



Water Resources Data Minnesota Water Year 1996



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT MN-96-1

Prepared in cooperation with the Minnesota Department of Natural Resources, Division of Waters; the Minnesota Department of Transportation; and with other State, municipal, and Federal agencies

CALENDAR FOR WATER YEAR 1996

1995

OCTOBER							NOVEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	7				1	2	3	4						1	2
8	9	10	11	12	13	14	5	6	7	8	9	10	11	3	4	5	6	7	8	9
15	16	17	18	19	20	21	11	12	13	14	15	16	17	10	11	12	13	14	15	16
22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
29	30	31					26	27	28	29	30			24	25	26	27	28	29	30
														31						

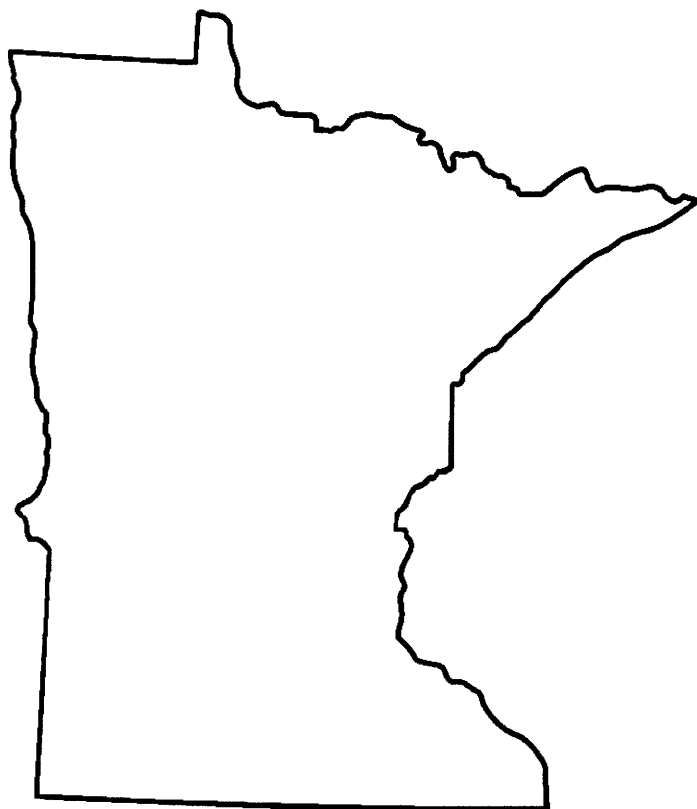
1996

JANUARY							FEBRUARY							MARCH						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
	1	2	3	4	5	6					1	2	3						1	2
7	8	9	10	11	12	13	4	5	6	7	8	9	10	3	4	5	6	7	8	9
14	15	16	17	18	19	20	11	12	13	14	15	16	17	10	11	12	13	14	15	16
21	22	23	24	25	26	27	18	19	20	21	22	23	24	17	18	19	20	21	22	23
28	29	30	31				25	26	27	28	29			24	25	26	27	28	29	30
														31						
APRIL							MAY							JUNE						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
	1	2	3	4	5	6				1	2	3	4							1
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14	15	16	17	18	19	20	12	13	14	15	16	17	18	9	10	11	12	13	14	15
21	22	23	24	25	26	27	19	20	21	22	23	24	25	16	17	18	19	20	21	22
28	29	30					26	27	28	29	30	31		23	24	25	26	27	28	29
														30						
JULY							AUGUST							SEPTEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
	1	2	3	4	5	6					1	2	3	1	2	3	4	5	6	7
7	8	9	10	11	12	13	4	5	6	7	8	9	10	8	9	10	11	12	13	14
14	15	16	17	18	19	20	11	12	13	14	15	16	17	15	16	17	18	19	20	21
	2	22	23	24	25	26	18	19	20	21	22	23	24	22	23	24	25	26	27	28
28	29	30	31				25	26	27	28	29	30	31	29	30					



Water Resources Data Minnesota Water Year 1996

by Gregory B. Mitton, Eric S. Wakeman, and Kevin G. Guttormson



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Prepared in cooperation with the Minnesota Department of
Natural Resources, Division of Waters; the Minnesota
Department of Transportation; and with other State,
municipal, and Federal agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

BRUCE BABBITT, Secretary

U. S. GEOLOGICAL SURVEY

Gordon Eaton, Director

**Prepared in cooperation with the
State of Minnesota
and with other agencies as listed
under cooperation**

**For additional information write to
District Chief, Water Resources Division
U.S. Geological Survey
2280 Woodale Drive
Mounds View, MN 55112**

PREFACE

This volume of the annual hydrologic report of Minnesota is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface- and ground-water data-collection networks in each State, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and water quality provide the hydrologic information needed by State, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and water quality provide the hydrologic information needed by State, local, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources. Hydrologic data for Minnesota, including four major basins; Great Lakes, Souris-Red Rainy River, Upper Mississippi River, and Missouri River, are contained in this volume.

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. The authors had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to U.S. Geological Survey policy and established guidelines.

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13. ABSTRACT (Maximum 200 words) Water resources data for the 1996 water year for Minnesota consists of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels and water quality in wells and springs. This report contains discharge records for 100 stream-gaging stations; stage and contents for 14 lakes and reservoirs; water quality for 34 stream-gaging stations; and water levels for 15 observation wells. Also included are 87 high-flow partial-record stations, and rainfall totals and water quality for one precipitation station. Additional water data were collected at various sites that are not part of the systematic data collection program, and are published as miscellaneous measurements. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State and Federal agencies in Minnesota.				
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CONTENTS

	<u>Page</u>
Preface.....	iii
List of surface-water stations, in downstream order, for which records are published in this volume	v
List of ground-water wells, by county, for which records are published in this volume.....	ix
List of discontinued surface-water discharge or stage-only stations	x
List of discontinued surface-water-quality stations	xiv
Introduction.....	1
Cooperation.....	1
Summary of hydrologic conditions.....	1
Precipitation.....	1
Surface water	1
Water quality	7
Ground-water levels	8
Special networks and programs	8
Explanation of the records	9
Station identification numbers	9
Downstream order system and station numbers	9
Numbering system for wells and miscellaneous sites	9
Records of stage and water-discharge.....	9
Data collection and computation	9
Data presentation.....	10
Station manuscript	10
Data table of daily-mean values	11
Statistics of monthly-mean data	11
Summary statistics	11
Identifying estimated daily discharge.....	12
Accuracy of the records	12
Other records available.....	12
Records of surface water-quality	12
Classification of records	12
Arrangement of records.....	12
On site measurement and sample collection	12
Water temperature	13
Sediment	13
Laboratory measurements	13
Data presentation	14
Remark codes	14
Dissolved trace-element concentrations	14
Changes in national trends network procedures.....	14
Records of ground-water levels	14
Data collection and computation	14
Data presentation	14
Records of ground-water quality	15
Data collection and computation	15
Data presentation.....	15
Access to WATSTORE data.....	15
Definition of terms.....	16
Publications on Techniques of Water-Resources Investigations	21
Surface water station records	25
Discharge at high-flow partial-record stations, and miscellaneous and low-flow sites	343
High-flow partial-record stations.....	345
Miscellaneous sites	356
Low-flow sites	360
Analyses of samples collected at water-quality partial-record stations	368
Analyses of samples collected at water-quality miscellaneous sites.....	391
Ground water stations	403
Ground-water levels	403
Quality of ground water	420
Chemical quality of precipitation.....	502
Index	508

ILLUSTRATIONS

	Page
Figure 1. Map showing precipitation, in inches for 1996 water year, for Minnesota.....	2
2. Map showing precipitation, in inches for a 30-year period, for Minnesota.....	3
3. Graphs showing comparison of mean discharge for 1996 water year with median of mean discharge for 1961-90 at seven long-term representative gaging stations.....	4-5
4. Graphs showing comparison of dissolved-solids concentrations in samples collected during water year 1996 with median for period of record at three national network stations.....	6
5. Graphs showing comparison of nitrite plus nitrate concentrations in samples collected during water year 1996 with median for period of record at three national network stations.....	7
6. Diagram showing system for numbering wells and miscellaneous sites.....	9
7. Map showing location of lake- and stream-gaging stations.....	26
8. Map showing location of surface-water-quality stations.....	27
9. Map showing location of high-flow partial-record stations.....	344
10. Map showing location of ground-water wells.....	404

SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED

Note.--Data for partial-record stations and miscellaneous sites for both surface-water quantity and quality are published in separate sections of the data report. See references at the end of this list for page numbers for these sections.

[Letters after station name designates type of data: (d) discharge; (e) gage height, elevation, or contents; (c) chemical, radio-chemical, or pesticides; (b) biological or micro-biological; (p) physical (water temperature, sediment, or specific conductance)]

ST. LAWRENCE RIVER BASIN

	Station Number	
STREAMS TRIBUTARY TO LAKE SUPERIOR		
Pigeon River at Middle Falls, near Grand Portage.....(d - - -)	04010500	28
Knife River near Two Harbors.....(d - - -)	04015330	30
St. Louis River at Scanlon.....(d - - -)	04024000	32
Nemadji River:		
Deer Creek near Holyoke.....(d - - -)	04024098	34

HUDSON BAY BASIN

STREAMS TRIBUTARY TO LAKE WINNIPEG (head of Nelson River):

RED RIVER OF THE NORTH BASIN

Otter Tail River (head of Red River of the North):

Otter Tail River near Elizabeth.....(d - - -)	05030500	36
Orwell Lake (Reservoir) near Fergus Falls.....(- e - -)	05045950	38
Otter Tail River below Orwell Dam, near Fergus Falls.....(d - - -)	05046000	40
Bois de Sioux River near White Rock, SD.....(d - - -)	05050000	42
Bois de Sioux River near Doran.....(d - - -)	05051300	44
Red River of the North at Wahpeton, ND.....(d - c - p)	05051500	46
Red River of the North at Hickson, ND.....(d - c - p)	05051522	50
Red River of the North at Fargo, ND.....(d - c - p)	05054000	54
Buffalo River near Hawley.....(d - - -)	05061000	56
South Branch Buffalo River at Sabin.....(d - - -)	05061500	58
Buffalo River near Dilworth.....(d - - -)	05062000	60
Wild Rice River at Twin Valley.....(d - c - p)	05062500	62
Wild Rice River at Hendrum.....(d - - -)	05064000	66
Red River of the North at Halstad.....(d - c b p)	05064500	68
Marsh River near Shelly.....(d - - -)	05067500	70
Sand Hill River at Climax.....(d - - -)	05069000	72
Red Lake River:		
Upper Red Lake at Waskish.....(- e - -)	05073500	74
Lower Red Lake at Battle River mouth near Saum.....(- e - -)	05073650	76
Lower Red Lake near Red Lake.....(- e - -)	05074000	78
Red Lake River at High Landing, near Goodridge.....(d - - -)	05075000	80
Thief River near Thief River Falls.....(d - - -)	05076000	82
Clearwater River at Plummer.....(d - - -)	05078000	84
Lost River at Oklee.....(d - - -)	05078230	86
Clearwater River at Red Lake Falls.....(d - - -)	05078500	88
Red Lake River at Crookston.....(d - - -)	05079000	90

SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED--Continued

HUDSON BAY BASIN--Continued

Station Number Page

STREAMS TRIBUTARY TO LAKE WINNIPEG (head of Nelson River)--Continued

RED RIVER OF THE NORTH BASIN--Continued

Red River of the North at Grand Forks, ND.....	(d - c b p).....05082500	92
Snake River above Alvarado.....	(d - c - p).....05085900	9A
Middle River at Argyle.....	(d - - -).....05087500	9P
Red River of the North at Drayton, ND.....	(d - c b p).....05092000	10C
Two Rivers:		
South Branch Two Rivers at Lake Bronson	(d - - -).....05094000	102
Red River of the North at Emerson, Manitoba.....	(d - c b p).....05102500	104
Roseau River below South Fork near Malung	(d - - -).....05104500	106
Roseau River at Ross.....	(d - - -).....05107500	108
Roseau River below State ditch 51, near Caribou.....	(d - - -).....05112000	11C

WINNIPEG RIVER BASIN

Namakan River (head of Rainy River):

Basswood River:

Kawishiwi River near Ely.....	(d - c b p).....05124480	112
Kawishiwi River near Winton	(d - - -).....05127000	116
Basswood River near Winton	(d - - -).....05127500	118
Namakan River at outlet of Lac la Croix, Ontario	(d - - -).....05128000	120

Vermilion River:

Vermilion River near Crane Lake.....	(d - - -).....05129115	122
Rainy Lake near Fort Frances, Ontario	(- e - -).....05129400	124

Rainy River:

Little Fork River:

Sturgeon River near Chisholm.....	(d - - -).....05130500	126
Nett Lake River:		
Wood Duck Creek near Nett Lake	(d - - -).....05131448	128
Nett Lake River near Nett Lake.....	(d - - -).....05131455	130
Little Fork River at Littlefork.....	(d - - -).....05131500	132
Rainy River at Manitou Rapids.....	(d - - -).....05133500	134

Lake of the Woods (head of Winnipeg River):

Lake of the Woods at Springsteel Island near Warroad	(- e - -).....05140521	136
------------------------------------------------------------	------------------------------	-----

UPPER MISSISSIPPI RIVER BASIN

Mississippi River near Bemidji.....	(d - - -).....05200510	138
Winnibigoshish Lake near Deer River.....	(- e - -).....05201000	140
Mississippi River:		
Leech Lake River:		
Leech Lake:		
Shingobee River:		
Williams Lake near Akeley	(- e - -).....05202000	142
Leech Lake at Federal Dam.....	(- e - -).....05206000	144
Mississippi River:		
Pokagama Lake near Grand Rapids.....	(- e - -).....05210500	146
Mississippi River at Grand Rapids	(d - - -).....05211000	148
Sandy River:		
Sandy Lake at Libby	(- e - -).....05218500	150
Mississippi River at Aitkin	(d - - -).....05227500	152
Mississippi River:		
Pine River:		
Pine River Reservoir at Cross Lake.....	(- e - -).....05230500	154
Mississippi River at Brainerd.....	(d - - -).....05242300	156
Crow Wing River:		
Shell River:		
Straight River near Park Rapids.....	(d - - -).....05243725	15P
Crow Wing River at Nimrod	(d - - -).....05244000	160
Long Prairie River at Long Prairie	(d - - -).....05245100	162
Gull River:		
Gull Lake near Brainerd.....	(- e - -).....05246500	164
Crow Wing River near Pillager	(d - - -).....05247500	166

SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED--Continued

UPPER MISSISSIPPI RIVER BASIN--Continued

	Station Number	Page
Mississippi River near Fort Ripley.....(d - - -)	05261000	168
Mississippi River near Royalton.....(d - c b p)	05267000	170
Sauk River near St. Cloud.....(d - - -)	05270500	176
Mississippi River at St. Cloud.....(d - - -)	05270700	178
Elk River near Big Lake.....(d - - -)	05275000	180
Crow River:		
North Fork Crow River above Paynesville.....(d - c b p)	05276005	182
Crow River at Rockford.....(d - - -)	05280000	189
Rum River:		
Mille Lacs Lake (head of Rum River) at Cove Bay near Onamia.....(- e - -)	05284000	192
Rum River near St. Francis.....(d - - -)	05286000	194
Cedar Creek near Coopers Corner.....(d - c b p)	05286290	196
Elm Creek near Champlin.....(d - c b p)	05287890	202
Mississippi River near Anoka.....(d - c - p)	05288500	206
Shingle Creek at Queen Ave. in Minneapolis.....(d - c b p)	05288705	216

MINNESOTA RIVER BASIN

Little Minnesota River (head of Minnesota River) near Peever, SD.....(d - - -)	05290000	236
Whetstone River near Big Stone City, SD.....(d - - -)	05291000	238
Minnesota River at Ortonville.....(d - - -)	05292000	240
Yellow Bank River near Odessa.....(d - - -)	05293000	242
Pomme de Terre River at Appleton.....(d - - -)	05294000	244
Lac qui Parle River near Lac qui Parle.....(d - - -)	05300000	246
Chippewa River near Milan.....(d - - -)	05304500	248
Minnesota River at Montevideo.....(d - - -)	05311000	250
Yellow Medicine River near Granite Falls.....(d - - -)	05313500	252
Redwood River near Marshall.....(d - - -)	05315000	254
Redwood River near Redwood Falls.....(d - - -)	05316500	256
Cottonwood River near New Ulm.....(d - - -)	05317000	258
Little Cottonwood River near Courtland.....(d - - -)	05317200	260
Blue Earth River:		
Watonwan River near Garden City.....(d - - -)	05319500	262
Blue Earth River near Rapidan.....(d - - -)	05320000	264
Le Sueur River:		
Cobb River:		
Little Cobb River near Beauford.....(d - c - p)	05230270	266
Le Sueur River near Rapidan.....(d - - -)	05320500	276
Minnesota River at Mankato.....(d - c b p)	05325000	278
High Island Creek near Henderson.....(d - - -)	05327000	274
Minnesota River near Jordan.....(d - c - p)	05330000	276
Mississippi River at St. Paul.....(d - - -)	05331000	298
Mississippi River below Lock and Dam 2, at Hastings.....(- c - p)	05331580	300

ST CROIX RIVER BASIN

St. Croix River:		
Kettle River below Sandstone.....(d - - -)	05336700	310
Snake River:		
Knife River near Mora.....(d - - -)	05337400	312
Snake River near Pine City.....(d - - -)	05338500	314
St. Croix River at St. Croix Falls, WI.....(d - - -)	05340500	316
Mississippi River at Prescott, WI.....(d - - -)	05344500	318
Vermillion River near Empire.....(d - - -)	05345000	320
Cannon River:		
Straight River near Faribault.....(d - - -)	05353800	322
Cannon River at Welch.....(d - - -)	05355200	324
Zumbro River:		
South Fork Zumbro River at Rochester.....(d - - -)	05372995	326
Whitewater River near Beaver.....(d - - -)	05376800	328
Mississippi River at Winona.....(d - - - p)	05378500	330
Root River near Houston.....(d - - -)	05385000	334

SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED--Continued

UPPER MISSISSIPPI RIVER BASIN--Continued

	<u>Station Number</u>	<u>Page</u>
Iowa River:		
Cedar River near Austin	(d - - -)05457000	336
Des Moines River at Jackson	(d - - -)05476000	338
MISSOURI RIVER:		
Big Sioux River:		
Rock River at Luverne	(d - c b p).....06483000	340

GROUND-WATER WELLS, BY COUNTY, FOR WHICH
RECORDS ARE PUBLISHED IN THIS VOLUME

GROUND-WATER LEVELS

	<u>Page</u>
ANOKA	
Well 450927093033802 Local number 031N22W23CBC02	405
BLUE EARTH	
Well 440050094102801 Local number 106N28W03DBA01	406
CLAY	
Well 465237096383901 Local number 139N47W05CDC01	407
DAKOTA	
Well 445330093054301 Local number 028N22W19DCC02	408
Well 444205092500001 Local number 114N17W10AAA01	409
HENNEPIN	
Well 444801093202801 Local number 027N24W30BDA01	410
Well 450116093205301 Local number 029N24W06CCC01	411
Well 445740093333001 Local number 117N23W11BBD01	412
Well 450223093231801 Local number 118N21W07DCB01	413
MORRISON	
Well 460444094212501 Local number 130N29W08DCC01	414
RAMSEY	
Well 445700093051001 Local number 029N22W31DDD01	415
Well 450238093082501 Local number 030N23W35BDC01	416
SCOTT	
Well 444427093353902 Local number 115N23W28BDD02	417
Well 444427093353903 Local number 115N23W28BDD03	418
WATONWAN	
Well 440037194372601 Local number 106N32W01DDB01	419

QUALITY OF GROUND-WATER RECORDS

ANOKA	421,468,495
BELTRAMI	425,495
BENTON	425,468,495
BLUE EARTH	425,496
DAKOTA	430,470,497
DOUGLAS	430,497
GOODHUE	430,473,497
HENNEPIN	436,473,498
HUBBARD	442,473,499
MORRISON	447,499
NICOLLET	447,473,499
NOBLES	447,499
POPE	447,499
RAMSEY	447,499
REDWOOD	447,473
RICE	451,477,499
ROCK	451,477,500
SCOTT	457,488,501
SHERBURNE	462,501
STEARNS	462,488,501
WASHINGTON	462,488,501

PRECIPITATION SITES, FOR WHICH CHEMICAL-QUALITY RECORDS ARE PUBLISHED

Precipitation Station at Camp Ripley	503
--------------------------------------------	-----

DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

The following continuous-record surface-water discharge or stage-only stations (gaging stations) in Minnesota have been discontinued. Daily streamflow or stage records were collected and published for the period of record, expressed in water years, shown for each station. Those stations with an asterisk (*) after the station number are currently operated as crest-stage partial-record stations. Discontinued project stations with less than 3 years of record have not been included. Information regarding these stations may be obtained from the District Office at the address given on the back side of the title page of this report.

[Letters after station name designate type of data collected: (d) discharge, (e) elevation (stage only)].

Station name	Station number	Drainage area (mi ²)	Period of record
Pigeon River above mouth of Arrow River, MN (d)	04010000	256	1924-27
Poplar River at Lutsen, MN (d)	04012500	114	1911 (e), 1912-17, 1924-47, 1952-61
Cross River at Schroeder, MN (d)	04013000	91	1921-32
Baptism River near Beaver Bay, MN (d)	04014500	140	1924-93
Beaver Creek (Beaver Bay Run) at Beaver Bay, MN (d)	04015000	126	1911-14, 1928-31
South Branch Partridge River near Babbitt, MN (d)	04015455	18.5	1977-80
Partridge River above Colby Lake, at Hoyt Lakes, MN (d)	04015475	106	1970-88
Second Creek near Aurora, MN (d)	04015500	29	1955-80
Partridge River near Aurora, MN (d)	04016000	161	1942-82
St. Louis River near Aurora, MN (d)	04016500	290	1942-87
Embarrass River at Embarrass, MN (d)	04017000	93.8	1942-64
Embarrass River near McKinley, MN (d)	04018000	171	1953-62
St. Louis River at Forbes, MN (d)	04018750	713	1965-90
East Two Rivers near Iron Junction, MN (d)	04018900	40.0	1965-79
West Two Rivers near Iron Junction, MN (d)	04019000	65.3	1953-62, 1965-79
West Swan River near Silica, MN (d)	04019300	16.3	1963-79
East Swan River near Toivola, MN (d)	04019500	112	1953-62, 1964-71
Swan River near Toivola, MN (d)	04020000	254	1952-61
Whiteface River below (at) Meadowlands, MN (d)	04021000	453	1909-17
Cloquet River at Independence, MN (d)	04023000	750	1909-17
Elim Creek near Holyoke, MN (d)	04024090	1.06	1976-78
Skunk Creek below Elim Creek near Holyoke, MN (d)	04024093	8.83	1976-78
Otter Tail River near Detroit Lakes, MN (d)	05030000	270	1937-71
Pelican River at Detroit Lakes, MN (d)	05033900	-	1968-71
Pelican River at Detroit Lk outlet nr Detroit Lakes, MN (d)	05034100	-	1968-71, 1974-75
Long Lake outlet near Detroit Lakes, MN (d)	05035100	-	1968-71
West Branch Cty. Ditch No. 14 nr Detroit Lakes, MN (d)	05035200	-	1968-71
East Branch County Ditch No. 14 nr Detroit Lakes, MN (d)	05035300	-	1968-71
St. Clair Lake outlet near Detroit Lakes, MN (d)	05035500	-	1968-75
Pelican River at Muskrat Lk outlt nr Detroit Lakes, MN (d)	05035600	-	1968-75
Pelican River at Sallie Lk outlet nr Detroit Lakes, MN (d)	05037100	-	1968-75
Pelican River at Lake Melissa olt nr Detroit Lakes, MN (d)	05039100	-	1968-75
Pelican River near Detroit Lakes, MN (d)	05040000	123	1942-53
Pelican River near Fergus Falls, MN (d)	05040500	482	1909-12
Otter Tail River near Breckenridge, MN (d)	05046500	2,040	1921-32, 1939-46
Mustinka River (head of Bois de Sioux River) nr Norcross, MN (d)	05047000	-	1940-47
Mustinka Ditch above West Branch Mustinka River (Twelve Mile Creek) near Charlesville, MN (d)	05047500	-	1943-55
Mustinka Ditch below West Branch Mustinka River (Twelve Mile Creek) near Charlesville, MN (d)	05048000	-	1943-55
W. Branch Mustinka River (Twelve Mile Creek) below	05048500	-	1943-55
Mustinka Ditch near Charlesville, MN (d)			
Mustinka River above (near) Wheaton, MN (d)	05049000	834	1915-24, 1930-58
Bois de Sioux River below Fairmont, ND (d)	05050500	1,540	1919-44
Rabbit River at Campbell, MN (d)	05051000	266	1942-52
Red River of the North below Fargo, ND (d)	05054020	-	1949-78
Whiskey Creek at Barnesville, MN (d)	05061200*	25.3	1944-66
Wild Rice River near Ada, MN (d)	05063000	1,100	1948-54
South Branch Wild Rice River near Borup, MN (d)	05063500	254	1944-49
Marsh River below Ada, MN (d)	05067000	-	1948-52
Sand Hill River at Beltrami, MN (d)	05068000	324	1943-58
Sand Hill Ditch at Beltrami, MN (d)	05068500	-	1943-58
Red Lake River near Red Lake, MN (d)	05074500	1,950	1933-94
Thief River near Gatske, MN (d)	05075500	-	1943-56

DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS--Continued

Station name	Station number	Drainage area (mi ²)	Period of record
Red Lake River at Thief River Falls, MN (d)	05076500	3,450	1909-18, 1920-30
Clearwater River near Pinewood, MN (d)	05077000	132	1940-45
Clearwater River near Leonard, MN (d)	05077500	153	1934-47
Ruffy Brook near Gonvick, MN (d)	05077700*	45.2	1960-78
Red River of the North at Oslo, MN (d)	05083500	331,200	1936-37, 1941-43, 1945-60, 1973-78
Snake River at Warren, MN (d)	05085500	-	1945, 1953-56
Snake River at Alvarado, MN (d)	05086000	220	1945, 1953-56
Middle River near Strandquist, MN (d)	05087000	-	1953-56
Tamarac River near Strandquist, MN (d)	05090500	-	1953-56
Tamarac River near Stephen, MN (d)	05091500	320	1945
Two Rivers (Middle Fork Two Rivers) nr Hallock, MN (d)	05092500	131	1931-38
South Branch (South Fork) Two Rivers near Pelan, MN (d)	05093000	281	1928-38, 1953-56
South Branch Two Rivers (Two Rivers) at Hallock, MN (d)	05094500	-	1940-47
Two Rivers (South Branch Two Rivers) at Hallock, MN (d)	05095000	-	1911-14, 1929-30, 1938-39, 1941-43
Two Rivers below Hallock, MN (d)	05095500	644	1945-55
North Branch (North Fk) Two Rivers nr Lancaster, MN (d)	05096000	32	1929-38, 1941-55 1953-55
State Ditch 85 near Lancaster, MN (d)	05096500	95	1929-38, 1942-55
North Branch Two Rivers at Lancaster, MN (d)	05096500	209	1941-42, 1953-56
North Branch Two Rivers near Northcote, MN (d)	05097500	386	1941-42, 1945-51
Two Rivers below North Branch near Hallock, MN (d)	05098000	1,060	1941-43
Roseau River (at) near Malung, MN (d)	05103000	252	1928-46
South Fork (W. Branch) Roseau River nr Malung, MN (d)	05104000	312	1911-14, 1928-46
Roseau River at Roseau, MN (d)	05105000	-	1940-47
Roseau River near Roseau, MN (d)	05105500	-	1930-60
Sprague Creek near Sprague, Manitoba (d)	05106000	176	1928-81
Pine Creek near Pine Creek, MN (d)	05107000	74.6	1928-53
Roseau River at Roseau Lake, MN (e)	05106500	-	1939-91
Roseau River near Badger, MN (d)	05108000	-	1928-69
Roseau River near Duxby, MN (d)	05108500	-	1929-51, 1952-56
Badger Creek near Badger, MN (d)	05109000	2.2	1929-30, 1931-38
Roseau River near Haug, MN (d)	05109500	-	1932-66
Roseau River at odt of State Ditch 69 nr Oak Point, MN (d)	05110000	-	1939-42
Roseau R. at head of State Ditch 51 nr Oak Point, MN (d)	05110500	-	1933-42
Roseau River at Oak Point, MN (d)	05111000	-	1933-39, 1941-60
Roseau River at international boundary, nr Caribou, MN (d)	05112500	1,590	1933-69
Shagawa Lake tributary at Ely, MN (d)	05127219	1.84	1971-78
Burgo Creek near Ely, MN (d)	05127220	3.04	1967-78
Shagawa River near Ely, MN (d)	05127230	99	1967-78
Vermilion Lake near Soudan, MN (e)	05128200	-	1913-15, 1941-42 1946-87
Pike River near Biwabik, MN (d)	05128340	-	1977-79
Pike River near Embarrass, MN (d)	05128500	115	1953-64, 1976-79
Gold Portage Oult from Kabetogama Lake near Ray, MN (d)	05129290	-	1982-93
Rainy River at International Falls, MN (d)	05129500	14,900	1905-60
Sturgeon River (Lake) at Side Lake, MN (d)	05130000	-	1938-47
Dark River near Chisholm, MN (d)	05131000	50.6	1942-61, 1965-79
Deer Lake outlet (Deer Lake) near Effie, MN (d)	05131800	-	1937-39, 1940-46
Big Fork River at Big Falls, MN (d)	05132000	1,460	1909-10, 1928-79 1982-93
Rapid River near Baudette, MN (d)	05134200	543	1956-85
Warroad River near Warroad, MN (d)	05139500	162	1946-80
Bulldog Run near Warroad, MN (d)	05140000	14.2	1946-51, 1966-77
East Branch Warroad River nr Warroad, MN (d)	05140500	102	1946-54, 1966-77 1979-94
Lake of the Woods at Warroad, MN (e)	05140520	27,200	1979-94
Mississippi River near Deer River, MN (d)	05210000	3,190	1945-50
Prairie River near Taconite, MN (d)	05212700	360	1967-83
Prairie River near Grand Rapids, MN (d)	05213000	485	1909 (e), 1925-49
O'Brien Creek near Pengilly, MN (d)	05216800	-	1963-68

DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS--Continued

Station name	Station number	Drainage area (mi ²)	Period of record
Initial tailings basin outflow near Keewatin, MN (d)	05216820	2.5	1982-85
Swan River near Calumet, MN (d)	05216850	114	1964-90
Swan River near Warba, MN (d)	05217000	254	1954-69
Mississippi River above Sandy River near Libby, MN (d)	05218000	4,560	1895-1915, 1925-29
Mississippi River below Sandy River near Libby, MN (d)	05220500	5,060	1930-90
Pelican Brook (Long Lake) near Pequot Lakes, MN (d)	05232000	-	1938-42, 1943-47
Rabbit River near Crosby, MN (d)	05241500	8.38	1945-63
Little Sand Lake outlet (Sand Lake outlet) nr Dorset, MN (d)	05242700	74	1930-41
Straight River at County Highway 125 near Osage, MN (d)	05243721	-	1986-91
Straight River at Cty. Hwy. 115 near Park Rapids, MN (d)	05243723	-	1986-89
Crow Wing River at Motley, MN (d)	05244500	2,140	1909 (e), 1913-17 1930-31
Diversion from Long Prairie River near Osakis, MN (d)	05244980	-	1939-47
Long Prairie River near Osakis, MN (d)	05245000	-	1949-54
Long Prairie near Motley	05245500	973	1909-17, 1930-31
Crow Wing River at Pillager, MN (d)	05246000	-	1909-13, 1925-50
Platte (Platt) River at Pillager, MN (d)	05268000*	338	1929-36
Mississippi River near Sauk Rapids, MN (d)	05269000	12,400	1903-06
Mississippi River at Sartell, MN (d)	05270000	12,450	1929, 1943-47(e)
Clearwater River at Clearwater, MN (d)	05273500	-	1937, 1940-42
St. Francis River at Santiago, MN (d)	05274700	-	1965-70, 1980-81
St. Francis River above Zimmerman, MN (d)	05274750	-	1980-84
St. Francis River near Big Lake, MN (d)	05274900	-	1965-70
Mississippi River at Elk River, MN (d)	05275500	14,500	1915-56
North Fork Crow River near Regal, MN (d)	05276000	215	1943-54
Middle Fork Crow River at New London, MN (e)	05277000	-	1939-42, 1943-47
Middle Fork Crow River (Calhoun Lk Diversion) nr Spicer, MN (e)	05277500	-	1939, 1940-46
Middle Fork Crow River near Spicer, MN (d)	05278000	179	1949-87
South Fork Crow River at Cosmos, MN (d)	05278500	221	1945-64
Buffalo Creek near Glencoe, MN (d)	05278930*	374	1972-80
South Fork Crow River near Mayer, MN (d)	05279000	1,170	1934-79
South Fork Crow River near Rockford, MN (d)	05279500	1,250	1909-12
Mississippi River at Anoka, MN (d)	05283500	17,100	1897, 1905-13
Rum River at Onamia, MN (d)	05284500	414	1910-12
Rum River at Spencer Brook, MN (d)	05284750	-	1960-64
Rum River at Cambridge, MN (d)	05285000	1,160	1909-14
Rum River near Anoka, MN (d)	05286500	1,430	1905-06, 1909
Minnetonka Lake (head of Minnehaha Creek) near Wayzata (at Excelsior), MN (d)	05289000	-	1938-64
Minnehaha Creek at Minnetonka Mills, MN (d)	05285900	130	1953-64
Big Stone Lake near Big Stone City, SD (formerly Big Stone Lake at Ortonville, MN (e)	05291500	-	1937-93
Minnesota River near Odessa, MN (d)	05292500	1,340	1909-12, 1944-63
Pomme de Terre River near Morris, MN (d)	05293500	-	1937-39, 1940-47
Canby Creek at Canby, MN (d)	05299500	-	1938-39, 1940-46
Minnesota River near Lac qui Parle, MN (d)	05301000	4,050	1942-94
Chippewa River at diversion dam near Hancock, MN (d)	05303000	-	1930-39, 1940-46
Chippewa River at Benson, MN (d)	05303500	1,270	1949-51
Shakopee Creek near Benson, MN (d)	05304000	352	1949-54
Chippewa River near Watson, MN (d)	05305000	2,050	1910-17, 1931-36
South Branch Yellow Medicine River at Minneota, MN (d)	05311400	111	1960-81, 1983-87
Spring Creek near Hazel Run, MN (d)	05312500	101	1945-48
Chetomba Creek near Maynard, MN (d)	05314000	200	1949-51
Hawk Creek near Maynard, MN (d)	05314500*	474	1949-54
Prairie Ravine near Marshall, MN (d)	05315200	5.63	1959-64
Redwood River near Green Valley, MN (d)	05315500	436	1947-57
Minnesota River at New Ulm, MN (d)	05316770	9,536	1968-76
Dry Creek near Jeffers, MN (d)	05316900	3.13	1982-85
Minnesota River at Judson, MN (d)	05317500	11,200	1938-50
East Branch (East Fork) Blue Earth River near Bricelyn, MN (d)	05318000	132	1951-70

DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS--Continued

Station name	Station number	Drainage area (mi ²)	Period of record
South Fork Watonwan River at diversion dam near St. James, MN (d)	05319000	-	193 ^a , 1940-46
Blue Earth River at Mankato, MN (d)	05321000	3,550	193 ^a -39, 1940-42
Sand Creek at diversion dam near Jordan, MN (d)	05330400	-	193 ^a -39, 1940-46
Purgatory Creek at Eden Prairie, MN (d)	05330800	-	197 ^c -80
Nine Mile Creek at Bloomington, MN (d)	05330900	-	1963-73
Glaishy Brook near Kettle River, MN (d)	05336200*	24.2	195 ^a -70
Kettle River near Sandstone, MN (d)	05336500	825	190 ^a -16
Grindstone River at Hinckley, MN (d)	05337000	-	194 ^a -47
Snake River at Mora, MN (d)	05337500	422	190 ^a -13
St. Croix River near Rush City, MN (d)	05339500	5,120	1923-61
Sunrise River near Stacy, MN (d)	05340000	167	194 ^a -65
Sunrise River near Lindstrom, MN (d)	05340050	231	1965-85
Vermillion River at Hastings, MN (d)	05346000	195	1942-47, 90
South Fork Zumbro River near Rochester, MN (d)	05373000	304	1952-81
Zumbro River (South Branch) near Zumbro Falls, MN (d)	05373500	821	1911-17
Zumbro River at Zumbro Falls, MN (d)	05374000*	-	190 ^a -17, 1929-80
Zumbro River at Theilman, MN (d)	05374500	1,320	193 ^a -56
Zumbro River at Kellogg, MN (d)	05374900	1,400	197 ^c -90
North Fork Whitewater River near Elba, MN (d)	05376000	101	193 ^a -41, 1967-93
Middle Fork Whitewater River near St. Charles, MN (d)	05376100	-	198 ^a -92
South Fork Whitewater River near Altura, MN (d)	05376500	76.8	193 ^a -71
Whitewater River at Beaver, MN (d)	05377500	288	193 ^a -38, 1939-56
Stockton Valley Creek at Stockton, MN (d)	05378230	-	1982-85
Garvin Brook near Minnesota City, MN (d)	05378235	-	1982-91
Straight Valley Creek near Rollingstone, MN (d)	05378300	5.16	197 ^a -85
Gilmore Creek at Winona, MN (d)	05379000	8.95	193 ^a -63
Mississippi River at LaCrosse, WI (d)	05383500	-	192 ^a -55
North Branch Root River tributary near Stewartville, MN (d)	05386000	0.73	195 ^a -64
Root River near Lanesboro, MN (d)	05384000*	615	1910, 11-17, 1940-85, 1987-90
Rush Creek near Rushford, MN (d)	05384500*	129	1942-79
South Fork Root River near Houston, MN (d)	05385500*	275	1953-83
Root River below South Fork near Houston, MN (d)	05386000	1,560	1938-61
Turtle Creek near Austin, MN (d)	05456500	144	1947-51
Heron Lake outlet nr Heron Lake, MN (d)	05475000	-	1930-43
Little Sioux River near Lakefield, MN (d)	06603000	17.1	1948-63
Jackson County Ditch No. 11 near Lakefield, MN (d)	06603500	7.69	1948-61

DISCONTINUED SURFACE-WATER-QUALITY STATIONS

Station name	Station number	Drainage area (mi ²)	Type of record	Period of record
Baptism River near Beaver Bay, MN	04014500	140	C., Bio., Sed., Temp., D.O., pH, S.C.	1968-93
Partridge River abv Colby Lake at Hoyt Lakes, MN	04015475	1qw06	Temp., S.C.	1976-85
St. Louis River at Forbes, MN	04018750	713	Sed.	1968-70
St. Louis River at Scanlon, MN	04024000	3430	C., Bio., Sed., Temp., D.O., pH, S.C.	1958-66, 68-94
Elim Creek near Holyoke, MN	04024090	1.06	Sed.	1976-79
Skunk Creek below Elim Creek near Holyoke, MN	04024093	8.83	C., Sed., Temp., D.O., pH, S.C.	1976-79
Deer Creek near Holyoke, MN	04024098	7.77	C., Bio., Temp., D.O., pH, S.C.	1977-79
			Sed.	1977-81
Otter Tail River below Orwell Dam, near Fergus Falls, MN	05046000	1740	C., Sed., Temp., D.O., pH, S.C.	1961-63, 65-66, 85-93-95
Bois de Sioux River near Doran, MN	05051300	1880	C., Sed., Temp., D.O., pH, S.C.	1993-95
Buffalo River near Dilworth, MN	05062000	1040	Sed.	1971-81
Clearwater River at Red Lake Falls, MN	05078500	1370	C., Sed., Temp., D.O., pH, S.C.	1964-66, 79, 92, 95
Red Lake River at Crookston, MN	05079000	5270	C., Sed., Temp., D.O., pH, S.C.	1962, 74-76, 79-95
Roseau River below Roseau	05105300		C., Bio., Sed., Temp., D.O., pH, S.C.	1973-83
Roseau River below State Ditch 51, near Caribou, MN	05112000	1560	C., Bio., Sed., Temp., D.O., pH, S.C.	1972-95
Little Fork River at Littlefork, MN	05131500	1730	C., Bio., Sed., Temp., D.O., pH, S.C.	1967, 69, 71, 73-86
Big Fork River at Big Falls, MN	05132000	1460	C., Bio., Sed., Temp., D.O., pH, S.C.	1968, 71-77
Rainy River at Manitou Rapids, MN	05133500	19,400	C., Bio., Sed., Temp., D.O., pH, S.C.	1968-70, 78-94
Elk River near Big Lake, MN	05275000	615	Sed., Temp.	1976-81
Crow River at Rockford, MN	05280000	2520	Sed., Temp.	1975-81
Mississippi River at Fridley, MN	05288550		Temp., D.O., pH, S.C.	1975-86
Mississippi River at Ford Plant at St. Paul, MN	05288950	19,700	Temp., D.O., pH, S.C.	1974-78, 81-82
Whetstone River near Big Stone City, SD	05291000	389	Sed., Temp.	1974-88
Yellow Bank River near Odessa, MN	05293000	398	Sed., Temp.	1974-88
Chippewa River near Milan, MN	05304500	1870	Sed., Temp.	1972-81
Yellow Medicine River near Granite Falls, MN	05313500	653	Sed., Temp.	1971-75, 77-81
Redwood River near Marshall, MN	05315000	259	Sed., Temp.	1968-71
Redwood River near Redwood Falls, MN	05316500	629	Sed., Temp.	1968-70
Cottonwood River near New Ulm, MN	05317000	1280	C., Bio., Temp., D.O., pH, S.C.,	1961-62, 64-68, 71-74-76, 89-92, 95
			Sed.,	1968-76
			Sed.	1977-80
Watonwan River near Garden City, MN	05319500	812		
Minnesota River at Burnsville, MN	05330908		Temp., D.O., pH, S.C.	1980-83
Minnesota River at Fort Snelling State Pk., St. Paul, MN	05330920	16,900	Temp., D.O., pH, S.C.	1973-83
Mississippi River at Industrial Molasses, St. Paul, MN	05331005		Temp., D.O., pH, S.C.	1976-85
Mississippi River at Fifth at Newport, MN	05331545		Temp., D.O., pH, S.C.	1979-90
Mississippi River at Grey Cloud Island near Cottage Grove, MN	05331560		Temp., D.O., pH, S.C.	1977-90
Mississippi River at Ninninger	05331570	37,000	C., Bio., Sed., Temp., D.O., pH, S.C.,	1977-95
Mississippi River at Lock and Dam 2 at Hastings, MN	05331578		Temp., D.O., pH, S.C.	1975-90
Snake River near Pine City, MN	05338500	958	C., Bio., Temp., D.O., pH, S.C.	1963, 65, 67-68, 75-83, 85, 92-94
St. Croix River at Afton, MN	05341770		Temp., D.O., pH, S.C.	1977-83
Vermillion River near Empire, MN	05345000	110	Temp., D.O., pH, S.C.	1974-91
			C., Bio.	1990-91
Mississippi River at Lock and Dam 3 near Red Wing, MN	05344980	46,000	Temp., D.O., pH, S.C.	1976-83
South Fork Zumbro River at Rochester, MN	05372995	303	Sed., Temp.	1981-82
Zumbro River at Kellogg, MN	05374900	1400	Sed., Temp.	1975-81
North Fork Whitewater River near Elba, MN	05376000	101	C., Bio., Sed., Temp., D.O., pH, S.C.	1967-93
Middle Fork Whitewater River near St. Charles, MN	05376100		Sed., Temp., S.C.	1988-92
Whitewater River near Beaver, MN	05376800	271	Sed., Temp.	1975-81
Mississippi River at Winona, MN	05378500	59,200	C., Bio., D.O., pH	1963-66, 76-88
Root River near Houston, MN	05385000	1270	Sed., Temp.	1975-81
South Fork Root River near Houston, MN	05385500	275	Sed., Temp.	1975-81
Cedar River near Austin, MN	05457000	425	Sed., Temp., S.C.	1971, 73-75, 78-81
Des Moines River at Jackson, MN	05476000	1220	C., Bio., D.O., pH, S.C.	1968-69, 73-76, 78-83, 89-90, 94-95
			Sed., Temp.	1968-81

INTRODUCTION

Water Resources Division of the U.S. Geological Survey, in cooperation with State agencies, obtains a large amount of data pertaining to the water resources of Minnesota each water year. These data, accumulated during many years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the Geological Survey, the data are published annually in this report series entitled 'Water Resources Data - Minnesota'.

Water resources data for the 1996 water year for Minnesota consist of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels and water quality of ground water. This volume contains discharge records for 100 stream-gaging stations; stage and contents for 14 lakes and reservoirs; water quality for 34 stream-gaging stations; and water levels for 15 observation wells. Also included are 87 high-flow partial-record stations and 1 precipitation water-quality station. These data represent a part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Minnesota.

This series of annual reports for Minnesota began with the 1961 water year with a report that contained only data relating to the quantities of surface water. For the 1964 water year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report was changed to present, in one volume, data on quantities of surface water, quality of surface and ground water, and ground-water levels.

Prior to introduction of this series and for several water years concurrent with it, water-resources data for Minnesota were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United States, Parts 4, 5 and 6A." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." The above mentioned Water-Supply papers can be consulted in the libraries of the principal cities of the United States and may be purchased from the books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225.

Publications similar to this report are published annually by the Geological Survey for all States. These official Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and volume number. For example, this volume is identified as the "U.S. Geological Survey Water-Data Report MN-96-1. For archiving and general distribution, the reports for 1971-1974 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

Additional information, including current prices, for ordering specific reports may be obtained from the district chief at the address given on the back of the title page or by telephone (612) 783-3100.

COOPERATION

The U.S. Geological Survey and agencies of the State of Minnesota have had cooperative agreements for the systematic collection of streamflow records since 1909, for ground-water levels since 1948, and for water-quality records since 1952.

Organizations that assisted in collecting data through cooperative agreement with the Survey are:

Minnesota Department of Natural Resources
Minnesota Department of Transportation
Minnesota Pollution Control Agency
Red Lake Watershed Management Board
Grand Portage Reservation Tribal Council
Beltrami Soil and Water Conservation District
Elm Creek Conservation Commission
Red River Watershed Management Board
City of Rochester
Bois Forte Reservation Tribal Council

Assistance in the form of funds or services was given by the U.S. Army Corps of Engineers, U.S. Department of State, and the Federal Energy Regulatory Commission. Other organizations that supplied data are acknowledged in station descriptions.

SUMMARY OF HYDROLOGIC CONDITIONS

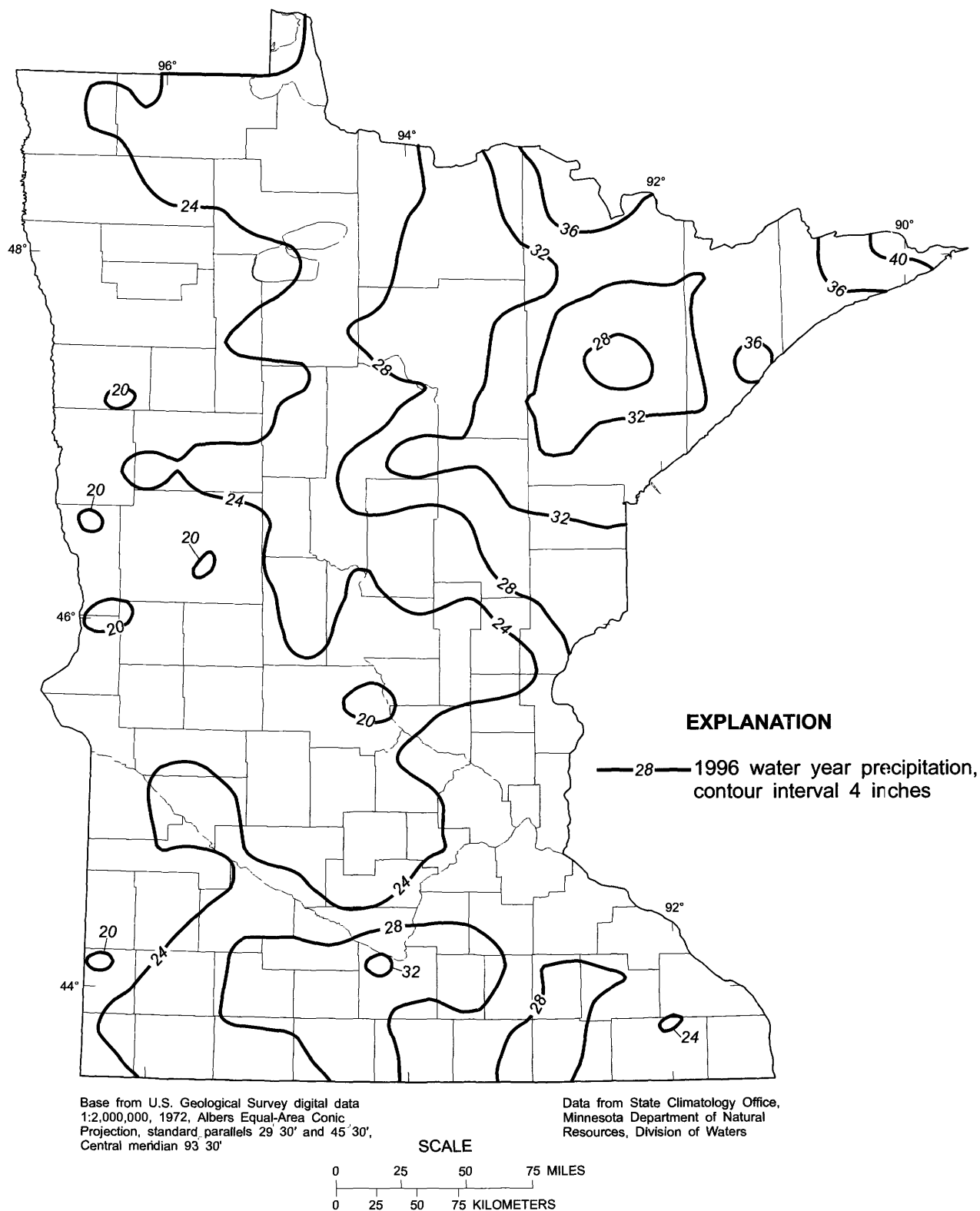
Precipitation

While the north central, northeast, southwest, and south central regions of Minnesota received greater than normal (based on data from 1961-90; fig. 2) precipitation during the 1996 water year, the northwest, west central, central, east central, and southeast regions received less than normal (fig. 1). Departures from normal ranged from -5.22 inches in the southeast to +3.24 inches in north-central Minnesota. Precipitation during the first two quarters of the 1996 water year was above normal in all regions of the State. The first snow fell on October 23 when western and northern Minnesota received 5-9 inches. By mid December, much of northern Minnesota had at least 18 inches of snow on the ground. A major storm on January 17-18 produced heavy snow in the north and west and left southeastern Minnesota with a coating of ice. A cold period in late January and early February produced many daily low-temperature records and a State record low of -60 degrees Fahrenheit at Tower in northeast Minnesota. Temperatures moderated by the second week of February and slowly melted the snow cover from southern Minnesota, but much of northern Minnesota still had more than 30 inches of snow cover on March 7. Significant snow cover persisted in the north well into mid-April. In the third quarter, Minnesota had below-normal precipitation with two notable storm events. In mid May, 2-6 inches of rain fell in the Red River Valley, and, on June 16-17, more than 6 inches of rain fell in parts of Nicollet and Blue Earth Counties in south-central Minnesota. In the 4th quarter, relatively dry weather continued with the southwest being the only region with above-normal precipitation. However, the northern part of the northwest region received above-normal rainfall in July and part of Blue Earth County, for the second time, received over 6 inches of rain in early September that produced mud slides in the Mankato area.

Surface Water

Figure 3 shows monthly-mean and annual-mean discharges for water year 1996 compared to normal (median of monthly-mean discharges for the period 1961-90) for 7 stations. The stations are located in 4 major basins - Lake Superior, Red River of the North, Lake of the Woods, and the upper Mississippi River. The 1996 annual-mean discharges were greater than the medians for all 7 stations.

Except for April and September, monthly-mean discharges in the Pigeon River at Middle Falls near Grand Portage were above normal in water year 1996. The annual mean discharge for 1996 was 669 ft³/s, which is 128 percent of normal. Annual runoff was 15.17 inches, an increase of 8.76 inches from the previous year.



**Figure 1.--Precipitation, in inches, during 1996
water year in Minnesota.**

WATER RESOURCES DATA FOR MINNESOTA, 1996

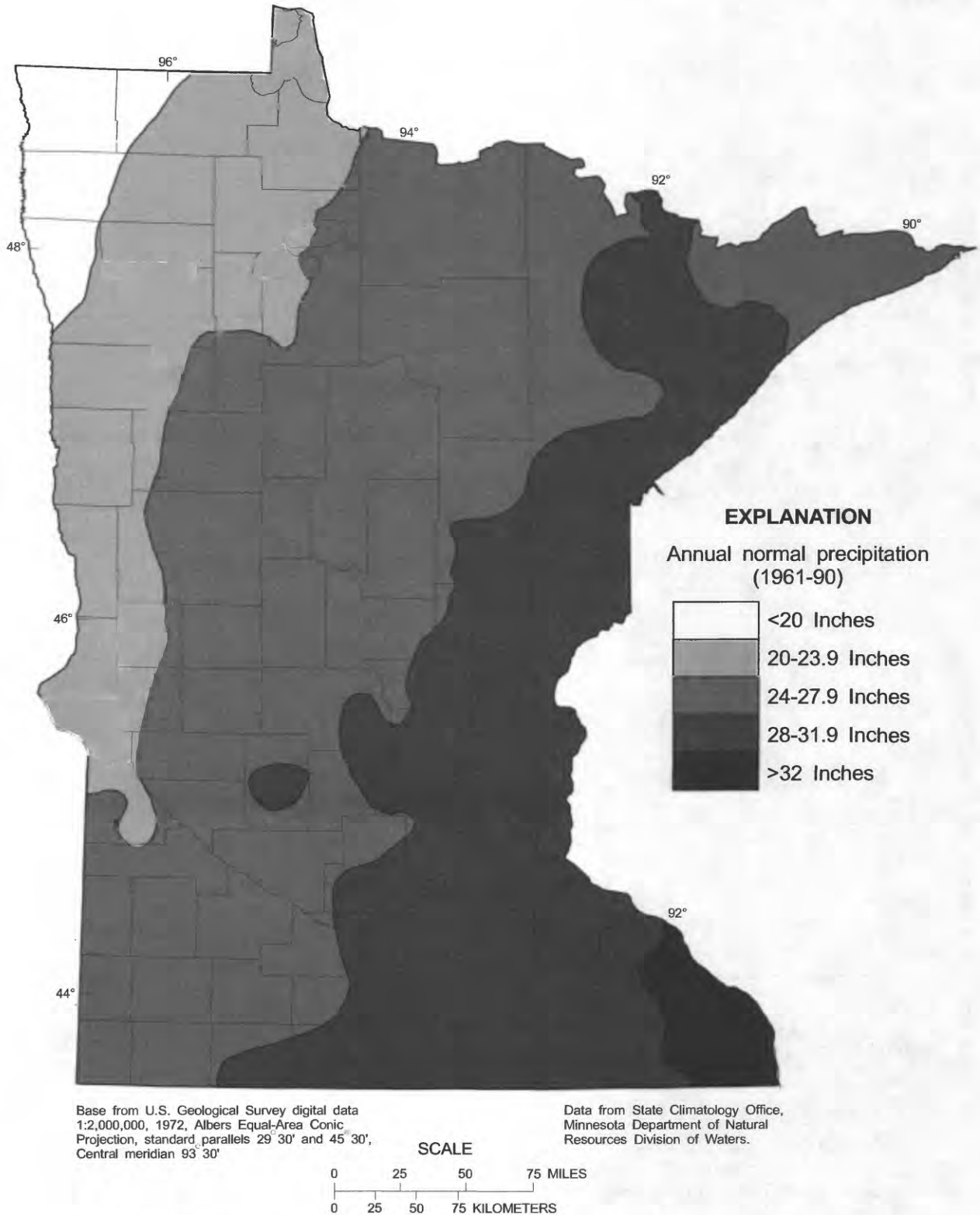
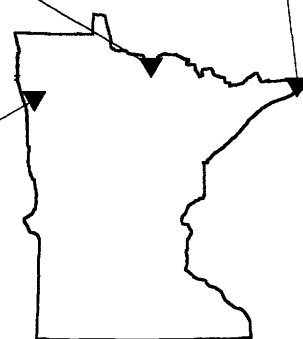
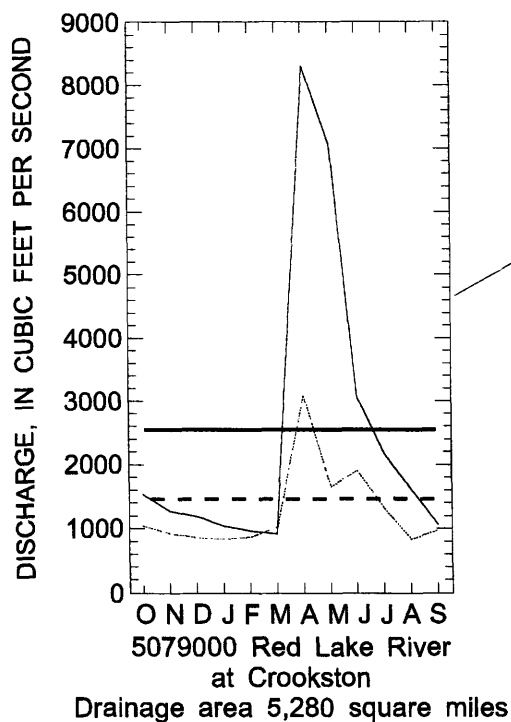
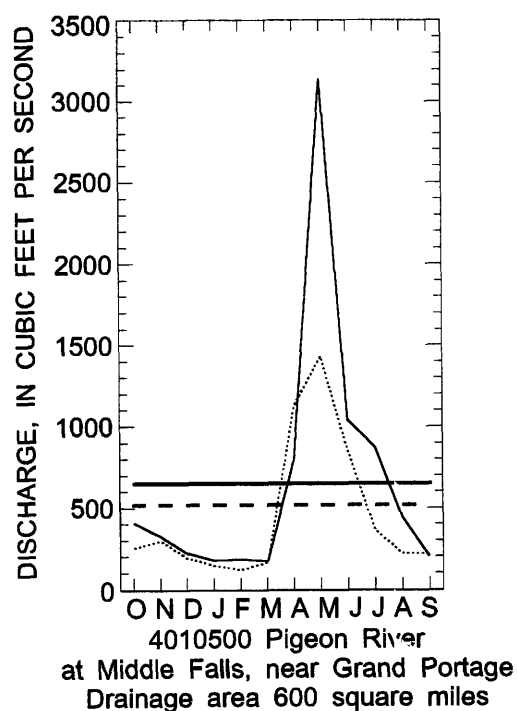
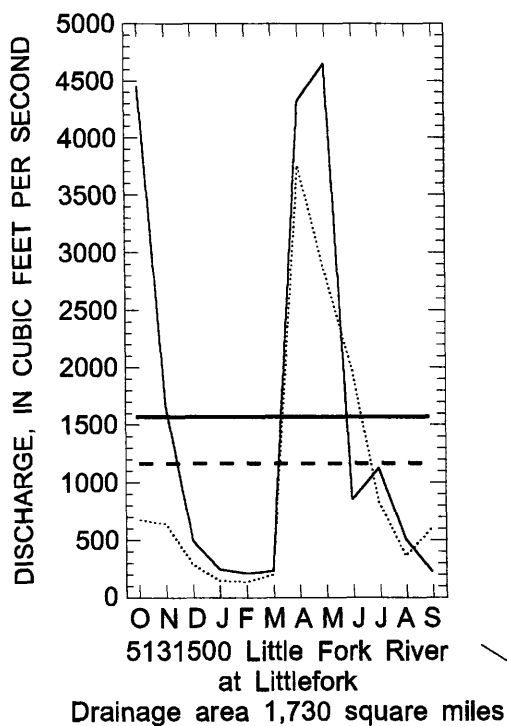


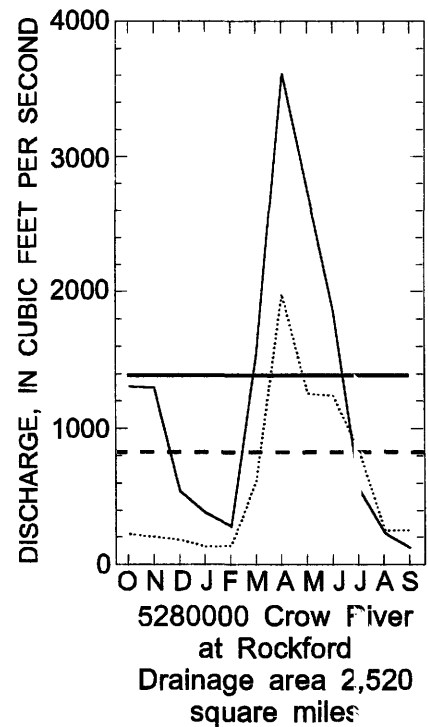
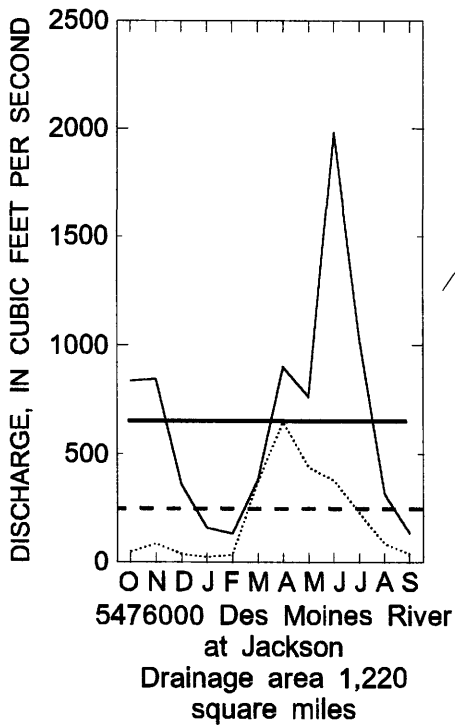
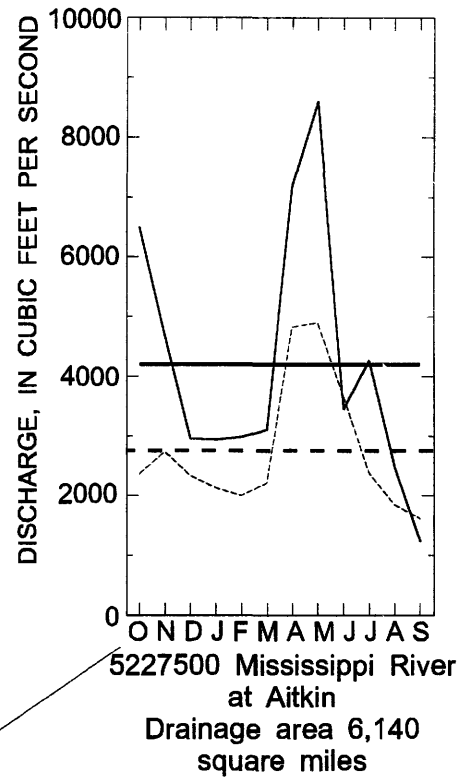
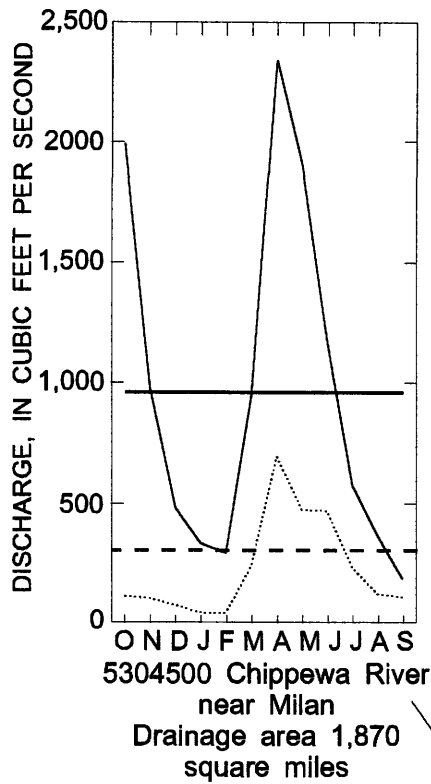
Figure 2.--Average annual precipitation, in inches, for 30-year period, 1961-90, in Minnesota.



EXPLANATION

- Mean monthly discharge, water year 1996
- Median of mean monthly discharge, 1961-1990
- Mean annual discharge, water year 1996
- - - - Median of mean annual discharge, 1961-1990

Figure 3.--Comparison of mean discharge for the 1996 water year with the median



of mean discharges for 1961-90 at seven long-term representative gaging stations.

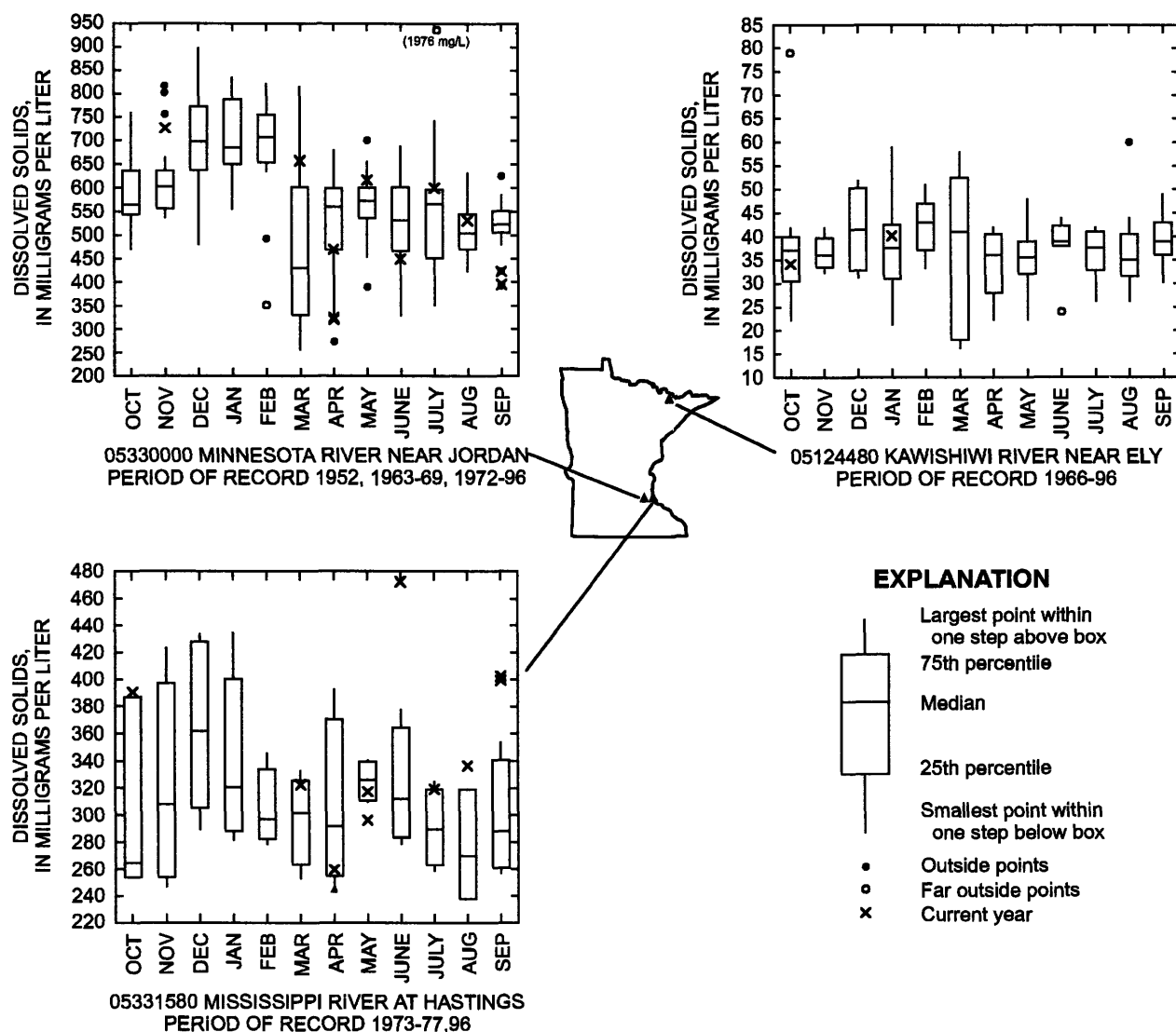


Figure 4. Dissolved-solids concentrations in samples collected during water year 1996 and selected statistics for period of record at four network stations.

Above-normal monthly-mean discharges occurred every month in the Red Lake River at Crookston, which is in the Red River of the North basin. Flows ranged from 108 percent of normal in September to 844 percent of normal in March. Water year 1996 ended with an annual runoff of 6.47 inches and an annual mean discharge of 2503 ft³/s, which is 174 percent of normal.

Except for June and September, monthly-mean discharges in the Little Fork River at Littlefork, which is in the Lake of the Woods basin, were above normal. The water year began with October being 663 percent of normal and it ended at 37 percent of normal in September. The annual mean discharge for 1996 was 1581 ft³/s, which is 136 percent of normal. Annual runoff for 1996 was 12.44 inches, an increase of 6.45 inches from the previous year.

Flows in the Mississippi River at Aitkin were above normal from October to May and from July to August. Flows were below normal in June and September. The annual discharge of 4195 ft³/s for 1996 is 152 percent of normal and is 1083 ft³/s more than last year's.

Flows in the Crow River at Rockford, located about 30 miles west of the

Twin Cities, were higher than normal the entire year except for the last three months. Monthly-mean flows ranged from 44 to 646 percent of normal. The annual mean discharge of 1198 ft³/s for 1996 is 189 ft³/s less than last year and is 144 percent of normal.

In the Chippewa River near Milan, monthly-mean flows were again much greater than normal for the entire year. The month with the greatest departure from normal was July with a monthly-mean discharge of 1988 ft³/s, which is 1820 percent of normal. September had the smallest departure from normal with a monthly-mean discharge of 181 ft³/s, which is 174 percent of normal. The annual mean discharge for 1996 was 995 ft³/s, which is 327 percent of normal and 89 ft³/s greater than the previous year.

The Minnesota River drains approximately 17,000 mi² that cover a large portion of western and southern Minnesota. Above-normal flows in the Minnesota River near Jordan, about 40 miles southwest of the Twin Cities, continued throughout the 1996 water year. Flows ranged from 123 percent of normal for July to 694 percent of normal for November. The year ended with

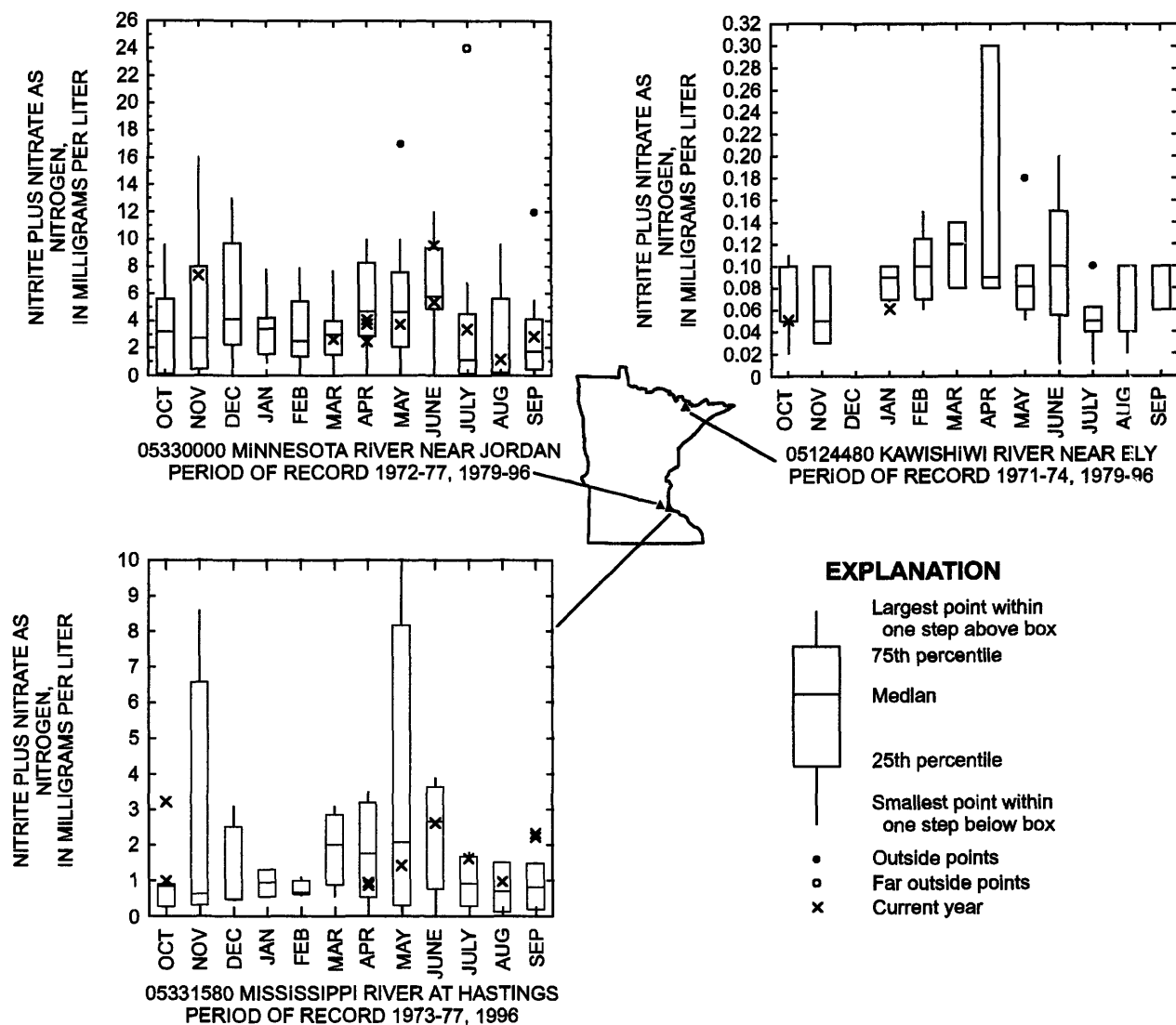


Figure 5. Nitrite plus nitrate concentrations in samples collected during water year 1996 and selected statistics for period of record at four network stations.

an annual-mean flow of 7275 ft³/s, 194 percent of normal and 1894 ft³/s less than the previous year.

In the Mississippi River at St. Paul, located 5.5 miles downstream from the mouth of the Minnesota River, monthly-mean flows were above normal the entire year except September. The annual-mean discharge of 19,650 ft³/s for 1996 is 146 percent of normal and is 820 ft³/s less than the mean discharge for the previous year.

Flows in the Root River near Houston in southeast Minnesota were above normal during all months except for April, May, and September. The year began with October having a monthly-mean flow that was 126 percent of normal, and the year ended with a monthly-mean flow that was 89 percent of normal. The annual-mean discharge of 721 ft³/s for 1996 is greater than normal but is 128 ft³/s less than last year's mean.

Flows in the Des Moines River at Jackson in southwest Minnesota were again greater than normal for the entire year. Flows ranged from 102 percent of normal for March to 1780 percent of normal for October. Monthly mean

flows ranged from 131 ft³/s for February to 1986 ft³/s for June. The annual mean discharge of 654 ft³/s for 1996 is 272 percent of normal but is 174 ft³/s less than the flow for the previous year.

Combined storage in the 6 Mississippi River Headwater Reservoirs (Winnibigoshish, Leech, Pokegama, Pine, Sandy, and Gull), in north-central Minnesota, was 1,583,000 acre-feet at the close of the 1995 water year. This was an increase of 48,000 acre-feet from the close of last year.

Water Quality

Boxplots for 2 U.S. Geological Survey National Stream-Quality Accounting Network (NASQAN) stations and 1 Benchmark station are used to depict, to a limited extent, variability in concentrations of dissolved solids and nitrate as nitrogen (figs. 4 and 5).

Boxplots display the central tendency, variation, and skewness of a data set as well as the presence or absence of extreme values. A boxplot consists of a centerline (the median) dividing a rectangle whose ends are defined by the

75th and 25th percentiles. Whiskers extend from the ends of the box to the most extreme observation within 1.5 times the interquartile range (the distance from the 25th to the 75th percentile values) beyond the ends of the box. Values more than 1.5 interquartile ranges from the box ends may indicate extreme hydrologic and chemical conditions or sampling and analytical errors. Observations from 1.5 to 3 interquartile ranges from the box in either direction are plotted individually with a closed circle.

Observations greater than 3 interquartile ranges from the ends of the box are plotted with an open circle. Water year 1996 values are plotted with an " " to show where these data lie with respect to the distribution of the historic data.

Dissolved-solids concentrations at the Benchmark station, Kawishiwi River near Ely, can be significantly affected by dissolved organic content. Samples in water year 1996 were collected in October and January; dissolved-solids concentrations were 34 and 40 milligrams per liter, respectively. A mixture of samples for Minnesota River near Jordan and Mississippi River below Lock and Dam 2 at Hastings were collected under the NASQAN program and the NAWQA (National Water-Quality Assessment) program. Dissolved-solids concentrations varied at Jordan depending on flow conditions. Dissolved-solids concentrations at Hastings collected in the 1996 water year are compared to data that were collected in the 1970's. Current water-year values for June, August, and September were much higher than historical data.

Nitrate concentrations reported as nitrogen (analyzed for nitrate plus nitrite) are shown in figure 5. In the two samples collected at Kawishiwi River near Ely, nitrate concentrations are <0.05 and 0.06 mg/L. Nitrate concentrations in the Minnesota River near Jordan ranged from 1.1 mg/L in an August sample to 9.5 mg/L in a June sample. The June sample was collected during a rising stage. Most nitrate concentrations in the Mississippi River below Lock and Dam 2 at Hastings compared with historical data. Two samples collected in October were collected during different flow conditions; the higher-concentration sample was collected when the flow was >30,000 ft³/s and the lower-concentration sample was collected when the flow was >10,000 ft³/s.

Data for 194 ground-water samples collected in 22 counties are published in this report. Nitrate concentrations (reported as nitrogen) were determined in 130 samples; 9 of those concentrations are above the primary drinking-water standard of 10 mg/L (Minnesota Pollution Control Agency, 1988). Iron concentrations were determined in 53 samples, and 26 iron concentrations are above the standard of 300 µg/L. Manganese concentrations were determined in 54 samples, and 35 of these concentrations are above the manganese standard of 50 µg/L.

Ground-Water Levels

The current observation-well network includes 15 wells, of which 12 are equipped with recorders. These wells include three in surficial sand aquifers, one in the St. Peter aquifer, eight in the Prairie du Chien-Jordan aquifer, two in the Franconia-Ironton-Galesville aquifer, and one in the Mount-Simon-Hinckley-Fond du Lac aquifer. Data from these wells are presented in this volume. The location of these wells is shown in figure 10.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Bench-Mark Network is a network of 50 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by human activities.

National Stream-Quality Accounting Network (NASQAN) monitors the water quality of large rivers within four of the Nation's largest river basins—the Mississippi, Columbia, Colorado, and Rio Grande. The network consists of 39 stations. Samples are collected with sufficient frequency that the flux of a wide range of constituents can be estimated. The objective of NASQAN is to characterize the water quality of these large rivers by measuring

concentration and mass transport of a wide range of dissolved and suspended constituents, including nutrients, major ions, dissolved and sediment-bound heavy metals, common pesticides, and inorganic and organic forms of carbon. This information will be used (1) to describe the long-term trends and changes in concentration and transport of these constituents; (2) to test findings of the National Water-Quality Assessment Program (NAWQA); (3) to characterize processes unique to large-river systems such as storage and re-mobilization of sediments and associated contaminants; and (4) to refine existing estimates of off-continent transport of water, sediment, and chemicals for assessing human effects on the world's oceans and for determining global cycles of carbon, nutrients, and other chemicals.

The National Atmospheric Deposition Program/National Trends Network (NADP/NTN) provides continuous measurement and assessment of the chemical climate of precipitation throughout the United States. As the lead federal agency, the USGS works together with over 100 organizations to accomplish the following objectives: (1) Provide a long-term, spatial and temporal record of atmospheric deposition generated from a network of 191 precipitation chemistry monitoring sites. (2) Provide the mechanism to evaluate the effectiveness of the significant reduction in SO₂ emissions that began in 1995 as implementation of the Clean Air Act Amendments (CAAA) occurred. (3) Provide the scientific basis and nationwide evaluation mechanism for implementation of the Phase II CAAA emission reductions for SO₂ and NO₂ scheduled to begin in 2000.

Data from the network, as well as information about individual sites, are available through the world wide web at:

<http://nadp.nrel.colostate.edu/NADP>

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is a long-term program with goals to describe the status and trends of water-quality conditions for a large, representative part of the Nation's ground- and surface-water resources; provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Assessment activities are being conducted in 53 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents will be measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide information for decision making by water-resources managers and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

Communication and coordination between USGS personnel and other local, State, and federal interests are critical components of the NAWQA Program. Each study unit has a local liaison committee consisting of representatives from key federal, State, and local water resources agencies, Indian nations, and universities in the study unit. Liaison committees typically meet semiannually to discuss their information needs, monitoring plans and progress, desired information products, and opportunities to collaborate efforts among the agencies.

Additional information about the NAWQA Program is available through the world wide web at:

http://wwwrvares.er.usgs.gov/nawqa/nawqa_home.html

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Tritium network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation

stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1996 water year that began October 1, 1995, and ended September 30, 1996. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, water-quality data for the surface and ground water, and ground-water-level data. The locations of the stations and wells where the data were collected are shown in figures 7, 8, 9 and 10. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

STATION IDENTIFICATION NUMBERS

Each data station, whether stream site or well, in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The system used by the U.S. Geological Survey to assign identification numbers for surface-water stations and for ground-water well sites differ, but both are based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for wells and, in Minnesota, for surface-water stations where only miscellaneous measurements are made.

Downstream Order System and Station Number

Since October 1, 1950, the order of listing hydrologic-station records in U.S. Geological Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a mainstream station are listed before that station. A station on a tributary that enters between two main-stream sections is listed between them. A similar order is followed by listing stations on first rank, second rank, and other order ranks of tributaries. The rank of any tributary on which a station is situated with respect to the stream to which it is immediately tributary is indicated by an indentation in a list of stations in front of the report. Each indentation represents one rank. This downstream order and system of indention show which stations are on tributaries between any two stations and the rank of the tributary on which each station is situated.

As an added means of identification, each hydrologic station and partial-record station has been assigned a station number. These are in the same downstream order in this report. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station such as 05041000, which appears just to the left of the station name, includes the two-digit part number "05" plus the six-digit downstream order number "041000."

Numbering System for Wells and Miscellaneous Sites

The eight-digit downstream order station numbers are not assigned to wells and miscellaneous sites where only random water-quality samples or discharge measurements are taken.

The well and miscellaneous site numbering system of the U.S. Geological Survey is based on the grid system of latitude and longitude. The system provides the geographic location of the well or miscellaneous site and a unique number for each site. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the wells or other sites within a one-second grid. See figure 6. Each well site is also identified by a local well number which consists of

township, range, and section numbers, three letters designating 1/4, 1/4, 1/4 section location, and a two-digit sequential number.

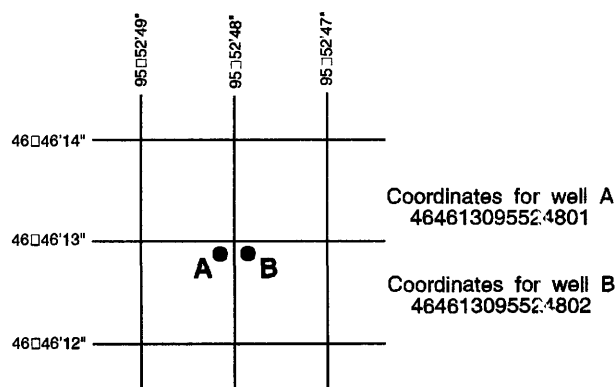


Figure 6. Example of system for numbering wells and miscellaneous sites.

RECORDS OF STAGE AND WATER DISCHARGE

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean daily discharge may be computed for anytime, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "High-flow partial records," or "Low-flow partial records." Records of miscellaneous discharge measurements or of measurements from special studies, such as low-flow seepage studies, may be considered as partial records, but they are presented separately in this report. Location of all complete-record and high-flow partial-record stations for which data are given in this report are shown in figures 7 and 9.

Data Collection and Computation

The data obtained at a complete-record gaging station on a stream or canal consist of a continuous record of stage, individual measurements of discharge throughout a range of stages, and notations regarding factors that may affect the relationships between stage and discharge. These data, together with supplemental information, such as weather records, are used to compute daily discharges. The data obtained at a complete-record gaging station on a lake or reservoir consist of a record of stage and of notations regarding factors that may affect the relationship between stage and lake content. These data are used with stage-area and stage-capacity curves or tables to compute water-surface areas and lake storage.

Records of stage are obtained with recorders that trace continuous graphs of stage; or encode stage values at selected time intervals and store on a variety of mediums. Measurements of discharge are made with current meters using methods adapted by the U.S. Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter A6.

In computing discharge records, results of individual measurements are plotted against the corresponding stages, and stage-discharge relation curves are then constructed. From these curves, rating

tables indicating the approximate discharge for any stage within the range of the measurements are prepared. If it is necessary to define extremes of discharge outside the range of current-meter measurements, the curves are extended using: (1) logarithmic-plotting; (2) velocity-area studies; (3) results of indirect measurements of peak discharge, such as slope-area or contracted-opening measurements, and computations of flow-over-dams or weirs; or (4) step-backwater techniques.

Daily-mean discharges are computed by applying the daily-mean stages (gage heights) to the stage-discharge curves or tables. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on the individual discharge measurements and notes of the personnel making the measurements are applied to the gage heights before the discharges are determined from the curves or tables. This shifting-control method also is used if the stage-discharge relation is changed temporarily because of aquatic growth or debris on the control. For some stations, formation of ice in the winter may so obscure the stage-discharge relations that daily-mean discharges must be estimated from other information such as temperature and precipitation records, notes of observations, and records for other stations in the same or nearby basins for comparable periods.

At some stream-gaging stations the stage-discharge relation is affected by the backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage; at these stations the rate of change in stage is used as a factor in computing discharge.

In computing records of lake or reservoir contents, it is necessary to have available from surveys, curves, or tables defining the relationship of stage and content. The application of stage to the stage-content curves or tables gives the contents from which daily, monthly, or yearly changes then are determined. If the stage-content relationship changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relationship. Even when this is done, the contents computed may become increasingly in error as time since the last survey increases. Discharge over lake or reservoir spillways are computed from stage-discharge relationships much as other stream discharges are computed.

For some gaging stations there are periods when no gage-height record is obtained, or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. For such periods, the daily discharges are estimated from the recorded range in stage, previous or following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous or following record, inflow-outflow studies, and other information. Information explaining how estimated daily-discharge values are identified in station records is included in the next two sections, "Data Presentation" (REMARKS paragraph) and "Identifying Estimated Daily Discharge."

Data Presentation

Streamflow data in this report are presented in a new format that is considerably different from the format in data reports prior to the 1991 water year. The major changes are that statistical characteristics of discharge now appear in tabular summaries following the water-year data table and less information is provided in the text or station manuscript above the table. These changes represent the results of a pilot program to reformat the annual water-data report to meet current user needs and data preferences.

The records published for each continuous-record surface-water discharge station (gaging station) now consist of four parts, the manuscript or station description; the data table of daily mean values of discharge for the

current water year with summary data; a tabular statistical summary of monthly mean flow data for a designated period, by water year; and a summary statistics table that includes statistical data of annual, daily and instantaneous flows as well as data pertaining to annual runoff, 7-day low-flow minimums, and flow duration.

Station manuscript

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside the period of record; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments to follow clarify information presented under the various headings of the station description.

LOCATION.--Information on locations is obtained from the most accurate maps available. The location of the gage with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages, given for only a few stations, were determined by methods given in "River Mileage Measurement," Bulletin 14, Revision of October 1968 prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

DRAINAGE AREA.--Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

PERIOD OF RECORD.--This indicates the period for which there are published records for the station or for an equivalent station. An equivalent station is one that was in operation at a time when the present station was not, and whose location was such that records from it can reasonably be considered equivalent with records from the present station.

REVISED RECORDS.--Published records, because of new information, occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all reports in which revisions have been published for the station and water years to which the revisions apply. If a revision did not include daily, monthly, or annual figures of discharge, that fact is noted after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" means that only the instantaneous minimum was revised; and "(P)" means that only peak discharges were revised. If the drainage area has been revised, the report in which the most recently revised figure was first published is given.

GAGE.--The type of gage in current use, the datum of the current gage referred to National Geodetic Vertical Datum of 1929 (see glossary), and a condensed history of the types, locations, and datum of previous gages are given under this heading.

REMARKS.--All periods of estimated daily-discharge record will either be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily-discharge table. If a remarks statement is used to identify estimated record, the paragraph will begin with this information presented as the first entry. The paragraph is also used to present information relative to the accuracy of the records, to special methods of computation, to conditions that affect natural flow at the station and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

COOPERATION.--Records provided by a cooperating organization or obtained for the U.S. Geological Survey by a cooperating organization are identified here.

EXTREMES OUTSIDE PERIOD OF RECORD.--Included here is the information concerning major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the U.S. Geological Survey.

REVISIONS.--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the Minnesota District office (address given on the back of title page of this report) to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check because any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the "Remarks" and to the inclusion of a skeleton stage-capacity table when daily contents are given.

Headings for AVERAGE DISCHARGE, EXTREMES FOR PERIOD OF RECORD, AND EXTREMES FOR CURRENT YEAR have been deleted and the information contained in these paragraphs, except for the listing of secondary instantaneous peak discharges in the EXTREMES FOR CURRENT YEAR paragraph, is now presented in the tabular summaries following the discharge table or in the REMARKS paragraph, as appropriate. No changes have been made to the data presentations of lake contents.

Data table of daily-mean values

The daily table of discharge records for stream-gaging stations gives mean discharge for each day of the water year. In the monthly summary for the table, the line headed "TOTAL" gives the sum of the daily figures for each month; the line headed "MEAN" gives the average flow in cubic feet per second for the month; and the lines headed "MAX" and "MIN" give the maximum and minimum daily mean discharges, respectively, for each month. Discharge for the month also is usually expressed in cubic feet per second per square mile (line headed "CFSM"); or in inches (line headed "IN"); or in acre-feet (line headed "AC-FT). Figures for cubic feet per second per square mile and runoff in inches or in acre-feet may be omitted if there is extensive regulation or diversion or if the drainage area includes large noncontributing areas. At some stations monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversion data or reservoir contents are given. These figures are identified by a symbol and corresponding footnote.

Statistics of monthly mean data

A tabular summary of the mean (line headed "MEAN"), maximum (line headed "MAX"), and minimum (line headed "MIN") of monthly mean flows for each month for a designated period is provided below the mean values table. The water years of the first occurrence of the maximum and minimum monthly flows are provided immediately below those figures. The designated period will be expressed as "FOR WATER YEARS 19__-19__, BY WATER YEAR (WY)," and will list the first and last water years of the range of years selected from the PERIOD OF RECORD paragraph in the station manuscript. It will consist of all of the station record within the specified water years, inclusive, including complete months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript.

Summary statistics

A table titled "SUMMARY STATISTICS" follows the statistics of monthly mean data tabulation. This table consists of four columns, with the first column containing the line headings of the statistics being reported. The table provides a statistical summary of yearly, daily, and instantaneous flows, not only for the current water year but also for the previous calendar year and for a designated period, as appropriate. The

designated period selected, "WATER YEARS 19__-19__," will consist of all of the station record within the specified water years, inclusive, including complete months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript. All of the calculations for the statistical characteristics designated ANNUAL (see line headings below), except for the ANNUAL 7-DAY MINIMUM statistic, are calculated for the designated period using complete water years. The other statistical characteristics may be calculated using partial water years.

The date or water year, as appropriate, of the first occurrence of each statistic reporting extreme values of discharge is provided adjacent to the statistic. Repeated occurrences may be noted in the REMARKS paragraph of the manuscript or in footnotes. Because the designated period may not be the same as the station period of record published in the manuscript, occasionally the dates of occurrence listed for the daily and instantaneous extremes in the designated-period column may not be within the selected water years listed in the heading. When this occurs, it will be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration curve statistics and runoff data are also given. Runoff data may be omitted if there is extensive regulation or diversion of flow in the drainage basin.

The following summary statistics data, as appropriate, are provided with each continuous record of discharge. Comments to follow clarify information presented under the various line headings of the summary statistics table.

ANNUAL TOTAL.--The sum of the daily-mean values of discharge for the year. At some stations the yearly-mean discharge is adjusted for reservoir storage or diversion. The adjusted figures are identified by symbol and corresponding footnotes.

ANNUAL MEAN.--The arithmetic mean of the individual daily mean discharges for the year noted or for the designated period. At some stations the yearly-mean discharge is adjusted for reservoir storage or diversion. The adjusted figures are identified by a symbol and corresponding footnotes.

HIGHEST ANNUAL MEAN.--The maximum annual mean discharge occurring for the designated period.

LOWEST ANNUAL MEAN.--The minimum annual mean discharge occurring for the designated period.

HIGHEST DAILY MEAN.--The maximum daily mean discharge for the year or for the designated period.

LOWEST DAILY MEAN.--The minimum daily mean discharge for the year or for the designated period.

ANNUAL 7-DAY MINIMUM.--The lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1-March 31). The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day 10-year low-flow statistic.)

INSTANTANEOUS PEAK FLOW.--The maximum instantaneous discharge occurring for the water year or for the designated period. Note that secondary instantaneous peak discharges above a selected base discharge are stored in Minnesota District computer files for stations meeting certain criteria. Those discharge values may be obtained by writing to the Minnesota District Office. (See address on back of title page of this report.)

INSTANTANEOUS PEAK STAGE.--The maximum instantaneous stage occurring for the water year or for the designated period. If the dates of occurrence for the instantaneous peak flow and instantaneous peak stage differ, the REMARKS paragraph in the manuscript or a footnote may be used to provide further information.

INSTANTANEOUS LOW FLOW.--The minimum

instantaneous discharge occurring for the water year or for the designated period.

ANNUAL RUNOFF --Indicates the total quantity of water in runoff for a drainage area for the year. Data reports may use any of the following units of measurement in presenting annual runoff data.

Acre-foot (AC-FT) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Cubic feet per second per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming the runoff is distributed uniformly in time and area.

Inches (INCHES) indicates the depth to which the drainage area would be covered if all of the runoff for a given time period were uniformly distributed on it.

10 PERCENT EXCEEDS.--The discharge that is exceeded by 10 percent of the flow for the designated period.

50 PERCENT EXCEEDS.--The discharge that is exceeded by 50 percent of the flow for the designated period.

90 PERCENT EXCEEDS.--The discharge that is exceeded by 90 percent of the flow for the designated period.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified either by flagging individual daily values with the letter symbol "e" and printing a table footnote, "e Estimated", or by listing the dates of the estimated record in the REMARKS paragraph of the station description.

Accuracy of the Records

The accuracy of streamflow records depends primarily on: (1) The stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements; and (2) the accuracy of measurements of stage, measurements of discharge, and interpretation of records.

The accuracy attributed to the records is indicated under "REMARKS." "Excellent" means that about 95 percent of the daily discharges are within 5 percent of the true; "good," within 10 percent; and "fair," within 15 percent. Records that do not meet the criteria mentioned, are rated "poor." Different accuracies may be attributed to different parts of a given record.

Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than 1 ft³/s; to the nearest tenth between 1.0 and 10 ft³/s; to whole numbers between 10 and 1000 ft³/s; and to 3 significant figures for more than 1000 ft³/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to

artificial causes, or to other factors. For such stations figures of cubic feet per second per square mile and of runoff, in inches, are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge

Other Records Available

Information of a more detailed nature than that published for most of the gaging stations such as observations of water temperatures, discharge measurements, gage-height records, and rating tables is on file in the Minnesota District office. Also most gaging-station records are available in computer-usable form and many statistical analyses have been made.

Information on the availability of unpublished data or statistical analyses may be obtained from the district office.

The National Water Data Exchange, Water Resources Division, U.S. Geological Survey, National Center, Reston, VA 22092, maintains an index of all discharge-measurement sites in the State as well as an index of records of discharge collected by other agencies but not published by the U.S. Geological Survey. Information on records available at specific sites can be obtained upon request.

RECORDS OF SURFACE-WATER QUALITY

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may involve a variety of types of data and measurement frequencies.

Classification of Records

Water-quality data for surface-water sites are grouped into one of three classifications. A **continuing record station** is a site where data are collected on a regularly scheduled basis. Frequency may be once or more times daily, weekly, monthly, or quarterly. A **partial-record station** is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A **miscellaneous** sampling site is a location other than a continuing or partial-record station, where random samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A distinction needs to be made between "continuing records" as used in this report and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figure 9.

Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of discharge measurements at miscellaneous sites.

On-Site Measurement and Sample Collection

Water quality data must be representative of the in situ quality of water.

To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen need to be made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to be followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory. Procedures for on-site measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," Book 1, Chap. D2; Book 3, Chap. C2; Book 5 Chap. A1, A3, and A4. All of these references are listed on p. of this report. Also, detailed information on collecting, treating, and shipping samples may be obtained from the Geological Survey Minnesota District office.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream Quality Accounting Network (see definitions) are obtained from at least several verticals. Whether samples are obtained from the centroid of flow or from several verticals, depends on flow conditions and other factors which must be evaluated by the collector.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the U.S. Geological Survey Minnesota District office whose address is given on the back of the title page of this report.

Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the Minnesota District office.

Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross section, or a single sample may be obtained at a fixed point and a coefficient applied to determine the mean concentration in the cross sections.

