

## RED RIVER OF THE NORTH BASIN--Continued

05051522 RED RIVER OF THE NORTH AT HICKSON, ND

LOCATION.--Lat 46°39'35", long 96 47'44", in SW $\frac{1}{4}$  sec. 19, T.137 N., R.48 W., Clay County, MN, Hydrologic Unit 09020104, on right bank 60 ft downstream from bridge on township road, and 1 mi southeast of Hickson, ND.

DRAINAGE AREA.--4,300 mi<sup>2</sup> (approximately).

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 877.06 ft above sea level.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by Orwell Reservoir, capacity, 14,100 acre-ft at 1,070 ft above sea level, adjustment of 1912; Lake Traverse, capacity, 137,000 acre-ft, available for flood control, numerous other controlled lakes and ponds, and several power plants.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	500	933	978	e560	e760	e750	1650	1360	1350	1460	903	655
2	507	810	1040	e560	e720	e780	1480	1340	1530	1450	837	711
3	505	726	1220	e540	e720	e800	1430	1320	1620	1440	786	793
4	501	705	1260	e540	e700	e810	1540	1330	1610	1480	708	923
5	480	713	1320	e520	e680	e840	1710	1340	1560	1480	481	1230
6	476	688	1370	e500	e680	e900	1710	1350	1800	1420	351	1460
7	464	707	1370	e500	e660	e1000	1590	1370	2550	1370	310	1390
8	455	799	1360	e500	e660	e1100	1490	1410	3210	1360	321	1260
9	464	922	1360	e500	e640	e1200	1400	1410	3610	1390	576	1160
10	585	976	1440	e500	e620	e1350	1320	1580	3630	1380	730	1250
11	671	851	1500	e520	e620	e1500	1260	1690	3110	1390	863	1290
12	610	530	1420	e520	e620	e1500	1230	1680	2520	1380	927	1290
13	549	491	1310	e520	e620	e1450	1210	1750	2340	1330	1030	1310
14	526	e530	1180	e540	e620	e1400	1230	1830	2290	1290	1720	1290
15	528	e580	e1100	e530	e600	e1400	1330	1810	2230	1310	2450	1260
16	547	e640	e1000	e540	e600	e1500	1380	1770	2170	1350	2820	1230
17	752	e680	e900	e540	e600	e1800	1390	1810	2110	1350	2670	1190
18	886	e650	e800	e560	e600	e2200	1400	1830	2020	1330	1990	1150
19	853	e600	e660	e600	e600	e2500	1390	1820	1850	1330	1500	1110
20	930	e520	e560	e640	e620	e2700	1370	1790	1750	1330	1420	1080
21	938	e470	e520	e670	e620	e2600	1370	1740	1710	1310	1380	1050
22	920	e490	e515	e700	e620	e2400	1380	1670	1700	1270	1320	1010
23	863	e600	e510	e720	e620	e2100	1390	1580	1890	1180	1270	936
24	810	e680	e510	e760	e620	e1900	1390	1430	2230	1070	1270	889
25	777	e750	e515	e800	e640	e1800	1380	1360	2440	1030	1250	841
26	753	e800	e520	e810	e660	1450	1380	1340	2370	1010	1130	821
27	746	e830	e520	e840	e700	1350	1380	1330	2040	967	937	805
28	755	e860	e520	e840	e720	1430	1380	1310	1710	962	839	778
29	784	916	e520	e840	---	1720	1380	1290	1540	1040	758	760
30	904	950	e540	e830	---	2130	1370	1230	1480	1020	673	766
31	957	---	e560	e800	---	2100	---	1190	---	948	643	---
TOTAL	20996	21397	28898	19340	18140	48460	42310	47060	63970	39427	34863	31688
MEAN	677	713	932	624	648	1563	1410	1518	2132	1272	1125	1056
MAX	957	976	1500	840	760	2700	1710	1830	3630	1480	2820	1460
MIN	455	470	510	500	600	750	1210	1190	1350	948	310	655
AC-FT	41650	42440	57320	38360	35980	96120	83920	93340	126900	78200	69150	62850

