Water-Data Report 2011

06354000 CANNONBALL RIVER AT BREIEN, ND

Cannonball, Heart, and Knife Basin
Lower Cannonball Subbasin

LOCATION.--Lat 46°22′34″, long 100°56′04″ referenced to North American Datum of 1983, in sec.36, T.134 N., R.82 W., Morton County, ND, Hydrologic Unit 10130206, on left bank at downstream side of bridge on State Highway 6, 1,100 ft downstream from Dogtooth Creek, and 0.6 mi southeast of Breien.

DRAINAGE AREA.--4,100 mi^2, approximately.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--DAILY DISCHARGE--August 1934 to current year.

PERIOD OF RECORD.--DAILY GAGE HEIGHT--October 2000 to current year.

REVISED RECORDS.--WSP 786: 1934. WSP 1146: 1943. WSP 1279: 1936-37(M), 1947(M). WSP 1509: 1955(M).

GAGE.--Water-stage recorder. Datum of gage is 1,673.54 ft above National Geodetic Vertical Datum of 1929. From June 12, 1973, to July 1, 1985, at site 450 ft downstream. Prior to June 12, 1973, at site 50 ft upstream at datum 3.00 ft higher. June 13, 1973, to April 8, 1980, at datum 2.00 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are poor. Some storage in several small lakes above station.

Suggested citation: U.S. Geological Survey, 2012, Water-resources data for the United States, Water Year 2011: U.S. Geological Survey Water-Data Report WDR-US-2011, site 06354000, accessed at http://wdr.water.usgs.gov/wy2011/pdfs/06354000.2011.pdf

06354000 CANNONBALL RIVER AT BREIEN, ND—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	70	43	e37	e31	e39	e44	3,160	1,150	1,220	535	163	131
2	68	45	e37	e32	e39	e44	5,130	977	1,360	471	170	125
3	66	43	e36	e33	e38	e43	8,600	822	1,470	447	198	115
4	61	44	e36	e34	e38	e43	9,750	721	1,450	426	171	107
5	58	47	e35	e34	e37	e42	10,200	646	1,500	378	150	103
6	52	46	e35	e34	e37	e42	9,750	587	1,350	404	203	97
7	50	46	e35	e34	e37	e42	7,230	530	1,110	366	363	92
8	49	47	e35	e33	e36	e42	4,660	477	882	361	242	89
9	48	46	e34	e32	e35	e42	3,700	555	706	1,290	217	85
10	47	47	e33	e31	e36	e43	3,230	627	620	1,290	186	82
11	45	48	e32	e32	e37	e45	2,870	630	574	696	153	80
12	45	47	e33	e33	e39	e48	2,460	619	489	465	148	76
13	45	47	e34	e34	e43	e53	2,100	592	471	356	150	73
14	43	47	e34	e35	e46	e60	1,770	540	1,090	299	146	71
15	42	48	e34	e35	e48	e100	1,580	529	3,230	284	143	70
16	39	49	e34	e35	e48	e300	1,390	478	1,840	248	195	69
17	40	49	e34	e35	e47	e1,000	1,340	413	1,920	230	241	69
18	39	49	e34	e35	e46	e4,100	1,250	475	1,620	205	199	69
19	37	e49	e33	e36	e45	6,180	1,140	444	1,270	195	182	68
20	37	e47	e32	e37	e44	7,380	1,170	409	1,080	175	179	70
21	38	e45	e32	e38	e44	8,340	1,340	1,500	1,430	170	169	72
22	38	e44	e33	e39	e43	10,800	2,490	2,200	1,610	173	157	69
23	38	e42	e33	e40	e43	10,800	3,140	1,460	1,020	309	142	69
24	39	e40	e34	e40	e42	9,000	2,460	1,910	775	276	149	69
25	41	e39	e34	e40	e42	7,870	2,430	2,810	684	270	153	67
26	38	e38	e34	e40	e43	6,390	2,420	3,550	630	222	180	67
27	41	e38	e33	e39	e44	4,740	2,100	3,330	986	192	172	65
28	45	e38	e33	e38	e44	3,400	1,890	2,660	1,050	180	159	62
29	43	e37	e32	e37	---	2,700	1,740	2,100	622	170	143	59
30	45	e37	e31	e36	---	2,280	1,420	1,700	536	177	134	59
31	46	---	e30	e35	---	2,060	---	1,400	---	168	138	---
Total	1,433	1,332	1,046	1,097	1,160	88,073	103,910	36,841	34,595	11,428	5,495	2,399
Mean	46.2	44.4	33.7	35.4	41.4	2,841	3,464	1,188	1,153	369	177	80.0
Max	70	49	37	40	48	10,800	10,200	3,550	3,230	1,290	363	131
Min	37	37	30	31	35	42	1,140	409	471	168	134	59
Ac-ft	2,840	2,640	2,070	2,180	2,300	174,700	206,100	73,070	68,620	22,670	10,900	4,760