During periods of rapidly changing flow or rapidly changing

concentration, samples may have been collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided-day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method. For periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

At other stations, suspended-sediment samples were collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observations, such data are useful in establishing seasonal relations between quality and streamflow and in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of suspended-sediment discharge records of the periodic measurements of the particle-size distribution of the suspended sediment and bed material are included for some stations.

Laboratory Measurements

Samples for indicator bacteria and specific conductance are analyzed locally. All other samples are analyzed in the Geological Survey Laboratories in Arvada, Colo., Doraville, Ga., or Iowa City, Ia. Methods used in analyzing sediment samples and computing sediment records are given in Transactions of Water Resources Investigations (TWRI), Book 5, Chap. C1. Methods used by the U.S. Geological Survey laboratories are given in TWRI, Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4.

Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of "daily values" of specific conductance, pH, water temperature, dissolved, and suspended sediment then follow in sequence.

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information, when appropriate, is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.--See Data Presentation under "Records of stage and Water Discharge"; same comments apply.

DRAINAGE AREA.--See Data Presentation under "Records of stage and Water Discharge"; same comments apply.

PERIOD OF RECORD.--This indicates the periods for which there are published water-quality records for the station. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.--Information on instrumentation is given only if a water-quality monitor, temperature recorder, sediment pump-and-sampler, or other sampling device is in operation at a station.

REMARKS.--Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.--Records provided by a cooperating

organization or obtained from the U.S. Geological Survey by a cooperating organization are identified here.

EXTREMES.--Maximums and minimums are given only for parameters measured daily or more frequently. None are given for parameters measured weekly or less frequently, because the true maximums or minimums may not have been sampled. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made to the Water-Quality File in the U.S. Geological Survey's computerized data system, WATSTORE, and subsequently by monthly transfer of update transactions to the U.S. Environmental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file to insure the most recent updates.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given for these records. Each station is published with its own station number and name in the regular downstream-order sequence.

Remark Codes

The following remark codes may appear with the water-quality data in this report:

<u>CODE</u>	<u>REMARK</u>
E	Estimated value
>	Actual value is known to be greater than the value shown
<	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)
L	Biological organisms count less than 0.5 percent (organisms may be observed rather than counted)
D	Biological organism count equal to or greater than 15 percent (dominant)
&	Biological organism estimated as dominant

Dissolved Trace-Element Concentrations

Traditionally, dissolved trace-element concentrations have been reported at the microgram per liter ($\mu\text{g/L}$) level. Recent evidence, mostly from large rivers, indicates that actual dissolved-phase concentrations for a number of trace elements are within the range of 10's and 100's of nanograms per liter (ng/L). Present data above the $\mu\text{g/L}$ level should be used with caution. Such data may actually represent elevated environmental concentrations from natural or human causes; however, these data could reflect contamination introduced during sampling, processing, or analysis. To confidently produce dissolved trace-element data with insignificant contamination, the U.S. Geological Survey began using new trace-element protocols at some stations in water year 1994.

Changes in National Trends Network Procedures

Sample handling procedures at all National Trends Network stations were changed substantially on January 11, 1994, in order to reduce contamination from the sample shipping container. The data for samples

before and after that date are different and not be comparable. A tabular summary of the differences based on a special intercomparison study, is available from the NADP/NTN Coordination Office, Colorado State University, Fort Collins, CO 80523 (Telephone: 303-491-5643).

RECORDS OF GROUND-WATER LEVELS

Only water-level data from a national network of observation wells are given in this report. These data are intended to provide a sampling and historical record of water-level changes in the Nation's most important aquifers. Locations of the observation wells in this network in Minnesota are shown in figure 10.

Although, in this report, records of water levels are presented for fewer than 20 wells, records are obtained through cooperative efforts of many Federal, State, and local agencies for several hundred observation wells throughout Minnesota and are placed in computer storage. Each spring, the Minnesota Department of Natural Resources, Division of Waters publishes a report for the previous water year entitled "Observation Well Data Summary, Water Year 19__." This report contains hydrographs of recorder wells, detailed maps showing the location of active observation wells, and other useful items. Information about the availability of the data in the water-level file may be obtained from the District Chief, Minnesota District. (See address on back of front page).

Data Collection and Computation

Measurements of water levels are made in many types of wells under varying conditions, but the methods of measurement are standardized to the extent possible. The equipment and measuring techniques used at each observation well assure that measurements at each well are of consistent accuracy and reliability.

Tables of water-level data are presented by counties arranged in alphabetical order. The prime identification number for a given well is the 15-digit number that appears in the upper left corner of the table. The secondary identification number is the local well number, an alphanumeric number, derived from the township-range location of the well.

Water-level records are obtained from direct measurements with a steel tape or from the graph or punched tape of a water-stage recorder. The water-level measurements in this report are given in feet with reference to land-surface datum (lsd). Land-surface datum is a datum plane that is approximately at land surface at each well. If known, the elevation of the land-surface datum is given in the well description. The height of the measuring point (MP) above or below land-surface datum is given in each well description. Water levels in wells equipped with recording gages are reported for every fifth day and the end of each month (eom).

All water-level measurements are reported to the nearest hundredth of a foot. The error of water-level measurements is normally only a hundredth or a few hundredths of a foot.

Hydrographs showing water-level fluctuations are included for all of the representative wells in both the surficial-sand and bedrock aquifers.

Data Presentation

Each well record consists of two parts, the station description and the data table of water levels observed during the water year. In addition a graph of water levels for the current year or other selected period is included for several representative wells. The description of the well is presented first through use of descriptive headings preceding the tabular data. The comments to follow clarify information presented under the various headings.

LOCATION.--This paragraph follows the well-identification number and reports the latitude and longitude (given in degrees, minutes and seconds); a landline-location designation; the hydrologic-unit number; the distance and direction from a geographic point of reference; and the owner's name.

AQUIFER.-- This entry designates by name (if a name exists) and

geologic age the aquifer(s) open to the well.

WELL CHARACTERISTICS.--This entry describes the well in terms of depth, diameter, casing depth and/or screened interval, method of construction, use, and includes additional information such as casing breaks, collapsed screen, and other changes since construction.

INSTRUMENTATION.--This paragraph provides information on both the frequency of measurement and the collection method used, allowing the user to better evaluate the reported water-level extremes by knowing whether they are based on weekly, monthly, or some other frequency of measurement.

DATUM.--This entry describes both the measuring point and the land-surface elevation at the well. The measuring point is described physically (such as top of collar, notch in the top of casing, plug in pump base and so on), and in relation to land surface (such as 1.3 ft above land-surface datum). The elevation of the land-surface datum is described in feet above (or below) sea level; it is reported with a precision depending on the method of determination.

REMARKS.--This entry describes factors that may influence the water level in a well or the measurement of the water level. It should identify wells that are also water-quality observation wells, and may be used to acknowledge the assistance of local (non-U.S. Geological Survey) observers.

PERIOD OF RECORD.--This entry indicates the period for which there are published records for the well. It reports the month and year of the start of the publication of water-level records by the U.S. Geological Survey and the words "to current year" if the records are to be continued into the following year. Periods for which water-level records are available, but are not published by the U.S. Geological Survey, may be noted.

EXTREMES FOR THE PERIOD OF RECORD.--This entry contains the highest and lowest water levels of the period of published record, with respect to land-surface datum, and the dates of their occurrence.

A table of water levels follows the station description for each well. Water levels are reported in feet below land-surface datum and all taped measurements of water level are listed. For wells equipped with recorders, abbreviated tables are published; generally, only water-level lows are listed for every fifth day and at the end of the month (eom). The highest and lowest water levels of the water year and their dates of occurrence are shown on a line below the abbreviated table. Because all values are not published for wells with recorders, the extremes may be values that are not listed in the table. Missing records are indicated by dashes in place of the water level. A hydrograph for a selected period of record follows the water-level table for several representative wells.

RECORDS OF GROUND-WATER QUALITY

Records of ground-water quality in this report differ from other types of records in that for most sampling sites they consist of only one set of measurements for the water year. The quality of ground water ordinarily changes only slowly; therefore, for most general purposes one annual sampling, or only a few samples taken at infrequent intervals during the year, is sufficient. Frequent measurement of the same constituents is not necessary unless one is concerned with a particular problem, such as monitoring for trends in nitrate concentration. In the special cases where the quality of ground water may change more rapidly, more frequent measurements are made to identify the nature of the changes.

Data Collection and Computation

The records of ground-water quality in this report were obtained mostly as a part of special studies in specific areas. Consequently, a number of chemical analyses are presented for some counties but none are presented for others. As a result, the records for this year, by themselves, do not provide a balanced view of ground-water quality statewide. Such a view can be attained only by considering records for this year in context

with similar records obtained for these and other counties in earlier years.

Most methods for collecting and analyzing water samples are described in the "U.S. Geological Survey Techniques of Water-Resources Investigation" manuals listed on a following page. The values reported in this report represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. All samples were obtained by trained personnel. The wells sampled were pumped long enough to assure that the water collected came directly from the aquifer and had not stood for a long time in the well casing where it would have been exposed to the atmosphere and to the material, possibly metal, comprising the casings.

Data Presentation

The records of ground-water quality are published in the section titled QUALITY OF GROUND WATER, immediately following the ground-water-level records. Data for quality of ground water are listed alphabetically by County, and are identified by well number. The prime identification number for wells sampled is the 15-digit number derived from the latitude-longitude locations. No descriptive statements are given for ground-water-quality records; however, the well number, depth of well, date of sampling, and other pertinent data are given in the table containing the chemical analyses of the ground water. The REMARK codes listed for surface-water-quality records also are applicable to ground-water-quality records.

ACCESS TO WATSTORE DATA

The U.S. Geological Survey is the principal Federal water-data agency and, as such, collects and disseminates about 70 percent of the water data currently being used by numerous State, local, private, and other Federal agencies to develop and manage our water resources. As part of the U.S. Geological Survey's program of releasing water data to the public, a large-scale computerized system has been developed for the storage and retrieval of water data collected through its activities. The National Water Data Storage and Retrieval System (WATSTORE) was established in 1972 to provide an effective and efficient means for the processing and maintenance of water data collected through the activities of the U.S. Geological Survey and to facilitate release of the data to the public. A variety of useful products, ranging from data tables to complex statistical analyses such as Log Pearson Type III, can be produced using WATSTORE. The system resides on the central computer facilities of the U.S. Geological Survey at its National Center in Reston, Virginia, and consists of related files and data bases.

- Station Header File - Contains descriptive information on more than 440,000 sites throughout the United States and its territories where the U.S. Geological Survey collects or has collected data.
- Daily Values File - Contains more than 220 million daily values of stream flows, stages, reservoir contents, water temperature, specific conductances, sediment concentrations, sediment discharges, and ground-water levels.
- Peak Flow File - Contains approximately 500,000 maximum (peak) streamflow and gage-height values at surface-water sites.
- Water Quality File - Contains approximately 2 million analyses of water samples that describe the chemical, physical, biological, and radio-chemical characteristics of both surface and ground water.
- Ground-Water Site Inventory Data Base - Contains inventory data for more than 900,000 wells, springs, and other sources of ground water. The data includes site location, geohydrologic characteristics, well-construction history, and one-time field measurements such as water temperature.

In 1976, the U.S. Geological Survey opened WATSTORE to the public for direct access. The signing of a Memorandum of Agreement with the Survey is required to obtain direct access to WATSTORE. The system can be accessed either synchronously or asynchronously. The requester will be expected to pay all computer costs incurred. Direct access may be obtained by contacting:

U.S. Geological Survey
National Water Data Exchange
421 USGS National Center
Reston, Virginia 22092

DEFINITION OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also table for converting inch-pound units to International System of units (SI) on the inside of back cover.

Acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Adenosine triphosphate (ATP) is the primary energy donor in cellular life process. Its central role in living cells makes it an excellent indicator of the presence of living material in water. A measure of ATP, therefore, provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter of the original water sample.

Algae are mostly aquatic single-celled, colonial, or multi-celled plants, containing chlorophyll and lacking roots, stems, and leaves.

Algal growth potential (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample.

Aquifer is a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian means confined and is used to describe a well in which the water level stands above the top of the aquifer tapped by the well. A flowing artesian well is one in which the water level is above the land surface.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35°C. In the laboratory these bacteria are defined as the organisms which produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35°C \pm 1.0°C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warmblooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms which produce blue colonies within 24 hours when incubated at 44.5°C \pm 0.2°C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria also found in the intestine of warmblooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35°C \pm 1.0°C on M-FS medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Bed material is the unconsolidated material of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by microorganisms, such as bacteria.

Biomass is the amount of living matter present at any given time, expressed as the mass per unit area or volume of habitat.

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of 500°C for 1 hour. The ash mass values of zooplankton and phytoplankton are expressed in grams per cubic meter (g/m^3), and periphyton and benthic organisms in grams per square meter (g/m^2).

Dry mass refers to the weight of residue present after drying in an oven at 60°C for zooplankton and 105°C for periphyton, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry mass values are expressed in the same units as ash mass.

Organic mass or volatile mass of the living substance is the difference between the dry mass and the ash mass, and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash mass and dry mass.

Wet mass is the mass of living matter plus contained water.

Bottom material: See Bed Material.

Cells/volume refers to the number of cells or any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually milliliters (mL) or liters (L).

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-feet, or about 646,000 gallons or 2,447 cubic meters.

Chemical oxygen demand (COD) is a measure of the chemically oxidizable material in the water, and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with natural water color or with carbonaceous organic pollution from sewage or industrial wastes.

Chlorophyll refers to the green pigments of plants. Chlorophyll *a* and *b* are the two most common pigments in plants.

Color unit is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, an artificial structure, or a uniform cross section over a long reach of the channel.

Cubic feet per second per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

Cubic foot per second (ft^3/s , ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to approximately 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment), that passes a given point within a given period of time.

Mean discharge (MEAN) is the arithmetic mean of individual

daily mean discharges during a specific period.

Instantaneous discharge is the discharge at a particular instant of time.

Annual 7-day minimum is the lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1-March 31). The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day 10-year low-flow statistic.)

Dissolved refers to the amount of substance present in true chemical solution. In practice, however, the term includes all forms of substance that will pass through a 0.45-micrometer membrane filter, and thus may include some very small (colloidal) suspended particles. Analyses are performed on filtered samples.

Dissolved-solids concentration of water is determined either analytically by the "residue-on-evaporation" method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination of dissolved solids, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. Therefore, in the mathematical calculation of dissolved-solids concentration, the bicarbonate value, in milligrams per liter, is multiplied by 0.492 to reflect the change.

Diversity index is a numerical expression of evenness of distribution of aquatic organisms. The formula for diversity index is:

$$\bar{d} = - \sum_{i=1}^s \frac{n_i}{n} \log_2 \frac{n_i}{n}$$

Where 'n_i' is the number of individuals per taxon, 'n' is the total number of individuals, and 's' is the total number of taxa in the sample of the community. Diversity index values range from zero, when all the organisms in the sample are the same, to some positive number, when some or all of the organisms in the sample are different.

Drainage area of a stream at a specified location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the river above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Gage height (G.H.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage", although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate (CaCO₃).

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an 8-digit number.

Metamorphic stage refers to the stage of development that an organism exhibits during its transformation from an immature form to an adult form. This developmental process exists for most insects, and the degree of difference from the immature stage to the adult form varies from relatively slight to pronounced, with many intermediates. Examples of metamorphic stages of insects are egg-larva-adult or egg-nymph-adult.

Methylene blue active substance (MBAS) is a measure of apparent detergents. This determination depends on the formation of a blue color when methylene blue dye reacts with synthetic detergent compounds.

Micrograms per gram (UG/G, ug/g) is a unit expressing the concentration of a chemical element as the mass (micrograms) of the element sorbed per unit mass (gram) of sediment.

Micrograms per kilogram (MG/KG, mg/kg) is a unit expressing the concentration of a chemical element as the mass (micrograms) of the element sorbed per unit mass (kilogram) of sediment.

Micrograms per liter (UG/L, ug/L) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligrams per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represent the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in mg/L, and is based on the mass of sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (NGVD) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called "Sea Level Datum of 1929" or "mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in natural or regional water-quality planning and management. The 500 or so sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for, (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

Normal is a central value (such as median) for a 30-year period ending with an even 10-year, e.g. 1931-60, or 1961-90.

Organism is any living entity, such as an insect, phytoplankter, or zooplankter.

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per area habitat, usually square meters (m²), acres, or hectares. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliters (mL) or liters (L). Numbers of planktonic organisms can be expressed in these terms.

Total organism count is the total number of organisms collected and enumerated in any particular sample.

Parameter code numbers are unique five-digit code numbers assigned to each parameter placed into storage. These codes are assigned by the Environmental Protection Agency and are also used to identify data exchanged among agencies.

Partial-record station is a particular site where limited streamflow and (or) water-quality data are collected systematically over a period of years for use in hydrologic analyses.

Particle size is the diameter, in millimeters (mm), of suspended sediment or bed material determined by either sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) determine fall diameter of particles in distilled water (chemically dispersed).

Particle-size classification used in this report agrees with recommendations made by the American Geophysical Union Subcommittee on Sediment Terminology.

The classification is as follows:

Classification	Size (mm)	Method of analysis
Clay	0.00024-0.004	Sedimentation
Silt	.004-.062	Sedimentation
Sand	.062-2.0	Sedimentation or sieve
Gravel	2.0-64.0	Sieve

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic material is removed and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water.

Percent composition is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population, in terms of types, numbers, mass or volume.

Periphyton is the assemblage of microorganisms attached to and growing upon solid surfaces. While primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms. Periphyton is a useful indicator of water quality.

Pesticides are chemical compounds used to control undesirable plants and animals. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides. Insecticides and herbicides, which control insects and plants respectively, are the two categories reported.

Picocurie (PC, pCi) is one trillionth (1×10^{-12}) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7×10^{10} radioactive disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers.

Phytoplankton is the plant part of the plankton. They are usually microscopic and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment, and are commonly known as algae.

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells/mL of sample.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algal mats or floating "moss" in lakes. Their concentrations are expressed as number of cells/mL of sample.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column, and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers.

Polychlorinated biphenyls (PCBs) are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organo-chlorine insecticides.

Primary productivity is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly green plants). The rate of primary production is estimated by measuring the amount of oxygen released (oxygen method) or the amount of carbon assimilated by the plants (carbon method).

Milligrams of carbon per area or volume per unit time [$\text{mg C}/(\text{m}^2 \cdot \text{time})$ for periphyton and macrophytes and $\text{mg C}/(\text{m}^3 \cdot \text{time})$ for phytoplankton] are units for expressing primary productivity. They define the amount of carbon dioxide consumed as measured by radioactive carbon (carbon 14). The carbon 14 method is of greater sensitivity than the oxygen light and dark bottle method, and is preferred for use in unenriched waters. Unit time may be either the hour or day, depending on the incubation period.

Milligrams of oxygen per area or volume per unit time [$\text{mg O}_2/(\text{m}^2 \cdot \text{time})$ for periphyton and macrophytes and $\text{mg O}_2/(\text{m}^3 \cdot \text{time})$ for phytoplankton] are the units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Recoverable from bottom material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of only readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Return period is the average time interval between occurrences of a hydrological event of a given or greater magnitude, usually expressed in years. May also be called recurrence interval.

Runoff in inches (IN, in) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)--a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material, such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and precipitation.

Bed load is the sediment that is transported in a stream by rolling, sliding, or skipping along the bed and very close to it. In this report, bed load is considered to consist of particles in transit within 0.25 ft of the streambed.

Bed load discharge (tons per day) is the quantity of bed load measured by dry weight that moves past a section as bed load in a given time.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour day.

Suspended-sediment discharge (tons/day) is the rate at which dry weight of sediment passes a section of a stream or is the quantity sediment, as measured by dry weight or volume, that passes a section in a given time. It is computed by multiplying discharge times mg/L times 0.0027.

Suspended-sediment load is quantity of suspended sediment passing a section in a specified period.

Total sediment discharge (tons/day) is the sum of the suspended-sediment discharge and the bed-load discharge. It is the total quantity of sediment, as measured by dry weight or volume, that passes a section during a given time.

Total sediment load or total load is a term which refers to the total sediment (bed load plus suspended-sediment load) that is in transport. It is not synonymous with total-sediment discharge.

7-day 10 year low flow ($7 Q_{10}$) is the discharge at the 10-year recurrence interval taken from a frequency curve of annual values of the lowest mean discharge for 7 consecutive days (the 7-day low flow).

Sodium-adsorption-ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Solute is any substance derived from the atmosphere, vegetation, soil, or rocks that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in micromhos per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids

(in milligrams per liter) is about 65 percent of the specific conductance (in micromhos). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stage-discharge relation is the relation between gage height (stage) and volume of water per unit of time, flowing in a channel.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as a streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Substrate is the physical surface upon which an organism lived.

Natural substrates refers to any naturally occurring emerged or submersed solid surface, such as a rock or tree, upon which an organism lived.

Artificial substrate is a device which is purposely placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is taken. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multi-plate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton collection.

Surface area of a lake is that area outlined on the latest USGS topographic map as the boundary of the lake and measured by a planimeter in acres. In localities not covered by topographic maps, the areas are computed from the best maps available at the time planimeted. All areas shown are those for the stage when the planimeted map was made. All areas shown are those for the stage when the planimeted map was made.

Surficial bed material is that part (0.1 to 0.2 ft) of the bed material that is sampled using U.S. Series Bed-Material Samplers.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of the total concentration in a water-sediment mixture. The water-sediment mixture is associated with (or sorbed on) that material retained on a 0.45 micrometer filter.

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45 micrometer filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Determinations of "suspended, recoverable" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45 μ m membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

Taxonomy is the division of biology concerned with the classification of organisms is based upon a hierarchical scheme beginning with Kingdom and

ending with Species at the base. The higher the classification level, the fewer features the organisms have in common.

For example, the taxonomy of a particular mayfly, *Hexagenia limbata* is the following:

Kingdom.....Animal
Phylum.....Arthropoda
Class.....Insects
Order.....Ephemeroptera
Family.....Ephemeridae
Genus.....*Hexagenia*
Species.....*Hexagenia limbata*

Thermograph is an instrument that continuously records variations of temperature on a chart. The more general term "temperature recorder" is used in the table headings and refers to any instrument that records temperature whether on a chart, a tape, or any other medium.

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the year.

Tons per acre-foot indicates the dry mass of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration in milligrams per liter by 0.00136.

Tons per day is the quantity of substance in solution or suspension that passes a stream section during a 24-hour day.

Total is the total amount of a given constituent in a representative water-suspended sediment sample, regardless of the constituent's physical or chemical form. The term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical methods determines all of the constituent in the sample).

Total in bottom material is the total amount of a given constituent in a representative sample of bottom material. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total in bottom material."

Total load (tons) is the total quantity of any individual constituent, as measured by dry mass or volume, that is dissolved in a specific amount of water (discharge) during a given time. It is computed by multiplying the total discharge, times the mg/L of the constituent, times the factor 0.0027, times the number of days.

Total recoverable refers to the amount of a given constituent that is in solution after a representative water-suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Tritium Network is a network of stations which has been

established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

Water year in Geological Survey reports dealing with surface-water supply is the 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1992 is called the "1992 water year."

WDR is used as an abbreviation for "Water-Data Report" in reference to published reports beginning in 1975.

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

WRD is used as an abbreviation for "Water-Resources Data" in the REVISED RECORDS paragraph to refer to State annual basic-data reports published before 1975.

WSP is used as an abbreviation for "Water-Supply Paper" in references to previously published reports.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

The reports listed below are for sale by the U.S. Geological Survey, Branch of Information Services, Box 25286, Federal Center, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

- 1-D1. *Water temperature--influential factors, field measurement, and data presentation*, by H. H. Stevens, Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.
- 1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.
- 2-D1. *Application of surface geophysics to ground-water investigations*, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.
- 2-D2. *Application of seismic-refraction techniques to hydrologic studies*, by F. P. Haeni: USGS--TWRI Book 2, Chapter D2. 1988. 86 pages.
- 2-E1. *Application of borehole geophysics to water-resources investigations*, by W. S. Keys and L.M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.
- 2-E2. *Borehole geophysics applied to ground-water investigations*, by W. S. Keys: USGS--TWRI Book 2, Chapter E2. 1990. 150 pages.
- 2-F1. *Application of drilling, coring, and sampling techniques to test holes and wells*, by Eugene Shuter and W. E. Teasdale: USGS--TWRI Book 2, Chapter F1. 1989. 97 pages.
- 3-A1. *General field and office procedures for indirect discharge measurements*, by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.
- 3-A2. *Measurement of peak discharge by the slope-area method*, by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.
- 3-A3. *Measurement of peak discharge at culverts by indirect methods*, by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1969. 60 pages.
- 3-A4. *Measurement of peak discharge at width contractions by indirect methods*, by H. F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 pages.
- 3-A5. *Measurement of peak discharge at dams by indirect methods*, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.
- 3-A6. *General procedure for gaging streams*, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.
- 3-A7. *Stage measurement at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.
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**Surface-Water
Station Records**

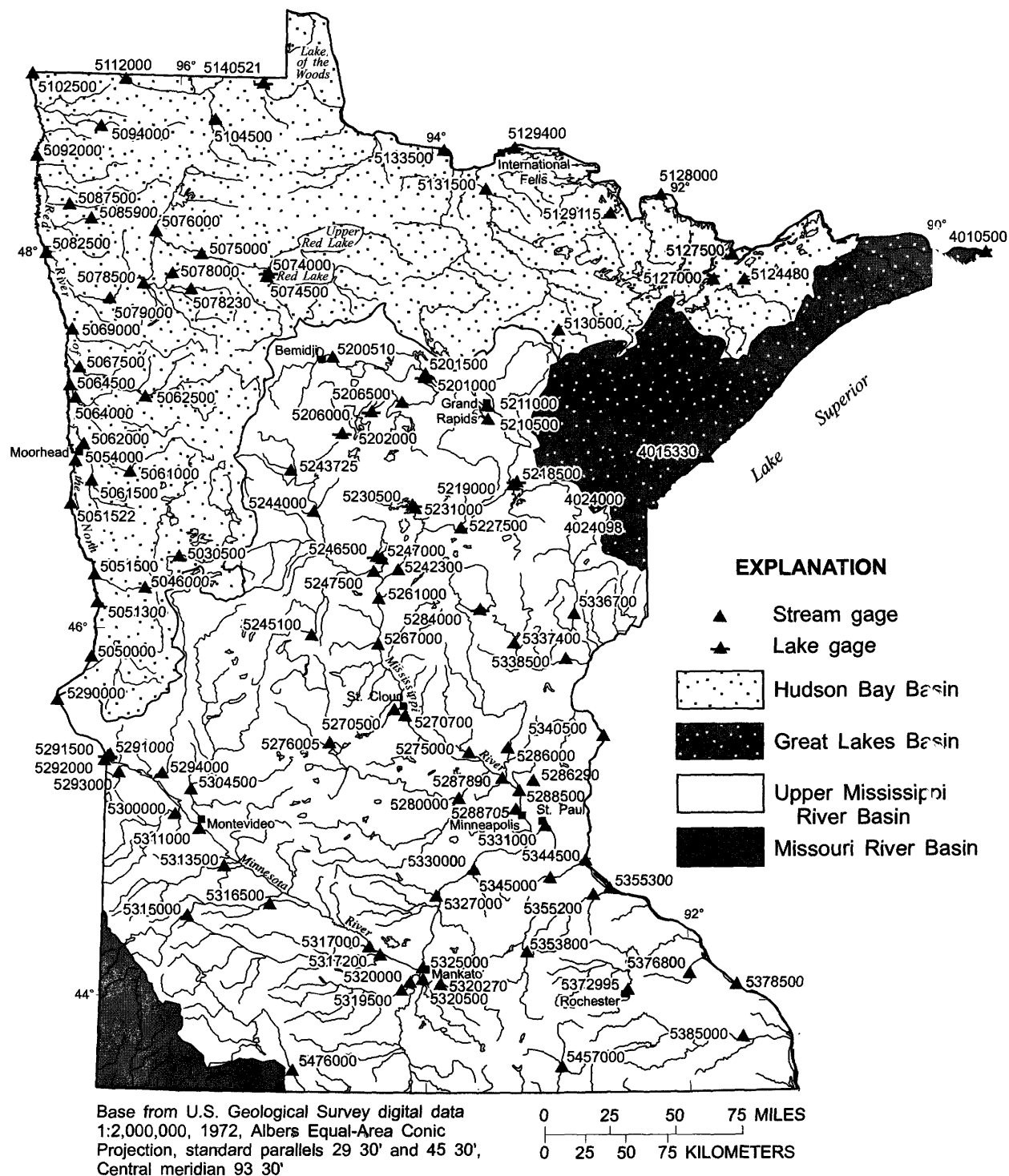


Figure 7.--Location of lake and stream-gaging stations

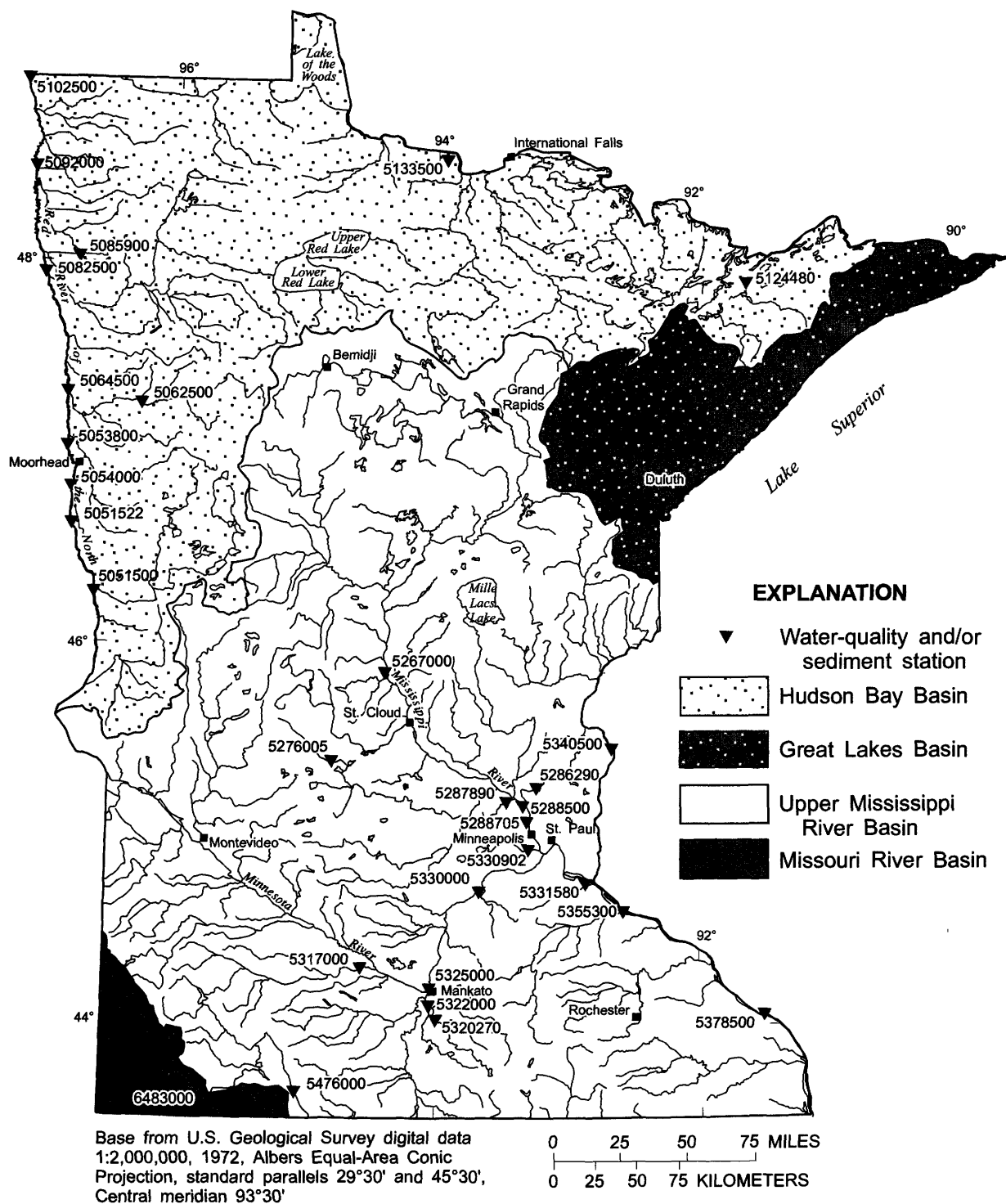


Figure 8.--Location of surface-water quality stations.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04010500 PIGEON RIVER AT MIDDLE FALLS, NEAR GRAND PORTAGE, MN

(International gaging station)

LOCATION.--Lat 48°00'44", long 89°36'58", in SW1/4NE1/4, sec. 24, T.64 N., R.6 E., Cook County, Hydrologic Unit 04010101, on the Grand Portage Indian Reservation, on right bank 400 ft upstream from Middle Falls, 2.5 mi upstream from Grand Portage Port of Entry, 3.5 mi upstream from mouth, and 4.7 mi northeast of city of Grand Portage.

DRAINAGE AREA.--600 mi².

PERIOD OF RECORD.--June to October 1921, April to November 1922, March 1923 to current year. Published as "at International Bridge" Apr¹ 1924 to September 1940; as "below International Bridge" October 1940 to September 1965. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 744:1927-28. WSP 804: 1934(M). WSP 974: Drainage area. WSP 1337:1924(M), 1925, 1926-28(M), 1931(M), 1938(M), 1941(M), 1945-46(M), 1947, 1948(M), 1950(M).

GAGE.--Water-stage recorder. Datum of gage is 787.58 ft above sea level. Prior to Sept. 30, 1940, nonrecording gage at International Bridge, 5.8 mi upstream at datum 102.24 ft higher. Oct. 1, 1940, to Dec. 31, 1975, at present site at datum 2.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Satellite telemeter at station.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 18	2000	*6410	*10.71				

(No other peak greater than base discharge.)

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	410	576	e240	e197	e168	e178	e177	1720	1680	789	503	236
2	621	625	e240	e193	e168	e176	e178	1610	1760	683	474	230
3	583	573	e240	e189	e168	e174	e178	1750	1810	617	451	243
4	514	e505	e240	e183	e168	e172	e178	2050	1760	556	432	240
5	466	e470	e240	e180	e170	e170	e179	2340	1620	517	488	238
6	421	e465	e239	e180	e184	e167	e179	2600	1590	839	585	228
7	371	e450	e235	e180	e194	e163	e180	3100	1720	1350	704	217
8	322	e340	e230	e180	e194	e163	e182	3370	1600	1330	880	221
9	282	e330	e228	e180	e194	e164	e188	3440	1440	1380	772	217
10	245	e320	e222	e180	e192	e165	e192	3670	1330	1200	652	211
11	222	e310	e218	e180	e190	e167	e200	3690	1230	1010	569	205
12	196	e290	e218	e180	e188	e171	e220	3440	1150	1170	517	207
13	181	e280	e220	e179	e185	e176	e250	3200	1070	1150	480	204
14	167	e265	e220	e178	e183	e176	e275	3190	999	1110	459	194
15	154	e250	e220	e177	e182	e176	e295	3350	916	1140	436	184
16	148	e240	e220	e176	e181	e176	e310	3440	847	1170	419	177
17	148	e240	e220	e175	e180	e176	e330	3700	794	1150	398	169
18	142	e240	e218	e174	e180	e176	e390	5820	744	1020	374	162
19	151	e245	e217	e173	e182	e176	e490	6220	691	935	359	155
20	225	e260	e216	e172	e184	e176	e600	5480	651	854	347	150
21	274	e258	e214	e171	e186	e176	e1200	4520	622	781	333	142
22	329	e255	e212	e171	e188	e176	e1800	3830	588	737	350	138
23	372	e250	e210	e170	e188	e176	e2400	3370	556	721	349	134
24	527	e245	e210	e170	e188	e175	e2200	3030	520	716	348	134
25	597	e240	e208	e170	e187	e175	e2000	2740	489	693	331	132
26	600	e238	e207	e169	e185	e175	1780	2520	468	654	314	134
27	722	e235	e206	e169	e182	e176	1850	2340	445	610	299	292
28	917	e232	e205	e169	e181	e176	1830	2180	442	568	284	304
29	876	e238	e204	e168	e180	e176	1910	2030	792	535	266	277
30	762	e242	e202	e168	---	e176	1930	1900	911	514	256	246
31	644	---	e200	e168	---	e177	---	1780	---	516	245	---
TOTAL	12589	9707	6819	5469	5300	5372	24071	97420	31235	27015	13674	6021
MEAN	406	324	220	176	183	173	802	3143	1041	871	441	201
MAX	917	625	240	197	194	178	2400	6220	1810	1380	880	304
MIN	142	232	200	168	168	163	177	1610	442	514	245	132
AC-FT	24970	19250	13530	10850	10510	10660	47740	193200	61950	53580	27120	11940
CFSM	.68	.54	.37	.29	.30	.29	1.34	5.24	1.74	1.45	.74	.33
IN.	.78	.60	.42	.34	.33	.33	1.49	6.04	1.94	1.67	.85	.37

e Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04010500 PIGEON RIVER AT MIDDLE FALLS, NEAR GRAND PORTAGE, MN--Continued

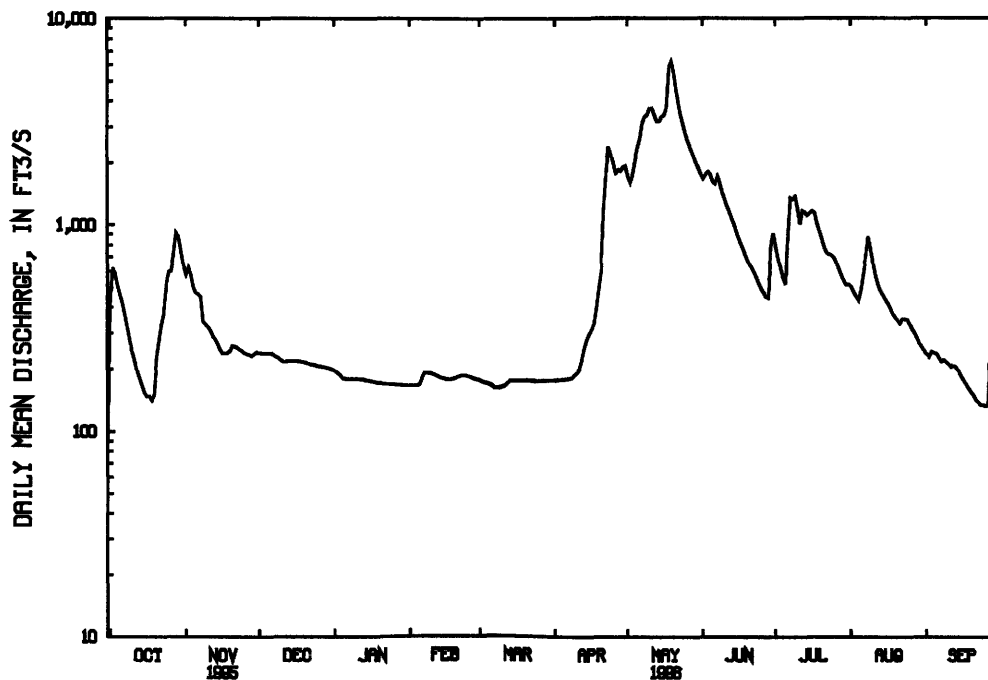
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	361	348	203	149	125	174	1185	1637	857	416	243	2 ^a 8
MAX	2095	1461	720	431	300	1169	2701	4016	2801	1127	1029	29 ^a 5
(WY)	1978	1971	1978	1975	1969	1945	1976	1950	1947	1968	1950	1977
MIN	17.4	11.4	2.85	2.18	8.02	60.0	290	138	125	78.0	57.7	40.2
(WY)	1977	1977	1977	1977	1977	1941	1977	1977	1977	1958	1991	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1921 - 1996
ANNUAL TOTAL	119127	244692	
ANNUAL MEAN	326	669	503
HIGHEST ANNUAL MEAN			840
LOWEST ANNUAL MEAN			158
HIGHEST DAILY MEAN	2240	May 14	6220
LOWEST DAILY MEAN	46	Sep 29	132
ANNUAL SEVEN-DAY MINIMUM	50	Sep 23	138
INSTANTANEOUS PEAK FLOW			6410
INSTANTANEOUS PEAK STAGE			10.71
INSTANTANEOUS LOW FLOW			123 ^b
ANNUAL RUNOFF (AC-FT)	236300	485300	364100
ANNUAL RUNOFF (CFSM)	.54	1.11	.84
ANNUAL RUNOFF (INCHES)	7.39	15.17	11.38
10 PERCENT EXCEEDS	679	1790	1300
50 PERCENT EXCEEDS	231	245	220
90 PERCENT EXCEEDS	79	170	85

a Site and datum then in use.

b Rising stage.



— 04010500 PIGEON RIVER AT MIDDLE FALLS NR GRAND PORTAGE MN

STREAMS TRIBUTARY TO LAKE SUPERIOR
04015330 KNIFE RIVER NEAR TWO HARBORS, MN

LOCATION.--Lat 46°56'49", long 91°47'32", in SW 1/4 NW 1/4 sec.31, T.52 N., R.11 W., Lake County, Hydrologic Unit 04010102, on right bank 600 ft downstream from bridge on U.S. Highway 61, 0.5 mi upstream from bridge on County Highway 102, in town of Knife River, 0.8 mi upstream from Lake Superior, and 7.8 mi southwest of Two Harbors.

DRAINAGE AREA.--85.6 mi².

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1970-71, July 1974 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 640 ft above sea level from topographic map.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 1	0300	1360	5.98	May 19	0930	1110	5.61
Oct. 3	0600	1670	6.36	June 26	1345	1790	6.47
Oct. 24	0745	852	5.27	July 6	2030	1850	6.53
Oct. 27	1400	1080	5.61	July 12	0515	1300	5.86
Nov. 2	0815	897	5.34	Sep. 27	0730	*2810	*7.53
Apr. 19	1945	a1250	7.45				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1110	150	e52	e27	e16	e16	42	272	29	40	20	7.3
2	514	719	e44	e28	e16	e16	42	234	36	322	17	9.3
3	1130	335	e40	e28	e16	e16	43	218	34	122	15	43
4	585	179	e36	e27	e16	e16	41	197	37	61	15	34
5	278	122	e33	e26	e16	e16	39	175	33	37	28	25
6	193	119	e31	e25	e16	e16	40	152	93	480	46	18
7	167	110	e28	e24	e16	e16	e43	139	94	559	335	15
8	124	62	e27	e23	e16	e16	e50	139	56	231	139	14
9	121	56	e27	e22	e16	e16	e58	126	39	153	59	12
10	130	e68	e26	e22	e16	e16	e70	134	32	78	36	14
11	109	e76	e26	e21	e16	e16	e150	119	26	134	27	31
12	86	e82	e26	e21	e16	e16	e450	97	24	860	22	23
13	72	e88	e26	e20	e16	e17	e420	79	85	303	19	17
14	61	e91	e26	e20	e16	e17	e370	70	39	181	18	14
15	55	e88	e27	e20	e16	e18	e340	65	25	213	17	13
16	50	e82	e28	e19	e16	e20	e470	69	27	259	15	12
17	47	e74	e30	e19	e16	e23	e660	139	23	108	14	12
18	41	e68	e30	e19	e16	e28	e1000	273	21	69	13	11
19	47	e64	e30	e18	e16	e42	e1250	693	20	62	12	11
20	54	e62	e29	e18	e16	e44	e1240	312	19	48	13	11
21	52	e66	e29	e18	e16	e43	e1150	190	17	37	13	17
22	67	e70	e29	e18	e16	e42	e1000	148	19	300	12	75
23	89	e80	e29	e18	e16	e40	e770	116	18	113	12	63
24	666	e86	e29	e17	e16	e40	704	88	21	65	10	50
25	362	e88	e29	e17	e16	e39	699	68	20	50	9.3	42
26	219	e88	e28	e17	e16	e39	552	57	956	37	8.4	397
27	663	e83	e27	e17	e16	e39	396	50	501	28	8.0	1990
28	560	e75	e27	e16	e16	e40	331	41	176	26	7.9	958
29	287	e68	e27	e16	e16	e41	329	36	100	25	7.7	424
30	194	e58	e26	e16	---	e41	305	32	62	24	7.5	193
31	143	---	e26	e16	---	42	---	29	---	22	7.1	---
TOTAL	8276	3457	928	633	464	847	13054	4557	2682	5047	982.9	4555.6
MEAN	267	115	29.9	20.4	16.0	27.3	435	147	89.4	163	31.7	152
MAX	1130	719	52	28	16	44	1250	693	956	860	335	1990
MIN	41	56	26	16	16	16	39	29	17	22	7.1	7.3
AC-FT	16420	6860	1840	1260	920	1680	25890	9040	5320	10010	1950	9040
CFSM	3.12	1.35	.35	.24	.19	.32	5.08	1.72	1.04	1.90	.37	1.77
IN.	3.60	1.50	.40	.28	.20	.37	5.67	1.98	1.17	2.19	.43	1.98

a Mean daily discharge, affected by ice backwater.

e Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

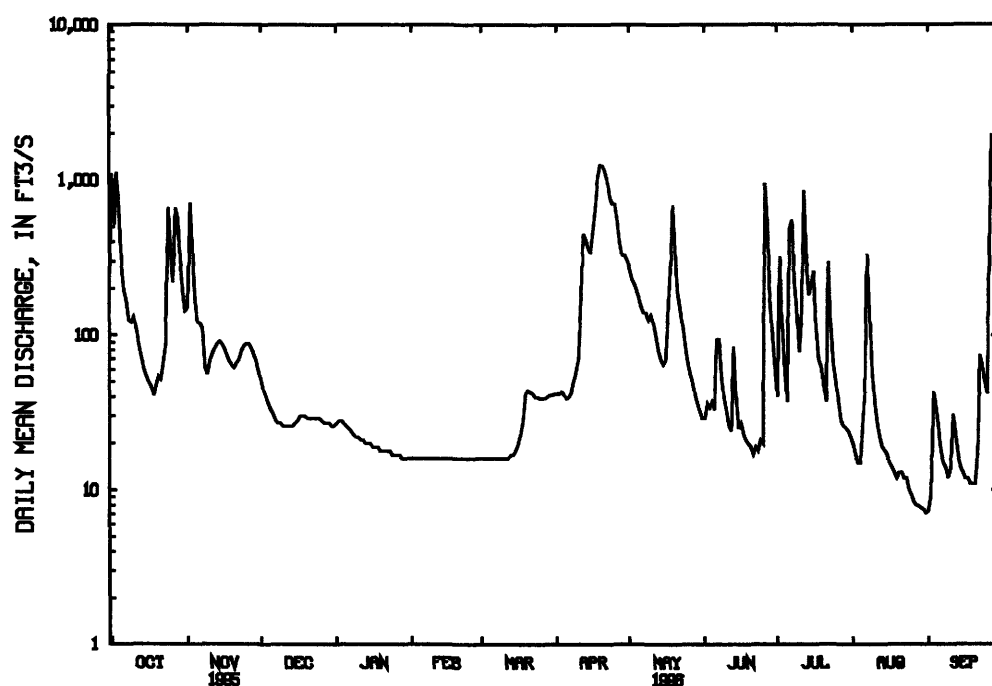
04015330 KNIFE RIVER NEAR TWO HARBORS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	90.9	70.4	21.8	11.3	9.00	52.9	368	166	88.3	89.1	38.2	87.4
MAX	267	198	60.6	31.4	22.2	136	631	427	240	345	163	214
(WY)	1996	1992	1983	1975	1984	1976	1982	1979	1984	1993	1988	1977
MIN	3.06	1.58	.000	.000	.000	8.65	73.6	16.0	13.0	4.87	2.95	1.43
(WY)	1977	1977	1977	1977	1977	1980	1977	1976	1995	1988	1976	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1974 - 1996
ANNUAL TOTAL	40358.9	45483.5	
ANNUAL MEAN	111	124	91.8
HIGHEST ANNUAL MEAN			147
LOWEST ANNUAL MEAN			44.2
HIGHEST DAILY MEAN	1760	Aug 25 1990	4480
LOWEST DAILY MEAN	5.0	Feb 1	.00 ^a
ANNUAL SEVEN-DAY MINIMUM	5.0	Feb 1	.00
INSTANTANEOUS PEAK FLOW		2810	7440
INSTANTANEOUS PEAK STAGE		7.53	11.16
INSTANTANEOUS LOW FLOW		6.8	
ANNUAL RUNOFF (AC-FT)	80050	90220	66470
ANNUAL RUNOFF (CFSM)	1.29	1.45	1.07
ANNUAL RUNOFF (INCHES)	17.54	19.77	14.56
10 PERCENT EXCEEDS	286	335	229
50 PERCENT EXCEEDS	35	38	22
90 PERCENT EXCEEDS	5.0	16	4.7

^a Many days in 1977.



— 04015330 KNIFE RIVER NEAR TWO HARBORS, MN

STREAMS TRIBUTARY TO LAKE SUPERIOR

04024000 ST. LOUIS RIVER AT SCANLON, MN

LOCATION.--Lat 46°42'12", long 92°25'07", in NW¼ sec.30, T.49 N., R.16 W., Carlton County, Hydrologic Unit 04010201, on right bank 25 ft downstream from lower bridge on U.S. Highway 61 at Scanlon, 0.6 mi downstream from Minnesota Power Co. powerplant, 3 mi upstream from Thomson Reservoir, and 3.2 mi upstream from Midway River.

DRAINAGE AREA.--3,430 mi², approximately.

PERIOD OF RECORD.--January 1908 to current year. Monthly discharge only for some periods published in WSP 1307. Published as "near Thomson" 1908-50.

REVISED RECORDS.--WSP 1337: 1911-12.

GAGE.--Water-stage recorder. Datum of gage is 1,101.23 ft above sea level. Oct. 5, 1909, to Sept. 5, 1914, nonrecording gage 3 mi downstream and 50 ft below powerplant at datum about 420 ft lower. Sept. 6, 1914, to Aug. 4, 1953, powerplant record at Thomson hydroelectric plant.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Diurnal fluctuation caused by powerplant upstream.

Flow regulated by Whiteface Reservoir and Boulder, Island, Rice and Fish Lakes, combined capacity, 332,160 acre-ft; the water-discharge table shows the monthly change in contents (+).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3270	7650	2310	e1760	e1430	e1520	1880	12300	3060	4340	2610	977
2	8000	7090	2180	e1740	e1420	e1470	1890	11200	2800	4030	2380	1100
3	9770	7090	2270	e1600	e1410	e1440	1870	10200	2630	3690	2110	1220
4	11500	6730	2020	e1580	e1410	e1450	1770	9210	2930	3110	1930	1300
5	12200	6280	2080	e1630	e1380	e1530	1780	8380	3220	2700	2010	1420
6	12000	5830	e1320	e1570	e1420	e1520	1770	7700	3400	2940	1990	1470
7	11300	5670	e1480	e1530	e1420	e1500	1800	7030	3330	4000	5550	1270
8	10100	5150	e2180	e1510	e1460	e1520	1820	6680	3380	4350	7430	1210
9	9120	4180	e1860	e1530	e1530	e1490	1960	6530	3200	4560	5470	1260
10	8290	3640	e1820	e1520	e1560	e1570	2130	6150	2850	4090	4070	1190
11	7180	3540	e1770	e1520	e1450	e1520	2890	5940	2710	3790	3470	1240
12	6380	3190	e2000	e1560	e1510	e1650	4290	5540	2460	6250	3090	1170
13	5740	2990	e1960	e1580	e1560	e1690	4960	5200	2250	8600	2850	1140
14	5250	2920	e2100	e1580	e1510	e1800	5310	4840	2010	7960	2820	1030
15	4800	2770	e1930	e1530	e1480	e1820	6200	4650	1860	7030	2630	1020
16	4390	2790	e1800	e1430	e1520	e1930	8150	4450	1780	6320	2390	1010
17	4160	2760	e1990	e1560	e1460	e2000	11500	4520	1700	5740	2260	1020
18	3590	2740	e2130	e1530	e1480	e2120	15900	5040	1670	5530	1970	867
19	3450	2580	e2090	e1240	e1480	e2000	e22500	6570	1560	5870	1910	903
20	3240	2600	e2150	e1270	e1480	e1960	27000	7650	1590	5940	1700	881
21	3230	2310	e2010	e1510	e1510	e1950	27400	7460	1600	5210	1640	977
22	3020	2160	e2050	e1570	e1500	e1990	25400	7320	1620	5350	1480	1060
23	3180	2180	e2030	e1570	e1500	e2020	22700	7600	1550	5650	1420	1010
24	3530	2230	e2030	e1500	e1560	e1940	20200	7550	1520	5130	1380	1050
25	4270	1890	e2000	e1500	e1550	e1900	18400	7070	1440	4740	1270	961
26	5150	2230	e1740	e1500	e1530	e1830	18100	6420	1970	4410	1190	1230
27	5830	2180	e1780	e1510	e1550	e1910	17600	5690	4290	3760	1140	1510
28	7430	e2060	e1680	e1460	e1470	e2050	16600	5070	6460	3380	1130	1820
29	8480	e2020	e1720	e1510	e1420	e1930	15200	4340	6300	3340	1030	1950
30	8730	e2320	e1710	e1460	---	e1910	13700	3730	5500	3240	1050	2000
31	8270	---	e1800	e1430	---	1900	---	3290	---	2970	939	---
TOTAL	204850	109770	59990	47290	42960	54830	322670	205320	82640	148020	74309	36266
MEAN	6608	3659	1935	1525	1481	1769	10760	6623	2755	4775	2397	1209
MAX	12200	7650	2310	1760	1560	2120	27400	12300	6460	8600	7430	2000
MIN	3020	1890	1320	1240	1380	1440	1770	3290	1440	2700	939	867
+	276	-592	-543	-593	-675	-696	1780	1010	-129	120	-131	-125
MEAN‡	6884	3067	1392	932	806	1073	12540	7633	2626	4895	2266	1084
CFSM ‡	2.01	.89	.41	.27	.23	.31	3.66	2.23	.77	1.43	.66	.32
IN ‡	2.32	.99	.47	.31	.25	.36	4.08	2.57	.86	1.65	.76	.36
CAL. YR. 94	TOTAL 1052380		MEAN 2883 MAX 12200 MIN 515 MEAN ‡ 2897 CFSM ‡ .84 IN ‡ 11.47									
WTR. YR. 96	TOTAL 1388916		MEAN 3795 MAX 27400 MIN 867 MEAN ‡ 3771 CFSM ‡ 1.10 IN ‡ 14.93									

+ Change in contents, equivalent in cubic feet per second, in Whiteface Reservoir, and Boulder, Island, Rice and Fish Lakes; records furnished by Minnesota Power Co.

‡ Adjusted for change in reservoir contents.

e Estimated.

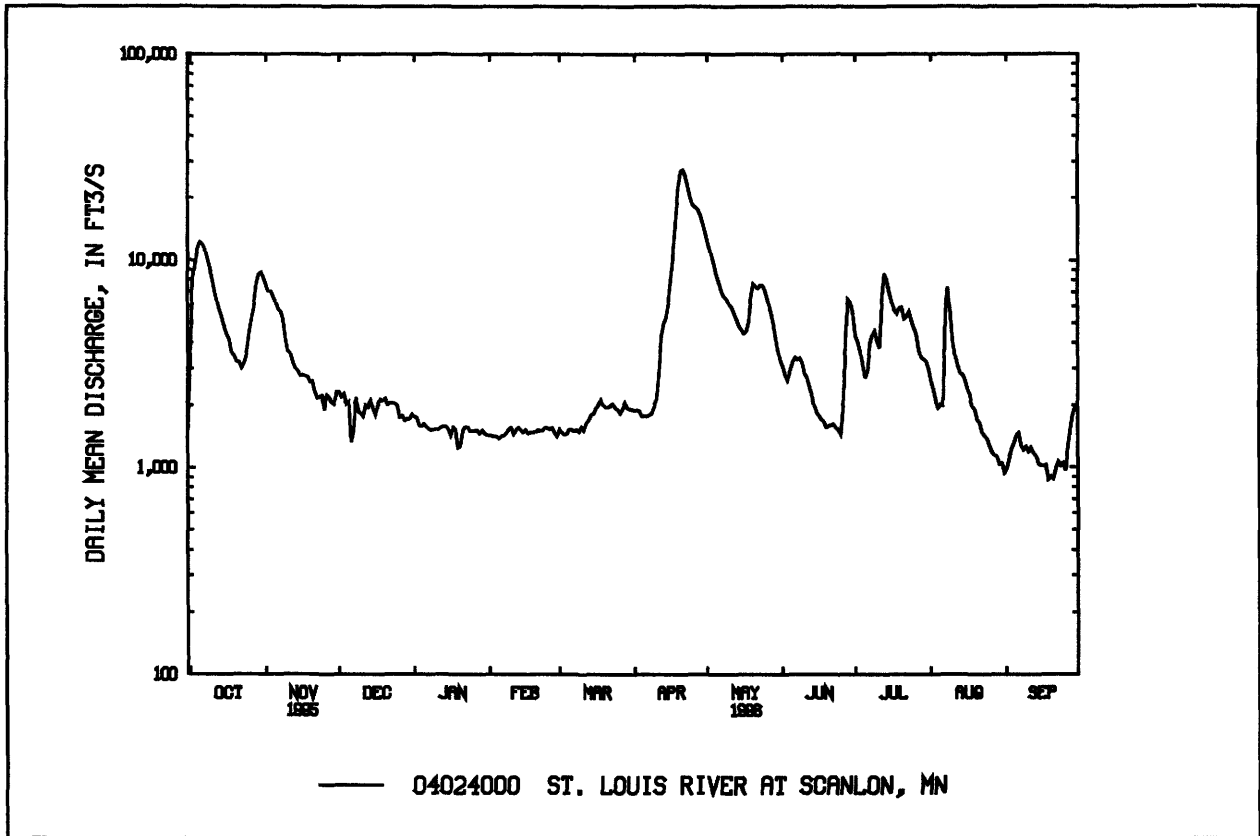
STREAMS TRIBUTARY TO LAKE SUPERIOR

04024000 ST. LOUIS RIVER AT SCANLON, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1908 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2022	1682	1261	1066	1047	1438	5596	5131	3584	2403	1679	1778
MAX	7508	8518	2993	2272	2200	6026	15230	22210	16480	9492	9197	7594
(WY)	1974	1972	1972	1966	1966	1945	1948	1950	1908	1993	1953	1928
MIN	407	473	282	265	249	301	667	593	458	199	377	402
(WY)	1935	1935	1911	1911	1924	1924	1977	1977	1988	1988	1977	1934

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1908 - 1996	
ANNUAL TOTAL	1052380		1388915			
ANNUAL MEAN	2883		3795		2377	
HIGHEST ANNUAL MEAN					4276	
LOWEST ANNUAL MEAN					945	
HIGHEST DAILY MEAN	12200	Oct 5	27400	Apr 21	37900	May 9 1950
LOWEST DAILY MEAN	515	Jul 1	867	Sep 18	88	Aug 24 1977
ANNUAL SEVEN-DAY MINIMUM	560	Jun 25	954	Sep 15	134	Jul 26 1988
INSTANTANEOUS PEAK FLOW			27600	Apr 21	37900	May 9 1950
INSTANTANEOUS PEAK STAGE			12.62 ^a	Apr 19	15.80	May 9 1950
ANNUAL RUNOFF (AC-FT)	2087000		2755000		1722000	
ANNUAL RUNOFF (CFMS)	.84		1.11		.69	
ANNUAL RUNOFF (INCHES)	11.41		15.06		9.42	
10 PERCENT EXCEEDS	5810		7650		5290	
50 PERCENT EXCEEDS	2120		2050		1380	
90 PERCENT EXCEEDS	1090		1400		644	

^a Backwater from ice.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04024098 DEER CREEK NEAR HOLYOKE, MN

LOCATION.--Lat 46°31'30", long 92°23'20", in NE1/4SE1/4 sec.29, T.47 N., R.16 W., Carlton County, Hydrologic Unit 04010301, on left bank 179 ft west of State Highway No. 23, 0.9 mi upstream from mouth and 4.0 mi north of Holyoke.

DRAINAGE AREA.--7.77 mi².

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

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 786.14 ft above mean sea level.

REMARKS.--Records fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	10	e2.6	e1.7	e1.9	e2.1	e4.0	15	2.4	3.3	2.1	1.4
2	8.9	15	e2.5	e1.7	e1.9	e2.1	e4.1	14	2.3	3.3	2.0	2.0
3	29	10	e2.5	e1.7	e1.9	e2.1	e4.1	12	2.4	2.9	1.9	2.8
4	12	6.9	e2.5	e1.7	e1.9	e2.1	e4.2	11	2.5	2.7	1.9	2.8
5	7.8	5.2	e2.5	e1.7	e2.0	e2.1	e4.3	11	2.4	3.2	2.0	1.7
6	18	e5.1	e2.5	e1.7	e2.0	e2.1	e4.5	11	3.9	3.3	2.0	1.5
7	18	e4.5	e2.5	e1.7	e2.0	e2.1	e5.2	9.8	3.1	4.9	5.0	1.6
8	7.4	4.1	e2.4	e1.7	e2.0	e2.1	e7.0	9.3	2.5	4.8	2.5	2.0
9	11	3.8	e2.4	e1.7	e2.0	e2.2	e10	8.7	2.2	4.5	1.7	2.6
10	9.9	3.8	e2.4	e1.7	e2.1	e2.2	e16	14	2.2	3.2	1.6	2.0
11	6.8	3.3	e2.4	e1.7	e2.1	e2.2	e62	11	2.0	11	1.3	1.7
12	4.4	e3.2	e2.3	e1.7	e2.1	e2.3	e58	8.5	1.9	17	1.0	1.5
13	4.0	3.1	e2.3	e1.7	e2.1	e2.4	e44	7.2	2.1	7.0	1.2	1.3
14	3.4	3.0	e2.2	e1.7	e2.1	e2.5	e44	6.5	1.8	4.8	3.3	1.4
15	3.3	e3.0	e2.2	e1.7	e2.1	e2.8	e50	6.5	2.5	3.2	1.9	1.6
16	3.1	e3.0	e2.2	e1.7	e2.1	e3.3	e70	6.5	4.8	2.5	1.6	1.5
17	3.0	e3.0	e2.1	e1.7	e2.1	e4.5	93	6.3	4.2	2.3	1.6	1.6
18	2.9	e3.0	e2.1	e1.7	e2.1	e6.3	84	6.0	2.9	40	2.5	1.5
19	3.1	e3.0	e2.0	e1.7	e2.1	e6.2	139	29	2.6	13	1.6	1.6
20	3.2	e3.0	e2.0	e1.7	e2.1	e6.0	69	12	2.3	5.4	1.2	1.6
21	3.3	e2.7	e2.0	e1.7	e2.1	e5.8	54	7.4	2.5	3.4	1.2	1.9
22	5.3	e2.6	e1.9	e1.7	e2.1	e5.6	42	8.5	3.8	3.0	1.3	2.0
23	12	e2.5	e1.9	e1.8	e2.1	e5.4	30	6.4	3.3	2.6	1.3	1.7
24	81	e2.5	e1.9	e1.8	e2.1	e5.1	27	4.9	4.7	2.6	1.4	1.4
25	30	e2.5	e1.9	e1.8	e2.1	e4.8	36	4.2	3.1	3.9	1.4	1.3
26	14	e2.6	e1.8	e1.8	e2.1	e4.6	41	3.6	95	2.7	1.6	3.1
27	29	e2.6	e1.8	e1.8	e2.1	e4.5	27	3.1	19	2.0	1.5	5.2
28	33	e2.6	e1.8	e1.8	e2.1	e4.3	23	3.0	6.7	2.9	1.6	3.2
29	17	e2.6	e1.8	e1.8	e2.1	e4.2	20	2.7	26	3.6	1.6	2.6
30	11	e2.6	e1.8	e1.8	---	e4.1	17	2.4	6.2	3.0	1.5	4.0
31	9.4	---	e1.7	e1.8	---	e4.0	---	2.3	---	2.3	1.4	---
TOTAL	429.2	124.8	66.9	53.6	59.6	112.1	1093.4	263.8	223.3	174.3	55.7	62.1
MEAN	13.8	4.16	2.16	1.73	2.06	3.62	36.4	8.51	7.44	5.62	1.80	2.07
MAX	81	15	2.6	1.8	2.1	6.3	139	29	95	40	5.0	5.2
MIN	2.9	2.5	1.7	1.7	1.9	2.1	4.0	2.3	1.8	2.0	1.0	1.3
AC-FT	851	248	133	106	118	222	2170	523	443	346	110	123
CFSM	1.78	.54	.28	.22	.26	.47	4.69	1.10	.96	.72	.23	.27
IN.	2.05	.60	.32	.26	.29	.54	5.23	1.26	1.07	.83	.27	.30

e Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04024098 DEER CREEK NEAR HOLYOKE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1976 - 1996, BY WATER YEAR (WY)

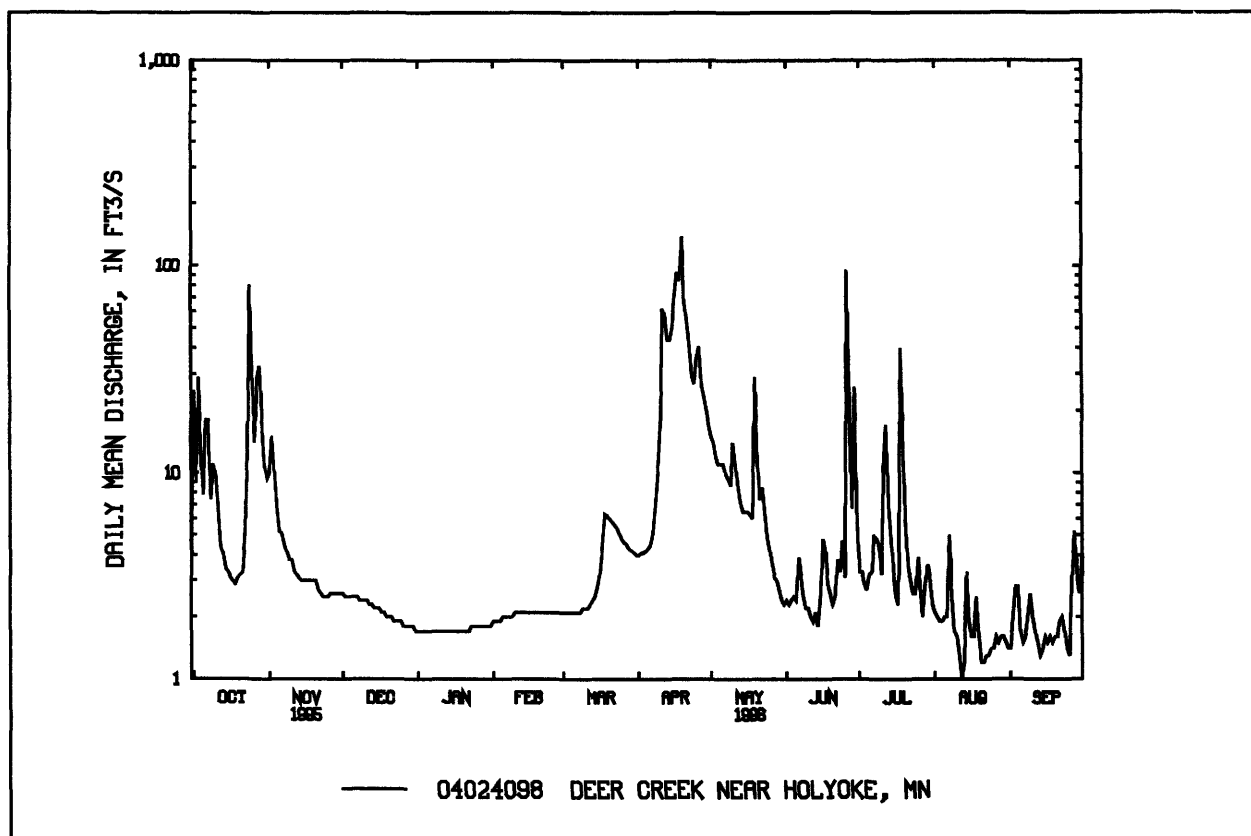
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	6.80	4.42	2.44	1.86	2.28	8.66	23.6	10.9	7.88	6.79	4.81	7.96
MAX	21.8	12.2	3.86	2.92	5.87	21.5	90.8	24.3	31.4	22.3	36.9	37.4
(WY)	1983	1983	1983	1992	1981	1995	1986	1991	1993	1991	1986	1986
MIN	1.69	1.59	1.31	.97	1.06	2.34	4.11	2.15	1.39	1.50	.89	1.24
(WY)	1988	1977	1977	1979	1979	1986	1977	1980	1995	1988	1982	1983

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1976 - 1996	
ANNUAL TOTAL	2598.87		2718.8			
ANNUAL MEAN	7.12		7.43		7.38	
HIGHEST ANNUAL MEAN					19.3	
LOWEST ANNUAL MEAN					3.65	
HIGHEST DAILY MEAN	110	Mar 14	139	Apr 19	553	Sep 6 1990
LOWEST DAILY MEAN	.65	Jun 25	1.0	Aug 12	.21	Jul 2 1976
ANNUAL SEVEN-DAY MINIMUM	.77	Jun 25	1.3	Aug 19	.47	Aug 10 1982
INSTANTANEOUS PEAK FLOW			251	Jun 26	2000 ^a	Sep 3 1985
INSTANTANEOUS PEAK STAGE			15.26	Jun 26	32.76 ^b	Sep 3 1985
INSTANTANEOUS LOW FLOW			.81	Aug 13	.20 ^c	Aug 13 1982
ANNUAL RUNOFF (AC-FT)	5150		5390		5350	
ANNUAL RUNOFF (CFSM)	.92		.96		.95	
ANNUAL RUNOFF (INCHES)	12.44		13.02		12.91	
10 PERCENT EXCEEDS	16		15		14	
50 PERCENT EXCEEDS	2.4		2.6		2.5	
90 PERCENT EXCEEDS	1.5		1.7		1.4	

a From rating curve extended above 1000 ft³/s on basis of flow-through-culvert computations.

b From floodmark.

c Occurred Aug. 13, 16, 1982 and July 12, 1989.



RED RIVER OF THE NORTH BASIN

05030500 OTTER TAIL RIVER NEAR ELIZABETH, MN

LOCATION.--Lat 46°22'10", long 96°01'02", in SW¼SE¼ sec.31, T.134 N., R.42 W., Ottertail County, Hydrologic Unit 09020103, on right bank, 2.5 miles below Taplin Gorge Dam, 5.0 miles above the Diversion Dam, 5.7 miles east of Elizabeth and 6.6 miles northeast of Fergus Falls.

DRAINAGE AREA.--1,230 mi², approximately.

PERIOD OF RECORD.--May 1904 to September 1917, monthly discharge only, published as at German Church near Fergus Falls in WSP 1308. July 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,250 ft above mean sea level, from topographic map. Nonrecording gage at same site Nov. 1913 to September 1917 at datum 1,265 ft from topographic map.

REMARKS.--Records good except those for estimated daily discharge, which are fair. Flow regulated by power plant upstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	148	332	e315	e255	e315	e305	339	661	890	589	287	146
2	154	321	e315	e250	e310	e305	344	680	879	579	289	149
3	170	319	e315	e250	e310	e305	348	711	856	573	285	149
4	195	321	e315	e250	e310	e305	347	740	840	566	277	151
5	208	325	e315	e250	e310	e305	348	744	836	545	264	152
6	207	326	e315	e250	e310	e305	355	748	846	537	241	152
7	205	324	e310	e250	e310	e305	359	757	842	516	235	156
8	207	327	e300	e250	e310	e300	374	800	830	510	217	156
9	211	338	e295	e250	e310	e310	383	824	821	479	185	153
10	235	343	e285	e260	e310	e310	398	817	814	472	261	150
11	242	330	e275	e265	e310	e310	425	813	804	481	256	146
12	244	321	e275	e270	e310	e390	451	814	782	484	254	137
13	242	325	e275	e280	e325	e390	443	821	772	478	246	134
14	235	331	e270	e290	e335	e390	434	841	770	471	234	134
15	226	342	e270	e295	e335	e390	431	857	773	463	231	135
16	227	346	e270	e300	e330	e380	437	883	769	421	170	134
17	226	353	e270	e305	e330	e370	448	901	761	409	160	133
18	227	356	e270	e300	e325	e365	461	943	730	414	195	119
19	223	351	e270	e300	e320	e360	469	955	722	406	214	115
20	231	346	e270	e295	e315	351	475	959	715	397	220	120
21	237	335	e270	e295	e315	324	484	957	704	397	212	121
22	236	337	e265	e290	e315	323	498	956	691	392	212	120
23	239	336	e265	e290	e320	323	519	954	675	373	204	120
24	247	338	e265	e290	e320	331	554	948	662	320	198	117
25	260	e328	e260	e290	e320	e335	570	939	661	317	194	116
26	276	e328	e260	e295	e310	357	577	935	667	345	187	120
27	291	e328	e260	e305	e305	331	592	931	645	345	183	121
28	296	e326	e260	e310	e300	333	610	920	629	314	179	121
29	295	e315	e255	e310	e300	336	647	910	624	305	173	120
30	297	e318	e255	e315	---	337	658	899	616	311	157	122
31	314	---	e255	e315	---	341	---	892	---	295	147	---
TOTAL	7251	9966	8665	8720	9145	10422	13778	26510	22626	13504	6767	4019
MEAN	234	332	280	281	315	336	459	855	754	436	218	134
MAX	314	356	315	315	335	390	658	959	890	589	289	156
MIN	148	315	255	250	300	300	339	661	616	295	147	115
AC-FT	14380	19770	17190	17300	18140	20670	27330	52580	44880	26790	13420	7970
CFSM	.19	.27	.23	.23	.26	.27	.37	.70	.61	.35	.18	.11
IN.	.22	.30	.26	.26	.28	.32	.42	.80	.68	.41	.20	.12

e Estimated.

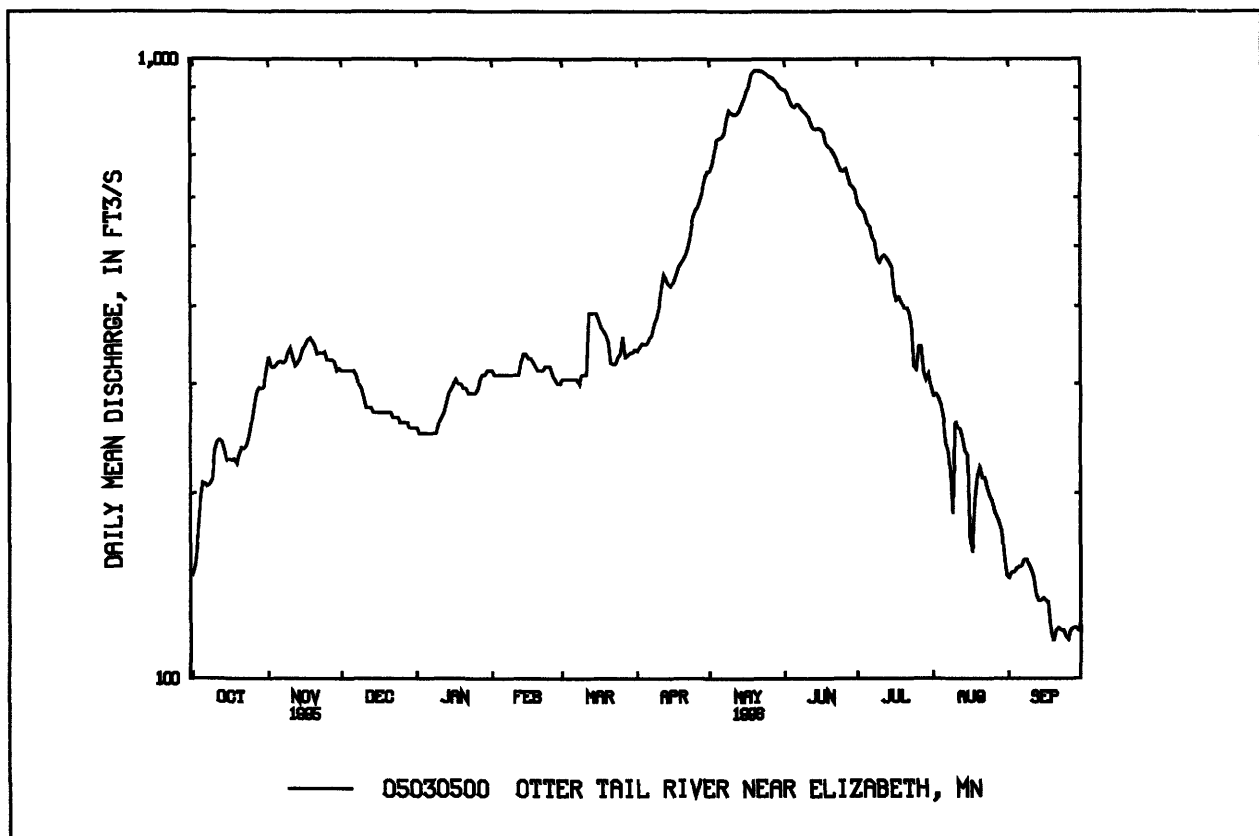
RED RIVER OF THE NORTH BASIN

05030500 OTTER TAIL RIVER NEAR ELIZABETH, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1996, BY WATER YEAR (WY)

MEAN	331	316	297	277	314	372	499	679	620	498	353	314
MAX	740	571	489	400	439	443	632	855	754	745	759	817
(WY)	1994	1994	1994	1994	1994	1994	1995	1996	1996	1993	1993	1993
MIN	139	143	141	181	209	314	357	453	454	358	218	134
(WY)	1993	1993	1993	1993	1993	1993	1993	1993	1995	1995	1996	1996

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1992 - 1996	
ANNUAL TOTAL	131471		141373		411	
ANNUAL MEAN	360		386		495	
HIGHEST ANNUAL MEAN					1994	
LOWEST ANNUAL MEAN					1995	
HIGHEST DAILY MEAN	702	May 16	959	May 20	959	May 20 1996
LOWEST DAILY MEAN	135	Sep 28	115	Sep 19	115	Sep 19 1996
ANNUAL SEVEN-DAY MINIMUM	147	Sep 26	118	Sep 19	118	Sep 19 1996
INSTANTANEOUS PEAK FLOW			961	May 19	961	May 19 1996
INSTANTANEOUS PEAK STAGE			8.17	May 19	8.17	May 19 1996
INSTANTANEOUS LOW FLOW			61 ^a	Aug 9	61 ^a	Aug 9 1996
ANNUAL RUNOFF (AC-FT)	260800		280400		297700	
ANNUAL RUNOFF (CFSM)	.29		.31		.33	
ANNUAL RUNOFF (INCHES)	3.98		4.28		4.54	
10 PERCENT EXCEEDS	652		776		737	
50 PERCENT EXCEEDS	310		315		338	
90 PERCENT EXCEEDS	203		170		165	

^a Result of regulation.

RED RIVER OF THE NORTH BASIN

05045950 ORWELL LAKE NEAR FERGUS FALLS, MN

LOCATION.--Lat 46°12'55", long 96°10'40", in SW¼, sec.26, T.132 N., R.44 W., Otter Tail County, Hydrologic Unit 09020103, at dam on Otter Tail River at outlet of Orwell Lake, 7 mi southwest of Fergus Falls.

DRAINAGE AREA.--1,830 mi², approximately.

PERIOD OF RECORD.--March 1953 to current year. Prior to October 1971, published as Orwell Reservoir.

GAGE.--Water-stage recorder. Datum of gage is in mean sea level, adjustment of 1912.

REMARKS.--Reservoir is formed by earth dam with concrete spillway with one taintor gate; storage began in March 1953. Capacity to elevation 1,070 ft (maximum operating stage) is 14,100 acre-ft of which 13,100 acre-ft is controlled storage above elevation 1,048 ft (minimum operating stage). Dead storage is 210 acre-ft. Figures given herein represent total contents. Reservoir is used for flood control and to increase low flow for water supply and pollution abatement.

COOPERATION.--Records were provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 16,920 acre-ft, June 17, 1962, May 23, 1966, elevation, 1,072.38 ft; minimum (after initial filling), 844 acre-ft, Aug. 26, 27, 1953, elevation, 1,046.96 ft.

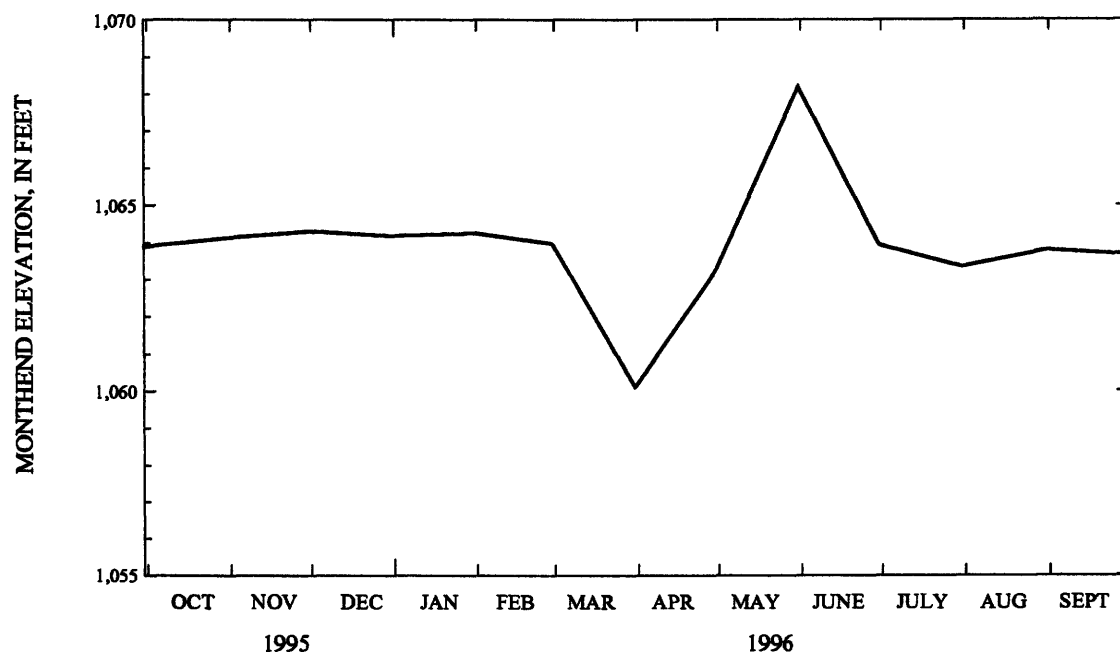
EXTREMES FOR CURRENT YEAR.--Maximum contents, 12,330 acre-ft, May 28, elevation, 1068.33 ft; minimum, 5460 acre-ft, Mar. 29, elevation, 1059.93 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1063.89	8220	
Oct. 31.....	1064.13	8410	+190
Nov. 30.....	1064.31	8560	+150
Dec. 31.....	1064.18	8450	-110
CAL YR 1995.....			-220
Jan. 31.....	1064.25	8510	+60
Feb. 29.....	1063.98	8280	-230
Mar. 31.....	1060.10	5560	-2720
Apr. 30.....	1063.24	7730	+2170
May 31.....	1068.18	12180	+4450
June 30.....	1063.93	8250	-3930
July 31.....	1064.34	8590	+340
Aug. 31.....	1063.79	8140	-450
Sept. 30.....	1063.67	8050	-90
WTR YR 1996.....			-170

RED RIVER OF THE NORTH BASIN

05045950 ORWELL LAKE NEAR FERGUS FALLS, MN--Continued



RED RIVER OF THE NORTH BASIN

05046000 OTTER TAIL RIVER BELOW ORWELL DAM, NEAR FERGUS FALLS, MN

LOCATION.--Lat 46°12'35", long 96°11'05", in NE¼ sec.34, T.132 N., R.44 W., Otter Tail County, Hydrologic Unit 09020103, on left bank 0.7 mi downstream from Orwell Dam, 6.1 mi downstream from Dayton Hollow Dam, 8 mi southwest of Fergus Falls, and 11.1 mi downstream from Pelican River.

DRAINAGE AREA.--1,740 mi².

PERIOD OF RECORD.--October 1930 to current year. Prior to October 1952, published as Otter Tail River below Pelican River, near Fergus Falls. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 785: 1934(M). WSP 1208: 1947(M). WSP 1308: 1931(M).

GAGE.--Water-stage recorder. Datum of gage is 1,029.65 ft above sea level, adjustment of 1912 (levels by U.S. Army Corps of Engineers). Oct. 11, 1930, to Nov. 17, 1933, at same site at datum 2.00 ft higher; Nov. 18, 1933, to Mar. 21, 1953, at site 6.1 mi upstream at datum 40.30 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow regulated by Orwell Lake (station 05045950) beginning Mar. 21, 1953 and powerplant upstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	DAILY MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	244	426	446	471	e425	477	560	832	1260	838	483	204
2	357	451	446	445	e425	476	576	840	1260	780	440	204
3	433	452	446	414	e420	471	599	885	1260	712	405	204
4	338	447	474	412	e418	471	623	916	1250	693	409	204
5	272	446	501	412	e416	477	630	899	1240	659	412	228
6	316	446	440	412	399	471	635	982	1230	635	407	248
7	339	446	336	412	331	471	635	1040	1230	635	448	248
8	339	446	301	323	e360	467	635	1040	1230	654	477	244
9	339	446	295	251	e320	462	649	1040	1220	670	444	311
10	339	446	294	296	294	459	667	1140	1210	630	412	362
11	361	446	275	342	295	462	649	1230	1210	580	407	354
12	413	446	295	361	372	497	813	1230	1200	555	306	214
13	410	436	360	362	419	540	974	1100	1190	551	286	131
14	378	426	410	368	412	601	972	1010	1140	555	331	131
15	377	419	454	367	412	670	973	1090	1080	599	352	131
16	349	419	477	e360	418	689	956	1170	1080	629	370	131
17	324	434	477	e360	420	691	865	1210	1080	610	370	170
18	324	446	399	e350	419	687	802	1220	1070	595	370	204
19	324	446	405	e340	419	683	758	1080	1070	558	313	226
20	330	465	420	329	446	649	729	702	1010	529	239	237
21	331	483	433	316	464	595	732	937	941	529	218	237
22	331	443	433	317	434	576	673	1230	900	529	204	237
23	331	412	433	331	412	578	633	1230	897	529	345	204
24	331	395	429	314	412	579	652	1240	851	529	435	176
25	397	370	426	356	412	556	676	1250	808	491	433	193
26	452	370	426	354	397	543	760	1260	808	420	348	234
27	452	419	426	361	412	534	858	1260	826	391	286	252
28	452	446	457	362	418	517	858	1260	840	391	225	251
29	452	446	477	e410	454	521	823	1260	840	391	204	251
30	420	446	477	e420	---	526	798	1260	840	441	204	279
31	398	---	476	e420	---	529	---	1260	---	483	204	---
TOTAL	11253	13065	12844	11348	11655	16925	22163	34103	32071	17791	10787	6700
MEAN	363	435	414	366	402	546	739	1100	1069	574	348	223
MAX	452	483	501	471	464	691	974	1260	1260	838	483	362
MIN	244	370	275	251	294	459	560	702	808	391	204	131
AC-FT	22320	25910	25480	22510	23120	33570	43960	67640	63610	35290	21400	13290
CFSM	.21	.25	.24	.21	.23	.31	.42	.63	.61	.33	.20	.13

e Estimated.

RED RIVER OF THE NORTH BASIN

05046000 OTTER TAIL RIVER BELOW ORWELL DAM, NEAR FERGUS FALLS, MN--Continued

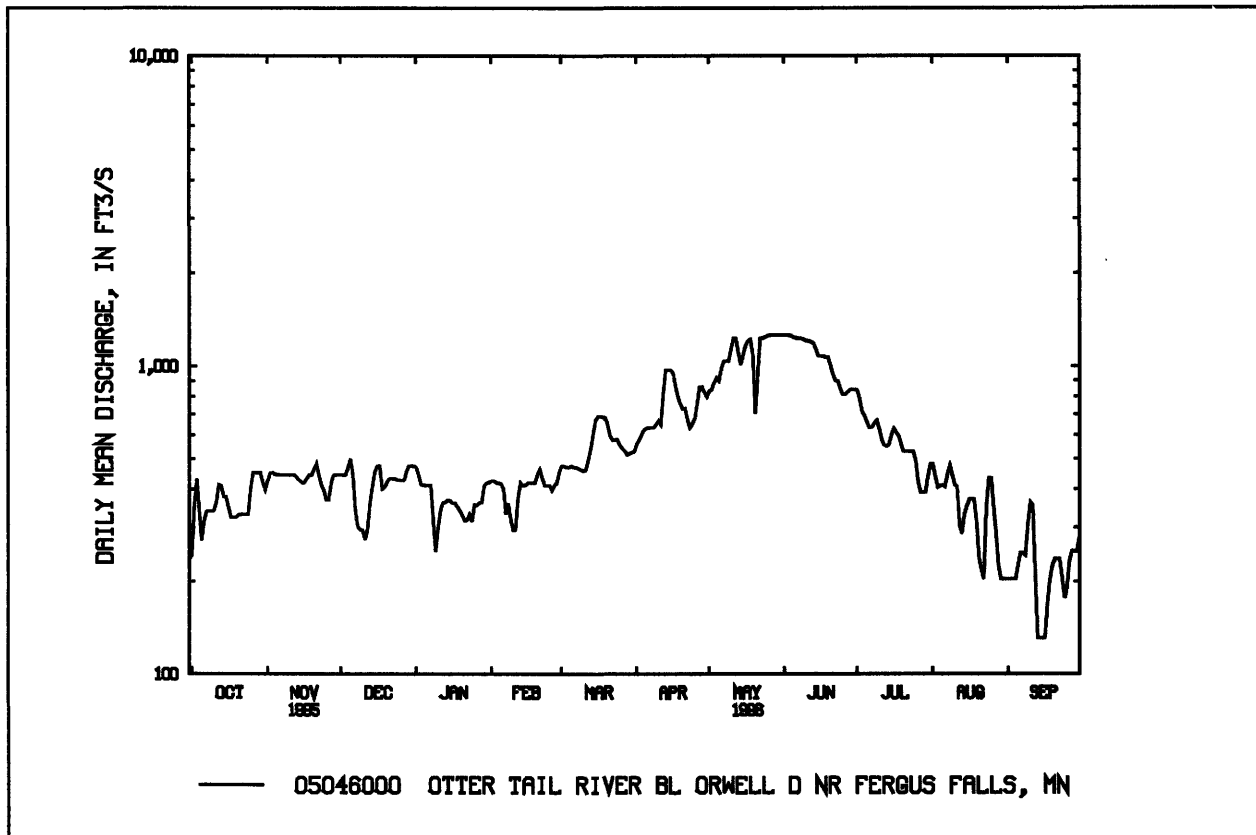
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	238	246	234	224	229	312	469	573	562	410	276	234
MAX	973	831	706	603	647	724	1051	1427	1425	1246	1080	1026
(WY)	1994	1986	1987	1986	1994	1994	1986	1986	1986	1953	1985	1993
MIN	9.15	8.42	8.10	15.1	10.8	23.5	39.5	14.1	14.2	12.8	11.5	7.9 ^a
(WY)	1977	1977	1977	1937	1935	1937	1934	1977	1934	1936	1934	1934

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1931 - 1996	
ANNUAL TOTAL	186812		200705			
ANNUAL MEAN	512		548		334	
HIGHEST ANNUAL MEAN					842	1986
LOWEST ANNUAL MEAN					20.4	1934
HIGHEST DAILY MEAN	1100	Mar 20	1260	May 26	1670	Jun 20 1953
LOWEST DAILY MEAN	115	Mar 17	131	Sep 13	1.6	Feb 7 1937
ANNUAL SEVEN-DAY MINIMUM	205	Sep 19	159	Sep 12	5.9	Sep 15 1934
INSTANTANEOUS PEAK FLOW			1260	May 25	1710	Jun 17 1953
INSTANTANEOUS PEAK STAGE			4.31	May 30	5.60 ^a	Jun 17 1953
INSTANTANEOUS LOW FLOW			84 ^b	Feb 7	.70 ^b	Aug 5 1970
ANNUAL RUNOFF (AC-FT)	370500		398100		242100	
ANNUAL RUNOFF (CFSM)	.29		.32		.19	
10 PERCENT EXCEEDS	896		1070		730	
50 PERCENT EXCEEDS	446		446		262	
90 PERCENT EXCEEDS	274		274		32	

a Backwater from aquatic vegetation.

b Result of regulation.



RED RIVER OF THE NORTH BASIN

05050000 BOIS DE SIOUX RIVER NEAR WHITE ROCK, SD

LOCATION.--Lat 45°51'45", long 96°34'25", in SW¹/₄SW¹/₄ sec.27, T.128 N., R.47 W., Roberts County, Hydrologic Unit 09020101, on Sisseton Indian Reservation, on left bank just downstream from Big Slough Outlet, 300 ft downstream from White Rock Dam, 4 mi south of White Rock, SD and 5 mi northwest of Wheaton.

DRAINAGE AREA.--1,160 mi², approximately.

PERIOD OF RECORD.--October 1941 to current year.

GAGE.--Water-stage recorder. Datum of gage is 960.00 ft, adjustment of 1912 (levels by U.S. Army Corps of Engineers). Prior to Jan. 14, 1943, nonrecording gage at same site at datum 0.11 ft lower. Jan. 15, 1943, to Sept. 30, 1963, water-stage recorder at same site at datum 0.11 ft lower.

REMARKS.--Records fair, except those for estimated period which are poor. Flow regulated by Lake Traverse-Boise de Sioux Flood Control and Water Conservation project..

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	98	566	69	e10	e7.5	e300	e930	513	624	9.3	7.2	1.6
2	83	670	67	e10	e8.0	e450	e950	505	610	7.6	7.4	.52
3	73	655	66	e10	e8.5	e450	e970	421	476	6.1	7.6	.63
4	65	726	e62	e10	e9.2	e500	e700	329	352	6.0	7.4	1.1
5	67	667	e60	e10	e9.8	e620	e600	338	349	5.6	6.6	2.7
6	73	609	e140	e9.4	e10	e620	e600	342	348	5.7	6.4	.63
7	68	507	e100	e8.8	e11	e620	e600	342	345	5.6	6.3	.51
8	60	405	e20	e8.6	e12	e620	702	346	341	5.4	5.5	.45
9	60	400	e9.0	e8.4	e13	e620	317	398	337	5.2	5.9	.41
10	74	359	e8.0	e8.5	e14	e620	200	557	258	5.0	6.2	.43
11	151	395	e8.0	e8.6	e15	e620	178	614	176	5.0	6.5	.33
12	256	277	e8.0	e8.8	e15	e620	611	606	175	4.8	6.3	.30
13	374	250	e8.0	e9.0	e16	e620	1160	599	174	4.7	5.1	.29
14	428	246	e8.0	e9.6	e16	e620	1150	625	150	4.6	4.7	.40
15	459	238	e8.0	e9.8	e16	e620	1140	750	131	4.5	4.6	.29
16	488	232	e8.0	e9.8	e16	e620	1120	775	116	4.1	4.6	.25
17	510	193	e8.2	e9.8	e16	e620	1100	865	123	3.7	4.7	.22
18	490	159	e8.3	e9.8	e16	e620	1100	1210	84	4.7	4.3	.21
19	482	160	e8.4	e9.0	e16	e620	1090	1120	48	7.4	2.8	.25
20	397	165	e8.5	e8.6	e17	e620	1090	639	54	7.2	2.5	.26
21	304	136	e8.6	e8.2	e18	e620	1080	506	63	6.7	4.3	.28
22	272	188	e8.8	e7.8	e19	e620	1070	928	65	6.1	1.2	.26
23	216	237	e9.0	e7.6	e20	e620	1050	1080	66	6.1	1.5	.25
24	215	161	e9.0	e7.5	e20	e620	1030	1170	71	5.0	1.6	.27
25	306	129	e9.3	e7.5	e20	e620	1040	1140	46	5.3	.97	.24
26	336	119	e9.5	e7.4	e21	e620	902	1110	11	5.6	1.2	.27
27	327	131	e9.5	e7.3	e22	e680	726	1070	8.5	5.8	1.2	.24
28	350	94	e9.8	e7.2	e30	e780	714	1030	7.7	6.3	1.2	.26
29	389	73	e9.8	e7.2	e40	e880	704	919	7.3	6.7	1.3	.21
30	445	71	e10	e7.3	---	e890	624	844	7.0	7.1	1.0	.18
31	511	---	e10	e7.4	---	e910	---	728	---	7.1	1.1	---
TOTAL	8427	9218	785.7	268.9	472.0	19480	25248	22419	5623.5	180.0	129.17	14.24
MEAN	272	307	25.3	8.67	16.3	628	842	723	187	5.81	4.17	.47
MAX	511	726	140	10	40	910	1160	1210	624	9.3	7.6	2.7
MIN	60	71	8.0	7.2	7.5	300	178	329	7.0	3.7	.97	.18
AC-FT	16710	18280	1560	533	936	38640	50080	44470	11150	357	256	28
CFSM	.23	.26	.02	.01	.01	.54	.73	.62	.16	.01	.00	.00
IN.	.27	.30	.03	.01	.02	.62	.81	.72	.18	.01	.00	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

05050000 BOIS DE SIOUX RIVER NEAR WHITE ROCK, SD--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	31.1	17.1	5.26	2.74	3.60	42.9	247	286	242	163	72.4	35.8
MAX	535	307	57.5	36.0	53.0	628	1322	1310	1103	1035	1182	1052
(WY)	1994	1996	1985	1987	1966	1996	1969	1969	1986	1962	1993	1973
MIN	.000	.000	.000	.000	.000	.000	.000	.23	.010	.000	.000	.070
(WY)	1942	1942	1942	1942	1942	1942	1942	1977	1977	1961	1970	1950

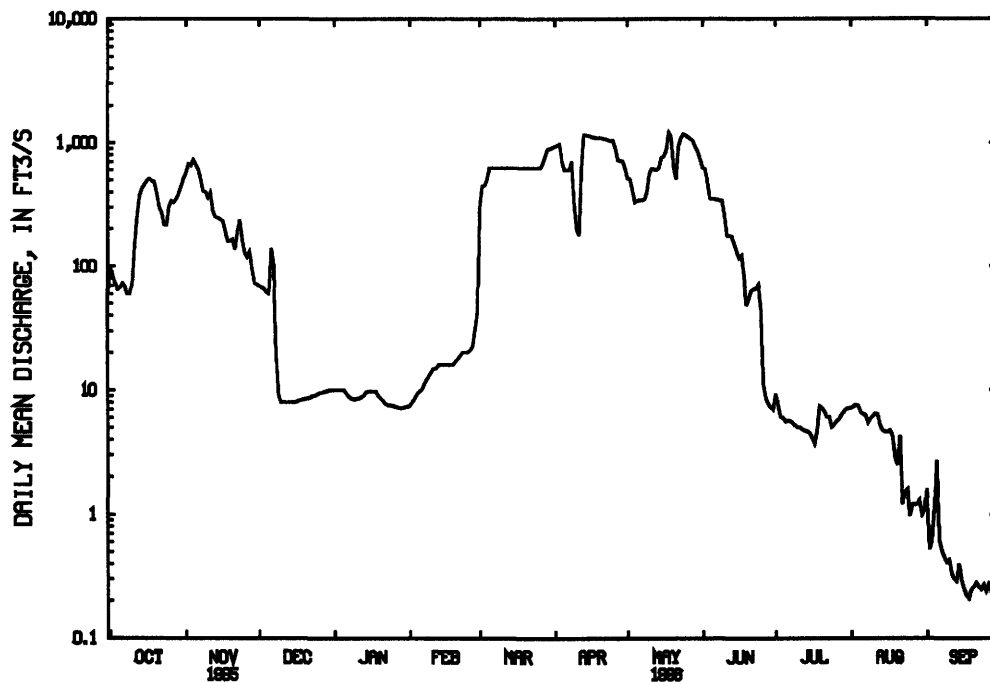
SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1942 - 1996
ANNUAL TOTAL	125397.7	92265.51	
ANNUAL MEAN	344	252	96.0 ^a
HIGHEST ANNUAL MEAN			360
LOWEST ANNUAL MEAN			.38
HIGHEST DAILY MEAN	1340	Apr 3	1210
LOWEST DAILY MEAN	3.5	Aug 6	.18
ANNUAL SEVEN-DAY MINIMUM	3.9	Aug 1	.24
INSTANTANEOUS PEAK FLOW			1230
INSTANTANEOUS PEAK STAGE			12.98 ^c
INSTANTANEOUS LOW FLOW			.18
ANNUAL RUNOFF (AC-FT)	248700	183000	69530
ANNUAL RUNOFF (CFSM)	.30	.22	.083
ANNUAL RUNOFF (INCHES)	4.02	2.96	1.12
10 PERCENT EXCEEDS	1240	727	320
50 PERCENT EXCEEDS	69	51	2.4
90 PERCENT EXCEEDS	4.9	1.4	.00

a Median of annual mean discharges is 55 ft³/s.

b Many days, several years.

c Backwater from ice.

d From floodmark.



