

Water-Data Report 2013

06324500 POWDER RIVER AT MOORHEAD, MT

Powder Basin
Middle Powder Subbasin

LOCATION.--Lat 45°03'26", long 105°52'42" referenced to North American Datum of 1983, in SE ¼ NE ¼ NE ¼ sec.18, T.9 S., R.48 E., Powder River County, MT, Hydrologic Unit 10090207, on left bank 25 ft downstream from bridge on Powder River, 7.3 mi upstream from Buffalo Creek, and at river mile 183.7.

DRAINAGE AREA.--8,086 mi². Sept. 13, 1956 to Aug. 27, 2001 published as 8,088 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD.--May 1929 to September 1972, October 1974 to current year. Monthly discharge only for some periods, published in Water Supply Paper (WSP) 1309.

REVISED RECORDS.--WSP 1309: 1932, maximum discharge. WSP 1729: Drainage area. Water Data Report MT-04-01: 2003, drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,350.6 ft, referenced to the National Geodetic Vertical Datum of 1929. Prior to Aug. 28, 1931, nonrecording gage at site 0.8 mi downstream at different elevation. Aug. 28, 1931, to Mar. 21, 1956, water-stage recorder at site 0.1 mi upstream at different elevation. Mar. 22 to July 24, 1956, nonrecording gage at site 1.4 mi downstream at different elevation. July 25 to Sept. 12, 1956, nonrecording gage at different site and elevation. Sept. 13, 1956 to Aug. 27, 2001, water-stage recorder during period of gage operation 1.1 mi downstream at different elevation.

REMARKS.--Records are good except for estimated daily discharges, which are poor. Some regulation occurs by three reservoirs in Wyoming with a combined usable capacity of 36,800 acre-ft. Diversions for irrigation of about 66,300 acres occur upstream from station. U.S. Geological Survey satellite telemeter is located at the station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Sept. 30, 1923, reached a stage of 19 ft, site and elevation used 1931-56, from information by local residents.

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DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	23	186	e200	e140	e150	e210	262	251	634	163	49	37
2	23	187	e210	e140	e160	e220	261	246	522	156	45	33
3	26	187	e210	e110	e160	e220	254	244	506	148	39	32
4	36	189	e200	e120	e170	e210	250	256	468	130	878	31
5	39	192	e200	e130	e170	e200	247	253	450	119	484	29
6	47	193	e210	e120	e170	e200	247	250	417	129	246	36
7	50	193	e200	e130	e180	e220	255	237	371	514	269	28
8	61	193	e160	e140	e180	e250	251	204	348	408	225	30
9	80	195	e100	e150	e180	e280	251	183	317	854	169	41
10	87	205	e60	e150	e180	e300	251	168	312	564	132	44
11	81	175	e110	e140	e180	e320	236	169	382	408	104	90
12	80	e120	e150	e120	e180	e350	191	190	574	285	86	153
13	80	e110	e160	e100	e190	e400	268	199	864	220	63	101
14	87	e130	e170	e100	e190	e450	335	199	978	166	296	85
15	95	e140	e170	e120	e180	e600	289	203	985	128	252	74
16	103	e150	e180	e130	e180	e550	313	217	841	101	184	73
17	109	e190	e180	e130	e190	433	334	285	693	83	136	116
18	e110	e210	e180	e130	e180	369	313	626	612	79	106	136
19	e120	e250	e170	e130	e180	341	298	667	561	66	94	128
20	127	e240	e170	e130	e180	312	277	606	513	58	82	123
21	132	e230	e180	e130	e180	300	264	715	463	52	72	153
22	e140	e220	e170	e130	e190	302	281	927	351	47	64	198
23	e150	e210	e170	e140	e190	283	273	924	360	42	67	211
24	156	e200	e160	e140	e200	271	283	809	373	40	65	196
25	157	e200	e140	e150	e200	254	e290	650	339	64	61	190
26	165	e200	e120	e150	e210	250	e280	614	287	37	51	188
27	170	e190	e130	e160	e210	266	e280	617	246	33	46	200
28	171	e180	e130	e160	e210	267	273	596	210	32	44	217
29	174	e190	e130	e160	---	260	275	600	187	34	38	219
30	179	e200	e130	e150	---	259	268	600	174	39	49	201
31	182	---	e130	e150	---	257	---	633	---	40	45	---
Total	3,240	5,655	4,980	4,180	5,120	9,404	8,150	13,338	14,338	5,239	4,541	3,393
Mean	105	188	161	135	183	303	272	430	478	169	146	113
Max	182	250	210	160	210	600	335	927	985	854	878	219
Min	23	110	60	100	150	200	191	168	174	32	38	28
Ac-ft	6,430	11,220	9,880	8,290	10,160	18,650	16,170	26,460	28,440	10,390	9,010	6,730