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1934 - 2011, BY WATER YEAR (WY)

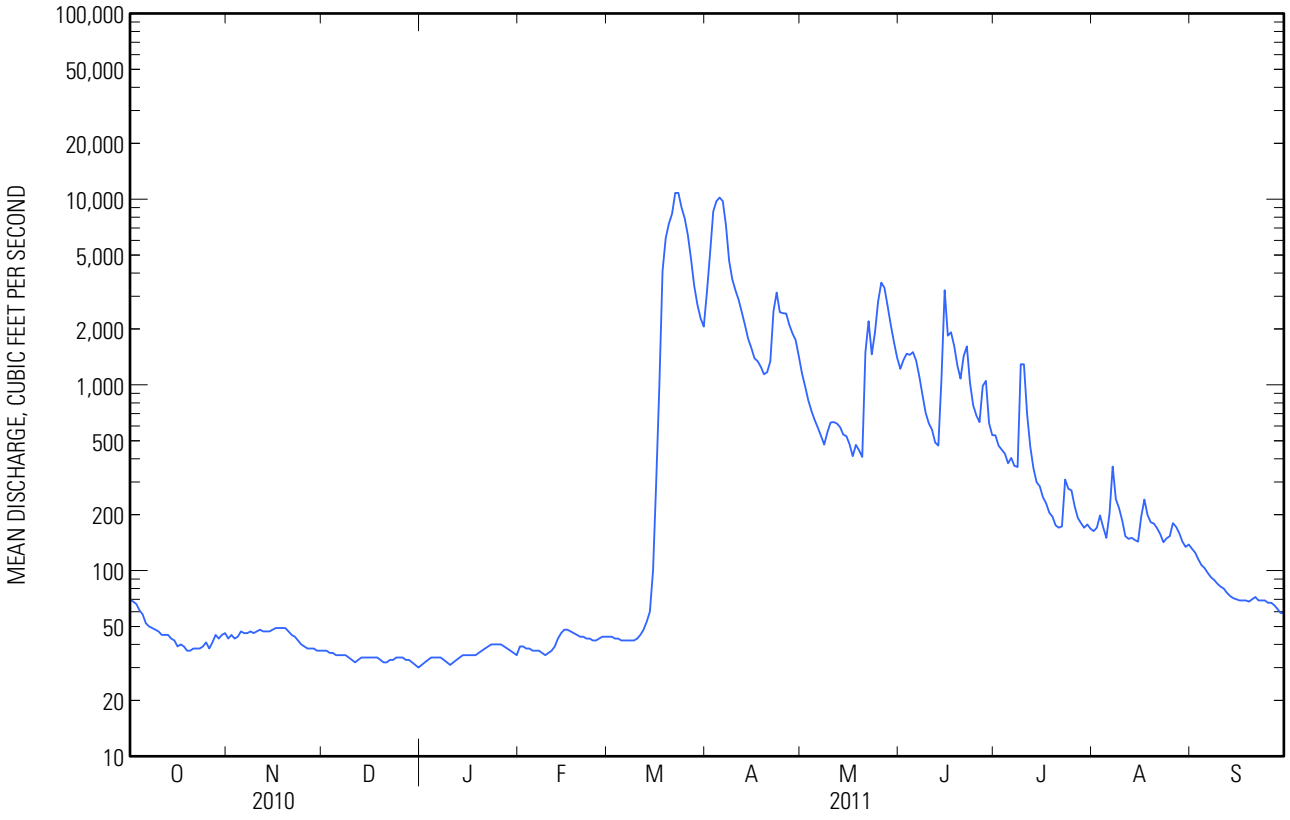
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	32.8	28.3	16.9	15.4	69.2	918	919	336	368	188	68.9	32.5
Max	281	238	98.8	342	1,058	5,428	10,070	2,399	2,384	1,409	459	267
(WY)	(1978)	(1983)	(1999)	(1973)	(1982)	(1997)	(1950)	(1975)	(1937)	(1969)	(1999)	(1977)
Min	0.21	0.63	0.38	0.00	0.00	3.29	17.1	6.48	3.10	0.17	0.04	0.01
(WY)	(1961)	(1961)	(1935)	(1941)	(1935)	(1965)	(1961)	(1992)	(1936)	(1936)	(2003)	(1974)