— 05050000 BOIS DE SIOUX RIVER NEAR WHITE ROCK, SD

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, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	73	599	e75	e11	e15	e560	e1120	834	909	8.2	5.5	.51
2	160	671	e72	e11	e15	e640	e1150	763	822	7.8	5.3	.50
3	145	667	e70	e11	e16	e720	e1200	746	756	8.0	5.2	.48
4	113	992	e66	e11	e16	e780	e1220	578	545	7.7	5.4	.47
5	118	1230	e60	e11	e17	e800	e1300	541	480	5.9	7.0	.45
6	164	1150	e90	e10	e18	e800	e1350	556	466	4.9	6.3	.41
7	176	947	e90	e10	e19	e800	e1500	562	458	4.5	6.0	.44
8	147	750	e45	e10	e20	e800	e1600	572	451	4.5	5.0	.45
9	135	686	e12	e10	e20	e800	e1800	587	436	3.8	4.1	.46
10	143	677	e9.8	e11	e21	e800	e2000	695	417	3.7	3.7	.46
11	150	487	e9.4	e11	e21	e800	2750	843	280	3.7	3.5	.43
12	214	e480	e9.3	e11	e21	e800	2390	872	234	3.6	3.2	.40
13	329	e475	e9.1	e12	e21	e800	2280	858	229	3.7	3.0	.39
14	427	e470	e9.1	e12	e21	e800	2150	903	225	3.3	2.9	.36
15	466	e465	e9.0	e12	e21	e800	1990	1290	199	3.4	2.9	.33
16	504	e460	e9.1	e12	e22	e800	1890	1490	181	3.3	2.5	.31
17	526	e450	e9.2	e12	e22	e800	1830	1520	159	3.1	2.3	.29
18	532	436	e9.3	e12	e22	e800	1770	3110	164	2.9	2.1	.26
19	514	288	e9.3	e11	e23	e800	1740	3580	115	2.8	1.8	.24
20	483	239	e9.4	e11	e24	e800	1710	3070	77	2.6	1.4	.24
21	373	175	e9.5	e11	e24	e810	1630	2010	82	2.5	1.4	.24
22	315	e170	e9.6	e11	e25	e820	1550	1350	93	5.4	1.4	.24
23	269	e170	e9.7	e11	e26	e830	1500	1360	98	5.8	1.2	.25
24	239	e170	e9.8	e10	e27	e860	1460	1420	101	5.3	1.0	.26
25	390	e150	e9.9	e10	e28	e890	1420	1430	106	4.9	.97	.29
26	544	e120	e10	e11	e30	e920	1380	1390	81	5.1	.90	.38
27	528	e110	e10	e11	e33	e950	1190	1340	30	4.8	.77	.41
28	477	e95	e10	e12	e50	e980	1070	1280	16	5.5	.64	.41
29	478	e85	e11	e13	e150	e1000	1030	1210	11	6.1	.58	.36
30	494	e80	e11	e14	---	e1050	1000	1070	8.8	6.0	.56	.31
31	560	---	e11	e15	---	e1100	---	1010	---	5.8	.54	---
TOTAL	10186	13944	793.5	351	788	25710	47970	38840	8229.8	148.6	89.06	11.03
MEAN	329	465	25.6	11.3	27.2	829	1599	1253	274	4.79	2.87	.37
MAX	560	1230	90	15	150	1100	2750	3580	909	8.2	7.0	.51
MIN	73	80	9.0	10	15	560	1000	541	8.8	2.5	.54	.24
AC-FT	20200	27660	1570	696	1560	51000	95150	77040	16320	295	177	22
CFSM	.17	.25	.01	.01	.01	.44	.85	.67	.15	.00	.00	.00
IN.	.20	.28	.02	.01	.02	.51	.95	.77	.16	.00	.00	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

05051300 BOIS DE SIOUX RIVER NEAR DORAN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 1996, BY WATER YEAR (WY)

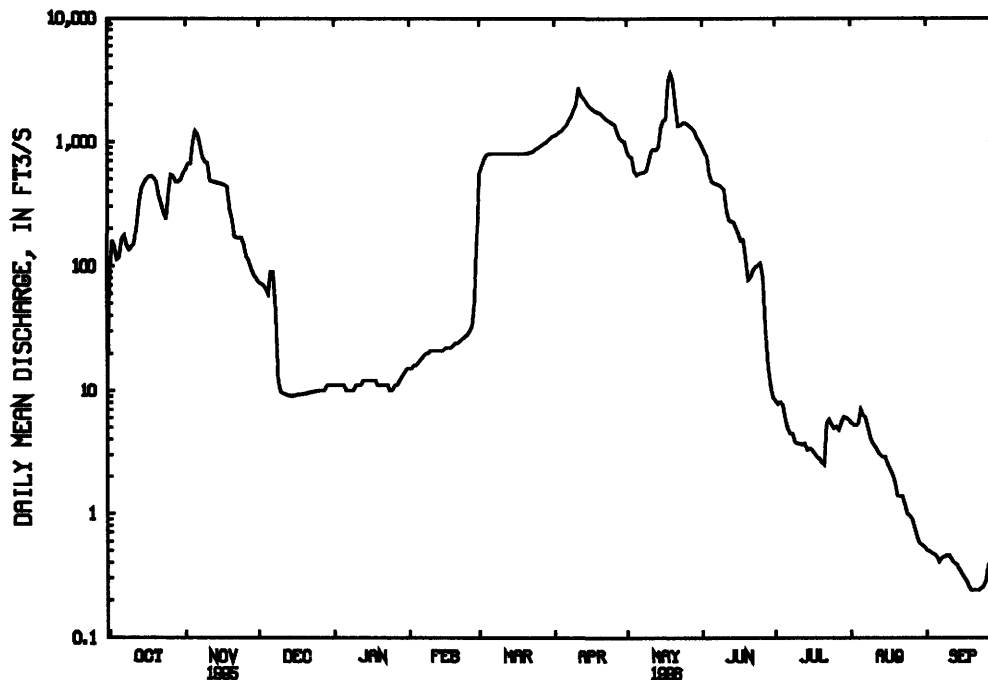
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	156	73.3	7.94	3.97	7.09	496	856	634	356	527	269	240
MAX	592	465	25.6	11.3	27.2	1757	1599	1432	749	1477	1486	1244
(WY)	1994	1996	1996	1996	1996	1995	1996	1995	1995	1993	1993	1973
MIN	.026	1.97	.65	.077	.000	25.5	12.6	11.8	12.6	4.37	.000	.070
(WY)	1991	1991	1991	1991	1990	1990	1990	1990	1990	1990	1990	1970

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1990 - 1996
ANNUAL TOTAL	197947.31	147060.99	
ANNUAL MEAN	542	402	304
HIGHEST ANNUAL MEAN			553
LOWEST ANNUAL MEAN			8.77
HIGHEST DAILY MEAN	4200	Mar 17	3580
LOWEST DAILY MEAN	.58	Aug 1	.24
ANNUAL SEVEN-DAY MINIMUM	.79	Jul 28	.25
INSTANTANEOUS PEAK FLOW			3640
INSTANTANEOUS PEAK STAGE			20.83c
INSTANTANEOUS LOW FLOW			.22b
ANNUAL RUNOFF (AC-FT)	392600	291700	219900
ANNUAL RUNOFF (CFSM)	.29	.21	.16
ANNUAL RUNOFF (INCHES)	3.92	2.91	2.19
10 PERCENT EXCEEDS	1510	1240	1230
50 PERCENT EXCEEDS	118	72	11
90 PERCENT EXCEEDS	2.3	.95	.18

a Many days, several years; affected by regulation.

b Result of regulation.

c Backwater from ice.



— 05051300 BOIS DE SIOUX RIVER NEAR DORAN, MN

RED RIVER OF THE NORTH BASIN

05051500 RED RIVER OF THE NORTH AT WAHPETON, N.D.

LOCATION.--Lat 46°15'55", long 96°35'40", in NE¼ sec.8, T.132 N., R.47 W., Richland County, Hydrologic Unit 09020104, on left bank in Wahpeton, 800 ft downstream from confluence of Bois de Sioux and Otter Tail Rivers, and at mile 548.6.

DRAINAGE AREA.--4,010 mi², approximately.

PERIOD OF RECORD.--April 1942 to October 1942, March 1943 to current year. Gage-height records collected in this vicinity since 1917 are contained in reports of the National Weather Service.

GAGE.--Water-stage recorder and concrete and wooden dam. Datum of gage is 942.97 ft above sea level. Prior to Aug. 6, 1943, National Weather Service nonrecording gage 800 ft upstream, converted to present datum. Aug. 6, 1943, to Oct. 27, 1950, nonrecording gage at present site and datum.

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 elevation 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 powerplants.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 17.0 ft, discharge, 10,500 ft³/s, occurred in the spring of 1897. The discharge has not been exceeded since.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	316	1090	e640	e549	e736	e560	e1880	1600	2180	877	455	183
2	378	1180	e595	e549	e748	e470	e2060	1520	e2070	867	462	187
3	507	1200	e566	e466	e759	e470	e2280	1590	e1970	847	438	192
4	593	1010	e531	e428	e720	e660	e2490	1520	e1860	774	392	191
5	570	1300	e538	e431	e660	e928	e2630	1480	e1760	729	422	233
6	487	1310	e456	e440	e610	e975	e2780	1490	e1650	713	404	231
7	536	1320	e514	e500	e550	e1000	e3040	1550	e1640	662	402	249
8	568	1130	e542	e531	e500	e1030	e3380	1600	e1630	644	411	245
9	571	1040	e365	e466	e460	e1060	e3820	1630	e1610	660	450	239
10	587	1110	e337	e353	e435	e1100	e4110	1690	e1600	681	440	280
11	583	961	e456	e580	e421	e1120	e4100	1880	1550	663	397	325
12	598	833	e428	e443	e359	e1200	e3950	2000	1450	607	384	330
13	741	898	e392	e472	e389	e1320	3720	2030	1420	561	331	224
14	861	928	e443	e469	e456	e1520	3580	2050	1410	556	270	125
15	898	945	e483	e428	e440	e2000	3330	2180	1420	555	302	116
16	929	937	e500	e456	e427	e2620	3100	2450	1340	578	318	114
17	930	e928	e540	e431	e446	e3400	2940	2630	1280	622	335	102
18	927	e832	e510	e422	e450	e4000	2810	4440	1260	615	338	85
19	923	e732	e434	e198	e450	e4640	2680	5320	1230	575	335	129
20	906	e681	e422	e416	e450	e4490	2570	4700	1170	564	319	183
21	832	e486	e434	e531	e450	e4100	2420	3670	1150	521	278	225
22	731	e493	e456	e510	e460	e3200	2320	2480	1100	513	278	237
23	692	e599	e462	e500	e460	e2700	2210	2440	1050	513	223	235
24	680	e644	e469	e517	e460	e2300	2130	2560	1040	515	265	218
25	728	e751	e469	e524	e460	e2000	2090	2600	1010	520	383	182
26	1020	e724	e466	e538	e450	e1830	2060	2590	930	495	409	198
27	1120	e647	e459	e603	e450	e1500	2010	2540	888	433	372	234
28	1080	e559	e453	e628	e440	e1520	1960	2490	865	392	302	272
29	1050	e617	e483	e640	e420	e1570	1920	2430	874	397	243	266
30	1050	e636	e534	e625	---	e1640	1830	2320	882	389	198	264
31	1060	---	e542	e689	---	e1760	---	2250	---	406	186	---
TOTAL	23452	26521	14919	15333	14516	58683	82200	73720	41289	18444	10742	6294
MEAN	757	884	481	495	501	1893	2740	2378	1376	595	347	210
MAX	1120	1320	640	689	759	4640	4110	5320	2180	877	462	330
MIN	316	486	337	198	359	470	1830	1480	865	389	186	85
AC-FT	46520	52600	29590	30410	28790	116400	163000	146200	81900	36580	21310	12480

e Estimated.

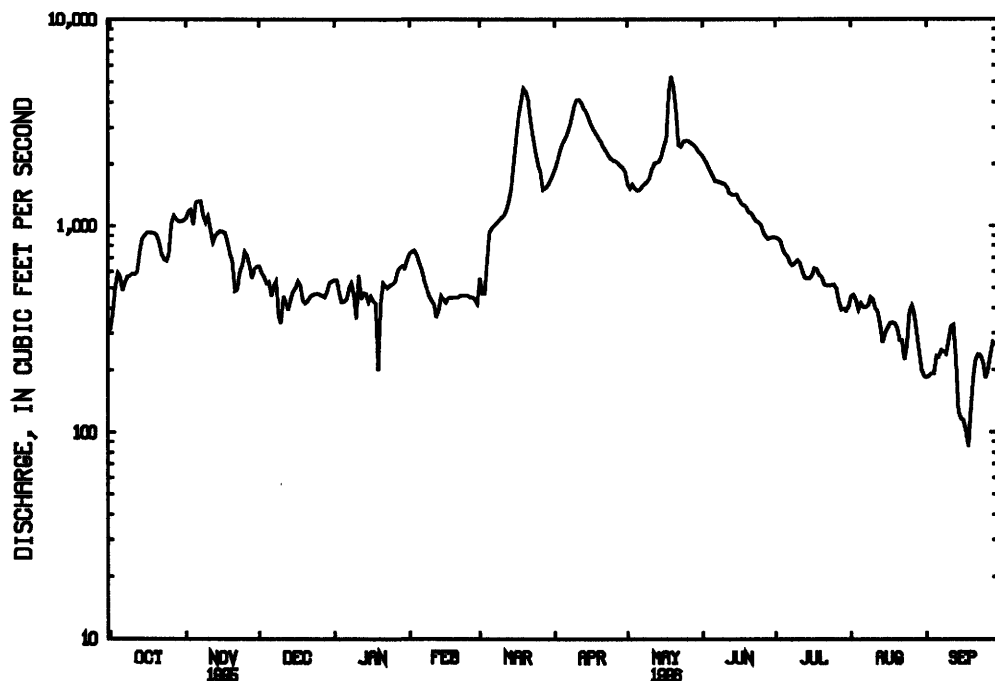
RED RIVER OF THE NORTH BASIN

05051500 RED RIVER OF THE NORTH AT WAHPETON, ND--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	331	307	274	265	276	665	1286	1074	1042	775	416	329
MAX	1599	952	820	678	687	2629	4436	3085	2675	2787	2496	2148
(WY)	1994	1987	1987	1986	1987	1995	1969	1986	1962	1993	1993	1993
MIN	5.72	7.40	6.60	8.81	18.0	84.3	138	22.5	90.0	65.6	53.5	2.18
(WY)	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1942 - 1996
ANNUAL TOTAL	414402	386113	
ANNUAL MEAN	1135	1055	583
HIGHEST ANNUAL MEAN			1477
LOWEST ANNUAL MEAN			54.0
HIGHEST DAILY MEAN	6200	Mar 17	8940
LOWEST DAILY MEAN	155	Jan 8	1.7
ANNUAL SEVEN-DAY MINIMUM	197	Sep 20	1.7
INSTANTANEOUS PEAK FLOW		4180	9200
INSTANTANEOUS PEAK STAGE		13.49 ^a	17.95
INSTANTANEOUS LOW FLOW			1.7
ANNUAL RUNOFF (AC-FT)	822000	765900	422100
10 PERCENT EXCEEDS	2610	2460	1410
50 PERCENT EXCEEDS	636	626	361
90 PERCENT EXCEEDS	296	279	105

^a Backwater from ice.

— 05051500 RED RIVER OF THE NORTH AT WAHPETON, ND
MEAN DAILY DISCHARGE (CFS)

RED RIVER OF THE NORTH BASIN

05051500 RED RIVER OF THE NORTH AT WAHPETON, ND--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL AS CACO3) (00900)	ALKA- LINITY LAB AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM DIS- SOLVED (MG/L AS MG) (00925)
OCT											
11...	1235	548	753	--	--	23.0	13.5	--	--	--	--
NOV											
21...	1210	465	522	--	--	1.0	0.5	--	--	--	--
JAN											
04...	1025	428	568	--	--	-9.0	0.5	--	--	--	--
13...	0930	371	687	--	--	-3.0	0.5	--	--	--	--
APR											
10...	1140	4130	467	--	--	10.0	2.0	--	--	--	--
13...	1640	3550	--	413	--	5.0	--	280	91	58	32
MAY											
02...	1000	1470	600	--	8.1	13.5	11.0	310	194	61	37
19...	1030	5190	582	--	--	20.0	18.0	--	--	--	--
JUL											
11...	1255	665	414	--	--	28.5	24.0	--	--	--	--
AUG											
14...	1525	263	439	--	8.1	22.0	24.0	210	209	38	29

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO AS K) (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS SO4) (00935)	SULFATE DIS- SOLVED (MG/L AS CL) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS F) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L (00950)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER (70303)
APR										
13...	16	11	0.4	6.9	130	11	0.10	309	371	0.50
MAY										
02...	17	11	0.4	6.0	130	12	0.20	380	391	0.53
AUG										
14...	12	11	0.4	3.4	23	12	0.20	243	272	0.37

RED RIVER OF THE NORTH BASIN

05051500 RED RIVER OF THE NORTH AT WAHPETON, ND--Continued

WATER-QUALITY RECORDS

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR a13...	3560	4	20	2	30	110	<0.1	<1	2	280
MAY 02...	1550	7	100	<1	30	50	0.1	1	<1	240
AUG 14...	193	4	10	<1	10	20	<0.1	<1	<1	180

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

05051522 RED RIVER OF THE NORTH AT HICKSON, ND

LOCATION.--Lat 46°39'35", long 96 °47'44", in SW¼ 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 mi², 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 powerplants.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	286	974	591	e541	e620	e436	e1690	1830	2430	836	380	199
2	308	985	634	e520	e690	e441	e1900	1660	2310	832	417	203
3	324	1020	650	e503	e710	e476	e2200	1520	2170	826	447	200
4	394	1050	638	e494	e740	e491	e2510	1530	2050	819	449	191
5	551	839	610	e428	e760	e500	e2820	1520	1930	778	424	191
6	652	957	565	e416	e705	e551	e3130	1460	1770	730	404	182
7	624	1220	523	e410	e650	e624	e3410	1450	1680	707	398	219
8	568	1410	512	e424	e595	e705	e3710	1480	1650	669	385	229
9	585	1160	505	e425	e540	e739	e4050	1520	1650	642	377	234
10	611	886	475	e490	e485	e778	e4400	1570	1620	639	388	231
11	596	955	353	e485	e460	e815	e4770	1580	1580	666	402	226
12	616	928	e335	e480	e430	e863	e5190	1690	1540	672	397	268
13	576	789	e399	e480	e400	e944	e5700	1830	1430	642	364	305
14	621	755	e404	e475	e360	e1070	e6190	1910	1350	595	342	300
15	751	863	e386	e460	e366	e1480	e6090	1970	1340	567	305	215
16	818	931	e429	e450	e387	e2080	e5360	2040	1340	564	285	158
17	850	966	e481	e440	e398	e2560	e4730	2310	1290	567	306	145
18	869	988	e514	e430	e396	e2960	e4180	3600	1220	601	325	143
19	878	951	e541	e425	e400	e3370	e3710	4810	1190	624	335	144
20	882	914	e541	e420	e397	e3730	e3300	5550	1170	599	338	141
21	863	830	e488	e220	e386	e3980	e2970	5890	1120	588	335	164
22	827	699	e480	e420	e390	e4030	e2720	5760	1080	554	305	194
23	740	532	e486	e520	e414	e3860	e2520	5210	1050	510	289	220
24	688	446	e496	e510	e430	e3640	e2370	4320	1020	502	267	229
25	667	495	e496	e500	e440	e3310	e2230	3530	991	510	231	227
26	658	622	e490	e520	e436	e3010	2140	3070	985	508	292	218
27	801	698	e480	e540	e435	e2630	2070	2840	931	507	376	203
28	988	652	e465	e570	e439	e2100	2010	2730	884	469	388	214
29	1010	570	e455	e590	e440	e1700	1950	2650	845	420	344	238
30	979	539	e471	e610	---	e1520	1900	2600	834	399	289	253
31	968	---	e507	e640	---	e1570	---	2520	---	392	233	---
TOTAL	21549	25624	15400	14836	14299	56963	101920	83950	42450	18934	10817	6284
MEAN	695	854	497	479	493	1838	3397	2708	1415	611	349	209
MAX	1010	1410	650	640	760	4030	6190	5890	2430	836	449	305
MIN	286	446	335	220	360	436	1690	1450	834	392	231	141
AC-FT	42740	50830	30550	29430	28360	113000	202200	166500	84200	37560	21460	12460

e Estimated.

RED RIVER OF THE NORTH BASIN

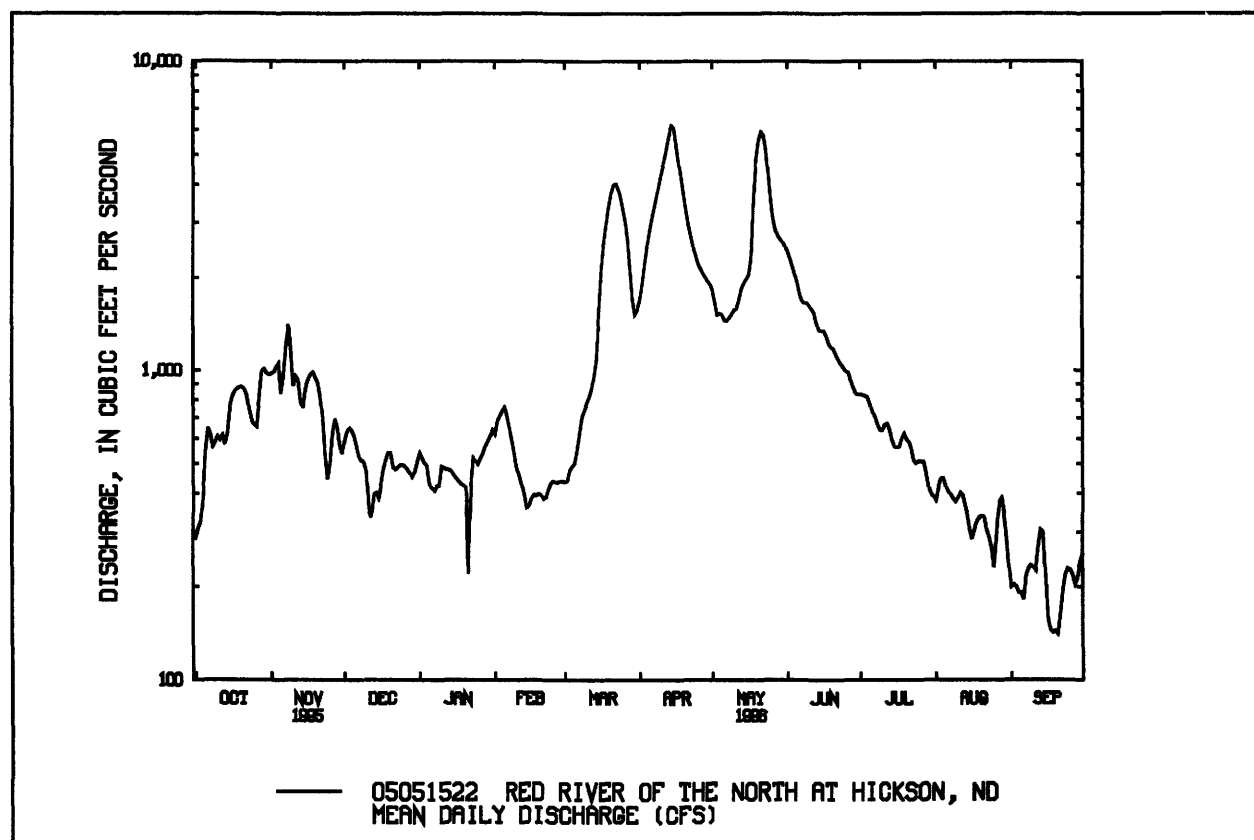
05051522 RED RIVER OF THE NORTH AT HICKSON, ND--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	405	335	287	278	321	924	1840	1159	1003	831	500	426
MAX	1558	900	817	747	745	2687	4165	3394	2485	2674	2674	2135
(WY)	1994	1987	1986	1986	1987	1995	1978	1986	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	1977

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1975 - 1996	
ANNUAL TOTAL	427808		413026			
ANNUAL MEAN	1172		1128		693	
HIGHEST ANNUAL MEAN					1604	
LOWEST ANNUAL MEAN					53.1	
HIGHEST DAILY MEAN	7600		Mar 20		12000	
LOWEST DAILY MEAN	182		Sep 24		.00	
ANNUAL SEVEN-DAY MINIMUM	207		Sep 22		.00	
INSTANTANEOUS PEAK FLOW			6290		Apr 14	
INSTANTANEOUS PEAK STAGE			28.26a		Apr 14	
ANNUAL RUNOFF (AC-FT)	848600		819200		501900	
10 PERCENT EXCEEDS	2500		2760		1740	
50 PERCENT EXCEEDS	634		623		381	
90 PERCENT EXCEEDS	307		291		83	

a Backwater from ice.



RED RIVER OF THE NORTH BASIN

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 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM DIS- SOLVED (MG/L AS MG) (00925)
OCT 11...	1550	591	726	--	--	23.5	13.0	--	--	--	--
NOV 21...	1645	824	600	--	--	1.0	1.0	--	--	--	--
JAN 08...	1330	424	467	--	--	1.5	0.0	--	--	--	--
APR 15...	0940	6200	456	--	9.1	-1.0	0.5	210	109	46	23
17...	1145	4610	550	--	--	8.0	6.0	--	--	--	--
MAY 10...	1110	1590	603	8.0	--	12.5	10.0	310	203	60	38
20...	1505	5490	541	--	--	22.0	18.5	--	--	--	--
JUL 23...	1005	524	424	--	--	21.5	23.0	--	--	--	--
AUG 15...	1650	306	599	8.1	--	28.5	26.0	250	242	43	34

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO AS K) (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS SO4) (00935)	SULFATE DIS- SOLVED (MG/L AS CL) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS F) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L (00950)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (70300)	SOLIDS, DIS- SOLVED (TONS PER (70303)
APR 15...	11	10	0.3	6.2	89	7.9	0.10	249	303	0.41
MAY 10...	17	11	0.4	5.4	120	12	0.20	375	386	0.52
AUG 15...	24	16	0.7	24	50	25	0.10	345	365	0.50

RED RIVER OF THE NORTH BASIN

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

WATER-QUALITY RECORDS

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR 15...	5070	5	20	7	20	60	<0.1	<1	1	230
MAY 10...	1660	6	100	<1	30	50	0.1	<1	<1	240
AUG 15...	302	5	20	<1	20	10	<0.1	<1	<1	220

a Replicate sample also collected for quality-assurance purposes.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 7, 1897, reached a stage of 39.1 ft present datum, discharge, 25,000 ft³/s at site 1.5 mi downstream.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	288	1210	549	559	638	438	1600	2560	3120	1090	419	217
2	270	1210	605	568	665	425	1700	2450	2950	1070	440	241
3	312	1220	652	560	705	453	1870	2250	2790	1050	512	183
4	675	1270	641	581	763	549	2150	2150	2650	1040	702	170
5	1000	1160	633	488	784	580	2670	2120	2550	1010	537	173
6	1020	1040	588	445	748	618	3240	2020	2410	953	484	e190
7	1000	1280	524	430	721	698	3800	1930	2270	894	487	e195
8	942	1420	508	424	691	849	4330	1900	2190	850	473	e225
9	923	1410	527	461	599	994	4870	1910	2140	802	462	e230
10	933	1430	534	490	509	1080	5460	1940	2100	765	476	e220
11	952	892	486	475	429	1120	6010	1950	2050	821	524	209
12	952	735	408	377	458	1110	6450	2030	2010	807	520	228
13	924	710	417	330	436	1120	7150	2160	2060	788	484	273
14	877	662	409	360	357	1200	8480	2260	1960	738	448	306
15	929	732	374	420	325	1420	9730	2290	1880	678	390	269
16	997	881	390	426	383	1710	9880	2330	1840	655	278	191
17	1040	972	448	434	450	2280	9340	2710	1810	644	271	146
18	1080	1030	483	485	468	3430	8540	4620	1690	667	292	135
19	1090	1040	521	532	489	4270	7690	5970	1600	708	313	127
20	1090	1020	535	504	478	4890	6750	7260	1570	708	331	137
21	1080	919	498	344	449	5370	5790	8250	1550	667	327	152
22	1060	824	469	256	454	5570	4930	8930	1520	656	311	167
23	1010	645	465	376	502	5550	4230	9020	1500	605	266	185
24	920	496	488	475	469	5460	3640	8340	1450	587	256	220
25	859	453	494	479	459	5090	3120	6970	1430	591	226	228
26	831	545	488	502	456	4580	2670	5570	1360	592	217	282
27	874	688	486	532	445	3970	2350	4480	1300	640	292	273
28	1080	714	483	552	434	3110	2290	3880	1230	589	377	239
29	1210	623	479	566	428	2060	2350	3590	1160	531	363	232
30	1220	552	480	578	---	1620	2450	3410	1110	468	288	251
31	1200	---	521	592	---	1570	---	3290	---	435	233	---
TOTAL	28638	27783	15583	14601	15192	73184	145530	120540	57250	23099	11999	6294
MEAN	924	926	503	471	524	2361	4851	3888	1908	745	387	210
MAX	1220	1430	652	592	784	5570	9880	9020	3120	1090	702	306
MIN	270	453	374	256	325	425	1600	1900	1110	435	217	127
AC-FT	56800	55110	30910	28960	30130	145200	288700	239100	113600	45820	23800	12480
(+)	1150	241	1100	1360	1330	1060	1350	1420	1800	2040	1930	1630
*	57950	55350	32000	30320	31460	146260	290050	240520	115400	47860	25730	14110

* Adjusted for diversion to cities of Fargo and Moorhead.

MEAN	315	273	225	207	208	722	1761	1047	1024	855	412	315
MAX	1741	942	800	740	778	4722	9924	4589	5122	5692	3293	2280
(WY)	1994	1907	1987	1986	1987	1995	1969	1986	1962	1962	1993	1993
MIN	.000	.000	.000	.000	.18	26.8	102	8.12	2.87	.000	.000	.000
(WY)	1935	1937	1938	1933	1933	1937	1934	1934	1936	1934	1932	1934

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1901 - 1996	
ANNUAL TOTAL	600971		539693			
ANNUAL MEAN	1646 (*1620)		1475 (*1500)		615	
HIGHEST ANNUAL MEAN					1928	
LOWEST ANNUAL MEAN					17.5	
HIGHEST DAILY MEAN	10500	Mar 22	9880	Apr 16	24800	Apr 14
LOWEST DAILY MEAN	160	Sep 25	127	Sep 19	.00	Jul 25
ANNUAL SEVEN-DAY MINIMUM	197	Sep 22	150	Sep 17	.00	Jul 25
INSTANTANEOUS PEAK FLOW			9940	Apr 15	25300	Apr 15
INSTANTANEOUS PEAK STAGE			28.75	Apr 15	37.34	Apr 15
INSTANTANEOUS LOW FLOW					.00	Jul 25
ANNUAL RUNOFF (AC-FT)	1192000 (*1207900)		1070000 (*1087000)		445400	

(*) Adjusted for diversion to cities of Fargo and Moorhead.

RED RIVER OF THE NORTH BASIN

05054000 RED RIVER OF THE NORTH AT FARGO, ND--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1956 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT 12...	0745	947	627	--	6.5	11.0	--	--	--	--
NOV 22...	0945	854	--	--	0.5	0.5	--	--	--	--
JAN 09...	1000	456	534	--	1.5	1.0	--	--	--	--
FEB 21...	1235	442	551	--	0.5	1.0	--	--	--	--
APR 12...	1005	6450	385	--	3.0	1.0	--	--	--	--
MAY 01...	0920	2640	708	8.0	12.0	10.5	330	195	68	39
21...	1105	8150	490	--	20.5	18.0	--	--	--	--
JUL 09...	1655	778	578	--	27.0	25.0	--	--	--	--
SEP 05...	1205	178	628	--	32.5	24.5	--	--	--	--
DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO AS K) (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS SO4) (00935)	SULFATE DIS- SOLVED (MG/L AS CL) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS F) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L (00950)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) AC-FT) (70300)	SOLIDS, DIS- SOLVED (TONS PER (70303)
MAY 01...	25	14	0.6	8.8	180	14	0.10	452	473	0.6
DATE	SOLIDS, DIS- SOLVED (TONS DATE DAY) (70302)	MANGA- ARSENIC DIS- SOLVED PER AS AS) (01000)	MOLYB- IRON, DIS- SOLVED (UG/L AS FE) (01046)	SELE- LEAD, DIS- SOLVED (UG/L AS PB) (01049)	STRON- LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NIUM, DIS- SOLVED (UG/L AS SE) (01145)	TIUM, DIS- SOLVED (UG/L(UG/L AS SR) (01080)
MAY 01...	3370	2	70	<1	30	20	<0.1	1	<1	330

RED RIVER OF THE NORTH BASIN

05061000 BUFFALO RIVER NEAR HAWLEY, MN

LOCATION.--Lat 46°51'00", long 96°19'45", in NW¼, SE¼, sec.14, T.139 N., R.45 W., Clay County, Hydrologic Unit 09020106, near left downstream end of bridge on farm lane, 2 mi southwest of Hawley.

DRAINAGE AREA.--322 mi².

PERIOD OF RECORD.--March 1945 to current year, WY 1981 (annual maximum only), March 1982 to September 1985 (no winter records).

REVISED RECORDS.--WSP 1308: 1945-46(M), 1948(M).

GAGE.--Water-stage recorder. Datum of gage is 1,111.91 ft above sea level. Prior to Jan. 29, 1953, nonrecording gage at bridge 1,800 ft upstream at datum 3.17 ft lower.

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, about 11.3 ft, present datum, spring of 1921, from information by local resident.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUE

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	85	e51	e36	e34	e34	e78	264	198	54	40	24
2	56	87	e51	e36	e34	e34	e80	243	179	51	37	33
3	50	88	e50	e36	e34	e34	82	224	161	48	35	37
4	54	e88	e49	e36	e34	e34	89	210	144	45	35	32
5	65	e87	e49	e36	e34	e34	90	199	128	44	35	29
6	91	e86	e48	e36	e34	e34	120	193	126	43	35	27
7	96	e84	e48	e36	e34	e34	163	187	205	42	34	27
8	88	e82	e47	e36	e34	e34	217	185	284	40	32	27
9	85	e81	e47	e36	e34	e34	265	184	270	40	30	27
10	87	e79	e46	e36	e34	e34	e350	177	203	39	29	26
11	83	e78	e45	e36	e34	e35	707	168	155	41	29	25
12	77	e76	e45	e36	e34	e36	1170	158	121	40	29	24
13	70	e74	e44	e36	e34	e37	1190	151	113	40	28	22
14	70	e71	e43	e35	e34	e39	1000	145	112	44	28	22
15	74	e69	e43	e35	e34	e45	929	145	105	44	28	22
16	77	e68	e42	e35	e34	e54	808	148	100	42	27	20
17	71	e66	e41	e35	e34	e62	701	e250	95	38	26	19
18	69	e65	e41	e35	e34	e76	616	e500	90	36	26	19
19	69	e64	e40	e35	e34	e90	559	e800	86	35	26	18
20	74	e62	e40	e35	e34	e110	512	e930	79	32	25	18
21	80	e61	e39	e35	e34	e125	481	e780	71	32	26	18
22	81	e60	e39	e35	e34	e133	463	e660	66	33	24	19
23	78	e59	e39	e35	e34	e140	440	572	64	31	25	20
24	76	e58	e38	e35	e34	e135	411	505	66	31	24	21
25	77	e56	e38	e35	e34	e130	391	434	70	29	24	20
26	78	e55	e37	e35	e34	e120	374	372	71	29	24	23
27	78	e54	e37	e35	e34	e110	353	317	70	34	24	27
28	83	e54	e37	e35	e34	e100	323	275	64	40	23	35
29	90	e53	e37	e35	e34	e95	301	241	59	42	24	38
30	89	e52	e36	e35	---	e88	282	214	56	47	25	34
31	86	---	e36	e35	---	e80	---	196	---	45	24	---
TOTAL	2363	2102	1323	1098	986	2180	13545	10027	3611	1231	881	753
MEAN	76.2	70.1	42.7	35.4	34.0	70.3	451	323	120	39.7	28.4	25.1
MAX	96	88	51	36	34	140	1190	930	284	54	40	38
MIN	50	52	36	35	34	34	78	145	56	29	23	18
AC-FT	4690	4170	2620	2180	1960	4320	26870	19890	7160	2440	1750	1490
CFSM	.24	.22	.13	.11	.11	.22	1.40	1.00	.37	.12	.09	.08
IN.	.27	.24	.15	.13	.11	.25	1.56	1.16	.42	.14	.10	.09

e Estimated.

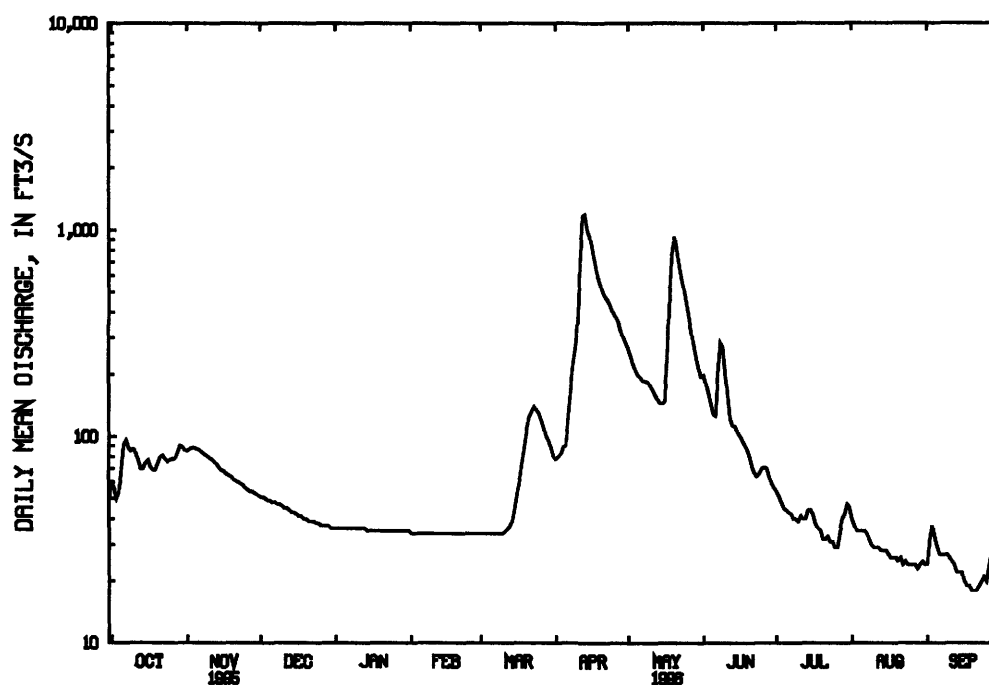
RED RIVER OF THE NORTH BASIN

05061000 BUFFALO RIVER NEAR HAWLEY, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	39.2	36.4	24.9	20.8	21.7	87.0	254	127	97.7	98.6	51.6	37.6
MAX	151	176	63.8	54.7	99.6	434	792	372	530	784	472	182
(WY)	1974	1972	1972	1981	1981	1966	1978	1985	1962	1993	1955	1957
MIN	11.6	12.2	10.6	9.94	9.87	15.0	33.3	21.5	12.7	10.1	5.87	8.52
(WY)	1979	1977	1977	1962	1949	1969	1981	1977	1977	1976	1976	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1945 - 1996	
ANNUAL TOTAL	37034		40100		74.6	
ANNUAL MEAN	101		110		168	
HIGHEST ANNUAL MEAN					1993	
LOWEST ANNUAL MEAN					16.7	
HIGHEST DAILY MEAN	900		Mar 16		1970	
LOWEST DAILY MEAN	17		Sep 20		3.2	
ANNUAL SEVEN-DAY MINIMUM	18		Sep 17		4.3	
INSTANTANEOUS PEAK FLOW			1350		Apr 13	
INSTANTANEOUS PEAK STAGE			9.31		Apr 13	
INSTANTANEOUS LOW FLOW			16		Sep 19	
ANNUAL RUNOFF (AC-FT)	73460		79540		54040	
ANNUAL RUNOFF (CFSM)	32		.34		.23	
ANNUAL RUNOFF (INCHES)	4.28		4.63		3.15	
10 PERCENT EXCEEDS	212		254		176	
50 PERCENT EXCEEDS	54		45		31	
90 PERCENT EXCEEDS	28		27		13	



05061000 BUFFALO RIVER NEAR HAWLEY, MN

RED RIVER OF THE NORTH BASIN

05061500 SOUTH BRANCH BUFFALO RIVER AT SABIN, MN

LOCATION--Lat 46° 46'20", long 96° 37'40", in SW¼, SW¼, sec. 9, T.138 N., R.47 W., Clay County, Hydrologic Unit 09020106, near center of span on downstream side of highway bridge, 0.3 mi downstream from Stony Creek and 1 mi east of Sabin.

DRAINAGE AREA.--522 mi².

PERIOD OF RECORD.--March 1945 to current year. Water year 1981, annual maximum only. March 1982 to September 1985, no winter records.

REVISED RECORDS.--WSP 1308: 1949(M).

GAGE.--Water-stage recorder. Datum of gage is 902.39 ft above mean sea level (levels by Soil Conservation Service). Prior to April 17, 1948, nonrecording gage at site 1 mi downstream at different datum. Aug. 17, 1948 to Oct. 4, 1989, nonrecording gage at present site and datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	DAILY MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	39	e15	e1.6	e.59	e.59	e12	145	101	8.9	3.3	3.7
2	31	37	e14	e1.5	e.59	e.59	e14	130	112	11	3.9	3.9
3	31	33	e14	e1.4	e.59	e.59	e20	117	121	10	4.8	3.3
4	25	31	e13	e1.4	e.59	e.59	e30	106	114	7.3	5.2	3.0
5	33	30	e13	e1.3	e.59	e.59	e50	101	99	5.3	5.2	2.5
6	59	e29	e12	e1.2	e.59	e.60	e100	98	89	5.7	5.4	1.9
7	102	e28	e9.0	e1.2	e.59	e.62	e200	100	84	6.2	5.4	2.1
8	131	e27	e7.0	e1.1	e.59	e.62	e350	107	83	6.1	5.0	1.8
9	130	e26	e6.0	e1.1	e.59	e.64	e700	110	80	6.2	5.0	1.4
10	125	e26	e5.5	e1.0	e.59	e.66	e1150	112	70	5.0	4.9	1.4
11	135	e25	e5.0	e.98	e.59	e1.0	1230	114	57	4.2	4.7	1.7
12	136	e24	e4.7	e.94	e.59	e2.0	1040	109	46	3.8	5.1	2.0
13	120	e23	e4.4	e.90	e.59	e5.0	872	100	39	3.5	4.8	1.6
14	100	e22	e4.1	e.87	e.59	e7.0	772	93	39	2.9	5.2	1.3
15	82	e22	e3.9	e.84	e.59	e9.0	689	87	42	2.7	4.8	1.1
16	66	e21	e3.6	e.80	e.59	e20	599	87	39	2.9	4.3	.91
17	53	e20	e3.5	e.77	e.59	e50	509	116	38	3.0	4.1	.83
18	41	e20	e3.3	e.75	e.59	e100	427	373	38	2.9	4.1	.82
19	35	e19	e3.1	e.72	e.59	e90	370	1360	35	2.6	4.2	.72
20	28	e19	e3.0	e.70	e.59	e60	330	1890	30	2.7	3.4	.60
21	25	e18	e2.8	e.68	e.59	e50	296	1400	26	2.9	2.9	.56
22	24	e18	e2.6	e.66	e.59	e40	266	1030	21	3.2	3.3	.90
23	24	e18	e2.5	e.64	e.59	e34	239	793	18	3.2	4.0	1.4
24	24	e17	e2.3	e.62	e.59	e27	216	594	15	3.0	4.3	2.4
25	24	e17	e2.2	e.61	e.59	e23	197	412	14	3.0	4.3	1.1
26	27	e17	e2.1	e.60	e.59	e20	184	311	14	3.0	4.0	2.1
27	33	e16	e2.0	e.60	e.59	e15	181	243	11	3.0	4.0	1.4
28	39	e16	e1.9	e.60	e.59	e13	180	197	11	3.2	4.2	2.8
29	43	e16	e1.8	e.59	e.59	e11	173	160	10	3.2	4.3	4.1
30	43	e15	e1.7	e.59	---	e10	161	130	9.1	3.2	4.4	4.5
31	41	---	e1.7	e.59	---	e10	---	109	---	3.3	4.2	---
TOTAL	1834	689	170.7	27.85	17.11	603.09	11557	10834	1505.1	137.1	136.7	57.84
MEAN	59.2	23.0	5.51	.90	.59	19.5	385	349	50.2	4.42	4.41	1.93
MAX	136	39	15	1.6	.59	100	1230	1890	121	11	5.4	4.5
MIN	24	15	1.7	.59	.59	.59	12	87	9.1	2.6	2.9	.56
AC-FT	3640	1370	339	55	34	1200	22920	21490	2990	272	271	115
CFSM	.11	.04	.01	.00	.00	.04	.74	.67	.10	.01	.01	.00
IN.	.13	.05	.01	.00	.00	.04	.82	.77	.11	.01	.01	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

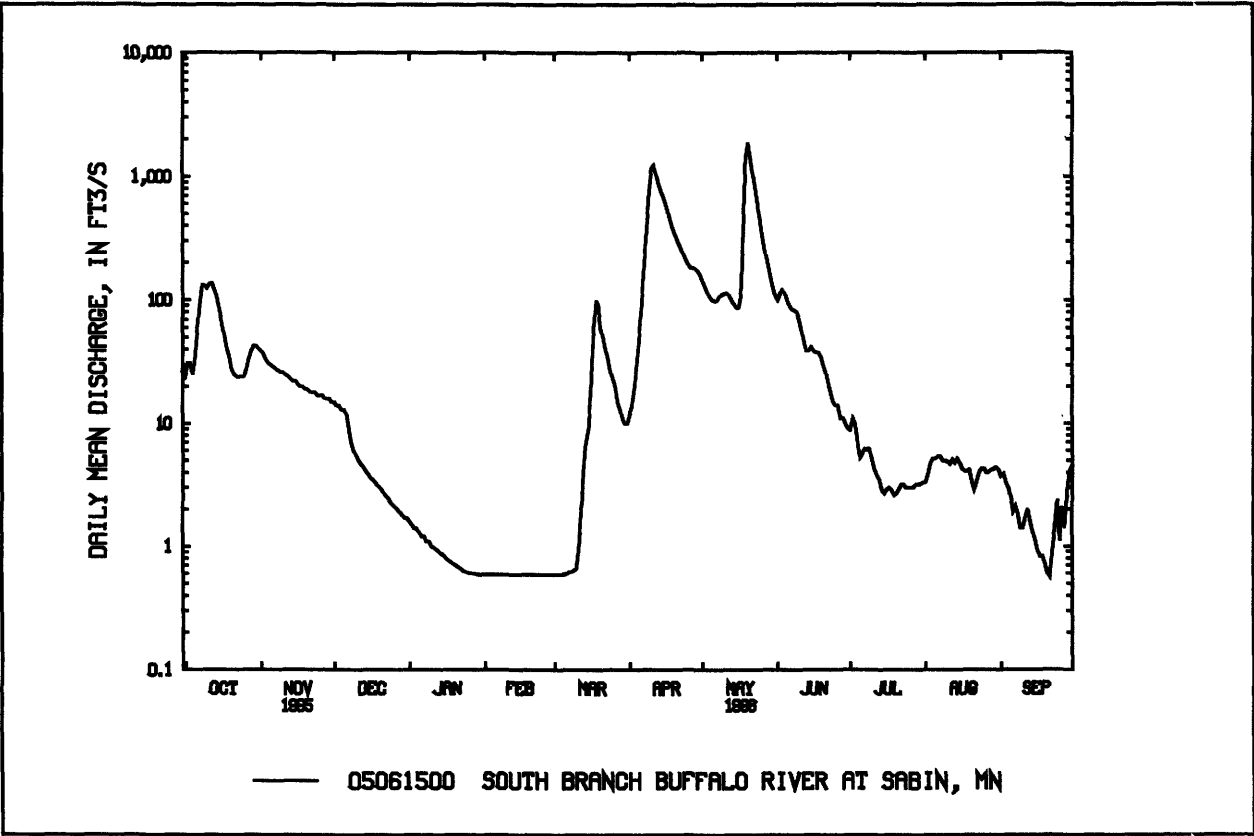
05061500 SOUTH BRANCH BUFFALO RIVER AT SABIN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	15.1	14.9	5.09	1.73	1.66	107	254	82.1	90.6	75.0	11.8	13.5
MAX	59.2	76.7	23.5	13.1	14.0	581	928	580	1068	1112	152	173
(WY)	1996	1972	1978	1978	1987	1966	1969	1962	1962	1975	1993	1975
MIN	.023	2.05	.006	.000	.000	.000	27.9	8.28	1.30	.000	.000	.000
(WY)	1977	1977	1961	1946	1946	1951	1973	1980	1976	1988	1976	1975

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1945 - 1996	
ANNUAL TOTAL	20762.23		27569.49			
ANNUAL MEAN	56.9		75.3		56.3a	
HIGHEST ANNUAL MEAN					198	
LOWEST ANNUAL MEAN					12.2	
HIGHEST DAILY MEAN	1650	Mar 16	1890	May 20	8200	Jul 1 1975
LOWEST DAILY MEAN	.70	Aug 22	.56	Sep 21	.00b	Dec 13 1945
ANNUAL SEVEN-DAY MINIMUM	1.1	Aug 6	.59	Jan 29	.00	Dec 13 1945
INSTANTANEOUS PEAK FLOW			2000	May 20	8500	Jul 2 1975
INSTANTANEOUS PEAK STAGE			14.60g	Mar 18	19.90	Jul 2 1975
INSTANTANEOUS LOW FLOW			.49	Sep 21	.00	Dec 13 1945
ANNUAL RUNOFF (AC-FT)	41180		54680		40750	
ANNUAL RUNOFF (CFSM)	.11		.14		.11	
ANNUAL RUNOFF (INCHES)	1.48		1.96		1.46	
10 PERCENT EXCEEDS	121		149		102	
50 PERCENT EXCEEDS	13		6.2		7.2	
90 PERCENT EXCEEDS	2.0		.59		.00	

a Median of annual mean discharges is 41.7 ft³/s.
b Many days, most years.
c Backwater from ice.



RED RIVER OF THE NORTH BASIN

05062000 BUFFALO RIVER NEAR DILWORTH, MN

LOCATION--Lat 46° 57'40", long 96° 39'40", in SW¹/₄ SE¹/₄ sec. 6, T.140 N., R.47 W., Clay County, Hydrologic Unit 09020106, on left bank 4.5 mi southeast of Kragnes, 6.5 mi northeast of Dilworth, and 9 mi downstream from South Branch.

DRAINAGE AREA--1,040 mi², approximately.

PERIOD OF RECORD--March 1931 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS--WSP 1308: 1931(M).

GAGE--Water-stage recorder. Datum of gage is 878.31 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to April 5, 1937, nonrecording gage at same site and datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	132	184	e79	e46	e35	e35	e220	483	397	86	50	25
2	136	183	e78	e45	e35	e35	e220	453	386	80	50	26
3	133	177	e76	e44	e35	e35	e230	431	373	75	45	30
4	129	174	e74	e43	e35	e35	e240	406	352	71	43	34
5	143	e165	e72	e42	e35	e35	e270	379	326	68	47	35
6	233	e155	e71	e42	e35	e35	e330	358	298	66	44	33
7	266	e145	e70	e41	e35	e35	e450	345	276	62	40	30
8	287	e140	e69	e41	e35	e35	e600	335	293	58	37	29
9	301	e135	e68	e40	e35	e35	e800	337	350	56	36	28
10	305	e130	e67	e40	e35	e35	e1250	339	377	55	34	28
11	293	e125	e65	e39	e35	e36	e1900	333	352	55	33	27
12	286	e120	e64	e38	e35	e38	e2400	322	290	55	32	26
13	281	e120	e63	e38	e35	e42	2680	306	237	54	31	25
14	267	e115	e62	e37	e35	e48	2660	290	203	51	31	25
15	249	e110	e61	e37	e35	e60	2350	278	192	49	30	24
16	229	e107	e60	e36	e35	e80	2030	270	191	50	29	23
17	214	e104	e60	e36	e35	e110	1830	295	184	50	29	23
18	199	e102	e59	e36	e35	e140	1640	963	174	47	28	22
19	181	e100	e58	e36	e35	e170	1440	1280	162	43	27	21
20	169	e98	e57	e35	e35	e220	1250	1320	152	42	27	21
21	162	e94	e56	e35	e35	e300	1080	1660	141	41	27	21
22	158	e92	e55	e35	e35	e350	946	1930	129	39	26	21
23	158	e92	e54	e35	e35	e390	838	1840	119	39	26	21
24	156	e90	e53	e35	e35	e380	772	1640	113	38	26	21
25	153	e89	e52	e35	e35	e360	717	1410	110	37	25	21
26	151	e87	e51	e35	e35	e330	672	1170	115	37	25	23
27	154	e85	e50	e35	e35	e310	624	949	116	38	25	26
28	157	e84	e49	e35	e35	e290	582	741	111	39	25	29
29	162	e83	e49	e35	e35	e260	548	582	104	42	25	35
30	173	e81	e48	e35	---	e240	514	480	94	45	25	39
31	182	---	e47	e35	---	e230	---	419	---	47	24	---
TOTAL	6199	3566	1897	1177	1015	4734	32083	22344	6717	1615	1002	792
MEAN	200	119	61.2	38.0	35.0	153	1069	721	224	52.1	32.3	26.4
MAX	305	184	79	46	35	390	2680	1930	397	86	50	39
MIN	129	81	47	35	35	35	220	270	94	37	24	21
AC-FT	12300	7070	3760	2330	2010	9390	63640	44320	13320	3200	1990	1570
CFSM	.19	.11	.06	.04	.03	.15	1.03	.69	.22	.05	.03	.03
IN.	.22	.13	.07	.04	.04	.17	1.15	.80	.24	.06	.04	.03

e Estimated.

RED RIVER OF THE NORTH BASIN

05062000 BUFFALO RIVER NEAR DILWORTH, MN--Continued

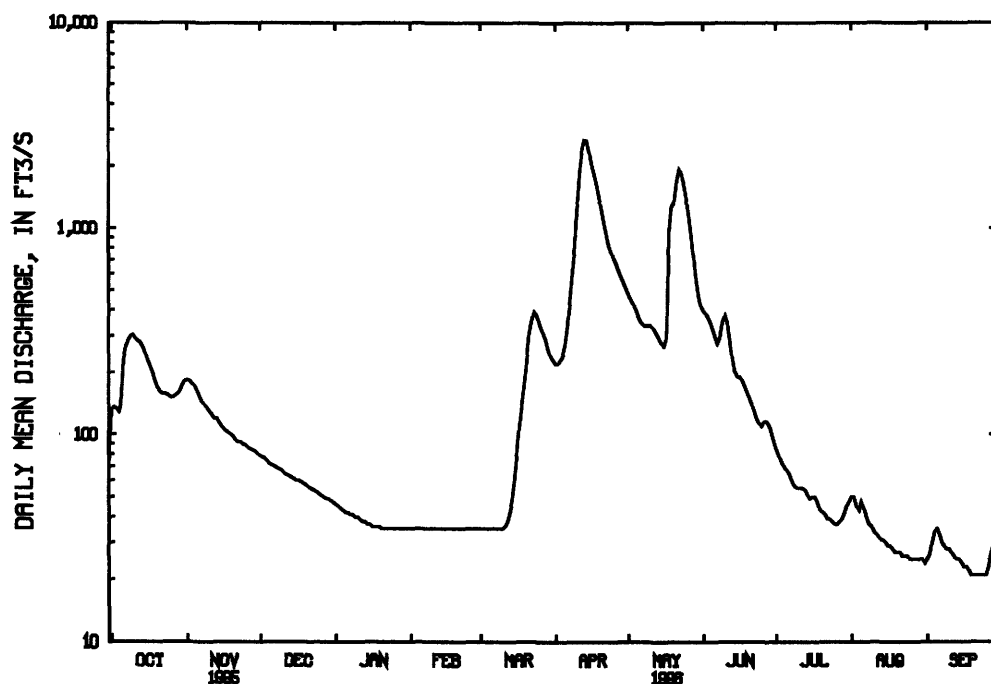
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT
MEAN	53.8	50.1	30.1	20.0	20.2	184	542	224	195	183	71.8	53.3
MAX	200	305	97.0	53.5	61.1	1308	1984	909	2138	2814	910	517
(WY)	1996	1972	1972	1994	1984	1966	1978	1986	1962	1975	1993	1944
MIN	5.48	8.74	4.75	.87	.76	2.26	33.5	27.2	15.1	2.23	.000	.73
(WY)	1940	1937	1938	1940	1940	1940	1931	1931	1934	1936	1936	1936

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1931 - 1996	
ANNUAL TOTAL	69166		83141		137	
ANNUAL MEAN	189		227		441	
HIGHEST ANNUAL MEAN					25.6	
LOWEST ANNUAL MEAN					13500	
HIGHEST DAILY MEAN	2110	Mar 19	2680	Apr 13	Jul 2	1975
LOWEST DAILY MEAN	22	Sep 28	21	Sep 19-25	Jul 22	1936
ANNUAL SEVEN-DAY MINIMUM	23	Sep 22	21	Sep 19	Jul 28	1936
INSTANTANEOUS PEAK FLOW			2720	Apr 14	Jul 2	1975
INSTANTANEOUS PEAK STAGE			19.42	Apr 12 ^a , 14	Jul 2	1975
INSTANTANEOUS LOW FLOW			21	Sep 18	Jul 22	1936
ANNUAL RUNOFF (AC-FT)	137200		164900		99360	
ANNUAL RUNOFF (CFSM)	.18		.22		.13	
ANNUAL RUNOFF (INCHES)	2.47		2.97		1.79	
10 PERCENT EXCEEDS	376		481		293	
50 PERCENT EXCEEDS	81		66		36	
90 PERCENT EXCEEDS	39		29		9.5	

a Occurred many times in 1936.

b Backwater from ice.



— 05062000 BUFFALO RIVER NEAR DILWORTH, MN

RED RIVER OF THE NORTH BASIN

05062500 WILD RICE RIVER AT TWIN VALLEY, MN

LOCATION.--Lat 47°16'00", long 96°14'40", in NW¼NE¼ sec.27, T.144 N., R.44, Norman County, Hydrologic Unit 09020108, on left bank 100 ft upstream from highway bridge, 0.8 mi northeast of Twin Valley, and 2 mi upstream from small tributary.

DRAINAGE AREA.--929 mi² (updated, 1996).

PERIOD OF RECORD.--June 1909 to September 1917, July 1930 to September 1983, October 1989 to current year. Monthly discharge only for some periods, published in WSP 1308. October 1983 to September 1989, annual maximums only.

REVISED RECORDS.--WSP 955: 1941. WSP 1308: 1915(M), 1917(M).

GAGE.--Water-stage recorder. Datum of gage is 1,008.16 ft above mean sea level (U.S. Army Corps of Engineers bench mark). June 1909 to September 1917, nonrecording gage at site 0.2 mi downstream at different datum. July 23, 1930, to Nov. 24, 1934, nonrecording gage at highway bridge 100 ft downstream from present site at present datum. Nov. 25, 1934, to Aug. 2, 1950, water-stage recorder 80 ft upstream from present site at present datum.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. Flow slightly regulated by Rice Lake and many other small lakes above station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	153	280	e140	e140	e130	e130	e150	1490	594	142	86	28
2	162	283	e140	e140	e130	e130	e150	1400	567	135	80	36
3	162	280	e130	e140	e130	e130	e150	1320	541	129	74	35
4	165	250	e130	e140	e130	e130	e160	1250	522	118	75	31
5	189	e250	e130	e140	e130	e130	e160	1190	495	108	80	32
6	221	e240	e130	e130	e130	e130	e170	1100	479	104	73	35
7	256	e240	e130	e130	e130	e130	e190	1040	490	98	70	38
8	251	e230	e130	e130	e130	e120	e300	999	443	95	67	38
9	246	e220	e130	e130	e130	e120	e620	960	413	90	65	38
10	246	e220	e130	e130	e140	e120	e1300	921	382	85	62	37
11	247	e210	e130	e130	e140	e120	e2100	857	351	86	60	34
12	233	e200	e130	e130	e140	e130	e2400	792	324	84	57	31
13	219	e180	e130	e130	e140	e130	e2700	747	299	82	54	29
14	212	e170	e130	e130	e140	e130	e3700	741	280	81	51	28
15	206	e170	e130	e130	e140	e140	2930	739	266	82	50	27
16	208	e170	e130	e130	e140	e140	2620	730	258	80	46	27
17	208	e170	e130	e130	e140	e140	2700	772	242	79	43	25
18	219	e170	e130	e130	e140	e140	e2750	2110	227	76	41	24
19	226	e170	e130	e130	e140	e140	2700	2600	212	72	39	24
20	232	e160	e130	e130	e140	e130	2620	2100	198	68	37	22
21	260	e160	e130	e130	e140	e130	2510	1900	185	83	37	22
22	285	e150	e130	e130	e140	e140	2250	1660	172	87	37	27
23	284	e150	e130	e130	e140	e140	2060	1460	164	85	36	30
24	278	e150	e140	e130	e140	e140	1870	1300	159	85	36	26
25	276	e140	e140	e130	e140	e140	1780	1120	156	86	35	26
26	273	e140	e140	e130	e140	e140	1770	964	154	88	35	34
27	276	e140	e140	e130	e140	e140	1710	875	149	82	34	37
28	313	e140	e140	e130	e140	e140	e1660	792	150	78	32	39
29	280	e140	e140	e130	e140	e150	e1620	718	172	74	31	42
30	272	e140	e140	e130	---	e150	1560	661	160	76	30	44
31	279	---	e140	e130	---	e150	---	620	---	91	29	---
TOTAL	7337	5713	4130	4080	3970	4170	49360	35928	9204	2809	1582	946
MEAN	237	190	133	132	137	135	1645	1159	307	90.6	51.0	31.5
MAX	313	283	140	140	140	150	3700	2600	594	142	86	44
MIN	153	140	130	130	130	120	150	620	149	68	29	22
AC-FT	14550	11330	8190	8090	7870	8270	97910	71260	18260	5570	3140	1880
CFM	.25	.20	.14	.14	.15	.14	1.77	1.25	.33	.10	.05	.03
IN.	.29	.23	.17	.16	.16	.17	1.98	1.44	.37	.11	.06	.04

e Estimated.

RED RIVER OF THE NORTH BASIN

05062500 WILD RICE RIVER AT TWIN VALLEY, MN--Continued

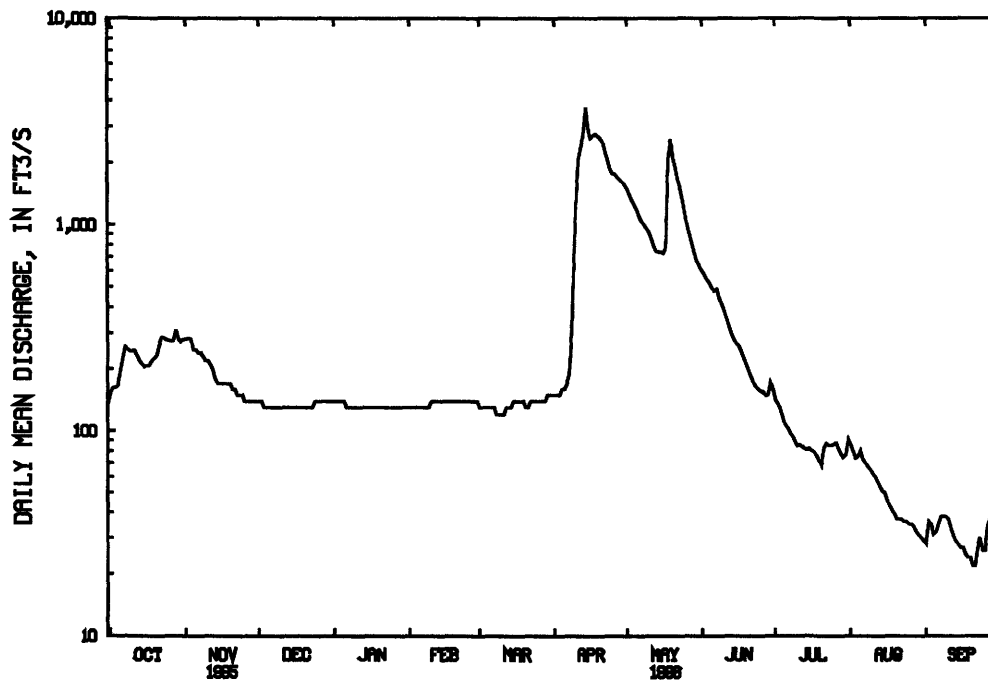
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	91.0	79.1	53.3	41.0	38.2	139	580	427	304	239	107	86.3
MAX	614	488	201	132	137	828	1645	2259	1560	1923	1024	778
(WY)	1974	1972	1995	1996	1996	1995	1996	1950	1943	1909	1993	1973
MIN	6.10	9.31	6.00	4.00	4.00	12.8	73.8	30.9	26.4	8.04	3.02	2.96
(WY)	1933	1933	1933	1933	1933	1940	1931	1977	1977	1934	1932	1936

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1909 - 1996
ANNUAL TOTAL	119864	129229	
ANNUAL MEAN	328	353	179
HIGHEST ANNUAL MEAN			500
LOWEST ANNUAL MEAN			22.7
HIGHEST DAILY MEAN	2200	Mar 14	3700a
LOWEST DAILY MEAN	72	Sep 28	22
ANNUAL SEVEN-DAY MINIMUM	79	Sep 22	24
INSTANTANEOUS PEAK FLOW			3700
INSTANTANEOUS PEAK STAGE			12.82b
INSTANTANEOUS LOW FLOW			22
ANNUAL RUNOFF (AC-FT)	237800	256300	129800
ANNUAL RUNOFF (CFSM)	.35	.38	.19
ANNUAL RUNOFF (INCHES)	4.80	5.17	2.62
10 PERCENT EXCEEDS	718	1010	469
50 PERCENT EXCEEDS	190	140	66
90 PERCENT EXCEEDS	110	38	15

a Estimated, ice-affected.

b Ice-affected.



— 05062500 WILD RICE RIVER AT TWIN VALLEY, MN

RED RIVER OF THE NORTH BASIN
05062500 WILD RICE RIVER AT TWIN VALLEY, MN--Continued
(National Water-Quality Assessment Station)

PERIOD OF RECORD.-- Water years 1966, 71, 73-79, 93 to current year; sediment, 1976-79.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CAR- BONATE WATER DIS T FIELD MG/L AS CO3 (00452)
OCT												
30...	1015	—	482	476	8.2	7.8	2.0	730	8.2	228	238	0
FEB												
14...	1100	—	600	596	6.7	7.6	0.0	741	3.5	—	319	—
JUN												
27...	0850	147	436	446	8.0	8.0	22.5	743	8.0	199	227	0
JUL												
11...	1020	—	473	468	7.5	8.3	21.5	740	8.2	225	240	0
AUG												
20...	0950	37	530	527	7.9	7.8	18.5	745	9.0	252	270	0
26...	1115	—	539	533	7.7	8.2	20.0	747	9.3	245	269	0

DATE	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	SOLID RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70307)
OCT												
30...	278	<0.015	<0.010	0.70	0.80	<0.050	0.040	<0.010	<0.010	13	0.80	310
FEB												
14...	—	0.340	0.010	0.90	1.0	0.080	0.020	<0.010	<0.010	10	—	357
JUN												
27...	243	<0.015	<0.010	0.60	0.70	<0.050	0.020	<0.010	0.010	9.9	—	270
JUL												
11...	275	0.040	<0.010	0.60	0.60	0.090	0.020	<0.010	0.010	—	—	281
AUG												
20...	307	0.030	0.010	0.60	0.70	0.050	<0.010	<0.010	0.020	11	—	329
26...	299	<0.015	<0.010	0.70	0.60	<0.050	0.010	0.010	0.010	9.4	—	321

DATE	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04029)
OCT												
30...	57	23	6.7	3.4	4.3	23	0.20	15	30	15	<0.007	<0.002
FEB												
14...	76	31	8.4	3.7	3.9	12	0.10	26	110	990	—	—
JUN												
27...	55	24	7.3	2.3	2.9	16	0.20	11	63	31	—	—
JUL												
11...	57	25	8.1	2.5	3.1	18	0.20	12	37	38	—	—
AUG												
20...	62	28	10	2.9	3.5	24	0.20	15	30	51	—	—
26...	65	29	12	3.0	3.9	27	0.20	14	27	51	—	—

DATE	BRO- MACIL, WATER, DISS, REC (UG/L) (04029)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER, DISS, REC (UG/L) (04095)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	DICAMBA LINURON WATER, FLTRD, GF 0.7U REC (UG/L) (38442)	MCPA, WATER, FLTRD, GF 0.7U REC (UG/L) (38478)	MCPA, WATER, FLTRD, GF 0.7U REC (UG/L) (38482)	MCFB, WATER, FLTRD, GF 0.7U REC (UG/L) (38487)
OCT												
30...	<0.035	<0.005	<0.018	EO.002	<0.004	<0.003	<0.002	<0.006	<0.035	<0.018	<0.050	<0.035

RED RIVER OF THE NORTH BASIN

05062500 WILD RICE RIVER AT TWIN VALLEY, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	METHIO-CARB, WATER, FLTRD, GF 0.7U REC (UG/L) (38501)	PRO-POXUR, WATER, FLTRD, GF 0.7U REC (UG/L) (38538)	BENTA-ZON, WATER, FLTRD, GF 0.7U REC (UG/L) (38711)	2,4-DB, WATER, FLTRD, GF 0.7U REC (UG/L) (38746)	FLUO-METURON, WATER, FLTRD, GF 0.7U REC (UG/L) (38811)	FLUO-NOXAMYL, WATER, FLTRD, GF 0.7U REC (UG/L) (38866)	CHLOR-PYRIFOS, DIS-SOLVED (UG/L) (38933)	LINDANE, DIS-SOLVED (UG/L) (39341)	DI-ELDRIN, DIS-SOLVED (UG/L) (39381)	METO-LACHLOR, WATER, DISSOLV (UG/L) (39415)	MALA-THION, DIS-SOLVED (UG/L) (39532)	PARA-THION, DIS-SOLVED (UG/L) (39542)
OCT 30...	<0.026	<0.035	<0.014	<0.035	<0.035	<0.018	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004
DATE	DI-AZINON, DIS-SOLVED (UG/L) (39572)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	2,4-D, DIS-SOLVED (UG/L) (39732)	2,4,5-T, DIS-SOLVED (UG/L) (39742)	SILVEX, DIS-SOLVED (UG/L) (39762)	ALA-CHLOR, WATER, DISS, REC (UG/L) (46342)	TRI-CLOPYR, WATER, FLTRD, GF 0.7U REC (UG/L) (49235)	PRO-PHAM, WATER, FLTRD, GF 0.7U REC (UG/L) (49236)	ACETO-CHLOR, WATER, FLTRD, REC (UG/L) (49260)	PIC-LORAM, WATER, FLTRD, GF 0.7U REC (UG/L) (49291)	ORY-ZALIN, WATER, FLTRD, GF 0.7U REC (UG/L) (49292)	
OCT 30...	<0.002	0.011	<0.035	<0.035	<0.021	<0.002	<0.050	<0.035	<0.002	<0.050	<0.019	
DATE	NORFLURAZON, WATER, FLTRD, GF 0.7U REC (UG/L) (49293)	NEB-URON, WATER, FLTRD, GF 0.7U REC (UG/L) (49294)	1-NAPHTHOL, WATER, FLTRD, GF 0.7U REC (UG/L) (49295)	METH-OMYL, WATER, FLTRD, GF 0.7U REC (UG/L) (49296)	FEN-URON, WATER, FLTRD, GF 0.7U REC (UG/L) (49297)	ESFEN-VAL-ERATE, WAT,FLT GF 0.7U REC (UG/L) (49298)	DNOC, WAT,FLT GF 0.7U REC (UG/L) (49299)	DIURON, WATER, FLTRD, GF 0.7U REC (UG/L) (49300)	DINOSEB, WATER, FLTRD, GF 0.7U REC (UG/L) (49301)	DICHLOR PROP, WATER, FLTRD, GF 0.7U REC (UG/L) (49302)	DICHLOR-BENIL, WATER, FLTRD, GF 0.7U REC (UG/L) (49303)	
OCT 30...	<0.024	<0.015	<0.007	<0.017	<0.013	<0.019	<0.035	<0.020	<0.035	<0.032	<0.020	
DATE	DACTHAL MONO-ACID, WAT,FLT GF 0.7U REC (UG/L) (49304)	CLOPYR-ALID, WATER, FLTRD, GF 0.7U REC (UG/L) (49305)	CHLORO-THALO-NIL, WAT,FLT GF 0.7U REC (UG/L) (49306)	CHLOR-AMBEN, WATER, FLTRD, GF 0.7U REC (UG/L) (49307)	3HYDRXY CARBO-FURAN, WAT,FLT GF 0.7U REC (UG/L) (49308)	CARBO-FURAN, WATER, FLTRD, GF 0.7U REC (UG/L) (49309)	CAR-BARYL, WATER, FLTRD, GF 0.7U REC (UG/L) (49310)	BRO-MOXYNIL, WATER, FLTRD, GF 0.7U REC (UG/L) (49311)	ALDI-CARB, WATER, FLTRD, GF 0.7U REC (UG/L) (49312)	ALDI-CARB SULFONE, WAT,FLT GF 0.7U REC (UG/L) (49313)	ALDICA-RB SUL-FOXIDE, WAT,FLT GF 0.7U REC (UG/L) (49314)	
OCT 30...	<0.017	<0.050	<0.035	<0.011	<0.014	<0.028	<0.008	<0.035	<0.016	<0.016	<0.021	
DATE	ACIFL-UORFEN, WATER, FLTRD, GF 0.7U REC (UG/L) (49315)	METRI-BUZIN, SENCOR, WATER, DISSOLV (UG/L) (82630)	2,6-DI-ETHYL ANILINE, WAT FLT 0.7 U GF, REC (UG/L) (82660)	TRI-FLUR-ALIN, WAT FLT 0.7 U GF, REC (UG/L) (82661)	ETHAL-FLUR-ALIN, WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82664)	TER-BACIL, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82665)	LIN-URON, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82666)	METHYL PARA-THION, WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82668)	PEB-ULATE, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82669)	
OCT 30...	<0.035	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	
DATE	TEBU-THIURON, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82670)	MOL-INATE, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82671)	ETHO-PROP, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82672)	BEN-FLUR-ALIN, WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO-FURAN, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82674)	TER-BUFOS, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82675)	PRON-AMIDE, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82676)	DISUL-FOTON, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82677)	TRIAL-LATE, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82678)	PRO-PANIL, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82679)	CAR-BARYL, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82680)	
OCT 30...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	E0.003	0.004	<0.003	
DATE	THIO-BENCARB, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82681)	DCPA, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82682)	PENDI-METH-ALIN, WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP-AMIDE, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82684)	PRO-PARGITE, WATER, FLTRD, GF 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN-PHOS, WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER-METHRIN, CIS, WAT FLT 0.7 U GF, REC (UG/L) (82687)	DIAZ-INON, D10 SRG, WAT FLT 0.7 U GF, REC (UG/L) (91063)	TERBUTH YLAZINE, SURROGT, WAT FLT 0.7 U GF, REC (UG/L) (91064)	HCH ALPHA D6 SRG, WAT FLT 0.7 U GF, REC (UG/L) (91065)	BDMC, SURROG, WATER, UNFLTRD REC (UG/L) (99835)	
OCT 30...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	118	113	107	88.0	

RED RIVER OF THE NORTH BASIN
05064000 WILD RICE RIVER AT HENDRUM, MN

LOCATION.--Lat 47°16'05", long 96°47'50", in SE¼SE¼ sec.19, T.144 N., R.48 W., Norman County, Hydrologic Unit 09020108, on right bank 30 ft downstream from highway bridge, 0.5 mi east of Hendrum and 4 mi upstream from mouth.

DRAINAGE AREA.--1,600 mi², approximately.

PERIOD OF RECORD.--March 1944 to September 1984 and May 1985 to current year. Operated as a high-flow partial-record station October 1984 to April 1985.

REVISED RECORDS.--WSP 1728: 1958.

GAGE.--Water-stage recorder. Datum of gage is 836.75 ft above mean sea level (levels by U.S. Army Corps of Engineers). Prior to July 18, 1989, nonrecording gage at same site and datum.

REMARKS.--Records poor. Large part of high flow diverted into Marsh River basin at overflow section 3.5 mi east of Ada. Another diversion into the Marsh River basin formed in 1947, 1.5 mi southeast of Ada and diverted water at all stages 1947-51, after which it was closed except for a small regulated flow diverted for abatement of pollution from Ada sewage plant effluent. Amount of diversion not known.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	229	342	e140	e150	e140	e140	e160	2190	905	254	96	49
2	231	353	e140	e150	e140	e140	e160	2050	857	224	102	53
3	247	344	e140	e150	e140	e140	e160	1910	803	219	96	53
4	244	e340	e140	e150	e140	e140	e170	1780	e760	202	91	48
5	271	e320	e140	e150	e140	e140	e180	1660	e720	190	93	44
6	360	e290	e140	e150	e140	e140	e200	1570	e700	180	93	41
7	461	e270	e140	e150	e140	e140	e380	1490	e680	170	85	40
8	476	e250	e140	e150	e140	e130	e700	1410	e720	160	78	41
9	456	e240	e140	e160	e150	e130	e1300	1340	e720	153	77	43
10	427	e220	e140	e160	e150	e130	e2300	1310	e700	147	75	45
11	418	e210	e140	e160	e150	e130	e3400	1240	e660	143	72	45
12	399	e200	e140	e160	e150	e140	e4100	1160	e600	142	70	44
13	365	e190	e140	e160	e150	e140	e5000	1070	e560	138	68	42
14	333	e180	e140	e160	e150	e140	5680	992	e520	132	65	40
15	316	e170	e140	e160	e150	e150	5670	955	e480	127	63	38
16	296	e170	e140	e150	e150	e150	5500	943	e450	125	60	38
17	295	e170	e140	e150	e150	e150	5460	959	e440	128	57	37
18	284	e170	e140	e150	e150	e150	5460	2330	e430	134	55	36
19	284	e170	e140	e150	e150	e150	5340	3750	e390	123	52	36
20	293	e160	e140	e150	e160	e140	5180	4250	e360	114	51	35
21	300	e160	e140	e140	e160	e140	4980	4420	e340	108	48	36
22	324	e150	e140	e140	e160	e150	4730	4330	e310	102	46	35
23	356	e150	e140	e140	e160	e150	4450	4020	e290	116	45	34
24	360	e150	e140	e140	e160	e150	4120	3590	e280	115	45	34
25	353	e140	e140	e140	e160	e150	3770	3070	e270	116	45	37
26	348	e140	e150	e140	e150	e150	3400	2600	260	110	44	40
27	345	e140	e150	e140	e150	e150	3060	2130	252	112	42	44
28	342	e140	e150	e140	e150	e150	2780	1760	241	114	42	48
29	362	e140	e150	e140	e150	e160	2510	1430	251	108	41	51
30	360	e140	e150	e140	---	e160	2320	1140	249	101	41	51
31	340	---	e150	e140	---	e160	---	976	---	96	40	---
TOTAL	10475	6209	4400	4610	4330	4480	92620	63825	15198	4403	1978	1258
MEAN	338	207	142	149	149	145	3087	2059	507	142	63.8	41.9
MAX	476	353	150	160	160	160	5680	4420	905	254	102	53
MIN	229	140	140	140	140	130	160	943	241	96	40	34
AC-FT	20780	12320	8730	9140	8590	8890	183700	126600	30150	8730	3920	2500
CFSM	.21	.13	.09	.09	.09	.09	1.93	1.29	.32	.09	.04	.03
IN.	.24	.14	.10	.11	.10	.10	2.15	1.48	.35	.10	.05	.03

e Estimated.

RED RIVER OF THE NORTH BASIN

05064000 WILD RICE RIVER AT HENDRUM, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1996, BY WATER YEAR (WY)

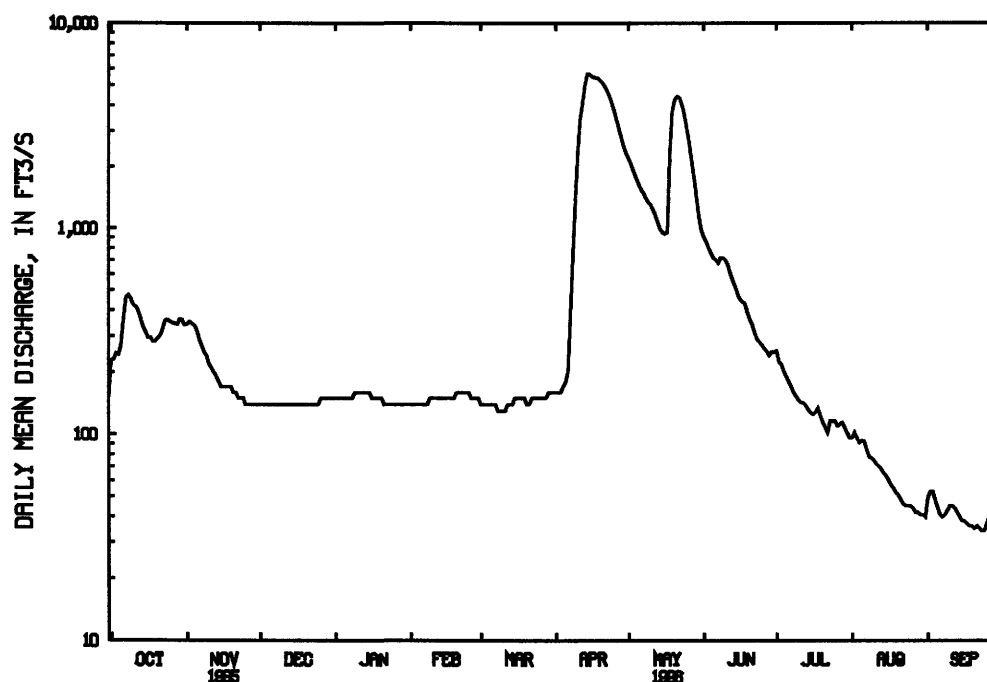
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	129	113	67.5	49.4	47.9	290	1114	597	417	341	149	113
MAX	744	784	217	149	149	1485	3261	2074	1776	3136	1833	824
(WY)	1972	1972	1995	1996	1996	1966	1978	1985	1962	1975	1993	1973
MIN	.44	3.32	1.08	.092	.22	.46	106	56.1	9.15	8.82	1.07	.18
(WY)	1949	1949	1977	1977	1977	1949	1981	1977	1952	1951	1977	1948

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1944 - 1996
ANNUAL TOTAL	173967	213786	
ANNUAL MEAN	477	584	278 ^a
HIGHEST ANNUAL MEAN			682
LOWEST ANNUAL MEAN			28.9
HIGHEST DAILY MEAN	3100	Mar 17	5680
LOWEST DAILY MEAN	102	Sep 27	34
ANNUAL SEVEN-DAY MINIMUM	104	Sep 23	35
INSTANTANEOUS PEAK FLOW		5750 ^b	Apr 14
INSTANTANEOUS PEAK STAGE		29.00 ^c	Apr 15
ANNUAL RUNOFF (AC-FT)	345100	424000	201400
ANNUAL RUNOFF (CFSM)	.30	.37	.17
ANNUAL RUNOFF (INCHES)	4.04	4.97	2.36
10 PERCENT EXCEEDS	1290	1690	700
50 PERCENT EXCEEDS	221	150	87
90 PERCENT EXCEEDS	115	49	15

a Median of annual mean discharges is 258 ft³/s.

b Gage height is 28.72 ft.

c Backwater from Red River of the North.



05064000 WILD RICE RIVER AT HENDRUM, MN

RED RIVER OF THE NORTH BASIN

05064500 RED RIVER OF THE NORTH AT HALSTAD, MN

LOCATION.--Lat 47°21'10", long 96°50'50", on line between secs.24 and 25, T.14S N., R.49 W., Trail County, Hydrologic Unit 09020107, on left bank on upstream side of highway bridge, 0.5 mi west of Halstad, 2.5 mi downstream from Wild Rice River, and at mile 375.2.

DRAINAGE AREA.--21,800 mi², approximately, including 3,800 mi² in closed basins.

PERIOD OF RECORD.--April 1936 to June 1937 (no winter records), April 1942 to September 1960 (spring and summer months only), May 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 826.65 ft above sea level. Prior to July 17, 1961, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods of estimated discharges, which are poor.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1897 reached a stage of about 38.5 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e880	1950	e1520	e840	e725	e940	e4300	8760	6430	1820	1140	521
2	e1170	1980	e1460	e820	e740	e930	e4000	8500	6020	1730	1120	542
3	1140	2000	e1410	e810	e750	e940	e3850	8370	5630	1650	1110	532
4	1140	1890	e1470	e825	e760	e960	e3750	8280	5320	1590	1110	586
5	1220	1770	e1420	e840	e750	e1000	e3900	8200	5080	1550	1220	692
6	1790	1820	e1380	e850	e740	e1040	e4500	8180	4900	1510	1470	808
7	2570	1680	e1320	e835	e740	e1080	e5200	8160	4800	1460	1370	687
8	2820	1650	e1290	e820	e735	e1100	e6400	8080	4850	1400	1230	563
9	2710	2170	e1250	e810	e740	e1130	e8000	7760	4690	1340	1160	472
10	2580	1900	e1210	e800	e750	e1180	e11000	7500	4450	1290	1090	497
11	2470	e1700	e1220	e795	e760	e1270	e14400	7160	4360	1260	1000	472
12	2350	e1500	e1260	e790	e750	e1400	e17500	6710	4270	1260	940	481
13	2250	e1300	e1300	e800	e745	e1620	e20000	6220	e4100	1270	925	562
14	2100	e1100	e1290	e800	e740	e1950	e22400	5730	e4000	1250	906	572
15	1950	e1200	e1270	e810	e730	e2350	e23000	5370	e3850	1210	878	567
16	1830	e1400	e1230	e805	e725	e2800	e23500	5210	e3700	1160	835	563
17	1820	e1500	e1190	e800	e740	e3400	e24500	5160	e3500	1130	782	520
18	1860	e1600	e1150	e795	e760	e3900	25100	8360	e3300	1140	713	422
19	1910	e1700	e1120	e790	e780	e4200	24700	12500	3190	1120	670	325
20	1930	e1800	e1100	e795	e795	e5100	23900	14200	3040	1130	657	266
21	1910	e1700	e1080	e790	e820	e5700	22200	15200	2880	1140	655	243
22	1880	e1500	e1050	e785	e840	e6400	20100	15700	2680	1150	668	228
23	1880	e1400	e1030	e780	e860	e7100	17900	15900	2530	1120	668	229
24	1850	e1350	e1010	e785	e850	e7500	16600	16000	2420	1100	644	246
25	1760	e1300	e1000	e790	e860	e7700	15200	15800	2350	1060	584	256
26	1660	e1300	e975	e780	e900	e7600	13700	14900	2290	1020	526	325
27	1550	e1250	e950	e775	e950	e6900	12300	13600	2230	1010	467	396
28	1480	e1300	e940	e760	e980	e6400	11100	11700	2090	1040	415	552
29	1630	e1400	e910	e750	e960	e5700	10000	9810	1980	1110	467	617
30	1840	e1480	e880	e740	---	e5200	9250	8130	1900	1130	536	584
31	1920	---	e860	e735	---	e4750	---	7050	---	1150	542	---
TOTAL	57850	47590	36545	24700	22975	109240	422250	302200	112830	39300	26498	14326
MEAN	1866	1586	1179	797	792	3524	14070	9748	3761	1268	855	478
MAX	2820	2170	1520	850	980	7700	25100	16000	6430	1820	1470	808
MIN	880	1100	860	735	725	930	3750	5160	1900	1010	415	228
AC-FT	114700	94390	72490	48990	45570	216700	837500	599400	223800	77950	52560	28420

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1996, BY WATER YEAR (WY)

MEAN	800	711	546	456	468	2306	6996	3342	2575	2569	1110	709
MAX	2875	1843	1253	1023	1052	9444	20080	9748	10310	20060	11700	3360
(WY)	1995	1995	1987	1987	1987	1995	1969	1996	1962	1975	1993	1993
MIN	61.5	92.3	51.2	32.1	45.9	249	705	449	242	153	59.5	38.4
(WY)	1977	1977	1977	1977	1977	1962	1981	1977	1977	1988	1977	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1961 - 1996
ANNUAL TOTAL	1331175	1216304	
ANNUAL MEAN	3647	3323	1897
HIGHEST ANNUAL MEAN			3968
LOWEST ANNUAL MEAN			214
HIGHEST DAILY MEAN	23000	25100	41500
LOWEST DAILY MEAN	474	228	10
ANNUAL SEVEN-DAY MINIMUM	532	256	17
INSTANTANEOUS PEAK FLOW		25200	42000
INSTANTANEOUS PEAK STAGE		35.11	39.00
INSTANTANEOUS LOW FLOW			5.4
ANNUAL RUNOFF (AC-FT)	2640000	2413000	1374000
10 PERCENT EXCEEDS	9260	8300	4170
50 PERCENT EXCEEDS	1520	1290	769
90 PERCENT EXCEEDS	860	656	210

e Estimated.

RED RIVER OF THE NORTH BASIN

05064500 RED RIVER OF THE NORTH AT HALSTAD, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1961-67, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	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)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)
JAN 09...	1520	807	682	--	-1.0	0.0	--	--	--	--
FEB 22...	1035	843	621	--	-3.0	0.5	--	--	--	--
APR 11...	0955	14400	362	--	-5.0	0.5	--	--	--	--
20...	1625	24000	417	--	--	--	--	--	--	--
23...	1200	17800	475	--	--	5.5	--	--	--	--
MAY 08...	1010	8160	564	8.1	2.0	10.0	240	52	26	24
23...	0755	15900	529	--	12.0	10.0	--	--	--	--
JUN 18...	0900	3330	489	--	--	18.5	--	--	--	--
SEP 03...	1450	567	772	8.2	24.0	25.5	280	57	34	50
DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO AS K) (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS CACO3) (00935)	ALKA- LINITY LAB (MG/L AS AS SO4) (90410)	SULFATE DIS- SOLVED (MG/L AS CL) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS F) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L (00950)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L AC-FT) (70300)	SOLIDS, DIS- SOLVED (TONS PER (70303)
MAY 08...	17	0.7	7.4	174	110	14	0.10	338	384	0.52
SEP 03...	26	1	18	249	120	37	0.20	466	481	0.65
DATE	SOLIDS, DIS- SOLVED (TONS DATE DAY) (70302)	ARSENIC DIS- SOLVED PER AS AS) (01000)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L(UG/L AS SR) (01080)
MAY 08...	8460	2	20	<1	30	10	0.1	1	1	230
SEP 03...	--	6	10	<1	30	<10	<0.1	3	<1	300

RED RIVER OF THE NORTH BASIN

05067500 MARSH RIVER NEAR SHELLY, MN

LOCATION.--Lat 47°24'45", long 96°45'50", in NE¼,NW¼, sec.3, T.145 N., R.48 W., Norman County, Hydrologic Unit 09020107, near center of span on downstream truss of bridge, 3.8 mi southeast of Shelly and 10 mi upstream from mouth.

DRAINAGE AREA.--151 mi².

PERIOD OF RECORD.--March 1944 to September 1983 and April 1985 to current year (no winter records since 1989). Monthly discharge only for March 1944, published in WSP 1308. Operated as a high-flow partial-record station October 1983 to March 1985.

GAGE.--Water-stage recorder. Datum of gage is 841.14 ft above mean sea level (levels by U.S. Army Corps of Engineers). Prior to Oct. 1, 1965, nonrecording gage at datum 3.0 ft higher. Oct. 1, 1965, to May 17, 1989, nonrecording gage at present site and datum.