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 2013, BY WATER YEAR (WY)*

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	220	224	160	154	277	591	493	1,047	1,351	456	166	137
Max	897	660	326	445	1,200	2,290	1,314	5,553	4,131	2,500	1,219	686
(WY)	(1995)	(1999)	(1981)	(1981)	(1930)	(1947)	(1965)	(1978)	(1967)	(1937)	(1941)	(1982)
Min	16.1	80.0	56.2	27.2	20.9	185	117	82.6	31.1	10.0	0.60	1.28
(WY)	(1955)	(1936)	(1933)	(1950)	(1933)	(2002)	(1961)	(1934)	(2004)	(2006)	(1966)	(1960)

*During periods of operation (1930-72, 1975 to current year).

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SUMMARY STATISTICS

	Calendar Year 2012		Water Year 2013		Water Years 1930 – 2013*	
Annual total	101,850.7		81,578			
Annual mean	278		224		440	
Highest annual mean					1,091	1978
Lowest annual mean					109	1961
Highest daily mean	3,000	Mar 8	985	Jun 15	27,500	May 20, 1978
Lowest daily mean	6.1	Sep 3	23	Oct 1	0.00	Many days
Annual seven-day minimum	10	Sep 9	31	Sep 2	0.00	Sep 4, 1960
Maximum peak flow			^a 1,620 Aug 4		^d 33,000 May 20, 1978	
Maximum peak stage			^b 8.03 Mar 14		^e 17.70 Mar 21, 1956	
Instantaneous low flow			^c 22 Oct 1		0.00 Many days	
Annual runoff (ac-ft)	202,000		161,800		318,500	
10 percent exceeds	549		450		1,000	
50 percent exceeds	210		183		216	
90 percent exceeds	22		56		47	

*During periods of operation (1930-72, 1975 to current year).