06354000 CANNONBALL RIVER AT BREIEN, ND—Continued

SUMMARY STATISTICS

	Calendar Year 2010		Water Year 2011		Water Years 1934 - 2011	
Annual total	122,955		288,809			
Annual mean	337		791		250	
Highest annual mean					1,021	2009
Lowest annual mean					9.90	1961
Highest daily mean	6,740	Apr 3	10,800	Mar 22	63,100	Apr 19, 1950
Lowest daily mean	15	Jan 3	30	Dec 31	0.00	Jan 11, 1935
Annual seven-day minimum	15	Jan 2	32	Dec 27	0.00	Jan 11, 1935
Maximum peak flow			[a]12,400	Mar 22	[b]94,800	Apr 19, 1950
Maximum peak stage			[c]15.39	Mar 18	[d]22.30	Apr 19, 1950
Annual runoff (ac-ft)	243,900		572,900		181,000	
10 percent exceeds	687		2,140		402	
50 percent exceeds	56		73		28	
90 percent exceeds	23		35		0.85	

[a] Gage height, 14.06 ft.
[b] From rating curve extended above 16,000 ft³/s on basis of indirect measurement of discharge.
[c] Backwater from ice.
[d] From floodmark, site and datum then in use.

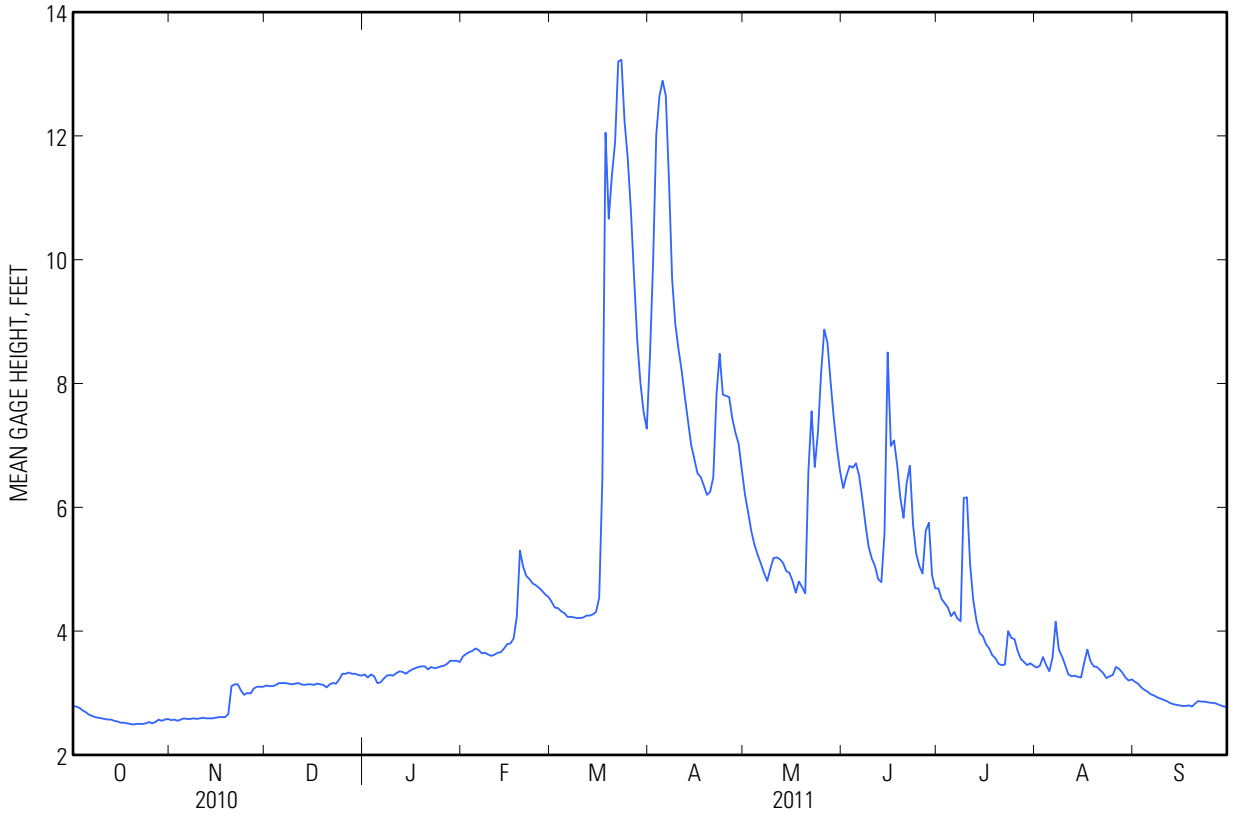


06354000 CANNONBALL RIVER AT BREIEN, ND—Continued

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2.79	2.56	3.12	3.30	3.59	4.47	8.44	6.20	6.31	4.69	3.41	3.18
2	2.78	2.57	3.11	3.25	3.63	4.38	9.96	5.91	6.51	4.52	3.44	3.15
3	2.76	2.55	3.11	3.30	3.66	4.37	12.02	5.61	6.67	4.45	3.58	3.09
4	2.72	2.57	3.13	3.27	3.68	4.32	12.64	5.39	6.64	4.38	3.45	3.05
5	2.69	2.59	3.16	3.16	3.72	4.29	12.89	5.23	6.71	4.24	3.35	3.02
6	2.65	2.58	3.16	3.17	3.69	4.23	12.65	5.09	6.51	4.31	3.57	2.98
7	2.63	2.58	3.16	3.23	3.64	4.23	11.29	4.94	6.14	4.20	4.15	2.96
8	2.61	2.59	3.15	3.28	3.65	4.22	9.69	4.81	5.72	4.16	3.70	2.93
9	2.60	2.58	3.14	3.29	3.62	4.21	8.96	5.01	5.36	6.15	3.59	2.91