REMARKS.--Records fair. Large part of high flow of Wild Rice River diverted into Marsh River basin at overflow section 4.6 mi east of Ada. Another diversion from Wild Rice River basin formed in 1947, 1.5 mi southeast of Ada and diverted water at all stages 1947-51, after which it was closed except for a small regulated flow diverted for abatement of pollution from Ada sewage plant effluent.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	DAILY MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	---	---	---	---	---	e8.0	88	32	1.5	1.1	.02
2	8.1	---	---	---	---	---	e9.0	76	32	1.3	.92	.09
3	5.9	---	---	---	---	---	e10	66	30	1.1	.73	.06
4	5.6	---	---	---	---	---	e14	57	30	1.1	.63	.06
5	13	---	---	---	---	---	e20	51	30	1.2	.57	.02
6	31	---	---	---	---	---	e30	45	29	1.4	.44	.00
7	40	---	---	---	---	---	e60	42	23	1.2	.35	.05
8	33	---	---	---	---	---	e150	40	21	1.1	.18	.11
9	31	---	---	---	---	---	e220	40	19	1.0	.15	.08
10	33	---	---	---	---	---	e380	41	16	.72	.16	.06
11	30	---	---	---	---	---	e640	38	13	.74	.13	.04
12	23	---	---	---	---	---	e900	36	10	.79	.11	.02
13	18	---	---	---	---	---	e1400	37	8.1	.74	.07	.00
14	15	---	---	---	---	---	1840	34	6.2	.69	.05	.00
15	23	---	---	---	---	---	2080	33	5.1	.68	.02	.00
16	12	---	---	---	---	---	1990	32	4.0	.64	.00	.00
17	7.6	---	---	---	---	---	1950	37	3.6	1.1	.00	.00
18	11	---	---	---	---	---	e1700	795	3.0	3.2	.00	.00
19	13	---	---	---	---	---	e1200	1490	2.7	2.2	.00	.00
20	13	---	---	---	---	---	e1000	1340	2.4	1.9	.00	.00
21	19	---	---	---	---	---	e840	792	2.2	11	.00	.00
22	17	---	---	---	---	---	692	442	1.9	7.6	.03	.00
23	16	---	---	---	---	---	531	337	2.1	5.8	.01	.00
24	17	---	---	---	---	---	406	278	2.4	10	.00	.00
25	27	---	---	---	---	---	328	225	2.4	7.9	.00	.00
26	19	---	---	---	---	---	299	172	2.4	7.9	.00	.00
27	17	---	---	---	---	---	230	91	2.2	4.9	.00	.03
28	14	---	---	---	---	---	166	59	2.1	3.0	.00	.04
29	14	---	---	---	---	---	130	46	2.0	2.3	.00	.01
30	11	---	---	---	---	---	104	37	1.8	1.8	.00	.00
31	12	---	---	---	---	---	---	32	---	1.3	.00	---
TOTAL	553.2	---	---	---	---	---	19327.0	6929	341.6	87.80	5.65	0.69
MEAN	17.8	---	---	---	---	---	644	224	11.4	2.83	.18	.023
MAX	40	---	---	---	---	---	2080	1490	32	11	1.1	.11
MIN	4.0	---	---	---	---	---	8.0	32	1.8	.64	.00	.00
AC-FT	1100	---	---	---	---	---	38340	13740	678	174	11	1.4
CFSM	.12	---	---	---	---	---	4.27	1.48	.08	.02	.00	.00
IN.	.14	---	---	---	---	---	4.76	1.71	.08	.02	.00	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

05067500 MARSH RIVER NEAR SHELLY, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	13.3	11.0	5.60	3.79	3.29	76.7	292	127	78.8	74.1	20.0	12.7
MAX	130	102	77.1	64.5	62.1	437	1537	2617	1030	820	363	144
(WY)	1952	1952	1951	1951	1951	1945	1950	1950	1950	1950	1949	1914
MIN	.000	.000	.000	.000	.000	.000	.078	.87	.000	.000	.000	.070
(WY)	1955	1956	1956	1946	1946	1964	1981	1980	1980	1961	1959	1974

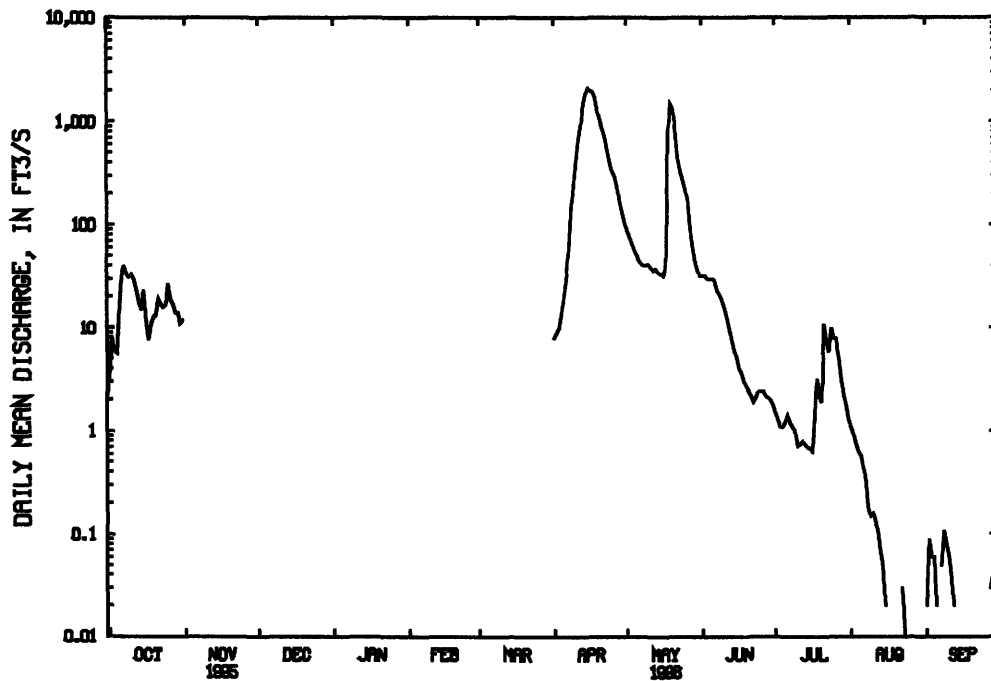
SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1944 - 1996
ANNUAL MEAN			63.3 ^a
HIGHEST ANNUAL MEAN			543 ^a
LOWEST ANNUAL MEAN			1.24 ^a
HIGHEST DAILY MEAN	1470	Mar 29	2080
LOWEST DAILY MEAN	.00	Mar 1	.00 ^b
ANNUAL SEVEN-DAY MINIMUM	.00	Mar 1	.00
INSTANTANEOUS PEAK FLOW			4880
INSTANTANEOUS PEAK STAGE		19.01	Apr 15
			23.36 ^d
			Apr 19 1979
			Sep 4 1945
			Sep 12 1945
			Apr 19 1979
			Apr 19 1979

a Based on complete water years only, 1945-83, 86-89.

b Observed on many days.

c Many days, several years.

d From floodmark.



— 05067500 MARSH RIVER NEAR SHELLY, MN

RED RIVER OF THE NORTH BASIN

05069000 SAND HILL RIVER AT CLIMAX, MN

LOCATION.--Lat 47°36'43", long 96°48'52", in NE1/4NE1/4 sec.30, T.148 N., R.48 W., Polk County, Hydrologic Unit 09020301, on left bank 25 ft upstream from bridge on U.S. Highway 75 in Climax and 3.7 mi upstream from mouth.

DRAINAGE AREA.--426 mi².

PERIOD OF RECORD.--March 1943 to September 1984, June 1985 to current year (winter records incomplete prior to 1947). Monthly discharge only for some periods, published in WSP 1308 and 1728. October 1984 to May 1985, operated as a high-flow partial-record station.

REVISED RECORDS.--WSP 1388: 1943(M), 1944, 1947(M). WSP 1728: 1951(M), 1960 (Average discharge).

GAGE.--Water stage recorder. Datum of gage is 820.10 ft above mean sea level (levels by U.S. Army Corps of Engineers). Prior to Oct. 1, 1966, nonrecording gage at site 3.2 mi upstream at datum 12.78 ft higher. Oct. 1, 1966, to Sept 5, 1989, nonrecording gage at present site and datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e380	e70	e44	e32	e27	e29	e37	144	222	33	27	14
2	e450	e80	e43	e32	e27	e29	e37	94	205	32	27	14
3	e350	e90	e42	e32	e27	e29	e37	67	189	31	25	20
4	e280	e60	e42	e32	e27	e28	e37	53	178	30	23	29
5	e230	e66	e41	e32	e27	e28	e37	44	165	27	25	21
6	e240	e90	e40	e32	e28	e28	e37	38	153	28	30	19
7	e300	e100	e40	e32	e29	e28	e38	34	141	32	27	18
8	157	e80	e40	e32	e29	e28	e38	31	130	30	27	17
9	136	e60	e40	e32	e30	e28	e100	29	119	30	26	17
10	118	e50	e39	e33	e30	e28	e270	31	107	30	23	16
11	105	e46	e38	e34	e30	e28	e350	47	98	28	21	15
12	95	e42	e36	e35	e30	e29	e450	66	89	28	20	16
13	84	e40	e35	e35	e30	e30	e600	86	83	28	20	16
14	77	e41	e36	e35	e30	e31	e800	108	77	27	19	14
15	74	e41	e36	e34	e30	e33	e1100	132	70	33	19	15
16	70	e42	e36	e33	e30	e34	e1800	159	65	28	20	15
17	65	e42	e35	e33	e30	e34	e2800	257	60	26	18	15
18	61	e45	e35	e33	e29	e34	e3500	1720	56	58	16	15
19	67	e52	e34	e32	e29	e33	4230	1300	53	65	17	15
20	73	e54	e34	e32	e28	e33	4150	872	50	42	19	15
21	80	e52	e33	e31	e28	e33	3700	891	46	35	19	18
22	84	e50	e32	e31	e27	e33	3100	895	41	36	18	17
23	82	e49	e32	e31	e28	e33	2370	876	41	31	18	19
24	77	e48	e32	e30	e28	e32	1640	812	41	45	16	19
25	73	e46	e33	e30	e29	e32	1130	696	42	41	14	17
26	71	e45	e34	e29	e29	e31	896	548	43	33	15	18
27	69	e45	e34	e29	e29	e32	671	400	42	27	16	18
28	66	e45	e34	e29	e29	e33	486	314	40	30	15	25
29	63	e45	e32	e28	e29	e34	339	276	38	29	14	23
30	60	e44	e32	e27	---	e34	227	248	35	29	13	22
31	e62	---	e32	e26	---	e36	---	227	---	29	13	---
TOTAL	4199	1660	1126	978	833	965	35007	11495	2719	1031	620	532
MEAN	135	55.3	36.3	31.5	28.7	31.1	1167	371	90.6	33.3	20.0	17.7
MAX	450	100	44	35	30	36	4230	1720	222	65	30	29
MIN	60	40	32	26	27	28	37	29	35	26	13	14
AC-FT	8330	3290	2230	1940	1650	1910	69440	22800	5390	2040	1230	1060
CFSM	.32	.13	.09	.07	.07	.07	2.74	.87	.21	.08	.05	.04
IN.	.37	.14	.10	.09	.07	.08	3.06	1.00	.24	.09	.05	.05

e Estimated.

RED RIVER OF THE NORTH BASIN

05069000 SAND HILL RIVER AT CLIMAX, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 1996, BY WATER YEAR (WY)

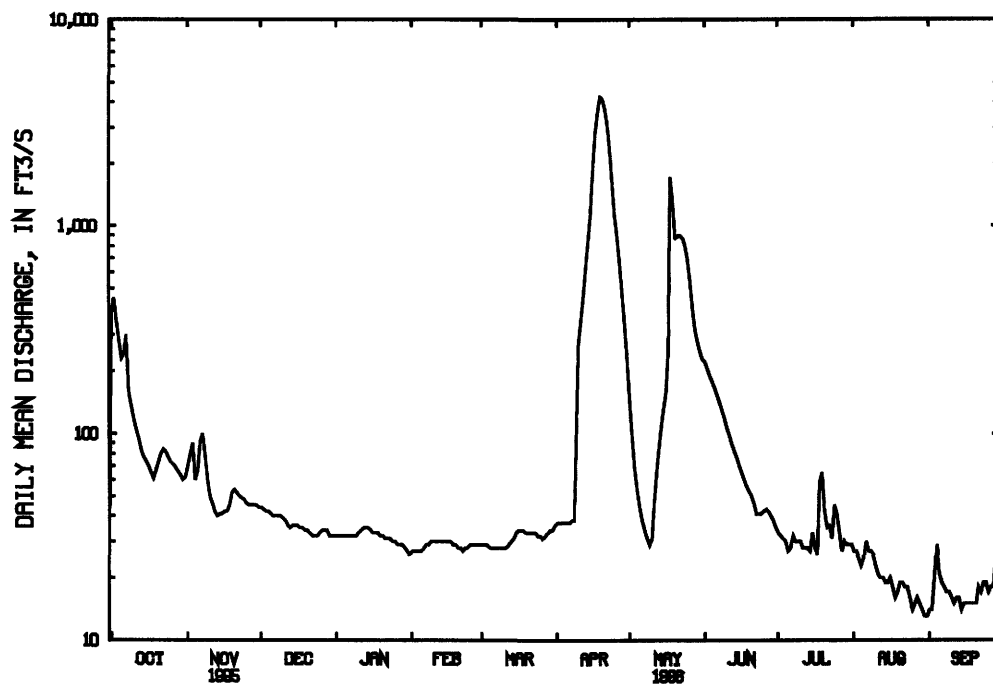
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	35.7	28.8	17.7	13.0	12.8	80.8	356	123	94.4	71.6	37.9	26.9
MAX	223	209	48.7	31.5	46.8	455	1167	1156	596	376	426	124
(WY)	1972	1972	1972	1996	1984	1995	1996	1950	1984	1994	1993	1994
MIN	9.43	8.64	5.11	2.02	3.55	5.81	25.3	23.7	11.5	8.95	6.30	6.4 ^a
(WY)	1977	1956	1964	1962	1962	1948	1981	1958	1980	1980	1961	1955

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR			FOR 1996 WATER YEAR			WATER YEARS 1943 - 1996		
ANNUAL TOTAL	47747			61165					
ANNUAL MEAN	131			167			74.5 ^a		
HIGHEST ANNUAL MEAN							204		
LOWEST ANNUAL MEAN							18.4		
HIGHEST DAILY MEAN	1300			Mar 17			4360		
LOWEST DAILY MEAN	13			Sep 24,25			1.0		
ANNUAL SEVEN-DAY MINIMUM	14			Sep 19			1.1		
INSTANTANEOUS PEAK FLOW				4290			4560		
INSTANTANEOUS PEAK STAGE				25.17 ^b			32.79 ^c		
ANNUAL RUNOFF (AC-FT)	94710			121300			53980		
ANNUAL RUNOFF (CFSM)	.31			.39			.17		
ANNUAL RUNOFF (INCHES)	4.17			5.34			2.38		
10 PERCENT EXCEEDS	380			272			150		
50 PERCENT EXCEEDS	47			34			23		
90 PERCENT EXCEEDS	22			19			9.0		

a Median of annual mean discharges is 60 ft³/s.

b Backwater from Red River of the North.

c From floodmark, backwater from Red River of the North.



— 05069000 SAND HILL RIVER AT CLIMAX, MN

RED RIVER OF THE NORTH BASIN
05073500 UPPER RED LAKE AT WASKISH, MN

LOCATION.--Lat 48°10'32", long 94°30'51", in NW¹/₄SW¹/₄NE¹/₄NW¹/₄ sec. 8, T.154 N., R. 30 W., Beltrami County, Hydrologic Unit 09020302, on east side of Upper Red Lake, near mouth of Tamarack River, on Minnesota Department of Natural Resources property, 500 feet east of State Highway 72 bridge on north edge of Waskish.

PERIOD OF RECORD.-- October 1921 to September 1933, May 1940 to July 1946, October 1995 to current year.

GAGE.-- Water-stage recorder. Datum of gage is 1,100.00 ft, adjustment of 1912. October 1921 to September 1929, nonrecording gage at datum 1170.00 ft (no winter readings). April 1930 to September 1933, nonrecording gage at datum 1100.00 ft (some winter readings). May 1940 to July 1946, nonrecording gage at datum 1170.00 ft.

REMARKS.-- Water level subject to fluctuation caused by change in direction and velocity of wind and by seiches.

EXTREMES FOR PERIOD OF RECORD.-- Maximum elevation, 1,178.34 ft, June 28, 1943; minimum recorded, 1,172.10 ft, Oct. 17, 1932.

EXTREMES FOR CURRENT YEAR.-- Maximum elevation, 1176.15 ft, May 18; minimum elevation, 1173.78 ft, Sept. 26.

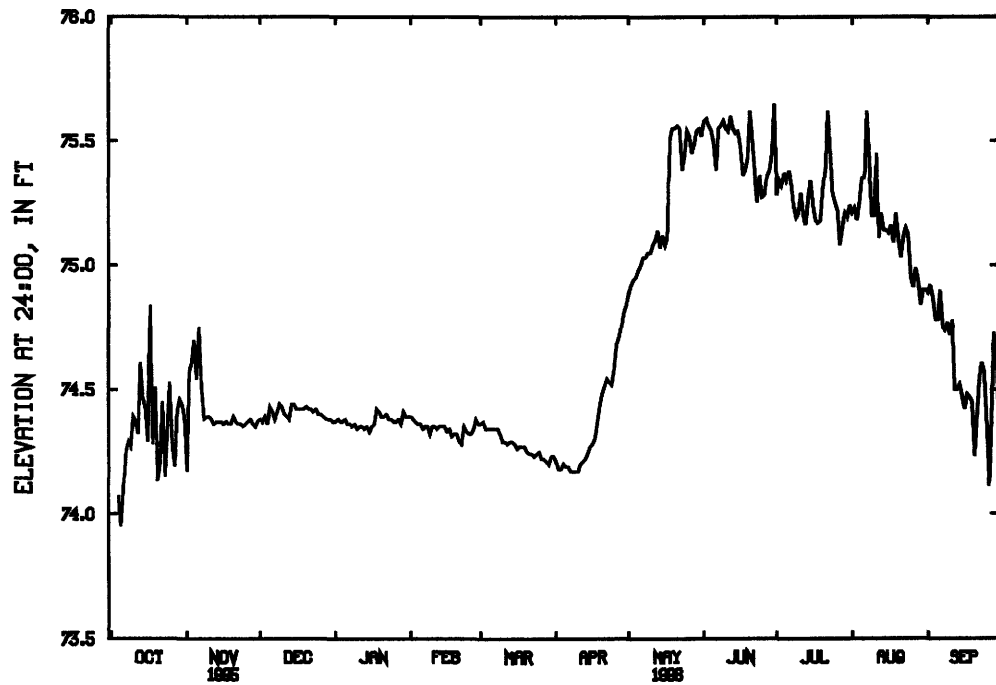
GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	74.17	74.38	74.37	74.39	74.36	74.21	74.89	75.58	75.28	75.21	74.89
2	---	74.57	74.37	74.38	74.38	74.37	74.18	74.92	75.59	75.34	75.23	74.92
3	---	74.61	74.39	74.37	74.37	74.34	74.18	74.94	75.56	75.32	75.18	74.87
4	74.07	74.70	74.36	74.37	74.36	74.34	74.20	74.95	75.54	75.37	75.25	74.78
5	73.95	74.54	74.43	74.38	74.36	74.34	74.19	74.98	75.49	75.34	75.35	74.78
6	74.10	74.75	74.41	74.36	74.34	74.34	74.19	75.00	75.38	75.38	75.35	74.90
7	74.25	74.51	74.38	74.36	74.35	74.34	74.17	75.03	75.55	75.33	75.62	74.75
8	74.29	74.38	74.41	74.35	74.35	74.34	74.17	75.03	75.56	75.24	75.42	74.74
9	74.27	74.39	74.44	74.36	74.32	74.32	74.17	75.05	75.58	75.19	75.20	74.77
10	74.39	74.39	74.43	74.34	74.35	74.29	74.17	75.05	75.55	75.21	75.20	74.72
11	74.37	74.38	74.40	74.35	74.35	74.29	74.20	75.08	75.54	75.29	75.45	74.78
12	74.32	74.36	74.39	74.35	74.34	74.28	74.21	75.10	75.60	75.20	75.11	74.50
13	74.61	74.37	74.38	74.34	74.35	74.29	74.22	75.14	75.55	75.16	75.21	74.50
14	74.46	74.37	74.44	74.35	74.35	74.29	74.24	75.07	75.53	75.27	75.14	74.52
15	74.43	74.37	74.44	74.33	74.35	74.28	74.27	75.12	75.54	75.34	75.14	74.47
16	74.29	74.36	74.42	74.35	74.33	74.26	74.28	75.08	75.48	75.24	75.13	74.42
17	74.84	74.37	74.42	74.36	74.34	74.27	74.30	75.11	75.36	75.18	75.16	74.48
18	74.28	74.36	74.42	74.42	74.31	74.27	74.36	75.51	75.38	75.17	75.09	74.47
19	74.51	74.36	74.42	74.41	74.32	74.27	74.43	75.55	75.43	75.18	75.21	74.45
20	74.13	74.39	74.43	74.39	74.32	74.25	74.48	75.55	75.62	75.31	75.10	74.23
21	74.21	74.37	74.42	74.39	74.29	74.24	74.51	75.56	75.50	75.39	75.03	74.38
22	74.45	74.36	74.42	74.40	74.28	74.24	74.54	75.55	75.36	75.62	75.11	74.54
23	74.15	74.36	74.41	74.38	74.35	74.23	74.53	75.38	75.25	75.44	75.15	74.61
24	74.35	74.35	74.42	74.38	74.33	74.24	74.52	75.44	75.36	75.29	75.12	74.57
25	74.53	74.36	74.40	74.37	74.32	74.25	74.58	75.54	75.27	75.25	74.95	74.36
26	74.27	74.37	74.40	74.37	74.32	74.22	74.68	75.52	75.28	75.22	74.91	74.11
27	74.19	74.38	74.39	74.38	74.34	74.22	74.71	75.45	75.36	75.08	74.99	74.39
28	74.41	74.36	74.38	74.36	74.38	74.21	74.75	75.49	75.38	75.15	74.94	74.73
29	74.46	74.35	74.38	74.41	74.36	74.20	74.81	75.54	75.45	75.21	74.84	74.63
30	74.44	74.37	74.38	74.39	---	74.23	74.84	75.55	75.65	75.19	74.90	74.38
31	74.39	---	74.37	74.39	---	74.23	---	75.52	---	75.24	74.90	---
TOTAL	---	2232.33	2306.53	2305.51	2155.90	2302.64	2231.29	2332.69	2264.27	2333.42	2329.59	2237.64
MEAN	---	74.41	74.40	74.37	74.34	74.28	74.38	75.25	75.48	75.27	75.15	74.59
MAX	---	74.75	74.44	74.42	74.39	74.37	74.84	75.56	75.65	75.62	75.62	74.92
MIN	---	74.17	74.36	74.33	74.28	74.20	74.17	74.89	75.25	75.08	74.84	74.11

RED RIVER OF THE NORTH BASIN

05073500 UPPER RED LAKE AT WASKISH, MN--Continued



— 05073500 UPPER RED LAKE AT WASKISH, MN

RED RIVER OF THE NORTH BASIN

05073650 LOWER RED LAKE AT BATTLE RIVER MOUTH NEAR SAUM, MN

LOCATION.-- Lat 47°57'35", long 94°44'31", in NW¹/₄SE¹/₄NW¹/₄ sec. 28, T. 152 N., R. 32 W., Beltrami County, Hydrologic Unit 09020302, on east side of Lower Red Lake, near mouth of Battle River, 900 feet southwest of highway bridge, and 2.3 mi southwest of Saum.

PERIOD OF RECORD.--June 5, 1996 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,100.00 ft, adjustment of 1912.

REMARKS.--Water level subject to fluctuation caused by change in direction and velocity of wind and by seiches.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 1175.58 ft, June 6, 1996; minimum recorded, 1174.23 ft, Sep* 26, 1996.

EXTREMES FOR CURRENT YEAR.-- Maximum elevation, 1175.58 ft, June 6; minimum elevation, 1,174.23 ft, Sept. 26.

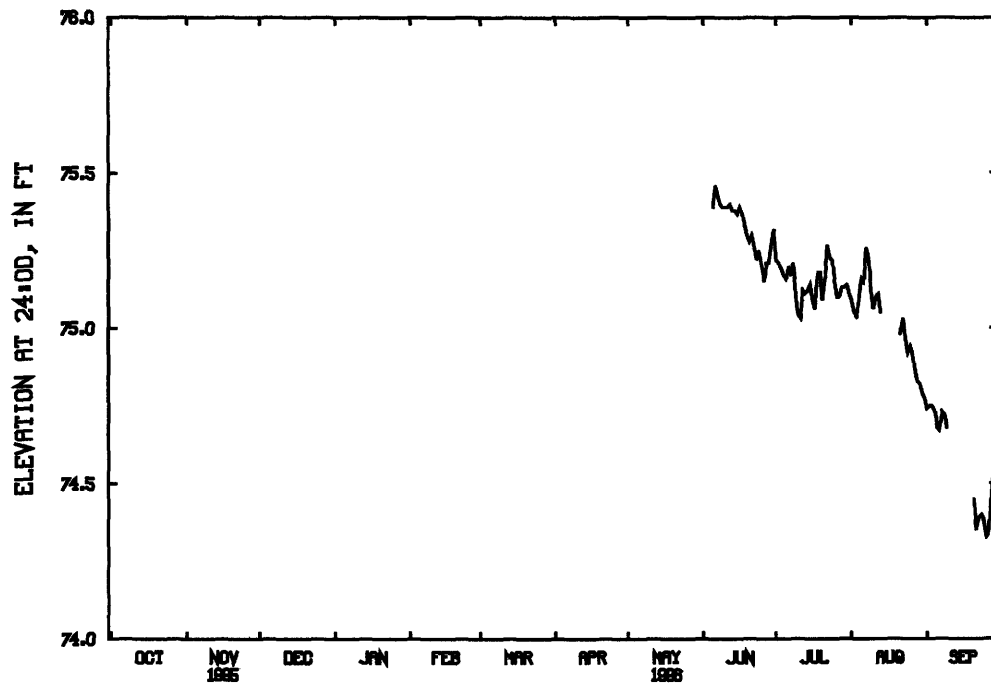
GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	75.22	75.09	74.74
2	---	---	---	---	---	---	---	---	---	75.21	75.05	74.75
3	---	---	---	---	---	---	---	---	---	75.19	75.03	74.75
4	---	---	---	---	---	---	---	---	---	75.17	75.09	74.73
5	---	---	---	---	---	---	---	---	75.39	75.16	75.16	74.68
6	---	---	---	---	---	---	---	---	75.46	75.20	75.15	74.67
7	---	---	---	---	---	---	---	---	75.43	75.17	75.26	74.73
8	---	---	---	---	---	---	---	---	75.40	75.21	75.23	74.72
9	---	---	---	---	---	---	---	---	75.39	75.11	75.12	74.68
10	---	---	---	---	---	---	---	---	75.39	75.04	75.06	---
11	---	---	---	---	---	---	---	---	75.39	75.03	75.10	---
12	---	---	---	---	---	---	---	---	75.40	75.12	75.11	---
13	---	---	---	---	---	---	---	---	75.38	75.11	75.05	---
14	---	---	---	---	---	---	---	---	75.38	75.12	---	---
15	---	---	---	---	---	---	---	---	75.37	75.14	---	---
16	---	---	---	---	---	---	---	---	75.39	75.09	---	---
17	---	---	---	---	---	---	---	---	75.37	75.06	---	---
18	---	---	---	---	---	---	---	---	75.33	75.18	---	---
19	---	---	---	---	---	---	---	---	75.30	75.18	---	---
20	---	---	---	---	---	---	---	---	75.28	75.09	---	74.45
21	---	---	---	---	---	---	---	---	75.30	75.16	74.98	74.35
22	---	---	---	---	---	---	---	---	75.26	75.27	75.03	74.39
23	---	---	---	---	---	---	---	---	75.22	75.23	74.97	74.40
24	---	---	---	---	---	---	---	---	75.25	75.22	74.92	74.38
25	---	---	---	---	---	---	---	---	75.20	75.15	74.94	74.33
26	---	---	---	---	---	---	---	---	75.15	75.10	74.92	74.34
27	---	---	---	---	---	---	---	---	75.21	75.10	74.86	74.44
28	---	---	---	---	---	---	---	---	75.21	75.13	74.83	74.53
29	---	---	---	---	---	---	---	---	75.27	75.13	74.82	74.47
30	---	---	---	---	---	---	---	---	75.32	75.14	74.79	74.35
31	---	---	---	---	---	---	---	---	---	75.11	74.77	---
TOTAL	---	---	---	---	---	---	---	---	---	2329.54	---	---
MEAN	---	---	---	---	---	---	---	---	---	75.15	---	---
MAX	---	---	---	---	---	---	---	---	---	75.27	---	---
MIN	---	---	---	---	---	---	---	---	---	75.03	---	---

RED RIVER OF THE NORTH BASIN

05073650 LOWER RED LAKE AT BATTLE RIVER MOUTH NEAR SAUM, MN--Continued



— 05073650 LOWER RED LAKE AT MOUTH BATTLE RIVER NR SAUM, MN

RED RIVER OF THE NORTH BASIN
05074000 LOWER RED LAKE NEAR RED LAKE, MN

LOCATION.--Lat 47°57'27", long 95°16'34", in SW¹/₄NW¹/₄, sec. 28, T. 152 N., R. 36 W., Clearwater County, Hydrologic Unit 09020302, on Red Lake Indian Reservation, on left bank just upstream from dam at outlet, 13 mi northwest of city of Red Lake.

DRAINAGE AREA.--1,950 mi², approximately.

PERIOD OF RECORD.--June 1930 to November 1932 and May 1933 to current year. Published as "Red lake at Redby" prior to May 1933 and as "Red Lake near Red Lake" May 1933 to September 1940. Records on Upper Red Lake published as Red Lake at Waskish, April 1930 to September 1933, all in reports of Geological Survey. October 1921 to September 1929 gage heights at Redby and on Upper Red Lake at Waskish in files of Minnesota Department of Natural Resources (fragmentary).

GAGE.--Water-stage recorder. Datum of gage is 1,100.00 ft, adjustment of 1912 (levels by U.S. Army Corps of Engineers); gage readings have been reduced to elevations based on adjustment of 1912. May 1933 to Sept. 6, 1934, nonrecording gage and Sept. 7, 1934 to Sept. 30, 1986, recording gage at same site at datum 69.00 ft higher. Nonrecording gages at Waskish and Redby.

REMARKS.--Water level subject to fluctuation caused by change in direction and velocity of wind and by seiches.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 1,178.53 ft, June 25, 1950; minimum recorded, 1,169.80 ft, Nov. 20, 1936.

EXTREMES FOR CURRENT YEAR.--**Maximum daily, 1,175.68 ft, June 30; minimum daily, 1,173.90 ft, Oct. 6.

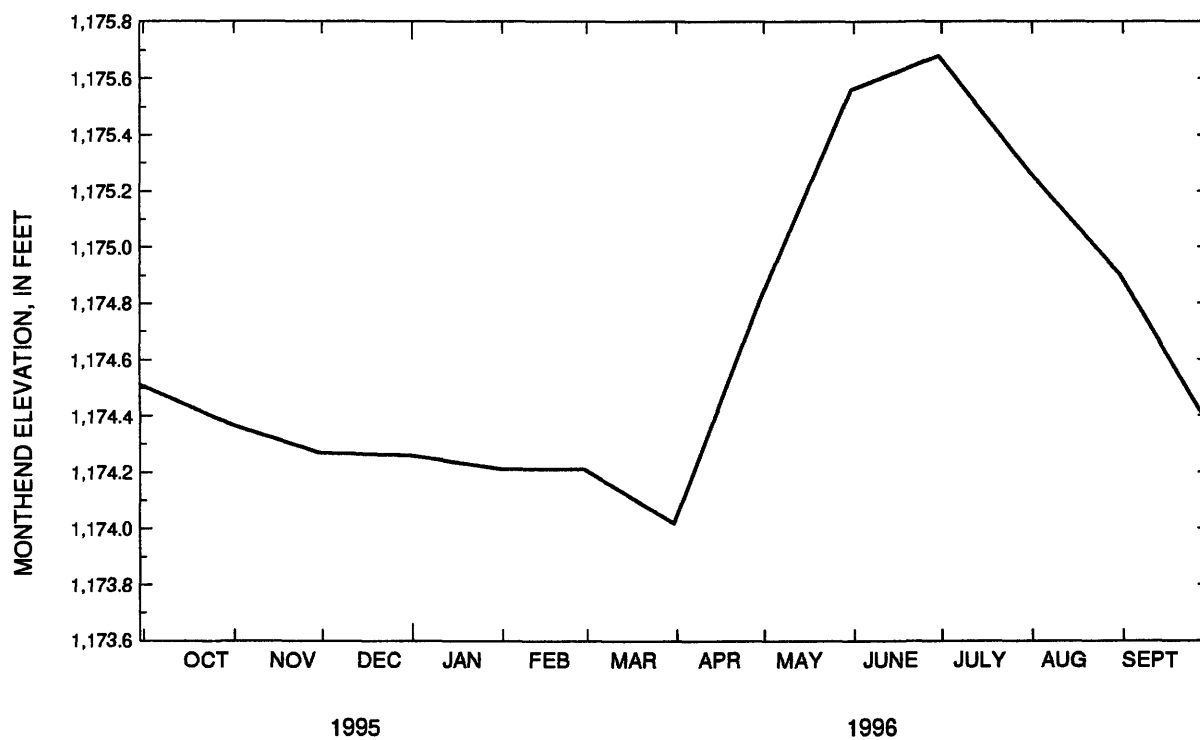
**MONTHEND ELEVATION, IN FEET, OCTOBER 1995 TO SEPTEMBER 1996

Oct. 31	1174.37	Feb. 29	1174.21	June 30	1175.68
Nov. 30	1174.27	Mar. 31	1174.02	July 31	1175.27
Dec 31	1174.26	Apr. 30	1174.82	Aug. 31	1174.90
Jan. 31	1174.21	May 31	1175.56	Sept. 30	1174.36

(NOTE.--Daily-mean gage heights are available).

** From Corp - check figures with our own.

RED RIVER OF THE NORTH BASIN
05074000 LOWER RED LAKE NEAR RED LAKE, MN--Continued



RED RIVER OF THE NORTH BASIN

05075000 RED LAKE RIVER AT HIGH LANDING, NEAR GOODRIDGE, MN

LOCATION.--Lat 48°02'34", long 95°48'28", in NW¼NW¼, sec.28, T.153 N., R.40 W., Pennington County, Hydrologic Unit 09020303, on left bank 50 ft upstream from highway bridge at High Landing, 7 mi south of Goodridge and 33 mi upstream from Thief River.

DRAINAGE AREA.--2,300 mi², approximately.

PERIOD OF RECORD.--September 1929 to current year. Prior to October 1930, published as "at Kratka".

GAGE.--Water-stage recorder. Datum of gage is 1,141.57 ft above sea level, adjustment of 1912 (levels by U.S. Army Corps of Engineers). See WSP 1308 or 1738 for history of changes prior to Oct. 1, 1949.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow regulated by outlet dam on Lower Red Lake.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	587	437	e920	e940	e820	e1000	e1000	1600	1010	1040	1070	1070
2	581	455	e920	e940	e820	e1000	e1000	1460	999	1000	1100	1080
3	605	487	e900	e940	e820	e1000	e1000	1290	983	982	1140	1080
4	645	760	e900	e940	e840	e1000	e1000	1300	977	1020	1190	1080
5	640	924	e900	e940	e880	e1000	e1000	1440	973	1070	1260	1090
6	648	1200	e900	e940	e900	e1000	e1000	1460	992	1140	1290	1090
7	637	902	e880	e940	e920	e1000	e1000	1410	995	1160	1220	1070
8	613	685	e880	e940	e940	e1000	e1000	1350	1010	1170	1070	1020
9	586	e660	e880	e960	e960	e1000	e1000	1290	1100	1180	919	980
10	570	e660	e880	e960	e1000	e1000	e1000	1240	1170	1180	825	947
11	553	e700	e880	e960	e1000	e1000	e900	1190	1190	1190	824	923
12	523	e800	e880	e940	e1000	e1100	e680	1140	1200	1190	878	909
13	489	e900	e880	e920	e1000	e1100	e640	1090	1190	1200	934	902
14	484	e1000	e880	e920	e1000	e1100	e900	1060	1190	1200	977	896
15	483	e1100	e880	e900	e1000	e1100	992	1090	1190	1210	1010	891
16	476	e1100	e880	e880	e1000	e1100	1030	1220	1180	1230	1020	883
17	486	e1100	e900	e860	e1000	e1100	1410	1450	1180	1240	1030	871
18	485	e1200	e900	e860	e1000	e1000	2320	2260	1190	1280	1030	869
19	481	e1200	e900	e860	e1000	e1000	3020	2410	1260	1320	1030	871
20	503	e1200	e900	e840	e1000	e1000	2970	2070	1310	1270	1030	873
21	513	e1100	e900	e820	e1100	e1000	2650	1450	1330	1140	1020	881
22	507	e1100	e900	e820	e1100	e1000	2340	1060	1350	1000	1040	890
23	494	e1000	e900	e820	e1100	e1000	2140	929	1380	903	1050	884
24	483	e1000	e920	e820	e1100	e1000	2100	1020	1410	902	1050	873
25	469	e980	e920	e820	e1100	e1000	2270	1270	1420	931	1050	867
26	458	e960	e920	e820	e1100	e1000	2390	1390	1430	950	1050	885
27	450	e960	e940	e820	e1100	e1000	2250	1420	1400	976	1050	922
28	443	e960	e940	e820	e1100	e1000	2090	1420	1290	1010	1060	938
29	446	e940	e940	e820	e1100	e1000	1910	1300	1170	1010	1060	926
30	441	e940	e940	e820	---	e1000	1760	985	1090	1000	1060	913
31	435	---	e940	e820	---	e1000	---	973	---	1020	1060	---
TOTAL	16214	27410	28000	27400	28800	31600	46762	42037	35559	34114	32397	28374
MEAN	523	914	903	884	993	1019	1559	1356	1185	1100	1045	946
MAX	648	1200	940	960	1100	1100	3020	2410	1430	1320	1290	1090
MIN	435	437	880	820	820	1000	640	929	973	902	824	867
AC-FT	32160	54370	55540	54350	57120	62680	92750	83380	70530	67670	64260	56280
CFSM	.23	.40	.39	.38	.43	.44	.68	.59	.52	.48	.45	.41
IN.	.26	.44	.45	.44	.47	.51	.76	.68	.58	.55	.52	.46

e Estimated.

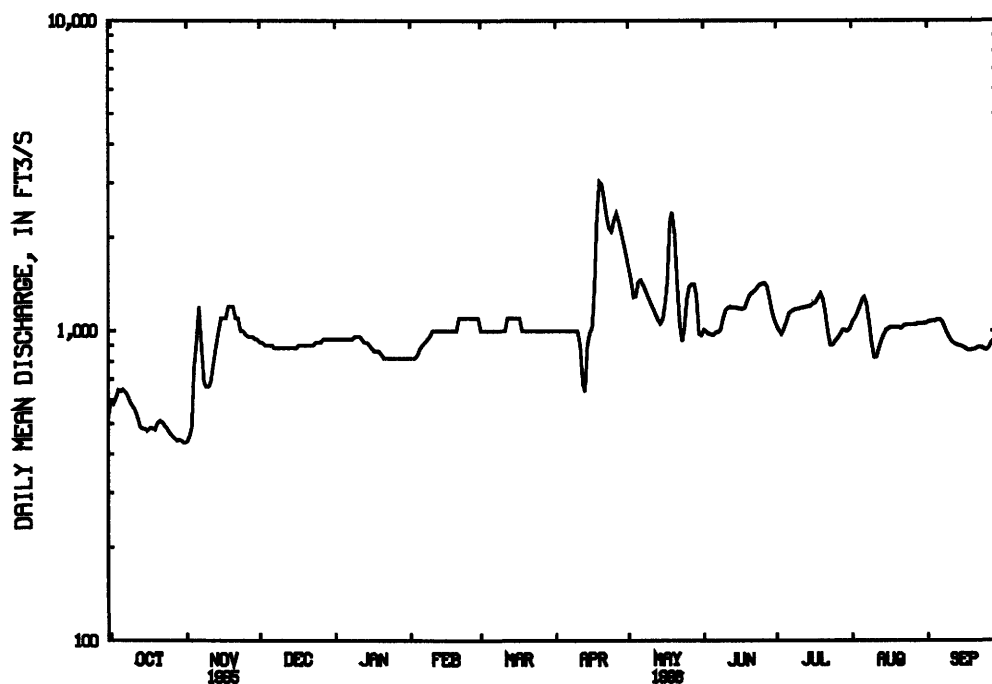
RED RIVER OF THE NORTH BASIN

05075000 RED LAKE RIVER AT HIGH LANDING, NEAR GOODRIDGE, MN

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	527	501	459	457	456	496	669	673	664	580	505	522
MAX	1955	1730	1539	1424	1366	1453	1980	3179	2161	2474	1478	1733
(WY)	1951	1951	1951	1951	1951	1951	1951	1950	1950	1975	1975	1950
MIN	2.11	1.61	.000	.000	.000	.000	24.7	5.58	1.04	5.92	.026	.000
(WY)	1934	1934	1934	1934	1934	1936	1933	1933	1936	1934	1934	1934

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1930 - 1996	
ANNUAL TOTAL	290429		378667			
ANNUAL MEAN	796		1035		543	
HIGHEST ANNUAL MEAN					1407	
LOWEST ANNUAL MEAN					6.21	
HIGHEST DAILY MEAN	2670		3020		4040	
LOWEST DAILY MEAN	141		435		.00 ^a	
ANNUAL SEVEN-DAY MINIMUM	343		444		.00	
INSTANTANEOUS PEAK FLOW			3100		4060	
INSTANTANEOUS PEAK STAGE			12.64		13.44	
ANNUAL RUNOFF (AC-FT)	576100		751100		393100	
ANNUAL RUNOFF (CFSM)	.35		.45		.24	
ANNUAL RUNOFF (INCHES)	4.70		6.12		3.21	
10 PERCENT EXCEEDS	1090		1310		1160	
50 PERCENT EXCEEDS	780		1000		445	
90 PERCENT EXCEEDS	463		660		34	

^a Many days, several years.

— 05075000 RED LAKE RIVER AT HIGH LANDING NR GOODRIDGE, MN

RED RIVER OF THE NORTH BASIN

05076000 THIEF RIVER NEAR THIEF RIVER FALLS, MN

LOCATION.--Lat 48°11'08", long 96°10'11", in NW¼SW¼, sec.3, T.154 N., R.43 W., Marshall County, Hydrologic Unit 09020304, on right bank, 0.2 mi upstream from highway bridge, 5 mi north of Thief River Falls, 7 mi upstream from mouth, and 9 mi downstream from Mud Lake National Wildlife Refuge.

DRAINAGE AREA.--959 mi².

PERIOD OF RECORD.--July 1909 to September 1917, April 1920 to September 1921, October 1922 to September 1924, October 1928 to September 1981, March 1982 to current year. Monthly discharge only for some periods, annual maximums for water years 1919, 1922, 1925, 1926, published in WSP 1308. October 1981 to February 1982, operated as a high-flow partial-record station.

REVISED RECORDS.--WSP 925: Drainage area. WSP 1308: 1917(M), 1924(M), 1929(M), 1931-33(M), 1935(M), 1937(M).

GAGE.--Water-stage recorder and control of grouted boulders. Datum of gage is 1,112.33 ft above mean sea level (levels by Minnesota Department of Transportation). Prior to May 4, 1939, nonrecording gages at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Some regulation by Thief and Mud Lakes.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	72	107	e28	e9.5	e1.7	e1.5	e32	2830	1760	721	917	111
2	77	114	e30	e9.0	e1.6	e1.5	e30	2610	1720	363	828	112
3	79	e105	e31	e8.5	e1.6	e1.5	e28	2410	1660	395	573	104
4	83	e95	e32	e8.0	e1.6	e1.5	e35	2240	1600	387	545	102
5	90	e90	e33	e6.5	e1.6	e1.5	e45	2090	1540	378	545	100
6	92	e84	e33	e4.5	e1.6	e1.5	e50	1970	1500	374	645	65
7	87	e76	e32	e3.5	e1.6	e1.5	e50	1880	1460	367	706	54
8	83	e75	e30	e3.3	e1.6	e1.5	e45	1800	1370	375	659	54
9	79	e40	e25	e3.0	e1.6	e1.7	e40	1740	1310	444	612	52
10	75	e35	e23	e2.9	e1.6	e2.5	e40	1670	1250	448	294	30
11	71	e35	e21	e2.8	e1.6	e25	e55	1570	1190	450	223	12
12	71	e32	e19	e2.7	e1.5	e100	e60	1490	1150	454	218	8.0
13	69	e30	e18	e2.7	e1.5	e150	e65	1410	1120	457	209	5.9
14	73	e30	e17	e2.6	e1.5	e175	e70	1360	1090	461	202	4.2
15	70	e30	e16	e2.5	e1.5	e160	e85	1320	1070	462	213	3.2
16	68	e30	e16	e2.4	e1.5	e125	e100	1320	1060	459	318	2.8
17	66	e29	e15	e2.3	e1.5	e120	e300	2170	1050	458	303	2.6
18	67	e29	e15	e2.2	e1.5	e115	e875	3280	1100	1200	288	2.4
19	71	e29	e14	e2.1	e1.5	e110	e1650	3250	1100	1650	281	2.1
20	102	e28	e14	e2.0	e1.5	e90	e1700	3120	1080	1280	276	2.1
21	106	e28	e13	e2.0	e1.5	e90	e1850	2820	1040	1110	283	2.4
22	130	e28	e13	e2.0	e1.5	e75	e1550	2700	1030	1070	288	3.0
23	129	e27	e12	e2.0	e1.5	e65	e1850	2480	1020	1030	275	3.1
24	205	e27	e12	e2.0	e1.5	e60	e2510	2320	1000	1040	268	3.0
25	211	e27	e12	e2.0	e1.5	e55	e3000	2190	856	950	268	2.7
26	201	e27	e11	e1.9	e1.5	e50	3280	2090	827	763	261	4.1
27	193	e27	e11	e1.9	e1.5	e45	3270	2010	833	710	176	10
28	160	e26	e11	e1.9	e1.5	e40	3240	1940	823	681	159	21
29	129	e26	e10	e1.9	e1.5	e40	3160	1880	841	713	116	27
30	113	e26	e10	e1.9	---	e38	3040	1820	840	873	109	29
31	107	---	e9.8	e1.8	---	e34	---	1760	---	879	109	---
TOTAL	3229	1392	586.8	104.3	44.7	1778.2	32105	65540	35290	21402	11167	934.6
MEAN	104	46.4	18.9	3.36	1.54	57.4	1070	2114	1176	690	360	31.2
MAX	211	114	33	9.5	1.7	175	3280	3280	1760	1650	917	112
MIN	66	26	9.8	1.8	1.5	1.5	28	1320	823	363	109	2.1
AC-FT	6400	2760	1160	207	89	3530	63680	130000	70000	42450	22150	1850
CFSM	.11	.05	.02	.00	.00	.06	1.12	2.20	1.23	.72	.38	.03
IN.	.13	.05	.02	.00	.00	.07	1.25	2.54	1.37	.83	.43	.04

e Estimated.

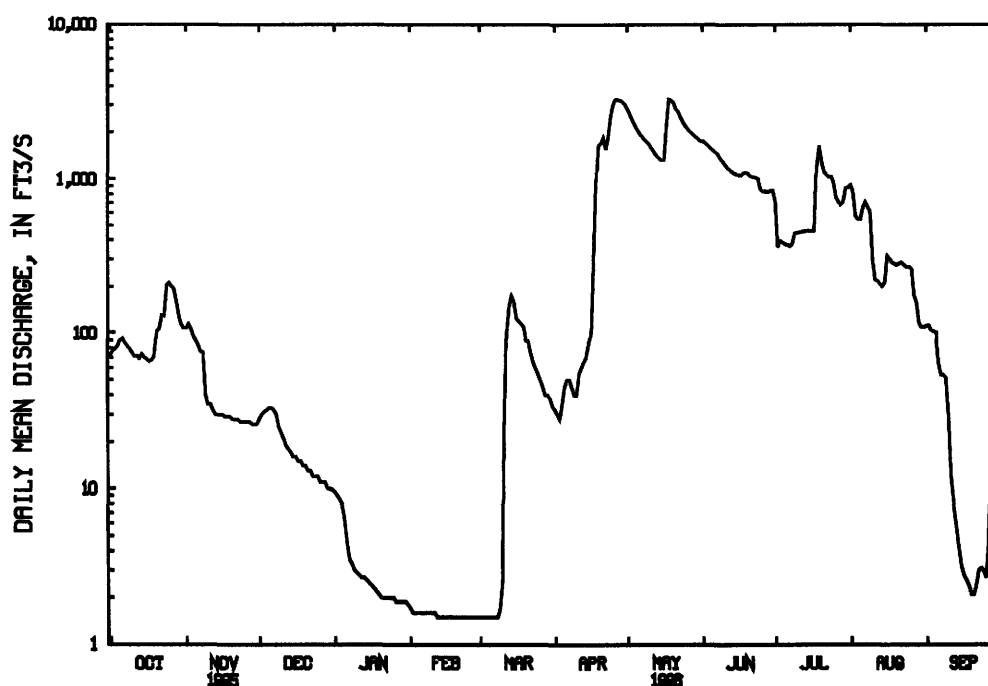
RED RIVER OF THE NORTH BASIN

05076000 THIEF RIVER NEAR THIEF RIVER FALLS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	87.6	66.4	20.0	5.60	3.42	76.2	580	473	291	214	97.8	98.3
MAX	637	844	206	100	45.0	773	2827	4274	1774	2103	1012	1012
(WY)	1986	1972	1945	1910	1910	1995	1966	1950	1962	1975	1993	1993
MIN	.000	.000	.000	.000	.000	.000	7.75	1.83	.032	.000	.000	.000
(WY)	1911	1911	1911	1911	1911	1930	1981	1990	1980	1932	1932	1929

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1909 - 1996	
ANNUAL TOTAL	73014.20		173573.6			
ANNUAL MEAN	200		474		167 ^a	
HIGHEST ANNUAL MEAN					607	
LOWEST ANNUAL MEAN					1.28	
HIGHEST DAILY MEAN	1900	Mar 16	3280	Apr 26	5580	May 13 1950
LOWEST DAILY MEAN	.10	Feb 16	1.5	Feb 12	.00	Oct 1 1910
ANNUAL SEVEN-DAY MINIMUM	.19	Feb 11	1.5	Feb 12	.00	Oct 1 1910
INSTANTANEOUS PEAK FLOW			3350 ^b	May 18	5610	May 13 1950
INSTANTANEOUS PEAK STAGE			14.43 ^c	Apr. 21	17.38	May 13 1950
ANNUAL RUNOFF (AC-FT)	144800		344300		121000	
ANNUAL RUNOFF (CFSM)	.21		.49		.17	
ANNUAL RUNOFF (INCHES)	2.83		6.73		2.37	
10 PERCENT EXCEEDS	645		1680		530	
50 PERCENT EXCEEDS	70		75		8.0	
90 PERCENT EXCEEDS	1.0		1.7		.00	

^a Median of annual mean discharges is 117 ft³/s.^b Gage height is 13.86 ft.^c Backwater from ice.

— 05076000 THIEF RIVER NEAR THIEF RIVER FALLS, MN

RED RIVER OF THE NORTH BASIN

05078000 CLEARWATER RIVER AT PLUMMER, MN

LOCATION.--Lat 47°55'24", long 96°02'46", in SE1/4SW1/4 sec. 4, T.151 N., R.42 W., Red Lake County, Hydrologic Unit 09020305, on right bank 200 ft downstream from Soo Line Railroad bridge, 300 ft downstream from bridge on U.S. Highway 59, 0.9 mi northwest of railroad depot in Plummer, and 8 mi upstream from Hill River.

DRAINAGE AREA.--512 mi².

PERIOD OF RECORD.--April 1939 to September 1979, March 1982 to current year. Annual maximums only, October 1979 to February 1982.

GAGE.--Water-stage recorder. Datum of gage is 1,098.57 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Nov. 10, 1939, nonrecording gage at site 100 ft upstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Since 1968, undetermined amounts of water diverted for the flooding of wild rice paddies upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 2	1600	576	5.68	May 19	1100	2200	9.72
Apr. 19	(daily)	*e3320	--				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	529	174	e58	e72	e62	e80	e100	1830	307	156	254	73
2	567	181	e60	e72	e62	e80	e100	1630	309	143	239	72
3	543	210	e58	e72	e62	e78	e100	1440	276	143	236	74
4	509	158	e56	e72	e64	e78	e100	1260	260	136	227	82
5	489	171	e56	e72	e66	e76	e100	1110	245	147	222	79
6	532	231	e60	e72	e68	e76	e100	968	249	158	221	71
7	552	241	e62	e72	e70	e76	e110	833	274	169	245	54
8	514	179	e62	e72	e70	e76	e110	668	291	160	206	44
9	441	e140	e60	e74	e72	e74	e110	571	279	178	189	37
10	395	e120	e60	e74	e74	e74	e120	535	263	191	163	39
11	373	e100	e58	e76	e74	e76	e130	487	243	183	142	41
12	345	e90	e58	e78	e76	e78	e160	452	250	173	127	37
13	298	e82	e58	e78	e76	e82	e180	413	294	181	117	40
14	259	e76	e58	e78	e76	e84	e210	353	244	179	117	41
15	242	e72	e60	e76	e74	e88	e300	322	213	168	111	41
16	224	e66	e60	e76	e74	e90	e620	360	213	169	107	42
17	196	e62	e62	e74	e74	e92	e1400	429	213	161	103	44
18	184	e60	e64	e74	e72	e92	e3200	1390	182	161	94	39
19	183	e62	e66	e72	e74	e90	3320	2140	159	178	89	40
20	215	e66	e66	e72	e74	e90	3050	2000	154	176	84	37
21	269	e64	e68	e70	e76	e88	2690	1750	155	166	91	44
22	273	e60	e70	e70	e78	e88	2840	1500	150	164	93	52
23	255	e58	e70	e70	e80	e88	3180	1290	156	176	99	54
24	236	e56	e72	e68	e80	e86	2970	1120	162	184	101	51
25	217	e54	e74	e68	e82	e86	2780	916	160	205	97	43
26	197	e54	e74	e66	e82	e84	2850	753	158	193	91	46
27	186	e54	e74	e66	e82	e86	2620	614	177	192	88	54
28	174	e54	e74	e66	e80	e88	2400	515	191	243	85	48
29	164	e54	e72	e64	e80	e90	2220	426	178	324	84	56
30	171	e54	e72	e64	---	e92	2040	351	158	333	80	59
31	174	---	e72	e62	---	e98	---	304	---	306	76	---
TOTAL	9906	3103	1994	2212	2134	2604	40210	28730	6563	5796	4278	1534
MEAN	320	103	64.3	71.4	73.6	84.0	1340	927	219	187	138	51.1
MAX	567	241	74	78	82	98	3320	2140	309	333	254	82
MIN	164	54	56	62	62	74	100	304	150	136	76	37
AC-FT	19650	6150	3960	4390	4230	5170	79760	56990	13020	11500	8490	3040
CFSM	.62	.20	.13	.14	.14	.16	2.62	1.81	.43	.37	.27	.10

e Estimated.

RED RIVER OF THE NORTH BASIN

05078000 CLEARWATER RIVER AT PLUMMER, MN--Continued

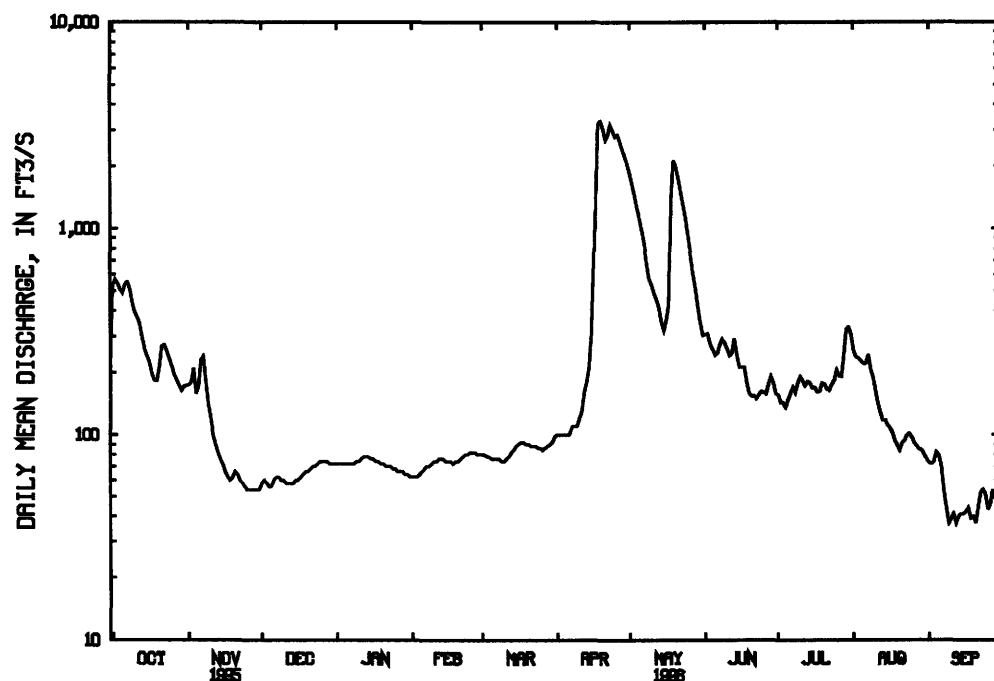
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	117	91.6	63.8	51.4	47.8	115	526	356	250	208	123	106
MAX	483	503	140	90.1	98.4	445	1391	1974	1140	844	507	666
(WY)	1972	1972	1978	1952	1974	1995	1966	1950	1962	1975	1985	1973
MIN	21.5	23.8	24.4	18.4	19.0	22.8	26.8	7.52	30.1	16.0	13.3	14.1
(WY)	1941	1991	1990	1940	1940	1940	1977	1977	1991	1940	1940	1940

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1939 - 1996	
ANNUAL TOTAL	70154		109064		172	
ANNUAL MEAN	192		298		354	
HIGHEST ANNUAL MEAN					1950	
LOWEST ANNUAL MEAN					57.0	
HIGHEST DAILY MEAN	1150	Mar 18	3320	Apr 19	3840	Apr 25 1979
LOWEST DAILY MEAN	30	Sep 28	37	Sep 9	2.6	May 16 1977
ANNUAL SEVEN-DAY MINIMUM	36	Sep 23	39	Sep 9	2.9	May 10 1977
INSTANTANEOUS PEAK FLOW			3320 ^a	Apr 19	3940	Apr 25 1979
INSTANTANEOUS PEAK STAGE			12.36 ^b	Apr 18	12.37 ^b	Apr 18 1979
INSTANTANEOUS LOW FLOW					2.5	May 16 1977
ANNUAL RUNOFF (AC-FT)	139200		216300		124800	
ANNUAL RUNOFF (CFSM)	.38		.58		.34	
10 PERCENT EXCEEDS	476		546		405	
50 PERCENT EXCEEDS	110		98		75	
90 PERCENT EXCEEDS	56		58		32	

a Estimated, daily-mean discharge, backwater from ice.

b Backwater from ice.



05078000 CLEARWATER RIVER AT PLUMMER, MN

RED RIVER OF THE NORTH BASIN

05078230 LOST RIVER AT OKLEE, MN

LOCATION.--Lat 47°50'35", long 95°51'30", in SE¼NE¼ sec.2, T.150 N., R.41 W., Red Lake County, Hydrologic Unit 09020305, or downstream side of bridge on State Highway 222 at northwest edge of Oklee, 12 mi upstream from mouth.

DRAINAGE AREA.--266 mi².

PERIOD OF RECORD.--April 1960 to September 1981, February 1982 to current year. Monthly and daily figures for April 1960, to June 1960, published in WSP 2113.

GAGE.--Water-stage recorder. Datum of gage is 1,126.94 ft above sea level, adjustment of 1912 (levels by U.S. Army Corps of Engineers). Prior to Sept. 9, 1960, reference points at same site at datum 8.00 ft higher. Sept. 9, 1960, to Sept. 30, 1964, nonrecording gage at same site at datum 8.00 ft higher. Oct. 1, 1964, to Sept. 30, 1981, and Feb. 24, 1982, to Sept. 6, 1989, nonrecording gage at same site and datum.

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since at least 1897, 18.39 ft, present datum, Apr. 21, 1950, from floodmarks, discharge, 2,790 ft³/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

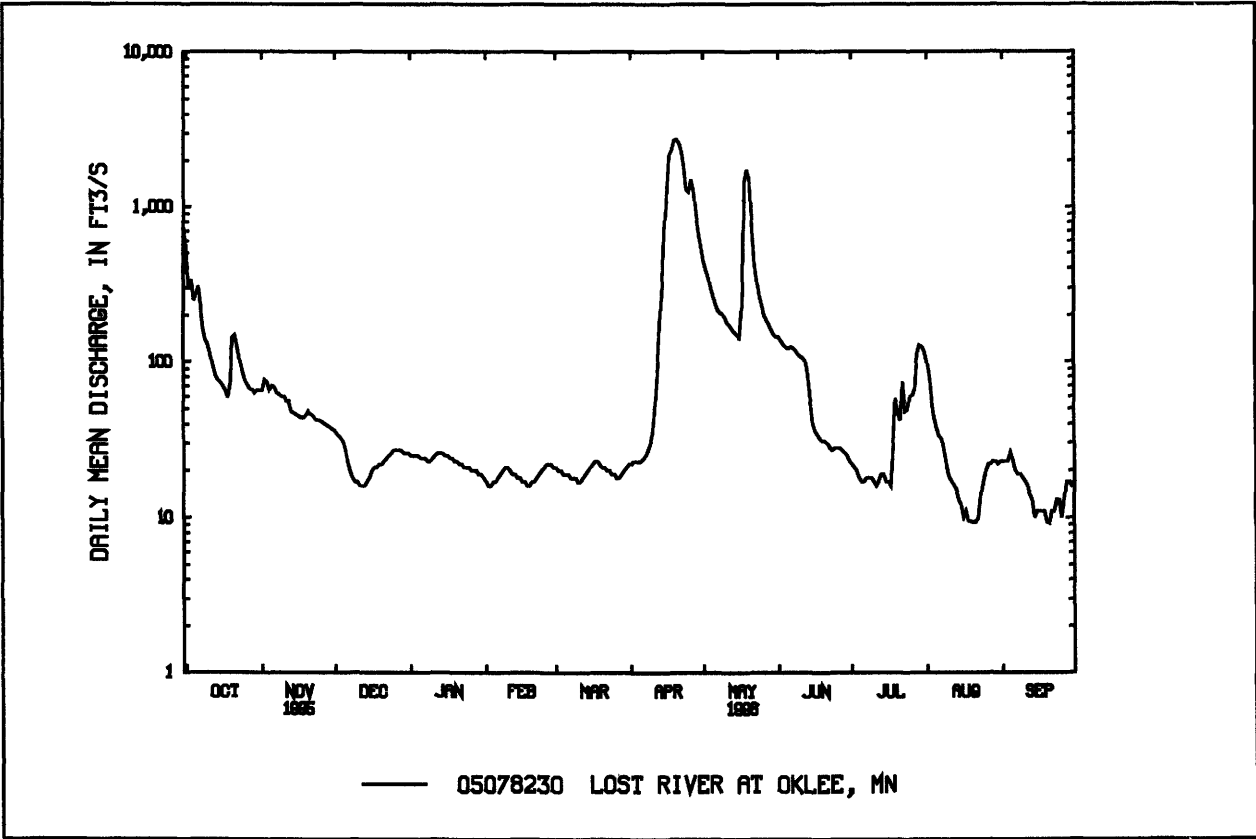
DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	553	65	e36	e25	e17	e21	e22	457	145	22	100	23
2	294	76	e34	e25	e16	e20	e23	392	137	21	81	23
3	340	74	e33	e25	e16	e20	e23	356	129	20	55	23
4	248	66	e31	e25	e17	e19	e23	299	124	18	43	26
5	271	70	e28	e24	e17	e19	e23	263	121	17	37	23
6	306	69	e23	e24	e18	e19	e24	232	124	17	33	20
7	226	63	e20	e24	e19	e18	e25	214	123	18	32	19
8	161	62	e18	e23	e20	e18	e27	206	119	18	26	19
9	138	60	e17	e23	e21	e18	e30	204	112	18	21	18
10	129	60	e17	e24	e21	e17	e35	192	108	17	18	17
11	111	56	e16	e25	e20	e17	e50	177	106	16	17	16
12	93	56	e16	e26	e19	e18	e86	170	101	17	16	14
13	81	e48	e16	e26	e19	e19	e170	161	82	19	15	13
14	76	e47	e17	e26	e18	e20	e300	154	58	19	13	10
15	74	e46	e18	e25	e18	e21	e740	149	41	17	12	11
16	70	e45	e20	e25	e17	e22	e1200	144	36	17	10	11
17	66	e44	e21	e24	e17	e23	e2200	244	34	16	11	11
18	59	e44	e21	e24	e16	e23	2340	1470	32	29	9.5	11
19	73	e45	e22	e23	e16	e22	2710	1750	31	58	9.4	9.4
20	143	e48	e22	e23	e17	e21	2750	1510	e31	47	9.3	9.2
21	149	e46	e23	e22	e17	e21	2630	781	30	42	9.4	11
22	124	e45	e24	e22	e18	e20	2320	449	28	74	9.8	11
23	101	e43	e25	e21	e19	e20	1850	334	27	48	14	13
24	86	e42	e26	e21	e20	e19	1300	268	28	49	17	13
25	76	e42	e27	e21	e21	e19	1260	231	28	60	20	10
26	71	e41	e27	e20	e22	e18	1510	203	28	61	22	13
27	67	e40	e27	e20	e22	e18	1280	186	27	67	22	17
28	66	e39	e27	e20	e22	e19	916	174	26	111	23	17
29	63	e38	e26	e19	e21	e20	693	161	25	127	23	16
30	66	e37	e26	e19	---	e21	560	150	23	125	22	17
31	65	---	e26	e18	---	e22	---	145	---	116	23	---
TOTAL	4446	1557	730	712	541	612	27120	11826	2064	1321	773.4	464.6
MEAN	143	51.9	23.5	23.0	18.7	19.7	904	381	68.8	42.6	24.9	15.5
MAX	553	76	36	26	22	23	2750	1750	145	127	100	26
MIN	59	37	16	18	16	17	22	144	23	16	9.3	9.2
AC-FT	8820	3090	1450	1410	1070	1210	53790	23460	4090	2620	1530	922
CFSM	.54	.20	.09	.09	.07	.07	3.40	1.43	.26	.16	.09	.06
IN.	.62	.22	.10	.10	.08	.09	3.79	1.65	.29	.18	.11	.06

e Estimated.

RED RIVER OF THE NORTH BASIN
05078230 LOST RIVER AT OKLEE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1996, BY WATER YEAR (WY)												
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	48.8	31.2	13.9	8.46	8.04	74.3	309	136	82.3	79.6	40.4	38.3
MAX	470	232	56.6	23.0	25.8	243	904	622	657	442	351	330
(WY)	1972	1972	1978	1996	1984	1995	1996	1962	1962	1962	1985	1973
MIN	1.02	1.11	.050	.002	.000	.19	29.5	10.5	8.20	1.99	1.17	.000
(WY)	1991	1977	1977	1977	1977	1964	1991	1980	1980	1961	1961	1950
SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR				FOR 1996 WATER YEAR				WATER YEARS 1960 - 1996			
ANNUAL TOTAL	32260.3				52167.0							
ANNUAL MEAN	88.4				143				72.2			
HIGHEST ANNUAL MEAN									177			
LOWEST ANNUAL MEAN									18.2			
HIGHEST DAILY MEAN	900				Mar 14				3040			
LOWEST DAILY MEAN	3.3				Aug 14				.00a			
ANNUAL SEVEN-DAY MINIMUM	3.5				Aug 11				.00			
INSTANTANEOUS PEAK FLOW					2790				3210			
INSTANTANEOUS PEAK STAGE					16.89				16.89			
ANNUAL RUNOFF (AC-FT)	63990				103500				52280			
ANNUAL RUNOFF (CFSM)	.33				.54				.27			
ANNUAL RUNOFF (INCHES)	4.51				7.30				3.69			
10 PERCENT EXCEEDS	222				236				169			
50 PERCENT EXCEEDS	44				25				18			
90 PERCENT EXCEEDS	9.5				16				2.4			

a Many days, several years.



RED RIVER OF THE NORTH BASIN

05078500 CLEARWATER RIVER AT RED LAKE FALLS, MN

LOCATION.--Lat 47°53'15", long 96°16'25", in NW¼NE¼ sec.22, T.151 N., R.44 W., Red Lake County, Hydrologic Unit 090203C5, on left bank 40 ft downstream from Great Northern Railroad bridge in Red Lake Falls, 1.4 mi upstream from mouth, and 3 mi downstream from Badger Creek.

DRAINAGE AREA.--1,370 mi² (approximately).

PERIOD OF RECORD.--June 1909 to September 1917, October 1934 to September 1981, March 1982 to current year. Monthly discharge only for October, November, 1934, published in WSP 1308. October 1981 to February 1982, operated as a high-flow partial-record station.

REVISED RECORDS.--WSP 355: 1911-12. WSP 1438: 1910-11, 1917(M). WDR MN-84-1:1983.

GAGE.--Water-stage recorder. Datum of gage is 948.94 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Sept. 12, 1911, nonrecording gage at site 0.5 mi upstream, and Sept. 12, 1911, to Sept. 30, 1917, nonrecording gage at site 40 ft upstream at different datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1590	412	e170	e150	e130	e150	e160	3380	708	165	395	95
2	1450	425	e170	e150	e130	e150	e160	2960	703	157	352	94
3	1260	466	e170	e150	e130	e140	e160	2620	650	145	356	90
4	1320	391	e170	e150	e130	e140	e160	2310	589	146	351	89
5	1170	342	e170	e150	e130	e140	e160	2020	547	139	341	97
6	1420	450	e170	e150	e130	e140	e160	1760	541	149	320	94
7	1300	417	e170	e150	e130	e140	e170	1550	523	157	314	90
8	1110	e300	e170	e150	e140	e140	e170	1350	533	163	316	74
9	952	e230	e170	e150	e150	e140	e180	1180	509	161	266	63
10	862	e180	e160	e150	e150	e140	e210	1090	467	176	251	56
11	802	e140	e160	e160	e150	e140	e270	981	427	185	217	53
12	726	e170	e160	e160	e150	e140	e480	887	396	181	195	55
13	644	e210	e160	e160	e150	e150	e800	808	409	171	181	50
14	579	e200	e160	e160	e140	e150	e1400	725	383	179	170	49
15	541	e190	e160	e160	e140	e150	e2400	631	333	175	170	51
16	513	e170	e160	e160	e140	e160	3800	610	307	167	165	52
17	470	e170	e160	e160	e140	e160	5860	753	303	170	163	53
18	431	e170	e160	e150	e130	e150	8320	4570	284	202	155	57
19	425	e170	e150	e150	e130	e150	8710	6180	245	215	148	52
20	549	e180	e150	e150	e140	e150	8050	5300	225	258	e135	53
21	753	e180	e150	e150	e140	e150	7590	4610	209	240	e133	53
22	751	e170	e150	e150	e140	e150	7130	3540	208	228	e128	57
23	672	e170	e160	e150	e140	e150	6970	2820	209	232	125	65
24	593	e160	e160	e140	e150	e150	6450	2350	217	254	129	70
25	540	e160	e160	e140	e150	e150	5900	1950	219	249	127	71
26	490	e160	e160	e140	e150	e150	6040	1630	210	262	123	74
27	456	e160	e160	e140	e150	e150	5540	1380	209	263	117	78
28	426	e160	e160	e140	e150	e150	4930	1170	218	262	111	96
29	401	e160	e160	e140	e150	e150	4280	1010	211	388	106	105
30	388	e160	e160	e130	---	e160	3810	862	186	460	103	112
31	401	---	e160	e130	---	e160	---	766	---	447	98	---
TOTAL	23985	7023	5010	4620	4080	4590	100420	63753	11178	6746	6261	2148
MEAN	774	234	162	149	141	148	3347	2057	373	218	202	71.6
MAX	1590	466	170	160	150	160	8710	6180	708	460	395	112
MIN	388	140	150	130	130	140	160	610	186	139	98	49
AC-FT	47570	13930	9940	9160	8090	9100	199200	126500	22170	13380	12420	4260
CFSM	.56	.17	.12	.11	.10	.11	2.44	1.50	.27	.16	.15	.05
IN.	.65	.19	.14	.13	.11	.12	2.73	1.73	.30	.18	.17	.06

e Estimated.

RED RIVER OF THE NORTH BASIN

05078500 CLEARWATER RIVER AT RED LAKE FALLS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1996, BY WATER YEAR (WY)

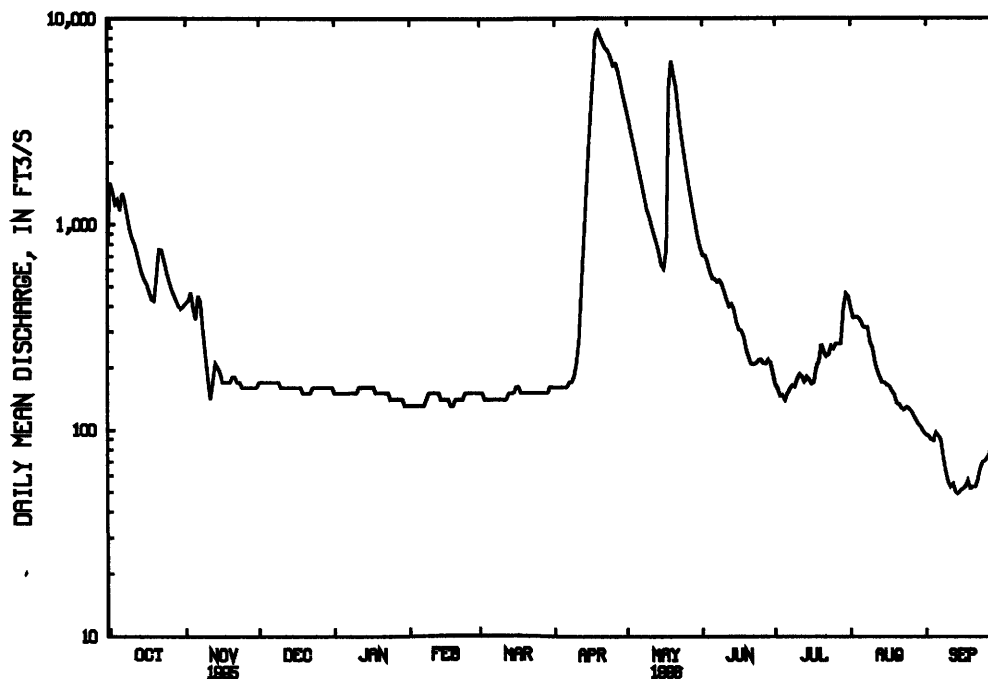
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	189	138	88.1	70.4	64.9	237	1147	683	476	371	205	179
MAX	1350	1233	260	220	150	1136	3458	5059	3042	1673	1686	1267
(WY)	1972	1972	1910	1910	1984	1995	1966	1950	1962	1994	1985	1973
MIN	10.0	19.0	21.4	21.4	19.1	13.6	61.0	32.2	26.5	8.34	1.49	2.52
(WY)	1935	1935	1937	1940	1937	1937	1981	1977	1980	1936	1936	1936

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1909 - 1996
ANNUAL TOTAL	170043	239814	
ANNUAL MEAN	466	655	318 ^a
HIGHEST ANNUAL MEAN			855
LOWEST ANNUAL MEAN			64.4
HIGHEST DAILY MEAN	2860	Mar 30	8710
LOWEST DAILY MEAN	90	Mar 3	49
ANNUAL SEVEN-DAY MINIMUM	107	Feb 27	52
INSTANTANEOUS PEAK FLOW			9400 ^b
INSTANTANEOUS PEAK STAGE			12.33
INSTANTANEOUS LOW FLOW			46
ANNUAL RUNOFF (AC-FT)	337300	475700	230200
ANNUAL RUNOFF (CFSM)	.34	.48	.23
ANNUAL RUNOFF (INCHES)	4.62	6.51	3.15
10 PERCENT EXCEEDS	1150	1390	781
50 PERCENT EXCEEDS	241	168	109
90 PERCENT EXCEEDS	127	124	37

a Median of annual mean discharges is 282 ft³/s.

b Gage height is 12.24 ft.

c Highwater mark, backwater from ice.



— 05078500 CLEARWATER RIVER AT RED LAKE FALLS, MN

RED RIVER OF THE NORTH BASIN

05079000 RED LAKE RIVER AT CROOKSTON, MN

LOCATION.--Lat 47°46'32", long 96°36'33", in SW1/4SW1/4 sec.30, T.150 N., R.46 W., Polk County, Hydrologic Unit 09020303, on right bank 100 ft upstream from Sargent Street bridge in Crookston, 0.3 mi downstream from Interstate Power Co.'s dam, 0.6 mi downstream from bridge on U.S. Highway 75, and 53 mi upstream from mouth.

DRAINAGE AREA.--5,270 mi².

PERIOD OF RECORD.--May 1901 to current year. Monthly discharge only for some periods, published in WSP 1308. Figures of daily discharge for Apr. 3-30, 1904, published in WSP 130, have been found unreliable and should not be used.

REVISED RECORDS.--WSP 1115: 1906, 1915-16, 1919-20, 1922, 1925, 1927, 1929. WSP 1308: 1916(M), 1919(M), 1928(M), 1930(M). (See also PERIOD OF RECORD).

GAGE.--Water-stage recorder. Datum of gage is 832.72 ft above sea level. May 18, 1901, to June 30, 1909, nonrecording gage at bridge 300 ft upstream at same datum. July 1, 1909, to Sept. 25, 1911, nonrecording gage, Sept. 26, 1911, to Sept. 30, 1919, water-stage recorder, Oct. 1, 1919, to Sept. 30, 1930, nonrecording gage, at present site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Diurnal fluctuation prior to 1975 caused by powerplant 1,000 ft upstream. Runoff from 1,950 mi² in the headwaters of Red Lake River is completely controlled by dam at outlet of Lower Red Lake. Flow partially affected by occasional regulation at Thief and Mud Lakes in Thief River basin (see station 05076000).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1730	1140	e1330	e1110	e940	e1280	e1200	9920	4080	2270	2300	1220
2	2190	1160	e1250	e1110	e940	e1270	e1190	9000	3930	2170	2250	1250
3	2090	1190	e1250	e1110	e940	e1260	e1180	8120	3910	1700	2240	1240
4	2100	901	e1240	e1100	e940	e1250	e1180	7280	3740	1640	2080	1230
5	2100	969	e1240	e1090	e940	e1230	e1180	6620	3640	1630	2040	1260
6	2140	1090	e1240	e1090	e980	e1220	e1200	6200	3550	1650	1990	1230
7	2300	1600	e1230	e1090	e1010	e1210	e1210	5860	3450	1760	2050	1220
8	2130	1490	e1230	e1090	e1070	e1200	e1280	5520	3420	1770	2190	1160
9	1910	1270	e1220	e1090	e1090	e1180	e1340	5170	3340	1770	2050	1150
10	1720	1100	e1210	e1090	e1110	e1170	e1900	4980	3190	1800	1950	1100
11	1610	1110	e1200	e1090	e1150	e1170	e2900	4650	3170	1860	1580	1080
12	1540	836	e1190	e1100	e1150	e1190	e3200	4420	3090	1880	1350	1020
13	1450	e850	e1180	e1120	e1150	e1210	e3700	4290	3050	1880	1250	929
14	1350	e1100	e1180	e1120	e1140	e1280	e4500	4280	3020	1840	1250	988
15	1180	e1300	e1180	e1100	e1130	e1300	e5400	4280	2930	1850	1280	919
16	1200	e1400	e1180	e1080	e1130	e1310	e6900	4280	2850	1800	1310	939
17	1090	e1450	e1170	e1070	e1120	e1330	e10000	4290	2810	1860	1410	952
18	1060	e1500	e1170	e1050	e1120	e1310	15800	8470	2740	2140	1460	923
19	951	1530	e1170	e1030	e1120	e1280	20200	17000	2770	3860	1440	923
20	1170	1560	e1170	e1010	e1200	e1240	21400	17100	2730	3900	1430	874
21	1280	1660	e1170	e990	e1200	e1220	19000	13600	2740	3340	1430	962
22	1520	e1500	e1170	e980	e1200	e1240	16200	11100	2720	2910	1440	971
23	1470	e1450	e1170	e960	e1230	e1240	14200	8580	2730	2570	1450	968
24	1430	e1400	e1180	e960	e1300	e1240	13700	7050	2760	2380	1430	942
25	1370	e1300	e1180	e950	e1300	e1220	13900	6210	2760	2290	1440	950
26	1370	e1290	e1180	e950	e1300	e1210	14700	5790	2670	2160	1410	1000
27	1270	e1250	e1170	e940	e1290	e1200	14600	5500	2570	2080	1420	1020
28	1260	e1220	e1160	e940	e1290	e1180	13100	5220	2630	1970	1360	1070
29	1230	e1210	e1140	e940	e1290	e1190	11800	4950	2590	2010	1280	1090
30	1130	e1200	e1120	e940	---	e1220	10800	4730	2400	2130	1260	1090
31	1120	---	e1120	e940	---	e1210	---	4360	---	2320	1210	---
TOTAL	47461	38026	36990	32230	32770	38260	248860	218820	91980	67190	50030	31670
MEAN	1531	1268	1193	1040	1130	1234	8295	7059	3066	2167	1614	1056
MAX	2300	1660	1330	1120	1300	1330	21400	17100	4080	3900	2300	1260
MIN	951	836	1120	940	940	1170	1180	4280	2400	1630	1210	874
AC-FT	94140	75420	73370	63930	65000	75890	493600	434000	182400	133300	99230	62820
CFSM	.29	.24	.23	.20	.21	.23	1.57	1.34	.58	.41	.31	.20
IN.	.34	.27	.26	.23	.23	.27	1.76	1.54	.65	.47	.35	.22

e Estimated.

RED RIVER OF THE NORTH BASIN

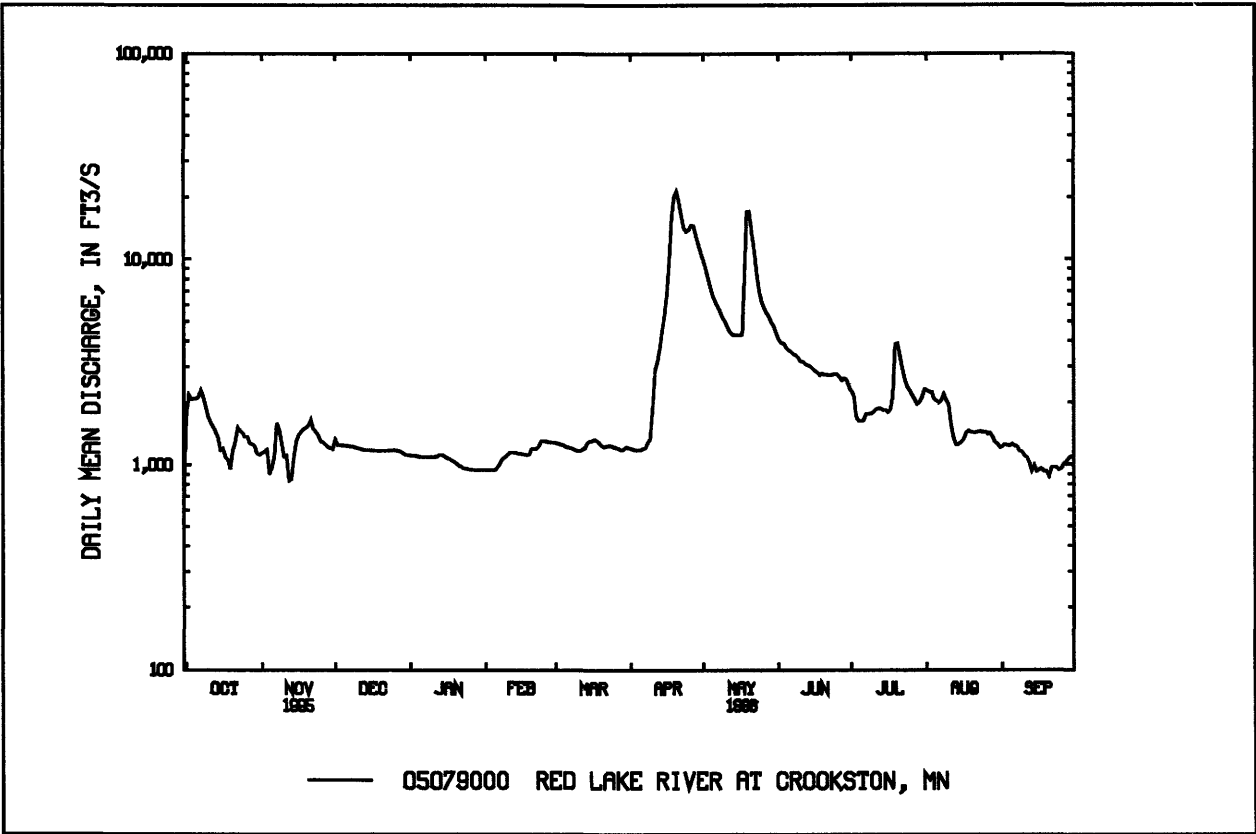
05079000 RED LAKE RIVER AT CROOKSTON, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1901 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	822	675	560	504	482	976	2978	2085	1650	1300	826	814
MAX	2836	3172	1900	1663	1464	4257	10260	15290	7205	6851	3868	3009
(WY)	1972	1972	1904	1951	1951	1995	1966	1950	1962	1975	1985	1905
MIN	8.02	10.1	5.34	15.6	17.8	24.9	232	154	80.4	26.2	12.3	8.87
(WY)	1937	1937	1937	1934	1937	1936	1981	1934	1934	1936	1934	1934

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1901 - 1996	
ANNUAL TOTAL	597219		934287			
ANNUAL MEAN	1636		2553		135	
HIGHEST ANNUAL MEAN					3129	
LOWEST ANNUAL MEAN					83.6	
HIGHEST DAILY MEAN	10000		21400		27100	
LOWEST DAILY MEAN	314		836		2.5	
ANNUAL SEVEN-DAY MINIMUM	497		927		3.9	
INSTANTANEOUS PEAK FLOW			21700		28400	
INSTANTANEOUS PEAK STAGE			24.84		27.33	
INSTANTANEOUS LOW FLOW					.00g	
ANNUAL RUNOFF (AC-FT)	1185000		1853000		822400	
ANNUAL RUNOFF (CFMS)	.31		.48		.22	
ANNUAL RUNOFF (INCHES)	4.22		6.59		2.93	
10 PERCENT EXCEEDS	2880		5040		2520	
50 PERCENT EXCEEDS	1180		1280		680	
90 PERCENT EXCEEDS	849		1010		114	

a From regulation by powerplant upstream.



RED RIVER OF THE NORTH BASIN

05082500 RED RIVER OF THE NORTH AT GRAND FORKS, ND

LOCATION.--Lat 47°55'38", long 97°01'34", in sec.2, T.151 N., R.50 W., Grand Forks County, Hydrologic Unit 09020301, on the right bank 200 ft upstream from the DeMers Avenue bridge, 0.4 mi downstream from Red Lake River, and at mile 293.8.

DRAINAGE AREA.--30,100 mi², approximately, including 3,800 mi² in closed basins.

PERIOD OF RECORD.--April 1882 to current year. Prior to January 1904 monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 855: 1936(M). WSP 1115: 1942. WSP 1175: 1897(M). WSP 1388: 1904, 1914-15, 1917-19, 1921-22, 1927, 1950. WSP 1728: Drainage area. WRD-ND-81-1: 1882, 1897 (M).

GAGE.--Water-stage recorder. Datum of gage is 779.00 ft above sea level. Oct. 1, 1983, to Sept. 30, 1986, datum of gage was 780.00 ft at same site. Apr. 14, 1965, to Sept. 30, 1983, water-stage recorder 1.9 mi downstream at a datum of 778.35 ft. Nov. 3, 1933, to Apr. 13, 1965, water-stage recorder 0.3 mi upstream at 778.35 ft datum. See WSP 1728 or 1913 for history of changes prior to Nov. 3, 1933.

REMARKS.--Records good except those for period of estimated daily discharges, which are fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1580	3340	e2340	e2160	e1860	e2180	e7950	e29700	e14600	4370	3630	1890
2	2630	3370	e2510	e2130	e1850	e1780	e7200	e28400	e13000	4180	3620	1910
3	3500	3420	e2490	e2120	e1860	e1760	e6650	e26900	e12100	3970	3540	1900
4	3470	3370	e2410	e2110	e1870	e1980	e6200	e25600	e11100	3560	3510	1870
5	3510	2960	e2430	e2120	e1880	e2100	e6000	e24400	e10500	3390	3400	1900
6	3640	3010	e2380	e2120	e1890	e2200	e6050	e19400	e10000	3340	3390	1900
7	4170	3120	e2300	e2220	e1870	e2300	e6100	e18100	e9560	3310	3600	2060
8	5010	3240	e2260	e2240	e1890	e2400	e6850	e16800	9190	3320	3610	2020
9	5210	3020	e2190	e2240	e1870	e2510	e8500	e15700	8950	3290	3560	1880
10	4970	3100	e2140	e2180	e1870	e2600	e12000	e14700	8500	3200	3380	1750
11	4660	2460	e2040	e2120	e1870	e2750	e15400	e14000	7910	3190	3200	1690
12	4420	e2060	e2140	e2070	e1900	e2860	e18600	e13200	7640	3190	2800	1680
13	4220	e2220	e2250	e2050	e1890	e3000	e21800	e12600	7410	3190	2470	1620
14	4050	e2230	e2270	e1990	e1870	e3200	e26000	e11700	7190	3210	2310	1590
15	3810	e2490	e2270	e1980	e1840	3370	e32000	e11000	7000	3180	2270	1660
16	3520	e2860	e2250	e2000	e1850	3610	e39000	e10300	6720	3140	2280	1620
17	3370	e3100	e2180	e1990	e1870	3840	41500	e11100	6430	3030	2270	1610
18	3250	e3200	e2200	e2000	e1850	4100	43200	e14200	6170	3520	2260	1610
19	3220	e3270	e2180	e1990	e1920	4490	47700	e20500	5980	3900	2260	1520
20	3190	e3360	e2150	e1980	e1940	5920	54900	e25800	5850	5000	2220	1450
21	3340	e3260	e2170	e1970	e1940	e6500	58100	e30300	5650	5390	2200	1400
22	3450	e3100	e2180	e1960	e2030	e7400	56200	e31900	5490	5200	2210	1400
23	3630	e2700	e2180	e1950	e2100	e8100	51300	e31800	5340	e4900	2200	1410
24	3650	e2410	e2200	e1940	e2070	e8600	46200	e28600	5210	e4600	2200	1410
25	3580	e2280	e2160	e1930	e1980	e9200	e42000	e26600	5160	e4300	2160	1390
26	3460	e2130	e2140	e1920	e2010	e9700	e40000	e24900	5090	e4000	2130	1450
27	3360	e2070	e2100	e1910	e2120	e9800	e38500	e23100	4970	e3710	2060	1560
28	3200	e2080	e2090	e1900	e1850	e9750	e37000	e21700	4820	3420	2010	1620
29	3060	e2050	e2130	e1890	e2140	e9450	e34700	e20000	4750	3370	1920	1750
30	3110	e2160	e2100	e1880	---	e9100	e32300	e18200	4600	3390	1840	1800
31	3240	---	e2140	e1870	---	e9600	---	e16400	---	3500	1870	---
TOTAL	112480	83440	68970	62930	55750	156150	849900	637600	226880	116260	82380	50320
MEAN	3628	2781	2225	2030	1922	5037	28330	20570	7563	3750	2657	1677
MAX	5210	3420	2510	2240	2140	9800	58100	31900	14600	5390	3630	2060
MIN	1580	2050	2040	1870	1840	1760	6000	10300	4600	3030	1840	1390
AC-FT	223100	165500	136800	124800	110600	309700	1686000	1265000	450000	230600	163400	99810

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1904 - 1996, BY WATER YEAR (WY)

	1403	1192	963	820	789	2524	9470	5114	3901	3280	1748	1430
MEAN	1403	1192	963	820	789	2524	9470	5114	3901	3280	1748	1430
MAX	5127	5218	3073	2030	1922	15370	31480	36510	19340	25270	17050	6251
(WY)	1995	1972	1972	1996	1996	1995	1979	1950	1962	1975	1993	1993
MIN	12.1	30.5	17.8	18.8	2.87	42.1	954	373	151	88.8	30.6	20.3
(WY)	1937	1937	1937	1937	1937	1937	1938	1934	1934	1936	1934	1936

SUMMARY STATISTICS

FOR 1995 CALENDAR YEAR

FOR 1996 WATER YEAR

WATER YEARS 1904 - 1996

ANNUAL TOTAL	2214710	2503060		
ANNUAL MEAN	6068	6839		
HIGHEST ANNUAL MEAN			2701	
LOWEST ANNUAL MEAN			7580	1950
HIGHEST DAILY MEAN	34700	Apr 1	58100	Apr 21
LOWEST DAILY MEAN	1310	Sep 28	1390	Sep 25
ANNUAL SEVEN-DAY MINIMUM	1400	Sep 24	1420	Sep 20
INSTANTANEOUS PEAK FLOW			58400	Apr 21
INSTANTANEOUS PEAK STAGE			45.93	Apr 21
ANNUAL RUNOFF (AC-FT)			4393000	4965000
				1957000

e Estimated.

RED RIVER OF THE NORTH BASIN

05082500 RED RIVER OF THE NORTH AT GRAND FORKS, ND--Continued

PERIOD OF RECORD.--Water years 1949, 1956 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	HARD- NESS TOTAL (MG/L AS CACO3)	ALKA- LITY LAB (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	
		(00061)	(00095)	(00400)	(00020)	(00010)	(00900)	(90410)	(00915)	(00925)	
OCT 02...	1030	2560	611	--	12.5	13.5	--	--	--	--	
NOV 07...	1220	3080	870	--	-4.0	1.0	--	--	--	--	
JAN 02...	1550	2160	536	--	-15.0	0.0	--	--	--	--	
FEB 06...	1515	1820	--	--	0.0	0.0	--	--	--	--	
MAR 04...	1600	2010	--	--	-10.0	0.0	--	--	--	--	
APR 15...	1020	31000	375	--	1.0	1.0	--	--	--	--	
22...	1155	54600	386	--	3.0	4.5	--	--	--	--	
24...	1005	45400	248	--	1.0	3.0	--	--	--	--	
MAY 01...	1415	29600	396	--	13.0	3.5	--	--	--	--	
10...	1450	14700	532	7.3	15.0	6.0	240	185	55	25	
22...	0745	32400	450	--	14.0	14.0	--	--	--	--	
23...	1205	30700	436	--	21.0	18.0	--	--	--	--	
28...	1235	21700	748	--	24.0	17.5	--	--	--	--	
JUN 07...	1150	9560	680	--	22.0	19.0	--	--	--	--	
JUL 01...	1215	4530	568	--	27.0	25.5	--	--	--	--	
26...	1315	4000	500	--	31.5	23.5	--	--	--	--	
AUG 29...	1425	1900	507	8.1	26.0	25.0	220	199	50	24	
DATE		SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO AS K) (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS SO4) (00935)	SULFATE DIS- SOLVED (MG/L AS CL) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS F) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L) (00950)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER (70303)	
MAY 10...	14	11	0.4	5.2	87	9.0	0.10	306	327	0.44	
AUG 29...	19	15	0.6	6.0	62	15	0.10	296	328	0.45	
		SOLIDS, DIS- SOLVED (TONS DATE DAY) (70302)	ARSENIC DIS- SOLVED PER AS AS) (01000)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L(UG/L AS SR) (01080)
MAY 10...	13000	1	10	<1	20	10	<0.1	1	1	200	
AUG 29...	1680	3	20	<1	20	<10	<0.1	<1	<1	210	

RED RIVER OF THE NORTH BASIN
05085900 SNAKE RIVER ABOVE ALVARADO, MN
(National Water-Quality Assessment Station)

LOCATION.--Lat 48°10'27", long 96°59'55", in SW1/4SW1/4NW1/4 sec. 8,T.154 N.,R.49 W., Marshall County, Hydrologic Unit 09021309, on right bank 100 ft upstream from bridge on Minnesota State Highway 220, 1/2 mi south of Alvarado.

DRAINAGE AREA.--218 mi².

PERIOD OF RECORD.--October 1992 to current year. Annual maximum discharges, water years 1945, 1954-56 and 1978-81. Records of daily discharges for period March to September 1945, and October 1953 to July 1956, that were collected at a location 1/2 mi downstream (station 05086000, Snake River at Alvarado, MN) are not considered to be equivalent because of the controlled releases from the city's sewage treatment facility. This discharge enters the river between the two sites. Records for annual maximum discharges for these periods and those for the 1978-81 water years, when the station was operated as a high flow site can be considered to be equivalent.

GAGE.-- Water stage recorder. Datum of gage is 800 ft above mean sea level.

REMARKS.-- Records fair except those for estimated days, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	e6.4	e.00	e.00	e.00	e.00	e.00	306	13	4.9	.27	e.00
2	14	e6.0	e.00	e.00	e.00	e.00	e.00	241	11	5.2	.41	e.00
3	15	e5.8	e.00	e.00	e.00	e.00	e.00	190	21	6.0	.54	.00
4	14	e5.7	e.00	e.00	e.00	e.00	e.00	155	21	5.1	.61	.00
5	15	e5.6	e.00	e.00	e.00	e.00	e.00	124	14	6.1	.68	.00
6	e20	e7.5	e.00	e.00	e.00	e.00	e1.0	107	8.6	7.8	.39	.00
7	e25	e10	e.00	e.00	e.00	e.00	e2.0	92	4.2	7.7	.22	.00
8	e18	e7.0	e.00	e.00	e.00	e.00	e3.0	88	2.8	e6.5	.06	.00
9	e16	e4.8	e.00	e.00	e.00	e.00	e4.5	80	1.6	e5.0	.00	.00
10	e15	e3.5	e.00	e.00	e.00	e.00	e6.0	76	.88	e3.8	e.00	.00
11	e14	e3.0	e.00	e.00	e.00	e.00	e10	74	.45	e3.0	e.00	.00
12	e13	e2.5	e.00	e.00	e.00	e.00	e20	67	.19	e2.5	e.00	.00
13	e12	e2.2	e.00	e.00	e.00	e.00	e35	65	.25	e1.8	e.00	.00
14	e12	e2.0	e.00	e.00	e.00	e.00	e100	62	.60	e.80	e.00	.00
15	e11	e1.6	e.00	e.00	e.00	e.00	e250	62	.87	.07	e.00	.00
16	e11	e1.3	e.00	e.00	e.00	e.00	e450	77	.90	.26	e.00	.00
17	e11	e1.0	e.00	e.00	e.00	e.00	e655	1040	1.2	.33	e.00	.00
18	e10	e.80	e.00	e.00	e.00	e.00	e1100	1440	e1.4	.67	e.00	.00
19	e13	e.60	e.00	e.00	e.00	e.00	1340	1840	e1.6	.82	e.00	.00
20	e20	e.40	e.00	e.00	e.00	e.00	1990	2240	e1.8	1.0	e.00	.00
21	e16	e.20	e.00	e.00	e.00	e.00	2230	2250	1.9	.53	e.00	.00
22	e13	e.10	e.00	e.00	e.00	e.00	1840	1910	2.4	.47	e.00	.00
23	e11	e.05	e.00	e.00	e.00	e.00	1330	1340	2.2	.60	e.00	.00
24	e10	e.02	e.00	e.00	e.00	e.00	976	991	2.8	.98	e.00	.00
25	e9.5	e.00	e.00	e.00	e.00	e.00	769	e580	4.3	.85	e.00	.00
26	e8.8	e.00	e.00	e.00	e.00	e.00	710	e220	5.5	.80	e.00	.00
27	e8.0	e.00	e.00	e.00	e.00	e.00	711	86	6.7	.57	e.00	.00
28	e7.6	e.00	e.00	e.00	e.00	e.00	586	47	5.0	.44	e.00	.00
29	e7.2	e.00	e.00	e.00	e.00	e.00	456	28	4.7	.37	e.00	.00
30	e7.0	e.00	e.00	e.00	---	e.00	375	19	5.2	.27	e.00	.00
31	e6.6	---	e.00	e.00	---	e.00	---	14	---	.35	e.00	---
TOTAL	396.7	78.07	0.00	0.00	0.00	0.00	15949.50	15911148.04	75.58	3.17	0.00	
MEAN	12.8	2.60	.000	.000	.000	.000	532	513	4.93	2.44	.10	.000
MAX	25	10	.00	.00	.00	.00	2230	2250	21	7.8	.68	.00
MIN	6.6	.00	.00	.00	.00	.00	.00	14	.19	.07	.00	.00
AC-FT	787	155	.00	.00	.00	.00	31640	31560	294	150	6.2	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

05085900 SNAKE RIVER ABOVE ALVARADO, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	12.3	18.1	2.89	.36	.023	145	177	152	17.6	82.3	47.7	94.4
MAX	26.5	60.2	9.23	1.12	.068	452	532	513	26.2	139	168	264
(WY)	1995	1995	1995	1995	1993	1995	1996	1996	1994	1994	1993	1993
MIN	.000	.000	.000	.000	.000	.000	26.7	4.18	4.93	2.44	.10	.000
(WY)	1993	1993	1993	1996	1995	1996	1994	1993	1996	1996	1996	1996

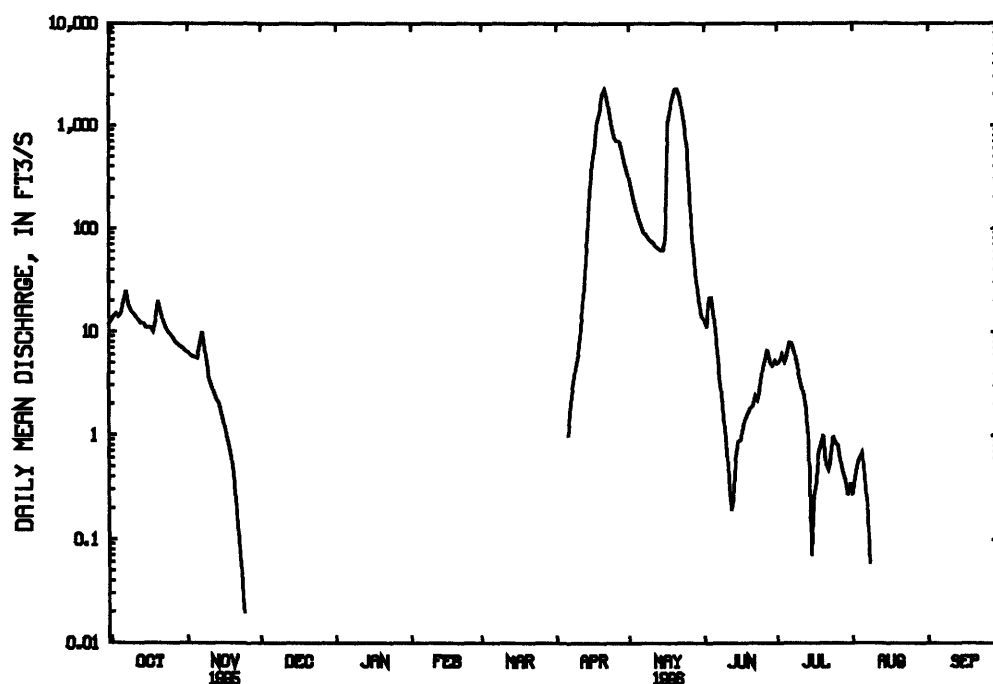
SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1993 - 1996
ANNUAL TOTAL	24113.69	32562.06	
ANNUAL MEAN	66.1	89.0	62.7
HIGHEST ANNUAL MEAN			89.0
LOWEST ANNUAL MEAN			39.5
HIGHEST DAILY MEAN	1420	Mar 17	2250
LOWEST DAILY MEAN	.00	Jan 27	.00 ^b
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 27	.00
INSTANTANEOUS PEAK FLOW		2300	3410 ^g
INSTANTANEOUS PEAK STAGE		22.80 ^d	22.80
ANNUAL RUNOFF (AC-FT)	47830	64590	45440
10 PERCENT EXCEEDS	146	82	114
50 PERCENT EXCEEDS	10	.00	6.0
90 PERCENT EXCEEDS	.00	.00	.00

a Many days throughout the water year.

b Many days, several years.

c Maximum observed.

d From floodmarks.



