Water-Data Report 2012

05051522 RED RIVER OF THE NORTH AT HICKSON, ND

Upper Red Basin
Upper Red Subbasin

LOCATION.--Lat 46°39′35″, long 96°47′44″ referenced to North American Datum of 1927, in SW ¼ sec.19, T.137 N., R.48 W., Cass County, ND, Hydrologic Unit 09020104, on right bank 60 ft downstream from bridge on township road and 1 mi southeast of Hickson.

DRAINAGE AREA.--4,300 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--DAILY DISCHARGE--October 1975 to current year.

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 876.38 ft above National Geodetic Vertical Datum of 1929 (Survey by North Dakota State Water Commission, 2009). Prior to August 2007, at datum 0.68 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are poor.

REGULATION--Flow regulated by: Orwell Reservoir, flood storage capacity, 13,300 acre-ft at elevation 1,070 ft above mean sea level, adjustment of 1912; Mud Lake, flood storage capacity, 78,600 acre-ft at elevation 981 ft above mean sea level, adjustment of 1912; Lake Traverse, flood storage capacity, 75,100 acre-ft at elevation 981 ft above mean sea level, adjustment of 1912; and numerous other controlled lakes, ponds and several powerplants.

05051522 RED RIVER OF THE NORTH AT HICKSON, ND—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	828	540	e405	e512	e509	e538	803	1,260	1,080	989	653	269
2	798	543	e421	e505	e509	e527	784	1,260	1,070	965	694	285
3	794	544	e437	e430	e500	e510	766	1,340	1,090	953	713	290
4	802	563	e392	e381	e469	e507	745	1,410	1,100	922	710	288
5	797	570	e404	e349	e446	e543	750	1,460	1,080	894	667	289
6	792	582	e444	e440	e463	e638	782	1,450	1,060	972	655	289
7	797	612	e440	e464	e478	e731	782	1,400	1,030	995	619	263
8	769	611	e389	e437	e487	e784	767	1,370	1,010	907	609	216
9	737	593	e382	e362	e492	e820	753	1,430	997	806	622	183
10	756	588	e409	e328	e494	e860	749	1,620	991	781	621	187
11	744	580	e428	e319	e492	e950	749	1,680	996	795	588	204
12	728	564	e439	e411	e456	e1,100	761	1,630	981	806	544	204
13	725	532	e446	e493	e406	e1,350	761	1,550	968	803	506	195
14	765	519	e449	e438	e444	e1,700	740	1,450	982	786	490	198
15	792	513	e449	e379	e463	e2,120	757	1,400	1,000	769	491	202
16	786	510	e447	e460	e471	e2,550	817	1,350	1,010	744	494	204
17	749	477	e441	e524	e471	e2,800	1,850	1,260	1,010	728	511	212
18	732	e409	e427	e504	e461	e2,630	2,760	1,200	1,010	716	521	212
19	730	e367	e437	e445	e457	1,580	2,820	1,130	1,030	700	524	217
20	737	e320	e445	e382	e452	1,180	2,550	1,080	1,240	687	517	225
21	756	e342	e444	e368	e452	1,100	2,260	1,070	1,720	659	511	221
22	735	e371	e439	e387	e453	1,050	2,130	1,060	1,980	611	496	217
23	703	e411	e437	e394	e457	986	2,160	1,060	1,920	637	452	199
24	679	e454	e444	e401	e474	951	2,160	1,030	1,600	649	427	179
25	640	e442	e446	e404	e506	923	2,100	979	1,360	947	389	177
26	619	e428	e448	e408	e511	871	2,010	956	1,220	760	342	172
27	571	e418	e449	e413	e512	841	1,860	1,050	1,140	673	285	166
28	558	e394	e442	e456	e518	823	1,630	1,200	1,130	660	257	151
29	574	e386	e433	e494	e534	803	1,410	1,280	1,110	748	252	121
30	567	e388	e419	e492	---	817	1,300	1,200	1,050	752	249	107
31	548	---	e438	e498	---	826	---	1,110	---	690	249	---
Total	22,308	14,571	13,370	13,278	13,837	34,409	41,266	39,725	34,965	24,504	15,658	6,342
Mean	720	486	431	428	477	1,110	1,376	1,281	1,166	790	505	211
Max	828	612	449	524	534	2,800	2,820	1,680	1,980	995	713	290
Min	548	320	382	319	406	507	740	956	968	611	249	107
Ac-ft	44,250	28,900	26,520	26,340	27,450	68,250	81,850	78,790	69,350	48,600	31,060	12,580

