RED RIVER OF THE NORTH BASIN

05051300 BOIS DE SIOUX RIVER NEAR DORAN, MN

LOCATION.--Lat 46° 09'08", long 96° 34'44", in NE¼ NE¼ sec. 21, T.131 N., R.47 W., Wilken County, MN, Hydrologic Unit 09020101, on right bank, 10 ft downstream from bridge on County Highway 6, 3 miles downstream from Rabbit River, 4.3 mi southwest of Doran, MN.

DRAINAGE AREA.--1,880 mi², (approximately).

PERIOD OF RECORD.--October 12, 1989 to current year.

GAGE.--Water-stage recorder. Datum of gage is 943.90 ft above mean sea level (elevation data obtained from Wilkin County Highway Engineer).

REMARKS.--Records good except for estimated daily discharges, which are fair to poor. Flow regulated by Lake Traverse-Boise de Sioux Flood Control and Water Conservation project near White Rock, S.D.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
JUL	AUG	SEP							
1	.28	5.3	8.5	e21	e67	e320	e680	4080	1130
108	4.0	8.2							
2	.24	5.1	7.4	e22	e68	e320	e950	3900	1130
149	4.8	8.5							
3	.24	3.9	7.6	e23	e68	e320	e1300	3620	992
168	5.6	8.4							
4	.22	3.2	9.6	e24	e68	e315	e1800	3350	1040
206	5.4	8.0							
5	.19	2.6	e10	e25	e68	e310	e2400	3080	1080
224	4.5	7.6							
6	.16	2.3	e11	e27	e68	e300	e3300	2830	1100
204	5.1	8.9							
7	.16	2.1	e11	e29	e69	e355	e4200	2600	1080
197	4.7	9.7							
8	.18	2.0	e11	e29	e69	e365	e5300	2340	1050
165	4.7	10							
9	.19	2.2	e11	e32	e69	e365	e5990	2110	1020
136	6.3	10							
10	.18	2.4	e11	e33	e70	e365	e6200	1950	998
107	6.2	12							
11	.17	1.9	e11	e35	e70	e360	e6800	1770	968
82	6.1	12							

12	.14	1.7	e11	e36	e71	e350	e7640	1650	939
69	5.0	11							
13	.12	1.6	e11	e38	e72	e340	8150	1600	903
26	4.7	9.8							
14	.21	1.5	e11	e40	e73	e360	9310	1530	785
11	4.4	9.3							
15	.20	1.4	e12	e41	e74	e400	11300	1500	730
7.4	4.7	11							
16	.14	1.4	e13	e44	e132	e415	11500	1480	685
6.6	5.3	9.4							
17	.25	2.6	e13	e46	e135	e410	11000	1460	568
6.1	5.5	8.3							
18	.34	1.6	e14	e48	e140	e405	9920	1420	507
5.6	6.8	7.3							
19	.38	1.5	e14	e50	e140	e400	8320	1390	415
5.2	8.8	7.0							
20	.82	2.0	e14	e52	e180	e395	7440	1380	400
4.7	9.4	7.5							
21	1.4	2.4	e15	e54	e185	e320	7090	1380	379
4.4	10	7.6							
22	1.3	2.3	e15	e56	e245	e325	6670	1400	357
4.0	13	7.7							
23	1.2	2.5	e15	e57	e250	e240	6230	1350	350
3.8	23	6.9							
24	1.1	3.0	e16	e58	e255	e240	5860	1270	288
3.9	22	2.5							
25	.94	3.5	e16	e60	e260	e240	5420	1240	280
4.2	16	1.6							
26	.95	4.1	e17	e61	e320	e240	5190	1220	260
4.3	11	1.6							
27	.97	4.6	e17	e62	e320	e241	4820	1180	165
4.1	8.2	1.2							
28	.89	4.8	e18	e63	e320	e241	4600	1170	120
3.9	6.9	1.4							
29	1.4	5.1	e19	e64	---	e241	4450	1150	115
3.8	7.1	1.3							
30	2.8	7.9	e20	e65	---	e350	4240	1140	108
4.1	7.4	.87							
31	3.1	---	e20	e66	---	e480	---	1140	---
3.9	7.9	---							
TOTAL	20.86	88.5	410.1	1361	3926	10328	178070	58680	19942
1932.0	244.5	216.57							
MEAN	.67	2.95	13.2	43.9	140	333	5936	1893	665
62.3	7.89	7.22							
MAX	3.1	7.9	20	66	320	480	11500	4080	1130
224	23	12							
MIN	.12	1.4	7.4	21	67	240	680	1140	108
3.8	4.0	.87							
AC-FT	41	176	813	2700	7790	20490	353200	116400	39550
3830	485	430							
CFSM	.00	.00	.01	.02	.07	.18	3.16	1.01	.35