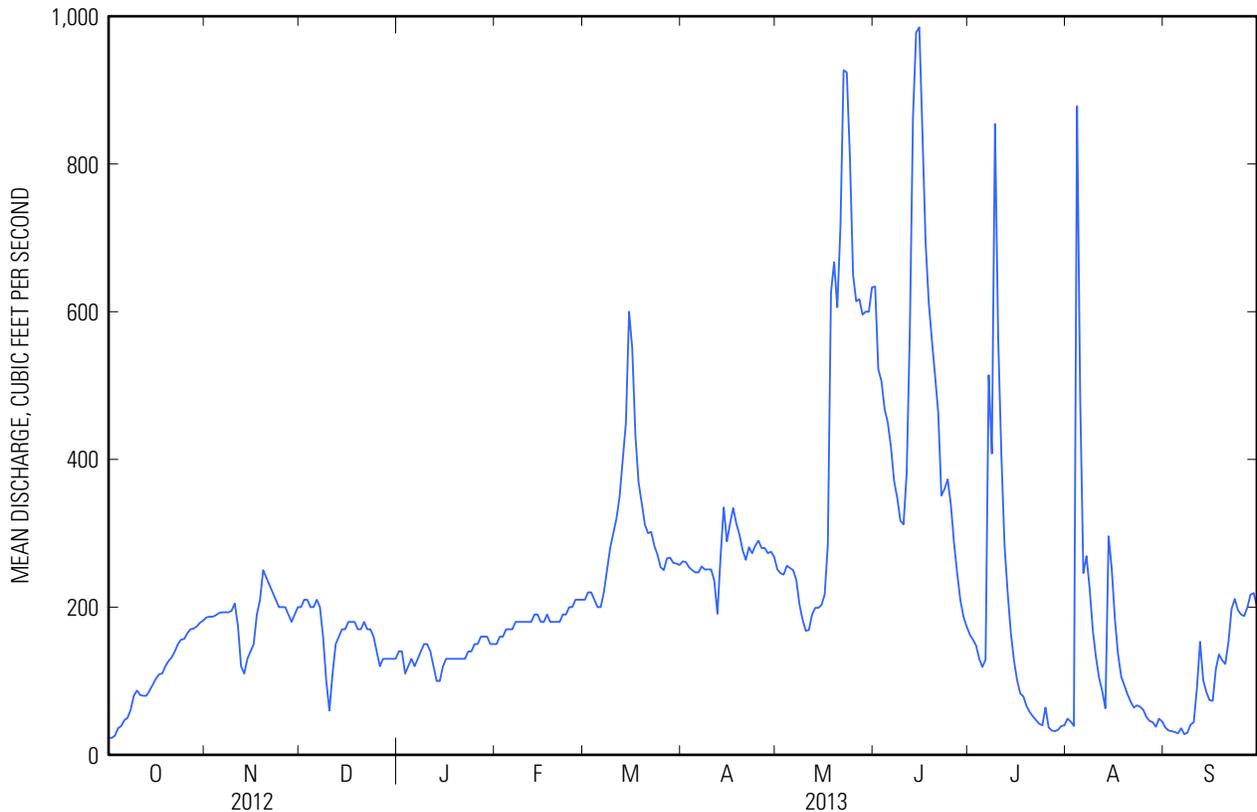
^aGage height, 4.95 ft.

^bBackwater from ice.

^cAlso occurred October 2 and September 8, gage height, 1.46 ft.

^dGage height, 15.24 ft.

^eIce jam, site and datum then in use.



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WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951-53, 1956-67, 1969-72, 1975-77, 2001 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1986 to November 1989 (observer samples), May 2001 to current year (seasonal records, continuous monitor).

WATER TEMPERATURE: February 1951 to September 1953, October 1955 to September 1957, October 1974 to September 1977, March 1978 to September 1981 (seasonal records only).

SUSPENDED-SEDIMENT DISCHARGE: October 1974 to September 1977, March 1978 to September 1996 (seasonal records only).

INSTRUMENTATION.--Specific conductance probe was installed May 20, 2001.

REMARKS.--Seasonal specific conductance record (October 2012, Apr. 1 to Sept. 30, 2013) are rated good to excellent (<3-10%), except for June 19, and Sept. 21-22 (>10-15%) which are rated fair, and June 21 (>15%) which is rated poor. The record is missing for Oct. 18-19, Oct. 22-24, May 26 to June 5, June 20, and July 18 to Aug. 14.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 6,240 microsiemens per centimeter ($\mu\text{S}/\text{cm}$) at 25.0°C, Aug. 17, 2006; minimum, 314 $\mu\text{S}/\text{cm}$ at 25.0°C, June 21, 2008.

WATER TEMPERATURE: Maximum daily, 33.0°C, July 14, 1981; minimum daily 0.0°C on many days during winter.

SEDIMENT CONCENTRATION: Maximum daily mean, 53,500 mg/L, May 27, 1980; minimum daily mean, 3 mg/L, Sept. 16-18, 1996.

SEDIMENT LOAD: Maximum daily, 2,230,000 tons, May 20, 1978; minimum daily, 0.17 ton, Aug. 1, 1988 and Sept. 16, 1996.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum recorded, 2,800 $\mu\text{S}/\text{cm}$ at 25.0°C, September 5, 2013; minimum recorded, 501 $\mu\text{S}/\text{cm}$ at 25.0°C, May 22, 2013.