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2012, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	589	544	440	420	459	1,291	2,540	1,600	1,493	1,155	709	572
Max	2,158	2,495	1,819	1,615	1,470	5,234	9,864	3,968	4,568	3,584	3,564	2,135
(WY)	(2011)	(2011)	(2011)	(2011)	(2011)	(2009)	(1997)	(2011)	(2007)	(2011)	(2011)	(1993)
Min	2.02	0.00	0.00	4.95	14.0	75.9	165	22.0	86.4	73.4	35.6	12.6
(WY)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1976)

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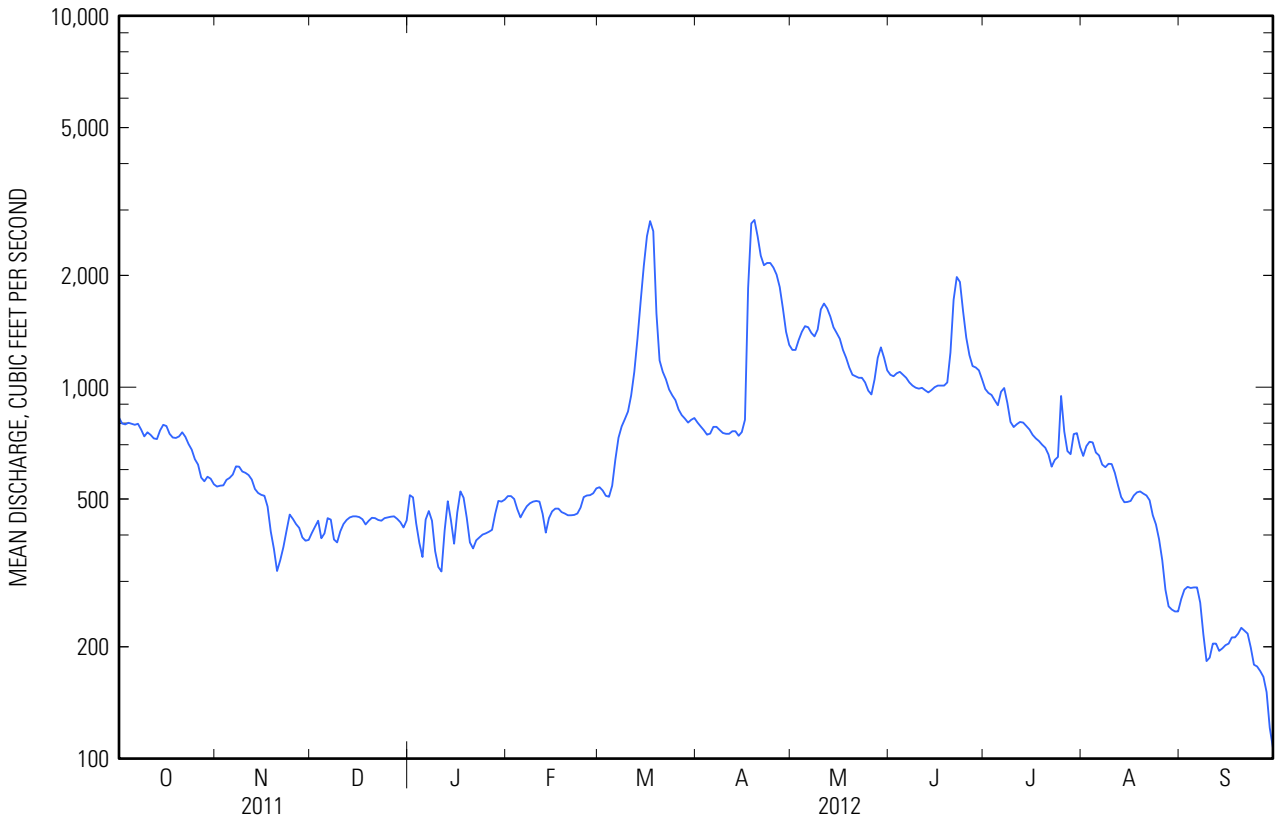
SUMMARY STATISTICS