.03 .00 .00
IN. .00 .00 .01 .03 .08 .20 3.52 1.16 .39
.04 .00 .00

o e Estimated

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 1997, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
JUL	AUG	SEP							
MEAN	136	64.5	8.60	8.96	23.6	476	1491	791	394
469	237	211							
MAX	592	465	25.6	43.9	140	1757	5936	1893	749
1477	1486	1244							
(WY)	1994	1996	1996	1997	1997	1995	1997	1997	1995
1993	1993	1993							
MIN	.026	1.97	.65	.077	.000	25.5	12.6	11.8	12.6
4.37	.000	.000							
(WY)	1991	1991	1991	1991	1990	1990	1990	1990	1990
1990	1990	1990							

SUMMARY STATISTICS	*FOR 1996 CALENDAR YEAR*		*FOR 1997 WATER YEAR*		*WATER YEARS 1990 - 1997*	
ANNUAL TOTAL	122656		275219			
ANNUAL MEAN	335		754		360	
HIGHEST ANNUAL MEAN						
754 1997						
LOWEST ANNUAL MEAN						
8.77 1990						
HIGHEST DAILY MEAN	3580	May 19	11500	Apr 16	11500	Apr
16 1997						
LOWEST DAILY MEAN	.12	Oct 13	.12	Oct 13	.00a	
Jan 7 1990						
ANNUAL SEVEN-DAY MINIMUM	.16	Oct 7	.16	Oct 7	.00b	
Jan 7 1990						
INSTANTANEOUS PEAK FLOW			12300	Apr 16	12300	Apr
16 1997						
INSTANTANEOUS PEAK STAGE			24.42	Apr 16	24.42	Apr
16 1997						
ANNUAL RUNOFF (AC-FT)	243300		545900		260700	
ANNUAL RUNOFF (CFSM)	.18		.40		.19	
ANNUAL RUNOFF (INCHES)	2.43		5.45		2.60	
10 PERCENT EXCEEDS	1240		1860		1250	
50 PERCENT EXCEEDS	11		35		12	
90 PERCENT EXCEEDS	.41		1.5		.26	

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o a Many days, several years; affected by regulation.

b Result of regulation.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1994-95, May to September 1997.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		SPE-	PH WATER			OXYGEN DEMAND,	ALKA-	COLI- FORM,	STREP-					
TOCOCCI		MAGNE-												
		CIFIC	WHOLE			BIO-	LINITY	FECAL,	FECAL,					
CALCIUM	SIUM,													
		CON-	FIELD	TEMPER-	OXYGEN,		CHEM-	LAB	0.7	KF				
AGAR	TOTAL	TOTAL												
		DUCT-	(STAND-	ATURE	DIS-	ICAL,	(MG/L	UM-MF	(COLS.					
RECOVER	RECOVER													
DATE	TIME	ANCE	ARD	WATER	SOLVED	5 DAY	AS	(COLS./	PER	-				
ABLE	-ABLE													
		(US/CM)	UNITS)	(DEG C)	(MG/L)	(MG/L)	CACO3)	100 ML)	100 ML)					
(MG/L)	(MG/L)													
		(00095)	(00400)	(00010)	(00300)		(00310)	(90410)	(31625)					
(31673)	(00918)	(00921)												
MAY														
20...	0930	695	8.1	11.5	8.2	3.0	151	580	K31					
68	36													
JUN														
10...	0900	802	7.3	21.0	6.7	2.0	183	K18	K180					
87	46													
JUL														
22...	0945	1370	7.4	24.5	5.1	--	--	160	180	--				
--														
AUG														
12...	1000	1350	7.3	20.5	7.1	3.0	277	1300	250					
130	90													
SEP														
16...	0945	1290	7.6	20.5	7.8	3.0	326	560	370					
110	76													

