	29.55	29.43	29.46	29.62	29.73	29.41	29.02	28.78	28.89	29.27	29.56
9	29.82	29.55	29.43	29.47	29.60	29.74	29.41	29.01	28.78	28.90	29.28	29.57
10	29.82	29.55	29.42	29.47	29.61	29.74	29.40	29.00	28.78	28.91	29.29	29.58
11	29.81	29.54	29.43	29.47	29.62	29.77	29.40	28.98	28.78	28.93	29.30	29.59
12	29.80	29.53	29.42	29.48	29.64	29.77	29.39	28.96	28.78	28.94	29.31	29.59
13	29.80	29.52	29.42	29.48	29.64	29.76	29.38	28.95	28.78	28.95	29.32	29.60
14	29.79	29.52	29.42	29.50	29.65	29.76	29.38	28.94	28.78	28.94	29.33	29.60
15	29.77	29.52	29.44	29.50	29.65	29.77	29.37	28.93	28.78	28.96	29.34	29.62
16	29.76	29.53	29.43	29.49	29.64	29.78	29.36	28.92	28.78	28.97	29.34	29.62
17	29.74	29.52	29.42	29.49	29.64	29.78	29.36	28.91	28.78	28.99	29.36	29.63
18	29.72	29.50	29.42	29.50	29.66	29.78	29.34	28.89	28.78	29.00	29.37	29.64
19	29.72	29.50	29.43	29.51	29.66	29.77	29.32	28.88	28.78	29.02	29.37	29.65
20	29.71	29.50	29.42	29.51	29.66	29.76	29.31	28.88	28.80	29.02	29.38	29.65
21	29.69	29.48	29.43	29.51	29.67	29.76	29.30	28.87	28.80	29.04	29.40	29.66
22	29.68	29.48	29.43	29.52	29.68	29.75	29.29	28.86	28.80	29.06	29.41	29.67
23	29.67	29.47	29.42	29.54	29.67	29.71	29.27	28.85	28.80	29.06	29.41	29.68
24	29.65	29.46	29.43	29.54	29.67	29.66	29.26	28.85	28.81	29.08	29.42	29.68
25	29.64	29.46	29.43	29.54	29.68	29.61	29.25	28.83	28.81	29.10	29.43	29.69
26	29.64	29.45	29.42	29.55	29.69	29.58	29.22	28.83	28.81	29.11	29.44	29.69
27	29.64	29.45	29.43	29.54	29.70	29.56	29.21	28.82	28.81	29.12	29.45	29.70
28	29.62	29.44	29.43	29.53	29.70	29.53	29.20	28.82	28.82	29.14	29.46	29.71
29	29.61	29.44	29.45	29.55	---	29.52	29.17	28.81	28.83	29.15	29.47	29.72
30	29.61	29.44	29.45	29.55	---	29.50	29.15	28.81	28.83	29.16	29.48	29.72
31	29.61	---	29.44	29.55	---	29.48	---	28.80	---	29.17	29.49	---
Mean	29.74	29.51	29.43	29.49	29.64	29.69	29.34	28.93	28.79	28.99	29.35	29.62
Max	29.82	29.60	29.45	29.55	29.70	29.78	29.47	29.13	28.83	29.17	29.49	29.72
Min	29.61	29.44	29.42	29.42	29.57	29.48	29.15	28.80	28.78	28.84	29.19	29.49

Calendar Year 2008 Water Year 2009		
Mean	29.92	29.38
High	29.42	28.78
Low	30.50	29.82

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WATER-QUALITY RECORDS

PERIOD OF RECORD.--

WATER TEMPERATURE: March 20, 2007 to the present.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: March 21, 2007 to the 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, 6.3°C, March 21-31, 2007; minimum, 5.3°C, many days in Aug. 2009 and on Sep. 25 2009.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 6.2°C during March 21-24, 26, 2007; minimum, 5.3°C on many days in Aug. 2009 and on Sep. 25, 2009.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum hourly, 6.1°C many times during Jan., Feb, Mar. and Apr. 3, 2009.; minimum hourly, 5.3°C many times during Aug. and Sept. 25, 2009.

Maximum daily, 6.0°C on many days during Jan. 6-Apr. 3, 2009; minimum daily, 5.4°C on Aug. 13 and Sept. 10, 2009.

**TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009
DAILY MEAN VALUES**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	5.6	5.7	5.8	5.9	6.0	6.0	5.9	5.8	5.7	5.6	5.5	5.5
2	5.6	5.7	5.8	5.9	6.0	6.0	6.0	5.8	5.7	5.6	5.5	5.5
3	5.6	5.7	5.8	5.9	6.0	6.0	5.9	5.8	5.7	5.6	5.5	5.5
4	5.6	5.7	5.8	5.9	6.0	6.0	5.9	5.8	5.7	5.6	5.5	5.5
5	5.6	5.7	5.8	5.9	6.0	6.0	5.9	5.8	5.7	5.6	5.5	5.5
6	5.6	5.7	5.8	6.0	6.0	6.0	5.9	5.8	5.7	5.6	5.5	5.5
7	5.6	5.7	5.8	5.9	6.0	6.0	5.9	5.8	5.7	5.6	5.5	5.5
8	5.6	5.7	5.8	5.9	6.0	6.0	5.9	5.8	5.7	5.6	5.5	5.5
9	5.6	5.7	5.8	5.9	6.0	6.0	5.9	5.8	5.7	5.6	5.5	5.5
10	5.6	5.7	5.8	5.9	6.0	6.0	5.9	5.8	5.7	5.6	5.5	5.4
11	5.6	5.7	5.8	6.0	6.0	6.0	5.9	5.8	5.7	5.5	5.5	5.5
12	5.6	5.7	5.8	6.0	6.0	6.0	5.9	5.8	5.7	5.5	5.5	5.5
13	5.6	5.7	5.8	6.0	6.0	6.0	5.9	5.8	5.7	5.5	5.4	5.5
14	5.6	5.7	5.8	6.0	6.0	5.9	5.9	5.8	5.7	5.5	5.5	5.5
15	5.6	5.7	5.9	6.0	6.0	6.0	5.9	5.8	5.7	5.5	5.5	5.5
16	5.6	5.7	5.9	6.0	6.0	6.0	5.9	5.8	5.7	5.5	5.5	5.5
17	5.6	5.8	5.9	6.0	6.0	5.9	5.9	5.8	5.7	5.5	5.5	5.5
18	5.6	5.8	---	6.0	6.0	6.0	5.9	5.8	5.7	5.5	5.5	5.5
19	5.6	5.8	---	6.0	6.0	6.0	5.9	5.8	5.6	5.5	5.5	5.5
20	5.6	5.7	5.9	6.0	6.0	5.9	5.9	5.8	5.6	5.5	5.5	5.5
21	5.6	5.7	5.9	6.0	6.0	6.0	5.9	5.8	5.6	5.5	5.5	5.5
22	5.6	5.8	5.9	6.0	6.0	5.9	5.9	5.8	5.6	5.5	5.5	5.5
23	5.7	5.8	5.9	6.0	6.0	6.0	5.9	5.7	5.6	5.5	5.5	5.5
24	5.6	5.8	5.9	6.0	6.0	5.9	5.8	5.8	5.6	5.5	5.5	5.5
25	5.7	5.8	5.9	6.0	6.0	5.9	5.9	5.8	5.6	5.5	5.5	5.5
26	5.6	5.8	5.9	6.0	6.0	5.9	5.9	5.7	5.6	5.5	5.5	5.5
27	5.7	5.8	5.9	6.0	6.0	5.9	5.9	5.8	5.6	5.5	5.5	5.5
28	5.7	5.8	5.9	6.0	6.0	5.9	5.9	5.7	5.6	5.5	5.5	5.5
29	5.7	5.8	5.9	6.0	---	5.9	5.8	5.7	5.6	5.5	5.5	5.5
30	5.7	5.8	5.9	6.0	---	5.9	5.8	5.7	5.6	5.5	5.5	5.5
31	5.7	---	5.9	6.0	---	5.9	---	5.7	---	5.5	5.5	---
Mean	5.6	5.7	---	6.0	6.0	6.0	5.9	5.8	5.7	5.5	5.5	5.5
Max	5.7	5.8	---	6.0	6.0	6.0	6.0	5.8	5.7	5.6	5.5	5.5
Min	5.6	5.7	---	5.9	6.0	5.9	5.8	5.7	5.6	5.5	5.4	5.4

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