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**SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013**

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
	October			November			December			January		
1	1,660	1,650	1,650	---	---	---	---	---	---	---	---	---
2	1,690	1,660	1,680	---	---	---	---	---	---	---	---	---
3	1,730	1,690	1,710	---	---	---	---	---	---	---	---	---
4	1,860	1,730	1,780	---	---	---	---	---	---	---	---	---
5	1,890	1,850	1,860	---	---	---	---	---	---	---	---	---
6	2,010	1,890	1,960	---	---	---	---	---	---	---	---	---
7	2,060	2,010	2,030	---	---	---	---	---	---	---	---	---
8	2,070	2,020	2,040	---	---	---	---	---	---	---	---	---
9	2,040	1,960	2,020	---	---	---	---	---	---	---	---	---
10	2,020	1,890	1,950	---	---	---	---	---	---	---	---	---
11	2,030	1,920	1,980	---	---	---	---	---	---	---	---	---
12	2,080	1,840	1,960	---	---	---	---	---	---	---	---	---
13	2,040	1,910	1,980	---	---	---	---	---	---	---	---	---
14	2,190	1,990	2,060	---	---	---	---	---	---	---	---	---
15	2,610	2,190	2,370	---	---	---	---	---	---	---	---	---
16	2,790	2,550	2,680	---	---	---	---	---	---	---	---	---
17	2,760	2,550	2,650	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	2,230	2,080	2,130	---	---	---	---	---	---	---	---	---
21	2,180	2,070	2,140	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	2,030	1,990	2,010	---	---	---	---	---	---	---	---	---
26	2,010	1,930	1,970	---	---	---	---	---	---	---	---	---
27	2,030	1,940	2,000	---	---	---	---	---	---	---	---	---
28	2,020	1,930	1,970	---	---	---	---	---	---	---	---	---
29	2,050	1,940	2,010	---	---	---	---	---	---	---	---	---
30	2,050	1,970	2,010	---	---	---	---	---	---	---	---	---
31	2,080	1,970	2,020	---	---	---	---	---	---	---	---	---
Month	---	---	---	---	---	---	---	---	---	---	---	---

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SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
	February			March			April			May		
1	---	---	---	---	---	---	1,900	1,860	1,880	2,020	1,980	1,990
2	---	---	---	---	---	---	1,900	1,860	1,880	2,090	2,020	2,060
3	---	---	---	---	---	---	1,900	1,870	1,890	2,050	2,020	2,030
4	---	---	---	---	---	---	1,880	1,870	1,880	2,060	2,010	2,040
5	---	---	---	---	---	---	1,900	1,850	1,880	2,010	1,980	1,990
6	---	---	---	---	---	---	1,860	1,850	1,860	2,000	1,980	1,990
7	---	---	---	---	---	---	1,860	1,800	1,840	1,980	1,900	1,930
8	---	---	---	---	---	---	1,840	1,810	1,830	1,940	1,880	1,900
9	---	---	---	---	---	---	1,830	1,800	1,810	1,990	1,940	1,970
10	---	---	---	---	---	---	1,830	1,770	1,810	2,030	1,990	2,000
11	---	---	---	---	---	---	1,850	1,820	1,840	2,100	2,030	2,080
12	---	---	---	---	---	---	1,840	1,820	1,830	2,160	2,090	2,140
13	---	---	---	---	---	---	1,940	1,820	1,850	2,150	2,070	2,090
14	---	---	---	---	---	---	1,950	1,840	1,890	2,130	1,970	2,050
15	---	---	---	---	---	---	1,840	1,780	1,800	2,180	2,050	2,110
16	---	---	---	---	---	---	1,820	1,720	1,780	2,070	1,930	2,020
17	---	---	---	---	---	---	1,890	1,720	1,780	1,930	932	1,780
18	---	---	---	---	---	---	1,920	1,840	1,890	1,700	1,400	1,550
19	---	---	---	---	---	---	1,900	1,810	1,860	1,450	1,110	1,280
20	---	---	---	---	---	---	2,050	1,890	1,960	1,110	749	848
21	---	---	---	---	---	---	2,110	2,050	2,080	749	629	716
22	---	---	---	---	---	---	2,070	1,910	1,980	680	501	542
23	---	---	---	---	---	---	1,970	1,910	1,940	633	514	566
24	---	---	---	---	---	---	2,010	1,970	1,990	628	601	618
25	---	---	---	---	---	---	2,050	2,010	2,030	733	628	679
26	---	---	---	---	---	---	2,020	1,940	1,970	---	---	---
27	---	---	---	---	---	---	2,180	1,940	2,070	---	---	---
28	---	---	---	---	---	---	2,180	2,060	2,110	---	---	---
29	---	---	---	---	---	---	2,060	1,980	2,040	---	---	---
30	---	---	---	---	---	---	2,000	1,980	1,990	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
Month	---	---	---	---	---	---	2,180	1,720	1,910	---	---	---