e Estimated

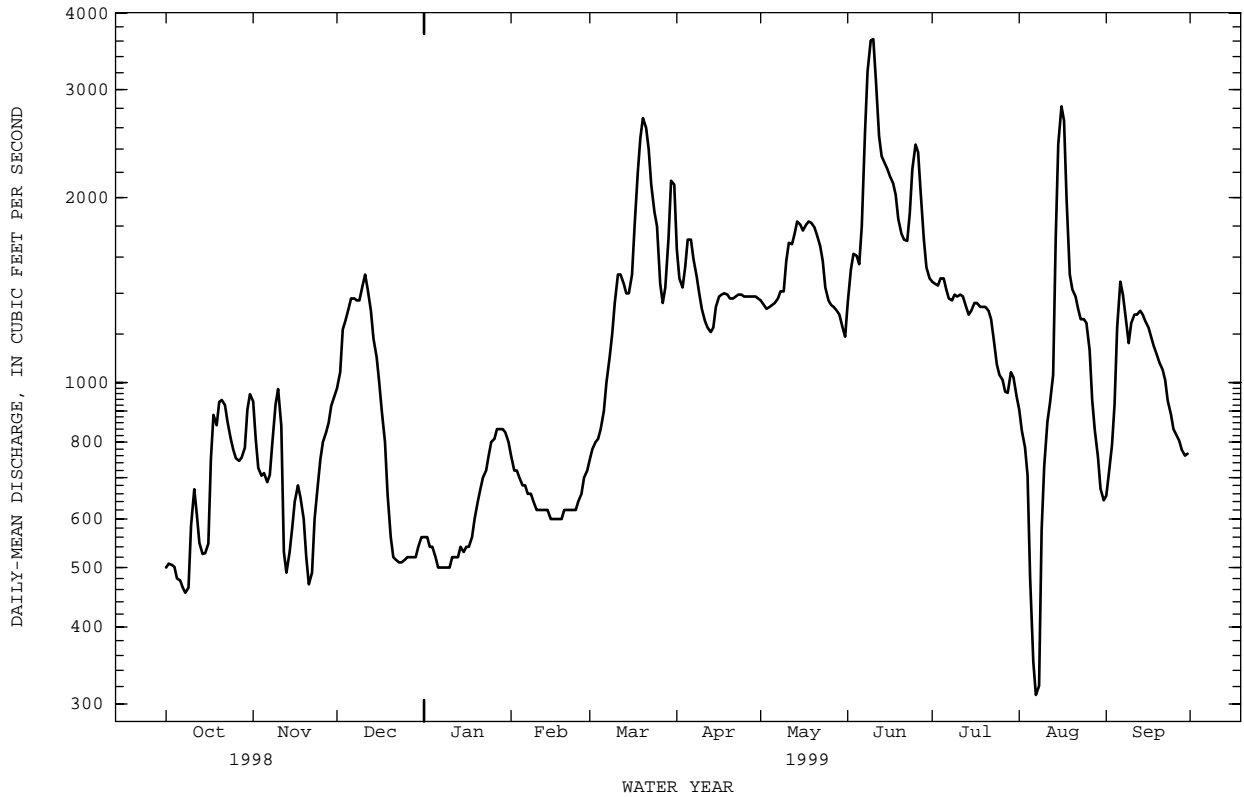
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STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	417	354	326	307	379	988	2141	1305	1085	906	556	465
MAX	1558	900	932	747	1058	2687	9864	3925	2485	2674	2674	2135
(WY)	1994	1987	1999	1986	1998	1995	1997	1997	1986	1993	1993	1993
MIN	2.02	.000	.000	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

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR	FOR 1999 WATER YEAR	WATER YEARS 1975 - 1999
ANNUAL TOTAL	405542	416549	
ANNUAL MEAN	1111	1141	769
HIGHEST ANNUAL MEAN			1729
LOWEST ANNUAL MEAN			53.1
HIGHEST DAILY MEAN	4540	Feb 28	3630
LOWEST DAILY MEAN	196	Sep 25	310
ANNUAL SEVEN-DAY MINIMUM	362	Sep 23	478
INSTANTANEOUS PEAK FLOW			3700 <sup>a</sup>
INSTANTANEOUS PEAK STAGE			19.24 <sup>b</sup>
ANNUAL RUNOFF (AC-FT)	804400	826200	557300
10 PERCENT EXCEEDS	2170	1800	1810
50 PERCENT EXCEEDS	906	1040	430
90 PERCENT EXCEEDS	486	527	91

a Gage height, 18.52 ft.  
 b Backwater from ice.