	Calendar Year 2011		Water Year 2012		Water Years 1975 - 2012	
Annual total	966,471		274,233			
Annual mean	2,648		749		985	
Highest annual mean					3,053	2011
Lowest annual mean					53.1	1977
Highest daily mean	13,500	Apr 7	2,820	Apr 19	22,700	Mar 26, 2009
Lowest daily mean	320	Nov 20	107	Sep 30	0.00	Oct 26, 1976
Annual seven-day minimum	382	Nov 18	153	Sep 24	0.00	Oct 26, 1976
Maximum peak flow			[a]2,890	Apr 18	23,700	Mar 26, 2009
Maximum peak stage			[b]16.97	Mar 17	39.04	Mar 26, 2009
Annual runoff (ac-ft)	1,917,000		543,900		713,600	
10 percent exceeds	5,000		1,350		2,290	
50 percent exceeds	1,930		612		554	
90 percent exceeds	446		320		120	

[a] Gage height, 16.60 ft.
[b] Backwater from ice.

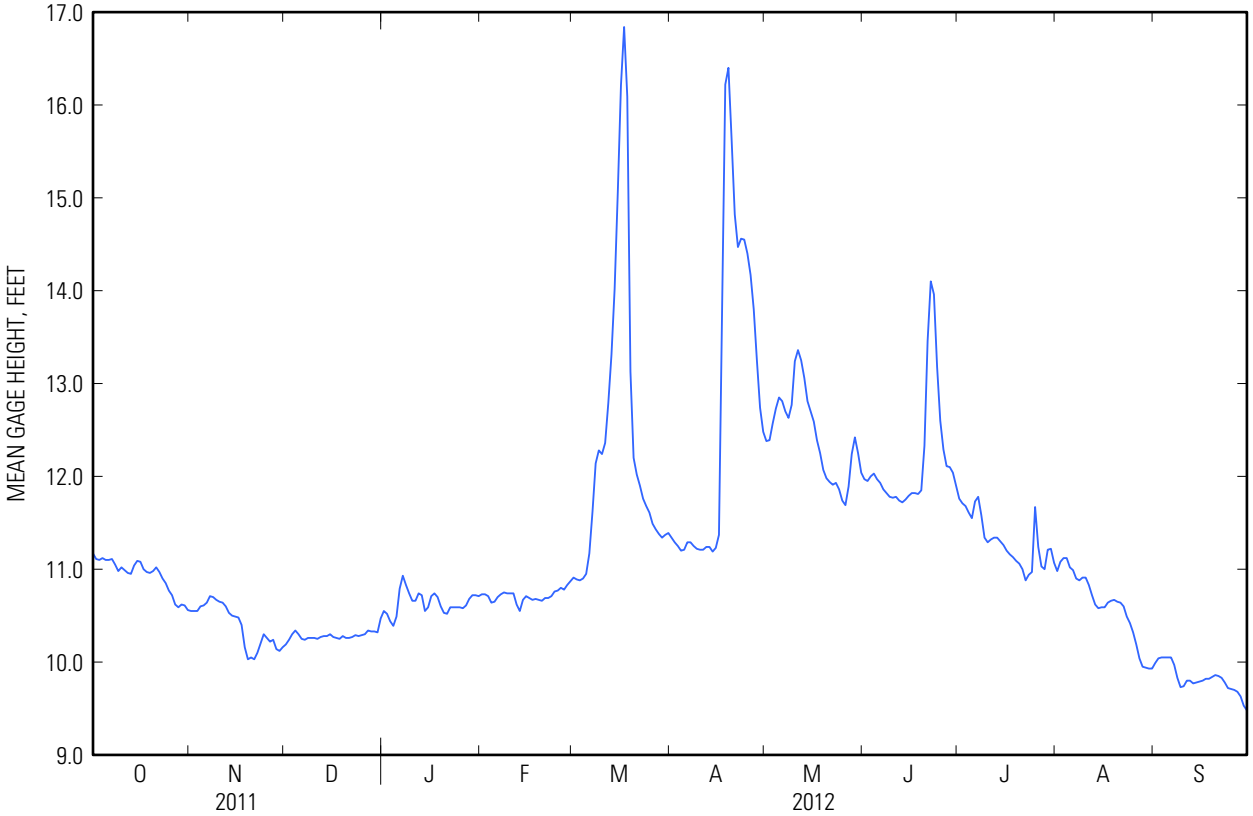


05051522 RED RIVER OF THE NORTH AT HICKSON, ND—Continued

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	11.17	10.55	10.19	10.55	10.73	10.91	11.34	12.38	11.97	11.76	10.98	9.99
2	11.11	10.55	10.24	10.52	10.73	10.89	11.29	12.39	11.95	11.71	11.08	10.04
3	11.10	10.55	10.30	10.44	10.71	10.88	11.25	12.57	12.00	11.68	11.12	10.05
4	11.12	10.60	10.34	10.39	10.64	10.90	11.20	12.73	12.03	11.61	11.12	10.05
5	11.10	10.61	10.30	10.49	10.65	10.95	11.21	12.85	11.97	11.55	11.02	10.05
6	11.10	10.64	10.25	10.79	10.70	11.17	11.29	12.81	11.93	11.73	10.99	10.05
7	11.11	10.71	10.24	10.93	10.73	11.62	11.29	12.70	11.86	11.78	10.90	9.97
8	11.05	10.70	10.26	10.83	10.75	12.14	11.25	12.63	11.82	11.58	10.88	9.83
9	10.98	10.67	10.26	10.74	10.74	12.28	11.22	12.77	11.78	11.34	10.91	9.73
10	11.02	10.65	10.26	10.66	10.74	12.24	11.21	13.24	11.77	11.29	10.91	9.74
11	10.99	10.64	10.25	10.66	10.74	12.36	11.21	13.36	11.78	11.32	10.83	9.80