05085900 SNAKE RIVER ABOVE ALVARADO, MINN

RED RIVER OF THE NORTH BASIN

05085900 SNAKE RIVER ABOVE ALVARADO, MN--Continued
(National Water-Quality Assessment Station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.-- October 1993 to current.

REMARKS.-- Records fair.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LITY LAB (MG/L AS CACO3) (90410)
APR 20...	1100	2020	295	--	7.7	--	1.5	--	--	--	--
MAY 17...	1415	--	273	--	8.2	--	15.0	--	--	--	--
JUN 05...	0900	--	739	724	7.2	8.1	15.5	741	8.7	252	277
JUL 22...	1130	--	753	--	7.1	--	20.0	748	5.5	--	--
DATE		CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	SOLIDS RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (7030C)
APR 20...	--	--	--	--	--	--	--	--	0.540	--	--
MAY 17...	--	--	--	--	--	--	--	--	--	--	--
JUN 05...	0	307	0.040	0.020	1.3	1.7	1.20	0.090	0.040	0.020	543
JUL 22...	--	--	0.030	0.020	0.90	1.4	0.210	0.140	<0.010	0.020	--

RED RIVER OF THE NORTH BASIN

05085900 SNAKE RIVER ABOVE ALVARADO, MN--Continued

[illegible]

RED RIVER OF THE NORTH BASIN
05087500 MIDDLE RIVER AT ARGYLE, MN

LOCATION.--Lat 48°20'25", long 96°48'58", in NE¼NW¼ sec.15, T.156 N., R.48 W., Marshall County, Hydrologic Unit 09020379, on left bank 30 ft upstream of bridge on County Highway 4 in Argyle and 14 mi upstream from mouth.

DRAINAGE AREA.--265 mi²

PERIOD OF RECORD.--March to September 1945, October 1950 to September 1981, February 1982 to current year. Monthly discharge only for some periods, published in WSP 1728. October 1981 to January 1982, operated as a high-flow partial-record station.

GAGE.--Water-stage recorder. Datum of gage is 828.53 ft above mean sea level. Prior to Nov. 8, 1951, nonrecording gage and Nov. 8, 1951, to Sept. 18, 1952, water-stage recorder at site 800 ft downstream at datum 1.0 ft higher. Sept. 19, 1952, to June 28, 1982, recording gage at site 800 feet downstream at present datum. June 29, 1982, to Sept. 20, 1983, nonrecording gage at present site and datum.

REMARKS.--Records poor.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 1950 reached a stage of 15.25 ft present datum, site then in use, from floodmarks, discharge, 2,790 ft³/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	4.8	e5.6	e3.4	e1.4	e1.3	e1.5	e580	e30	8.5	9.4	.61
2	5.4	5.1	e5.6	e3.4	e1.3	e1.3	e1.5	e540	e40	8.8	7.2	.85
3	8.7	4.5	e5.6	e3.4	e1.3	e1.3	e1.5	e480	e36	8.3	8.1	.98
4	9.9	e4.4	e5.6	e3.4	e1.3	e1.3	e1.5	e400	e30	7.8	5.6	1.1
5	11	e4.4	e5.6	e3.4	e1.3	e1.3	e1.5	e330	e25	7.1	4.5	3.3
6	11	e4.5	e5.4	e3.4	e1.3	e1.3	e1.8	e290	e20	7.1	e4.4	e2.4
7	11	e4.8	e4.5	e3.4	e1.3	e1.3	e2.5	e250	e13	7.2	e4.5	e2.0
8	10	e4.8	e4.0	e3.3	e1.3	e1.3	e5.0	e220	e10	7.0	e4.8	e1.8
9	9.9	e4.7	e3.5	e3.3	e1.3	e1.3	e9.0	e190	e8.0	6.2	5.4	e1.6
10	10	e4.8	e3.4	e3.3	e1.5	e1.4	e14	e180	e6.0	5.5	4.4	e1.4
11	9.4	e4.8	e3.4	e3.3	e1.5	e1.5	e20	e160	e4.6	5.9	3.8	e1.2
12	9.8	e4.8	e3.4	e3.2	e1.4	e1.6	e30	e150	e3.5	5.6	3.7	e1.0
13	9.5	e4.8	e3.4	e2.9	e1.4	e1.7	e45	133	e4.0	5.7	3.4	e.96
14	8.1	e4.8	e3.4	e2.7	e1.4	e1.7	e70	122	e5.0	6.7	3.5	e.92
15	8.4	e4.9	e3.4	e2.5	e1.4	e1.7	e150	109	e5.8	7.3	3.7	e.88
16	9.3	e4.9	e3.4	e2.3	e1.4	e1.7	e250	100	e6.8	6.5	3.5	e.84
17	6.7	e5.0	e3.4	e2.2	e1.4	e1.7	e400	e700	e8.4	5.3	3.3	e.80
18	12	e5.2	e3.4	e2.1	e1.4	e1.6	e700	e2800	e10	5.7	2.7	e.76
19	14	e5.4	e3.4	e2.0	e1.5	e1.5	e1300	e4800	e12	5.6	2.6	e.72
20	14	e5.6	e3.4	e1.9	e1.6	e1.5	e2600	e4500	e14	6.4	2.3	e.70
21	12	e5.6	e3.4	e1.8	e1.6	e1.5	e2000	e3500	e18	6.3	2.6	e1.2
22	11	e5.6	e3.4	e1.7	e1.6	e1.6	e1700	e3000	e17	5.7	2.6	e1.0
23	8.9	e5.6	e3.4	e1.7	e1.6	e1.6	e1400	e1600	e15	6.3	1.9	e.90
24	9.6	e5.6	e3.4	e1.6	e1.6	e1.6	e1200	e1000	e15	12	1.2	e.80
25	9.1	e5.6	e3.4	e1.6	e1.5	e1.6	e1100	e600	e15	38	1.5	e.74
26	12	e5.6	e3.4	e1.6	e1.4	e1.5	e1000	e400	e15	33	1.3	e.70
27	9.7	e5.6	e3.4	e1.5	e1.3	e1.4	e980	e250	e14	28	.97	e1.3
28	7.3	e5.6	e3.4	e1.5	e1.3	e1.4	e860	e170	11	22	.83	e1.1
29	7.0	e5.6	e3.4	e1.5	e1.3	e1.4	e740	e110	9.7	19	.91	e.98
30	6.1	e5.6	e3.4	e1.5	---	e1.5	e660	e70	8.8	15	.89	e.94
31	5.0	---	e3.4	e1.4	---	e1.5	---	e35	---	12	.71	---
TOTAL	292.0	153.0	120.2	76.2	40.9	45.9	17244.8	27769	430.6	331.5	106.21	34.48
MEAN	9.42	5.10	3.88	2.46	1.41	1.48	575	896	14.4	10.7	3.43	1.15
MAX	14	5.6	5.6	3.4	1.6	1.7	2600	4800	40	38	9.4	3.3
MIN	5.0	4.4	3.4	1.4	1.3	1.3	1.5	35	3.5	5.3	.71	.61
AC-FT	579	303	238	151	81	91	34210	55080	854	658	211	68
CFSM	.04	.02	.01	.01	.01	.01	2.17	3.38	.05	.04	.01	.00
IN.	.04	.02	.02	.01	.01	.01	2.42	3.90	.06	.05	.01	.00

e Estimated.

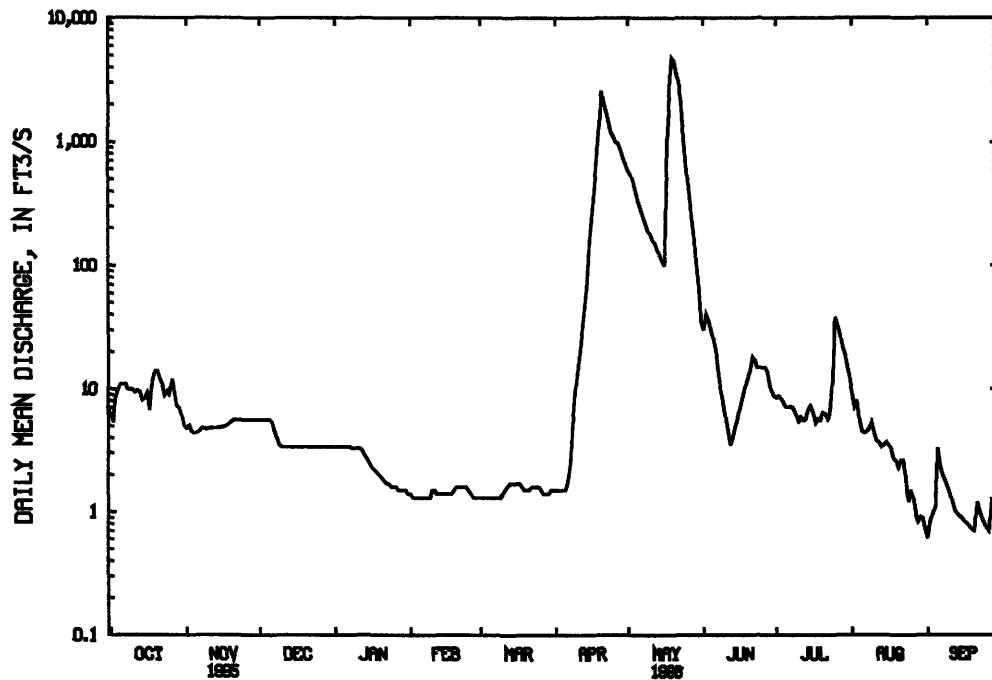
RED RIVER OF THE NORTH BASIN

05087500 MIDDLE RIVER AT ARGYLE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	9.99	7.46	2.81	1.22	.83	31.4	206	88.4	67.5	54.0	10.8	15.9
MAX	94.1	108	22.2	8.77	3.72	335	747	896	660	688	265	272
(WY)	1983	1995	1995	1995	1995	1995	1966	1996	1970	1975	1993	1993
MIN	.000	.000	.000	.000	.000	.000	.20	2.12	.37	.000	.000	.000
(WY)	1954	1954	1954	1953	1953	1954	1991	1981	1973	1961	1961	1952

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1945 - 1996	
ANNUAL TOTAL	22718.4		46644.79			
ANNUAL MEAN	62.2		127		41.3 ^a	
HIGHEST ANNUAL MEAN					127	
LOWEST ANNUAL MEAN					1.60	
HIGHEST DAILY MEAN	1200		Mar 16		4800	
LOWEST DAILY MEAN	2.5		Mar 2		Sep 1	
ANNUAL SEVEN-DAY MINIMUM	2.5		Mar 2		Sep 14	
INSTANTANEOUS PEAK FLOW			5020		May 19	
INSTANTANEOUS PEAK STAGE			18.27 ^c		May 19	
ANNUAL RUNOFF (AC-FT)	45060		92520		29950	
ANNUAL RUNOFF (CFMS)	.23		.48		.16	
ANNUAL RUNOFF (INCHES)	3.19		6.55		2.12	
10 PERCENT EXCEEDS	174		173		83	
50 PERCENT EXCEEDS	9.6		4.5		2.2	
90 PERCENT EXCEEDS	3.4		1.3		.00	

^a Median of annual mean discharges is 37 ft³/s.^b Many days, several years.^c From floodmark on gage house, at present datum.

— 05087500 MIDDLE RIVER AT ARGYLE, MN

RED RIVER OF THE NORTH BASIN

05092000 RED RIVER OF THE NORTH AT DRAYTON, ND

LOCATION.--Lat 48°34'20", long 97°08'50", in SE 1/4 SE 1/4 SE 1/4 sec.24, T.159 N., R.51 W., Pembina County, Hydrologic Unit 0902C311, on downstream side of bridge on North Dakota State Highway 11, at the North Dakota-Minnesota border, 1.5 mi northeast of Drayton, and at mile 206.7.

DRAINAGE AREA.--34,800 mi², approximately, includes 3,800 mi² in closed basins.

PERIOD OF RECORD.--April 1936 to June 1937, April 1941 to current year (fragmentary prior to April 1949).

REVISED RECORDS.--WSP 1388 1949-50. WSP 1728: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 755.00 ft above sea level (Minnesota highway bench mark). Prior to Nov. 30, 1954, nonrecording gage at site 1.5 mi upstream at datum 1.59 ft higher.

REMARKS.--Records fair.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 1897 reached a stage of about 41 ft, at site and datum in use prior to Nov. 30, 1954.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1350	3050	e2300	e2100	e1900	e2150	e12800	49000	26000	4700	3820	2140
2	1380	3120	e2360	e2110	e1940	e2160	e12200	46000	24500	4560	3720	2100
3	1740	3220	e2420	e2110	e1980	e2170	e11400	43600	23000	4380	3670	2060
4	2650	3260	e2480	e2110	e2020	e2180	e10200	41000	21300	4200	3650	2040
5	3150	3290	e2550	e2100	e2060	e2190	e9940	39000	19500	4000	3640	2020
6	3270	3270	e2550	e2100	e2060	e2200	e9080	36500	18000	e3950	3580	2020
7	3370	3060	e2550	e2100	e2070	e2220	e8610	34500	16400	e3900	3550	2000
8	3580	2940	e2480	e2100	e2040	e2220	e8490	32500	14900	e3850	3520	1990
9	4080	2550	e2400	e2100	e2010	e2230	e8700	30500	13400	e3800	3510	1980
10	4480	2490	e2320	e2100	e1990	e2230	e8850	29000	12100	e3700	3510	1980
11	4560	2520	e2250	e2090	e1990	e2230	e12400	27000	11100	e3700	3490	1980
12	4450	2470	e2180	e2090	e1920	e2330	e15400	25500	10200	e3650	3470	1930
13	4280	2600	e2100	e2090	e1870	e2390	e18100	23800	9450	e3600	3420	1880
14	4120	2620	e2080	e2080	e1880	e2360	e20900	22300	8900	e3550	3250	1830
15	3960	2660	e2050	e2080	e1870	e2330	e24200	20500	8600	e3500	3040	1780
16	3780	2730	e2050	e2070	e1850	e2290	e27200	18800	8380	e3500	2860	1730
17	3560	2920	e2040	e2060	e1840	e2340	e30500	21200	7810	3430	2710	1700
18	3410	3130	e2030	e2040	e1840	e2560	e34800	24000	7290	3260	2610	1670
19	3270	3330	e2020	e2030	e1870	e2800	e39000	28500	6860	3320	2550	1650
20	3200	3470	e2010	e2020	e1900	e3150	43000	30600	6480	3710	2470	1640
21	3150	3540	e2010	e2020	e1900	e3940	48600	32100	6180	4290	2440	1630
22	3140	3630	e2000	e2010	e1900	e5540	53500	33200	5910	4830	2390	1590
23	3180	e3250	e2010	e2010	e1960	e7000	58500	33800	5700	5020	2370	1550
24	3300	e3070	e2020	e2000	e2180	e8200	59500	34300	5510	4870	2350	1490
25	3370	e2900	e2030	e2000	e2100	e8500	60500	34000	5340	4590	2340	1460
26	3400	e2770	e2040	e2000	e2010	e10200	60500	33800	5210	4490	2320	1450
27	3390	e2640	e2050	e2000	e2130	e11900	60000	32300	5120	4450	2310	1430
28	3350	e2510	e2060	e2000	e2140	e12600	55000	30600	5010	4380	2280	1430
29	3270	e2380	e2070	e1980	e2140	e13600	54000	30000	4940	4270	2240	1420
30	3150	e2320	e2080	e1960	---	e13100	50600	28500	4820	4150	2210	1420
31	3060	---	e2090	e1940	---	e13100	---	27500	---	4000	2180	---
TOTAL	103400	87710	67680	63600	57360	154410	926470	973900	327910	125600	91470	52990
MEAN	3335	2924	2183	2052	1978	4981	30880	31420	10930	4052	2951	1766
MAX	4560	3630	2550	2110	2180	13600	60500	49000	26000	5020	3820	2140
MIN	1350	2320	2000	1940	1840	2150	8490	18800	4820	3260	2180	1420
AC-FT	205100	174000	134200	126200	113800	306300	1838000	1932000	650400	249100	181400	105100

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 1996, BY WATER YEAR (WY)

	MEAN	1841	1549	1230	1076	1048	2952	14180	8674	5310	4590	2431	1838
MAX	5194	5653	3072	2065	1978	15720	38390	58890	23420	28240	21580	7912	
(WY)	1995	1972	1972	1966	1996	1995	1966	1950	1962	1975	1993	1993	
MIN	317	277	149	174	201	280	1275	938	676	348	243	329	
(WY)	1991	1977	1977	1990	1977	1962	1981	1977	1977	1988	1977	1988	

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1949 - 1996
ANNUAL TOTAL	2496650	3032500	
ANNUAL MEAN	6840	8286	3910
HIGHEST ANNUAL MEAN			10510
LOWEST ANNUAL MEAN			536
HIGHEST DAILY MEAN	37800	Apr 1	60500
LOWEST DAILY MEAN	1350	Oct 1	110
ANNUAL SEVEN-DAY MINIMUM	1460	Sep 26	118
INSTANTANEOUS PEAK FLOW			61300
INSTANTANEOUS PEAK STAGE			42.41
INSTANTANEOUS LOW FLOW			43.66
ANNUAL RUNOFF (AC-FT)	4952000	6015000	2833000

e Estimated.

RED RIVER OF THE NORTH BASIN

05092000 RED RIVER OF THE NORTH AT DRAYTON, ND--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
NOV										
06...	1550	3260	880	--	-3.0	1.0	--	--	--	--
JAN										
03...	1500	2120	688	--	-10.0	0.5	--	--	--	--
MAR										
08...	1305	2220	741	--	-12.0	0.0	--	--	--	--
APR										
21...	1500	48600	320	--	3.0	3.5	--	--	--	--
25...	1335	60500	309	--	8.0	4.5	--	--	--	--
MAY										
03...	1100	43700	450	--	8.0	8.5	--	--	--	--
13...	1310	23800	558	7.7	16.0	8.0	230	168	53	24
20...	1115	30000	527	--	15.5	17.0	--	--	--	--
29...	1320	30000	587	--	26.0	18.0	--	--	--	--
JUN										
11...	1130	11100	692	--	25.0	20.0	--	--	--	--
18...	1250	7340	650	--	26.0	20.0	--	--	--	--
AUG										
12...	1500	3290	640	8.1	28.0	25.5	270	210	60	28

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO AS K) (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS SO4) (00935)	SULFATE DIS- SOLVED (MG/L AS CL) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS F) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L (00950)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER (70303)
MAY										
13...	21	16	0.6	6.8	97	18	0.20	321	354	0.48
AUG										
12...	35	22	0.9	5.0	95	29	0.20	378	411	0.56

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAY										
13...	22700	<1	10	<1	20	<10	0.1	<1	1	220
AUG										
12...	3650	3	20	<1	30	<10	<0.1	<1	<1	270

RED RIVER OF THE NORTH BASIN

05094000 SOUTH BRANCH TWO RIVERS AT LAKE BRONSON, MN

LOCATION.--Lat 48°43'50", long 96°39'50", in SW¹/₄SW¹/₄, sec.30, T.161 N., R.46 W., Kittson County, Hydrologic Unit 09020312, on left bank 70 ft upstream from culvert on U.S. Highway 59 at Lake Bronson and 3.4 mi downstream from dam at outlet of Bronson Lake.

DRAINAGE AREA.--444 mi².

PERIOD OF RECORD.--September 1928 to November 1936, April to September 1937, April 1941 to October 1943, April to December 1944, April 1945 to September 1947, October 1953 to September 1981, April 1985 to current year. Monthly discharge only for some periods, published in WSP 1308. October 1981 to March 1985, annual maximums only. Published as South Fork Two Rivers at Bronson prior to 1941.

REVISED RECORDS.--WSP 1308: 1929(M), 1931(M), 1936(M), 1944(M), 1947(M).

GAGE.--Water-stage recorder. Datum of gage is 928.53 ft above mean sea level (Minnesota Department of Transportation bench mark). Prior to Nov. 23, 1953, nonrecording gage at bridge 100 ft downstream at datum 2.00 ft higher. Nov 23, 1953, to Oct. 5, 1963, water-stage recorder at same site at datum 2.00 ft higher.

REMARKS.--Records poor. Flow partly regulated since 1937 by Bronson Lake, usable capacity, 3,700 acre-ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	DAILY MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	5.1	e11	e7.0	e6.0	e7.0	e13	1940	609	219	147	19
2	1.9	25	e11	e7.0	e6.0	e7.0	e13	1720	601	219	132	18
3	14	31	e11	e7.0	e6.0	e7.0	e13	1360	558	219	113	18
4	17	8.3	e11	e7.0	e6.0	e7.0	e13	1390	542	219	113	18
5	18	20	e11	e7.0	e6.0	e7.0	e13	1190	534	219	94	20
6	33	e50	e10	e7.0	e6.2	e6.8	e14	930	525	178	54	24
7	36	e50	e10	e7.0	e6.6	e6.6	e16	713	522	28	53	24
8	6.3	e50	e10	e7.0	e7.0	e6.6	e18	839	500	25	54	24
9	9.2	e49	e10	e7.0	e7.6	e6.8	e25	741	472	89	62	24
10	16	e45	e9.0	e7.0	e8.0	e7.0	e86	654	467	123	67	23
11	20	e45	e9.0	e7.0	e8.0	e8.0	e82	597	398	133	e66	22
12	18	e45	e9.0	e7.4	e8.0	e10	e150	621	361	135	e30	22
13	17	e45	e9.0	e8.0	e8.0	e11	e200	639	360	135	e24	22
14	16	18	e9.0	e7.4	e8.0	e11	e170	535	351	135	23	21
15	16	12	e9.0	e7.0	e8.0	e12	e120	567	347	135	22	21
16	16	6.4	e9.0	e6.6	e7.8	e13	e140	547	340	135	22	21
17	16	10	e8.0	e6.4	e7.6	e14	353	839	334	92	21	21
18	17	12	e8.0	e6.4	e7.2	e14	951	2810	327	49	20	20
19	18	13	e8.0	e6.2	e7.2	e14	2210	3590	300	50	19	20
20	18	14	e8.0	e6.0	e7.8	e13	3610	3620	232	65	19	20
21	17	14	e8.0	e6.0	e8.0	e13	3720	3690	226	169	24	19
22	17	e13	e8.0	e6.0	e8.0	e14	4110	3670	220	238	26	19
23	16	e12	e8.0	e6.0	e8.0	e14	4150	3190	218	236	25	92
24	16	e12	e8.0	e6.0	e8.0	e14	3550	2520	214	191	24	173
25	20	e12	e8.0	e6.0	e8.0	e13	3290	1990	215	191	21	36
26	21	e11	e7.0	e6.0	e7.6	e12	3250	1580	217	180	20	36
27	49	e11	e7.0	e6.0	e7.4	e12	2920	1110	217	166	20	35
28	43	e11	e7.0	e6.0	e7.2	e12	2700	845	218	161	20	34
29	2.7	e11	e7.0	e6.0	e7.0	e12	2460	826	219	156	20	38
30	2.1	e11	e7.0	e6.0	---	e13	2180	681	219	152	20	41
31	1.7	---	e7.0	e6.0	---	e13	---	565	---	148	19	---
TOTAL	530.2	671.8	272.0	204.4	212.2	330.8	40540	46509	10863	4590	1394	945
MEAN	17.1	22.4	8.77	6.59	7.32	10.7	1351	1500	362	148	45.0	31.5
MAX	49	50	11	8.0	8.0	14	4150	3690	609	238	147	173
MIN	1.3	5.1	7.0	6.0	6.0	6.6	13	535	214	25	19	18
AC-FT	1050	1330	540	405	421	656	80410	92250	21550	9100	2760	1870
CFSM	.04	.05	.02	.01	.02	.02	3.04	3.38	.82	.33	.10	.07
IN.	.04	.06	.02	.02	.02	.03	3.40	3.90	.91	.38	.12	.08

e Estimated.

RED RIVER OF THE NORTH BASIN

05094000 SOUTH BRANCH TWO RIVERS AT LAKE BRONSON, MN--Continued

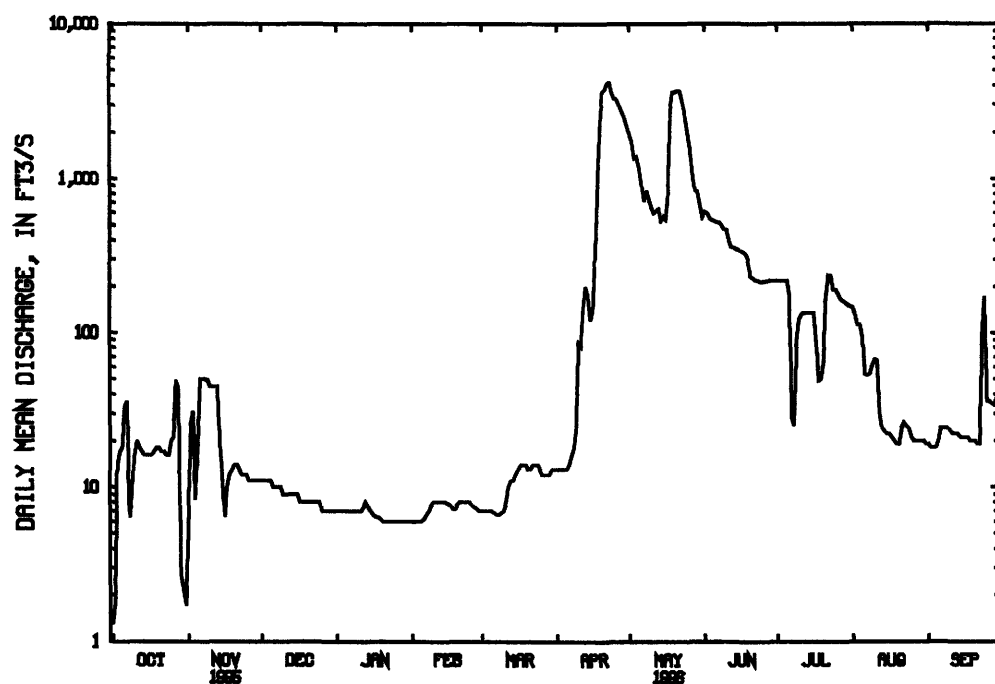
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	19.9	13.1	4.84	2.96	3.30	71.2	411	214	163	109	49.4	45.0
MAX	153	97.0	34.5	12.1	23.6	689	1977	1500	1336	1136	1349	525
(WY)	1958	1995	1992	1992	1981	1995	1966	1996	1970	1956	1993	1957
MIN	.40	.38	.13	.12	.12	.66	.54	.98	1.43	.44	.089	.000
(WY)	1991	1990	1987	1987	1987	1934	1991	1991	1980	1988	1988	1937

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1929 - 1996	
ANNUAL TOTAL	49979.6		107062.4			
ANNUAL MEAN	137		293		92.7 ^a	
HIGHEST ANNUAL MEAN					312	1966
LOWEST ANNUAL MEAN					2.89	1934
HIGHEST DAILY MEAN	1750		Mar 28		5290	Apr 5 1966
LOWEST DAILY MEAN	1.3		Oct 1		.00 ^b	Jul 25 1937
ANNUAL SEVEN-DAY MINIMUM	3.0		Feb 28		.00	Aug 2 1937
INSTANTANEOUS PEAK FLOW			4290		Apr 22	Apr 5 1966
INSTANTANEOUS PEAK STAGE			14.45		Apr 22	Apr 5 1966
ANNUAL RUNOFF (AC-FT)	99130		212400		67180	
ANNUAL RUNOFF (CFSM)	.31		.66		.21	
ANNUAL RUNOFF (INCHES)	4.19		8.97		2.84	
10 PERCENT EXCEEDS	450		662		220	
50 PERCENT EXCEEDS	24		20		4.8	
90 PERCENT EXCEEDS	3.5		7.0		.80	

a Median of annual mean discharges is 58 ft³/s.

b Many days, several years.



— 05094000 SOUTH BRANCH TWO RIVERS AT LAKE BRONSON, MN

RED RIVER OF THE NORTH BASIN

05102500 RED RIVER OF THE NORTH AT EMERSON, MANITOBA

(International Gaging Station)

LOCATION.--Lat 49°00'30", long 97°12'40", in sec.2, T.1, R.2 E., Hydrologic Unit 09020311, on right bank 1,500 ft downstream from Canadian National Railway bridge in Emerson, 0.8 mi downstream from international boundary, 3.6 mi downstream from Pembina River, and at mile 154.3.

DRAINAGE AREA.--40,200 mi², approximately, includes 3,800 mi² in closed basins.

PERIOD OF RECORD.--March to November 1902 (gage heights only), May 1912 to September 1929 (monthly discharge only, published in WSP 1308), October 1929 to current year.

GAGE.--Water-stage recorder. Datum of gage is Geodetic Survey of Canada Datum of 1929. See WSP 1728 or 1913 for history of changes prior to Apr. 10, 1953.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States. Records provided by Water Survey of Canada.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1680	3270	e2630	e2120	e1740	e2000	e9290	55400	34100	6600	4200	2070
2	1630	3270	e2620	e2130	e1740	e2070	e9220	55800	32700	6390	4130	2070
3	1650	3330	e2630	e2130	e1740	e2120	e8970	55400	31200	6110	4100	2020
4	1770	3380	e2670	e2110	e1740	e2150	e8620	55100	29500	5830	4130	1980
5	2220	3430	e2730	e2090	e1740	e2150	e8120	54000	27500	5540	4100	1990
6	2860	3450	e2750	e2080	e1750	e2140	e7560	53000	25400	5190	4060	2020
7	3250	3390	e2720	e2060	e1750	e2130	e7100	51600	23700	4870	3990	2020
8	3460	e3350	e2650	e2030	e1750	e2130	e6820	49400	21900	4590	3990	1960
9	3670	e3250	e2580	e2000	e1740	e2140	e6710	45600	20000	4310	3960	1960
10	4100	e3190	e2490	e1960	e1740	e2170	e6820	43100	17900	4060	3920	1990
11	4590	e3110	e2380	e1910	e1740	e2190	e7240	41000	16100	3920	3850	2000
12	4770	e3090	e2260	e1890	e1750	e2210	e8370	39600	14400	3850	3780	1960
13	4730	e3030	e2190	e1850	e1760	e2250	e10100	38100	12900	3780	3600	1900
14	4630	e3060	e2150	e1820	e1760	e2280	e12700	36700	11800	3740	3400	1820
15	4480	e3090	e2120	e1800	e1770	e2330	e16000	35000	10900	3740	3130	1760
16	4340	e3080	e2110	e1800	e1780	e2400	e20400	33700	10200	3740	2850	1700
17	4130	e3080	e2100	e1820	e1780	e2490	e24500	33600	9640	3710	2630	1660
18	3920	e3150	e2100	e1840	e1780	e2590	e28900	34000	9110	3710	2490	1650
19	3710	e3280	e2080	e1830	e1780	e2750	e33800	34500	8620	3740	2420	1650
20	3530	e3450	e2050	e1820	e1790	e2930	e38100	34900	8230	3810	2380	1660
21	3430	e3570	e2040	e1810	e1810	e3130	e45900	35300	7840	4060	2370	1640
22	3340	e3640	e2030	e1790	e1820	e3430	54400	36000	7560	4590	2370	1620
23	3320	e3600	e2030	e1780	e1840	e4130	58300	36400	7310	5470	2350	1600
24	3370	e3520	e2040	e1780	e1860	e5090	62500	37100	7100	5900	2330	1540
25	3470	e3330	e2060	e1780	e1890	e6000	65700	37400	6920	5790	2320	1480
26	3570	e3080	e2080	e1780	e1920	e6780	66000	37800	6780	5440	2290	1470
27	3600	e2910	e2100	e1770	e1920	e7590	63600	37800	6640	5190	2270	1540
28	3600	e2780	e2100	e1760	e1920	e8230	59700	37400	6530	4980	2240	1590
29	3530	e2660	e2110	e1750	e1950	e8720	56200	36700	6890	4770	2200	1610
30	3480	e2620	e2110	e1740	---	e9110	55800	36000	6780	4560	2160	1650
31	3370	---	e2110	e1740	---	e9250	---	35100	---	4380	2120	---
TOTAL	107200	96440	70820	58570	52050	117080	867440	1282500	446150	146360	96130	53580
MEAN	3458	3215	2285	1889	1795	3777	28910	41370	14870	4721	3101	1786
MAX	4770	3640	2750	2130	1950	9250	66000	55800	34100	6600	4200	2070
MIN	1630	2620	2030	1740	1740	2000	6710	33600	6530	3710	2120	1470
AC-FT	212600	191300	140500	116200	103200	232200	1721000	2544000	884900	290300	190700	106300

e Estimated.

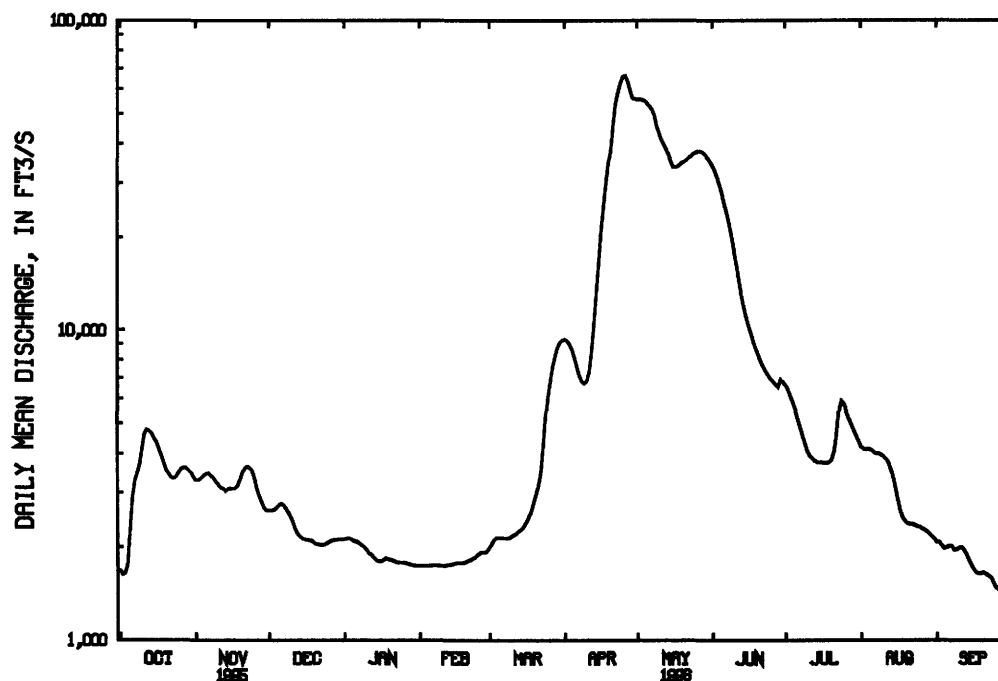
RED RIVER OF THE NORTH BASIN

05102500 RED RIVER OF THE NORTH AT EMERSON, MANITOBA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1536	1355	989	813	775	2234	12980	8762	5036	3983	2072	1626
MAX	6015	5163	2945	2053	1914	15340	45820	72820	25430	28020	27000	10010
(WY)	1995	1972	1995	1951	1952	1995	1966	1950	1962	1975	1993	1997
MIN	28.6	23.7	33.3	7.05	1.21	2.25	1282	663	196	121	46.6	23.6
(WY)	1937	1937	1937	1937	1937	1937	1938	1934	1934	1936	1934	1934

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1912 - 1996
ANNUAL TOTAL	2948250	3394320	
ANNUAL MEAN	8077	9274	3523
HIGHEST ANNUAL MEAN			12100
LOWEST ANNUAL MEAN			333
HIGHEST DAILY MEAN	42400	Apr 2	66000
LOWEST DAILY MEAN	1590	Mar 11	1470
ANNUAL SEVEN-DAY MINIMUM	1600	Mar 7	1550
INSTANTANEOUS PEAK FLOW			66700
INSTANTANEOUS PEAK STAGE			789.10
INSTANTANEOUS LOW FLOW			1450
ANNUAL RUNOFF (AC-FT)	5848000	6733000	2552000
10 PERCENT EXCEEDS	23200	35000	7850
50 PERCENT EXCEEDS	3460	3270	1430
90 PERCENT EXCEEDS	1780	1760	263



— 05102500 RED RIVER OF THE NORTH AT EMERSON, MAN

RED RIVER OF THE NORTH BASIN

05104500 ROSEAU RIVER BELOW SOUTH FORK NEAR MALUNG, MN

LOCATION.--Lat 48°47'30", long 95°44'40", in NW1/4SW1/4 sec.6, T.161 N., R.39 W., Roseau County, Hydrologic Unit 09020314, on left bank 0.3 mi downstream from South Fork and 1.5 mi northwest of Malung.

DRAINAGE AREA.--573 mi².

PERIOD OF RECORD.--October 1946 to current year.

REVISED RECORDS.--WSP 2113:1948, 1950, 1951, 1956(M), 1957(M), 1962(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,029.67 ft, adjustment of 1912.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Some flow bypasses the gaging station through a natural overflow channel 0.8 mi upstream and returns to river 0.5 mi downstream. Overflow begins at stage of about 13.0 ft, discharge, 1,800 ft³/s.

These records include any flow in the overflow channel.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	41	e19	e11	e9.1	e9.4	e9.4	1490	414	117	102	15
2	9.6	44	e19	e11	e9.1	e9.4	e9.4	1260	386	116	85	14
3	14	45	e19	e11	e9.1	e9.4	e9.4	1090	351	104	81	13
4	19	44	e18	e11	e9.1	e9.4	e9.4	982	288	91	74	12
5	22	e45	e18	e10	e9.1	e9.4	e9.4	876	242	84	103	11
6	28	e44	e18	e10	e9.2	e9.4	e9.4	790	242	72	152	10
7	26	e42	e18	e10	e9.2	e9.4	e9.4	733	262	59	143	11
8	25	e41	e18	e10	e9.2	e9.4	e9.4	667	262	55	119	10
9	24	e38	e17	e10	e9.2	e9.4	e9.4	612	227	55	96	9.6
10	24	e36	e17	e10	e9.2	e9.4	e10	568	194	55	77	9.1
11	24	e34	e16	e10	e9.2	e9.4	e11	525	167	64	63	8.3
12	21	e32	e16	e9.8	e9.2	e9.4	e12	489	145	74	51	7.9
13	24	e30	e15	e9.8	e9.2	e9.4	e14	447	128	84	44	7.2
14	21	e29	e15	e9.6	e9.2	e9.4	e17	398	114	89	38	6.5
15	21	e28	e14	e9.6	e9.2	e9.4	e20	362	116	82	33	6.1
16	23	e27	e14	e9.4	e9.2	e9.4	e30	331	89	82	31	5.5
17	23	e26	e13	e9.4	e9.2	e9.4	e45	1000	79	73	28	5.4
18	25	e26	e13	e9.2	e9.2	e9.4	e160	3480	73	713	24	5.9
19	27	e25	e13	e9.2	e9.2	e9.4	e600	6970	66	2480	22	4.7
20	31	e24	e12	e9.2	e9.2	e9.4	e4000	5750	60	2230	21	4.3
21	38	e24	e12	e9.1	e9.4	e9.4	e3600	3970	57	1410	20	4.1
22	49	e23	e12	e9.1	e9.4	e9.4	e2800	3040	53	853	27	3.8
23	50	e22	e12	e9.1	e9.4	e9.4	e2400	2310	52	562	65	4.1
24	51	e22	e12	e9.1	e9.4	e9.4	e2100	1710	53	410	63	4.2
25	51	e21	e12	e9.1	e9.4	e9.4	e2000	1290	52	268	51	5.1
26	48	e21	e11	e9.1	e9.4	e9.4	e2400	1030	52	200	41	6.6
27	44	e21	e11	e9.1	e9.4	e9.4	2590	864	52	164	32	8.3
28	41	e20	e11	e9.1	e9.4	e9.4	2310	730	53	139	29	9.0
29	40	e20	e11	e9.1	e9.4	e9.4	1990	619	62	120	27	9.9
30	39	e19	e11	e9.1	---	e9.4	1740	535	85	121	22	9.5
31	40	---	e11	e9.1	---	e9.4	---	469	---	125	18	---
TOTAL	930.8	914	448	299.3	268.1	291.4	28933.6	45387	4476	11151	1782	241.1
MEAN	30.0	30.5	14.5	9.65	9.24	9.40	964	1464	149	360	57.5	8.04
MAX	51	45	19	11	9.4	9.4	4000	6970	414	2480	152	15
MIN	8.2	19	11	9.1	9.1	9.4	9.4	331	52	55	18	3.8
AC-FT	1850	1810	889	594	532	578	57390	90030	8880	22120	3530	478
CFSM	.05	.05	.03	.02	.02	.02	1.68	2.56	.26	.63	.10	.01
IN.	.06	.06	.03	.02	.02	.02	1.88	2.95	.29	.72	.12	.02

e Estimated.

RED RIVER OF THE NORTH BASIN

05104500 ROSEAU RIVER BELOW SOUTH FORK NEAR MALUNG, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 1996, BY WATER YEAR (WY)

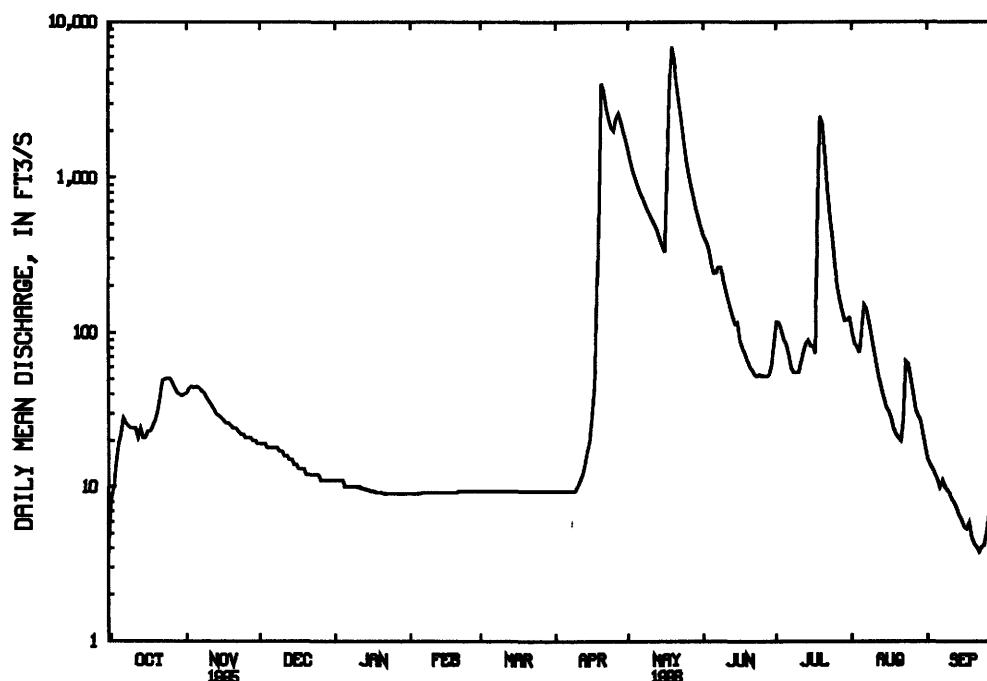
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	67.8	50.2	15.5	7.32	5.45	64.2	583	320	216	161	63.5	82.5
MAX	351	362	65.6	21.0	14.4	524	2035	1589	1140	1152	585	710
(WY)	1983	1995	1995	1966	1986	1995	1966	1950	1968	1968	1968	1957
MIN	.029	.16	.013	.000	.000	.83	5.60	8.77	4.16	.092	.000	.025
(WY)	1991	1991	1977	1977	1977	1977	1991	1990	1980	1980	1961	1978

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1947 - 1996	
ANNUAL TOTAL	43779.4		95122.3			
ANNUAL MEAN	120		260		136 ^a	
HIGHEST ANNUAL MEAN					304	
LOWEST ANNUAL MEAN					7.28	
HIGHEST DAILY MEAN	1500		6970		6970	
LOWEST DAILY MEAN	3.5		3.8		.00 ^b	
ANNUAL SEVEN-DAY MINIMUM	6.8		4.3		.00	
INSTANTANEOUS PEAK FLOW			7310		7310	
INSTANTANEOUS PEAK STAGE			23.45 ^c		23.45 ^c	
INSTANTANEOUS LOW FLOW			3.6			
ANNUAL RUNOFF (AC-FT)	86840		188700		98740	
ANNUAL RUNOFF (CFSM)	.21		.45		.24	
ANNUAL RUNOFF (INCHES)	2.84		6.18		3.23	
10 PERCENT EXCEEDS	320		633		313	
50 PERCENT EXCEEDS	27		21		17	
90 PERCENT EXCEEDS	8.3		9.2		1.5	

a Median of annual mean discharges is 114 ft³/s.

b Many days, several years.

c Highwater mark, backwater from ice.



— 05104500 ROSEAU RIVER BELOW SOUTH FORK NEAR MALUNG, MN

RED RIVER OF THE NORTH BASIN

05107500 ROSEAU RIVER AT ROSS, MN

LOCATION.--Lat 48°54'37", long 95°55'18", in NE¼/SE¼, sec. 27, T. 163 N., R. 41 W., Roseau County, Hydrologic Unit 090203014, on left bank 300 ft downstream from highway bridge, 0.2 mi. north of Ross, and 2.3 mi downstream from Pine Creek.

DRAINAGE AREA.--1,220 mi², approximately.

PERIOD OF RECORD.--July 1928 to September 1991, April 1995 to current year.

REVISED RECORDS.--WSP 1055: 1945. WSP 1175: Drainage area. WSP 1308: 1936(m). WSP 1508: 1848-49(P).

GAGE.--Water-stage recorder. Datum of gage is 1,018.61 ft above National Geodetic Vertical Datum of 1929 (levels by Geodetic Survey of Canada). Prior to Mar. 13, 1929, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair.. High flow affected by natural storage in Roseau Lake.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, about 19 ft in 1896. Other outstanding floods reached the following stages, from information by local residents: flood of July 1919, 17.5 ft; flood of 1927, about 16 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	78	e49	e40	e34	e27	e27	3310	3170	544	753	39
2	12	83	e48	e40	e34	e27	e27	3370	3010	501	669	33
3	24	e84	e48	e39	e33	e27	e27	3410	2890	449	579	29
4	29	e86	e47	e39	e33	e27	e27	3410	2790	388	484	26
5	38	e88	e47	e39	e33	e27	e27	3360	2690	320	415	24
6	42	e86	e46	e39	e32	e27	e27	3290	2630	253	387	23
7	52	e84	e45	e38	e32	e27	e27	3230	2520	197	371	23
8	58	e80	e45	e38	e32	e27	e27	3160	2430	169	337	22
9	54	e76	e45	e38	e31	e27	e27	3060	2360	168	297	22
10	50	e74	e44	e38	e31	e27	e28	2990	2290	163	259	21
11	49	e75	e44	e38	e30	e27	e29	2910	2220	164	215	20
12	50	e74	e44	e38	e30	e27	e30	2810	2120	194	166	20
13	51	e73	e44	e38	e30	e27	e32	2730	2030	219	128	20
14	52	e72	e43	e38	e29	e27	e37	2660	1940	216	104	19
15	54	e70	e43	e37	e29	e27	e45	2590	1840	218	87	15
16	51	e69	e43	e37	e29	e27	e55	2540	1750	253	75	12
17	47	e68	e43	e37	e28	e27	e70	2580	1640	241	67	18
18	46	e66	e42	e37	e28	e27	e150	2680	1530	258	58	19
19	55	e64	e42	e37	e28	e27	e250	2860	1420	882	52	15
20	71	e62	e42	e37	e28	e27	e400	3220	1310	1150	54	12
21	84	e60	e42	e37	e28	e27	e760	3720	1220	1230	59	10
22	92	e59	e42	e36	e27	e27	e1400	4160	1130	1340	76	9.9
23	99	e57	e41	e36	e27	e27	e1900	4460	1050	1400	105	9.2
24	100	e56	e41	e36	e27	e27	2390	4490	971	1380	131	8.3
25	99	e55	e41	e36	e27	e27	2660	4410	891	1310	124	7.1
26	98	e54	e41	e36	e27	e27	2770	4290	815	1230	105	7.2
27	91	e53	e41	e36	e27	e27	2910	4120	735	1150	86	11
28	87	e51	e40	e35	e27	e27	3030	3880	656	1060	69	28
29	83	e50	e40	e35	e27	e27	3160	3670	626	974	61	51
30	80	e49	e40	e34	---	e27	3270	3470	578	889	54	64
31	78	---	e40	e34	---	e27	---	3330	---	830	48	---
TOTAL	1887	2056	1343	1153	858	837	25619	104170	53252	19740	6475	637.7
MEAN	60.9	68.5	43.3	37.2	29.6	27.0	854	3360	1775	637	209	21.3
MAX	100	88	49	40	34	27	3270	4490	3170	1400	753	64
MIN	11	49	40	34	27	27	27	2540	578	163	48	7.1
AC-FT	3740	4080	2660	2290	1700	1660	50820	206600	105600	39150	12840	1260
CFSM	.05	.06	.04	.03	.02	.02	.70	2.75	1.45	.52	.17	.02
IN.	.06	.06	.04	.04	.03	.03	.78	3.18	1.62	.60	.20	.02

e Estimated.

RED RIVER OF THE NORTH BASIN

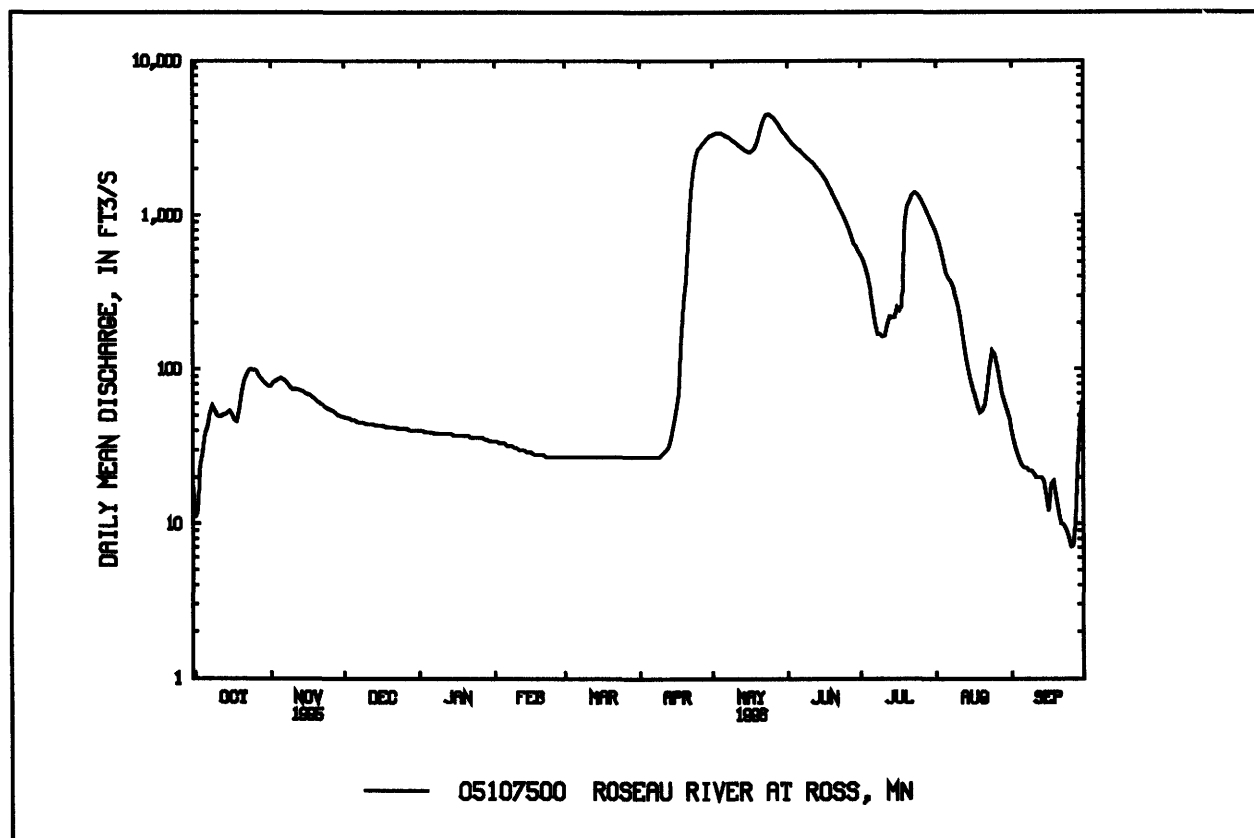
05107500 ROSEAU RIVER AT ROSS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	132	91.5	29.7	14.9	11.6	77.8	848	891	482	287	122	132
MAX	974	512	107	57.7	29.6	551	3234	4583	2258	1494	1352	1041
(WY)	1942	1957	1978	1966	1996	1946	1966	1950	1970	1968	1968	1968
MIN	1.91	1.63	.27	.001	.000	2.76	32.1	29.5	6.83	1.39	.84	.38
(WY)	1991	1977	1977	1977	1977	1989	1991	1988	1980	1980	1961	1990

SUMMARY STATISTICS

	FOR 1996 WATER YEAR	WATER YEARS 1929 - 1996
ANNUAL TOTAL	218027.7	
ANNUAL MEAN	596	261 ^a
HIGHEST ANNUAL MEAN		725
LOWEST ANNUAL MEAN		28.9
HIGHEST DAILY MEAN	4490	6510
LOWEST DAILY MEAN	7.1	.00 ^b
ANNUAL SEVEN-DAY MINIMUM	9.0	.00
INSTANTANEOUS PEAK FLOW	4530	6560
INSTANTANEOUS PEAK STAGE	17.40	18.25
INSTANTANEOUS LOW FLOW	6.7	.00 ^b
ANNUAL RUNOFF (AC-FT)	432500	188800
ANNUAL RUNOFF (CFSM)	.49	.21
ANNUAL RUNOFF (INCHES)	6.65	2.90
10 PERCENT EXCEEDS	2680	840
50 PERCENT EXCEEDS	51	37
90 PERCENT EXCEEDS	27	5.7

^a Median of annual mean discharges is 229 ft³/s.^b Many days, 1961.

RED RIVER OF THE NORTH BASIN

05112000 ROSEAU RIVER BELOW STATE DITCH 51, NEAR CARIBOU, MN
(International Gaging Station)

LOCATION.--Lat 48°58'54", long 96°27'46", in SE 1/4 SW 1/4 sec.34, T.164 N., R.45 W., Kittson County, Hydrologic Unit 09020314, on left bank 400 ft downstream from State ditch 51 (known locally as Caribou cutoff ditch) and 0.6 mi west of Caribou.

DRAINAGE AREA.--1,560 mi².

PERIOD OF RECORD.--April to October 1917, April 1920 to current year (no winter records in water years 1931, 1932, 1934-36, 1938-40, 1944-72). Published as "at Caribou," prior to April 1929; as "below Cutoff ditch, near Caribou" April 1929 to September 1936. Records published for both sites April 1929 to September 1930. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1938(M). WSP 1508: 1917(M), 1920, 1932(M), 1934-35(M). WSP 1913: 1954(M).

GAGE.--Water-stage recorder. Datum of gage is 1,002.31 ft above sea level (levels by Geodetic Survey of Canada). Prior to Apr. 1, 1929, nonrecording gage at site at Caribou 0.6 mi upstream at datum 0.95 ft lower.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Satellite telemeter at station. Occasionally, at high stages, there is some natural diversion of flow above station to headwaters of Two Rivers.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1916 is reported to have reached a stage of about 15.5 ft at former site.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	88	e110	e37	e31	e27	e27	2390	3120	1560	1110	50
2	33	96	e108	e37	e31	e27	e27	2480	3130	1470	1070	46
3	34	142	e105	e36	e30	e27	e27	2560	3100	1360	1020	38
4	34	177	e103	e36	e30	e27	e27	2620	3060	1220	955	32
5	39	284	e100	e36	e30	e27	e27	2680	3030	1050	849	28
6	45	316	e80	e36	e30	e27	e28	2720	3030	859	694	27
7	50	e320	e66	e36	e30	e27	e28	2750	3010	633	563	26
8	55	e305	e54	e35	e30	e27	e29	2790	2970	487	488	25
9	61	e297	e44	e35	e30	e27	e33	2810	2930	395	431	25
10	64	e285	e38	e35	e30	e27	e40	2810	2880	330	372	25
11	60	e273	e38	e34	e30	e27	e50	2810	2830	303	317	24
12	58	e260	e38	e34	e29	e28	e60	2810	2790	288	266	23
13	60	e253	e39	e34	e29	e28	e64	2810	2740	300	210	22
14	63	e247	e40	e33	e29	e28	e70	2810	2680	307	157	22
15	63	e239	e40	e33	e29	e28	e90	2820	2620	295	124	22
16	61	e230	e40	e33	e29	e28	e150	2820	2550	296	104	23
17	63	e225	e40	e33	e29	e28	e250	3030	2490	317	89	23
18	59	e218	e40	e33	e29	e28	e450	3320	2430	306	78	24
19	65	e210	e40	e33	e28	e28	e720	3290	2370	351	71	31
20	63	e200	e40	e33	e28	e28	e800	3170	2310	699	63	39
21	71	e190	e40	e32	e28	e28	e820	3090	2240	906	71	39
22	83	e172	e39	e32	e28	e28	e820	3050	2160	1000	84	39
23	93	e160	e39	e32	e28	e28	e820	3010	2100	1040	81	49
24	99	e147	e39	e32	e28	e28	e1050	2980	2060	1080	93	61
25	100	e135	e39	e32	e28	e28	e1280	2960	2000	1110	115	71
26	101	e125	e38	e32	e27	e28	e1600	2960	1940	1130	117	71
27	100	e115	e38	e32	e27	e28	1870	2980	1870	1150	101	77
28	96	e108	e38	e31	e27	e27	2000	3010	1790	1160	85	80
29	92	e105	e38	e31	e27	e27	2130	3040	1760	1170	72	82
30	90	e110	e37	e31	---	e27	2270	3060	1670	1160	61	98
31	88	---	e37	e31	---	e27	---	3080	---	1140	55	---
TOTAL	2076	6032	1625	1040	839	853	17657	89520	75660	24872	9966	1242
MEAN	67.0	201	52.4	33.5	28.9	27.5	589	2888	2522	802	321	41.4
MAX	101	320	110	37	31	28	2270	3320	3130	1560	1110	98
MIN	33	88	37	31	27	27	27	2390	1670	288	55	22
AC-FT	4120	11960	3220	2060	1660	1690	35020	177600	150100	49330	19770	2460
CFSM	.04	.13	.03	.02	.02	.02	.38	1.85	1.62	.51	.21	.03
IN.	.05	.14	.04	.02	.02	.02	.42	2.13	1.80	.59	.24	.03

e Estimated.

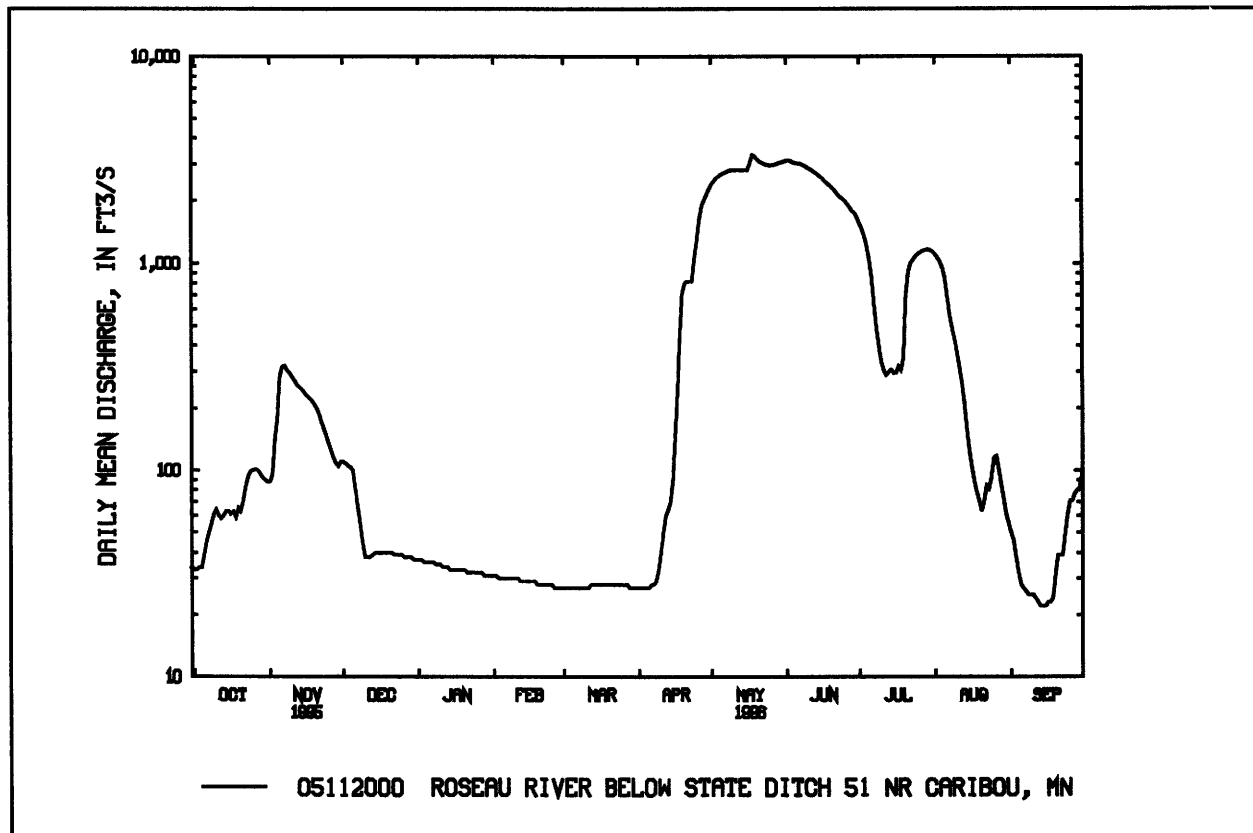
RED RIVER OF THE NORTH BASIN

05112000 ROSEAU RIVER BELOW STATE DITCH 51, NEAR CARIBOU, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1917 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT
MEAN	169	127	51.6	25.1	19.6	117	803	931	584	397	161	187
MAX	1302	712	303	134	75.1	793	2167	3029	2588	1653	1582	1451
(WY)	1942	1995	1995	1927	1927	1995	1966	1950	1970	1968	1993	1969
MIN	.12	.26	.53	.090	.060	1.57	38.2	26.9	6.70	.65	2.09	.37
(WY)	1991	1991	1991	1991	1991	1989	1981	1988	1980	1980	1936	1997

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1917 - 1996
ANNUAL TOTAL	125031	231382	
ANNUAL MEAN	343	632	298
HIGHEST ANNUAL MEAN			683
LOWEST ANNUAL MEAN			35.9
HIGHEST DAILY MEAN	2300	3320	4020
LOWEST DAILY MEAN	23	22	.00
ANNUAL SEVEN-DAY MINIMUM	23	23	.04
INSTANTANEOUS PEAK FLOW		3350	4080
INSTANTANEOUS PEAK STAGE		10.78	11.81
INSTANTANEOUS LOW FLOW		21	.00 ^a
ANNUAL RUNOFF (AC-FT)	248000	458900	216200
ANNUAL RUNOFF (CFSM)	.22	.41	.19
ANNUAL RUNOFF (INCHES)	2.98	5.52	2.60
10 PERCENT EXCEEDS	1050	2760	1200
50 PERCENT EXCEEDS	92	74	76
90 PERCENT EXCEEDS	29	27	8.8

^a Also occurred Sept 15-17, Oct 12,13, and Nov 13, 1990.

LAKE OF THE WOODS BASIN

05124480 KAWISHIWI RIVER NEAR ELY, MN

(Hydrologic Bench-Mark Station)

LOCATION.--Lat 47°55'22", long 91°32'06", in SE¹/₄SE¹/₄ sec.24, T.63 N., R.10 W., Lake County, Hydrologic Unit 09030001, in Superior National Forest, on left bank upstream from rapids, 2 mi upstream from South Kawishiwi River, 2.2 mi southwest of Fernberg Lookout Tower and 14 mi east of Ely.

DRAINAGE AREA.--253 mi².

PERIOD OF RECORD.--June 1966 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,450 ft above sea level, from topographic map.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	DAILY MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	107	230	208	123	e86	78	61	626	775	449	303	157
2	152	239	204	119	e86	76	60	688	732	478	290	150
3	170	246	204	116	e85	75	59	750	696	487	277	145
4	188	247	199	114	e85	74	59	815	653	478	270	138
5	193	247	195	111	85	73	59	884	614	460	277	132
6	197	246	189	109	84	71	59	951	589	461	282	127
7	201	243	185	107	83	70	59	1010	554	449	293	121
8	202	240	181	106	83	70	58	1070	520	452	289	115
9	206	238	180	106	82	69	58	1120	487	453	284	109
10	205	246	177	105	82	68	58	1150	456	438	282	105
11	199	247	172	104	83	68	61	1170	427	438	282	104
12	194	244	168	103	83	68	60	1170	400	493	278	98
13	186	241	166	101	83	68	60	1160	376	538	271	91
14	183	240	173	99	82	68	61	1160	351	566	264	87
15	176	240	171	96	82	68	63	1140	332	590	255	83
16	167	240	166	96	79	68	67	1130	318	597	246	81
17	159	237	162	e96	79	68	72	1150	298	583	240	79
18	153	237	159	e94	78	67	87	1250	283	554	232	76
19	153	237	156	e93	77	66	123	1300	269	527	225	74
20	153	234	151	e93	77	65	147	1310	253	497	230	71
21	151	232	149	e92	74	64	167	1300	238	474	220	68
22	151	229	146	e92	73	64	195	1270	224	453	243	67
23	154	227	143	e91	75	64	217	1220	214	437	237	66
24	169	224	141	e91	80	63	244	1170	205	421	229	67
25	172	228	138	e90	78	63	304	1120	196	404	222	66
26	175	227	136	e89	75	63	349	1070	192	385	212	65
27	185	221	135	e89	77	62	394	1020	227	369	201	73
28	198	216	132	e88	80	62	445	972	228	357	191	75
29	209	210	130	e88	78	62	497	918	380	339	182	72
30	218	210	128	e87	---	62	558	867	423	326	173	69
31	225	---	126	e87	---	62	---	819	---	314	165	---
TOTAL	5551	7043	5070	3075	2334	2089	4761	32750	11910	14267	7645	2831
MEAN	179	235	164	99.2	80.5	67.4	159	1056	397	460	247	94.4
MAX	225	247	208	123	86	78	558	1310	775	597	303	157
MIN	107	210	126	87	73	62	58	626	192	314	165	65
AC-FT	11010	13970	10060	6100	4630	4140	9440	64960	23620	28300	15160	5620
CFSM	.71	.93	.65	.39	.32	.27	.63	4.18	1.57	1.82	.97	.37
IN.	.82	1.04	.75	.45	.34	.31	.70	4.82	1.75	2.10	1.12	.42

e Estimated.

LAKE OF THE WOODS BASIN

05124480 KAWISHIWI RIVER NEAR ELY, MN--Continued
(Hydrologic Bench-Mark Station)

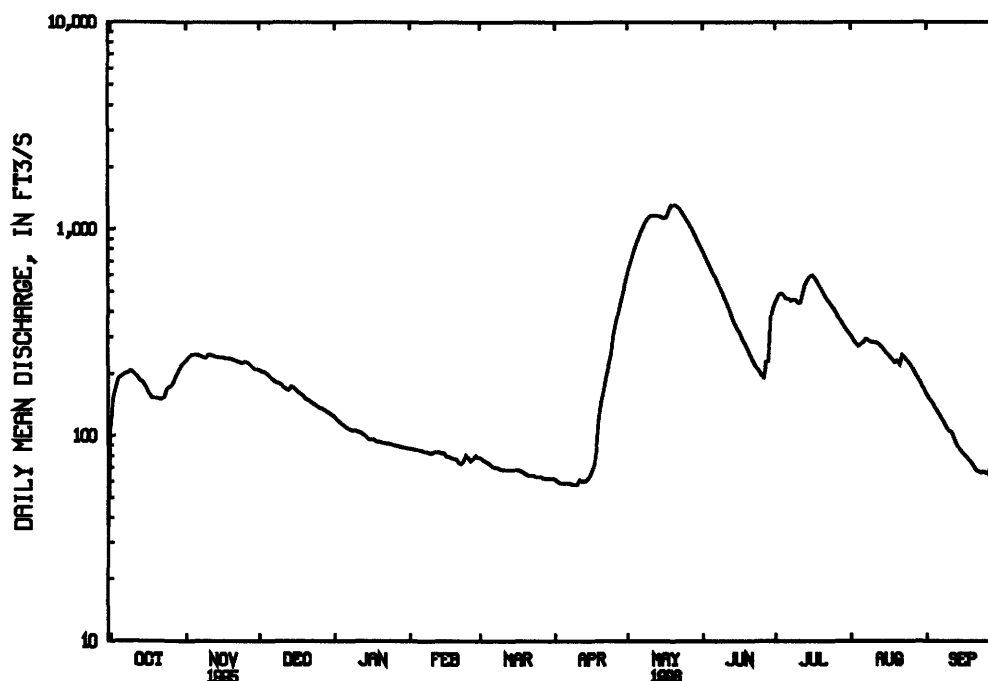
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	156	167	134	91.8	67.9	56.5	234	670	391	211	148	142
MAX	881	684	345	163	107	85.2	785	1133	1069	467	758	698
(WY)	1978	1971	1983	1984	1971	1969	1976	1979	1970	1968	1988	1978
MIN	12.1	9.43	7.25	5.32	4.77	5.87	8.95	13.3	115	74.5	46.7	18.5
(WY)	1977	1977	1977	1977	1977	1977	1977	1977	1977	1980	1976	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1966 - 1996
ANNUAL TOTAL	51994	99326	
ANNUAL MEAN	142	271	207
HIGHEST ANNUAL MEAN			313
LOWEST ANNUAL MEAN			94.5
HIGHEST DAILY MEAN	400	May 23	1310
LOWEST DAILY MEAN	22	Sep 29	58
ANNUAL SEVEN-DAY MINIMUM	23	Sep 23	59
INSTANTANEOUS PEAK FLOW		1330	May 20
INSTANTANEOUS PEAK STAGE		5.61	May 20
INSTANTANEOUS LOW FLOW		49b	Oct 1
ANNUAL RUNOFF (AC-FT)	103100	197000	149800
ANNUAL RUNOFF (CFSM)	.56	1.07	.82
ANNUAL RUNOFF (INCHES)	7.64	14.60	11.11
10 PERCENT EXCEEDS	265	602	520
50 PERCENT EXCEEDS	126	181	107
90 PERCENT EXCEEDS	43	68	38

a Occurred Jan 31 to Feb 2, 1977.

b Rising stage.



05124480 KAWISHIWI RIVER NEAR ELY, MN

LAKE OF THE WOODS BASIN
05124480 KAWISHIWI RIVER NEAR ELY, MN--Continued
(Hydrologic Bench-Mark Station)

WATER QUALITY RECORDS

PERIOD OF RECORD.--Water years 1966 to current year.

REMARKS.-- Letter K indicates non-ideal colony count.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	
OCT 10...	1545	206	24	32	7.3	7.3	11.5	1.5	720	9.8	
JAN 17...	1500	112	30	33	6.5	6.8	0.0	0.60	716	10.3	
DATE		COLI-FORM, FECAL, 0.7 UM-MF (COLS/ 100 ML) (31625)	STREP-TOCOCCHI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	ALKA-MAGNE-CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	CAR-POTAS-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	BICAR-LINITY SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	ALKA-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BONATE WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BONATE LINITY LAB (MG/L AS CACO3) (90410)	WATER DIS IT FIELD MG/L AS CO3 (00452)	WATER DIS IT FIELD MG/L AS HCO3 (00453)
OCT 10...	K2	50	2.9	1.4	1.0	0.30	10	11	0	12	
JAN 17...	0	31	3.0	1.5	1.1	0.30	10	12	0	12	
DATE		SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)
OCT 10...	1.8	0.30	<0.10	3.2	34	<0.010	<0.050	0.020	0.40	0.010	
JAN 17...	1.6	0.30	<0.10	3.6	40	<0.010	0.060	<0.015	0.40	<0.010	

LAKE OF THE WOODS BASIN

05124480 KAWISHIWI RIVER NEAR ELY, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)
OCT 10...	<0.010	<0.010	4	79	90	3	<3	240	<4	7
JAN 17...	<0.010	<0.010	2	85	50	3	<3	220	<4	7

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L) (09511)	URANIUM RA-226 2 SIGMA WATER, DISS, (PCI/L) (76001)	MURANIUM DIS- SOLVED (UG/L AS U) (22703)	NATURAL 2 SIGMA WATER, DISS, (UG/L) (75990)
OCT 10...	<10	<1	<1	<1.0	12	<6	<0.02	<0.00	<0.01	0.0
JAN 17...	<10	<1	<1	<1.0	12	<6	--	--	--	--

LAKE OF THE WOODS BASIN

05127000 KAWISHIWI RIVER NEAR WINTON, MN

LOCATION.--Lat 47°56'05", long 91°45'50", in NE1/4NW1/4, sec.20, T.63 N., R.11 W., Lake County, Hydrologic Unit 09030001, Superior National Forest, at powerplant of Minnesota Power Co., just upstream from Fall Lake, and 1.8 mi east of Winton.

DRAINAGE AREA.--1,229 mi².

PERIOD OF RECORD.--June 1905 to June 1907, October 1912 to September 1919 (fragmentary), September 1923 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WDR MN-77-1: Drainage area.

REMARKS.--No estimated daily discharges. Records good. Daily discharge computed from powerplant records. Flow regulated by powerplant and by Camp Six, Bald Eagle, Gabbro, Little Gabbro, Birch, White Iron, South Farm, and Garden Lakes.

COOPERATION.--Records collected by Minnesota Power Co., under general supervision of Geological Survey, in connection with a Federal Power Commission project.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1300	2180	882	898	748	735	375	6990	3910	2370	1090	508
2	1520	2190	882	786	811	818	450	7210	7340	2410	892	455
3	1880	2190	884	790	692	603	404	7390	7260	2330	906	711
4	2030	2240	883	688	692	691	404	7550	7310	2340	906	326
5	2030	2270	883	610	693	737	404	7680	3930	2680	763	548
6	2030	2250	883	749	692	586	404	7800	1710	3170	773	876
7	2030	2010	883	706	692	875	404	7870	1080	3700	544	236
8	2140	1820	883	559	692	877	359	7960	1330	4270	301	236
9	2300	1820	881	485	575	876	316	8020	1330	3540	510	536
10	2420	1830	882	568	485	875	424	8080	1420	3400	670	502
11	2490	1830	882	568	536	875	501	8130	1550	2970	473	504
12	2480	1160	855	568	686	874	420	8210	1550	2890	482	504
13	2310	1140	626	523	688	873	298	8270	1540	2140	442	199
14	2130	1140	638	467	574	872	378	8260	1540	3250	441	143
15	2110	1140	648	467	617	871	542	8320	1410	3250	441	144
16	2130	1140	884	470	661	870	528	8290	1290	3210	441	298
17	1270	1140	883	471	683	869	689	8310	1290	2950	1070	326
18	875	1140	883	471	794	868	642	8420	1140	2940	1150	475
19	875	1140	882	471	668	720	906	8430	825	2560	1150	473
20	876	1050	882	470	543	504	1330	5250	836	2580	1150	473
21	876	881	883	522	505	642	1440	4860	700	2560	1150	472
22	876	882	765	665	550	223	1600	4830	240	2490	1150	421
23	876	882	616	627	697	253	3370	4630	422	1860	1150	377
24	875	882	760	616	587	314	5060	4680	651	2140	1150	428
25	1320	883	649	629	871	307	5380	4740	884	2160	1140	460
26	1800	883	882	697	824	223	5680	4760	883	2150	1140	470
27	1790	883	883	620	666	225	5980	4750	306	2060	979	351
28	1980	882	883	612	696	228	6240	4650	407	1450	884	308
29	2110	882	883	604	668	524	6480	4580	896	891	884	283
30	2110	882	882	729	---	688	6750	4100	1780	949	719	147
31	2180	---	893	697	---	579	---	3800	---	1170	475	---
TOTAL	54019	41642	25868	18803	19286	20075	58158	206820	56760	78830	25416	12190
MEAN	1743	1388	834	607	665	648	1939	6672	1892	2543	820	406
MAX	2490	2270	893	898	871	877	6750	8430	7340	4270	1150	876
MIN	875	881	616	467	485	223	298	3800	240	891	301	143
+	39.6	17.2	-55.2	-147	-305	-233	336	72.9	324	-35.4	-14.6	-9.68
MEAN ‡	1782	1405	779	460	360	415	2275	6745	2216	2508	805	397
CFSM ‡	1.45	1.14	.63	.37	.29	.34	1.85	5.49	1.80	2.04	.66	.32
IN ‡	1.67	1.27	.73	.43	.31	.39	2.06	6.33	2.01	2.35	.76	.36
CAL. YR. 95	TOTAL 305723 MEAN 838 MAX 2490 MIN 0.0 MEAN ‡ 848 CFSM ‡ .69 IN ‡ 9.37											
WTR. YR. 96	TOTAL 617867 MEAN 1688 MAX 8430 MIN 143 MEAN ‡ 1687 CFSM ‡ 1.37 IN ‡ 18.64											

+ Change in contents, equivalent in cubic feet per second, in Camp Six, Bald Eagle, Gabbro, Little Gabbro, Birch, White Iron, Farm, South Farm, and Garden Lakes.

‡ Adjusted for change in reservoir contents.

LAKE OF THE WOODS BASIN

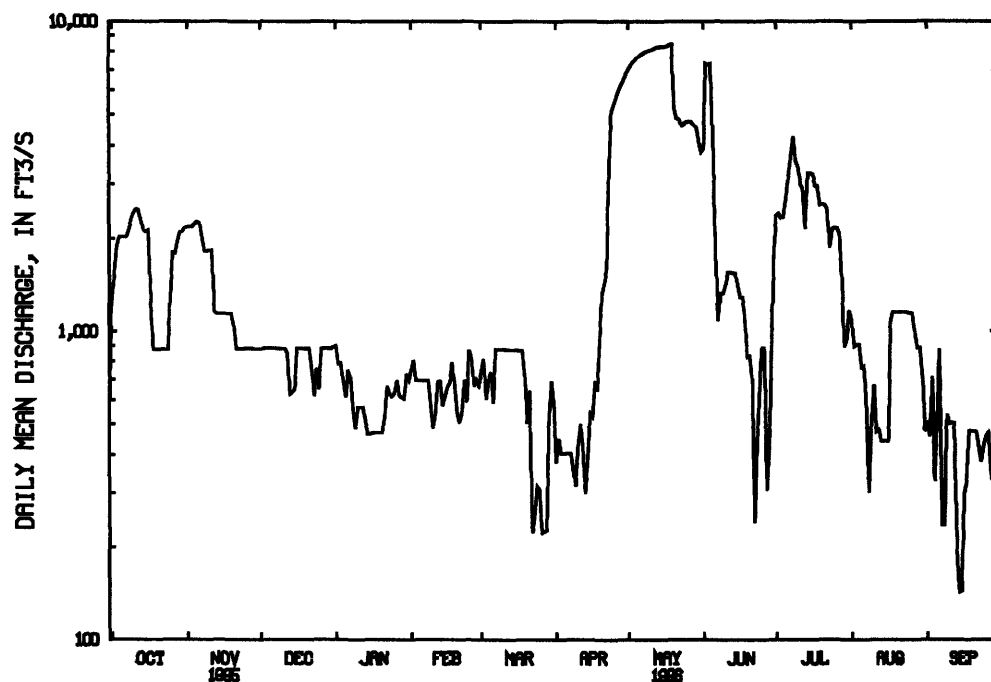
05127000 KAWISHIWI RIVER NEAR WINTON, MN

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1905 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	901	752	589	451	349	376	1183	3142	1953	1166	693	749
MAX	4277	3572	1422	862	770	844	5020	9278	5661	2748	3775	3149
(WY)	1947	1971	1983	1978	1927	1945	1945	1950	1968	1944	1988	1927
MIN	66.5	8.97	76.1	80.3	74.5	103	19.3	111	519	217	51.7	38.1
(WY)	1924	1924	1977	1977	1977	1924	1924	1924	1980	1961	1919	1919

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1905 - 1996
ANNUAL TOTAL	305723.00	617867	
ANNUAL MEAN	838	1688	1036
HIGHEST ANNUAL MEAN			1967
LOWEST ANNUAL MEAN			240
HIGHEST DAILY MEAN	2490	Oct 11	8430
LOWEST DAILY MEAN	.00	Apr 20	143
ANNUAL SEVEN-DAY MINIMUM	70	Apr 18	253
ANNUAL RUNOFF (AC-FT)	606400		1226000
ANNUAL RUNOFF (CFSM)	.68		1.37
ANNUAL RUNOFF (INCHES)	9.25		18.70
10 PERCENT EXCEEDS	1840		4660
50 PERCENT EXCEEDS	691		882
90 PERCENT EXCEEDS	274		422

a Many days, several years.



— 05127000 KAWISHIWI RIVER NEAR WINTON, MN

LAKE OF THE WOODS BASIN

05127500 BASSWOOD RIVER NEAR WINTON, MN
(International Gaging Station)

LOCATION.--Lat 48°04'57", long 91°39'09", in SE 1/4 SE 1/4 sec.30, T.65 N., R.10 W., Lake County, Hydrologic Unit 09030001, in Superior National Forest, on island in Jackfish Bay of Basswood Lake, used to determine discharge at outlet [lat 48°06'21", long 91°38'51", in sec.19, T.65 N., R.10 W., on international boundary 14 mi northeast of Winton].

DRAINAGE AREA.--1,740 mi², approximately (above outlet of Basswood Lake).

PERIOD OF RECORD.--March to June 1924, September 1925 to March 1928, January 1930 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 955: Drainage area. WSP 1145: 1935, 1937.

GAGE.--Water-stage recorder. Datum of gage is 1,296.80 ft above sea level, 1928 datum, (levels by Geodetic Survey of Canada). Prior to Oct. 27, 1938, nonrecording gages at several sites in vicinity of gage, at datum 3.0 ft higher. Oct. 28, 1938, to Sept. 30, 1966, water-stage recorder at datum 3.0 ft higher.

REMARKS.--Records good. Satellite telemeter at station. Some regulation by powerplant on Kawishiwi River at Winton, and by many lakes located upstream from station.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	842	2210	1650	1240	1020	1060	738	3720	6110	1900	2470	1420
2	934	2250	1630	1250	1020	1050	726	4000	5890	1970	2380	1370
3	1060	2290	1610	1240	1020	1050	714	4270	5690	2080	2280	1330
4	1190	2330	1590	1230	1030	1050	706	4540	5470	2180	2200	1290
5	1310	2380	1570	1220	1030	1050	689	4790	5210	2280	2190	1250
6	1410	2410	1530	1200	1030	1040	684	5030	4920	2490	2180	1200
7	1500	2420	1510	1190	1030	1030	666	5250	4570	2680	2350	1160
8	1590	2440	1500	1180	1030	1020	654	5440	4250	2980	2350	1130
9	1690	2470	1490	1160	1030	1030	646	5620	3980	3200	2340	1090
10	1780	2460	1470	1140	1050	1040	645	5780	3740	3330	2290	1050
11	1860	2420	1460	1120	1050	1040	649	5910	3530	3460	2190	1020
12	1970	2360	1440	1100	1030	1040	650	6030	3370	3640	2080	994
13	2050	2300	1430	1080	1030	1040	646	6120	3210	3660	1990	925
14	2120	2240	1460	1060	1020	1060	648	6210	3070	3570	1890	861
15	2180	2190	1430	1040	1020	1070	649	6280	2960	3550	1830	810
16	2220	2140	1390	1040	1020	1080	662	6330	2860	3580	1790	765
17	2190	2100	1380	1030	1010	1080	701	6460	2770	3590	1780	709
18	2150	2070	1370	1120	1010	1080	765	6750	2640	3590	1760	667
19	2120	2040	1350	1110	1020	1090	944	6860	2520	3580	1730	646
20	2060	1990	1350	1100	1000	1080	1090	6940	2380	3520	1690	631
21	2000	1950	1340	1080	995	1060	1220	6960	2250	3480	1670	611
22	1960	1910	1320	1060	973	1040	1370	6960	2120	3420	1750	596
23	1930	1860	1310	1050	991	1010	1540	6900	2020	3360	1730	589
24	1950	1830	1290	1030	1020	966	1720	6830	1890	3280	1710	584
25	1930	1810	1270	1030	1010	921	2000	6760	1790	3180	1670	593
26	1920	1770	1260	1020	1010	889	2310	6720	1740	3100	1650	622
27	1960	1740	1250	1010	1050	844	2580	6670	1770	3030	1610	668
28	2000	1720	1250	1010	1060	799	2840	6600	1730	2960	1570	659
29	2050	1680	1250	1020	1060	757	3130	6510	1900	2850	1540	647
30	2090	1670	1250	1020	---	742	3420	6420	1880	2710	1500	633
31	2150	---	1240	1020	---	738	---	6280	---	2580	1470	---
TOTAL	56166	63450	43640	34200	29669	30846	36402	185940	98230	94780	59630	26520
MEAN	1812	2115	1408	1103	1023	995	1213	5998	3274	3057	1924	884
MAX	2220	2470	1650	1250	1060	1090	3420	6960	6110	3660	2470	1420
MIN	842	1670	1240	1010	973	738	645	3720	1730	1900	1470	584
AC-FT	111400	125900	86560	67840	58850	61180	72200	368800	194800	188000	118300	52600
CFSM	1.04	1.22	.81	.63	.59	.57	.70	3.45	1.88	1.76	1.11	.51
IN.	1.20	1.36	.93	.73	.63	.66	.78	3.98	2.10	2.03	1.27	.57

LAKE OF THE WOODS BASIN

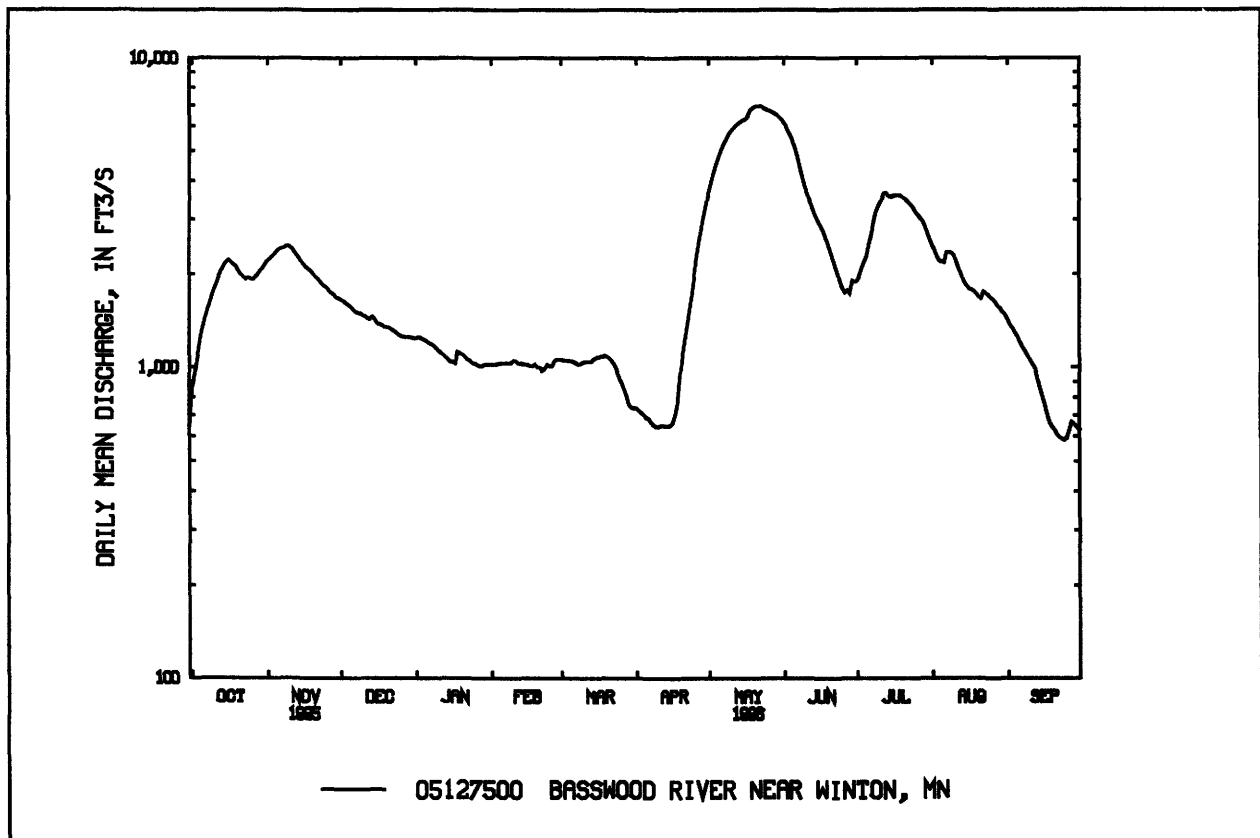
05127500 BASSWOOD RIVER NEAR WINTON, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1103	1018	870	724	599	573	1198	3760	2898	1843	1127	1004
MAX	5320	3879	2510	1475	1229	1143	5069	9114	7332	4453	3487	5034
(WY)	1978	1971	1983	1966	1966	1966	1945	1950	1950	1944	1944	1980
MIN	65.1	60.2	76.2	86.2	95.0	135	269	225	696	512	323	170
(WY)	1977	1977	1977	1977	1977	1977	1977	1977	1980	1980	1980	1975

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1931 - 1996
ANNUAL TOTAL	415442	759473	
ANNUAL MEAN	1138	2075	1406
HIGHEST ANNUAL MEAN			2643
LOWEST ANNUAL MEAN			557
HIGHEST DAILY MEAN	2470	Nov 9	6960
LOWEST DAILY MEAN	446	Sep 4	584
ANNUAL SEVEN-DAY MINIMUM	458	Aug 31	604
INSTANTANEOUS PEAK FLOW			7040
INSTANTANEOUS PEAK STAGE			6.84
INSTANTANEOUS LOW FLOW			576
ANNUAL RUNOFF (AC-FT)	824000	1506000	1019000
ANNUAL RUNOFF (CFSM)	.65	1.19	.81
ANNUAL RUNOFF (INCHES)	8.88	16.24	10.98
10 PERCENT EXCEEDS	2060	4260	3250
50 PERCENT EXCEEDS	899	1590	867
90 PERCENT EXCEEDS	540	789	382

a Present datum.



LAKE OF THE WOODS BASIN

05128000 NAMAKAN RIVER AT OUTLET OF LAC LA CROIX, ONTARIO

(International Gaging Station)

LOCATION.--Lat 48°21'14", long 92°13'01", at Campbell's Camp, on Lac La Croix Lake, used to determine discharge at outlet [Lat 48°23'00", long 92°10'40", 2.5 mi east of Campbell's Camp].

DRAINAGE AREA.--5,170 mi².

PERIOD OF RECORD.--September 1921 to January 1922, April 1922 to current year, in reports of Geological Survey. Monthly discharge only for some periods, published in WSP 1308. August 1921 to current year, in reports of Water Survey of Canada.

GAGE.--Water-stage recorder. Gage readings have been reduced to elevations, United States and Canada Boundary Survey datum. Prior to October 1933, nonrecording gages at various sites on Lac la Croix. October 1933 to Mar. 13, 1963, nonrecording gage at present site and datum.

REMARKS.--Records good. Satellite telemeter at station.

COOPERATION.--This station is one of the international stations maintained by Canada under agreement with the United States.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1560	5580	4910	3510	2950	2750	2450	6040	16300	8020	9080	5760
2	1770	5650	4840	3470	2920	2740	2440	6460	16100	7880	8970	5620
3	1980	5690	4770	3400	2900	2730	2430	6920	15900	7770	8860	5510
4	2170	5720	4700	3400	2880	2720	2400	7380	15800	7630	8760	5370
5	2380	5790	4630	3380	2870	2720	2390	7840	15600	7520	8690	5300
6	2560	5760	4560	3350	2850	2710	2360	8330	15400	7590	8620	5160
7	2720	5760	4520	3330	2820	2700	2340	8830	15100	7490	8480	5010
8	2900	5790	4480	3290	2810	2680	2320	9320	14900	7520	8330	4910
9	3080	5900	4410	3260	2790	2680	2300	9820	14500	7450	8260	4800
10	3250	5830	4410	3230	2800	2660	2290	10300	14200	7450	8190	4730
11	3400	5860	4340	3200	2810	2650	2280	10800	13900	7520	8050	4590
12	3570	5900	e4310	3180	2810	2630	2270	11200	13500	7630	7950	4520
13	3670	5900	e4270	3150	2800	2620	2260	11600	13100	7700	7910	4340
14	3780	5900	4240	3110	2790	2620	2260	12000	12800	7840	7730	4240
15	3880	5860	4200	3100	2780	2620	2260	12400	12400	8020	7630	4130
16	4060	5860	4130	3090	2770	2620	2260	12800	12100	8160	7520	4030
17	4060	5830	4100	3080	2770	2610	2270	13200	11800	8330	7380	3920
18	4240	5790	4060	3110	2760	2600	2320	13800	11400	8480	7270	3810
19	4380	5720	4030	3100	2740	2590	2460	14300	11100	8580	7060	3710
20	4480	5650	3960	e3100	2730	2570	2630	14800	10600	8690	6890	3640
21	4560	5580	3920	3100	2720	2570	2810	15200	10200	8790	6820	3530
22	4660	5540	3850	3090	2720	2560	3030	15600	9850	8830	6850	3430
23	4770	5470	3810	e3080	2730	2560	3280	16000	9610	9010	6780	3350
24	4910	5440	3780	e3050	2730	2540	3530	16200	9290	9180	6670	3260
25	4980	5370	3740	e3030	2730	2520	3920	16400	9040	9290	6600	3220
26	5050	5300	3710	e3010	2720	2520	4270	16500	8900	9360	6460	3260
27	5160	5230	3670	2990	2740	2510	4560	16600	8720	9390	6360	3260
28	5260	5120	3640	2990	2770	2500	4870	16600	8510	9390	6220	3170
29	5330	5050	3600	2990	2770	2490	5230	16600	8440	9320	6110	3140
30	5400	4980	3570	2980	---	2480	5620	16500	8160	9250	5970	3100
31	5470	---	3530	2970	---	2480	---	16400	---	9180	5860	---
TOTAL	119440	168820	128690	98120	80980	80950	88110	386740	367220	258260	232330	125820
MEAN	3853	5627	4151	3165	2792	2611	2937	12480	12240	8331	7495	4194
MAX	5470	5900	4910	3510	2950	2750	5620	16600	16300	9390	9080	5760
MIN	1560	4980	3530	2970	2720	2480	2260	6040	8160	7450	5860	3100
AC-FT	236900	334900	255300	194600	160600	160600	174800	767100	728400	512300	460800	249600
CFSM	.75	1.09	.80	.61	.54	.51	.57	2.41	2.37	1.61	1.45	.81
IN.	.86	1.21	.93	.71	.58	.58	.63	2.78	2.64	1.86	1.67	.91

e Estimated.