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**SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013**

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
	June			July			August			September		
1	---	---	---	1,640	1,540	1,590	---	---	---	2,380	2,190	2,260
2	---	---	---	1,730	1,640	1,690	---	---	---	2,520	2,380	2,470
3	---	---	---	1,720	1,640	1,660	---	---	---	2,590	2,500	2,540
4	---	---	---	1,700	1,640	1,670	---	---	---	2,740	2,530	2,610
5	---	---	---	1,780	1,700	1,740	---	---	---	2,800	2,730	2,760
6	1,470	1,320	1,390	1,840	1,700	1,780	---	---	---	2,730	2,640	2,690
7	1,320	1,270	1,290	2,280	1,040	1,980	---	---	---	2,650	2,550	2,580
8	1,290	1,270	1,280	1,720	1,080	1,360	---	---	---	2,680	928	2,380
9	1,330	1,280	1,290	1,770	821	1,310	---	---	---	2,180	1,650	1,900
10	1,380	1,330	1,360	1,450	1,380	1,410	---	---	---	2,390	2,070	2,260
11	1,360	1,140	1,280	1,410	1,250	1,300	---	---	---	2,070	1,410	1,660
12	1,240	961	1,120	1,270	1,240	1,260	---	---	---	2,430	1,720	2,190
13	1,240	688	929	1,270	1,220	1,250	---	---	---	2,080	1,780	1,880
14	709	585	634	1,230	1,190	1,210	---	---	---	1,780	1,540	1,620
15	644	571	604	1,340	1,230	1,280	2,510	1,910	2,160	1,550	1,480	1,520
16	660	613	636	1,460	1,340	1,390	2,160	1,920	2,090	1,480	1,420	1,440
17	732	655	697	1,520	1,460	1,480	1,920	1,750	1,790	1,460	1,310	1,420
18	792	722	765	---	---	---	1,960	1,790	1,860	1,370	1,310	1,340
19	828	786	808	---	---	---	2,000	1,960	1,980	1,330	1,260	1,290
20	---	---	---	---	---	---	1,980	1,960	1,970	1,310	1,280	1,290
21	901	726	846	---	---	---	2,000	1,970	1,980	1,290	1,270	1,280
22	1,010	890	939	---	---	---	2,040	2,000	2,020	1,290	1,180	1,250
23	1,150	986	1,080	---	---	---	2,060	2,010	2,040	1,210	1,090	1,170
24	1,220	1,120	1,160	---	---	---	2,010	1,990	2,000	1,140	1,070	1,110
25	1,370	1,220	1,260	---	---	---	2,000	1,950	1,970	1,140	1,040	1,090
26	1,550	1,370	1,480	---	---	---	2,110	1,970	2,040	1,040	996	1,030
27	1,410	1,290	1,350	---	---	---	2,240	2,100	2,150	1,050	974	1,010
28	1,330	1,280	1,300	---	---	---	2,280	2,240	2,260	1,090	1,030	1,060
29	1,440	1,330	1,390	---	---	---	2,300	2,250	2,270	1,090	1,040	1,070
30	1,540	1,440	1,490	---	---	---	2,350	2,300	2,320	1,070	1,040	1,060
31	---	---	---	---	---	---	2,360	2,280	2,330	---	---	---
Month	---	---	---	---	---	---	---	---	---	2,800	928	1,710