12	10.96	10.60	10.27	10.74	10.62	12.79	11.24	13.25	11.74	11.34	10.72	9.80
13	10.95	10.53	10.28	10.72	10.55	13.31	11.24	13.06	11.72	11.34	10.62	9.77
14	11.04	10.50	10.28	10.55	10.67	14.02	11.19	12.81	11.75	11.30	10.58	9.78
15	11.09	10.49	10.30	10.59	10.71	15.06	11.23	12.70	11.79	11.26	10.59	9.79
16	11.08	10.48	10.27	10.71	10.69	16.21	11.37	12.59	11.82	11.20	10.59	9.80
17	11.00	10.40	10.26	10.74	10.67	16.84	13.82	12.39	11.82	11.16	10.64	9.82
18	10.97	10.16	10.25	10.70	10.68	16.09	16.22	12.25	11.81	11.13	10.66	9.82
19	10.96	10.03	10.28	10.60	10.67	13.13	16.40	12.07	11.85	11.09	10.67	9.84
20	10.98	10.05	10.26	10.53	10.66	12.20	15.63	11.98	12.33	11.06	10.65	9.86
21	11.02	10.03	10.26	10.52	10.69	12.02	14.82	11.94	13.46	11.00	10.64	9.85
22	10.97	10.10	10.27	10.59	10.69	11.90	14.47	11.91	14.10	10.88	10.60	9.83
23	10.90	10.20	10.29	10.59	10.71	11.76	14.56	11.93	13.96	10.94	10.49	9.78
24	10.85	10.30	10.28	10.59	10.76	11.68	14.55	11.86	13.18	10.97	10.42	9.72
25	10.77	10.26	10.29	10.59	10.77	11.61	14.40	11.74	12.60	11.67	10.32	9.71
26	10.72	10.22	10.30	10.58	10.80	11.49	14.17	11.69	12.29	11.24	10.19	9.70
27	10.62	10.24	10.34	10.61	10.78	11.43	13.80	11.89	12.11	11.03	10.04	9.68
28	10.59	10.14	10.33	10.68	10.83	11.38	13.25	12.24	12.10	11.00	9.95	9.63
29	10.62	10.12	10.33	10.72	10.87	11.34	12.74	12.42	12.04	11.21	9.94	9.53
30	10.61	10.16	10.32	10.72	---	11.37	12.48	12.25	11.90	11.22	9.93	9.48
31	10.56	---	10.47	10.71	---	11.39	---	12.04	---	11.07	9.93	---
Mean	10.94	10.40	10.28	10.64	10.71	12.37	12.71	12.43	12.17	11.31	10.61	9.82
Max	11.17	10.71	10.47	10.93	10.87	16.84	16.40	13.36	14.10	11.78	11.12	10.05
Min	10.56	10.03	10.19	10.39	10.55	10.88	11.19	11.69	11.72	10.88	9.93	9.48