LAKE OF THE WOODS BASIN

05128000 NAMAKAN RIVER AT OUTLET OF LAC LA CROIX, ONTARIO--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 1996, BY WATER YEAR (WY)

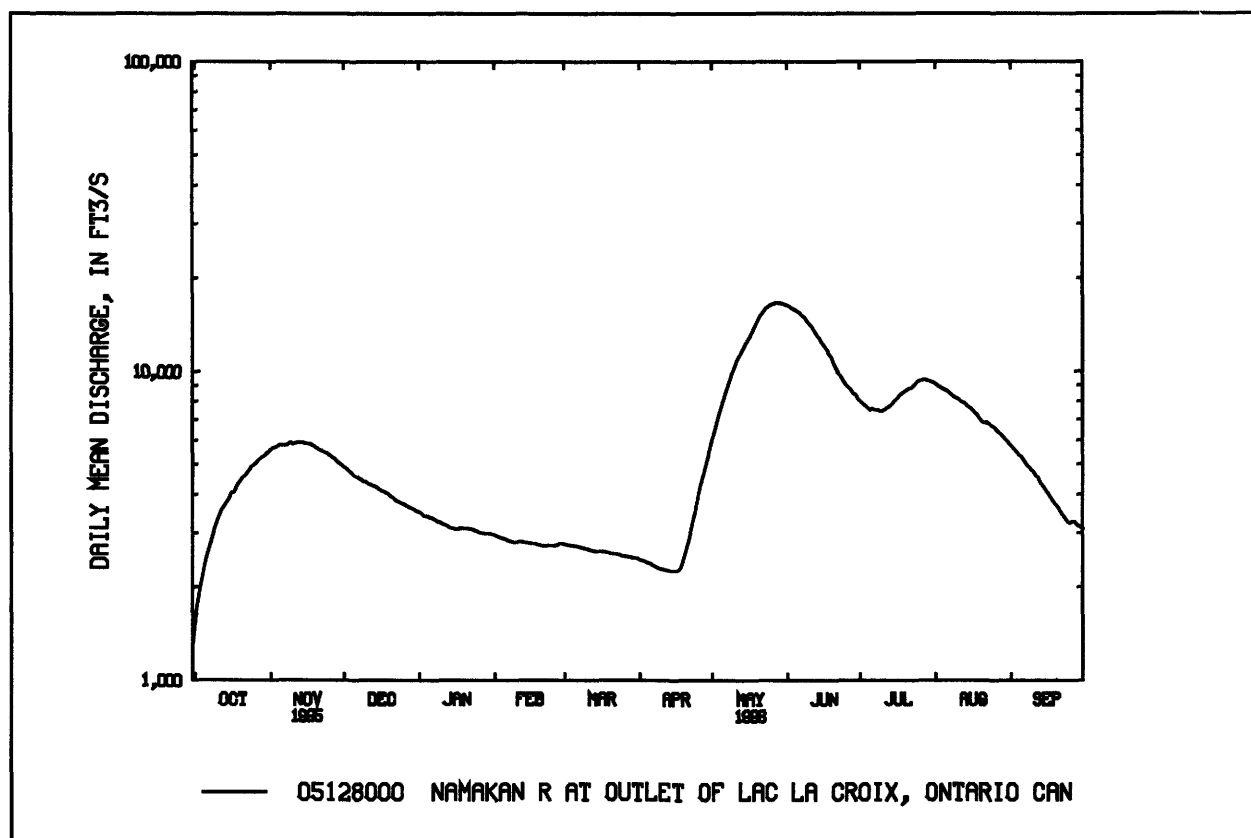
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3095	2920	2585	2183	1885	1675	2542	7702	8063	6167	4085	3199
MAX	14200	10610	7189	4568	3432	2996	9071	16900	22120	15930	11200	13140
(WY)	1978	1978	1972	1978	1966	1966	1945	1938	1950	1968	1944	1978
MIN	835	624	567	547	540	535	614	899	1475	1263	1141	1223
(WY)	1977	1977	1977	1977	1924	1924	1977	1977	1924	1924	1980	1933

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1921 - 1996	
ANNUAL TOTAL	1096890		2135480			
ANNUAL MEAN	3005		5835		3860	
HIGHEST ANNUAL MEAN					7270	
LOWEST ANNUAL MEAN					964	
HIGHEST DAILY MEAN	5900		Nov 9		28200 ^a	
LOWEST DAILY MEAN	1160		Sep 28		535	
ANNUAL SEVEN-DAY MINIMUM	1180		Sep 23		535	
INSTANTANEOUS PEAK FLOW			16700		May 27	
INSTANTANEOUS PEAK STAGE			1189.73		May 27	
INSTANTANEOUS LOW FLOW			1400 ^b		Oct 1	
ANNUAL RUNOFF (AC-FT)	2176000		4236000		2797000	
ANNUAL RUNOFF (CFSM)	.58		1.13		.75	
ANNUAL RUNOFF (INCHES)	7.89		15.37		10.15	
10 PERCENT EXCEEDS	4980		11500		8380	
50 PERCENT EXCEEDS	2630		4560		2670	
90 PERCENT EXCEEDS	1640		2570		1190	

a Occurred May 31 to June 2, 1950.

b Rising stage.

c Occurred at times in Feb, Mar, Apr, 1924.



LAKE OF THE WOODS BASIN

05129115 VERMILION RIVER NEAR CRANE LAKE, MN

LOCATION.--Lat 48°15'53", long 92°33'57", in NE $\frac{1}{4}$ /NE $\frac{1}{4}$, sec. 30, T.67 N., R.17 W., St. Louis County, Hydrologic Unit 09030002, in Superior National Forest, on left bank 350 ft downstream from bridge on Forest Route 491, 3.5 mi upstream from mouth, and 3.5 mi west of city of Crane Lake.

DRAINAGE AREA.-- 906 mi².

PERIOD OF RECORD.--August 1979 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,180 ft above sea level, from topographic map.

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 1979 reached a stage of 15.15 ft, from high-water mark, discharge, about 4,600 ft³/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	DAILY MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	935	1670	798	558	426	366	337	3080	1720	926	512	344
2	1700	1650	784	548	400	364	336	3070	1650	927	499	332
3	1950	1600	776	535	384	360	335	3040	1630	892	485	328
4	2100	e1550	756	522	377	360	335	3000	1580	850	490	315
5	2110	e1480	751	505	375	359	340	2950	1520	805	519	306
6	2010	e1410	729	486	379	355	341	2890	1480	807	536	302
7	1870	e1350	708	470	e375	e350	341	2830	1440	807	548	305
8	1710	e1280	697	464	e370	e350	342	2760	1390	836	541	296
9	1560	1210	696	472	e370	e345	345	2700	1330	857	528	285
10	1450	1220	682	478	e370	e340	358	2620	1270	828	517	291
11	1370	1200	661	480	e365	341	426	2550	1220	809	503	281
12	1310	1170	651	483	e365	343	550	2480	1190	801	474	270
13	1260	1140	646	482	e365	358	612	2410	1170	780	464	260
14	1210	1110	664	476	e365	373	690	2330	1130	759	530	251
15	1190	1090	679	457	e370	359	762	2260	1080	791	551	240
16	1170	1060	688	447	e370	367	880	2200	1060	815	556	231
17	1160	1040	680	447	e370	346	1100	2200	1020	799	536	223
18	1120	1020	673	455	e370	331	1490	2340	976	788	499	216
19	1120	997	663	460	e370	341	e2000	2500	941	767	463	208
20	1120	981	650	475	e370	348	e2600	2570	902	742	442	200
21	1130	950	638	489	372	346	e2800	2590	846	715	418	199
22	1160	925	630	494	369	341	e2950	2580	792	693	529	201
23	1170	905	621	487	367	338	3000	2520	749	660	610	203
24	1200	874	612	479	364	336	2950	2440	725	632	618	205
25	1240	864	600	463	368	335	3010	2350	696	616	581	198
26	1280	863	592	448	e368	332	3070	2250	701	598	530	208
27	1360	845	587	443	369	325	3080	2150	704	586	484	273
28	1520	826	578	437	362	326	3050	2060	698	573	445	363
29	1630	814	570	435	363	326	3050	1970	782	566	411	402
30	1690	806	565	438	---	328	3070	1880	906	547	383	408
31	1710	---	563	433	---	331	---	1800	---	528	363	---
TOTAL	44515	33900	20588	14746	10808	10720	44550	77370	33298	23100	15565	8144
MEAN	1436	1130	664	476	373	346	1485	2496	1110	745	502	271
MAX	2110	1670	798	558	426	373	3080	3080	1720	927	618	408
MIN	935	806	563	433	362	325	335	1800	696	528	363	198
AC-FT	88300	67240	40840	29250	21440	21260	88360	153500	66050	45820	30870	16150
CFSM	1.58	1.25	.73	.53	.41	.38	1.64	2.75	1.23	.82	.55	.30
IN.	1.83	1.39	.85	.61	.44	.44	1.83	3.18	1.37	.95	.64	.33

e Estimated.

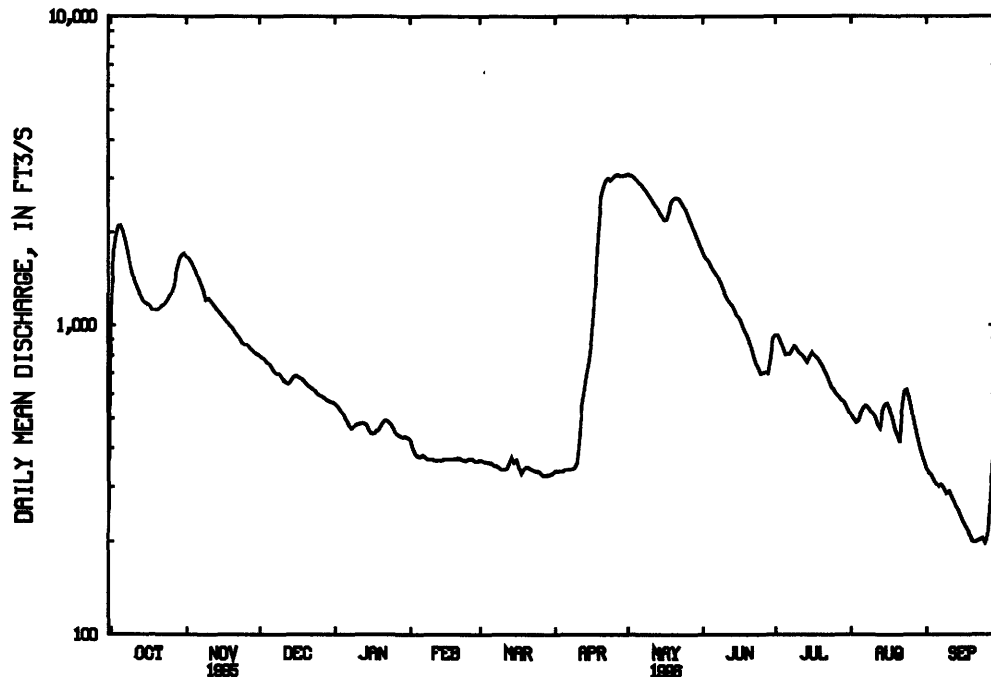
LAKE OF THE WOODS BASIN

05129115 VERMILION RIVER NEAR CRANE LAKE, MN

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1979 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT
MEAN	620	546	418	295	242	292	1115	1435	980	811	508	504
MAX	1436	1138	872	476	373	574	1641	2496	1840	1609	1612	1887
(WY)	1996	1983	1983	1996	1996	1995	1986	1996	1985	1985	1988	1987
MIN	181	152	116	97.8	94.1	89.5	627	507	205	113	60.0	103
(WY)	1980	1988	1988	1988	1988	1988	1987	1980	1980	1980	1980	1984

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1979 - 1996
ANNUAL TOTAL	213468	337304	
ANNUAL MEAN	585	922	650
HIGHEST ANNUAL MEAN			922
LOWEST ANNUAL MEAN			326
HIGHEST DAILY MEAN	2110	Oct 5	3080
LOWEST DAILY MEAN	110	Aug 17	198
ANNUAL SEVEN-DAY MINIMUM	125	Aug 12	202
INSTANTANEOUS PEAK FLOW			3100
INSTANTANEOUS PEAK STAGE			13.38
INSTANTANEOUS LOW FLOW			194
ANNUAL RUNOFF (AC-FT)	423400	669000	471200
ANNUAL RUNOFF (CFSM)	.65	1.02	.72
ANNUAL RUNOFF (INCHES)	8.76	13.85	9.75
10 PERCENT EXCEEDS	1160	2200	1440
50 PERCENT EXCEEDS	483	635	443
90 PERCENT EXCEEDS	158	336	168



— 05129115 VERMILION RIVER NR CRANE LAKE, MN

LAKE OF THE WOODS BASIN

05129400 RAINY LAKE NEAR FORT FRANCES, ONTARIO
(International Gaging Station)

LOCATION.--Lat 48°38'30", long 93°20'00", at Five Mile dock, approximately 5 mi northeast of city of Fort Frances.

PERIOD OF RECORD.--January 1910 to September 1917 and October 1934 to current year, in reports of Geological Survey. August 1911 to current year, in reports of Water Survey of Canada. Prior to October 1949, published as "at Ranier, Minn.", and as "at Fort Frances, Ontario" October 1949 to September 1964.

GAGE.--Water-stage recorder. Datum of gage is sea level (United States and Canadian Boundary Survey). January 1910 to December 1949, nonrecording gage 3 mi northeast at Ranier, Minn., at same datum. January 1950 to October 1964, water-stage recorder on Government dock at Pither's Point at Fort Frances, and supplementary gage in town pumping station, 0.5 mi south, used during winter months, at same datum.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation observed, 1,112.97 ft, July 5, 1950; minimum observed, 1,101.26 ft, Apr. 17, 1923, Apr. 2, 1930.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1109.27 ft, June 12; maximum daily elevation, 1109.21 ft, June 9-12; minimum 1105.19 ft, Apr. 2, minimum daily, 1105.20 ft, Apr. 1, 2.

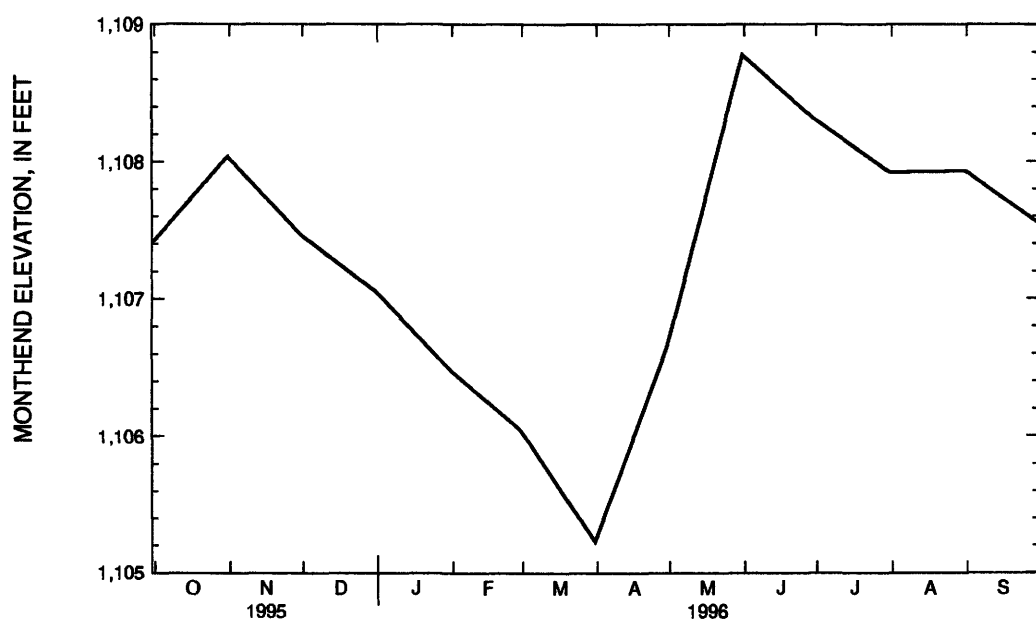
MONTHEND ELEVATION, IN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Oct. 31	1108.04	Feb. 29	1106.05	June 30	1108.31
Nov. 30	1107.47	Mar. 31	1105.23	July 31	1107.92
Dec. 31	1107.05	Apr. 30	1106.65	Aug. 31	1107.93
Jan. 31	1106.48	May 31	1108.78	Sept. 30	1107.55

NOTE.--Elevations other than those shown are available.

LAKE OF THE WOODS BASIN

05129400 RAINY LAKE NEAR FORT FRANCES, ONTARIO--Continued



LAKE OF THE WOODS BASIN
05130500 STURGEON RIVER NEAR CHISHOLM, MN

LOCATION.--Lat 47°40'25", long 92°54'00", in NE¹/₄NW¹/₄ sec.20, T.60 N., R.20 W., St. Louis County, Hydrologic Unit 09030005, on left bank 1,000 ft upstream from highway bridge, 0.6 mi downstream from East Branch Sturgeon River, and 11.5 mi north of Chisholm.

DRAINAGE AREA.--187 mi².

PERIOD OF RECORD.--August 1942 to current year.

REVISED RECORDS.--WSP 1438; 1946.

GAGE.--Water-stage recorder. Datum of gage is 1,305.7 ft above sea level. Prior to Aug. 24, 1944, nonrecording gage at site 1,000 ft downstream at different datum. Aug. 25, 1944, to Sept. 30, 1975, at present site at datum 1.00 ft higher.

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

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	0900	*1960	*6.21	May 20	0700	598	4.07
Oct. 29	2300	568	4.00	June 29	0600	820	4.53
Apr. 20	1800	1780	5.98				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1250	471	e115	e60	e40	e31	e36	811	194	620	129	53
2	1620	430	e115	e55	e38	e32	e36	759	193	504	120	61
3	1920	396	e115	e55	e36	e32	e36	704	222	386	116	63
4	1660	358	e112	e55	e35	e33	e36	650	257	300	114	60
5	1300	326	e110	e55	e34	e34	e36	603	270	246	128	59
6	998	296	e105	e55	e34	e34	e36	564	269	215	132	57
7	774	e255	e100	e50	e33	e35	e36	526	254	213	143	55
8	609	e240	e95	e50	e33	e36	e37	494	230	214	144	50
9	509	e240	e95	e50	e32	e36	e38	465	203	219	141	44
10	453	e230	e90	e50	e32	e36	e39	443	184	195	132	43
11	417	e210	e90	e50	e31	e36	e41	412	160	191	124	43
12	387	e210	e85	e45	e31	e36	e44	380	141	198	111	41
13	355	e200	e85	e45	e30	e36	e50	355	126	222	98	40
14	335	e190	e85	e45	e30	e36	e60	336	117	240	94	40
15	322	e175	e80	e45	e29	e36	e80	324	110	245	90	40
16	305	e170	e80	e45	e29	e36	e150	329	104	247	85	39
17	289	e170	e80	e45	e28	e36	e300	351	98	225	80	38
18	269	e165	e75	e45	e27	e36	704	516	94	215	76	38
19	265	e160	e75	e45	e27	e36	1310	577	92	206	74	38
20	268	e155	e75	e45	e27	e36	1720	592	91	191	72	37
21	272	e150	e70	e40	e28	e36	1700	540	89	180	69	39
22	272	e140	e70	e40	e28	e36	1570	475	91	180	77	42
23	275	e135	e70	e40	e29	e36	1390	410	88	170	71	42
24	294	e130	e70	e40	e30	e36	1210	360	87	167	69	44
25	315	e130	e65	e40	e31	e36	1120	322	86	158	66	45
26	340	e125	e65	e40	e31	e36	1060	293	284	149	64	52
27	402	e125	e65	e40	e31	e36	1030	269	497	146	61	74
28	494	e120	e65	e40	e31	e36	972	246	645	159	59	98
29	551	e120	e60	e40	e31	e36	911	228	799	155	57	102
30	561	e120	e60	e40	---	e36	857	215	719	148	55	95
31	525	---	e60	e40	---	e36	---	202	---	139	54	---
TOTAL	18606	6342	2582	1430	906	1095	16645	13751	6794	7043	2905	1572
MEAN	600	211	83.3	46.1	31.2	35.3	555	444	226	227	93.7	52.4
MAX	1920	471	115	60	40	36	1720	811	799	620	144	102
MIN	265	120	60	40	27	31	36	202	86	139	54	37
AC-FT	36900	12580	5120	2840	1800	2170	33020	27280	13480	13970	5760	3120
CFSM	3.21	1.13	.45	.25	.17	.19	2.97	2.37	1.21	1.21	.50	.28
IN.	3.70	1.26	.51	.28	.18	.22	3.31	2.74	1.35	1.40	.58	.31

e Estimated.

LAKE OF THE WOODS BASIN

05130500 STURGEON RIVER NEAR CHISHOLM, MN--Continued

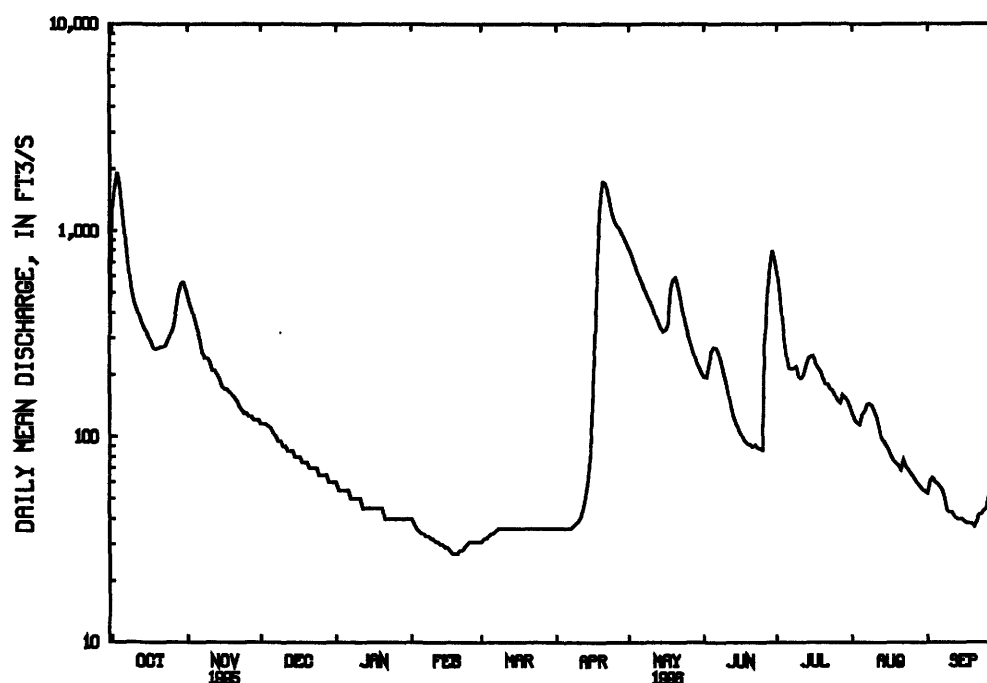
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	122	92.0	47.0	28.6	22.9	49.8	365	306	186	120	72.3	94.1
MAX	600	264	115	66.0	47.7	337	868	1451	528	623	268	424
(WY)	1996	1978	1978	1966	1984	1945	1948	1950	1944	1993	1988	1977
MIN	7.85	8.90	4.82	3.98	4.54	10.0	41.0	22.9	14.7	5.99	12.6	4.60
(WY)	1977	1977	1977	1977	1977	1957	1977	1977	1988	1988	1961	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1942 - 1996	
ANNUAL TOTAL	57267		79671			
ANNUAL MEAN	157		218		126	
HIGHEST ANNUAL MEAN					218	
LOWEST ANNUAL MEAN					63.1	
HIGHEST DAILY MEAN	1920		1920		3530	
LOWEST DAILY MEAN	27		27		2.5	
ANNUAL SEVEN-DAY MINIMUM	27		28		3.0	
INSTANTANEOUS PEAK FLOW			1960		3630 ^a	
INSTANTANEOUS PEAK STAGE			6.21		7.41 ^b	
ANNUAL RUNOFF (AC-FT)	113600		158000		91080	
ANNUAL RUNOFF (CFMS)	.84		1.16		.67	
ANNUAL RUNOFF (INCHES)	11.39		15.85		9.13	
10 PERCENT EXCEEDS	308		530		298	
50 PERCENT EXCEEDS	100		95		58	
90 PERCENT EXCEEDS	33		36		17	

^a From rating extended above 1600 ft³/s, on basis of slope-area measurement of peak flow.

^b Present datum.



— 05130500 STURGEON RIVER NEAR CHISHOLM, MN

LAKE OF THE WOODS BASIN

05131448 WOOD DUCK RIVER NEAR NETT LAKE, MN

LOCATION.-- Lat 48°09'24", long 93°08'20", in SW¹/₄/SW¹/₄ sec. 35, T.66 N., R.22 W., Koochiching County, Hydrologic Unit 0903000, at bridge on Indian Service Road, 2.9 miles above mouth at Nett Lake, and 3.5 miles northwest of the town of Nett Lake.

PERIOD OF RECORD.-- October 1995 to current year.

GAGE.-- Water-stage recorder. Elevation of gage 1,275 ft above mean sea level (from topographic map).

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

EXTREMES OUTSIDE PERIOD OF RECORD.-- A discharge of 1.3 ft³/s was measure Sept 19, 1995.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	119	e47	e12	e3.8	e1.8	e1.8	e2.7	281	20	34	15	30
2	196	e44	e12	e3.7	e1.8	e1.8	e2.7	246	18	27	14	28
3	221	e42	e11	e3.5	e1.8	e1.8	e2.8	246	14	22	13	26
4	187	e40	e11	e3.4	e1.8	e1.8	e2.8	222	12	17	15	25
5	137	e38	e10	e3.3	e1.8	e1.8	e2.9	214	9.4	14	27	25
6	99	e36	e9.8	e3.2	e1.8	e1.8	e3.0	202	8.7	15	29	24
7	75	e34	e9.7	e3.1	e1.8	e1.8	e3.2	194	7.6	28	32	25
8	60	e32	e9.4	e3.0	e1.8	e1.8	e3.5	190	6.7	72	30	26
9	52	e30	e9.0	e2.9	e1.8	e1.8	e4.0	194	5.8	59	29	26
10	48	e29	e8.7	e2.8	e1.8	e1.8	e5.0	169	4.9	47	28	25
11	42	e28	e8.3	e2.7	e1.8	e1.8	e6.4	132	4.0	44	26	23
12	37	e26	e8.0	e2.6	e1.8	e1.8	e7.0	106	3.6	42	24	23
13	33	e25	e7.8	e2.5	e1.8	e1.9	e7.6	90	3.1	39	23	22
14	31	e24	e7.4	e2.5	e1.8	e2.0	e9.4	78	2.8	33	24	22
15	33	e23	e7.0	e2.4	e1.8	e2.1	e13	70	2.8	31	25	21
16	32	e22	e6.8	e2.3	e1.8	e2.3	e30	65	2.9	31	23	21
17	29	e22	e6.6	e2.3	e1.8	e2.4	e60	79	2.8	28	22	20
18	29	e21	e6.4	e2.2	e1.8	e2.5	e100	175	2.6	37	22	20
19	31	e20	e6.2	e2.1	e1.8	e2.6	e170	258	2.5	45	21	19
20	35	e19	e6.0	e2.1	e1.8	e2.7	e280	210	2.4	41	20	18
21	38	e18	e5.8	e2.0	e1.8	e2.7	e270	149	2.2	42	21	18
22	40	e17	e5.6	e2.0	e1.8	e2.7	e250	136	2.1	42	76	18
23	41	e17	e5.4	e2.0	e1.8	e2.7	e220	115	1.9	32	230	18
24	e43	e16	e5.2	e1.9	e1.8	e2.7	e200	91	1.9	29	204	18
25	e46	e16	e5.0	e1.9	e1.8	e2.7	e190	70	1.8	29	119	18
26	e47	e15	e4.8	e1.9	e1.8	e2.7	e240	56	6.8	28	76	19
27	e48	e15	e4.6	e1.9	e1.8	e2.7	e230	46	11	24	56	22
28	e49	e14	e4.4	e1.9	e1.8	e2.7	213	39	11	22	45	25
29	e50	e13	e4.3	e1.9	e1.8	e2.7	206	32	22	20	39	25
30	e50	e13	e4.1	e1.9	---	e2.7	232	25	36	18	35	25
31	e49	---	e3.9	e1.9	---	e2.7	---	22	---	16	32	---
TOTAL	2027	756	226.2	77.6	52.2	69.8	2967.0	4202	233.3	1008	1395	675
MEAN	65.4	25.2	7.30	2.50	1.80	2.25	98.9	136	7.78	32.5	45.0	22.5
MAX	221	47	12	3.8	1.8	2.7	280	281	36	72	230	30
MIN	29	13	3.9	1.9	1.8	1.8	2.7	22	1.8	14	13	18
AC-FT	4020	1500	449	154	104	138	5890	8330	463	2000	2770	1340

e Estimated.

LAKE OF THE WOODS BASIN

05131448 WOOD DUCK RIVER NEAR NETT LAKE, MN--Continued

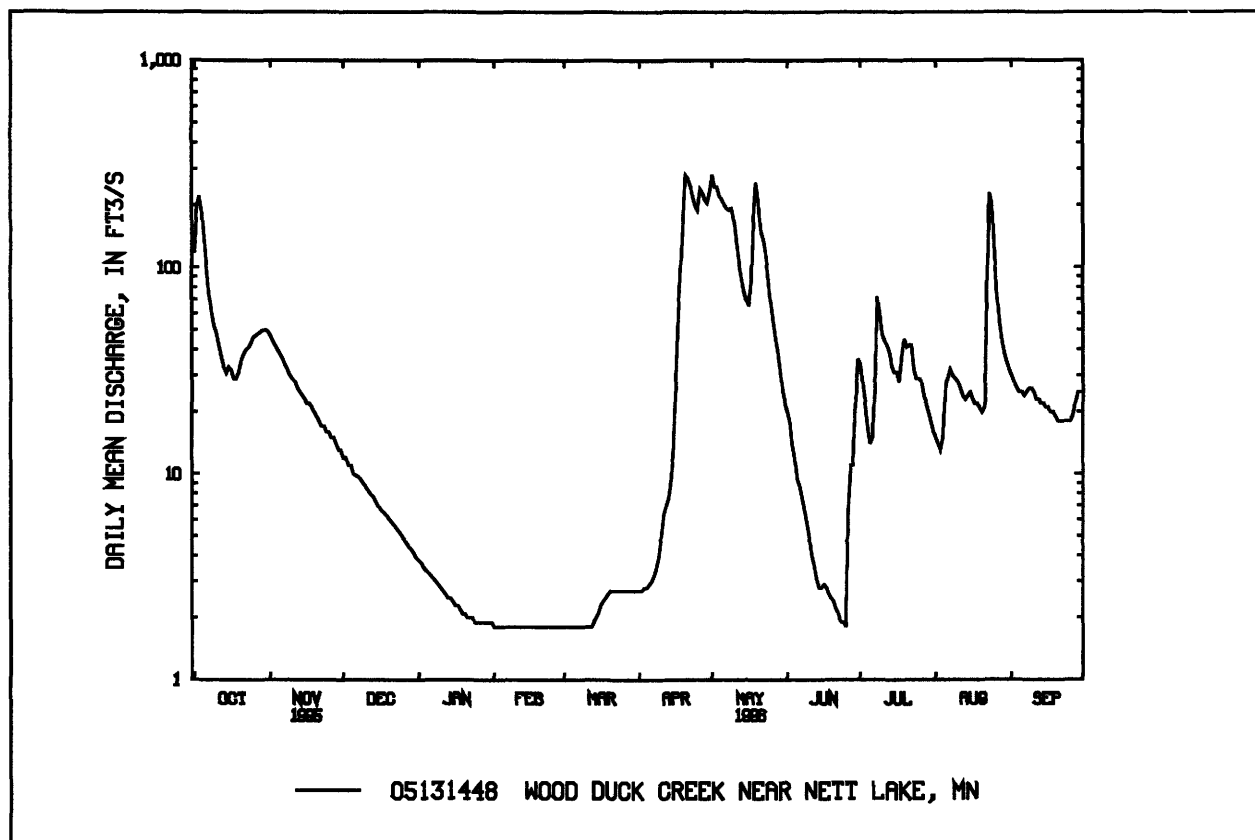
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	65.4	25.2	7.30	2.50	1.80	2.25	98.9	136	7.78	32.5	45.0	22.5
MAX	65.4	25.2	7.30	2.50	1.80	2.25	98.9	136	7.78	32.5	45.0	22.5
(WY)	1996	1996	1996	1996	1996	1996	1996	1996	1996	1996	1996	1996
MIN	65.4	25.2	7.30	2.50	1.80	2.25	98.9	136	7.78	32.5	45.0	22.5
(WY)	1996	1996	1996	1996	1996	1996	1996	1996	1996	1996	1996	1996

SUMMARY STATISTICS

FOR 1996 WATER YEAR

ANNUAL TOTAL	13689.1	
ANNUAL MEAN	37.4	
HIGHEST DAILY MEAN	281	May 1
LOWEST DAILY MEAN	1.8	Feb 1 to Mar 12, June 25.
ANNUAL SEVEN-DAY MINIMUM	1.8	Feb 1
INSTANTANEOUS PEAK FLOW	322	May 1
INSTANTANEOUS PEAK STAGE	11.52 ^a	Apr 20
INSTANTANEOUS LOW FLOW	1.7	Jun 25
ANNUAL RUNOFF (AC-FT)	27150	
10 PERCENT EXCEEDS	116	
50 PERCENT EXCEEDS	18	
90 PERCENT EXCEEDS	1.8	

^a Backwater from ice.

LAKE OF THE WOODS BASIN

05131455 NETT LAKE RIVER NEAR NETT LAKE, MN

LOCATION.--Lat 48°06'36", long 93°11'12", in NE¹/₄NE¹/₄ sec. 20, T.65 N., R.22 W., Koochiching County, Hydrologic Unit 09030005, downstream from dam at outlet of Nett Lake, 4 miles west of the town of Nett Lake.

PERIOD OF RECORD.--October 1995 to current year.

GAGE.--Water-stage recorder. Elevation of gage 1,270 ft above mean sea level (from topographic map).

REMARKS.--Records good except those for winter period, which are fair. Regulation from Nett Lake Dam upstream of gage.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	e185	e98	e61	e44	e33	e22	658	281	.44	5.2	3.7
2	60	e190	e96	e60	e43	e32	e22	659	266	.38	5.1	3.3
3	94	e190	e94	e60	e43	e32	e22	661	245	.11	4.3	3.3
4	121	e190	e92	e59	e42	e32	e22	659	239	.09	5.0	3.4
5	150	e185	e90	e58	e42	e32	e22	650	231	.06	6.0	3.5
6	155	e180	e88	e58	e41	e31	e22	641	231	.00	5.9	1.5
7	158	e180	e87	e57	e41	e31	e22	628	206	.04	5.7	9.0
8	164	e175	e86	e57	e40	e31	e22	618	193	.56	5.0	12
9	171	e170	e85	e56	e39	e31	e23	602	180	.14	4.8	12
10	172	e165	e84	e55	e39	e30	e24	592	172	.09	3.0	11
11	167	e160	e83	e55	e38	e30	e28	559	162	.19	.06	9.4
12	168	e155	e82	e54	e38	e30	e32	531	144	.42	.01	14
13	154	e150	e80	e54	e37	e30	e38	502	90	1.3	.00	12
14	154	e147	e79	e53	e37	e30	e47	484	4.3	1.5	.00	11
15	156	e143	e78	e52	e37	e30	e60	464	6.1	4.6	.00	11
16	163	e140	e77	e52	e36	e29	e74	457	7.5	3.4	.00	11
17	135	e137	e76	e51	e36	e29	e95	471	11	.15	.00	9.4
18	159	e133	e75	e50	e36	e28	e130	477	10	1.6	.00	8.7
19	157	e130	e74	e50	e35	e27	e160	483	3.8	3.6	.00	8.6
20	162	e127	e73	e49	e35	e26	e200	492	.01	3.3	.00	11
21	159	e123	e72	e49	e35	e25	e280	496	.00	3.1	.28	9.5
22	156	e120	e71	e48	e34	e24	e380	499	.00	1.4	1.8	9.4
23	170	e117	e70	e48	e34	e23	e480	504	.00	3.3	.88	9.5
24	166	e113	e69	e47	e34	e22	e540	473	.00	6.4	.46	8.8
25	161	e110	e68	e47	e33	e22	e570	445	.00	4.5	1.5	12
26	174	e107	e67	e46	e33	e22	e590	424	1.1	.44	3.0	30
27	188	e105	e66	e46	e33	e22	e610	405	.49	.05	2.9	23
28	182	e103	e65	e45	e33	e22	e620	378	.16	.03	3.0	23
29	180	e102	e64	e45	e33	e22	e640	351	1.9	.07	4.9	29
30	182	e100	e63	e45	---	e22	652	321	1.2	.09	3.7	45
31	e183	---	e62	e44	---	e22	---	301	---	2.3	3.6	---
TOTAL	4754	4332	2414	1611	1081	852	6449	15885	2687.56	43.65	76.09	368.0
MEAN	153	144	77.9	52.0	37.3	27.5	215	512	89.6	1.41	2.45	12.3
MAX	188	190	98	61	44	33	652	661	281	6.4	6.0	45
MIN	33	100	62	44	33	22	22	301	.00	.00	.00	1.5
AC-FT	9430	8590	4790	3200	2140	1690	12790	31510	5330	87	151	730

e Estimated.

LAKE OF THE WOODS BASIN

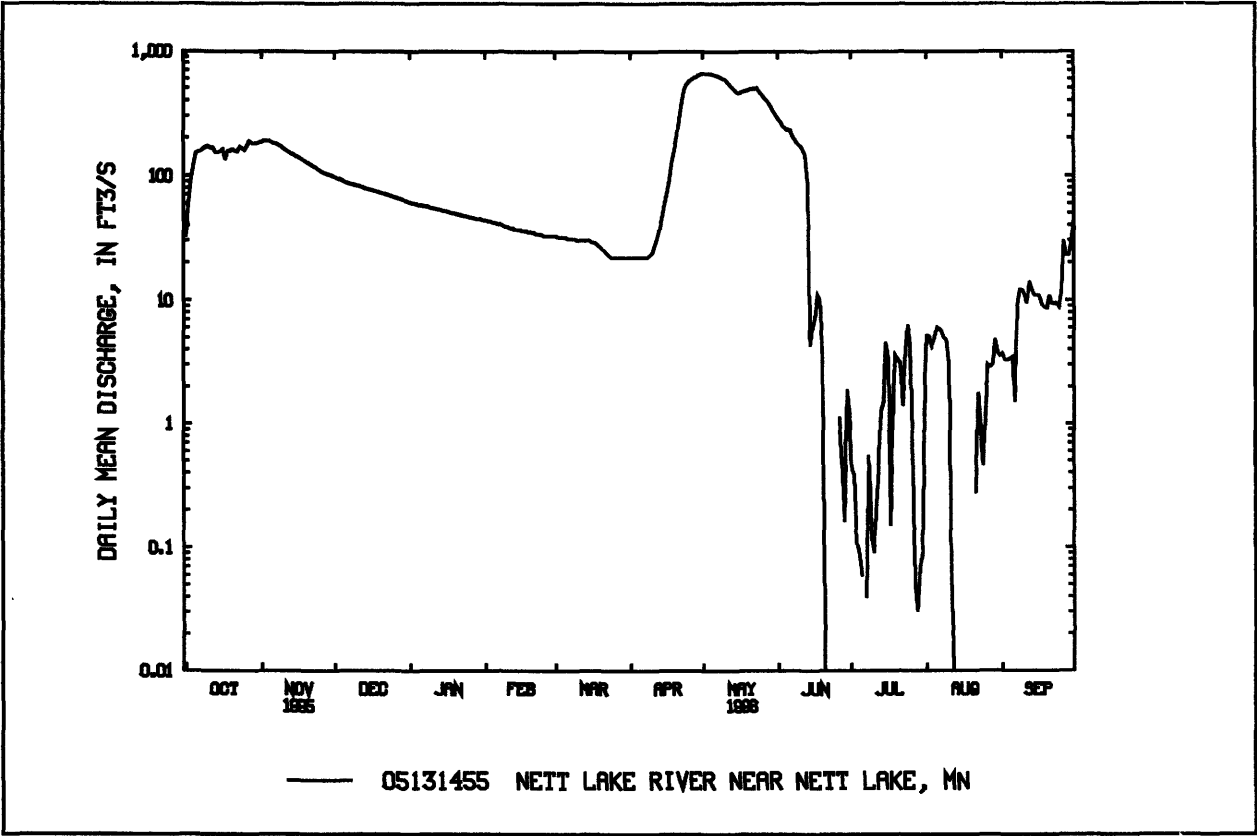
05131455 NETT LAKE RIVER NEAR NETT LAKE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	153	144	77.9	52.0	37.3	27.5	215	512	89.6	1.41	2.45	12.3
MAX	153	144	77.9	52.0	37.3	27.5	215	512	89.6	1.41	2.45	12.3
(WY)	1996	1996	1996	1996	1996	1996	1996	1996	1996	1996	1996	1996
MIN	153	144	77.9	52.0	37.3	27.5	215	512	89.6	1.41	2.45	12.3
(WY)	1996	1996	1996	1996	1996	1996	1996	1996	1996	1996	1996	1996

SUMMARY STATISTICS FOR 1996 WATER YEAR

ANNUAL TOTAL	40553.30
ANNUAL MEAN	111
HIGHEST DAILY MEAN	661 May 3
LOWEST DAILY MEAN	.00 Jun 21-25, July 6, Aug 13-20.
ANNUAL SEVEN-DAY MINIMUM	.00 Aug 13
INSTANTANEOUS PEAK FLOW	663 May 1
INSTANTANEOUS PEAK STAGE	5.08 May 1
ANNUAL RUNOFF (AC-FT)	80440
10 PERCENT EXCEEDS	379
50 PERCENT EXCEEDS	44
90 PERCENT EXCEEDS	.48



LAKE OF THE WOODS BASIN

05131500 LITTLE FORK RIVER AT LITTLEFORK, MN

LOCATION.--Lat 48°23'45", long 93°32'57", in NE1/4SE1/4 sec.9, T.68 N., R.25 W., Koochiching County, Hydrologic Unit 09030005, on right bank at town of Littlefork, 0.9 mi upstream from bridge on State Highway 217, 2.8 mi upstream from Beaver Creek, and 19 mi upstream from mouth.

DRAINAGE AREA.--1,730 mi², approximately.

PERIOD OF RECORD.--June to November 1909, April to November 1910, April 1911 to June 1917, September 1917, October 1917 to March 1919 (gage heights only), June 1928 to current year.

REVISED RECORDS.--WSP 955: Drainage area. WSP 1508: 1913, 1916, 1928-32, 1934. WRD MN-74: 1963.

GAGE.--Water-stage recorder. Datum of gage is 1,083.59 ft above sea level. June 23, 1909, to Mar. 4, 1917, nonrecording gage and July 21, 1937, to Oct. 23, 1979, water-stage recorder at site 1.2 mi downstream at datum 10.53 ft lower; Mar. 5 to Sept. 30, 1917, and June 22, 1928, to July 20, 1937, non-recording gage at site 1.18 mi downstream at datum 10.53 ft lower.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1600	3850	e710	e319	e208	e206	e230	e8750	1420	2700	615	253
2	7510	3590	e700	e311	e208	e205	e230	e8010	1280	2520	550	230
3	10400	3320	e680	e302	e208	e205	e230	e7600	1200	2190	496	215
4	11100	3030	e660	e298	e208	e205	e230	e7050	1160	1770	463	209
5	10900	2520	e640	e290	e208	e205	e230	e6500	1100	1390	460	208
6	e9700	2390	e620	e285	e208	e204	e232	6100	1150	1110	615	211
7	e8100	2330	e600	e280	e208	e204	e233	5690	1210	940	725	230
8	e6900	2080	e585	e273	e208	e204	e235	5330	1200	856	794	217
9	e5600	e1930	e565	e269	e208	e203	e240	5000	1120	826	788	237
10	e4700	e1880	e550	e262	e208	e203	e250	4700	1010	887	753	250
11	4020	e1780	e535	e258	e208	e204	e260	4360	893	930	717	236
12	3710	e1680	e520	e250	e208	e206	e270	4090	798	960	651	231
13	3300	e1600	e505	e246	e208	e210	e285	3780	713	975	576	221
14	2940	e1500	e498	e237	e208	e215	e310	3490	619	975	506	206
15	2700	e1400	e488	e234	e207	e220	e410	3270	524	942	442	199
16	2530	e1300	e475	e228	e207	e225	e700	3120	418	1030	399	191
17	2360	e1250	e462	e222	e207	e230	e1200	3210	376	1200	391	182
18	2170	e1200	e451	e220	e207	e235	e2100	4260	360	1220	368	174
19	2040	e1180	e440	e218	e206	e240	e3600	5800	348	1350	328	173
20	2160	e1130	e430	e217	e206	e245	e5900	5990	323	1260	301	171
21	2330	e1070	e420	e216	e206	e248	e11300	5690	295	1090	291	162
22	2390	e1030	e410	e212	e206	e252	e13900	5350	278	969	298	162
23	2460	e1000	e400	e211	e206	e257	e14300	4910	269	878	687	162
24	2540	e960	e390	e210	e206	e262	e13200	4340	261	847	663	164
25	2600	e920	e380	e209	e206	e260	e11800	3820	250	814	563	164
26	2730	e890	e371	e209	e206	e258	e10500	3320	282	744	498	168
27	2970	e850	e362	e209	e206	e255	e9600	2830	788	676	437	194
28	3310	e810	e350	e209	e206	e248	e9300	2380	1090	640	384	264
29	3940	e780	e341	e208	e206	e245	e9200	2040	1880	626	348	427
30	4130	e750	e337	e208	---	e240	e9010	1800	2730	657	310	532
31	4120	---	e328	e208	---	e235	---	1590	---	672	275	---
TOTAL	137960	50000	15203	7528	6006	7034	129485	144170	25345	34644	15692	6643
MEAN	4450	1667	490	243	207	227	4316	4651	845	1118	506	221
MAX	11100	3850	710	319	208	262	14300	8750	2730	2700	794	532
MIN	1600	750	328	208	206	203	230	1590	250	626	275	162
AC-FT	273600	99170	30160	14930	11910	13950	256800	286000	50270	68720	31130	13180
CFSM	2.57	.96	.28	.14	.12	.13	2.49	2.69	.49	.65	.29	.13
IN.	2.97	1.08	.33	.16	.13	.15	2.78	3.10	.54	.74	.34	.14

e Estimated.

LAKE OF THE WOODS BASIN

05131500 LITTLE FORK RIVER AT LITTLEFORK, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1996, BY WATER YEAR (WY)

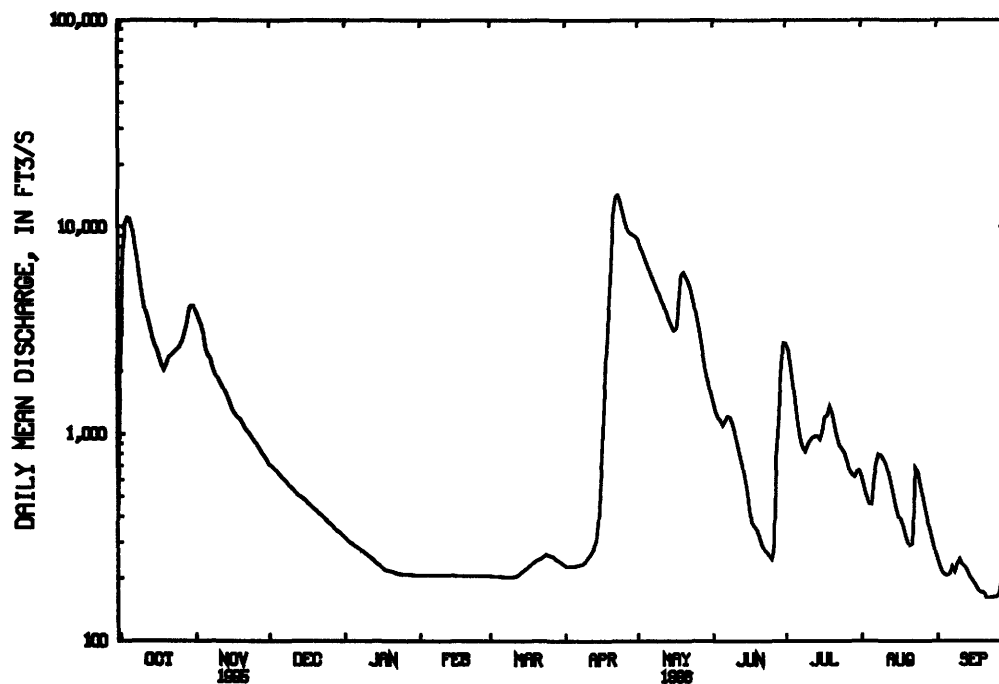
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	907	695	307	146	111	278	3159	2891	1771	977	553	743
MAX	4450	3044	972	477	270	3022	8421	12190	5490	3643	2679	518 ^a
(WY)	1996	1972	1983	1966	1969	1945	1966	1950	1944	1944	1988	1977
MIN	43.4	60.8	52.6	43.5	42.2	50.2	292	173	182	75.4	34.3	29.2
(WY)	1977	1977	1977	1931	1963	1940	1977	1977	1988	1988	1936	197 ^c

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1909 - 1996
ANNUAL TOTAL	399500	579710	
ANNUAL MEAN	1095	1584	1060
HIGHEST ANNUAL MEAN			1912
LOWEST ANNUAL MEAN			306
HIGHEST DAILY MEAN	11100	Oct 4	14300
LOWEST DAILY MEAN	106	Mar 1	162
ANNUAL SEVEN-DAY MINIMUM	106	Mar 1	165
INSTANTANEOUS PEAK FLOW		14300g	Apr 23
INSTANTANEOUS PEAK STAGE		23.60g	Apr 25
INSTANTANEOUS LOW FLOW		160	Sep 21
ANNUAL RUNOFF (AC-FT)	792400	1150000	768200
ANNUAL RUNOFF (CFSM)	.63	.92	.61
ANNUAL RUNOFF (INCHES)	8.59	12.47	8.33
10 PERCENT EXCEEDS	2530	4350	2800
50 PERCENT EXCEEDS	570	513	360
90 PERCENT EXCEEDS	160	206	85

a Estimated, daily mean discharge.

b Also occurred May 11, 1950, site and datum then in use.

c From highwater mark, backwater from ice.



— 05131500 LITTLE FORK RIVER AT LITTLEFORK, MN

LAKE OF THE WOODS BASIN

05133500 RAINY RIVER AT MANITOU RAPIDS, MN

(International Gaging Station)

LOCATION.--Lat 48°38'04", long 93°54'47", in NW¹/₄SE¹/₄ sec.36, T.160 N., R.26 W., Koochiching County, Hydrologic Unit 09030004, on left bank at Manitou Rapids, 4 mi west of Indus.

DRAINAGE AREA.--19,400 mi², approximately.

PERIOD OF RECORD.--July 1928 to current year. Monthly discharge only for some periods, published in WSP 1308. October 1911 to October 1924 (gage heights only) at site near Birchdale in files of U.S. Army Corps of Engineers. Published as "near Birchdale" 1932-34.

GAGE.--Water-stage recorder. Datum of gage is 1,062.48 ft above sea level. Prior to Nov. 10, 1934, nonrecording gage at site near Birchdale, 7 mi. downstream at different datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Satellite telemeter at station. Diurnal fluctuation caused by powerplant at International Falls. Some regulation at low and medium flows by Rainy and Namakan Lakes.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5290	24000	e15500	e12600	e7770	e10700	e10500	46200	37700	36900	17300	13700
2	8180	26000	e15100	e12200	e7700	e10800	8760	45900	37400	36500	16300	13000
3	15700	28400	e14300	e12900	e7520	e10700	7280	45000	37800	35400	15700	10900
4	22600	29000	e14100	e12400	e7690	e11000	6850	43800	38500	33900	15600	11700
5	26300	28500	e14200	e12400	e7870	e10700	6810	42700	38600	31800	16200	12300
6	28100	28000	e14000	e12200	e7800	e10500	6780	41700	39100	28900	19700	12900
7	27000	27500	e13800	e12300	e7860	e10700	6770	40900	39500	27500	21500	13400
8	25200	26300	e13300	e12200	e7680	e10300	6770	40200	39500	27200	22100	13500
9	23200	23500	e14200	e12200	e7720	e10700	6760	39600	39100	26600	22600	13500
10	22100	22200	e14100	e11900	e7730	e10800	6790	39200	38600	21500	24500	13100
11	22300	22200	e14100	e12300	e7510	e10600	6870	38600	38100	18100	25100	13000
12	21900	22100	e13900	e12300	e8010	e10800	7100	37800	37700	17000	24400	13000
13	21200	21800	e14000	e12200	e7750	e10400	7280	37100	37200	16900	22900	12900
14	20600	21200	e14000	e12200	e8600	e11100	7750	36400	36800	16900	22500	13200
15	20100	21200	e14000	e12200	e9720	e10500	8730	35800	36400	17000	22900	13500
16	19800	21300	e14100	e12200	e9540	e11100	9560	35600	35800	19000	22900	13100
17	19300	21900	e13900	e12100	e9450	e10700	10900	36900	35500	19700	20800	11900
18	18900	22100	e14000	e12000	e9540	e10500	13900	40300	35100	22300	19600	10100
19	18400	22100	e13500	e12000	e9270	e11100	19000	43700	34700	25900	18900	9480
20	18500	21900	e14100	e11800	e9630	e11100	22500	46000	34100	27600	15000	9510
21	18800	21800	e13200	e11800	e9450	e11100	25000	46400	33600	27700	13000	9510
22	19100	19600	e12500	e11600	e9450	e11100	28500	45800	33100	26900	13000	11800
23	19300	e17600	e13000	e10700	e9450	11100	34800	44900	32800	23700	13100	13900
24	19400	e17200	e12700	e10500	e9450	10300	35600	43700	32400	22100	14000	11300
25	19500	e17500	e12600	e9540	e9450	e10000	38600	42500	31900	21600	14600	8740
26	19700	e17000	e12700	e8250	e9450	e10000	41400	41400	32400	21300	14300	7390
27	20200	e17000	e12600	e7780	e10300	e10000	43900	40400	33000	21100	13300	7090
28	21800	e15600	e12400	e8040	e11000	e10200	45200	39700	33700	20900	12900	8380
29	22800	e15000	e13000	e7720	e11000	e10500	45700	39000	35700	20700	12600	8290
30	23400	e14900	e12400	e7830	---	e10600	46000	38500	36800	20500	13200	8740
31	23100	---	e12500	e7740	---	e10600	---	38000	---	18500	13600	---
TOTAL	631770	654400	421800	346100	255360	330300	572360	1273700	1082600	751600	554100	342830
MEAN	20380	21810	13610	11160	8806	10650	19080	41090	36090	24250	17870	11430
MAX	28100	29000	15500	12900	11000	11100	46000	46400	39500	36900	25100	13900
MIN	5290	14900	12400	7720	7510	10000	6760	35600	31900	16900	12600	7090
AC-FT	1253000	1298000	836600	686500	506500	655100	1135000	2526000	2147000	1491000	1099000	680000
CFSM	1.05	1.12	.70	.58	.45	.55	.98	2.12	1.86	1.25	.92	.59
IN.	1.21	1.25	.81	.66	.49	.63	1.10	2.44	2.08	1.44	1.06	.66

e Estimated.

LAKE OF THE WOODS BASIN

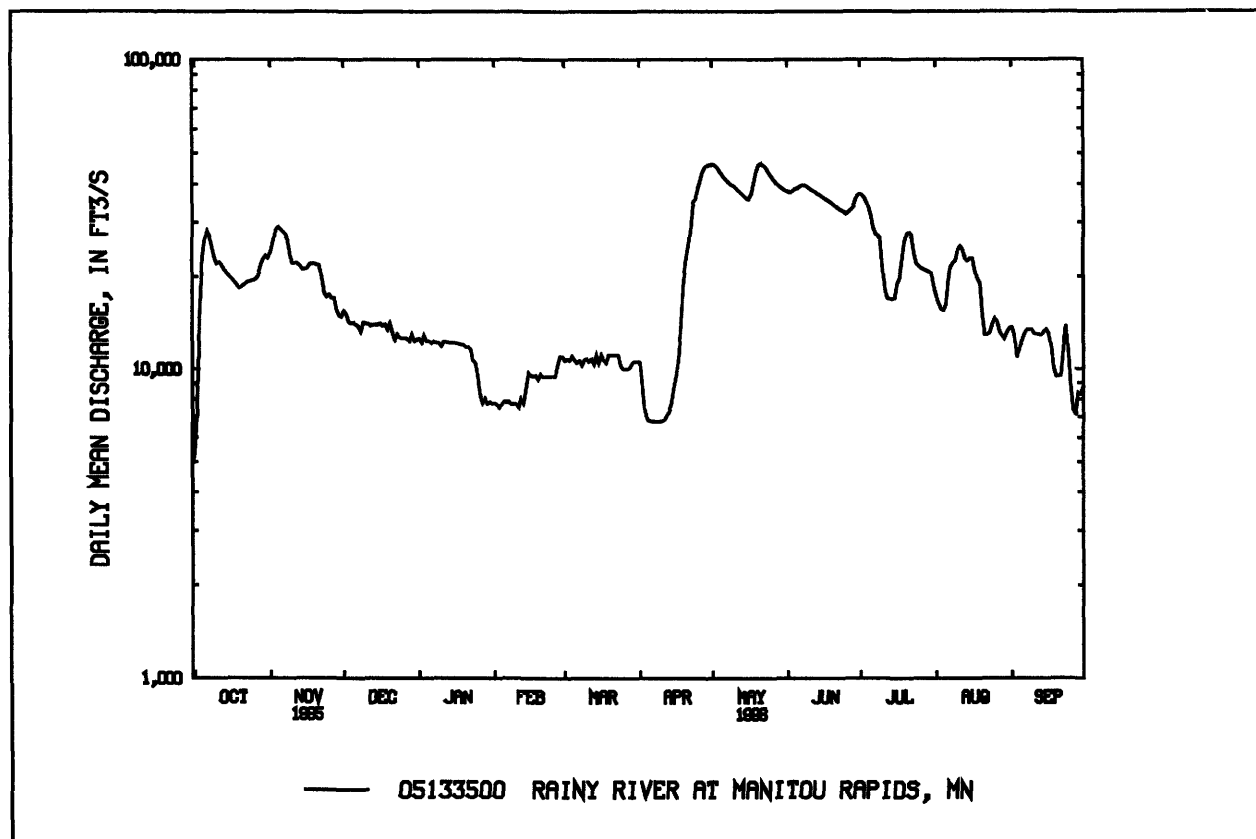
05133500 RAINY RIVER AT MANITOU RAPIDS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	12050	11330	10160	9158	8737	9021	15350	19640	20140	16680	11520	11240
MAX	42410	37280	27790	18430	17240	16640	38100	52880	49480	47970	33700	30620
(WY)	1942	1972	1972	1972	1969	1945	1966	1950	1950	1950	1944	1988
MIN	4728	3796	3190	2900	3129	2926	4378	4106	3676	3483	3422	4168
(WY)	1981	1977	1930	1931	1931	1931	1977	1977	1980	1980	1980	1958

SUMMARY STATISTICS FOR 1995 CALENDAR YEAR FOR 1996 WATER YEAR WATER YEARS 1929 - 1996

ANNUAL TOTAL	4144670	7216920										
ANNUAL MEAN	11360	19720							12930			
HIGHEST ANNUAL MEAN									23260			1950
LOWEST ANNUAL MEAN									4470			1931
HIGHEST DAILY MEAN		29000		Nov 4	46400		May 21	71300		May 11	1950	
LOWEST DAILY MEAN		4400		Jun 27	5290		Oct 1	928		Dec 26	1929	
ANNUAL SEVEN-DAY MINIMUM		4490		Jun 23	6790		Apr 4	1500		Dec 24	1929	
INSTANTANEOUS PEAK FLOW					46500		May 20	71600		May 12	1950	
INSTANTANEOUS PEAK STAGE					15.86		May 20	21.04		May 12	1950	
ANNUAL RUNOFF (AC-FT)	8221000				14310000			9370000				
ANNUAL RUNOFF (CFSM)	.59				1.02			.67				
ANNUAL RUNOFF (INCHES)	7.95				13.84			9.06				
10 PERCENT EXCEEDS	20400				38500			25500				
50 PERCENT EXCEEDS	10300				15000			10300				
90 PERCENT EXCEEDS	4860				8350			5030				



LAKE OF THE WOODS BASIN

05140521 LAKE OF THE WOODS AT SPRINGSTEEL ISLAND NEAR WARROAD, MN

LOCATION.--Lat 48°56'45", long 95°18'24", in SW¹/₄SW¹/₄ sec. 9, T. 163 N., R. 36 W., Roseau County, Hydrologic Unit 09030009, at Springsteel Resort on Springsteel Island, 2.8 mi north of Warroad.

DRAINAGE AREA.--27,200 mi².

PERIOD OF RECORD.--June 1985 to current year.

GAGE.--Water-stage recorder. Datum at gage is 1,000.00 ft above sea level, Lake of the Woods datum.

REMARKS.--Satellite telemeter at station. Water level subject to fluctuation caused by changes in direction and velocity of wind and seiches.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 62.24 ft, July 5, 1989; maximum daily, 61.81 ft, July 6, 7, 1985; minimum, 57.22 ft, Nov. 22, 1990; minimum daily, 57.43 ft, Mar. 18, 19, 20, 1988.

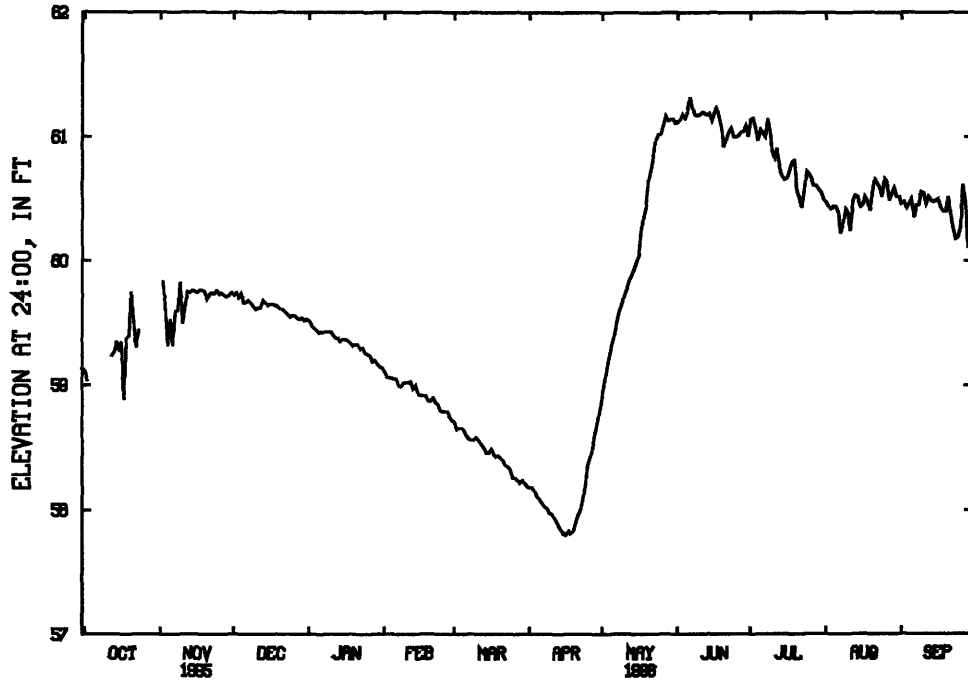
EXTREMES FOR CURRENT YEAR.--Maximum gage height, 61.56 ft, June 29; maximum daily, 61.32 ft, June 6; minimum, 57.77 ft, Apr. 15; minimum daily, 57.80 ft, Apr. 16.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	DAILY MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59.12	---	59.72	59.52	59.11	58.71	58.18	58.92	61.12	61.14	60.48	60.46
2	59.04	59.83	59.74	59.48	59.07	58.65	58.18	59.03	61.14	61.15	60.44	60.48
3	---	59.60	59.70	59.46	59.06	58.66	58.15	59.15	61.18	61.07	60.42	60.43
4	59.04	59.32	59.73	59.44	59.06	58.66	58.11	59.25	61.15	60.97	60.44	60.46
5	---	59.53	59.66	59.42	59.05	58.64	58.09	59.33	61.20	61.06	60.44	60.50
6	---	59.32	59.66	59.43	59.05	58.60	58.06	59.41	61.32	61.03	60.39	60.35
7	---	59.59	59.68	59.43	59.00	58.57	58.03	59.52	61.24	61.00	60.22	60.45
8	---	59.60	59.66	59.43	58.99	58.56	58.02	59.60	61.18	61.15	60.31	60.45
9	---	59.83	59.63	59.43	59.02	58.56	57.98	59.65	61.17	61.04	60.42	60.56
10	---	59.49	59.61	59.43	59.02	58.58	57.97	59.71	61.18	60.88	60.38	60.55
11	---	59.63	59.62	59.40	59.02	58.56	57.94	59.77	61.20	60.83	60.24	60.46
12	59.24	59.75	59.62	59.38	59.03	58.53	57.91	59.84	61.19	60.91	60.49	60.52
13	59.27	59.74	59.68	59.38	58.97	58.50	57.87	59.88	61.18	60.73	60.53	60.49
14	59.36	59.76	59.66	59.35	59.00	58.46	57.84	59.93	61.19	60.68	60.52	60.48
15	59.27	59.75	59.64	59.37	58.93	58.46	57.81	59.98	61.13	60.66	60.44	60.49
16	59.35	59.74	59.65	59.37	58.92	58.49	57.80	60.05	61.19	60.67	60.45	60.50
17	58.88	59.76	59.65	59.36	58.92	58.45	57.83	60.25	61.23	60.73	60.52	60.43
18	59.38	59.76	59.64	59.34	58.92	58.43	57.81	60.36	61.16	60.80	60.48	60.40
19	59.40	59.75	59.63	59.32	58.88	58.44	57.83	60.44	61.07	60.81	60.40	60.40
20	59.75	59.69	59.61	59.33	58.87	58.42	57.90	60.65	60.92	60.58	60.55	60.52
21	59.52	59.73	59.61	59.33	58.90	58.40	57.96	60.74	60.98	60.52	60.66	60.36
22	59.30	59.74	59.59	59.29	58.86	58.36	58.00	60.85	61.04	60.43	60.63	60.27
23	59.44	59.73	59.57	59.30	58.85	58.35	58.09	60.98	61.07	60.55	60.60	60.18
24	---	59.76	59.55	59.26	58.80	58.33	58.19	61.02	61.00	60.72	60.52	60.19
25	---	59.73	59.56	59.25	58.79	58.26	58.36	61.02	61.00	60.70	60.66	60.27
26	---	59.74	59.56	59.24	58.79	58.26	58.42	61.09	61.01	60.66	60.64	60.62
27	---	59.72	59.54	59.19	58.79	58.24	58.51	61.17	61.04	60.61	60.49	60.49
28	---	59.71	59.53	59.20	58.75	58.22	58.61	61.13	61.04	60.61	60.54	60.12
29	---	59.72	59.54	59.17	58.72	58.24	58.70	61.14	61.09	60.58	60.59	60.14
30	---	59.74	59.52	59.15	---	58.22	58.81	61.14	61.00	60.56	60.52	60.28
31	---	---	59.53	59.14	---	58.19	---	61.11	---	60.50	60.52	---
MEAN	---	---	59.62	59.34	58.94	58.45	58.10	60.20	61.12	60.78	60.48	60.41
MAX	---	---	59.74	59.52	59.11	58.71	58.81	61.17	61.32	61.15	60.66	60.62
MIN	---	---	59.52	59.14	58.72	58.19	57.80	58.92	60.92	60.43	60.22	60.12

LAKE OF THE WOODS BASIN

05140521 LAKE OF THE WOODS AT SPRINGSTEEL ISLAND NEAR WARROAD, MN--Continued



— 05140521 LK OF THE WOODS @ SPRINGSTEEL IS NR. WARROAD, MN

MISSISSIPPI RIVER MAIN STEM

05200510 MISSISSIPPI RIVER NEAR BEMIDJI, MN

LOCATION.--Lat 47°29'00", long 94°43'40", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.3, T.146 N., R.32 W., Beltrami County, Hydrologic Unit 07010101, 3.5 mi east of Bemidji on right bank 100 ft upstream of County Highway 12 and 400 ft downstream from Stump Lake dam.

DRAINAGE AREA.--610 mi², approximately.

PERIOD OF RECORD.--September 1987 to current year (no winter records).

GAGE.--Water-stage recorder. Elevation of gage is 1,315 ft above sea level from topographic map.

REMARKS.--Records good. Regulated by Stump Lake dam upstream from station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	179	---	---	---	---	171	347	1190	593	158	135	90
2	229	---	---	---	---	168	347	1190	588	159	134	90
3	314	---	---	---	---	168	344	1170	578	156	121	89
4	332	---	---	---	---	168	343	1150	542	156	131	92
5	406	---	---	---	---	166	343	1130	519	154	131	92
6	471	---	---	---	---	166	341	1110	408	151	133	91
7	527	---	---	---	---	167	341	1090	256	157	133	90
8	522	---	---	---	---	166	340	1060	257	156	123	92
9	582	---	---	---	---	165	331	997	257	135	110	91
10	597	---	---	---	---	163	329	940	261	141	109	99
11	683	---	---	---	---	161	278	958	269	139	107	144
12	642	---	---	---	---	161	300	942	268	141	106	129
13	655	---	---	---	---	161	321	749	263	144	105	121
14	662	---	---	---	---	191	322	512	261	144	104	123
15	657	---	---	---	---	212	296	527	263	143	103	120
16	637	---	---	---	---	210	275	532	261	142	104	120
17	510	---	---	---	---	208	276	460	250	133	104	120
18	427	---	---	---	---	208	271	492	198	127	104	120
19	417	---	---	---	---	207	271	494	174	128	88	120
20	418	---	---	---	---	207	272	446	168	156	93	119
21	416	---	---	---	---	318	274	453	138	148	126	119
22	416	---	---	---	---	368	306	542	136	150	103	118
23	416	---	---	---	---	365	396	573	139	154	101	116
24	416	---	---	---	---	365	421	642	139	157	100	116
25	416	---	---	---	---	363	651	695	137	156	98	117
26	416	---	---	---	---	361	1050	669	137	146	96	118
27	416	---	---	---	---	358	1120	641	139	148	99	119
28	416	---	---	---	---	355	1140	644	142	149	97	120
29	416	---	---	---	171	351	1170	629	155	149	94	118
30	414	---	---	---	---	351	1190	625	160	146	92	111
31	---	---	---	---	---	348	---	600	---	135	92	---
TOTAL	14025	---	---	---	171	7497	14006	23852	8056	4558	3376	3324
MEAN	467	---	---	---	171	242	467	769	269	147	109	111
MAX	683	---	---	---	171	368	1190	1190	593	159	135	144
MIN	179	---	---	---	171	161	271	446	136	127	88	89
AC-FT	27820	---	---	---	339	14870	27780	47310	15980	9040	6700	6590
CFSM	.77	---	---	---	.28	.40	.77	1.26	.44	.24	.18	.18
IN.	.86	---	---	---	.01	.46	.85	1.45	.49	.28	.21	.20

e Estimated.

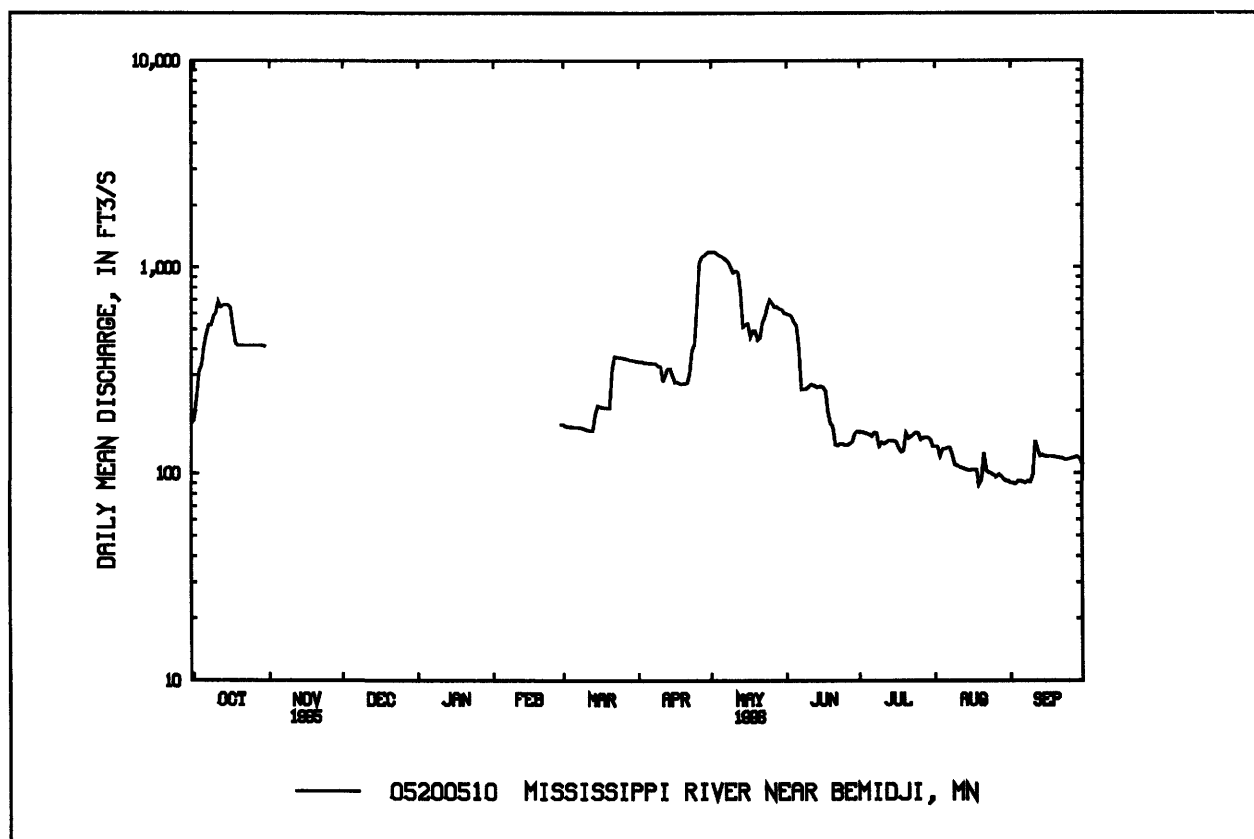
MISSISSIPPI RIVER MAIN STEM

05200510 MISSISSIPPI RIVER NEAR BEMIDJI, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	179	---	---	---	---	242	314	408	226	210	177	189
MAX	311	---	---	---	---	242	487	769	329	363	471	401
(WY)	1995	---	---	---	---	1996	1995	1996	1993	1993	1993	1993
MIN	75.5	---	---	---	---	242	148	181	104	62.2	61.9	62.3
(WY)	1991	---	---	---	---	1996	1992	1992	1988	1988	1989	1990

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1987 - 1996	
HIGHEST DAILY MEAN	707	Mar 28	1190 ^a	Apr 30	1190 ^a	Apr 30 1996
LOWEST DAILY MEAN	30	Aug 5	88	Aug 19	22	Jul 12 1988
INSTANTANEOUS PEAK FLOW			1260	Apr 26	1260	Apr 26 1996
INSTANTANEOUS PEAK STAGE			5.27	Apr 26	5.27	Apr 26 1996

^a Occurred Apr 30 to May 2, 1996.

MISSISSIPPI RIVER MAIN STEM

05201000 WINNIBIGOSHISH LAKE NEAR DEER RIVER, MN

LOCATION.--Lat 47°25'42", long 94°03'00", in sec.25, T.146 N., R.27 W., Itasca County, Hydrologic Unit 07010101, on Leech Lake Indian Reservation, at dam on Mississippi River, 1 mi northwest of Little Winnibigoshish Lake, 14 mi northwest of city of Deer River, and at mile 1,248 upstream from Olmsted River.

DRAINAGE AREA.--1,442 mi².

PERIOD OF RECORD.--April 1884 to current year. Prior to October 1941 monthend contents only, published in WSP 1308. Published as Winnibigoshish Reservoir near Deer River October 1941 to September 1956.

REVISED RECORDS.--WSP 1308: 1905(M).

GAGE.--Water-stage recorder. Datum of gage is in mean sea level (levels by U.S. Army Corps of Engineers). Prior to July 8, 1949, nonrecording gage at same site, and July 9, 1949, to July 10, 1973, water-stage recorder at same site and at datum of 1,288.94 ft above mean sea level.

REMARKS.--Reservoir is formed by Winnibigoshish Lake and several other natural lakes controlled by a concrete and timber dam, completed in 1884; storage began in 1884. Capacity between elevations 1,294.94 ft and 1,303.14 ft (maximum allowable range) is 668,737 acre-ft of which 439,636 acre-ft is controlled storage between elevations 1,294.94 ft and 1,300.94 ft (normal operating range). Contents shown herein are contents above elevation 1,286.00 ft. Prior to September 1978, published contents as contents above elevation 1,288.94 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records were provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 996,500 acre-ft, capacity table then in use, July 30, 1905, elevation, 1,303.39 ft; minimum observed, 33,680 acre-ft, below zero of capacity table then in use, Oct. 20, 1931, elevation, 1,288.25 ft.

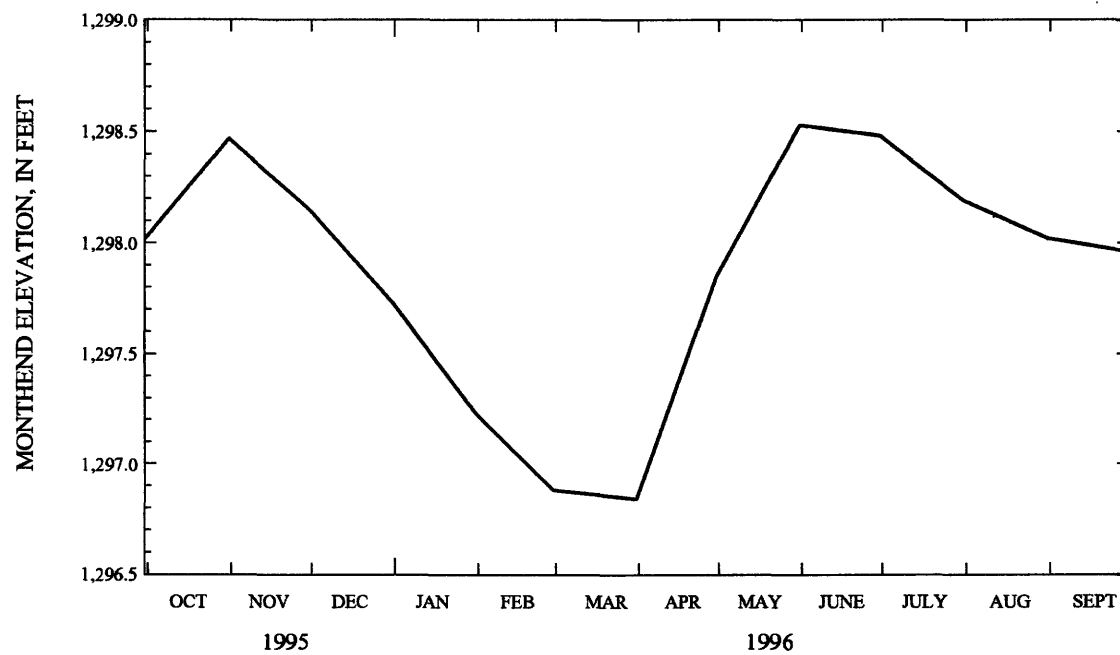
EXTREMES FOR CURRENT YEAR.--Maximum contents, 732,700 acre-ft, May 22, elevation, 1,298.69 ft; minimum, 605,100 acre-ft, Mar. 21, elevation, 1,296.74 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1298.02	688700	
Oct. 31	1298.47	718200	29500
Nov. 30	1298.15	697200	-21000
Dec. 31	1297.73	669700	-27500
CAL YR 1995.....			+34800
Jan. 31	1297.23	636800	-32900
Feb. 29	1296.88	613900	-22900
Mar. 31	1296.84	611400	-2500
Apr. 30	1297.85	677500	+66100
May 31	1298.53	722200	+44700
June 30	1298.48	718900	-3300
July 31	1298.19	699900	-19000
Aug. 31	1298.02	688700	-11200
Sept. 30	1297.96	684800	-3900
WTY YR 1996.....			-3900

MISSISSIPPI RIVER MAIN STEM

05201000 WINNIBIGOSHISH LAKE NEAR DEER RIVER, MN--Continued



LEECH LAKE RIVER BASIN

05202000 WILLIAMS LAKE NEAR AKELEY, MN

LOCATION.--Lat 46° 57'24", long 94 °40'26", in SE¹/₄ NW¹/₄ sec. 12, T. 140 N., R. 32 W., Hubbard County, Hydrologic Unit 07010102, on northwest shore of Williams Lake, 4 mi southeast of Akeley.

DRAINAGE AREA.--0.88 mi².

PERIOD OF RECORD.--October 1988 to September 1996, discontinued. August 1977 to September 1988, in files of the U.S. Geological Survey's Hydrology of Lakes Section in Denver, Colorado.

GAGE.--Water-stage recorder. Datum of gage is 1,379.09 ft above sea level. Prior to Oct. 1, 1990, at datum 2.00 ft higher.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 3.33 ft, present datum, June 25, 1989; minimum, 1.32 ft, Dec. 13, 1992.

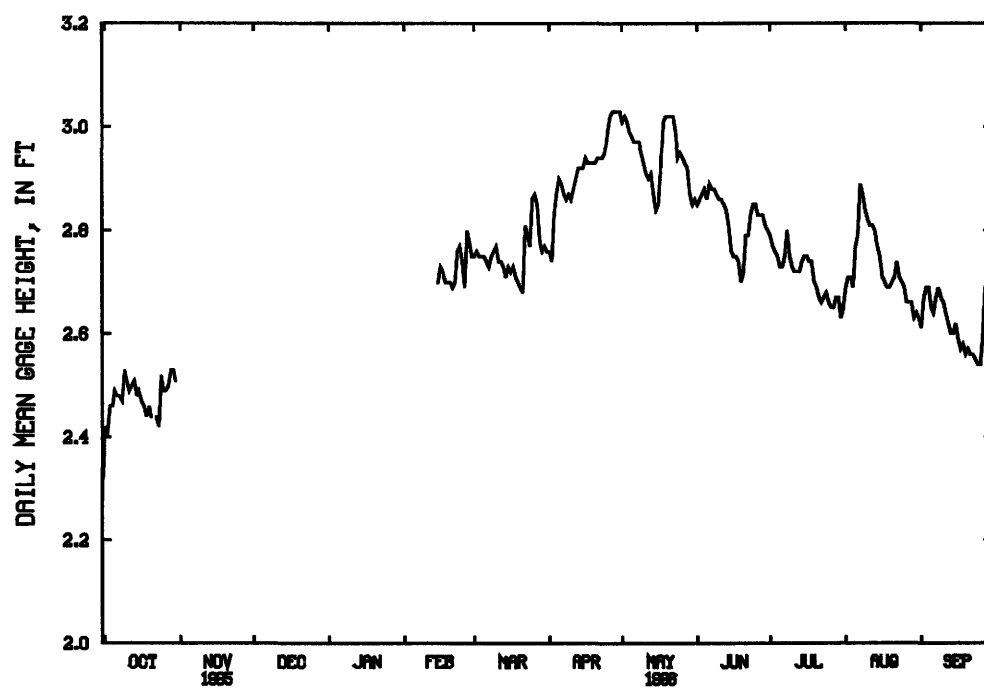
EXTREMES FOR CURRENT YEAR.--Maximum gage height, 3.07 ft, Apr. 30; minimum, 2.37 ft, Oct.2.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.42	---	---	---	---	2.75	2.76	3.01	2.85	2.79	2.69	2.61
2	2.41	---	---	---	---	2.76	2.74	3.02	2.86	2.77	2.71	2.67
3	2.46	---	---	---	---	2.75	2.83	3.01	2.87	2.76	2.71	2.69
4	2.46	---	---	---	---	2.75	2.87	2.99	2.88	2.75	2.69	2.69
5	2.49	---	---	---	---	2.75	2.90	2.98	2.86	2.73	2.77	2.65
6	2.48	---	---	---	---	2.74	2.89	2.97	2.89	2.73	2.79	2.64
7	2.48	---	---	---	---	2.73	2.87	2.97	2.88	2.75	2.89	2.67
8	2.47	---	---	---	---	2.75	2.86	2.97	2.88	2.80	2.87	2.69
9	2.53	---	---	---	---	2.76	2.87	2.95	2.87	2.75	2.84	2.67
10	2.51	---	---	---	---	2.77	2.86	2.93	2.86	2.73	2.82	2.66
11	2.49	---	---	---	---	2.74	2.88	2.91	2.86	2.72	2.81	2.64
12	2.50	---	---	2.60	---	2.74	2.90	2.90	2.85	2.72	2.81	2.62
13	2.51	---	---	---	---	2.73	2.92	2.91	2.84	2.72	2.80	2.60
14	2.48	---	---	---	---	2.71	2.92	2.87	2.81	2.74	2.77	2.60
15	2.49	---	---	---	2.70	2.73	2.92	2.84	2.76	2.75	2.75	2.62
16	2.47	---	---	---	2.73	2.72	2.94	2.85	2.75	2.75	2.71	2.59
17	2.46	---	---	---	2.72	2.73	2.93	2.92	2.75	2.74	2.70	2.57
18	2.44	---	---	---	2.70	2.71	2.93	3.01	2.74	2.74	2.69	2.58
19	2.46	---	---	---	2.70	2.70	2.93	3.02	2.70	2.70	2.69	2.56
20	2.44	---	---	---	2.70	2.69	2.93	3.02	2.72	2.69	2.70	2.57
21	---	---	---	---	2.69	2.68	2.94	3.02	2.79	2.67	2.71	2.56
22	2.44	---	---	---	2.70	2.81	2.94	3.02	2.79	2.66	2.74	2.56
23	2.42	---	---	---	2.76	2.79	2.94	2.99	2.83	2.67	2.71	2.55
24	2.52	---	---	---	2.77	2.77	2.95	2.94	2.85	2.68	2.70	2.54
25	2.49	---	---	---	2.74	2.86	2.99	2.95	2.85	2.66	2.69	2.54
26	2.49	---	---	---	2.69	2.87	3.02	2.94	2.83	2.65	2.66	2.59
27	2.50	---	---	---	2.80	2.85	3.03	2.93	2.83	2.65	2.66	2.69
28	2.53	---	---	---	2.78	2.78	3.03	2.92	2.83	2.67	2.66	2.70
29	2.53	---	---	---	2.75	2.76	3.03	2.87	2.81	2.67	2.63	2.66
30	2.51	---	---	---	---	2.77	3.03	2.85	2.80	2.63	2.64	2.64
31	---	---	---	---	---	2.76	---	2.86	---	2.65	2.63	---
MEAN---	---	---	---	---	2.76	2.92	2.95	2.82	2.71	2.73	2.62	
MAX---	---	---	---	---	2.87	3.03	3.02	2.89	2.80	2.89	2.70	
MIN---	---	---	---	---	2.68	2.74	2.84	2.70	2.63	2.63	2.54	

LEECH LAKE RIVER BASIN

05202000 WILLIAMS LAKE NEAR AKELEY, MN--Continued



— 465724094402601 WILLIAMS LAKE NEAR AKELEY, MN

LEECH LAKE RIVER BASIN

05206000 LEECH LAKE AT FEDERAL DAM, MN

LOCATION (REVISED).--Lat 47°10'14", long 94°17'12", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.25, T.143 N., R.29 W., Cass County, Hydrologic Unit 07010102, on Leech Lake Indian Reservation, at head of Leech Lake River, 1 mi. northeast of Battle Point, 6 mi southwest of town of Federal Dam.

DRAINAGE AREA.--1,163 mi².

PERIOD OF RECORD.--April 1884 to current year. Monthend contents only for some periods, published in WSP 1308. Prior to October 1956, published as "Leech Lake Reservoir."

GAGE.--Water-stage recorder. Datum of gage is in mean sea level (levels by U.S. Army Corps of Engineers). Prior to Dec. 31, 1884, nonrecording gage 0.5 mi north of outlet to Leech Lake River at datum 98.47 ft higher. Dec. 31, 1884, to May 24, 1931, nonrecording gage 0.5 mi north of outlet to Leech Lake River and May 25, 1931, to July 10, 1973, water-stage recorder at same site and at datum 92.70 ft higher.

REMARKS.--Reservoir is formed by Leech Lake and several other natural lakes controlled by concrete and timber dam; storage began in 1884; original timber structure completed in 1884, replaced by present dam in 1902. Capacity between elevation 1,292.70 ft and 1,297.94 ft (maximum allowable range) is 688,985 acre-ft of which 352,637 acre-ft is controlled storage between elevations 1,292.70 ft and 1,295.70. Reservoir is formed by Leech Lake and several other natural lakes controlled by concrete and timber dam; storage began in 1884; original timber structure completed in 1884, replaced by present dam in 1902. Capacity between elevation 1,292.70 ft and 1,297.94 ft (maximum allowable range) is 688,985 acre-ft of which 352,637 acre-ft is controlled storage between elevations 1,292.70 ft and 1,295.70 ft (normal operating range). Contents shown herein are contents above elevation 1,290.00 ft. Prior to September 1978, published contents as contents above elevation 1,292.20 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records were provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 734,300 acre-ft, capacity table then in use, June 30, 1916, elevation, 1,297.88 ft; minimum, 51,380 acre-ft, capacity table then in use, Dec. 8, 24, 1976, elevation, 1,292.69 ft.

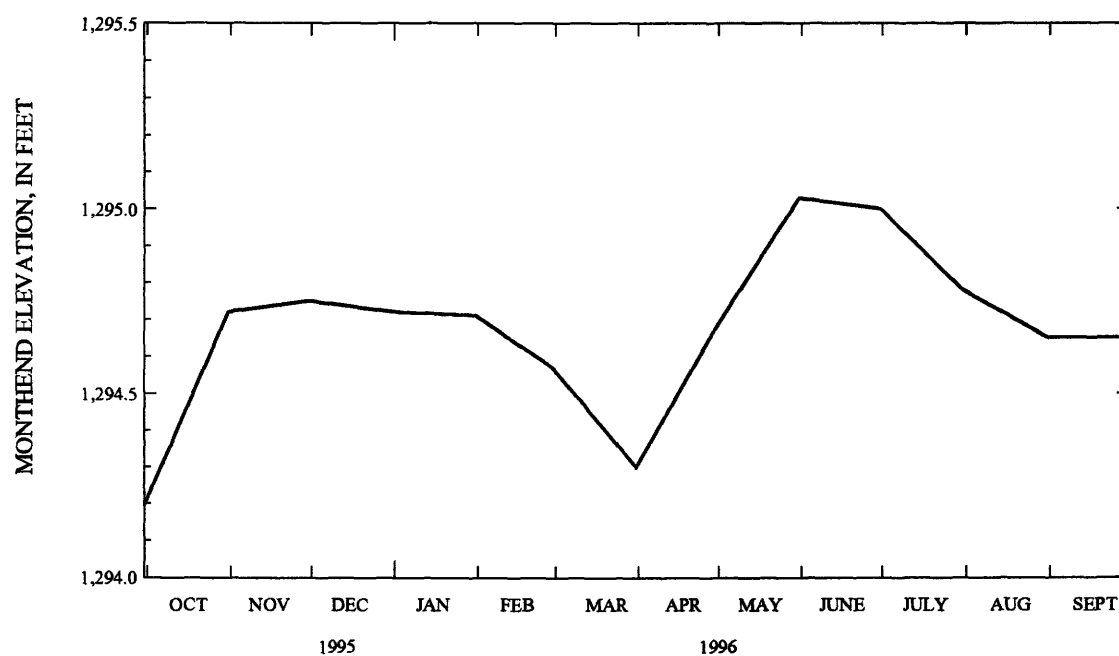
EXTREMES FOR CURRENT YEAR.--Maximum contents, 636,900 acre-ft, May 22, elevation, 1295.12 ft; minimum, 515,500 acre-ft, Apr. 13, elevation, 1,294.16 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Elevation	Contents	Change in contents
Sept. 30	1294.20	520600	
Oct. 31	1294.72	586300	+65700
Nov. 30	1294.75	590100	+3800
Dec. 31	1294.72	586300	-3800
CAL YR 1995			+37900
Jan. 31	1294.71	585000	-1300
Feb. 29	1294.57	567300	-17700
Mar. 31	1294.30	533200	-34100
Apr. 30	1294.68	581300	+48100
May 31	1295.03	625500	+44200
June 30	1295.00	621700	-3800
July 31	1294.78	593900	-27800
Aug. 31	1294.65	577500	-16400
Sept. 30	1294.65	577500	0
WTR YR 1996			+56900

LEECH LAKE RIVER BASIN

05206000 LEECH LAKE AT FEDERAL DAM, MN--Continued



MISSISSIPPI RIVER MAIN STEM

05210500 POKEGAMA LAKE NEAR GRAND RAPIDS, MN

LOCATION.--Lat 47°10'00", long 93°33'20", in NW¹/₄ sec.17, T.54 N., R.25 W., Itasca County, Hydrologic Unit 07010101, at narrows on U.S. Highway 169, 4 mi south of Grand Rapids and at mile 1,184 upstream from Ohio River.

DRAINAGE AREA.--3,265 mi².

PERIOD OF RECORD.--April 1884 to current year. Prior to October 1941 monthend contents only, published in WSP 1308. Published as Pokegama Reservoir near Grand Rapids, October 1941 to September 1956.

REVISED RECORDS.--WSP 1914: 1897(M).

GAGE.--Water-stage recorder. Datum of gage is in mean sea level (levels by U.S. Army Corps of Engineers). Prior to May 30, 1949, nonrecording gage at Pooles Arm of Pokegama Lake 5 mi northwest, and May 31, 1949, to July 12, 1973, water-stage recorder at same site and at datum 64.42 ft higher.

REMARKS.--Reservoir is formed by Pokegama Lake and several other natural lakes controlled by concrete dam; storage began in 1884; original timber dam completed in 1884, replaced by present structure in 1888-89. Capacity between elevation 1,270.42 ft and 1,276.42 ft (maximum allowable range) is 80,126 acre-ft of which 52,483 acre-ft is controlled storage between elevations 1,270.42 ft and 1,274.42 ft (normal operating range). Contents shown herein are contents above elevation 1,267.00 ft. Prior to September 1978, published contents as contents above elevation 1,268.92 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records were provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 153,200 acre-ft, May 1, 1996, elevation, 1,276.22 ft; maximum elevation, 1,277.92 ft, May 8, 1897; minimum contents observed, 4,520 acre-ft, below zero of capacity table then in use, Sept. 30, 1934, elevation, 1,268.54 ft.

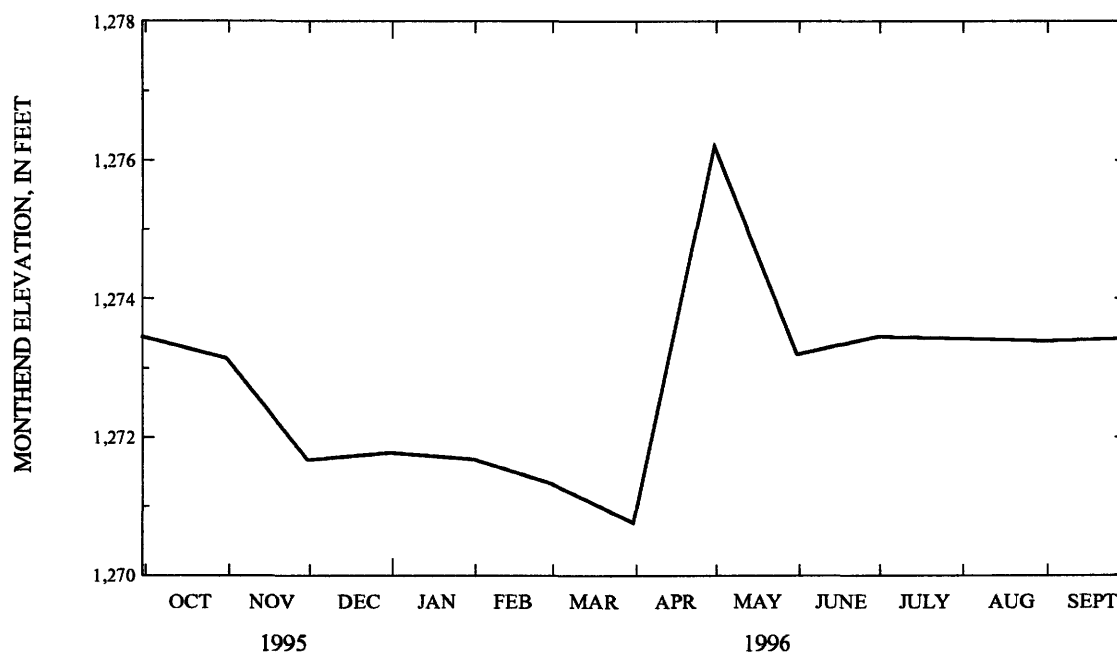
EXTREMES FOR CURRENT YEAR.--Maximum contents, 153,200 acre-ft, May 1, elevation, 1,276.22 ft; minimum, 59,890 acre-ft, Mar. 2ⁿ, elevation, 1,270.76 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

	Elevation	Contents	Change in contents
Sept. 30	1273.45	98380	
Oct. 31	1273.14	93670	-4710
Nov. 30	1271.67	72240	-21430
Dec. 31	1271.77	73670	+1430
CAL YR 1995			+2420
Jan. 31	1271.68	72380	-1290
Feb. 29	1271.33	67490	-4890
Mar. 31	1270.76	59890	-7600
Apr. 30	1276.20	152800	+92910
May 31	1273.20	94570	-58230
June 30	1273.45	98380	+3810
July 31	1273.43	98050	-330
Aug. 31	1273.39	97400	-650
Sept. 30	1273.43	98050	+650
WTR YR 1996			-330

MISSISSIPPI RIVER MAIN STEM

05210500 POKEGAMA LAKE NEAR GRAND RAPIDS, MN--Continued



MISSISSIPPI RIVER MAIN STEM

05211000 MISSISSIPPI RIVER AT GRAND RAPIDS, MN

LOCATION.--Lat 47°13'56", long 93°31'48", in SW¼NW¼ sec.21, T.55 N., R.25 W., Itasca County, Hydrologic Unit 07010103, on left bank, in super-calendar room of Blandin Paper Mill in Grand Rapids, 400 ft downstream from Blandin Dam, 400 ft upstream from bridge on U.S. Highway 169, 2.5 mi upstream from Prairie River, and at mile 1,182 upstream from Ohio River.