RED RIVER OF THE NORTH BASIN--Continued

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WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (00095)	TEMPER-AIRE (DEG C) (00020)	TEMPER-AIRE WATER (DEG C) (00010)
OCT												
02...	1040	--	500	--	--	--	--	--	--	451	8.0	12.5
27...	1600	746	--	--	--	10.8	8.3	8.4	469	461	11.1	10.9
DEC												
10...	1255	--	1420	--	--	--	--	--	--	--	4.5	-1.0
16...	0845	1000	--	730	99	13.6	8.3	8.0	706	683	.0	.8
JAN												
25...	1410	--	775	--	--	--	--	--	--	493	-12.0	5.0
FEB												
11...	0815	620	--	735	90	12.7	7.7	7.8	523	477	-6.0	.0
MAR												
25...	1400	1800	--	--	--	--	--	7.8	609	611	6.5	2.0
30...	1510	--	2120	730	95	11.6	8.0	--	545	559	17.0	4.8
APR												
27...	1515	1380	--	740	95	9.8	8.4	--	565	554	19.0	12.9
28...	1615	--	1420	--	--	--	--	--	--	560	17.5	12.0
JUN												
02...	1630	--	1580	740	86	7.9	7.9	7.5	443	448	23.5	17.7
29...	1440	--	1550	734	85	7.1	7.8	7.8	562	558	23.0	22.1
JUL												
22...	0845	--	1540	740	78	6.2	8.3	7.7	660	665	23.5	25.5
AUG												
24...	1500	--	1290	739	88	7.1	8.0	8.2	666	655	30.0	24.3
SEP												
22...	1455	--	990	735	116	11.1	8.1	8.4	407	652	29.0	15.8

DATE	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM AD-SORP-TION RATIO (00931)	SODIUM PERCENT (00932)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
OCT												
02...	--	--	--	--	--	--	--	--	--	--	--	--
27...	200	37	26	4	.3	8	8.8	200	12	--	42	.28
DEC												
10...	--	--	--	--	--	--	--	--	--	--	--	--
16...	320	61	40	5	.5	11	19	220	14	--	150	.56
JAN												
25...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
11...	230	43	30	4	.5	13	16	230	18	--	23	.58
MAR												
25...	280	56	35	5.3	.5	12	19	196	15	.10	130	--
30...	250	52	29	5	.3	9	12	170	4.6	--	100	.72
APR												
27...	270	52	33	5	.4	11	15	210	17	--	85	.44
28...	--	--	--	--	--	--	--	--	--	--	--	--
JUN												
02...	270	55	31	6	.2	7	8.9	180	9.4	--	44	.52
29...	280	57	33	5	.4	11	16	210	17	--	75	.49
JUL												
22...	320	62	41	14	.5	12	22	230	20	--	110	.78
AUG												
24...	350	69	42	7	.4	10	18	180	12	--	160	.56
SEP												
22...	220	40	29	4	.2	6	6.8	190	9.2	--	18	.50

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, TOTAL (MG/L AS N) (00600)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 180 DEG. C SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR PER (COLS. 100 ML) (31673)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)
OCT 02...	--	--	--	--	--	--	--	--	--	--	--	--
27...	.01	.05	.27	.33	.10	.11	500	--	248	K12	520	<3.0
DEC 10...	--	--	--	--	--	--	--	--	--	--	--	--
16...	<.01	.10	--	.66	.30	.33	1140	--	421	50	K12	<3.0
JAN 25...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 11...	.12	.18	.46	.76	.07	.24	454	--	271	K19	110	<3.0
MAR 25...	--	--	--	--	--	--	2080	427	378	--	--	--
30...	.15	2.3	.57	3.0	.13	.29	1770	--	309	<20	2000	<3.0
APR 27...	<.01	<.02	--	--	.07	.15	1240	--	333	<4.0	K32	<3.0
28...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 02...	.05	.40	.47	.92	<.01	.20	1130	--	265	K270	410	<3.0
29...	.01	.19	.47	.68	.13	.26	1380	--	330	96	88	<3.0
JUL 22...	.03	.40	.75	1.2	.12	.23	1700	--	408	42	70	34
AUG 24...	<.01	.05	--	.61	.12	.25	1440	--	413	44	58	39
SEP 22...	<.01	<.02	--	--	<.01	.03	584	--	219	K303	82	<12