10	2.59	2.59	3.15	3.28	3.60	4.21	8.56	5.18	5.17	6.16	3.45	2.89
11	2.58	2.60	3.16	3.32	3.62	4.22	8.21	5.19	5.05	5.08	3.30	2.87
12	2.57	2.59	3.14	3.35	3.65	4.25	7.79	5.16	4.84	4.50	3.27	2.84
13	2.57	2.59	3.13	3.34	3.66	4.25	7.40	5.10	4.79	4.17	3.28	2.82
14	2.55	2.59	3.14	3.31	3.72	4.27	7.01	4.97	5.58	3.97	3.26	2.81
15	2.54	2.60	3.14	3.35	3.79	4.31	6.78	4.94	8.50	3.92	3.25	2.80
16	2.52	2.61	3.13	3.38	3.80	4.54	6.55	4.81	6.99	3.79	3.49	2.79
17	2.52	2.61	3.15	3.40	3.88	6.46	6.49	4.62	7.08	3.72	3.70	2.79
18	2.51	2.61	3.14	3.42	4.23	12.05	6.35	4.80	6.68	3.61	3.51	2.80
19	2.50	2.66	3.13	3.43	5.30	10.66	6.20	4.71	6.15	3.56	3.43	2.78
20	2.49	3.11	3.09	3.43	5.04	11.36	6.25	4.61	5.83	3.47	3.42	2.83
21	2.50	3.14	3.14	3.38	4.89	11.89	6.49	6.59	6.40	3.45	3.37	2.87
22	2.50	3.14	3.16	3.42	4.84	13.20	7.82	7.55	6.67	3.46	3.32	2.86
23	2.50	3.04	3.15	3.40	4.77	13.23	8.48	6.65	5.72	4.00	3.24	2.86
24	2.51	2.97	3.22	3.41	4.74	12.23	7.82	7.21	5.25	3.89	3.27	2.85
25	2.53	3.00	3.31	3.43	4.70	11.64	7.80	8.17	5.05	3.87	3.29	2.84
26	2.51	2.99	3.31	3.44	4.65	10.79	7.78	8.87	4.93	3.68	3.42	2.84
27	2.53	3.07	3.33	3.47	4.59	9.72	7.43	8.66	5.62	3.55	3.39	2.82
28	2.57	3.10	3.31	3.52	4.55	8.69	7.20	8.02	5.75	3.50	3.33	2.80
29	2.55	3.10	3.31	3.52	---	8.01	7.02	7.44	4.90	3.45	3.25	2.78
30	2.57	3.10	3.29	3.52	---	7.54	6.60	6.96	4.69	3.48	3.20	2.78
31	2.58	---	3.28	3.50	---	7.27	---	6.57	---	3.44	3.22	---
Mean	2.58	2.77	3.18	3.36	4.10	7.21	8.35	5.97	5.94	4.09	3.42	2.89
Max	2.79	3.14	3.33	3.52	5.30	13.23	12.89	8.87	8.50	6.16	4.15	3.18
Min	2.49	2.55	3.09	3.16	3.59	4.21	6.20	4.61	4.69	3.44	3.20	2.78