DRAINAGE AREA.--3,370 mi², approximately.

PERIOD OF RECORD.--October 1883 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as "at Pokegama Dam near Grand Rapids" 1942-44.

GAGE.--Water-stage recorder. Datum of gage is 1,242.03 ft above mean sea level. See WSP 1914 for history of changes prior to Jan. 17, 1951.

REMARKS.--Records fair. Flow regulated by Winnibigoshish Lake (station 05201000), Leech Lake (station 05206000), Pokegama Lake (station 05210500) and occasionally at low flow by powerplant at Blandin Dam. Backwater from Prairie River occurs at times in most years.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1620	2260	e1780	e2150	e2200	e2000	2290	3080	e1820	2140	1060	496
2	2090	2270	e1790	e2150	e2200	e2010	2330	3230	e1820	2200	999	539
3	2260	2260	e1800	e2120	e2180	e2000	2340	3200	e1820	2230	1110	541
4	2280	2260	e1810	e2120	e2180	e2000	2370	3140	2210	2230	1100	724
5	2310	2260	e2020	e2130	e2180	e2180	2390	3000	2210	2190	1360	940
6	2350	2260	e1900	e2130	e2200	e2150	2460	3180	2220	2200	1580	1020
7	2430	2260	e2200	e2130	e2280	e2130	2540	3410	2210	2240	1500	896
8	2530	2260	e2030	e2170	e2330	e2110	2600	3280	2220	2060	1260	891
9	2450	2270	e2030	e2190	e2330	e2090	2700	3210	2210	1620	1060	713
10	2420	2270	e2030	e2400	e2300	e2090	2730	3230	2200	1800	1040	512
11	2370	2230	e2030	e2300	e2250	e2100	2540	3110	2210	1790	1020	466
12	e2150	2220	e2030	e2320	e2220	e2100	1720	3050	2230	1840	879	414
13	e1700	2220	e2030	e2300	e2210	e2100	855	2970	2180	1830	836	497
14	e1720	2230	e2030	e2300	e2200	e2250	892	3090	2210	1800	745	489
15	e1790	2220	e2080	e2300	e2180	2310	1280	3040	2220	1770	796	510
16	e1790	2230	e2100	e2300	e2160	2350	1790	2970	2220	1640	803	508
17	e1960	2260	e2140	e2300	e2150	2330	2340	2810	2170	1760	768	492
18	e1940	2250	e2140	e2250	e2150	2260	2280	2720	2070	1650	791	496
19	e2140	2230	e2160	e2200	e2130	2280	e1700	2800	2030	1650	826	509
20	e2120	2230	e2250	e2170	e2110	2230	e1680	2690	1800	1560	738	489
21	e2100	2220	e2200	e2190	e2100	2250	e1690	2590	1780	1580	600	498
22	e2080	2210	e2200	e2200	e2080	2290	e1300	2570	1840	1610	616	504
23	e2100	e1930	e2200	e2200	e2080	2370	e630	2460	1800	1570	546	490
24	2270	e1930	e2200	e2200	e2060	2390	e750	e2050	1840	1520	609	479
25	2280	e1940	e2190	e2190	e2040	2380	e2000	e2050	1830	1600	620	493
26	2270	e1940	e2180	e2180	e2020	2430	e2600	e2050	2220	1570	620	528
27	2270	e1940	e2180	e2180	e2100	2410	e3100	e2050	2360	1550	600	556
28	2270	e1750	e2180	e2190	e2100	2360	e3100	e2050	2230	1550	633	575
29	2270	e1750	e2180	e2200	e2050	2420	3100	e1780	2000	1490	522	600
30	2260	e1760	e2180	e2180	---	2210	3000	e1800	2000	1230	495	598
31	2260	---	e2150	e2170	---	2350	---	e1810	---	1110	458	---
TOTAL	66850	64320	64420	68510	62770	68930	63097	84470	62180	54580	26590	17463
MEAN	2156	2144	2078	2210	2164	2224	2103	2725	2073	1761	858	582
MAX	2530	2270	2250	2400	2330	2430	3100	3410	2360	2240	1580	1020
MIN	1620	1750	1780	2120	2020	2000	630	1780	1780	1110	458	414
AC-FT	132600	127600	127800	135900	124500	136700	125200	167500	123300	108300	52740	34640
CFSM	.64	.64	.62	.66	.64	.66	.62	.81	.62	.52	.25	.17
IN.	.74	.71	.71	.76	.69	.76	.70	.93	.69	.60	.25	.19

e Estimated.

MISSISSIPPI RIVER MAIN STEM

05211000 MISSISSIPPI RIVER AT GRAND RAPIDS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1441	1569	1466	1482	1482	1395	1205	1295	1322	1401	1255	1236
MAX	2865	2496	2375	2410	2729	2762	3442	3026	3271	3363	3711	3542
(WY)	1986	1954	1954	1952	1945	1945	1945	1979	1962	1962	1950	1950
MIN	187	174	186	168	177	198	247	32.5	206	125	98.3	195
(WY)	1977	1977	1977	1977	1977	1977	1959	1949	1988	1961	1961	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1942 - 1996
ANNUAL TOTAL	608306	704180	
ANNUAL MEAN	1667	1924	1386 ^a
HIGHEST ANNUAL MEAN			2265
LOWEST ANNUAL MEAN			277
HIGHEST DAILY MEAN	2740	Mar 23	3410
LOWEST DAILY MEAN	286	Jun 30	414
ANNUAL SEVEN-DAY MINIMUM	314	Jun 27	482
INSTANTANEOUS PEAK FLOW			3480
INSTANTANEOUS PEAK STAGE			10.86 ^c
INSTANTANEOUS LOW FLOW			195 ^e
ANNUAL RUNOFF (AC-FT)	1207000	1397000	1004000
ANNUAL RUNOFF (CFSM)	49	.57	.41
ANNUAL RUNOFF (INCHES)	6.71	7.77	5.59
10 PERCENT EXCEEDS	2260	2440	2330
50 PERCENT EXCEEDS	1750	2140	1390
90 PERCENT EXCEEDS	1000	689	360

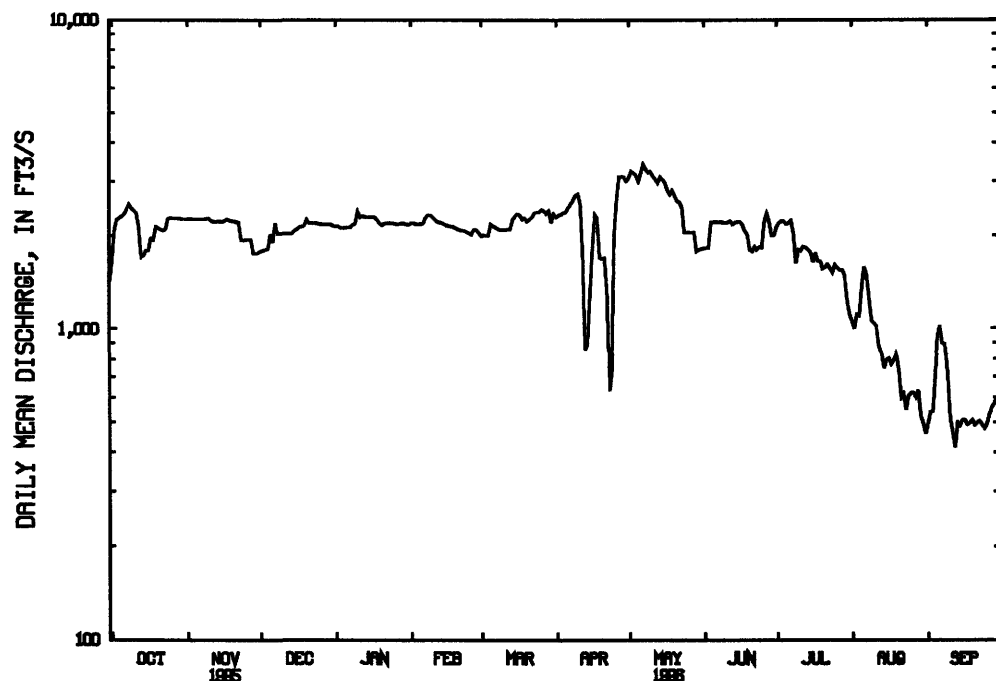
a Average based on 113 years of record is 1200 ft³/s; median of annual mean discharges is 1100 ft³/s.

b From rating curve extended above 4500 ft³/s.

c Backwater from Prairie River.

d From floodmark, caused by dam failure.

e Affected by regulation.



— 05211000 MISSISSIPPI RIVER AT GRAND RAPIDS, MN

SANDY RIVER BASIN

05218500 BIG SANDY LAKE AT LIBBY, MN

LOCATION.--Lat 46°47'20", long 93°19'10", in sec.25, T.50 N., R.24 W., Aitkin County, Hydrologic Unit 07010103, on dam on Sandy River at Libby, 1.2 mi upstream from mouth, and 14 mi north of McGregor.

DRAINAGE AREA.--421 mi².

PERIOD OF RECORD.--July to December 1893, October to December 1894, July 1895 to current year. Monthend contents only for some periods, published in WSP 1308. Published as Sandy Lake Reservoir at Libby, October 1941 to September 1956; and Sandy Lake at Libby, October 1956 to September 1995..

GAGE.--Water-stage recorder. Datum of gage is in mean sea level (levels by U.S. Army Corps of Engineers). Prior to Sept. 23, 1949, nonrecording gage and Sept. 24, 1949, to Nov. 28, 1962, water-stage recorder at site 1 mi upstream at datum 1,207.71 ft, adjustment of 1912. Nov. 29, 1962, to June 30, 1973, water-stage recorder at present site at datum 1,207.71 ft, adjustment of 1912.

REMARKS.--Lake is formed by concrete dam which controls Sandy, Flowage, Snake, and Aitkin Lakes. Storage began in 1893; original timber crib dam completed in 1895, replaced by present structure in 1911. Capacity between elevation 1,214.31 ft and 1,221.31 ft (top of structure) is 73,037 acre-ft, of which 37,539 acre-ft is controlled storage between elevations 1,214.31 ft and 1,218.31 ft (normal operating range). Contents shown herein are contents above elevation 1,207.00 ft. Prior to September 1978, published contents as contents above elevation 1,209.03 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records were provided by U.S. Army Corps of Engineers.

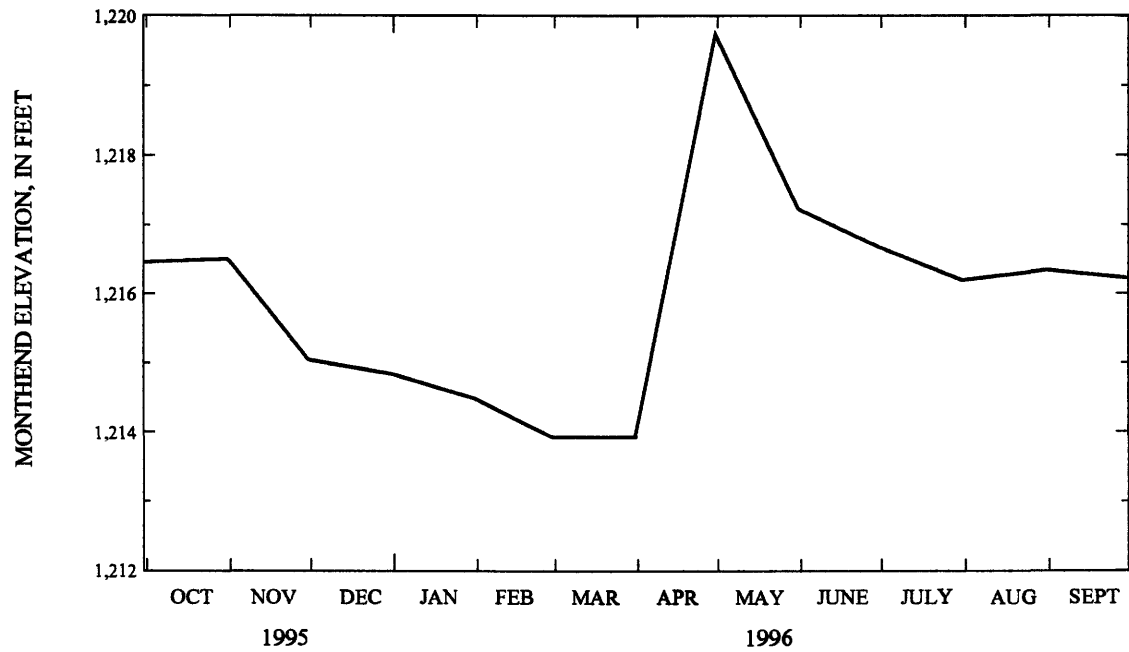
EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 167,200 acre-ft, capacity table then in use, May 19, 1950, elevation, 1,224.82 ft; minimum observed, 5,950 acre-ft, below zero of capacity table then in use, Jan. 20, 1921, elevation, 1,207.96 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 103,700 acre-ft, May 5, elevation, 1,220.22 ft; minimum, 40,210 acre-ft, Mar. 16, elevation, 1,213.79 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1216.46	63340	
Oct. 31	1216.50	63720	+380
Nov. 30	1215.05	50580	-13140
Dec. 31	1214.85	48870	-1710
CAL YR 1995.....			-1370
Jan. 31	1214.49	45860	-3010
Feb. 29	1213.93	41320	-4540
Mar. 31	1213.93	41320	0
Apr. 30	1219.74	97940	+56620
May 31	1217.23	70810	-27130
June 30	1216.68	65430	-5380
July 31	1216.19	60790	-4640
Aug. 31	1216.34	62200	+1410
Sept. 30	1216.22	61070	-1130
WTR YR 1996.....			-2270

SANDY RIVER BASIN
05218500 BIG SANDY LAKE AT LIBBY, MN--Continued



MISSISSIPPI RIVER MAIN STEM

05227500 MISSISSIPPI RIVER AT AITKIN, MN

LOCATION.--Lat 46°32'26", long 93°42'26", in SW1/4NW1/4, sec.24, T.47 N., R.27 W., Aitkin County, Hydrologic Unit 07010104, on right bank upstream side of highway bridge at north edge of Aitkin, 1 mi downstream from Ripple River and at mile 1,055.9 upstream from Ohio River.

DRAINAGE AREA.--6,140 mi², approximately.

PERIOD OF RECORD.--March 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,182.41 ft above sea level (levels by U.S. Army Corps of Engineers). Mar. 1, 1945, to Mar. 14, 1961, nonrecording gage, and Mar. 15, 1961, to Sept. 30, 1967, water-stage recorder at same site at datum 3.0 ft higher. Diversion channel: Non-recording gage and crest-stage gage. Datum of gage is 1,182.02 ft above sea level. Apr. 9, 1955, to Apr. 10, 1956, nonrecording gage at site 4 mi downstream at different datum. Apr. 11, 1956, to Sept. 30, 1967, non-recording gage at same site at datum 3.0 ft higher.

REMARKS.--Records fair. Flow regulated by Winnibigoshish Lake (sta 05201000), Leech Lake (sta 05206000), Pokegama Lake (sta 05210500), and Sandy Lake (sta 05218500). Water diverted at medium and high stages into Aitkin diversion channel 6.5 mi above station, bypasses station and returns to river 15.5 mi below station. Diversion began Apr. 2, 1955. These records include flow in diversion channel. Gage height telemeter and U.S. Army Corps of Engineers satellite telemeter at station.

EXTREMES FOR CURRENT YEAR.--Main channel: Maximum discharge, 6340 ft³/s, May 1, gage height, 15.79 ft. Diversion channel: Maximum discharge, 5470 ft³/s, May 1, gage height, 15.97 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e4000	6480	e3100	e2900	e2950	e3000	e3200	11700	5330	3980	3430	1110
2	e4800	6430	e3100	e2900	e2950	e3000	e3200	11700	5180	3950	3120	1080
3	e5700	6380	e3100	e2900	e2950	e3000	e3200	11600	5050	3940	2800	1090
4	e6400	6250	e3000	e2900	e2950	e3000	e3200	11400	4830	4060	2550	1140
5	7120	6160	e3000	e2900	e2950	e3000	e3200	11300	4490	4100	2480	1220
6	7240	6090	e3000	e2900	e2950	e3000	e3250	11000	4150	4050	2490	1310
7	7340	5980	e3000	e2900	e2950	e3000	e3300	10800	4050	4010	2710	1440
8	7520	5810	e3000	e2900	e2950	e3000	e3400	10500	4010	4050	3310	1600
9	e7550	5660	e3000	e2900	e2950	e3000	e3600	10200	3910	4070	3760	1640
10	e7600	5520	e3000	e2900	e2950	e3000	e4000	9850	3810	4060	3870	1610
11	7660	5290	e2900	e2900	e2950	e3000	e4600	9500	3660	4000	3780	1560
12	7680	e5100	e2900	e2900	e2950	e3000	e5200	9120	3460	4120	3640	1450
13	7650	e5300	e2900	e2900	e2950	e3000	e5700	8780	3300	4480	3450	1310
14	7580	e5100	e2900	e2900	e2970	e3000	e6200	8450	3220	4720	3270	1200
15	7420	e5000	e2900	e2900	e2970	e3050	e6600	8140	3180	4920	3040	1170
16	7140	e4800	e2900	e2900	e2970	e3050	e7000	7870	3120	5010	2750	1170
17	6820	e4600	e2900	e2900	e2970	e3100	e7600	7660	2990	5010	2520	1170
18	6450	e4400	e2900	e2950	e2970	e3100	8000	7630	2880	4940	2380	1160
19	6130	e4100	e2900	e2950	e2970	e3180	8990	7750	2770	4920	2260	1120
20	5890	e3800	e2900	e2950	e2970	e3200	9860	7780	2650	4830	2100	1040
21	5720	e3600	e2900	e2950	e3000	e3200	10400	7700	2610	4580	1930	995
22	5590	e3400	e2900	e2950	e3000	e3200	10800	7600	2510	4310	1830	995
23	5560	e3300	e2900	e2950	e3000	e3200	11000	7430	2380	4300	1660	994
24	5630	e3200	e2900	e2950	e3000	e3200	11200	7220	2330	4320	1540	994
25	5740	e3100	e2900	e2950	e3000	e3200	11300	7000	2290	4250	1480	987
26	5840	e3100	e2900	e2950	e3000	e3200	11400	6770	2340	4140	1410	999
27	6020	e3100	e2900	e2950	e3000	e3200	11500	6500	2510	3940	1370	1020
28	6340	e3100	e2900	e2950	e3000	e3200	11600	6240	2940	3750	1310	1090
29	6570	e3100	e2900	e2950	e3000	e3200	11600	5980	3440	3730	1270	1230
30	6520	e3100	e2900	e2950	---	e3200	11700	5760	3840	3760	1200	1400
31	6480	---	e2900	e2950	---	e3200	---	5520	---	3690	1170	---
TOTAL	201700	140350	91200	90600	86140	95880	215800	266450	103230	131990	75880	36294
MEAN	6506	4678	2942	2923	2970	3093	7193	8595	3441	4258	2448	1210
MAX	7680	6480	3100	2950	3000	3200	11700	11700	5330	5010	3870	1640
MIN	4000	3100	2900	2900	2950	3000	3200	5520	2290	3690	1170	987
AC-FT	400100	278400	180900	179700	170900	190200	428000	528500	204800	261800	150500	71990
CFM	1.06	.76	.48	.48	.48	.50	1.17	1.40	.56	.69	.40	.20
IN.	1.22	.85	.55	.55	.52	.58	1.31	1.61	.63	.80	.46	.22

e Estimated.

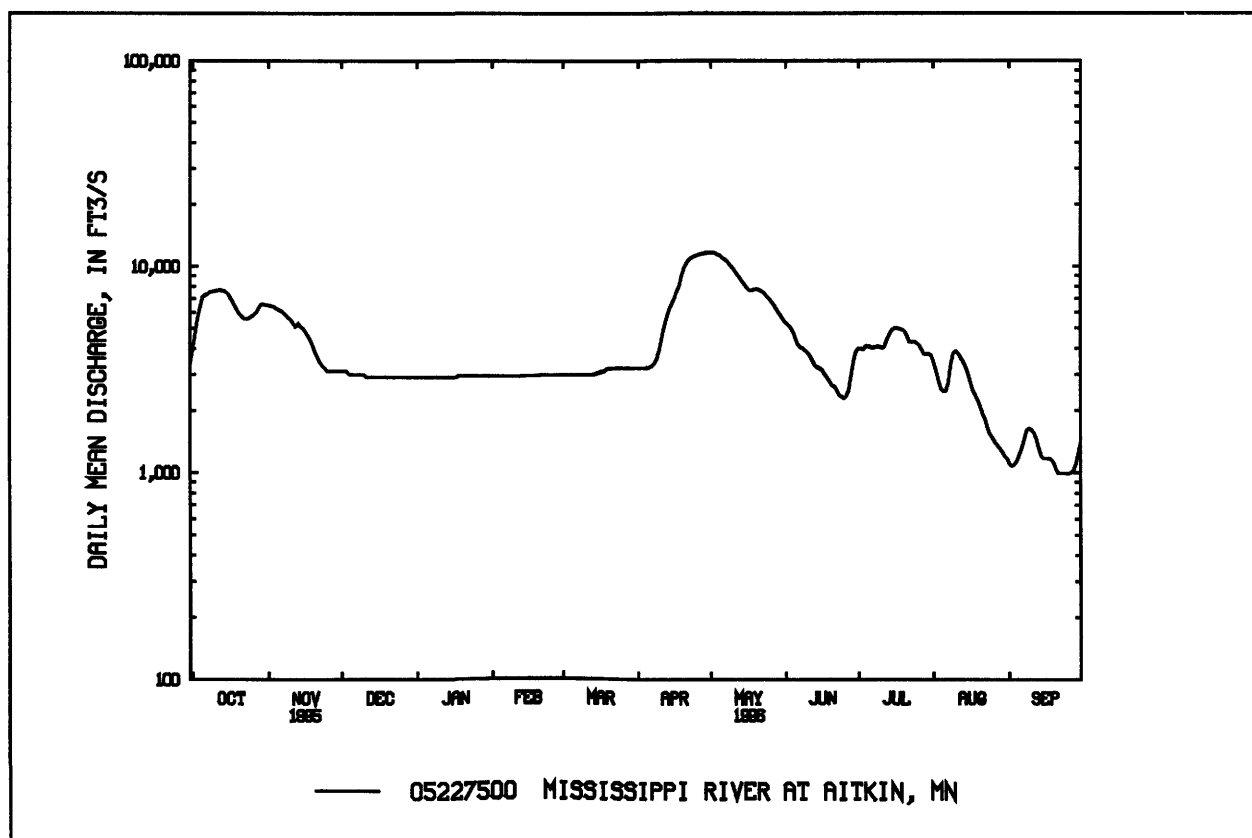
MISSISSIPPI RIVER MAIN STEM

05227500 MISSISSIPPI RIVER AT AITKIN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2668	2698	2201	1930	1846	2226	5135	5293	3669	3025	2317	2218
MAX	6534	6756	3762	3525	3196	5415	10830	15510	8072	8201	8270	6689
(WY)	1966	1972	1972	1966	1966	1945	1966	1950	1965	1993	1953	1986
MIN	313	328	324	345	398	638	1074	669	539	346	273	321
(WY)	1977	1977	1977	1977	1977	1977	1977	1958	1988	1961	1961	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1945 - 1996	
ANNUAL TOTAL	1260543		1535514			
ANNUAL MEAN	3454		4195		2927	
HIGHEST ANNUAL MEAN					4985	1966
LOWEST ANNUAL MEAN					796	1977
HIGHEST DAILY MEAN	7680	Oct 12	11700	Apr 30 to May 2	19900	May 20 1950
LOWEST DAILY MEAN	758	Jul 2	987	Sep 25	153	Sep 1 1961
ANNUAL SEVEN-DAY MINIMUM	848	Jun 28	998	Sep 21	195	Aug 26 1961
INSTANTANEOUS PEAK FLOW			11800	May 1	20000	May 20 1950
INSTANTANEOUS PEAK STAGE			15.79	May 1	22.49 ^a	May 20 1950
INSTANTANEOUS LOW FLOW			982	Sep 25	151	Sep 1 1961
ANNUAL RUNOFF (AC-FT)	2500000		3046000		2121000	
ANNUAL RUNOFF (CFSM)	.56		.68		.48	
ANNUAL RUNOFF (INCHES)	7.64		9.30		6.48	
10 PERCENT EXCEEDS	5990		7640		5830	
50 PERCENT EXCEEDS	3000		3190		2320	
90 PERCENT EXCEEDS	2050		1610		959	

^a Present datum.

PINE RIVER BASIN

05230500 PINE RIVER RESERVOIR (CROSS LAKE) AT CROSS LAKE, MN

LOCATION.--Lat 46°40'09", long 94°06'44", in SW¹/₄NW¹/₄ sec.21, T.137 N., R.27 W., Crow Wing County, Hydrologic Unit 07010105, at dam on Pine River, at outlet of Cross Lake at city of Cross Lake.

DRAINAGE AREA.--562 mi².

PERIOD OF RECORD.--March 1886 to current year. Monthend contents only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is in mean sea level (levels by U.S. Army Corps of Engineers). Prior to May 3, 1949, nonreconting gage at same site and datum.

REMARKS.--Reservoir is formed by Trout, Whitefish, Rush, and Cross Lakes and several other natural lakes controlled by timber crib dams; storage began in 1886; dam completed in 1886. Capacity between elevations 1,226.32 ft and 1,234.82 ft (maximum allowable range) is 118,703 acre-ft of which 53,272 acre-ft is controlled storage between elevations 1,226.32 ft and 1,230.32 ft (normal operating range). Contents shown herein are contents above an elevation 1,216.00 ft. Prior to September 1978, published contents as contents above elevation 1,218.67 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records were provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 173,600 acre-ft, capacity table then in use, July 10, 1916, elevation, 1,234.56 ft; minimum observed, 1,310 acre-ft, below zero of capacity table then in use, Aug. 20, 1918, elevation, 1,217.67 ft.

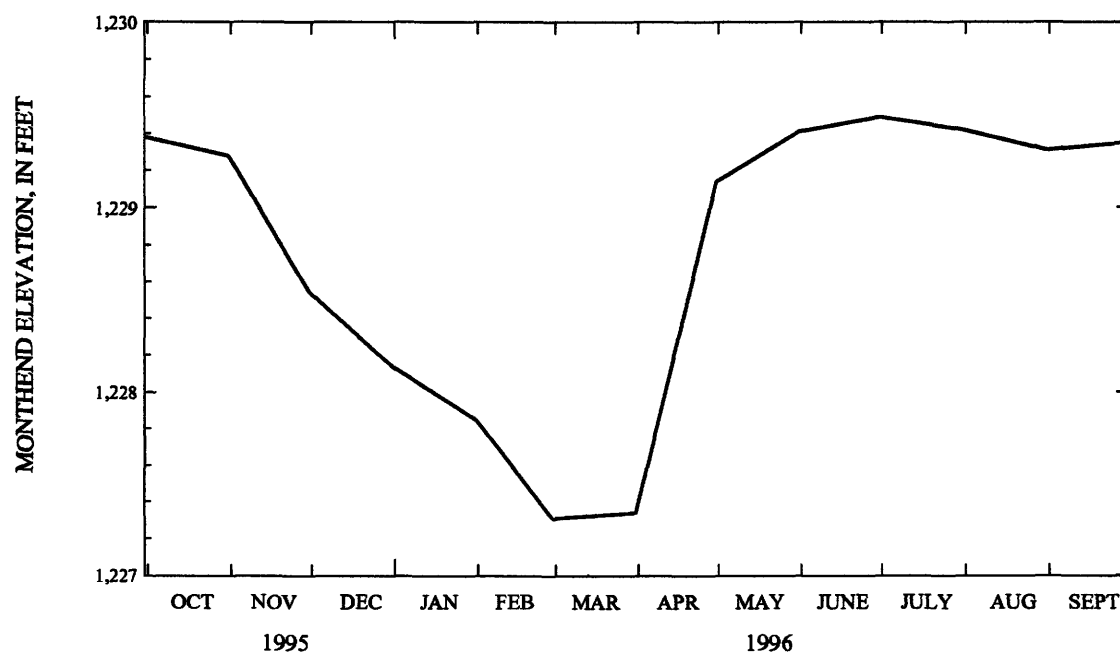
EXTREMES FOR CURRENT YEAR.--Maximum contents, 106,400 acre-ft, Oct. 1, elevation, 1,229.69 ft; minimum, 72,490 acre-ft, Mar. 12, elevation, 1,227.15 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Elevation (feet)	Contents (acre-feet)	Change in content (acre-feet)
Sept. 30	1229.38	102200	
Oct. 31	1229.28	100800	-1400
Nov. 30	1228.54	90820	-9980
Dec. 31	1228.14	85490	-5330
CAL YR 1995			+920
Jan. 31	1227.85	81660	-3830
Feb. 29	1227.31	74570	-7090
Mar. 31	1227.34	74970	+400
Apr. 30	1229.14	98900	+23930
May 31	1229.41	102600	+3700
June 30	1229.49	103700	+1100
July 31	1229.42	102700	-1000
Aug. 31	1229.31	101200	-1500
Sept. 30	1229.35	101800	+600
WTR YR 1996			-400

PINE RIVER BASIN

05230500 PINE RIVER RESERVOIR (CROSS LAKE) AT CROSS LAKE, MN--Continued



MISSISSIPPI RIVER MAIN STEM

05242300 MISSISSIPPI RIVER AT BRAINERD, MN

LOCATION.--Lat 46°22'40", long 94°10'59", in SE 1/4 SW 1/4 sec. 18, T. 145 N., R.30 W., Crow Wing County, Hydrologic Unit 07010104, on left bank in hydro-plant of Potlatch Corporation, Northwest Paper Division in Brainerd, 12.7 mi upstream from Crow Wing River, and at mile 1003.7 upstream from Ohio River.

DRAINAGE AREA.--7,320 mi², approximately.

PERIOD OF RECORD.--October 1987 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,146.96 ft above mean sea level.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow regulated by Winnibigoshish Lake (sta. 05201000), Leech Lake (sta. 05206000), Pokegama Lake (sta. 05210500), Sandy Lake (sta. 05218500), Pine River Reservoir at Cross Lake (sta. 05230500), and by hydro-plant in Brainerd.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3130	8010	3890	e3790	e3710	e3750	3940	13800	6910	4540	4310	1420
2	4800	7950	3920	e3790	e3700	e3710	4040	13700	6630	4690	3930	1430
3	6190	8110	4060	e3780	e3700	e3660	4030	13700	6540	4490	3590	1490
4	7540	7930	4230	e3780	e3700	e3600	4080	13600	6250	4750	3290	1350
5	8250	7920	4420	e3770	e3700	e3570	4060	13500	6040	4630	3170	1330
6	8660	7840	e4800	e3760	e3700	e3570	4120	13300	5650	4970	2990	1550
7	8890	7660	4620	e3750	e3700	e3580	4200	12900	5180	4840	3200	1640
8	9110	7430	e4500	e3740	e3700	e3590	4200	12500	5130	4730	3540	1740
9	9450	7260	e4400	e3740	e3780	e3600	4390	12400	5110	4810	4220	2020
10	9600	7050	e4300	e3750	e3850	e3600	4750	12200	5040	4790	4590	2000
11	9680	6190	e4250	e3760	e3880	e3650	5570	11700	4720	4820	4680	1970
12	9760	5230	e4200	e3800	e3900	e3690	6400	11400	4520	5120	4450	1860
13	9790	5060	e4150	e3810	e3950	e3750	6810	11100	4300	5160	4350	1850
14	9820	5230	e4100	e3860	e3940	e3900	7460	10800	3890	5660	4200	1530
15	9650	5690	e4070	e3900	e3920	e4100	7980	10400	3920	5820	3830	1580
16	9420	5650	e4020	e3900	e3910	4220	8140	10200	3840	6020	3720	1590
17	9140	5820	e4000	e3900	e3900	4120	8880	10200	3650	6060	3320	1400
18	8800	5880	e4000	e3880	e3900	4230	9870	9830	3440	5890	3130	1560
19	8230	5910	e4000	e3860	e3900	4140	10100	10100	3420	5850	3020	1510
20	7750	5880	e3950	e3840	e3890	4010	10800	10100	3230	5630	2810	1500
21	7360	5410	e3900	e3810	e3880	4060	11600	10100	3200	5530	2430	1310
22	7110	4470	e3880	e3800	e3870	4080	12100	9980	3120	5190	2520	1310
23	7110	4280	e3860	e3800	e3860	3990	12400	9740	2970	4980	2110	1310
24	6910	3630	e3840	e3790	e3850	4030	12900	9560	2810	4980	1960	1290
25	6970	3370	e3820	e3780	e3830	e4000	13200	9120	2730	5010	2010	1290
26	7010	3570	e3810	e3770	e3810	e4000	13400	8910	2850	4850	1770	1450
27	7080	3550	e3800	e3760	e3800	e4000	13500	8520	2760	4890	1640	1350
28	7300	3800	e3800	e3750	e3780	e4000	13700	8010	3240	4500	1710	1370
29	7720	3740	e3800	e3750	e3770	3990	13800	7790	3520	4370	1620	1470
30	7850	3880	e3800	e3740	---	3890	13800	7680	4090	4370	1570	1590
31	7990	---	e3800	e3720	---	3930	---	7100	---	4390	1430	---
TOTAL	248070	173400	125990	117630	110780	120010	254220	333940	128700	156330	95110	46060
MEAN	8002	5780	4064	3795	3820	3871	8474	10770	4290	5043	3068	1535
MAX	9820	8110	4800	3900	3950	4230	13800	13800	6910	6060	4680	2020
MIN	3130	3370	3800	3720	3700	3570	3940	7100	2730	4370	1430	1290
AC-FT	492000	343900	249900	233300	219700	238000	504200	662400	255300	310100	188700	91360
CFSM	1.09	.79	.56	.52	.52	.53	1.16	1.47	.59	.69	.42	.21
IN.	1.26	.88	.64	.60	.56	.61	1.29	1.70	.65	.79	.48	.23

e Estimated.

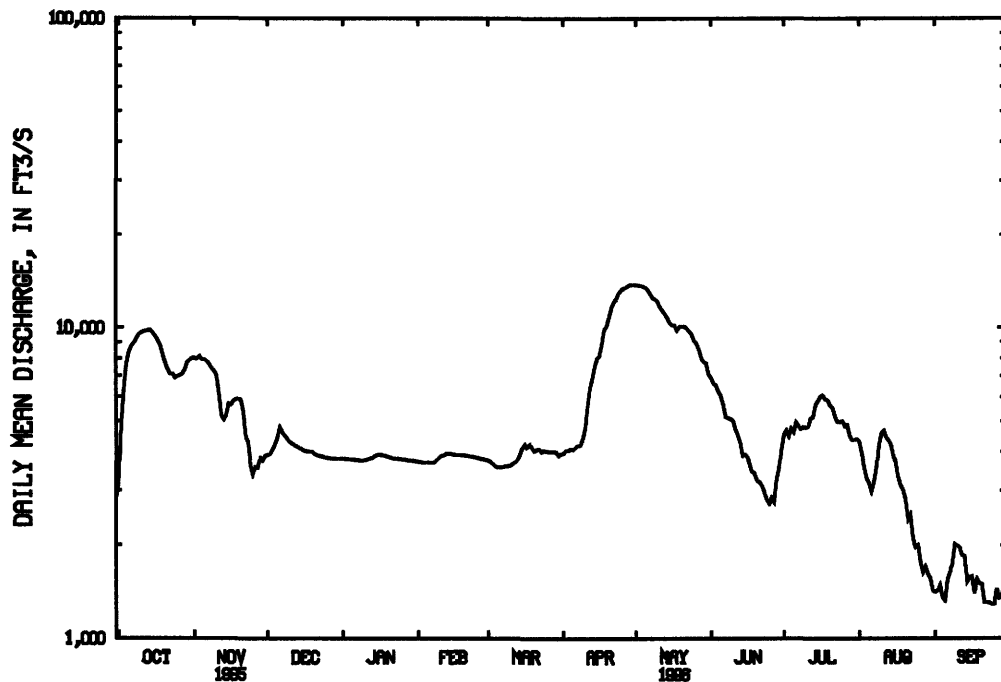
MISSISSIPPI RIVER MAIN STEM

05242300 MISSISSIPPI RIVER AT BRAINERD, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3265	3098	2574	2351	2158	2654	5525	5616	3634	4052	2329	2369
MAX	8002	5780	4064	3795	3820	3918	8601	10770	6193	10260	5071	3681
(WY)	1996	1996	1996	1996	1996	1995	1989	1996	1990	1993	1993	1993
MIN	1840	1931	1362	1140	1040	1435	3400	1928	662	442	935	1166
(WY)	1992	1993	1991	1991	1991	1991	1990	1988	1988	1988	1990	1990

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1987 - 1996	
ANNUAL TOTAL	1539536		1910240			
ANNUAL MEAN	4218		5219		3358	
HIGHEST ANNUAL MEAN					5219	1996
LOWEST ANNUAL MEAN					1950	1988
HIGHEST DAILY MEAN	9820	Oct 14	13800 ^a	Apr 29	13800 ^a	Apr 29 1996
LOWEST DAILY MEAN	919	Jun 30	1290	Sep 24,25	348	Jul 30 1988
ANNUAL SEVEN-DAY MINIMUM	1080	Jun 27	1330	Sep 21	357	Jul 29 1988
INSTANTANEOUS PEAK FLOW			14000	Apr 30	14000	Apr 30 1996
INSTANTANEOUS PEAK STAGE			14.59	Apr 30	14.59	Apr 30 1996
INSTANTANEOUS LOW FLOW			823 ^b	Sep 3	273 ^b	Jul 12 1988
ANNUAL RUNOFF (AC-FT)	3054000		3789000		2433000	
ANNUAL RUNOFF (CFSM)	.58		.71		.46	
ANNUAL RUNOFF (INCHES)	7.82		9.71		6.23	
10 PERCENT EXCEEDS	7430		9800		6100	
50 PERCENT EXCEEDS	3880		4050		2800	
90 PERCENT EXCEEDS	2100		2010		1280	

^a Also occurred Apr. 30 and May 1, 1996.^b Result of regulation.

— 05242300 MISSISSIPPI RIVER AT BRAINERD, MN

CROW WING RIVER BASIN

05243725 STRAIGHT RIVER NEAR PARK RAPIDS, MN

LOCATION.--Lat 46°52'30", long 95°03'56", in NW¼NE¼, sec. 11, T. 139 N., R. 35 W., Hubbard County, Hydrologic Unit 07010106, upstream from culvert on U.S. Highway 71 3.2 mi south of Park Rapids.

DRAINAGE AREA.--53.2 mi².

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1970-71, 1973, 1975-76. October 1986 to current year (no winter records in 1987, 1990-91). Records of hourly water temperature, available in files of the Geological Survey.

GAGE.--Water-stage recorder. Datum of gage is 1,399.55 ft above mean sea level (levels by Minnesota Department of Natural Resources).

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87	e78	e73	e62	e53	e63	e58	87	69	60	64	53
2	96	e77	e75	e58	e52	e60	e57	84	71	59	62	61
3	99	e77	e77	e52	e51	e58	e60	83	71	58	62	63
4	99	e76	e77	e51	e50	e55	e64	84	69	56	62	60
5	98	e76	e78	e50	e50	e52	e67	84	70	57	66	58
6	95	e77	e77	e50	e50	e52	e70	83	80	59	62	57
7	92	e78	e76	e50	e51	e51	e75	84	79	59	65	63
8	89	e78	e75	e61	e53	e51	e80	84	75	62	65	63
9	88	e76	e74	e69	e56	e51	e84	84	72	62	62	61
10	87	e75	e73	e71	e60	e51	e88	83	69	60	60	59
11	85	e74	e72	e72	e65	e56	e90	80	67	60	59	58
12	82	e73	e72	e73	e70	e60	e93	78	67	60	56	58
13	80	e72	e73	e74	e71	e64	e92	77	67	59	56	56
14	78	e72	e74	e74	e70	e66	e90	76	65	57	59	55
15	77	e72	e75	e72	e69	e68	88	80	67	57	59	55
16	76	e72	e76	e70	e69	e68	86	92	68	57	55	56
17	75	e72	e76	e69	e68	e67	90	91	67	56	55	56
18	73	e73	e77	e68	e67	e65	98	101	66	57	55	55
19	75	e75	e78	e67	e66	e64	102	97	66	57	58	55
20	76	e77	e78	e66	e67	e65	99	93	63	55	59	56
21	77	e78	e77	e65	e69	e66	98	91	65	55	55	60
22	77	e76	e76	e64	e70	e68	98	87	63	56	57	62
23	76	e74	e75	e62	e72	e68	96	83	66	56	59	62
24	79	e74	e74	e61	e73	e67	95	79	66	58	57	61
25	81	e76	e73	e60	e74	e64	97	76	65	57	55	61
26	80	e75	e71	e59	e71	e60	99	74	64	56	55	64
27	80	e74	e70	e58	e69	e56	96	73	63	60	55	70
28	80	e72	e69	e57	e67	e54	93	71	62	63	54	77
29	80	e70	e67	e56	e66	e54	92	70	62	66	53	77
30	80	e70	e66	e55	---	e58	90	68	60	68	53	75
31	79	---	e64	e54	---	e60	---	68	---	68	54	---
TOTAL	2576	2239	2288	1930	1839	1862	2585	2545	2024	1830	1810	1827
MEAN	83.1	74.6	73.8	62.3	63.4	60.1	86.2	82.1	67.5	59.0	57.4	60.9
MAX	99	78	78	74	74	68	102	101	80	68	65	77
MIN	73	70	64	50	50	51	57	68	60	55	53	53
AC-FT	5110	4440	4540	3830	3650	3690	5130	5050	4010	3630	3590	3620
CFSM	1.56	1.40	1.39	1.17	1.19	1.13	1.62	1.54	1.27	1.11	1.10	1.14
IN.	1.80	1.57	1.60	1.35	1.29	1.30	1.81	1.78	1.42	1.28	1.27	1.28

e Estimated.

CROW WING RIVER BASIN

05243725 STRAIGHT RIVER NEAR PARK RAPIDS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 1996, BY WATER YEAR (WY)

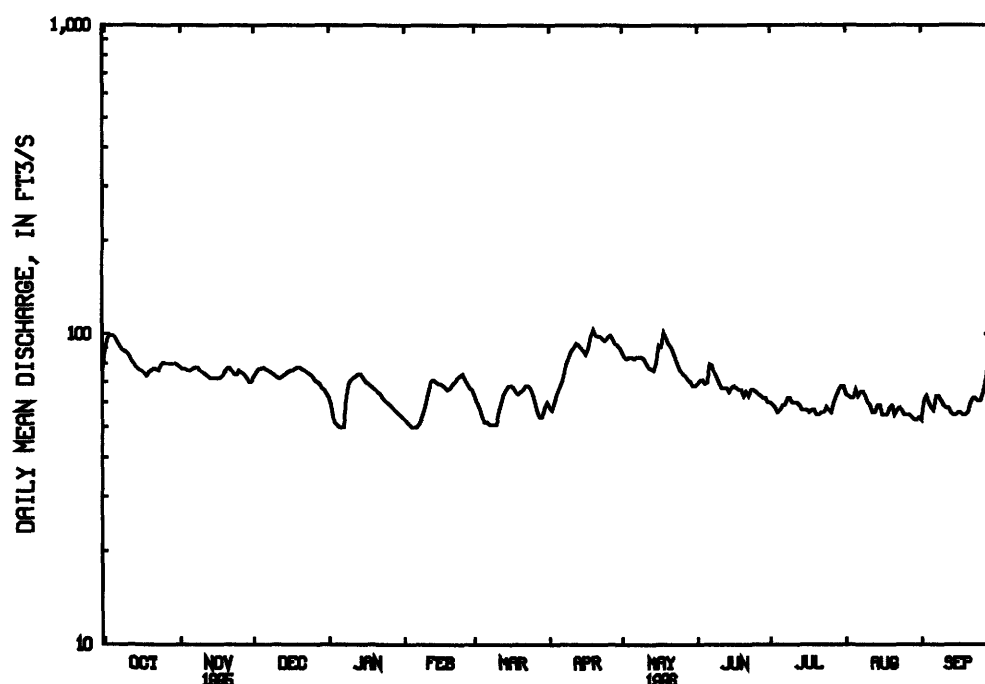
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	59.7	61.9	59.0	51.7	52.7	61.5	68.9	64.1	56.1	54.0	52.0	56.5
MAX	83.1	74.6	74.5	64.3	64.6	76.8	86.2	82.1	68.8	70.5	74.7	73.6
(WY)	1996	1996	1995	1995	1995	1995	1996	1996	1994	1993	1993	1993
MIN	42.2	47.4	46.0	41.9	44.8	50.9	56.1	46.2	41.9	39.5	35.9	38.7
(WY)	1993	1989	1989	1992	1992	1989	1991	1992	1992	1988	1990	1990

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1987 - 1996
ANNUAL TOTAL	25009	25355	
ANNUAL MEAN	68.5	69.3	60.0
HIGHEST ANNUAL MEAN			69.3
LOWEST ANNUAL MEAN			48.0
HIGHEST DAILY MEAN	99	Oct 3	102
LOWEST DAILY MEAN	47	Jun 22	50
ANNUAL SEVEN-DAY MINIMUM	48	Jun 19	51
INSTANTANEOUS PEAK FLOW		104	106
INSTANTANEOUS PEAK STAGE		2.38 ^a	2.84 ^b
INSTANTANEOUS LOW FLOW		25 ^c	1992
ANNUAL RUNOFF (AC-FT)	49610	50290	43450
ANNUAL RUNOFF (CFSM)	1.29	1.30	1.13
ANNUAL RUNOFF (INCHES)	17.49	17.73	15.32
10 PERCENT EXCEEDS	80	87	75
50 PERCENT EXCEEDS	66	68	56
90 PERCENT EXCEEDS	56	55	43

a Maximum observed, backwater from ice.

b From floodmark, backwater from ice.

c Result of freezeup.



05243725 STRAIGHT RIVER NEAR PARK RAPIDS, MN

CROW WING RIVER BASIN

05244000 CROW WING RIVER AT NIMROD, MN

LOCATION.--Lat 46°38'25", long 94°52'44", in SE 1/4 NW 1/4 sec. 32, T. 137 N., R. 33 W., Wadena County, Hydrologic Unit 07010106, on right bank 200 ft upstream from highway bridge, 0.2 mi north of Nimrod, and 0.7 mi upstream from Cat River.

DRAINAGE AREA.--1,010 mi² (2,620 km²), approximately.

PERIOD OF RECORD.--April 1910 to September 1914, July 1930 to September 1981, October 1991 to current year (winter records incomplete prior to 1940). October 1981 to September 1987, annual maximums only.

REVISED RECORDS.--WSP 1508: 1910-11, 1913-14, 1937, 1942(M), 1944(M).

GAGE.--Water-stage recorder. Datum of gage is 1,313.27 ft above sea level (levels by Wadena County Highway Department from Minnesota Department of Transportation bench mark). Apr. 15, 1910, to Sept. 30, 1914, nonrecording gage at same site, at datum 2.2 ft lower. July 28, 1930, to Nov. 4, 1949, nonrecording gages at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow affected by natural storage in many lakes.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	488	773	e500	e460	e450	e470	e580	1210	694	385	306	250
2	525	760	e500	e460	e450	e480	e590	1170	652	382	306	289
3	595	733	e500	e460	e450	e480	e590	1140	622	374	301	306
4	641	e710	e500	e460	e450	e480	e600	1110	603	366	301	319
5	707	e710	e500	e460	e450	e480	e600	1080	590	353	343	318
6	739	e670	e500	e460	e450	e480	e610	1050	649	349	347	311
7	748	e660	e500	e460	e450	e480	e620	1020	645	345	380	345
8	753	e660	e500	e460	e450	e480	e650	1000	644	344	374	369
9	809	e670	e500	e460	e450	e480	e670	980	637	343	368	365
10	824	e630	e500	e460	e450	e480	e690	952	629	327	358	352
11	818	e600	e490	e460	e450	e490	e730	907	624	331	352	344
12	803	e580	e490	e460	e450	e490	e770	867	616	327	342	339
13	791	e590	e490	e460	e450	e500	e820	838	597	324	335	336
14	786	e600	e490	e460	e450	e520	e870	828	568	313	327	333
15	786	e580	e480	e460	e450	e540	e950	831	557	298	326	328
16	780	e550	e480	e460	e450	e560	e1050	852	541	281	322	321
17	772	e540	e480	e460	e450	e580	1280	896	519	273	314	316
18	764	e540	e480	e460	e450	e600	1370	1000	496	266	307	320
19	775	e560	e480	e460	e450	e610	1450	1050	483	266	310	312
20	773	e500	e480	e460	e450	e610	1480	1040	479	256	313	306
21	767	e470	e470	e460	e450	e610	1480	1010	449	255	314	325
22	753	e470	e470	e460	e450	e610	1480	981	434	260	347	327
23	748	e480	e470	e460	e450	e610	1480	964	436	252	332	323
24	777	e500	e470	e460	e460	e610	1490	945	443	265	322	317
25	800	e530	e470	e460	e460	e610	1510	924	430	265	319	311
26	813	e520	e470	e450	e460	e600	1500	904	430	253	313	337
27	818	e520	e470	e450	e470	e590	1450	873	409	272	291	362
28	831	e510	e460	e450	e470	e590	1370	844	391	301	284	400
29	825	e510	e460	e450	e470	e580	1310	813	375	311	282	416
30	802	e500	e460	e450	---	e580	1260	784	387	311	274	418
31	782	---	e460	e450	---	e580	---	743	---	315	257	---
TOTAL	23393	17626	14970	14200	13140	16860	31300	29606	16029	9563	9987	10015
MEAN	755	588	483	458	453	544	1043	955	534	308	322	334
MAX	831	773	500	460	470	610	1510	1210	694	385	387	418
MIN	488	470	460	450	450	470	580	743	375	252	258	250
AC-FT	46400	34960	29690	28170	26060	33440	62080	58720	31790	18970	19810	19860
CFSM	.75	.58	.48	.45	.45	.54	1.03	.95	.53	.31	.32	.33

e Estimated.

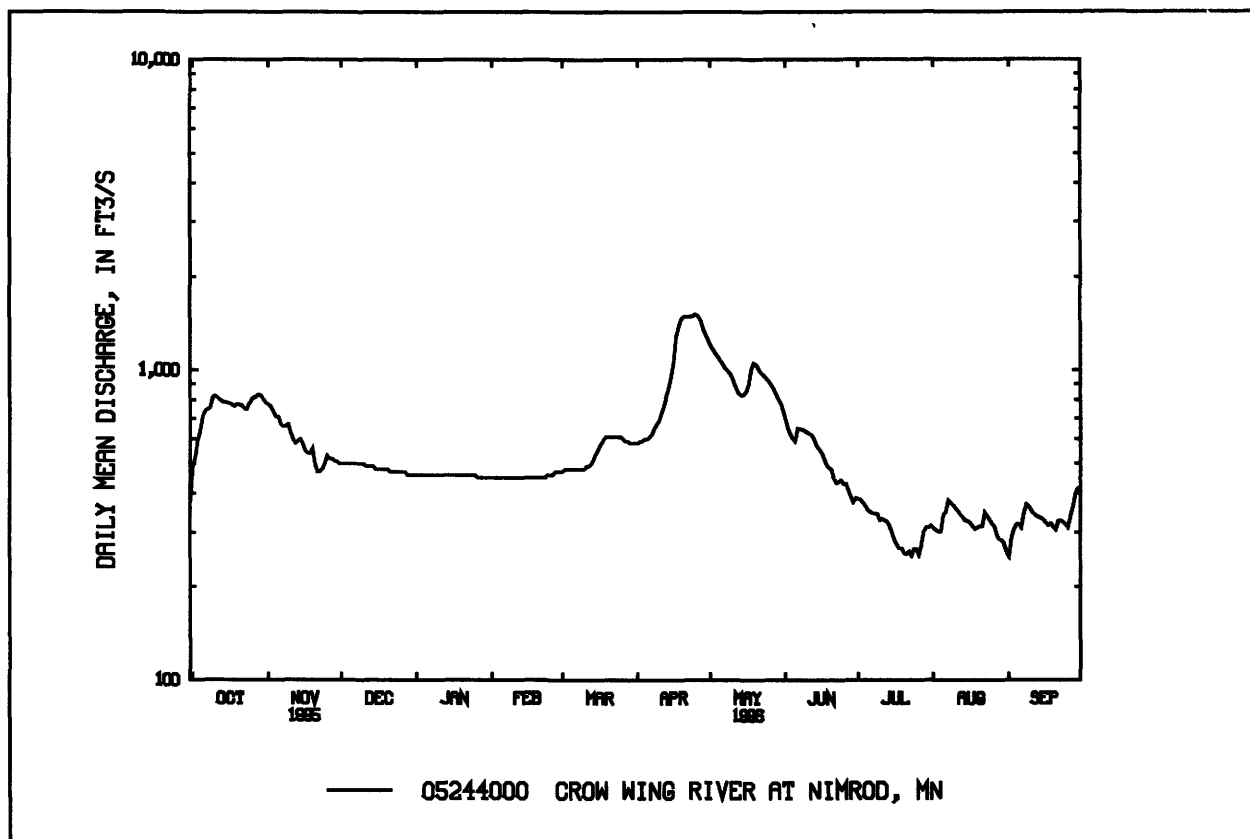
CROW WING RIVER BASIN

05244000 CROW WING RIVER AT NIMROD, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	409	397	334	296	299	403	748	668	571	432	372	382
MAX	1463	871	596	462	456	780	1624	1615	1354	956	1452	929
(WY)	1974	1972	1952	1966	1966	1995	1966	1950	1965	1949	1944	1944
MIN	137	146	131	125	170	171	202	181	149	84.0	74.3	131
(WY)	1937	1937	1940	1940	1940	1940	1911	1911	1934	1936	1936	1934

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1910 - 1996	
ANNUAL TOTAL	198832		206690			
ANNUAL MEAN	545		565		473	
HIGHEST ANNUAL MEAN					719	
LOWEST ANNUAL MEAN					230	
HIGHEST DAILY MEAN	1540		1510		3580	
LOWEST DAILY MEAN	250		250		45	
ANNUAL SEVEN-DAY MINIMUM	258		258		55	
INSTANTANEOUS PEAK FLOW			1520		3700	
INSTANTANEOUS PEAK STAGE			6.36 ^a		7.64 ^a	
INSTANTANEOUS LOW FLOW			242		45	
ANNUAL RUNOFF (AC-FT)	394400		410000		342800	
ANNUAL RUNOFF (CFSM)	54		.56		.47	
10 PERCENT EXCEEDS	810		898		792	
50 PERCENT EXCEEDS	490		480		375	
90 PERCENT EXCEEDS	307		313		198	

^a Backwater from ice.

CROW WING RIVER BASIN

05245100 LONG PRAIRIE RIVER AT LONG PRAIRIE, MN

LOCATION.--Lat 45°58'30", long 94°51'56", in NE¼NW¼ sec. 20, T. 129 N., R. 33 W., Todd County, Hydrologic Unit 07010108, on right brnk 90 ft upstream from bridge on First Avenue at Long Prairie and 400 ft downstream from Venewitz Creek.

DRAINAGE AREA.--432 mi².

PERIOD OF RECORD.--October 1971 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,281.74 ft above mean sea level.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	DAILY MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	368	370	e162	e123	e116	e127	250	408	e350	167	122	78
2	372	373	e152	e124	e115	e126	255	392	e345	163	118	99
3	385	366	e144	e123	e111	e125	263	378	e345	159	114	87
4	399	340	e140	e122	e114	e125	277	367	e335	156	111	82
5	407	303	e136	e122	e118	e124	282	366	325	154	118	82
6	428	339	e128	e122	e120	e123	305	363	323	155	112	82
7	467	325	e132	e122	e119	e122	347	363	346	156	115	86
8	476	319	e136	e121	e118	e122	403	367	351	152	112	91
9	497	284	e136	e120	e118	e121	508	368	356	152	107	92
10	501	317	e134	e120	e120	e121	756	370	358	148	106	95
11	481	209	e133	e121	e122	e122	1040	e380	359	152	106	97
12	448	208	e131	e121	e123	e130	1020	e390	350	154	106	94
13	435	261	e130	e121	e124	e145	925	e395	316	151	103	88
14	432	264	e129	e127	e124	e155	924	e400	275	151	99	82
15	427	261	e128	e129	e123	e160	880	e405	261	150	97	78
16	421	245	e128	e126	e123	e165	821	e410	250	148	95	75
17	411	237	e125	e122	e122	e160	789	e430	237	146	93	71
18	393	234	e124	e120	e122	e155	769	e480	229	145	91	70
19	374	237	e122	e120	e123	e153	741	e530	223	143	89	67
20	361	239	e122	e119	e125	e150	700	e590	215	142	87	66
21	347	164	e123	e118	e126	e147	665	e625	217	141	87	77
22	322	160	e124	e118	e128	e143	642	e620	210	142	125	96
23	302	166	e123	e118	e128	e140	607	e580	204	137	109	89
24	308	157	e123	e118	e128	e135	575	539	204	135	99	82
25	307	e152	e122	e119	e128	e132	544	476	198	136	97	81
26	314	e152	e122	e119	e129	e115	501	436	193	132	100	88
27	324	e152	e122	e119	e128	e122	458	e425	188	131	104	92
28	339	e155	e122	e118	e128	e130	439	e410	180	133	105	92
29	349	e157	e122	e117	e128	e150	430	e390	177	134	98	92
30	357	e160	e122	e117	---	e180	421	e370	174	131	89	94
31	364	---	e123	e116	---	e220	---	e360	---	126	82	---
TOTAL	12116	7306	4020	3742	3551	4345	17537	13383	8094	4522	3196	2545
MEAN	391	244	130	121	122	140	585	432	270	146	103	84.8
MAX	501	373	162	129	129	220	1040	625	359	167	125	99
MIN	302	152	122	116	111	115	250	360	174	126	82	66
AC-FT	24030	14490	7970	7420	7040	8620	34780	26550	16050	8970	6340	5050
CFSM	.90	.56	.30	.28	.28	.32	1.35	1.00	.62	.34	.24	.20

e Estimated.

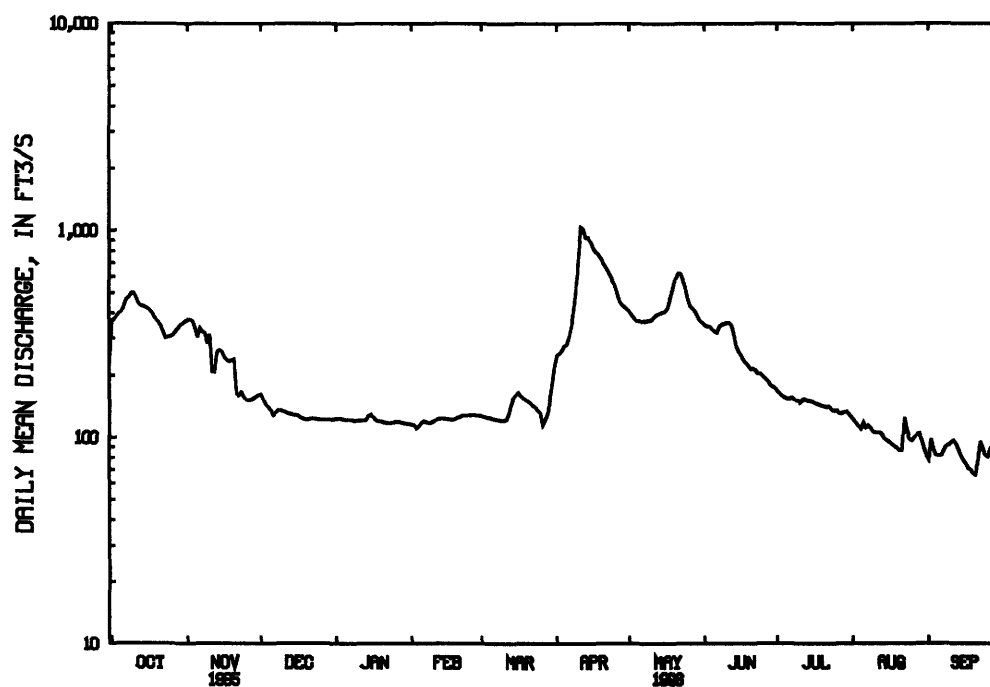
CROW WING RIVER BASIN

05245100 LONG PRAIRIE RIVER AT LONG PRAIRIE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	134	117	74.3	60.6	60.1	177	353	261	211	185	137	120
MAX	512	425	270	217	208	441	748	653	422	777	715	697
(WY)	1987	1972	1987	1987	1987	1985	1986	1986	1985	1972	1972	1976
MIN	13.4	8.69	3.19	1.05	1.62	19.8	71.8	45.5	27.5	4.73	10.0	5.32
(WY)	1977	1977	1977	1977	1977	1989	1977	1977	1988	1988	1989	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1972 - 1996
ANNUAL TOTAL	87566	84357	
ANNUAL MEAN	240	230	158
HIGHEST ANNUAL MEAN			366
LOWEST ANNUAL MEAN			25.2
HIGHEST DAILY MEAN	926	Mar 19	1040
LOWEST DAILY MEAN	48	Feb 7	66
ANNUAL SEVEN-DAY MINIMUM	49	Feb 5	72
INSTANTANEOUS PEAK FLOW			1120
INSTANTANEOUS PEAK STAGE			6.47
INSTANTANEOUS LOW FLOW			66
ANNUAL RUNOFF (AC-FT)	173700	167300	114200
ANNUAL RUNOFF (CFSM)	.56	.53	.37
10 PERCENT EXCEEDS	407	433	369
50 PERCENT EXCEEDS	229	145	97
90 PERCENT EXCEEDS	54	97	24



05245100 LONG PRAIRIE RIVER AT LONG PRAIRIE, MN

CROW WING RIVER BASIN

05246500 GULL LAKE NEAR BRAINERD, MN

LOCATION.--Lat 46°24'40", long 94°21'26", in NE 1/4 sec. 20, T. 134 N., R. 29 W., Cass County, Hydrologic Unit 07010106, in pool of dam on Gull River, 800 ft south of outlet of Gull Lake, 0.2 mi upstream from Gull Lake Dam, and 8 mi northwest of Brainerd.

DRAINAGE AREA.--287 mi².

PERIOD OF RECORD.--August 1911 to current year. Prior to October 1941 monthend contents only, published in WSP 1308. Published as Gull Lake Reservoir October 1941 to September 1956.

GAGE.--Water-stage recorder. Datum of gage is in mean sea level (levels by U.S. Army Corps of Engineers). Prior to Aug. 10, 1949, nonrecording gage 800 ft north of present site at same datum. Aug. 11, 1949, to June 30, 1973, water-stage recorder at present site and at datum 1,188.14 ft, adjustment of 1'12".

REMARKS.--Reservoir is formed by Gull Lake and several other natural lakes controlled by concrete dam completed in 1913; storage began in 1912. Capacity between elevation 1,192.75 ft and 1,194.75 ft (maximum allowable range and normal operating range) is 26,008 acre-ft. Contents shown herein are contents above elevation 1,188.00 ft. Prior to September 1978, published contents as contents above elevation 1,188.75 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records were provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 74,800 acre-ft, capacity table then in use, June 30, 1914, elevation, 1,195.05 ft; minimum observed, 22,250 acre-ft, capacity table then in use, Mar. 20, 1924, elevation, 1,190.75 ft.

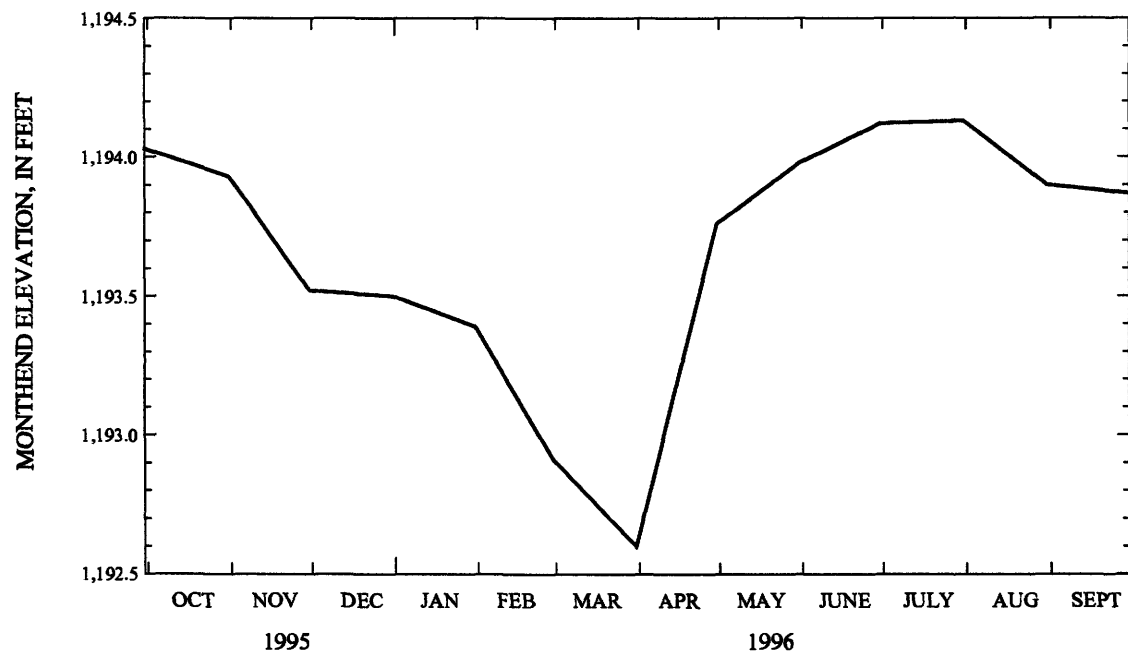
EXTREMES FOR CURRENT YEAR.--Maximum contents, 68,480 acre-ft, Oct. 5, elevation, 1194.57 ft; minimum, 42,880 acre-ft, Apr. 2, elevation, 1,192.58.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1194.03	61420	
Oct. 31	1193.93	60110	-1310
Nov. 30	1193.52	54780	-5330
Dec. 31	1193.50	54520	-260
CAL YR 1995			+1940
Jan. 31	1193.39	53100	-1420
Feb. 29	1192.91	46890	-6210
Mar. 31	1192.60	43110	-3780
Apr. 30	1193.76	57900	+14790
May 31	1193.98	60760	+2860
June 30	1194.12	62590	+1830
July 31	1194.13	62720	+130
Aug. 31	1193.90	59720	-3000
Sept. 30	1193.87	59330	-390
WTR YR 1996			-2090

CROW WING RIVER BASIN

05246500 GULL LAKE NEAR BRAINERD, MN--Continued



CROW WING RIVER BASIN

05247500 CROW WING RIVER NEAR PILLAGER, MN

LOCATION.--Lat 46°18'18", long 94°22'38", in SW¼NE¼ sec. 30, T. 133 N., R. 29 W., Cass County, Hydrologic Unit 07010106, at Sylvan dam powerplant of Minnesota Power Co., 3.6 mi above mouth and 4.9 mi southeast of Pillager.

DRAINAGE AREA.--3,520 mi², approximately.

PERIOD OF RECORD.--October 1968 to September 1986, October 1987 to current year. Records for August 1924 to September 1968 available in files of the Minnesota District Office.

GAGE.--Water stage recorder. Datum of gage is 1,151.00 ft, adjustment of 1912. Prior to January 16, 1991, staff gage attached to retaining wall approximately 20 ft below the turbine outlet bays. Datum of staff gage is 1,150.00 ft, adjustment of 1912.

REMARKS.--Records good except those for estimated daily discharges, which are fair to poor. Discharge computed on the basis of powerplant records prior to January 16, 1991. Records for Oct. 1, 1968 to Sept. 30, 1975, were adjusted for storage change in the Sylvan dam reservoir. Flow partly regulated by powerplants and Gull Lake (station 05246500).

COOPERATION.--Records collected by Minnesota Power Company prior to February 1991, in connection with a Federal Power Commission project.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum daily discharge since 1924, 18,300 ft³/s, Apr. 14, 1965.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2460	2570	1320	1250	e1130	e1310	1650	5460	2230	1250	1090	616
2	3270	2560	1370	1220	e1070	e1310	1700	5170	2260	1170	1090	748
3	3500	2500	1370	1250	e1100	e1170	e1720	4710	2210	1160	1090	772
4	3490	2270	1270	1220	e1100	e1120	1730	4370	2130	1150	919	736
5	3540	2370	1320	e1150	e1100	e1220	1770	4170	2200	1150	882	617
6	3650	2600	1230	e1100	e1100	e1220	1840	3930	2150	1120	1110	620
7	3590	2700	1130	e1100	e1110	e1170	2000	3650	2110	1080	1270	743
8	3470	2140	1260	e1150	e1110	e1040	2180	3340	2430	884	1290	956
9	3680	2120	e1200	1200	e1110	e1120	2290	3320	2540	868	1030	873
10	3430	2190	e1150	1180	e1180	e1150	2870	3370	2500	951	1030	847
11	3480	1280	e1100	1140	e1160	e1150	3890	3180	2270	1050	1030	842
12	3380	1440	e1150	1130	e1110	e1130	5450	3150	2160	1240	1030	835
13	3280	1590	e1250	1130	e1160	e1090	6830	3470	2080	1120	926	832
14	3120	1640	1310	1190	e1170	1210	9370	2780	1880	1080	814	782
15	3190	1730	1140	1220	e1170	1400	13900	2030	1840	1140	880	712
16	2900	1810	1240	1200	e1170	1460	13500	1900	1830	1160	822	679
17	2480	1720	1250	1260	e1170	1450	12500	2330	1750	1110	658	679
18	2480	1780	1230	e1250	e1170	1690	e12000	2750	1530	1110	633	666
19	2430	1750	1210	e1050	e1170	1480	e11500	3100	1510	1020	682	650
20	2370	1760	1250	e970	e1140	1760	11000	3240	1490	979	719	649
21	2370	1620	1240	e1020	e1120	1610	10500	3380	1420	978	723	784
22	2290	1540	1230	e1060	e1140	1770	9540	3390	1370	973	720	812
23	2240	1210	1220	e1060	e1140	1940	8890	3500	1230	906	719	715
24	2340	1140	1220	e1080	e1140	1890	8250	3390	1380	843	717	634
25	2270	1300	1270	e1090	e1140	1820	8080	3250	1380	765	688	666
26	2290	1530	1260	e1090	e1220	1850	7660	3180	1300	847	702	953
27	2400	1510	1260	e1130	e1300	1730	7380	3120	1280	850	688	980
28	2480	1350	1270	e1130	e1300	1820	7250	2720	1270	1070	628	873
29	2520	1250	1260	e1130	e1300	1760	6710	2540	1300	1040	627	809
30	2590	1240	1260	e1130	---	1650	6020	2350	1200	1030	617	855
31	2530	---	1260	e1130	---	1650	---	2300	---	1060	618	---
TOTAL	89510	54210	38500	35410	33500	45140	199970	102540	54230	32154	26442	22935
MEAN	2887	1807	1242	1142	1155	1456	6666	3308	1808	1037	853	764
MAX	3680	2700	1370	1260	1300	1940	13900	5460	2540	1250	1290	980
MIN	2240	1140	1100	970	1070	1040	1650	1900	1200	765	617	616
AC-FT	177500	107500	76360	70240	66450	89540	396600	203400	107600	63780	52450	45490
CFSM	.87	.55	.38	.35	.35	.44	2.02	1.00	.55	.31	.26	.23
IN.	1.01	.61	.43	.40	.38	.51	2.25	1.16	.61	.36	.30	.26

e Estimated.

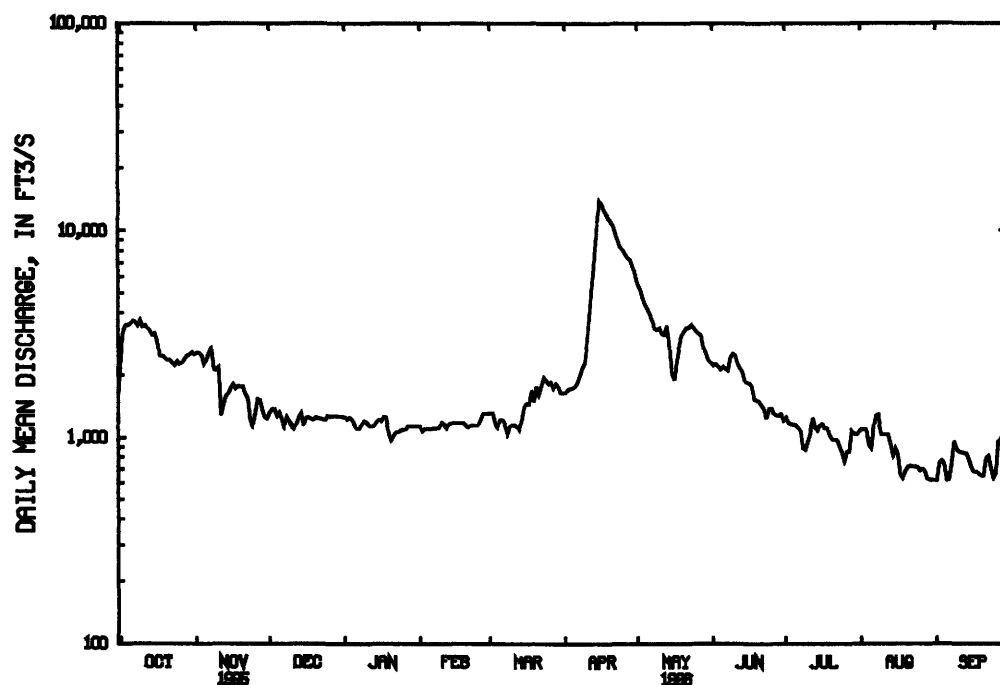
CROW WING RIVER BASIN

05247500 CROW WING RIVER NEAR PILLAGER, MN

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1969 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT
MEAN	1218	1167	806	667	669	1348	3216	2340	1616	1331	960	910
MAX	3771	3674	1544	1188	1155	2996	7429	5671	3625	3295	3520	3307
(WY)	1974	1972	1972	1986	1996	1972	1969	1986	1993	1972	1972	1986
MIN	215	215	199	218	255	548	882	545	447	206	120	161
(WY)	1977	1977	1977	1977	1977	1981	1981	1977	1988	1988	1976	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1969 - 1996
ANNUAL TOTAL	700960	734541	
ANNUAL MEAN	1920	2007	1355
HIGHEST ANNUAL MEAN			2564
LOWEST ANNUAL MEAN			446
HIGHEST DAILY MEAN	6600	Mar 19	13900
LOWEST DAILY MEAN	655	Jun 25	616
ANNUAL SEVEN-DAY MINIMUM	690	Jun 25	642
ANNUAL RUNOFF (AC-FT)	1390000	1457000	981700
ANNUAL RUNOFF (CFSM)	.58	.61	.41
ANNUAL RUNOFF (INCHES)	7.90	8.28	5.58
10 PERCENT EXCEEDS	3460	3470	2860
50 PERCENT EXCEEDS	1580	1260	900
90 PERCENT EXCEEDS	809	813	421



— 05247500 CROW WING RIVER NEAR PILLAGER, MN

MISSISSIPPI RIVER MAIN STEM

05261000 MISSISSIPPI RIVER NEAR FORT RIPLEY, MN

LOCATION.--Lat 46°10'50", long 94°21'56", in SE 1/4 NW 1/4 sec. 27, T. 43 N., R. 32 W., Crow Wing County, Hydrologic Unit 07010104, on left bank 600 ft upstream from Nokasippi River, 1.0 mile north of Fort Ripley, and a mile 982.1 upstream from Ohio River.

DRAINAGE AREA.--11,010 mi², approximately.

PERIOD OF RECORD.--June 1987 to current year. Operated as high-flow partial-record station October 1971 to June 1987. Prior to Oct. 1971 stage records collected by U.S. Weather Service.

GAGE.--Water-stage recorder. Datum of gage is 1,133.84 above sea level. Aug. 1904 to June 1987 nonrecording gages at different datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow partly regulated by powerplants and Winnibigoshish, Leech, Pokegama, Sandy, and Gull Lakes and by Pine River Reservoir (see stations 05201000, 05206000, 05210500, 05218500, 05230500, 05246500).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5710	11000	e4700	e5000	e4570	e4700	e5600	18800	9110	5670	6040	2200
2	7630	10900	e5000	e5000	e4560	e4600	e5600	18400	8760	5980	5710	e2300
3	9830	11000	e5200	e5000	e4550	e4500	e5600	18100	8640	5860	5420	e2400
4	11200	10300	e5600	e4980	e4560	e4500	e5700	17600	8090	5890	5020	e2600
5	12000	10300	e5900	e4980	e4550	e4500	e5800	17400	8060	5950	4640	e2750
6	12700	10500	e6000	e4960	e4550	e4510	6130	17000	7680	6050	4710	e2900
7	13200	10500	e6000	e4950	e4600	e4500	6140	16300	7110	6270	4920	e3000
8	13400	9660	e5900	e4930	e4650	e4490	6410	15800	7150	5890	5290	e3200
9	14000	9360	e5800	e4920	e4700	e4490	6840	15400	7290	5890	5680	e3150
10	14100	9280	e5700	e4950	e4800	e4550	8020	15400	7250	5960	6150	3080
11	14300	e8000	e5600	e4970	e5000	e4600	9480	14700	6820	6140	6300	3050
12	14200	e7000	e5600	e5000	e5000	e4600	11500	14300	6530	6500	6250	2970
13	14200	e6600	e5550	e5050	e4950	e4600	13200	14000	6250	6490	5970	2880
14	13800	e6600	e5500	e5100	e4900	e4600	15200	14400	5830	6800	5740	2720
15	13400	e6800	e5500	e5070	e4900	e4700	18000	13000	5720	7150	5470	2340
16	13100	e7000	e5450	e5050	e4870	e5000	19000	12200	5720	7350	5310	2420
17	12600	e7200	e5400	e5020	e4850	e5400	18900	12400	5610	7470	4710	2230
18	11800	e7400	e5400	e5000	e4830	e5700	20000	13100	5200	7370	4520	2290
19	11200	e7400	e5350	e4950	e4800	e5900	19900	13700	5080	7210	4190	2310
20	10600	e7200	e5300	e4900	e4800	e6100	20300	13900	5030	6960	4100	2280
21	10100	e6400	e5300	e4850	e4790	e6200	20800	14300	4810	6940	3890	2290
22	9670	e6000	e5250	e4800	e4790	e6300	21100	14300	4840	6690	3540	2250
23	9500	e5800	e5200	e4750	e4780	e6400	20900	14200	4520	6320	3490	2180
24	9610	e5600	e5200	e4700	e4800	e6400	20600	13700	4460	6250	3030	2020
25	9470	e5000	e5150	e4650	e4900	e6400	20500	13100	4410	6180	3010	1990
26	9510	e4700	e5100	e4640	e4800	e6400	20300	12700	4370	6110	2970	2360
27	9810	e4900	e5100	e4620	e4760	e6200	20000	12200	4450	6030	2580	2520
28	10000	e5000	e5080	e4600	e4760	e6000	19900	11400	4460	6200	2570	2370
29	10500	e5200	e5060	e4600	e4750	e5900	19700	10600	4860	6000	2540	2270
30	10700	e5100	e5040	e4600	---	e5800	19200	9880	5260	5840	2370	2460
31	10900	---	e5020	e4580	---	e5700	---	9310	---	5940	2290	---
TOTAL	352740	227700	166950	151170	138120	164240	430320	441590	183370	197350	138420	75780
MEAN	11380	7590	5385	4876	4763	5298	14340	14240	6112	6366	4465	2526
MAX	14300	11000	6000	5100	5000	6400	21100	18800	9110	7470	6300	3200
MIN	5710	4700	4700	4580	4550	4490	5600	9310	4370	5670	2290	1990
AC-FT	699700	451600	331100	299800	274000	325800	853500	875900	363700	391400	274600	150300
CFSM	1.03	.69	.49	.44	.43	.48	1.30	1.29	.56	.58	.41	.23

e Estimated.

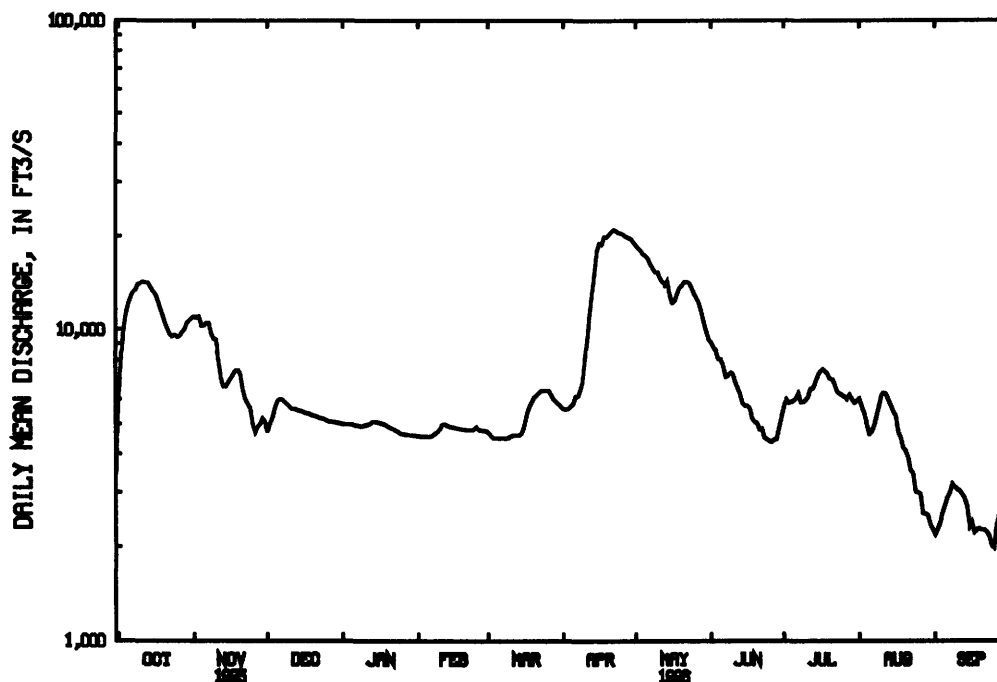
MISSISSIPPI RIVER MAIN STEM

05261000 MISSISSIPPI RIVER NEAR FORT RIPLEY, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4486	4116	3271	2962	2757	4436	8738	8417	5295	5416	3439	3388
MAX	11380	7590	5385	4876	4763	7156	14340	14240	9972	13710	7293	5657
(WY)	1996	1996	1996	1996	1996	1995	1996	1996	1993	1993	1993	1993
MIN	2563	2624	1827	1518	1508	2559	5510	3025	1196	729	1517	1760
(WY)	1993	1993	1991	1991	1991	1993	1990	1988	1988	1988	1989	1990

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1987 - 1996	
ANNUAL TOTAL	2279480		2667750			
ANNUAL MEAN	6245		7289		4768	
HIGHEST ANNUAL MEAN					7289	
LOWEST ANNUAL MEAN					2813	
HIGHEST DAILY MEAN	14300		Oct 11		21100	
LOWEST DAILY MEAN	1930		Jul 2		1990	
ANNUAL SEVEN-DAY MINIMUM	2110		Jun 27		2190	
INSTANTANEOUS PEAK FLOW					21200	
INSTANTANEOUS PEAK STAGE					11.25 ^a	
INSTANTANEOUS LOW FLOW					1960	
ANNUAL RUNOFF (AC-FT)	4521000		5291000		3454000	
ANNUAL RUNOFF (CFSM)	.57		.66		.43	
10 PERCENT EXCEEDS	10900		14100		9110	
50 PERCENT EXCEEDS	5540		5700		3720	
90 PERCENT EXCEEDS	2700		3130		1800	

^a Backwater from ice.

— 05261000 MISSISSIPPI RIVER NEAR FORT RIPLEY, MN

MISSISSIPPI RIVER MAIN STEM

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN

LOCATION.--Lat 45°51'41", long 94°21'33", in lot 2, sec. 20, T. 39 N., R. 32 W., Morrison County, Hydrologic Unit 07010104, at plant of Minnesota Power Co., 4 mi northwest of Royalton, 4.5 mi downstream from Swan River, and at mile 956 upstream from Ohio River.

DRAINAGE AREA.--11,600 mi², approximately.

PERIOD OF RECORD.--March 1924 to current year.

REMARKS.--Records fair. Discharge computed based on powerplant records adjusted by correction factors based on current-meter measurements and regression analysis using nearby gaging stations. Flow partly regulated by powerplants and Winnibigoshish, Leech, Pokegama, Sandy, and Gull Laker and by Pine River Reservoir (see stations 05201000, 05206000, 05210500, 05218500, 05230500, 05246500).

COOPERATION.--Records collected by Minnesota Power Co. under general supervision of Geological Survey, in connection with a Federal Power Commission project.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6300	11400	5960	5250	4790	4930	7510	19000	9870	5550	6250	2190
2	8870	11500	5440	5260	4780	4820	7280	16900	9590	6120	5880	2350
3	11700	11400	5700	5260	4770	4710	6960	18700	10200	6160	5560	2580
4	13000	11000	6580	5230	4780	4710	6740	20700	8830	5730	5090	3150
5	13500	10700	6680	5240	4770	4710	6520	20700	8740	6020	4680	3380
6	14000	10700	6490	5210	4770	4720	6680	20200	8700	6260	4780	3490
7	14400	11000	6370	5200	4830	4720	7010	18400	8170	6440	5020	3470
8	14600	9710	6220	5180	4880	4710	7230	16500	7820	5980	5460	3330
9	15200	9320	6100	5170	4940	4710	8380	15800	8050	6050	5910	3210
10	15100	9420	6000	5200	5050	4770	9250	15900	7850	5820	6460	3070
11	15300	8830	5890	5230	5280	4940	11500	15500	7160	6160	6580	3040
12	14500	6640	5890	5260	5280	5280	13700	14800	6880	6400	6510	2930
13	14800	5350	5840	5320	5220	5970	15300	14200	7000	6660	6170	2880
14	14400	7530	5790	5370	5150	6310	17500	15300	6270	6730	5900	2730
15	14100	7920	5800	5340	5140	6530	19300	13700	5920	7320	5580	2320
16	13900	7610	5740	5310	5110	6970	19300	12900	6050	7300	5400	2410
17	13100	6690	5680	5280	5090	7510	20400	13200	5920	7590	4750	2210
18	12500	7730	5690	5250	5070	7840	20600	14700	5380	7730	4540	2280
19	12300	7940	5630	5200	5040	8180	20700	15100	4880	7100	4210	2310
20	11400	8000	5580	5140	5040	8500	21200	16000	5100	7030	4130	2280
21	11000	7540	5580	5090	5030	8580	21300	16000	4690	6900	3920	2310
22	10600	7420	5520	5030	5030	8570	22500	15100	4610	6980	3570	2280
23	10300	7080	5470	4980	5020	8670	22800	14900	4500	6280	3530	2200
24	10500	6700	5470	4920	5040	8770	20400	14300	4210	5870	3030	2030
25	10200	5530	5410	4870	5160	8760	20700	13600	4060	6090	3020	1960
26	10200	5330	5360	4860	5040	8650	20800	13200	4120	6330	2990	2220
27	10300	5880	5360	4840	5000	8530	19300	12700	4080	6250	2580	2630
28	10400	6550	5340	4820	5000	8410	17600	11900	4030	6430	2600	2290
29	10900	6720	5320	4820	4980	8290	17500	11400	4640	6200	2560	2240
30	10800	6310	5300	4820	---	7950	18500	10400	5020	6030	2380	2330
31	10800	---	5280	4800	---	7730	---	9980	---	6140	2290	---
TOTAL	378970	245450	178480	158750	145080	208450	454460	471680	192340	199650	141330	78100
MEAN	12220	8182	5757	5121	5003	6724	15150	15220	6411	6440	4559	2603
MAX	15300	11500	6680	5370	5280	8770	22800	20700	10200	7730	6580	3490
MIN	6300	5330	5280	4800	4770	4710	6520	9980	4030	5550	2290	1960
AC-FT	751700	486900	354000	314900	287800	413500	901400	935600	381500	396000	280300	154900
CFSM1.05	.71	.50	.44	.43	.58	1.31	1.31	.55	.56	.39	.22	
IN.	1.22	.79	.57	.51	.47	.67	1.46	1.51	.62	.64	.45	.25

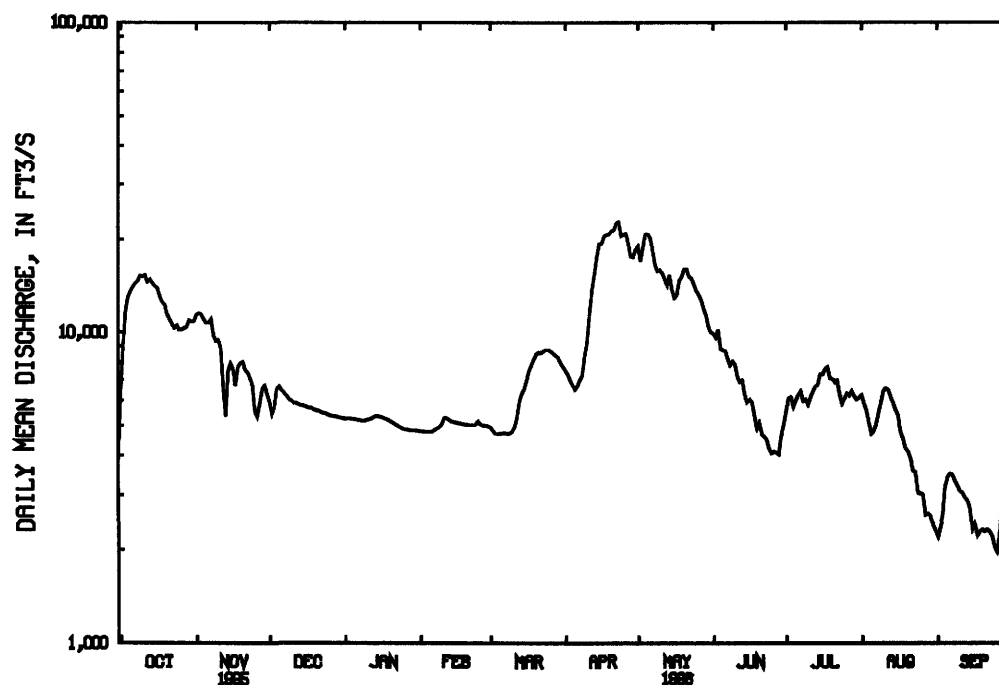
MISSISSIPPI RIVER MAIN STEM

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4114	3847	2999	2674	2559	3774	9004	8589	6400	4758	3641	3533
MAX	12930	14640	6456	5713	5048	12290	22200	24600	18160	15250	15230	12940
(WY)	1966	1972	1952	1966	1984	1966	1966	1950	1965	1993	1953	1976
MIN	632	618	627	534	758	968	1924	1663	1071	648	449	535
(WY)	1937	1937	1935	1935	1937	1940	1931	1977	1988	1988	1934	1934

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1924 - 1996
ANNUAL TOTAL	2440650	2852740	
ANNUAL MEAN	6687	7794	4685
HIGHEST ANNUAL MEAN			9555
LOWEST ANNUAL MEAN			1213
HIGHEST DAILY MEAN	15800	Mar 20	22800
LOWEST DAILY MEAN	1940	Jul 2	1960
ANNUAL SEVEN-DAY MINIMUM	2130	Jun 27	2180
ANNUAL RUNOFF (AC-FT)	4841000	5658000	3394000
ANNUAL RUNOFF (CFSM)	58	.67	.40
ANNUAL RUNOFF (INCHES)	7.83	9.15	5.49
10 PERCENT EXCEEDS	11600	15100	9690
50 PERCENT EXCEEDS	5890	6090	3390
90 PERCENT EXCEEDS	2870	3440	1290



— 05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN

MISSISSIPPI RIVER MAIN STEM

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN--Continued
(National Water-Quality Assessment Station)

PERIOD OF RECORD.--Water years 1963-66, 1975 to current year, NASOAN discontinued.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: May to September 1996.