		POTAS-		CHLO-	NITRO-	NITRO-	NITRO-	NITRO- GEN,AM-		
	SODIUM,	PHOS- SIUM,	SULFATE	RIDE,	GEN,	GEN,	GEN,	MONIA +	NITRO-	
PHOS-	PHORUS									

	TOTAL	TOTAL	DIS-	DIS-	NO2+NO3	AMMONIA	ORGANIC	ORGANIC	GEN,	PHORUS	DIS-
	RECOVER	RECOVER	SOLVED	SOLVED	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	SOLVED
	DATE	-ABLE	-ABLE	(MG/L	(MG/L	(MG/L	(MG/L	(MG/L	(MG/L	(MG/L	
	(MG/L	(MG/L	AS SO4)	AS CL)	AS N)	AS N)	AS N)	AS N)	AS N)	AS P)	
	(MG/L)	(MG/L)	(00945)	(00940)	(00630)	(00610)	(00605)	(00625)	(00600)	(00665)	(00666)
	(00923)	(00939)									
MAY											
20...	18	7.3	210	9.4	0.030	0.075	0.95	1.0	1.0	0.159	0.128
JUN											
10...	23	8.3	280	11	0.020	0.055	0.85	0.91	0.93	0.250	0.186
AUG											
12...	60	9.5	550	14	<0.020	<0.010	1.5	1.5	1.5	0.239	0.179
SEP											
16...	48	11.3	400	22	<0.020	<0.010	1.4	1.4	1.4	0.232	0.179

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

	PHOS-	ALUMI-			BARIUM,	BERYL-			CHRO-	COPPER,
	PHORUS	NUM,	ANTI-			LIUM	BORON,	CADMIUM	MIUM,	
	ORGANIC	TOTAL	MONY,	ARSENIC	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL
	TOTAL	RECOVER	TOTAL	TOTAL	RECOVER	RECOVER	RECOVER	RECOVER	RECOVER	RECOVER
DATE	(MG/L	-ABLE	(UG/L	(UG/L	-ABLE	-ABLE	-ABLE	-ABLE	-ABLE	-ABLE
	AS P)	(UG/L)	AS SB)	AS AS)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)
	(00670)	(01104)	(01097)	(01002)	(01009)	(00998)	(00999)	(01113)	(01118)	(01119)
MAY										
20...	0.16	380	0.8	7	54	<0.2	200	<0.02	1	3
JUN										
10...	0.25	1200	0.4	5	74	<0.2	100	0.1	2	5
JUL										
22...	--	--	--	--	--	--	--	--	--	--
AUG										
12...	0.24	420	<1	9	85	<1	300	<1	1	6
SEP										
16...	0.23	1200	2	10	90	<1	200	<1	3	7

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOVERABLE (UG/L) (01114)	MANGANESE TOTAL RECOVERABLE (UG/L) (01123)	NICKEL, TOTAL RECOVERABLE (UG/L) (01074)	SELENIUM, TOTAL RECOVERABLE (UG/L AS SE) (01147)	SILVER, TOTAL RECOVERABLE (UG/L) (01079)	THALLIUM TOTAL RECOVERABLE (UG/L AS TL) (01128)	ZINC, TOTAL RECOVERABLE (UG/L) (01094)	SEDIMENT, SUSPENDED SIEVE DIAM. (MG/L) (80154)	% FINER THAN .062 MM (70331)
MAY 20...	530	2	50	5	7	<0.04	<0.03	4	32	99
JUN 10...	1800	2	180	8	1	0.22	<0.03	10	105	99
AUG 12...	670	<1	270	9	<1	<1	<1	20	--	--
SEP 16...	1600	5	320	9	<1	<1	<1	30	--	--