DATE	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)	ALUMI- NUM, TOTAL RECOVER- ABLE (UG/L) (01104)	ANTI- MONY, TOTAL (UG/L AS SB) (01097)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOVER- ABLE (UG/L) (01009)	BERYL- LIUM TOTAL RECOVER- ABLE (UG/L) (00998)	BORON, TOTAL RECOVER- ABLE (UG/L) (00999)	CADMIUM TOTAL RECOVER- ABLE (UG/L) (01113)	CHRO- MIUM, TOTAL RECOVER- ABLE (UG/L) (01118)	COPPER, TOTAL RECOVER- ABLE (UG/L) (01119)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
OCT 02...	--	--	--	--	--	--	--	--	--	--	--	--
27...	<1.0	530	<1	--	3	81	<1	110	<1	<1	1	--
DEC 10...	--	--	--	--	--	--	--	--	--	--	--	--
16...	<1.0	430	<1	--	3	74	<1	120	<1	<1	2	--
JAN 25...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 11...	<1.0	170	<1	--	1	93	<1	84	<1	<1	<1	--
MAR 25...	--	--	--	3	--	--	--	--	--	--	--	30
30...	<1.0	8700	<1	--	6	150	<1	120	<1	12	10	--
APR 27...	<1.0	2000	<1	--	2	98	<1	98	<1	3	4	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 02...	--	8900	<1	--	5	160	<1	130	<1	11	8	--
29...	--	3300	<1	--	5	120	<1	86	<1	5	6	--
JUL 22...	<1.0	3100	<1	--	7	140	<1	140	<1	5	5	--
AUG 24...	<7.0	2500	<1	--	7	120	<1	130	<1	4	5	--
SEP 22...	<4.0	370	<1	--	5	80	1	75	<1	<1	1	--

RED RIVER OF THE NORTH BASIN

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LEAD, TOTAL RECOVER -ABLE (UG/L) (01114)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MANGAN- ESE TOTAL RECOVER - ABLE (UG/L) (01123)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOVER -ABLE (UG/L) (01074)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SELE- NIUM, TOTAL RECOVER (UG/L AS SE) (01147)	SILVER, TOTAL RECOVER -ABLE (UG/L) (01079)
OCT												
02...	--	--	--	--	--	--	--	--	--	--	--	--
27...	710	--	<1	--	--	37	--	--	3	--	<1	<1
DEC												
10...	--	--	--	--	--	--	--	--	--	--	--	--
16...	660	--	<1	--	--	43	--	--	3	--	<1	<1
JAN												
25...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
11...	350	--	<1	--	--	21	--	--	2	--	<1	<4
MAR												
25...	--	<1.0	--	30	20	--	<.1	1.0	--	<1	--	--
30...	12000	--	4	--	--	360	--	--	12	--	<1	<1
APR												
27...	2500	--	<1	--	--	140	--	--	6	--	<1	<1
28...	--	--	--	--	--	--	--	--	--	--	--	--
JUN												
02...	10000	--	4	--	--	370	--	--	11	--	<1	<1
29...	4600	--	2	--	--	240	--	--	8	--	<1	<1
JUL												
22...	4400	--	3	--	--	240	--	--	9	--	3	<1
AUG												
24...	3500	--	1	--	--	200	--	--	8	--	<1	<1
SEP												
22...	510	--	<1	--	--	34	--	--	3	--	9	<1

DATE	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	THAL- LIUM, TOTAL RECOV- ERABLE (UG/L AS TL) (01128)	ZINC, TOTAL RECOVER -ABLE (UG/L) (01094)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .031 MM (70341)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70331)
OCT											
02...	--	--	--	--	--	--	--	--	--	--	--
27...	--	<1	6	32	64	--	--	--	--	--	99
DEC											
10...	--	--	--	--	--	--	--	--	--	--	--
16...	--	<1	6	33	89	--	--	--	--	--	99
JAN											
25...	--	--	--	--	--	--	--	--	--	--	--
FEB											
11...	--	<1	6	11	18	--	--	--	--	--	97
MAR											
25...	270	--	--	--	--	--	--	--	--	--	--
30...	--	<1	43	379	2170	60	71	86	92	96	99
APR											
27...	--	<1	20	118	440	--	--	--	--	--	98
28...	--	--	--	--	--	--	--	--	--	--	--
JUN											
02...	--	<1	30	352	1500	69	74	--	89	--	98
29...	--	<1	16	181	757	--	--	--	--	--	98
JUL											
22...	--	<1	18	214	890	--	--	--	--	--	97
AUG											
24...	--	<1	17	148	515	--	--	--	--	--	98
SEP											
22...	--	<1	15	112	299	--	--	--	--	--	99