05051522 RED RIVER OF THE NORTH AT HICKSON, ND—Continued



05051522 RED RIVER OF THE NORTH AT HICKSON, ND—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1976 to current year.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Part 1 of 5

[ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; SiO_2, silicon dioxide; ft³/s, cubic feet per second; mg/L, milligrams per liter; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Discharge, instantaneous, ft³/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)	Dissolved solids, water, tons per day (70302)	Hardness, water, mg/L as $CaCO_3$ (00900)
03-28-2012	**1035**	830	8.4	8.2	671	656	8.5	416	931	329
08-01-2012	**1600**	652	7.6	8.2	526	526	28.1	315	555	244

WATER-QUALITY DATA
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Part 2 of 5

[ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; SiO_2, silicon dioxide; ft³/s, cubic feet per second; mg/L, milligrams per liter; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	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)	Chloride, water, filtered, mg/L (00940)	Fluoride, water, filtered, mg/L (00950)
03-28-2012	**1035**	64.8	40.7	5.53	0.47	11	19.4	208	15.9	0.17
08-01-2012	**1600**	44.9	31.9	4.10	.44	12	15.7	166	11.8	.16

WATER-QUALITY DATA
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Part 3 of 5

[ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; SiO_2, silicon dioxide; ft³/s, cubic feet per second; mg/L, milligrams per liter; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	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)	Copper, water, filtered, µg/L (01040)	Iron, water, filtered, µg/L (01046)
03-28-2012	**1035**	13.5	131	< 50	60.1	< 5.00	< 5.00	< 5.0	< 5.0	< 50.0
08-01-2012	**1600**	13.8	92.5	< 50	66.9	< 5.00	< 5.00	< 5.0	< 5.0	64.0

05051522 RED RIVER OF THE NORTH AT HICKSON, ND—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
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; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Lead, water, filtered, µg/L (01049)	Manganese, 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)	Arsenic, water, filtered, µg/L (01000)	Boron, water, filtered, µg/L (01020)
03-28-2012	**1035**	< 5.00	17.0	< 5.0	< 5.00	< 5.00	< 5.0	< 5.00	< 5.0	55
08-01-2012	**1600**	< 5.00	< 10.0	< 5.0	< 5.00	< 5.00	< 5.0	< 5.00	5.2	500

WATER-QUALITY DATA
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
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; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Selenium, water, filtered, µg/L (01145)
03-28-2012	**1035**	< 5.0
08-01-2012	**1600**	< 5.0