06354000 CANNONBALL RIVER AT BREIEN, ND—Continued



06354000 CANNONBALL RIVER AT BREIEN, ND—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1946-50, 1971 to current year.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 1 of 5

[ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; SiO_2, silicon dioxide; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Barometric pressure, mm Hg (00025)	Temperature, air, °C (00020)	Discharge, instantaneous, ft^3/s (00061)	pH, water, unfiltered, field, standard units (00400)	pH, water, unfiltered, laboratory, standard units (00403)	Specific conductance, water, unfiltered, laboratory, µS/cm at 25 °C (90095)	Specific conductance, water, unfiltered, µS/cm at 25 °C (00095)	Temperature, water, °C (00010)	Dissolved solids, water, filtered, sum of constituents, mg/L (70301)
04-06-2011	**1042**	714	8.6	9,910	7.5	7.0	649	740	6.0	402
09-02-2011	**1010**	--	--	129	8.6	8.5	2,350	2,300	19.8	1,460

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 2 of 5

[ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; SiO_2, silicon dioxide; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Dissolved solids, water, tons per day (70302)	Hardness, water, mg/L as $CaCO_3$ (00900)	Calcium, water, filtered, mg/L (00915)	Magnesium, water, filtered, mg/L (00925)	Potassium, water, filtered, mg/L (00935)	Sodium adsorption ratio, water, number (00931)	Sodium fraction of cations, water, percent in equivalents of major cations (00932)	Sodium, water, filtered, mg/L (00930)	ANC, water, unfiltered, fixed endpoint (pH 4.5) titration, laboratory, mg/L as $CaCO_3$ (90410)
04-06-2011	**1042**	10,800	182	34.6	23.1	11.2	2.0	42	61.3	92
09-02-2011	**1010**	509	663	94.1	104	12.4	5.6	52	330	321

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 3 of 5

[ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; SiO_2, silicon dioxide; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Chloride, water, filtered, mg/L (00940)	Fluoride, water, filtered, mg/L (00950)	Silica, water, filtered, mg/L as SiO_2 (00955)	Sulfate, water, filtered, mg/L (00945)	Aluminum, water, filtered, µg/L (01106)	Barium, water, filtered, µg/L (01005)	Beryllium, water, filtered, µg/L (01010)	Cadmium, water, filtered, µg/L (01025)	Chromium, water, filtered, µg/L (01030)
04-06-2011	**1042**	5.47	.15	9.96	215	160	31	< 5.00	< 5.00	< 5.0
09-02-2011	**1010**	17.6	.37	6.09	1,020	< 50	68	< 5.00	< 5.00	< 5.0

06354000 CANNONBALL RIVER AT BREIEN, ND—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
Part 4 of 5
[ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; SiO_2, silicon dioxide; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Copper, water, filtered, µg/L (01040)	Iron, water, filtered, µg/L (01046)	Lead, water, filtered, µg/L (01049)	Manga-nese, water, filtered, µg/L (01056)	Nickel, water, filtered, µg/L (01065)	Silver, water, filtered, µg/L (01075)	Thallium, water, filtered, µg/L (01057)	Zinc, water, filtered, µg/L (01090)	Antimony, water, filtered, µg/L (01095)
04-06-2011	**1042**	< 5.0	494	< 5.00	39.0	5.2	< 5.00	< 5.00	< 5.0	< 5.00
09-02-2011	**1010**	< 5.0	64	< 5.00	14.0	7.1	< 5.00	< 5.00	6.9	< 5.00

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
Part 5 of 5
[ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; SiO_2, silicon dioxide; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Arsenic, water, filtered, µg/L (01000)	Boron, water, filtered, µg/L (01020)	Selenium, water, filtered, µg/L (01145)
04-06-2011	**1042**	< 5.0	113	< 5.0
09-02-2011	**1010**	< 5.0	699	< 5.0