REMARKS.--Water-quality monitor since May 1996.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum, 27.0°C, June 30, 1996; minimum, 13.0°C, Sept. 30, 1996

EXTREMES FOR CURRENT YEAR--

WATER TEMPERATURES: Maximum 27.0°C, June 30; minimum, 13.0°C, Sept. 30.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN
	FEBRUARY				MARCH				APRIL				MAY		
1	---	---	---		---	---	---		---	---	---		---	---	---
2	---	---	---		---	---	---		---	---	---		---	---	---
3	---	---	---		---	---	---		---	---	---		---	---	---
4	---	---	---		---	---	---		---	---	---		---	---	---
5	---	---	---		---	---	---		---	---	---		---	---	---
6	---	---	---		---	---	---		---	---	---		---	---	---
7	---	---	---		---	---	---		---	---	---		---	---	---
8	---	---	---		---	---	---		---	---	---		---	---	---
9	---	---	---		---	---	---		---	---	---		---	---	---
10	---	---	---		---	---	---		---	---	---		---	---	---
11	---	---	---		---	---	---		---	---	---		---	---	---
12	---	---	---		---	---	---		---	---	---		---	---	---
13	---	---	---		---	---	---		---	---	---		---	---	---
14	---	---	---		---	---	---		---	---	---		---	---	---
15	---	---	---		---	---	---		---	---	---		---	---	---
16	---	---	---		---	---	---		---	---	---		---	---	---
17	---	---	---		---	---	---		---	---	---		---	---	---
18	---	---	---		---	---	---		---	---	---		---	---	---
19	---	---	---		---	---	---		---	---	---		---	---	---
20	---	---	---		---	---	---		---	---	---		---	---	---
21	---	---	---		---	---	---		---	---	---		---	---	---
22	---	---	---		---	---	---		---	---	---		---	---	---
23	---	---	---		---	---	---		---	---	---		---	---	---
24	---	---	---		---	---	---		---	---	---		17.0	16.5	17.0
25	---	---	---		---	---	---		---	---	---		17.0	15.5	16.0
26	---	---	---		---	---	---		---	---	---		16.0	15.5	15.5
27	---	---	---		---	---	---		---	---	---		16.5	15.5	16.0
28	---	---	---		---	---	---		---	---	---		16.5	15.0	15.5
29	---	---	---		---	---	---		---	---	---		17.0	15.5	16.0
30	---	---	---		---	---	---		---	---	---		17.5	16.0	16.5
31	---	---	---		---	---	---		---	---	---		17.5	16.5	17.0
MONTH	---	---	---		---	---	---		---	---	---		---	---	---

MISSISSIPPI RIVER MAIN STEM

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	17.5	17.0	17.0	25.5	24.0	25.0	23.0	21.0	22.0	24.5	22.0	23.0
2	19.0	17.0	18.0	25.5	24.0	24.5	23.5	21.5	22.5	24.0	22.5	23.0
3	18.0	17.0	17.5	25.0	23.5	24.0	24.5	22.0	23.0	25.0	22.5	23.5
4	17.5	16.5	17.0	26.0	24.0	25.0	23.5	22.5	23.0	24.5	22.0	23.0
5	18.0	16.5	17.0	26.5	24.0	25.0	24.5	22.5	23.0	24.5	22.0	23.0
6	18.0	16.5	17.0	26.0	25.0	25.5	25.0	22.5	23.5	25.0	22.5	23.5
7	18.5	16.5	17.5	26.0	24.5	25.0	25.5	23.0	24.0	23.5	22.5	23.0
8	19.5	17.0	18.0	24.5	23.0	24.0	25.5	23.5	24.5	24.5	22.5	23.0
9	20.5	18.5	19.5	24.5	22.5	23.5	25.5	23.5	24.0	24.0	22.0	23.0
10	22.0	19.5	20.5	24.0	22.0	22.5	24.0	23.0	23.5	23.5	21.5	22.5
11	22.5	20.0	21.5	24.0	22.0	23.0	24.5	23.0	23.5	21.5	20.5	21.0
12	23.5	21.5	22.5	23.5	22.5	22.5	24.5	22.5	23.5	21.5	19.5	20.5
13	24.0	22.5	23.0	23.0	22.0	22.5	25.5	23.0	24.0	21.5	19.0	20.0
14	24.5	23.0	23.5	23.5	22.0	22.5	24.0	23.0	23.5	21.0	18.5	19.5
15	24.0	23.0	23.5	24.0	22.5	23.0	24.5	23.0	23.5	19.5	18.0	18.5
16	23.5	22.5	23.0	24.5	23.0	23.5	24.0	22.0	23.0	19.5	17.5	18.0
17	22.5	21.0	22.0	25.0	23.5	24.0	24.5	22.0	23.0	19.0	17.0	18.0
18	21.0	20.5	21.0	25.0	24.0	24.5	24.5	22.5	23.5	19.5	17.0	18.0
19	22.0	20.0	21.0	24.5	24.0	24.5	24.0	22.5	23.5	19.0	17.0	17.5
20	22.5	20.0	21.0	25.0	23.5	24.0	24.5	22.5	23.0	17.0	17.0	17.0
21	22.5	20.5	21.0	24.5	23.0	23.5	24.0	22.0	23.0	17.0	16.5	16.5
22	23.0	20.5	21.5	24.5	23.0	23.5	24.5	22.5	23.0	18.0	15.5	16.5
23	21.0	20.0	20.5	24.0	23.0	23.5	24.5	22.0	23.0	17.0	15.0	16.0
24	21.5	19.5	20.5	23.5	22.5	22.5	25.0	22.5	23.0	17.0	15.0	15.5
25	21.0	19.5	20.0	23.5	22.0	22.5	24.5	22.5	23.0	16.5	15.0	15.5
26	22.5	19.5	20.5	24.0	21.5	22.5	24.5	22.5	23.0	15.0	15.0	15.0
27	23.5	20.0	22.0	23.0	22.5	22.5	24.5	21.5	22.5	15.0	14.0	14.5
28	25.5	21.5	23.5	23.0	22.0	22.5	24.5	21.5	22.5	15.0	13.5	14.0
29	26.5	24.0	25.0	22.0	21.0	21.5	24.5	21.5	22.5	15.0	13.0	14.0
30	27.0	24.5	25.5	22.5	20.5	21.5	24.5	21.5	22.5	15.0	13.0	13.5
31	---	---	---	22.0	20.5	21.0	24.5	22.0	22.5	---	---	---
MONTH	27.0	16.5	20.5	26.5	20.5	23.5	25.5	21.0	23.0	25.0	13.0	19.0

MISSISSIPPI RIVER MAIN STEM

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	PH WATER WHOLE LAB (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM HG)	OXYGEN, DIS-SOLVED (MG/L)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3)	ALKA-LINITY LAB (MG/L AS CACO3)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3)	
		(00061)	(00095)	(90095)	(00400)	(00403)	(00010)	(00025)	(00300)	(39086)	(90410)	(00452)	
APR													
01...	1000	E7590	322	336	7.6	7.6	0.5	--	11.8	153	164	0	
25...	1100	21100	195	200	7.7	7.8	7.5	714	11.6	91	95	0	
MAY													
23...	1040	15300	243	243	8.2	7.6	17.5	736	9.3	109	121	0	
JUN													
24...	1105	E4210	306	309	8.1	7.8	20.5	735	7.3	140	151	0	
JUL													
10...	1140	5910	256	256	7.9	7.9	23.0	736	8.4	112	121	0	
AUG													
15...	1230	4770	252	251	8.1	7.2	24.0	740	7.6	106	119	0	
SEP													
06...	1200	E3490	298	298	8.2	8.0	24.0	736	8.0	126	144	0	
DATE		BICAR-BONATE DIS IT FIELD (MG/L AS HCO3)	NITRO-GEN, DIS-SOLVED (MG/L AS N)	NITRO-GEN, DIS-SOLVED (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	SOLIDS, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	SOLIDS, AT 180 DEG. C DIS-SOLVED (MG/L)
		(00453)	(00608)	(00613)	(00623)	(00625)	(00631)	(00665)	(00666)	(00671)	(00681)	(00689)	(70300)
APR													
01...	187		0.140	<0.010	0.60	0.70	0.340	0.030	0.030	0.030	8.8	0.50	201
25...	111		0.050	0.020	0.60	0.60	0.160	<0.010	0.010	0.020	11	0.70	132
MAY													
23...	133		0.020	<0.010	0.50	0.70	0.060	0.010	<0.010	<0.010	12	0.70	169
JUN													
24...	171		0.060	0.010	0.40	0.60	0.200	0.050	0.010	0.020	9.1	0.60	186
JUL													
10...	137		0.050	0.010	0.50	0.60	0.170	0.040	0.020	0.030	10	0.90	162
AUG													
15...	129		0.020	0.010	0.60	0.60	0.130	0.020	<0.010	0.030	12	0.50	144
SEP													
06...	154		<0.015	<0.010	0.50	0.50	0.130	0.030	0.010	0.020	9.4	0.70	181

MISSISSIPPI RIVER MAIN STEM

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
APR												
01...	42	14	5.8	2.8	5.7	6.2	<0.10	13	400	59	4	100
25...	26	7.4	2.9	2.0	3.2	3.5	<0.10	8.9	350	24	20	97
MAY												
23...	33	9.4	4.1	1.7	4.0	3.5	<0.10	6.9	140	19	11	100
JUN												
24...	35	13	5.2	1.6	4.8	5.7	0.10	9.0	56	22	16	99
JUL												
10...	31	11	5.0	3.2	3.6	5.2	0.10	8.7	160	25	25	98
AUG												
15...	30	10	4.6	1.2	3.7	5.9	<0.10	8.8	98	7	12	94
SEP												
06...	37	12	5.6	1.6	5.7	8.1	0.10	10	17	5	6	91

SAUK RIVER BASIN

05270500 SAUK RIVER NEAR ST. CLOUD, MN

LOCATION.--Lat 45°33'35", long 94°14'00", in SW¹/₄SW¹/₄ sec. 8, T. 124 N., R. 28 W., Stearns County, Hydrologic Unit 07010203, on right bank 0.5 mi northwest of Waite Park, 3 mi west of St. Cloud, and 5 mi upstream from mouth.

DRAINAGE AREA.--925 mi².

PERIOD OF RECORD.--July 1909 to December 1912, April to December 1913, May to November 1929, March 1930 to September 1931, April to November 1932, March to November 1933, March 1934 to September 1981, October 1990 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORD--WSP 895: Drainage area. WSP 1308: 1912(M), 1932 (M). WSP 1508: 1937(m).

GAGE.--Water-stage recorder. Datum of gage is 1,034.63 ft above mean sea level. Prior to Nov. 22, 1934, nonrecording gage on highway bridge 1 mi downstream at datum 6.77 ft lower.

REMARKS:--Records good except those for estimated daily discharge, which are fair. Flow regulated by powerplants and reservoirs above station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	419	910	e410	e292	e225	e262	1150	1240	1110	384	254	99
2	485	951	408	e294	e225	e260	1240	1180	1060	371	246	93
3	612	948	e405	e290	e225	e255	1320	1130	1020	351	234	92
4	712	859	e404	e285	e225	e252	1380	1090	951	337	224	90
5	803	832	e403	e280	e220	e251	1420	1080	895	322	226	87
6	921	829	e401	e271	e225	e252	1450	1060	900	309	224	87
7	1010	838	e400	e255	e225	e248	1490	1030	873	302	251	86
8	1060	820	e385	e248	e225	e238	1540	1020	839	294	236	83
9	1150	807	e372	e246	e230	e232	1600	996	810	282	216	82
10	1260	810	e345	e245	e230	e230	1630	980	783	268	201	85
11	1410	794	e296	e251	e230	e231	1640	959	753	272	200	86
12	1560	740	e274	e262	e232	e240	1630	943	722	277	198	81
13	1650	676	e264	e272	e237	e268	1650	924	685	266	188	77
14	1690	644	e261	e278	e241	e328	1670	945	651	274	178	77
15	1660	635	e260	e279	e240	e390	1660	995	626	283	164	80
16	1620	635	e262	e280	e238	e470	1690	1000	620	272	152	82
17	1550	632	e268	e286	e233	e500	1660	1040	606	257	148	80
18	1520	650	e277	e283	e231	e540	1640	1110	588	281	141	82
19	1410	636	e277	e280	e230	e590	1680	1340	580	274	145	87
20	1380	633	e274	e268	e233	e630	1680	1410	567	246	179	93
21	1270	611	e268	e261	e242	e670	1650	1520	551	256	164	109
22	1190	579	e263	e262	e250	e720	1620	1580	533	265	163	129
23	1140	564	e261	e261	e253	e750	1580	1590	512	263	146	123
24	1160	528	e268	e253	e258	e810	1550	1570	501	260	142	129
25	1140	451	e268	e248	e265	e850	1510	1540	477	247	137	124
26	1070	435	e262	e243	e268	e840	1500	1500	457	228	130	125
27	1030	e432	e269	e238	e269	e840	1430	1430	444	217	122	155
28	1030	e440	e262	e228	e269	e850	1370	1350	431	252	119	164
29	992	e442	e261	e222	e265	e880	1320	1290	429	245	117	162
30	942	e428	e270	e225	---	e980	1280	1240	404	250	109	150
31	925	---	e283	e225	---	e1100	---	1180	---	257	106	---
TOTAL	35771	20189	9581	8111	6939	15957	45630	37262	20378	8662	5460	3079
MEAN ¹¹⁵⁴	673	309	262	239	515	1521	1202	679	279	176	103	
MAX	1690	951	410	294	269	1100	1690	1590	1110	384	254	164
MIN	419	428	260	222	220	230	1150	924	404	217	106	77
AC-FT	70950	40040	19000	16090	13760	31650	90510	73910	40420	17180	10830	6110
CFSM	1.25	.73	.33	.28	.26	.56	1.64	1.30	.73	.30	.19	.11

e Estimated.

SAUK RIVER BASIN

05270500 SAUK RIVER NEAR ST. CLOUD, MN--Continued

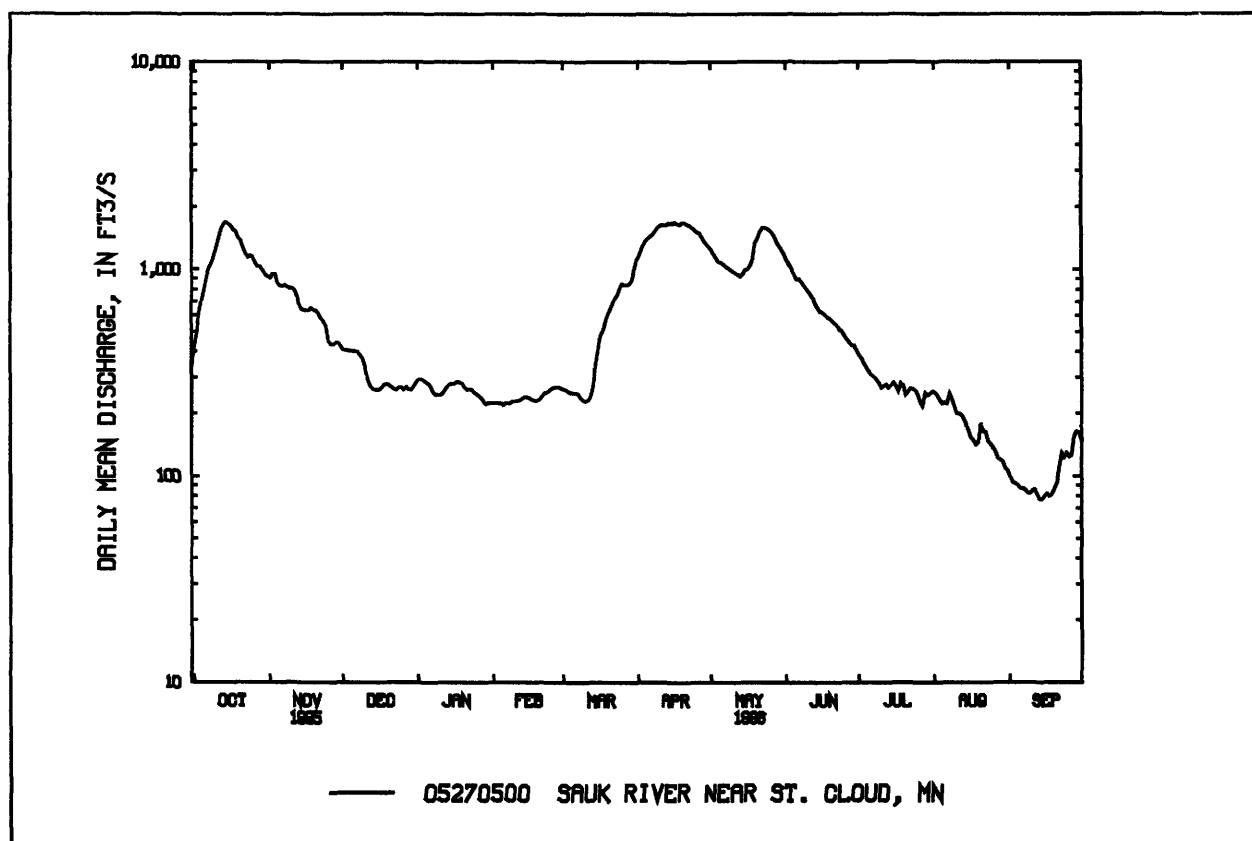
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	170	176	133	98.0	105	313	795	501	412	315	204	180
MAX	1154	1091	528	336	568	1380	2810	1572	1333	1262	1250	1136
(WY)	1996	1972	1972	1980	1966	1966	1965	1975	1957	1993	1972	1957
MIN	6.22	6.18	5.15	3.25	7.61	28.7	16.5	7.84	15.9	10.6	10.5	10.7
(WY)	1934	1934	1935	1935	1935	1940	1934	1934	1934	1934	1933	1933

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1909 - 1996
ANNUAL TOTAL	241013	217019	
ANNUAL MEAN	660	593	300 ^a
HIGHEST ANNUAL MEAN			732
LOWEST ANNUAL MEAN			51.0
HIGHEST DAILY MEAN	2110	Mar 20	1690
LOWEST DAILY MEAN	140	Mar 6	77
ANNUAL SEVEN-DAY MINIMUM	141	Mar 2	80
INSTANTANEOUS PEAK FLOW		1710	Oct 14
INSTANTANEOUS PEAK STAGE		4.92 ^b	Mar 27,28
INSTANTANEOUS LOW FLOW		74	Sep 13,14,17
ANNUAL RUNOFF (AC-FT)	478000	430500	217200
ANNUAL RUNOFF (CFSM)	.71	.64	.32
10 PERCENT EXCEEDS	1240	1420	727
50 PERCENT EXCEEDS	600	332	134
90 PERCENT EXCEEDS	164	146	35

^a Median of annual mean discharges is 281 ft³/s.

^b Backwater from ice.



MISSISSIPPI RIVER MAIN STEM

05270700 MISSISSIPPI RIVER AT ST. CLOUD, MN

LOCATION.--Lat 45°32'50", long 94°08'44", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 35 N., R. 31 W., Sherburne County, Hydrologic Unit 07010203, on left bank about 250 ft below the left downstream end of the City of St. Cloud hydropower dam and at mile 926.3 upstream from Ohio River.

DRAINAGE AREA.--13,320 mi², approximately.

PERIOD OF RECORD.--October 1988 to current year.

GAGE.--Water-stage recorder. Datum of gage is 958.49 ft above sea level.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow partly regulated by powerplants and reservoirs.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8280	13800	8080	e5600	e5100	e5500	9630	21100	11700	6650	6470	2210
2	10900	13800	7420	e5600	e5100	e5480	9810	20200	11500	6670	6270	2460
3	15000	13500	7740	e5600	e5150	e5420	10000	19900	11500	e6710	5550	2650
4	16800	13300	8280	e5590	e5200	e5400	10100	19500	10600	e6690	5500	2790
5	18000	12400	6720	e5580	e5300	e5350	9830	19400	9200	e6670	5000	2430
6	18600	12800	6680	e5400	e5400	e5300	10800	18900	10300	e6640	4870	2420
7	19200	12600	5950	e5200	e5400	e5300	10900	18600	9480	e6580	5030	2580
8	19500	11900	6060	e5100	e5450	e5350	11300	18200	8910	6500	5280	2600
9	20200	11600	5800	e5150	e5500	e5400	12400	17600	9410	6310	5460	2970
10	20800	11100	e5700	e5400	e5600	e5600	13900	17300	9400	6360	5960	3140
11	21400	9910	e6000	e5500	e5600	e5800	16800	17300	9020	6360	6420	3120
12	21400	9170	e6500	e5500	e5700	e6200	19200	16300	8550	6790	6450	2950
13	19800	8430	e6600	e5500	e5500	e6600	20100	16200	8170	7030	6170	2920
14	17800	7800	e6400	e5460	e5580	e7200	21000	16300	7670	6900	5930	2830
15	17500	8660	e6200	e5450	e5600	e7800	23000	16200	7280	7450	5610	2800
16	16900	8880	e6000	e5430	e5610	e9000	25000	15400	7470	7680	5470	2270
17	16600	9190	e5900	e5400	e5620	10800	24800	15100	7140	7810	4970	2610
18	15300	9170	e5800	e5300	e5650	11100	24600	16400	7020	8000	4790	2120
19	14800	9300	e5700	e5250	e5700	11500	25100	18300	6330	7490	4670	2290
20	14100	9460	e5700	e5200	e5700	11400	24800	19100	6610	7240	3950	2660
21	13400	9410	e5700	e5190	e5700	11200	24900	19300	6540	6990	3960	2570
22	12800	8240	e5650	e5180	e5720	11000	25500	19200	6040	7370	4070	2540
23	12800	6750	e5620	e5160	e5750	10800	24500	18700	6220	6710	3530	2240
24	13100	7110	e5600	e5140	e5800	11100	24300	18000	5890	6300	3540	2430
25	12500	7280	e5600	e5120	e5700	10100	23400	17200	5500	6520	2930	2150
26	12900	7250	e5600	e5100	e5600	9080	23200	16100	5870	6350	3210	2260
27	12600	7530	e5600	e5100	e5600	9890	22600	15600	5440	6240	3070	3050
28	13000	6720	e5600	e5080	e5580	10600	22400	14700	5790	6430	2480	2770
29	13100	6500	e5600	e5100	e5550	10000	21700	13800	5850	6590	2430	2650
30	13300	6700	e5600	e5100	---	9390	21300	12900	6300	6240	2800	2490
31	13600	---	e5600	e5100	---	9600	---	12000	---	5910	2350	---
TOTAL	485980	290260	191000	164580	160460	254260	566870	534800	236700	210180	144190	77970
MEAN	15680	9675	6161	5309	5533	8202	18900	17250	7890	6780	4651	2599
MAX	21400	13800	8280	5600	5800	11500	25500	21100	11700	8000	6470	3140
MIN	8280	6500	5600	5080	5100	5300	9630	12000	5440	5910	2350	2120
AC-FT	963900	575700	378800	326400	318300	504300	1124000	1061000	469500	416900	286000	154700
CFSM	1.18	.73	.46	.40	.42	.62	1.42	1.30	.59	.51	.35	.20

e Estimated.

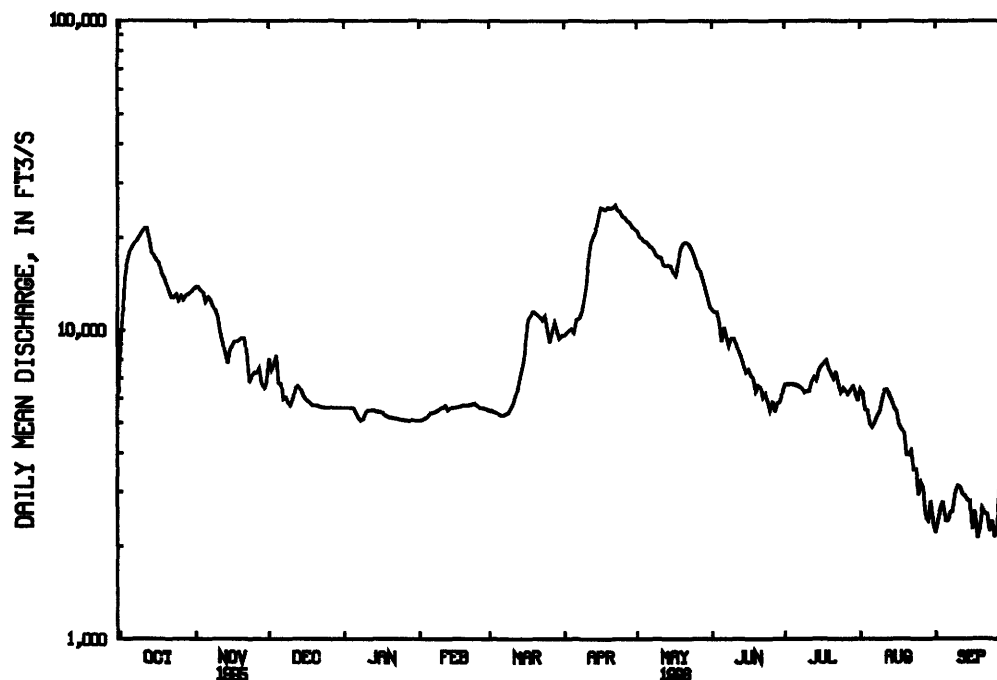
MISSISSIPPI RIVER MAIN STEM

05270700 MISSISSIPPI RIVER AT ST. CLOUD, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	5886	5190	4044	3709	3484	6720	12160	11530	7568	7761	4387	4714
MAX	15680	9675	6161	5309	5533	10600	18900	17250	12730	16830	9079	7369
(WY)	1996	1996	1996	1996	1996	1995	1996	1996	1993	1993	1993	1988
MIN	3106	2953	2310	1927	1815	3860	6576	6210	3743	3930	1535	2297
(WY)	1993	1989	1991	1991	1990	1989	1990	1992	1992	1989	1989	1990

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1988 - 1996
ANNUAL TOTAL	3048950	3317250	
ANNUAL MEAN	8353	9064	6420
HIGHEST ANNUAL MEAN			9064 1996
LOWEST ANNUAL MEAN			4615 1990
HIGHEST DAILY MEAN	21400	Oct 11 25500	Apr 22 1996
LOWEST DAILY MEAN	2640	Jul 2 2120	Sep 18 1989
ANNUAL SEVEN-DAY MINIMUM	3000	Jun 27 2410	Sep 18 1989
INSTANTANEOUS PEAK FLOW		27300	Apr 22 1996
INSTANTANEOUS PEAK STAGE		8.70	Apr 22 1994
INSTANTANEOUS LOW FLOW			8.77 ^a Mar 19 1994
			484 ^b Oct 18 1992
ANNUAL RUNOFF (AC-FT)	6048000	6580000	4651000
ANNUAL RUNOFF (CFSM)	.63	.68	.48
10 PERCENT EXCEEDS	14600	18600	12800
50 PERCENT EXCEEDS	7030	6600	5200
90 PERCENT EXCEEDS	3850	3190	2360

^a Backwater from ice.^b Result of regulation.

— 05270700 MISSISSIPPI RIVER AT ST. CLOUD, MN

ELK RIVER BASIN

05275000 ELK RIVER NEAR BIG LAKE, MN

LOCATION.--Lat 45°20'02", long 93°40'00", in NE1/4SW1/4 sec.23, T.22 N., R.27 W., Sherburne County, Hydrologic Unit 07010203, on right bank at upstream side of highway bridge, 4 mi east of Big Lake and 4 mi downstream from St. Francis River.

DRAINAGE AREA.--615 mi².

PERIOD OF RECORD.--April 1911 to September 1917, April to September 1931, April to November 1932, March to November 1933, March 1934 to September 1987, October 1990 to current year.

REVISED RECORDS.--WSP 895: 1939. WSP 1308: 1912(M), 1915-17(M).

GAGE.--Water-stage recorder. Datum of gage is 899.60 ft above mean sea level. April 1911 to Sept. 30, 1917, April 1, 1931, to July 26, 1934 nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods of estimated daily discharge, which are fair to poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	DAILY MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	242	472	e240	e168	e110	e125	849	770	623	151	137	70
2	241	498	e250	e164	e105	e124	871	712	603	153	127	66
3	246	493	e252	e161	e110	e123	924	656	598	141	117	70
4	262	452	e250	e158	e117	e122	939	601	569	132	109	75
5	268	441	e245	e152	e122	e120	990	598	514	132	111	79
6	280	462	235	e149	e122	e120	953	581	482	133	115	73
7	294	461	e208	e147	e121	e120	755	537	444	138	165	68
8	294	451	e180	e145	e120	e122	705	519	404	136	173	71
9	303	460	e170	e144	e119	e122	760	513	360	129	154	72
10	310	454	e172	e145	e118	e125	857	493	313	124	140	67
11	312	411	e177	e147	e117	e140	944	453	279	116	133	64
12	318	389	e178	e148	e118	e170	997	417	256	114	126	79
13	326	407	e182	e149	e118	e220	1030	398	236	118	118	66
14	349	313	e185	e148	e119	e310	1070	393	214	133	110	65
15	360	268	e180	e147	e120	e400	1130	409	201	147	104	64
16	347	246	e188	e144	e121	e440	1160	401	203	138	103	63
17	316	235	e195	e141	e122	e450	1140	419	216	128	97	63
18	288	226	e187	e138	e123	e470	1120	467	236	185	91	62
19	272	221	e183	e135	e124	e490	1160	841	223	184	90	61
20	258	220	e180	e132	e125	e500	1170	867	208	167	99	71
21	250	214	e178	e132	e127	e490	1150	850	230	152	98	83
22	243	179	e174	e132	e129	e480	1120	825	253	141	109	91
23	253	e200	e174	e133	e130	e470	1090	899	233	131	111	93
24	325	e210	e170	e133	e130	e460	1060	921	227	127	104	91
25	345	e220	e170	e132	e130	e450	1030	867	216	128	92	89
26	334	e230	e170	e130	e129	e440	984	806	201	123	88	87
27	354	e240	e171	e128	e128	e450	930	757	192	142	86	91
28	403	e240	e170	e126	e127	e470	886	728	179	167	82	94
29	444	e230	e172	e122	e126	e500	850	707	167	160	81	92
30	449	e230	e173	e120	---	e580	815	683	159	156	99	91
31	444	---	e171	e115	---	e700	---	649	---	145	74	---
TOTAL	9730	9773	5930	4365	3527	10303	29439	19737	9239	4371	3443	2271
MEAN	314	326	191	141	122	332	981	637	308	141	111	75.7
MAX	449	498	252	168	130	700	1170	921	623	185	173	94
MIN	241	179	170	115	105	120	705	393	159	114	74	61
AC-FT	19300	19380	11760	8660	7000	20440	58390	39150	18330	8670	6830	4500
CFSM	.51	.53	.31	.23	.20	.54	1.60	1.04	.50	.23	.18	.12
IN.	.59	.59	.36	.26	.21	.62	1.78	1.19	.56	.26	.21	.14

e Estimated.

ELK RIVER BASIN

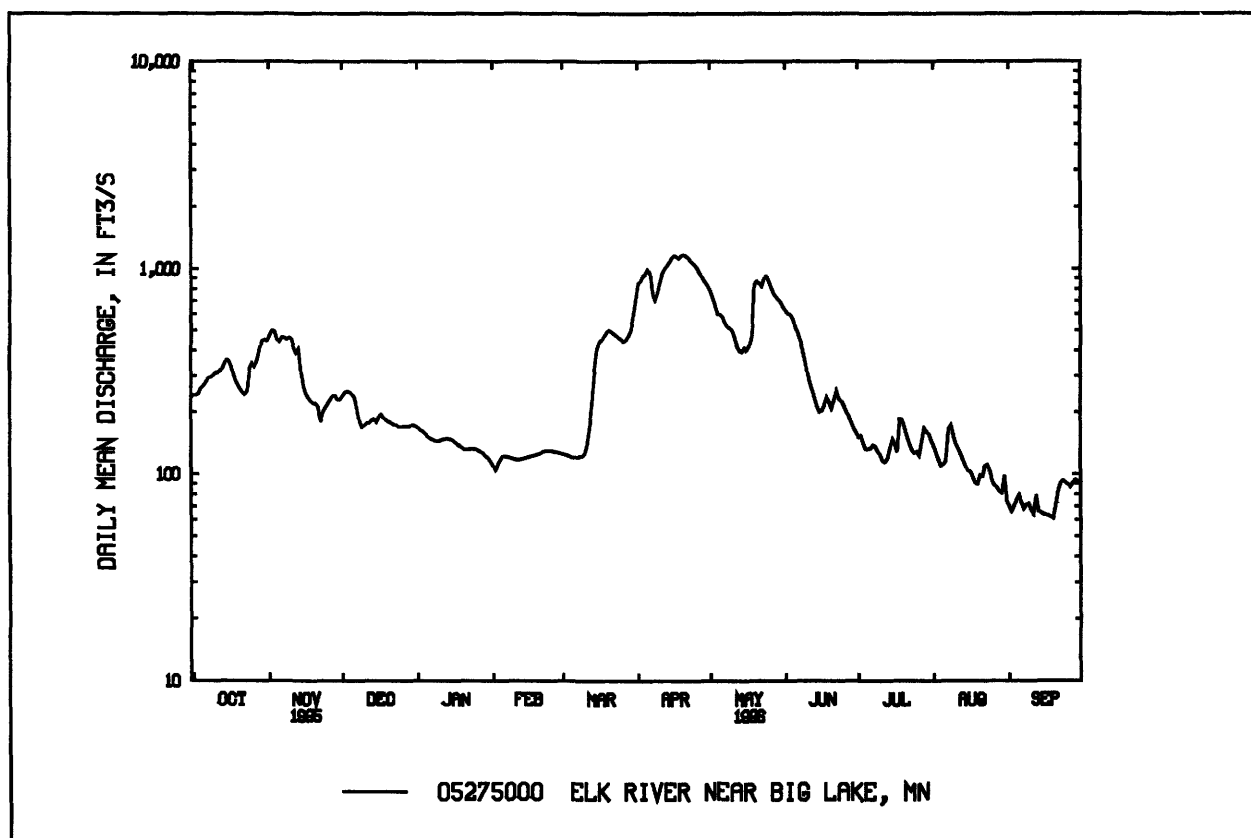
05275000 ELK RIVER NEAR BIG LAKE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	213	214	151	112	117	309	650	446	343	267	177	202
MAX	778	794	410	290	392	1125	1823	1620	1647	1026	926	1050
(WY)	1985	1972	1966	1979	1984	1966	1969	1986	1984	1978	1972	1986
MIN	32.7	56.3	44.1	38.4	29.8	58.8	75.5	37.5	20.5	8.94	8.74	23.4
(WY)	1934	1935	1935	1935	1936	1934	1934	1934	1934	1934	1934	1932

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1911 - 1996	
ANNUAL TOTAL	118685		112128		278 ^a	
ANNUAL MEAN	325		306		669	
HIGHEST ANNUAL MEAN					88.0	
LOWEST ANNUAL MEAN					1935	
HIGHEST DAILY MEAN	1730		Mar 18		7170	
LOWEST DAILY MEAN	95		Feb 12		4.0	
ANNUAL SEVEN-DAY MINIMUM	97		Feb 10		4.5	
INSTANTANEOUS PEAK FLOW			1180		Apr 20	
INSTANTANEOUS PEAK STAGE			3.95		Apr 20	
INSTANTANEOUS LOW FLOW			59		Sep 19	
ANNUAL RUNOFF (AC-FT)	235400		222400		201100	
ANNUAL RUNOFF (CFSM)	.53		.50		.45	
ANNUAL RUNOFF (INCHES)	7.18		6.78		6.13	
10 PERCENT EXCEEDS	693		763		561	
50 PERCENT EXCEEDS	240		180		166	
90 PERCENT EXCEEDS	110		93		67	

^a Median of annual mean discharge is 258 ft³/s.



CROW RIVER BASIN

05276005 NORTH FORK CROW RIVER ABOVE PAYNESVILLE, MN

LOCATION.--Lat. 45°22'38", long 94°47'00", in SW¹/₄NW¹/₄ sec. 13, T. 122 N., R. 33 W., Kandiyohi County, Hydrologic Unit 07010204, on left bank at downstream end of bridge on County Highway 6, 0.8 mile south of State Highway 55, 1 mile west of Kandiyohi/Stearns County line, and 2.5 miles west of Paynesville.

DRAINAGE AREA.-- 232 mi².

PERIOD OF RECORD.-- April to September 1996.

GAGE.-- Water-stage recorder. Elevation of gage is 1190 ft above sea level (from topographic map).

REMARKS.-- Records good.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	161	127	46	17	2.6
2	---	---	---	---	---	---	---	149	129	42	15	2.9
3	---	---	---	---	---	---	---	142	126	36	14	2.8
4	---	---	---	---	---	---	---	135	120	33	13	3.1
5	---	---	---	---	---	---	---	148	116	30	14	3.2
6	---	---	---	---	---	---	---	164	126	28	13	3.0
7	---	---	---	---	---	---	---	177	131	31	15	2.6
8	---	---	---	---	---	---	---	185	127	37	12	2.8
9	---	---	---	---	---	---	---	180	117	34	10	2.8
10	---	---	---	---	---	---	702	184	103	30	10	3.4
11	---	---	---	---	---	---	657	187	91	27	10	3.2
12	---	---	---	---	---	---	670	188	82	31	9.2	3.1
13	---	---	---	---	---	---	683	173	73	30	8.4	2.8
14	---	---	---	---	---	---	621	181	64	29	7.8	2.5
15	---	---	---	---	---	---	565	240	65	28	7.2	2.4
16	---	---	---	---	---	---	525	309	69	25	6.9	2.4
17	---	---	---	---	---	---	503	420	75	23	6.4	2.6
18	---	---	---	---	---	---	492	449	72	29	5.7	2.6
19	---	---	---	---	---	---	478	549	68	26	6.4	2.6
20	---	---	---	---	---	---	454	625	65	29	7.6	4.0
21	---	---	---	---	---	---	427	633	63	26	7.1	5.7
22	---	---	---	---	---	---	390	548	65	23	6.5	7.3
23	---	---	---	---	---	---	346	461	74	20	5.3	7.5
24	---	---	---	---	---	---	308	371	81	19	4.5	7.8
25	---	---	---	---	---	---	280	290	78	19	4.0	6.2
26	---	---	---	---	---	---	256	230	69	17	3.9	7.9
27	---	---	---	---	---	---	234	188	63	16	3.8	9.5
28	---	---	---	---	---	---	213	164	57	17	3.1	11
29	---	---	---	---	---	---	191	146	65	20	3.1	11
30	---	---	---	---	---	---	174	131	57	20	2.8	9.2
31	---	---	---	---	---	---	---	121	---	18	2.9	---
TOTAL	---	---	---	---	---	---	---	8229	2618	839	255.6	140.5
MEAN	---	---	---	---	---	---	---	265	87.3	27.1	8.25	4.68
MAX	---	---	---	---	---	---	---	633	131	46	17	11
MIN	---	---	---	---	---	---	---	121	57	16	2.8	2.4
AC-FT-	---	---	---	---	---	---	---	16320	5190	1660	507	279

CROW RIVER BASIN

05276005 NORTH FORK CROW RIVER ABOVE PAYNESVILLE, MN.--Continued

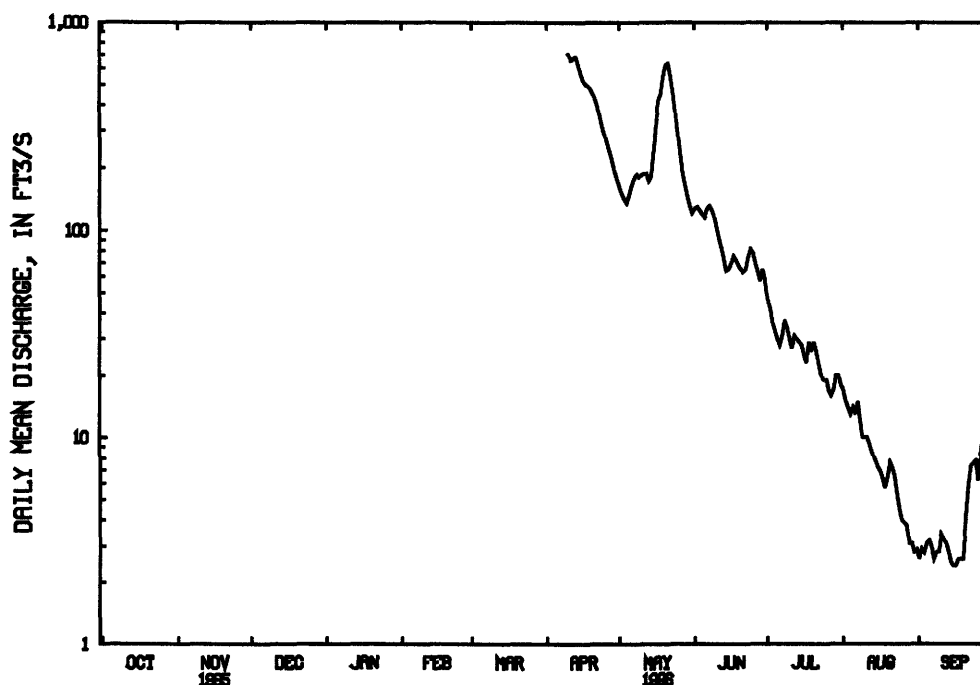
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	---	---	---	---	---	---	---	265	87.3	27.1	8.25	4.68
MAX	---	---	---	---	---	---	---	265	87.3	27.1	8.25	4.68
(WY)	---	---	---	---	---	---	---	1996	1996	1996	1996	1996
MIN	---	---	---	---	---	---	---	265	87.3	27.1	8.25	4.68
(WY)	---	---	---	---	---	---	---	1996	1996	1996	1996	1996

SUMMARY STATISTICS

FOR 1996 WATER YEAR

HIGHEST DAILY MEAN	702	Apr 10
LOWEST DAILY MEAN	2.40	Sep 15
INSTANTANEOUS PEAK FLOW	717	Apr 10
INSTANTANEOUS PEAK STAGE	11.51	Apr 10
INSTANTANEOUS LOW FLOW	2.00	Sep 1



— 05276005 NORTH FORK CROW RIVER ABOVE PAYNESVILLE, MN

DAY	MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN
	FEBRUARY				MARCH				APRIL					MAY	
1	---	---	---		---	---	---		---	---	---		---	---	--
2	---	---	---		---	---	---		---	---	---		---	---	---
3	---	---	---		---	---	---		---	---	---		---	---	---
4	---	---	---		---	---	---		---	---	---		---	---	---
5	---	---	---		---	---	---		---	---	---		---	---	---
6	---	---	---		---	---	---		---	---	---		---	---	---
7	---	---	---		---	---	---		---	---	---		---	---	---
8	---	---	---		---	---	---		---	---	---		---	---	---
9	---	---	---		---	---	---		---	---	---		---	---	---
10	---	---	---		---	---	---		---	---	---		---	---	---
11	---	---	---		---	---	---		---	---	---		---	---	---
12	---	---	---		---	---	---		---	---	---		---	---	---
13	---	---	---		---	---	---		---	---	---		---	---	---
14	---	---	---		---	---	---		---	---	---		---	---	---
15	---	---	---		---	---	---		---	---	---		---	---	---
16	---	---	---		---	---	---		---	---	---		---	---	---
17	---	---	---		---	---	---		---	---	---		---	---	---
18	---	---	---		---	---	---		---	---	---		---	---	---
19	---	---	---		---	---	---		---	---	---		---	---	---
20	---	---	---		---	---	---		---	---	---		---	---	---
21	---	---	---		---	---	---		---	---	---		---	---	---
22	---	---	---		---	---	---		---	---	---		---	---	---
23	---	---	---		---	---	---		---	---	---		---	---	---
24	---	---	---		---	---	---		---	---	---		---	---	---
25	---	---	---		---	---	---		---	---	---		---	---	---
26	---	---	---		---	---	---		---	---	---		---	---	---
27	---	---	---		---	---	---		---	---	---		---	---	---
28	---	---	---		---	---	---		---	---	---		647	608	627
29	---	---	---		---	---	---		---	---	---		626	598	611
30	---	---	---		---	---	---		---	---	---		618	594	607
31	---	---	---		---	---	---		---	---	---		623	610	617
MONTH	---	---	---		---	---	---		---	---	---		---	---	---

CROW RIVER BASIN

05276005 NORTH FORK CROW RIVER ABOVE PAYNESVILLE, MN.--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	621	596	609	---	---	---	641	615	627	608	511	561
2	621	606	613	---	---	---	639	612	626	580	482	530
3	638	617	626	---	---	---	639	613	627	593	435	511
4	649	614	632	---	---	---	777	630	725	619	469	557
5	642	625	634	---	---	---	785	632	723	615	540	587
6	634	621	627	---	---	---	750	563	681	615	542	584
7	637	620	627	---	---	---	740	546	650	613	560	599
8	646	619	631	---	---	---	653	537	563	621	559	595
9	633	621	628	610	555	582	576	542	559	640	593	614
10	639	624	632	604	552	579	580	559	569	623	560	595
11	641	590	623	608	565	588	594	552	575	647	601	623
12	634	598	618	596	558	579	612	570	591	660	590	632
13	---	---	---	584	551	570	620	572	601	674	564	628
14	---	---	---	611	561	582	637	605	622	692	589	637
15	---	---	---	609	523	570	651	597	625	666	556	623
16	---	---	---	599	534	566	648	568	621	663	593	629
17	644	623	630	590	538	564	642	568	612	673	565	637
18	---	---	---	575	527	551	636	571	608	684	580	633
19	---	---	---	619	568	581	635	577	611	670	577	626
20	---	---	---	622	574	605	639	538	604	640	609	622
21	---	---	---	682	579	599	627	533	592	640	580	616
22	---	---	---	613	589	601	627	502	590	645	562	609
23	---	---	---	632	595	613	647	537	594	626	577	610
24	640	609	624	632	607	620	644	507	585	649	563	609
25	636	605	622	633	611	622	630	543	583	624	589	608
26	---	---	---	636	609	623	633	531	592	626	588	601
27	---	---	---	629	604	619	638	515	594	618	578	604
28	---	---	---	632	618	626	632	558	600	633	571	602
29	---	---	---	635	620	628	608	519	578	626	533	590
30	---	---	---	641	613	627	610	546	582	654	501	588
31	---	---	---	640	615	628	606	513	570	---	---	---
MONTH	---	---	---	---	---	---	785	502	609	692	435	602

CROW RIVER BASIN

05276005 NORTH FORK CROW RIVER ABOVE PAYNESVILLE, MN.--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN
	FEBRUARY				MARCH				APRIL				MAY		
1	---	---	---		---	---	---		---	---	---		---	---	---
2	---	---	---		---	---	---		---	---	---		---	---	---
3	---	---	---		---	---	---		---	---	---		---	---	---
4	---	---	---		---	---	---		---	---	---		---	---	---
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6	---	---	---		---	---	---		---	---	---		---	---	---
7	---	---	---		---	---	---		---	---	---		---	---	---
8	---	---	---		---	---	---		---	---	---		---	---	---
9	---	---	---		---	---	---		---	---	---		---	---	---
10	---	---	---		---	---	---		---	---	---		---	---	---
11	---	---	---		---	---	---		---	---	---		---	---	---
12	---	---	---		---	---	---		---	---	---		---	---	---
13	---	---	---		---	---	---		---	---	---		---	---	---
14	---	---	---		---	---	---		---	---	---		---	---	---
15	---	---	---		---	---	---		---	---	---		---	---	---
16	---	---	---		---	---	---		---	---	---		---	---	---
17	---	---	---		---	---	---		---	---	---		---	---	---
18	---	---	---		---	---	---		---	---	---		---	---	---
19	---	---	---		---	---	---		---	---	---		---	---	---
20	---	---	---		---	---	---		---	---	---		---	---	---
21	---	---	---		---	---	---		---	---	---		---	---	---
22	---	---	---		---	---	---		---	---	---		---	---	---
23	---	---	---		---	---	---		---	---	---		---	---	---
24	---	---	---		---	---	---		---	---	---		---	---	---
25	---	---	---		---	---	---		---	---	---		---	---	---
26	---	---	---		---	---	---		---	---	---		---	---	---
27	---	---	---		---	---	---		---	---	---		---	---	---
28	---	---	---		---	---	---		---	---	---		16.5	11.0	13.5
29	---	---	---		---	---	---		---	---	---		18.5	13.0	15.5
30	---	---	---		---	---	---		---	---	---		19.5	15.0	17.0
31	---	---	---		---	---	---		---	---	---		17.5	16.0	16.5
MONTH	---	---	---		---	---	---		---	---	---		---	---	---

CROW RIVER BASIN

05276005 NORTH FORK CROW RIVER ABOVE PAYNESVILLE, MN.--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	19.5	15.5	17.0	---	---	---	26.5	19.5	23.0	25.5	19.0	22.0
2	19.5	16.5	18.0	---	---	---	27.5	20.0	23.5	23.5	19.0	21.0
3	17.5	14.0	15.5	---	---	---	27.0	21.0	23.5	27.5	18.0	22.5
4	18.5	12.5	15.5	---	---	---	26.5	21.5	23.0	28.5	19.0	23.5
5	17.0	15.0	16.0	---	---	---	29.0	22.0	24.5	27.5	20.5	23.5
6	19.5	15.0	17.0	---	---	---	31.5	22.5	26.5	27.0	19.0	22.5
7	21.0	15.5	18.0	---	---	---	28.5	22.5	25.0	22.5	19.0	20.5
8	22.5	17.0	20.0	---	---	---	27.0	20.0	23.5	25.5	17.0	20.5
9	24.5	18.5	21.5	23.5	17.5	20.5	28.0	18.5	23.0	23.5	15.0	19.5
10	25.5	19.5	22.5	25.5	17.5	21.5	22.5	19.5	21.0	27.5	18.0	22.0
11	27.0	20.5	23.5	24.5	19.0	21.5	27.5	18.5	22.5	20.0	15.0	17.0
12	28.0	22.0	24.5	24.5	19.5	22.0	29.0	20.0	24.0	20.0	14.0	16.0
13	---	---	---	24.0	19.5	21.5	30.5	21.5	25.0	21.5	12.0	16.5
14	---	---	---	25.5	19.5	22.5	23.5	19.0	21.0	21.5	10.0	15.5
15	---	---	---	27.0	19.5	23.5	27.5	16.0	21.5	19.5	13.0	16.5
16	---	---	---	28.5	21.0	25.0	28.0	18.0	22.5	21.5	13.5	17.0
17	20.0	18.0	19.0	28.5	22.5	25.5	28.5	18.5	23.0	19.0	12.5	15.0
18	---	---	---	29.0	23.5	26.0	26.0	19.5	22.5	21.0	11.5	16.0
19	---	---	---	25.5	22.5	24.0	23.5	19.5	21.0	18.5	12.0	15.0
20	---	---	---	26.5	20.0	23.0	27.5	16.5	21.5	15.0	13.5	14.0
21	---	---	---	27.5	22.0	24.5	28.5	19.5	23.5	17.0	13.5	14.5
22	---	---	---	26.5	21.5	24.0	28.0	21.0	23.5	19.5	11.5	15.5
23	---	---	---	26.0	20.0	22.5	27.5	17.5	22.0	17.5	13.0	15.0
24	22.5	16.5	19.5	23.5	19.5	21.5	27.5	18.0	22.5	19.0	10.5	14.5
25	23.5	18.0	20.5	25.5	18.5	22.0	29.0	19.5	23.5	15.5	12.5	14.0
26	---	---	---	26.0	19.0	22.5	26.5	18.0	22.0	13.0	11.5	12.5
27	---	---	---	24.5	21.0	22.5	27.5	17.0	21.5	13.0	10.5	11.5
28	---	---	---	24.5	20.0	22.0	27.5	17.0	22.0	15.5	9.0	12.0
29	---	---	---	22.5	19.5	20.5	28.0	18.5	23.0	16.0	9.5	12.0
30	---	---	---	25.0	17.0	21.0	28.0	18.0	22.5	18.0	10.5	13.5
31	---	---	---	26.0	18.5	22.0	26.5	19.5	22.5	---	---	---
MONTH	---	---	---	---	---	---	31.5	16.0	23.0	28.5	9.0	17.0

CROW RIVER BASIN

05276005 NORTH FORK CROW RIVER ABOVE PAYNESVILLE, MN.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE-CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CAR- BONATE WATE~ DIS IT FIELD MG/L AS CO3 (00452)
APR												
02...	1125	434	380	409	7.3	7.5	0.0	728	7.8	171	181	0
MAY												
16...	1225	307	597	593	7.9	7.9	16.0	728	9.1	242	259	0
JUN												
11...	1210	92	625	617	8.0	8.0	23.0	729	9.5	277	290	0
JUL												
08...	1115	37	590	582	8.3	8.3	20.5	725	8.7	253	265	0
AUG												
19...	1255	5.6	609	587	8.0	7.6	20.5	740	7.1	241	257	--
SEP												
09...	1312	2.6	596	601	8.1	7.9	19.5	732	9.6	250	265	0

DATE	BICAR- BONATE DIS IT FIELD MG/L AS HCO3 (00453)	NITRO- GEN, DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- ONIC DIS. (MG/L AS N) (00623)	NITRO- GEN,AM- ONIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	SOLID~ RESIDUE AT 18~ DEG. C DIS- SOLVED (MG/L) (70300)
APR												
02...	209	0.380	0.050	1.2	1.3	1.10	0.270	0.250	0.210	8.8	0.80	247
MAY												
16...	295	<0.015	0.030	0.90	1.1	1.60	0.140	0.090	0.070	10	0.60	369
JUN												
11...	338	<0.015	0.040	0.60	0.90	1.60	0.100	0.040	0.040	7.3	1.5	376
JUL												
08...	309	0.040	0.020	0.50	0.60	1.10	0.040	0.040	0.040	6.0	0.60	358
AUG												
19...	294	0.060	0.020	0.50	1.0	0.540	0.090	<0.010	0.040	5.2	1.0	413
SEP												
09...	305	<0.015	0.020	0.50	0.80	0.140	0.070	0.030	0.030	5.2	2.3	363

CROW RIVER BASIN

05276005 NORTH FORK CROW RIVER ABOVE PAYNESVILLE, MN.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
APR 02...	49	16	3.8	6.1	11	14	0.10	14	78	24	14	64
MAY 16...	81	28	9.1	4.5	17	33	0.20	17	47	27	11	83
JUN 11...	82	30	5.9	2.8	15	28	0.20	14	38	62	8920	100
JUL 08...	75	29	6.2	1.3	14	36	0.20	17	16	24	86	47
AUG 19...	73	28	6.7	3.3	15	40	0.20	16	4	170	62	73
SEP 09...	72	30	7.8	3.7	16	42	0.20	21	7	190	83	79

CROW RIVER BASIN

05280000 CROW RIVER AT ROCKFORD, MN

LOCATION.--Lat 45°05'12", long 93°44'02", in sec.29, T.119 N., R.24 W., Hennepin County, Hydrologic Unit 07010204, on right bank at Rockford, 150 ft downstream from bridge on State Highway 55 and 1 mi downstream from confluence of North and South Forks.

DRAINAGE AREA.--2,520 mi², approximately.

PERIOD OF RECORD.--April to July 1906 (published as "near Dayton"), June 1909 to September 1917, April to November 1929, March 1930 to September 1931, April to November 1932, March to November 1933, March 1934 to current year. Monthly discharge only for some periods, published in V'SP 1308.

REVISED RECORDS.--WSP 1115: 1932. WSP 1508: 1933. WDR MN-77-2: 1972 (M)(m).

GAGE.--Water-stage recorder. Datum of gage is 893.08 ft above mean sea level. Apr. 13 to July 21, 1906, nonrecording gage at Beming Mill 14 mi downstream at different datum. June 4, 1909, to Sept. 30, 1917, nonrecording gage at site 600 ft downstream at different datum; Apr. 23, 1929, to Aug. 21, 1934, nonrecording gage at site 600 ft downstream at present datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	525	1880	e620	e480	e285	e260	e4000	2620	3040	1070	278	137
2	610	1880	e610	e480	e285	e260	e4200	2530	2900	985	268	132
3	740	1880	e600	e475	e280	e260	4200	2490	2780	916	256	129
4	826	1850	e590	e470	e280	e260	4100	2430	2640	852	242	126
5	855	1800	e580	e468	e275	e260	4130	2420	2510	803	238	124
6	942	1760	e575	e460	e278	e260	4180	2410	2390	758	238	120
7	1020	1720	e570	e450	e275	e260	4200	2410	2290	728	247	117
8	1080	1680	e560	e430	e275	e260	4140	2410	2160	714	257	116
9	1140	1640	e555	e420	e275	e260	4050	2390	2020	690	263	114
10	1200	1600	e550	e410	e275	e260	3950	2380	1920	663	274	113
11	1250	1480	e545	e400	e270	e262	3860	2380	1840	624	279	111
12	1260	1430	e540	e390	e270	e270	3790	2380	1770	578	274	108
13	1280	1400	e535	e380	e270	e315	3760	2350	1680	520	266	106
14	1300	1420	e530	e370	e265	e450	3720	2320	1580	499	248	102
15	1320	1350	e525	e360	e265	e625	3690	2330	1480	488	235	100
16	1330	1310	e520	e355	e265	e910	3640	2340	1410	478	220	99
17	1340	1260	e515	e350	e265	e1200	3570	2350	1410	457	211	96
18	1340	1210	e510	e340	e262	e1400	3510	2360	1500	439	201	90
19	1340	1180	e505	e345	e260	e1800	3470	2680	1580	432	192	86
20	1330	1150	e505	e340	e275	e2100	3420	2870	1620	430	188	87
21	1320	1110	e500	e325	e280	e2500	3390	3030	1650	434	185	88
22	1310	1010	e500	e320	e280	e3000	3340	3130	1670	419	182	92
23	1330	768	e490	e310	e280	e3500	3280	3190	1670	381	182	98
24	1490	740	e490	e305	e280	e3700	3220	3230	1660	349	181	101
25	1660	e730	e490	e300	e278	e3550	3160	3290	1620	336	173	102
26	1790	e705	e490	e300	e268	e3350	3070	3380	1550	325	171	102
27	1850	e690	e490	e300	e265	e3270	2990	3450	1460	310	163	102
28	1900	e670	e490	e295	e262	e3000	2900	3470	1370	304	160	102
29	1910	e650	e490	e290	e262	e3000	2800	3430	1270	294	153	102
30	1910	e630	e490	e290	---	e3250	2720	3310	1170	291	146	102
31	1890	---	e485	e290	---	e3700	---	3170	---	285	142	---
TOTAL	40388	38583	16445	11498	7905	47752	108450	84930	55610	16852	6713	3204
MEAN	1303	1286	530	371	273	1540	3615	2740	1854	544	217	107
MAX	1910	1880	620	480	285	3700	4200	3470	3040	1070	279	137
MIN	525	630	485	290	260	260	2720	2320	1170	285	142	86
AC-FT	80110	76530	32620	22810	15680	94720	215100	168500	110300	33430	13320	6360
CFSM	.52	.51	.21	.15	.11	.61	1.43	1.09	.74	.22	.09	.04
IN.	.60	.57	.24	.17	.12	.70	1.60	1.25	.82	.25	.10	.05

e Estimated.

CROW RIVER BASIN

05280000 CROW RIVER AT ROCKFORD, MN--Continued

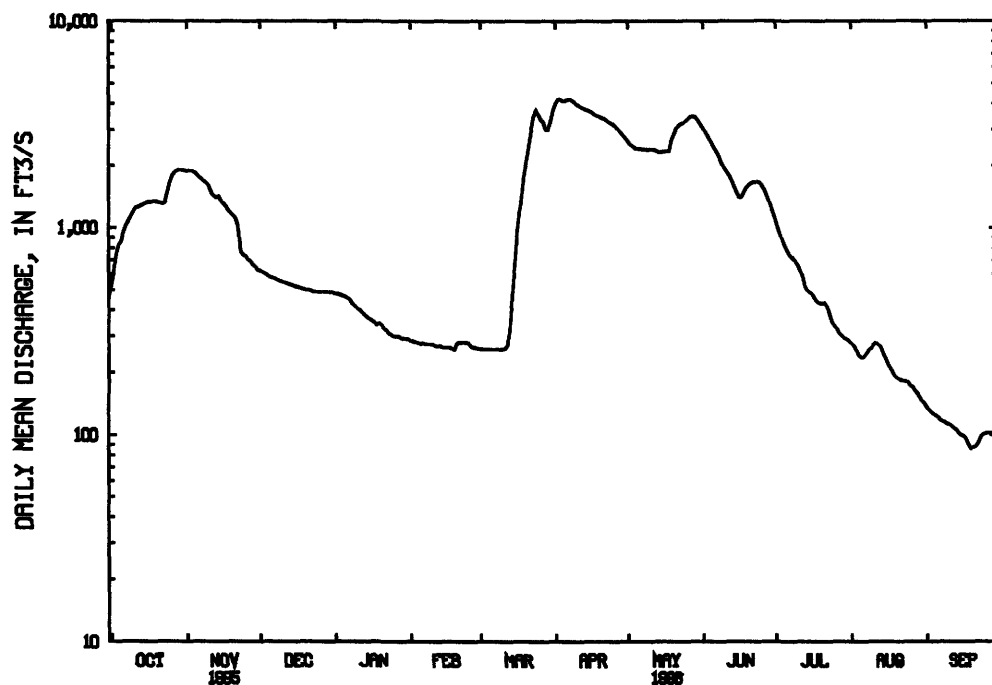
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	453	425	293	171	163	861	2125	1440	1265	978	525	480
MAX	3809	1909	1477	928	1115	4085	9026	5992	6166	6759	2784	4541
(WY)	1986	1972	1983	1992	1966	1983	1965	1986	1906	1993	1993	1991
MIN	16.6	28.3	17.3	12.4	12.5	25.1	57.1	26.7	14.8	5.76	5.87	13.0
(WY)	1934	1937	1938	1938	1959	1934	1934	1934	1934	1934	1934	1933

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1906 - 199 ^c	
ANNUAL TOTAL	529116		438330		796 ^a	
ANNUAL MEAN	1450		1198		2754	
HIGHEST ANNUAL MEAN					64.5	
LOWEST ANNUAL MEAN					1931	
HIGHEST DAILY MEAN	4300		4200		22100	
LOWEST DAILY MEAN	197		86		3.8	
ANNUAL SEVEN-DAY MINIMUM	199		91		4.0	
INSTANTANEOUS PEAK FLOW			4310		22400	
INSTANTANEOUS PEAK STAGE			9.05		19.27 ^b	
INSTANTANEOUS LOW FLOW			86		1.8 ^c	
ANNUAL RUNOFF (AC-FT)	1050000		869400		576800	
ANNUAL RUNOFF (CFSM)	.58		.48		.32	
ANNUAL RUNOFF (INCHES)	7.81		6.47		4.29	
10 PERCENT EXCEEDS	3040		3240		2200	
50 PERCENT EXCEEDS	1210		585		258	
90 PERCENT EXCEEDS	225		172		38	

a Median of annual mean discharges is 605 ft³/s.

b From floodmark.

c Caused by ice jam upstream.



— 05280000 CROW RIVER AT ROCKFORD, MN

RUM RIVER BASIN

05284000 MILLE LACS LAKE AT COVE BAY NEAR ONAMIA, MN

LOCATION.--Lat 46°06'36", long 93°37'08", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.21, T.42 N., R.26 W., Mille Lacs County, Hydrologic Unit 07010207, in Minnesota Department of Natural Resources boathouse at Cove Bay boatlanding, 3.6 mi northeast of Onamia.

PERIOD OF RECORD.--June 1931 to current year. Monthend records for the period October 1939 to September 1953 published in WSP 1278 (fragmentary 1940-41). Published as "at Wealthwood" prior to October 1939, and as "at Garrison" October 1939 to September 1987 (gage heights collected at Wealthwood October 1939 to September 1941, but converted to gage datum at Garrison for publication).

GAGE.--Water-stage recorder. Datum of gage is 1,240.40 ft above mean sea level (levels by Minnesota Department of Natural Resources). Gage readings have been reduced to elevations above sea level. Prior to Oct. 1, 1941, nonrecording gage at Wealthwood, 17 mi north of present site, at various datum; gage readings have been reduced to elevations, adjustment of 1912. Oct. 1, 1941, to Sept. 30, 1958, water-stage recorder at Garrison, 16 mi northwest of present site at datum 1,240.50 ft, adjustment of 1912. To convert these readings to National Geodetic Vertical Datum of 1929, subtract 0.10 ft. Oct. 1, 1958, to Sept. 30, 1987, water stage recorder at Garrison at present datum.

REMARKS.--Water level affected by fixed-crest spillway constructed in 1953 at outlet of Ogechie Lake, 2.7 mi downstream from outlet of Mille Lacs Lake, with crest at elevation 1,250.50 ft. Water level subject to fluctuation caused by change in direction and velocity of wind and by seiches.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 1,253.87 ft, Aug. 14, 1972, affected by wind action and seiche action; maximum daily, 1,253.43 ft, Aug. 22, 1972; minimum observed, 1,245.74 ft, Oct. 16-19, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,252.87 ft, May 21, affected by wind and seiche action; maximum daily, 1,252.26 ft, June 3; minimum, 1,251.11 ft, Sept. 26; minimum daily, 1,251.27 ft, Sept. 26.

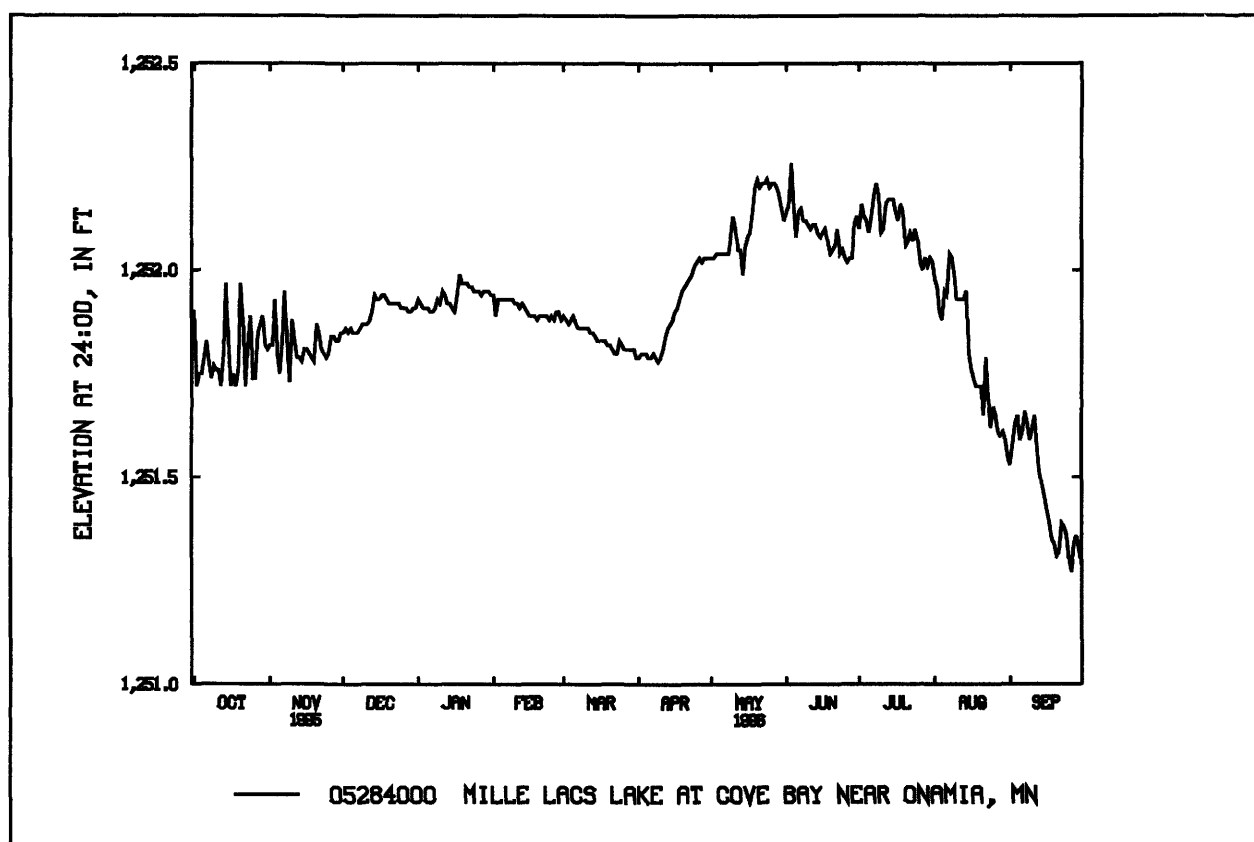
MONTHEND ELEVATION, IN FEET ABOVE SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Oct. 31	1251.81	Feb. 28.....	1251.88	June 30.....	1252.13
Nov. 30	1251.85	Mar. 31	1251.79	July 31	1252.02
Dec. 31	1251.91	Apr. 30.....	1252.03	Aug. 31	1251.55
Jan. 31	1251.94	May 31	1252.12	Sept. 30	1251.29

Note--Elevations other than those shown are available.

RUM RIVER BASIN

05284000 MILLE LACS LAKE AT COVE BAY NEAR ONAMIA, MN--Continued



RUM RIVER BASIN

05286000 RUM RIVER NEAR ST. FRANCIS, MN

LOCATION.--Lat 45°19'40", long 93°22'20", in SE 1/4, sec.19, T.33 N., R.24 W., Anoka County, Hydrologic Unit 07010207, on left bank at upstream side of highway bridge, 4 mi south of St. Francis and 15.8 mi upstream from mouth.

DRAINAGE AREA.--1,360 mi², approximately.

PERIOD OF RECORD.--May to November 1929, March 1930 to September 1931, April to November 1932, March 1933 to current year.

REVISED RECORDS.--WSP 1308: 1930(M), 1932(M).

GAGE.--Water-stage recorder. Datum of gage is 860.74 ft above mean sea level (levels by Anoka County Highway Department). Prior to Nov. 9, 1933, nonrecording gage at site 50 ft downstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Occasional regulation by Ogechie (also controls Mille Lacs Lake) and Onamia Lakes.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	DAILY MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	549	1430	521	e460	e490	e440	1170	2290	966	554	425	263
2	560	1480	556	e460	e470	e430	1160	2000	880	538	418	256
3	581	1490	543	e460	e460	e430	1260	1740	835	518	404	255
4	627	1430	e540	e460	e450	e420	1320	1520	802	499	402	258
5	668	1350	e530	e460	e460	e420	1420	1410	776	481	401	264
6	719	1270	e520	e470	e470	e420	1530	1350	766	465	394	259
7	753	1190	e515	e470	e500	e410	1660	1280	766	456	405	255
8	776	1110	e515	e470	e520	e410	1770	1270	752	449	395	255
9	801	1060	e510	e470	e540	e390	1910	1260	730	445	390	251
10	827	998	e510	e480	e550	e380	2070	1270	727	445	379	248
11	853	937	e510	e480	e550	e370	2300	1250	711	443	367	253
12	868	869	e510	e480	e560	e370	2440	1220	684	440	357	249
13	862	815	e500	e490	e560	e380	2480	1220	664	444	350	242
14	849	755	e500	e500	e560	e380	2560	1250	634	443	342	239
15	830	759	e480	e500	e560	e390	2820	1300	615	441	333	238
16	792	748	e470	e510	e560	e400	3280	1240	604	443	327	240
17	762	730	e470	e520	e560	e420	3750	1250	597	434	323	243
18	754	699	e470	e520	e560	e430	4030	1340	623	502	318	237
19	741	671	e470	e530	e550	e480	4150	1890	640	485	310	235
20	720	661	e470	e540	e550	e540	4200	2480	632	469	307	239
21	695	e665	e470	e540	e540	e800	4250	2630	652	449	304	250
22	672	e645	e470	e540	e540	e960	4300	2580	676	444	328	250
23	679	e615	e470	e540	e530	e1050	4390	2590	684	442	314	248
24	785	e595	e460	e540	e510	e1080	4400	2720	688	429	306	247
25	885	e590	e460	e540	e500	e1070	4220	2830	680	425	301	245
26	961	e575	e460	e540	e490	e1030	3920	2780	660	422	294	247
27	1050	e570	e450	e530	e480	e1000	3580	2480	649	425	285	251
28	1170	e570	e450	e530	e470	e1020	3210	2000	626	425	277	251
29	1300	e560	e450	e520	e450	e1100	2880	1540	610	426	272	251
30	1360	e550	e460	e510	---	1130	2580	1250	584	428	270	257
31	1370	---	e460	e500	---	1160	---	1080	---	425	267	---
TOTAL	25819	26387	15170	15560	14990	19710	85010	54310	20913	14134	10565	7476
MEAN	833	880	489	502	517	636	2834	1752	697	456	341	249
MAX	1370	1490	556	540	560	1160	4400	2830	966	554	425	264
MIN	549	550	450	460	450	370	1160	1080	584	422	267	235
AC-FT	51210	52340	30090	30860	29730	39090	168600	107700	41480	28030	20960	14830
CFSM	.61	.65	.36	.37	.38	.47	2.08	1.29	.51	.34	.25	.18

e Estimated.

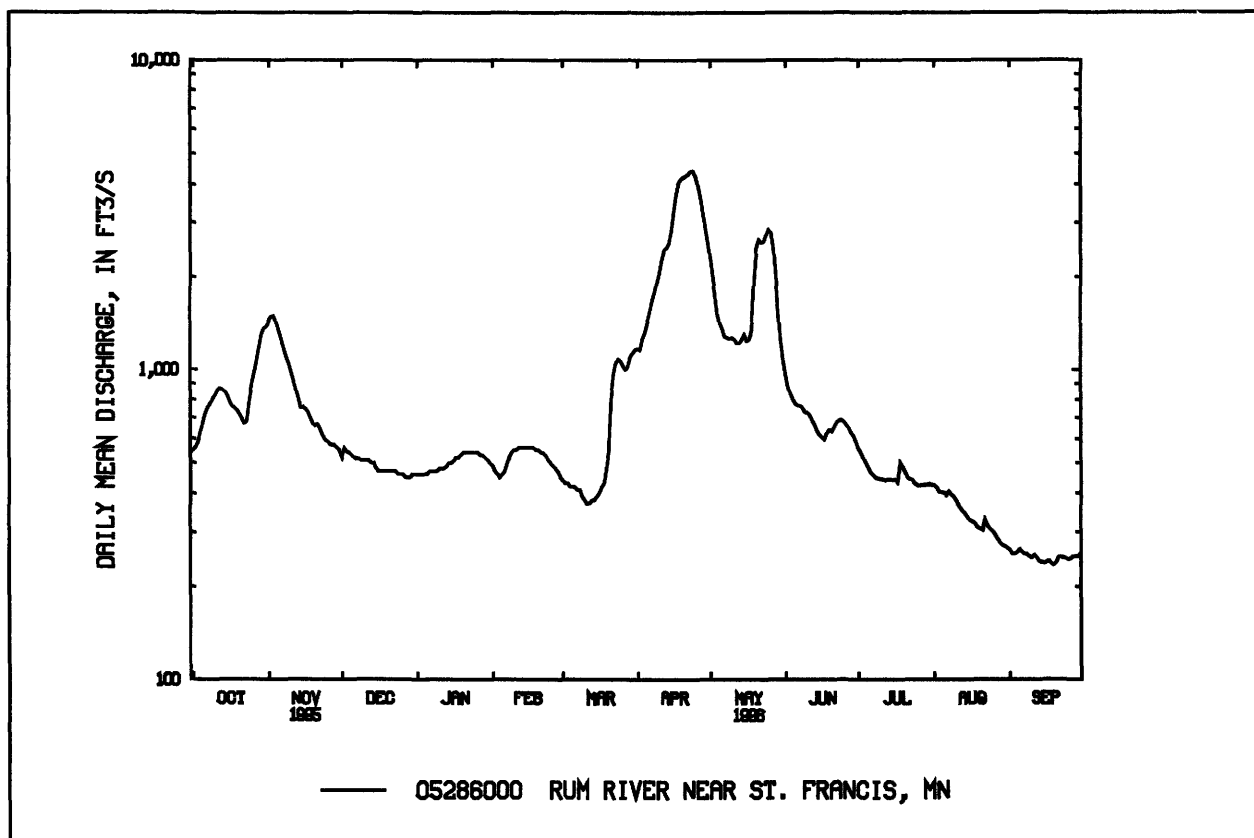
RUM RIVER BASIN

05286000 RUM RIVER NEAR ST. FRANCIS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	468	449	327	246	246	628	1529	1114	880	635	410	434
MAX	2300	1715	1051	660	813	2699	4269	3899	3399	2532	2251	2352
(WY)	1969	1972	1983	1987	1966	1966	1969	1986	1984	1954	1972	1976
MIN	65.4	71.8	55.8	51.5	59.2	75.8	154	73.6	43.7	34.5	37.3	47.1
(WY)	1934	1934	1934	1934	1934	1934	1934	1934	1934	1934	1934	1933

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1929 - 1996	
ANNUAL TOTAL	328123		310044			
ANNUAL MEAN	899		847		633	
HIGHEST ANNUAL MEAN					1512	
LOWEST ANNUAL MEAN					66.1	
HIGHEST DAILY MEAN	3860	Mar 23	4400	Apr 24	10000	Apr 13 1969
LOWEST DAILY MEAN	205	Jan 24	235	Sep 19	30	Aug 3 1934
ANNUAL SEVEN-DAY MINIMUM	216	Feb 5	239	Sep 14	31	Aug 1 1934
INSTANTANEOUS PEAK FLOW			4430	Apr 23	10100 ^a	Apr 20 1969
INSTANTANEOUS PEAK STAGE			7.36	Apr 23	11.63	Apr 13 1969
INSTANTANEOUS LOW FLOW			228	Sep 19	29	Aug 18 1934
ANNUAL RUNOFF (AC-FT)	650800		615000		458700	
ANNUAL RUNOFF (CFSM)	.66		.61		.47	
10 PERCENT EXCEEDS	1820		1680		1370	
50 PERCENT EXCEEDS	699		540		363	
90 PERCENT EXCEEDS	260		299		110	

^a Also occurred Apr. 13, 1969.

RUM RIVER BASIN

05286290 CEDAR CREEK NEAR COOPERS CORNER, MN

LOCATION.-- Lat 45°23'31", long 93°12'44", in NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.33, T.34 N., R.23 W., Anoka County, Hydrologic Unit 07010207, on right bank at upstream end of bridge on County Road No. 26, 1.2 miles southeast of Coopers Corner, and 1.8 miles east of Bethel.

DRAINAGE AREA.--27.3 mi².

PERIOD OF RECORD.--August to September 1996.

GAGE.--Water-stage recorder. Elevation of gage is 900 ft above sea level (from topographic map).

REMARKS.-- Records poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	e14	e5.1
2	---	---	---	---	---	---	---	---	---	---	e13	e5.0
3	---	---	---	---	---	---	---	---	---	---	e12	e7.6
4	---	---	---	---	---	---	---	---	---	---	e12	e7.5
5	---	---	---	---	---	---	---	---	---	---	e13	e7.0
6	---	---	---	---	---	---	---	---	---	---	e14	e6.5
7	---	---	---	---	---	---	---	---	---	---	e14	e6.3
8	---	---	---	---	---	---	---	---	---	---	e17	e6.3
9	---	---	---	---	---	---	---	---	---	---	e15	e6.3
10	---	---	---	---	---	---	---	---	---	---	e11	6.3
11	---	---	---	---	---	---	---	---	---	---	e9.0	6.3
12	---	---	---	---	---	---	---	---	---	---	e7.8	6.4
13	---	---	---	---	---	---	---	---	---	---	6.7	6.5
14	---	---	---	---	---	---	---	---	---	---	5.6	6.5
15	---	---	---	---	---	---	---	---	---	---	5.1	6.6
16	---	---	---	---	---	---	---	---	---	---	4.7	6.6
17	---	---	---	---	---	---	---	---	---	---	4.4	6.7
18	---	---	---	---	---	---	---	---	---	---	4.0	7.0
19	---	---	---	---	---	---	---	---	---	---	3.6	6.8
20	---	---	---	---	---	---	---	---	---	---	4.0	6.9
21	---	---	---	---	---	---	---	---	---	---	4.8	6.9
22	---	---	---	---	---	---	---	---	---	---	8.4	6.8
23	---	---	---	---	---	---	---	---	---	---	8.5	6.5
24	---	---	---	---	---	---	---	---	---	---	7.3	6.5
25	---	---	---	---	---	---	---	---	---	---	e7.0	6.5
26	---	---	---	---	---	---	---	---	---	---	e6.5	6.6
27	---	---	---	---	---	---	---	---	---	---	e6.2	6.6
28	---	---	---	---	---	---	---	---	---	---	e6.0	6.6
29	---	---	---	---	---	---	---	---	---	---	e5.8	6.5
30	---	---	---	---	---	---	---	---	---	---	e5.5	6.5
31	---	---	---	---	---	---	---	---	---	---	e5.3	---
TOTAL	---	---	---	---	---	---	---	---	---	---	261.2	196.2
MEAN	---	---	---	---	---	---	---	---	---	---	8.43	6.54
MAX	---	---	---	---	---	---	---	---	---	---	17	7.6
MIN	---	---	---	---	---	---	---	---	---	---	3.6	5.0
AC-FT	---	---	---	---	---	---	---	---	---	---	518	389

e Estimated.

RUM RIVER BASIN

05286290 CEDAR CREEK NEAR COOPERS CORNER, MN--Continued

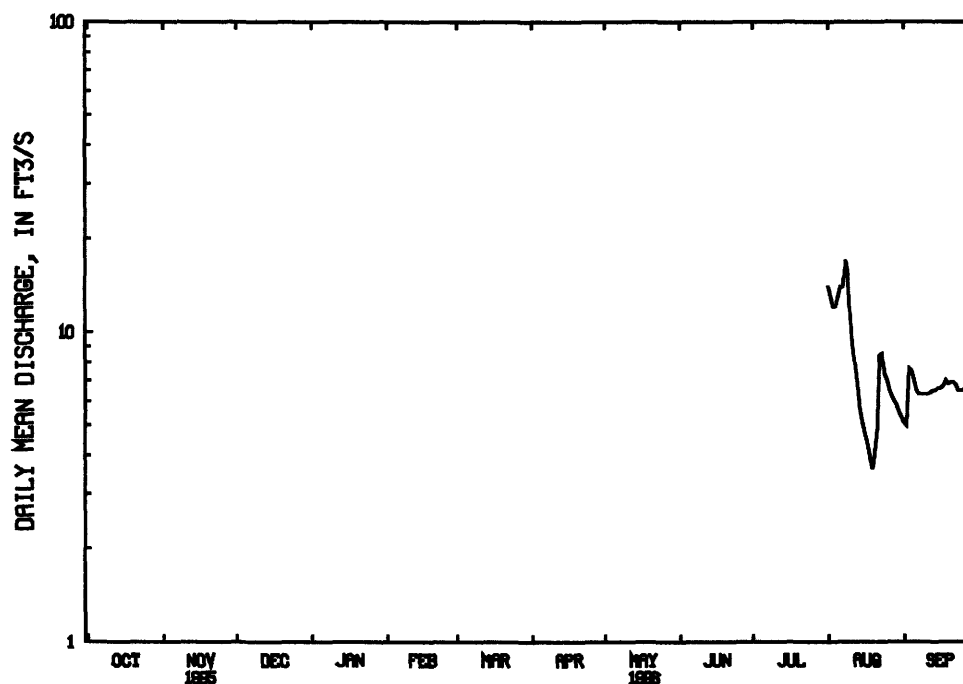
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SFP
MEAN	---	---	---	---	---	---	---	---	---	---	8.43	6.54
MAX	---	---	---	---	---	---	---	---	---	---	8.43	6.54
(WY)	---	---	---	---	---	---	---	---	---	---	1996	1996
MIN	---	---	---	---	---	---	---	---	---	---	8.43	6.54
(WY)	---	---	---	---	---	---	---	---	---	---	1996	1996

SUMMARY STATISTICS

FOR 1996 WATER YEAR

HIGHEST DAILY MEAN	17 ^e	Aug 8
LOWEST DAILY MEAN	3.6	Aug 19
INSTANTANEOUS PEAK STAGE	12.17	Sep 18
INSTANTANEOUS LOW FLOW	3.5	Aug 19

^e Estimated.

— 05286290 CEDAR CREEK NEAR COOPERS CORNER, MN

RUM RIVER BASIN

05286290 CEDAR CREEK NEAR COOPERS CORNER, MN--Continued
(National Water-Quality Assessment Station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.-- August to September 1996.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: August to September 1996.

WATER TEMPERATURES: August to September 1996.

INSTRUMENTATION.-- Water-quality monitor since August 1996.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 391 us/cm, Sep. 9; minimum, 266 us/cm, Aug. 8.

WATER TEMPERATURES: Maximum, 24.0 °C, Aug. 7; minimum, 10.0 °C, Sep. 28.

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	---	---	---	---	---	---	---	---	---	349	340	344
2	---	---	---	---	---	---	---	---	---	354	323	340
3	---	---	---	---	---	---	---	---	---	350	330	339
4	---	---	---	---	---	---	---	---	---	342	315	336
5	---	---	---	---	---	---	---	---	---	340	321	336
6	---	---	---	---	---	---	---	---	---	339	333	336
7	---	---	---	---	---	---	307	271	287	340	334	337
8	---	---	---	---	---	---	286	266	274	369	300	342
9	---	---	---	---	---	---	299	272	283	391	306	343
10	---	---	---	---	---	---	305	285	297	375	301	339
11	---	---	---	---	---	---	299	276	291	345	338	342
12	---	---	---	---	---	---	366	289	323	350	338	345
13	---	---	---	---	---	---	352	338	348	356	341	349
14	---	---	---	---	---	---	359	348	353	360	342	351
15	---	---	---	---	---	---	363	344	355	356	337	347
16	---	---	---	---	---	---	363	346	355	352	306	342
17	---	---	---	---	---	---	363	342	354	354	334	341
18	---	---	---	---	---	---	362	344	354	350	329	340
19	---	---	---	---	---	---	360	350	355	345	329	337
20	---	---	---	---	---	---	365	344	355	339	332	335
21	---	---	---	---	---	---	357	342	350	339	328	335
22	---	---	---	---	---	---	349	325	335	334	321	328
23	---	---	---	---	---	---	348	322	333	334	324	329
24	---	---	---	---	---	---	355	323	338	338	322	330
25	---	---	---	---	---	---	351	317	343	332	325	329
26	---	---	---	---	---	---	353	338	346	330	328	329
27	---	---	---	---	---	---	358	340	349	333	327	329
28	---	---	---	---	---	---	359	343	350	334	317	326
29	---	---	---	---	---	---	356	341	348	331	312	325
30	---	---	---	---	---	---	351	339	345	329	314	322
31	---	---	---	---	---	---	349	341	345	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	391	300	337

RUM RIVER BASIN

05286290 CEDAR CREEK NEAR COOPERS CORNER, MN--Continued

WATER-QUALITY RECORDS

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	---	---	---	---	---	---	---	---	---	21.5	18.0	21.5
2	---	---	---	---	---	---	---	---	---	21.5	19.0	21.5
3	---	---	---	---	---	---	---	---	---	22.5	19.0	22.5
4	---	---	---	---	---	---	---	---	---	23.0	19.5	23.0
5	---	---	---	---	---	---	---	---	---	23.0	20.5	23.0
6	---	---	---	---	---	---	---	---	---	23.0	20.0	23.0
7	---	---	---	---	---	---	24.0	21.0	24.0	22.0	19.5	22.0
8	---	---	---	---	---	---	21.5	18.5	21.5	20.0	18.0	20.0
9	---	---	---	---	---	---	19.0	15.5	19.0	19.5	16.5	19.5
10	---	---	---	---	---	---	16.5	14.0	16.5	20.5	17.0	20.5
11	---	---	---	---	---	---	17.0	13.5	17.0	18.5	16.5	18.5
12	---	---	---	---	---	---	23.5	13.5	23.5	17.0	15.0	17.0
13	---	---	---	---	---	---	23.5	20.0	23.5	16.0	13.0	16.0
14	---	---	---	---	---	---	21.5	19.0	21.5	15.5	12.0	15.5
15	---	---	---	---	---	---	22.0	17.5	22.0	15.0	13.0	15.0
16	---	---	---	---	---	---	22.0	17.5	22.0	16.0	13.5	16.0
17	---	---	---	---	---	---	22.5	17.5	22.5	15.0	13.5	15.0
18	---	---	---	---	---	---	21.5	18.0	21.5	16.0	13.0	16.0
19	---	---	---	---	---	---	20.0	18.5	20.0	15.5	13.0	15.5
20	---	---	---	---	---	---	22.0	16.5	22.0	14.5	13.5	14.5
21	---	---	---	---	---	---	23.0	18.0	23.0	14.0	13.0	14.0
22	---	---	---	---	---	---	23.0	20.0	23.0	15.5	12.5	15.5
23	---	---	---	---	---	---	22.5	18.0	22.5	14.5	13.0	14.5
24	---	---	---	---	---	---	22.5	17.5	22.5	15.0	12.0	15.0
25	---	---	---	---	---	---	22.5	18.5	22.5	13.5	12.5	13.5
26	---	---	---	---	---	---	22.0	18.5	22.0	13.0	12.0	13.0
27	---	---	---	---	---	---	21.0	17.0	21.0	12.0	11.0	12.0
28	---	---	---	---	---	---	21.0	16.5	21.0	13.0	10.0	13.0
29	---	---	---	---	---	---	21.0	17.0	21.0	13.0	10.5	13.0
30	---	---	---	---	---	---	22.0	18.0	22.0	14.0	11.0	14.0
31	---	---	---	---	---	---	21.5	18.0	21.5	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	23.0	10.0	17.0

RUM RIVER BASIN

05286290 CEDAR CREEK NEAR COOPERS CORNER, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (90095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (00400)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00403)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00010)	TEMPER- ATURE WATER (DEG C) (00025)	BARO- METRIC PRES- SURE (MM OF HG) (00300)	OXYGEN, DIS- SOLVED (MG/L) (39086)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (90410)	ALKA- LITY LAB (MG/L AS CACO3) (00452)	CAF- BONA TE WATER DIS IT FIELD MG/L AS CO3
AUG												
06...	1000	14	330	331	7.6	7.7	22.5	736	6.1	138	149	0
SEP												
09...	1210	6.4	343	343	7.5	7.6	17.0	741	4.9	146	151	0

DATE	BICAR- BONATE DIS IT FIELD MG/L AS HCO3 (00453)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	SOLIDS, RESIDUE AT 180 DEG C DIS- SOLVED (MG/L)
AUG												
06...	168	0.080	0.030	0.50	0.50	0.970	0.030	<0.010	0.030	7.0	0.50	202
SEP												
09...	178	0.080	0.050	0.30	0.40	1.30	0.040	0.040	0.030	4.1	0.60	212

RUM RIVER BASIN

05286290 CEDAR CREEK NEAR COOPERS CORNER, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
AUG 06...	46	11	3.9	0.90	7.8	9.0	0.10	18	190	44	6	82
SEP 09...	48	12	4.3	1.0	8.9	12	0.10	21	95	240	4	76

ELM CREEK BASIN

05287890 ELM CREEK NEAR CHAMPLIN, MN

LOCATION.--Lat 45°09'48", long 93°26'11", in NE1/4NW1/4 sec.35, T.120 N., R.22 W., Hennepin County, Hydrologic Unit 07010206, on left bank, 33 ft downstream from bridge on Elm Creek Road, 2.5 mi southwest of Champlin.

DRAINAGE AREA.--84.9 mi².

PERIOD OF RECORD.--October 1978 to current year.

GAGE.--Water-stage recorder. Datum of gage is 850.71 ft above mean sea level. Prior to March 15, 1979, nonrecording gage at present site and datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	133	e17	9.3	e3.8	e5.2	121	49	62	21	3.4	2.0
2	17	138	18	e8.9	e3.7	e5.4	144	46	54	18	3.2	1.9
3	20	138	18	e8.1	e3.6	e5.6	178	47	48	16	3.1	1.9
4	22	123	e17	e7.4	e3.7	e5.8	197	46	43	14	3.0	1.9
5	22	123	e16	e7.0	e5.0	e5.8	204	51	39	13	3.5	1.9
6	26	116	e14	e6.6	8.1	e5.6	199	56	37	11	3.7	1.8
7	36	111	e12	e6.6	7.7	e5.4	186	60	42	11	3.8	1.7
8	39	102	e10	e7.4	6.3	e5.3	169	66	44	11	3.6	1.7
9	46	93	e9.3	e8.4	5.3	e5.3	154	71	41	9.7	3.3	1.7
10	55	86	e8.8	9.5	5.1	e5.2	143	72	36	8.2	3.1	1.7
11	57	76	e8.6	9.1	4.8	5.3	137	72	33	7.3	3.2	1.7
12	58	77	e8.8	8.1	4.8	6.0	129	68	29	6.6	2.8	1.7
13	58	64	e9.2	7.0	4.9	14	123	64	25	5.9	2.6	1.7
14	57	59	e9.5	6.9	e4.7	61	119	62	22	5.6	2.6	1.7
15	53	53	e9.0	e6.6	e4.5	95	117	64	20	5.6	2.4	1.8
16	47	47	e8.6	e6.4	e4.1	197	114	65	20	5.0	2.3	1.9
17	43	44	e9.0	e6.3	e3.9	280	108	66	22	4.5	2.2	1.8
18	38	41	e9.0	e6.1	e3.8	354	104	67	28	6.7	2.1	1.9
19	34	38	8.7	e6.0	e3.9	369	106	203	30	7.1	2.1	1.9
20	30	37	8.3	e6.0	e4.0	357	101	278	31	6.5	2.1	2.3
21	26	32	8.1	e6.2	e4.2	336	97	308	35	5.4	2.2	2.3
22	24	e31	8.0	e6.0	4.0	292	93	320	43	4.7	2.9	2.2
23	28	e29	7.9	e6.0	4.4	235	89	306	45	4.3	2.5	2.0
24	62	e27	8.0	e6.0	4.5	210	85	275	45	4.0	2.3	2.0
25	77	25	8.5	e6.1	4.6	200	80	238	42	3.9	2.2	2.0
26	85	24	8.3	e6.1	4.8	174	73	197	39	3.6	2.2	2.2
27	98	23	8.5	e6.2	5.1	164	67	160	34	3.6	2.1	2.4
28	117	e21	e8.4	e6.0	e5.3	104	62	128	31	3.8	2.1	3.0
29	126	e20	9.2	e5.1	e5.4	82	57	104	27	3.9	2.0	3.3
30	129	e19	9.2	e4.5	---	94	53	86	23	3.8	2.1	3.2
31	129	---	9.4	e4.2	---	97	---	72	---	3.6	2.1	---
TOTAL	1676	1950	322.3	210.1	138.0	3780.9	3609	3767	1070	238.3	82.8	61.2
MEAN	54.1	65.0	10.4	6.78	4.76	122	120	122	35.7	7.69	2.67	2.04
MAX	129	138	18	9.5	8.1	369	204	320	62	21	3.8	3.3
MIN	17	19	7.9	4.2	3.6	5.2	53	46	20	3.6	2.0	1.7
AC-FT	3320	3870	639	417	274	7500	7160	7470	2120	473	164	121
CFSM	.64	.77	.12	.08	.06	1.44	1.42	1.43	.42	.09	.03	.02
IN.	.73	.85	.14	.09	.06	1.66	1.58	1.65	.47	.10	.04	.03

e Estimated.

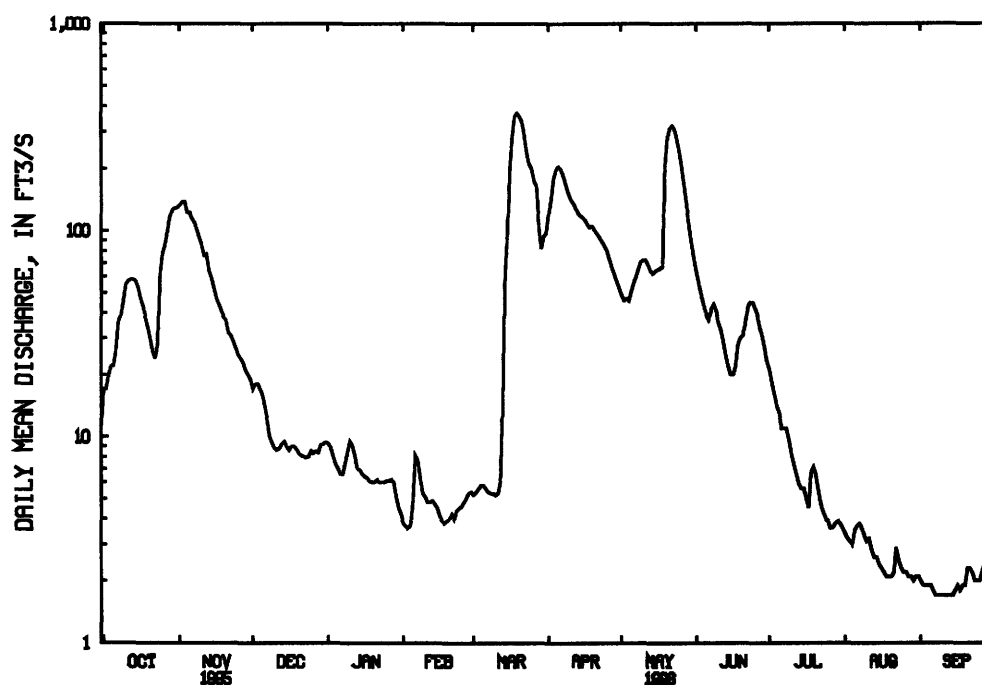
ELM CREEK BASIN

05287890 ELM CREEK NEAR CHAMPLIN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1979 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	31.2	22.9	12.4	5.94	10.8	74.2	90.9	61.0	42.3	33.2	31.0	29.5
MAX	229	67.4	41.3	22.0	99.1	182	221	146	140	157	143	170
(WY)	1986	1994	1992	1992	1984	1992	1986	1991	1991	1993	1993	1991
MIN	1.13	1.03	.92	.74	.91	5.51	5.31	4.95	1.34	.76	1.44	1.08
(WY)	1990	1990	1990	1991	1990	1981	1987	1987	1988	1988	1989	1988

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1979 - 1996
ANNUAL TOTAL	17713.5	16905.6	
ANNUAL MEAN	48.5	46.2	37.2
HIGHEST ANNUAL MEAN			75.1
LOWEST ANNUAL MEAN			4.54
HIGHEST DAILY MEAN	235	Mar 17	545
LOWEST DAILY MEAN	1.4	Mar 10	.31
ANNUAL SEVEN-DAY MINIMUM	1.7	Mar 4	.35
INSTANTANEOUS PEAK FLOW		383	Mar 19
INSTANTANEOUS PEAK STAGE		9.02	Mar 19
INSTANTANEOUS LOW FLOW		1.6	Sep 13
ANNUAL RUNOFF (AC-FT)	35130	33530	26950
ANNUAL RUNOFF (CFMS)	.57	.54	.44
ANNUAL RUNOFF (INCHES)	7.76	7.41	5.95
10 PERCENT EXCEEDS	124	129	109
50 PERCENT EXCEEDS	30	11	12
90 PERCENT EXCEEDS	3.5	2.3	1.7



05287890 ELM CREEK NR CHAMPLIN, MN

ELM CREEK BASIN

05287890 ELM CREEK NEAR CHAMPLIN, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--February 1988 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

(Hand Sampling)

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDEd (MG/L) (00530)
OCT								
26...	1210	78	472	7.8	7.0	--	12.0	3
JAN								
17...	1150	6.3	657	7.6	0.5	734	10.6	3
FEB								
21...	1205	4.2	737	7.3	0.5	746	11.1	11
APR								
01...	1215	117	460	7.0	1.0	749	10.8	30
MAY								
16...	1038	65	573	7.6	13.5	739	8.3	7
20...	1610	290	467	7.7	19.5	733	6.9	26
JUN								
03...	1200	47	467	7.7	15.0	--	7.3	--
18...	1040	25	493	7.6	16.5	--	6.3	5
AUG								
14...	1150	3.2	682	7.7	17.0	740	7.4	4
23...	1145	2.5	691	7.6	15.5	746	6.9	6
SEP								
06...	1220	2.4	699	7.6	17.5	741	7.5	3
12...	1205	1.7	710	7.5	13.5	744	7.4	4

DATE	RESIDUE VOLA- TILE, SUS- PENDEd (MG/L) (00535)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)
OCT							
26...	6	0.020	0.450	0.080	1.2	0.120	0.100
JAN							
17...	<1	<0.010	0.340	0.410	1.0	0.070	0.030
FEB							
21...	3	0.010	0.260	0.400	0.70	0.020	0.010
APR							
01...	2	0.040	0.520	0.430	1.6	0.220	0.120
MAY							
16...	13	<0.010	<0.050	<0.015	0.90	0.120	0.080
20...	10	0.020	0.170	0.030	1.1	0.210	0.150
JUN							
03...	--	<0.010	0.060	0.050	1.1	0.150	0.130
18...	5	0.050	0.190	0.180	1.1	0.230	0.150
AUG							
14...	<1	0.020	0.080	0.050	0.40	0.070	0.040
23...	2	0.020	0.120	0.080	0.50	0.080	0.020
SEP							
06...	5	0.010	0.090	0.040	0.30	0.060	0.030
12...	5	0.020	0.110	0.040	0.30	0.040	0.020

ELM CREEK BASIN

05287890 ELM CREEK NEAR CHAMPLIN, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

(Automatic Sampling)

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)
APR 10-27	435	7.9	48	14	14	9.4	17	0.220	0.160
MAY 20-27	456	7.9	49	14	18	11	15	0.170	0.100
JUN 07-10	491	7.9	53	17	18	6.5	12	0.180	0.090
JUN 17- JUL 02	492	8.1	51	17	19	12	7	0.160	0.140
AUG 14-23	614	8.0	71	32	8.6	20	15	0.050	<0.010
DATE	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	
APR 10-27	43	<0.5	1.0	<5	<3	<10	13	<10	
MAY 20-27	52	<0.5	2.0	<5	<3	<10	34	<10	
JUN 07-10	45	<0.5	<1.0	<5	<3	<10	62	<10	
JUN 17- JUL 02	50	<0.5	<1.0	<5	<3	<10	37	<10	
AUG 14-23	130	<0.5	<1.0	6	<3	<10	10	10	
DATE	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	
APR 10-27	5	<1	<10	<10	<1.0	83	<6	15	
MAY 20-27	5	4	<10	<10	<1.0	91	<6	6	
JUN 07-10	5	13	<10	<10	<1.0	110	<6	<3	
JUN 17- JUL 02	6	11	<10	<10	<1.0	110	<6	<3	
AUG 14-23	12	45	<10	10	<1.0	240	<6	9	

MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN

LOCATION.--Lat 45°07'36", long 93°17'48", in SW¼ sec.12, T.119 N., R.21 W., Hennepin County, Hydrologic Unit 07010206, on right bank 0.4 mi downstream from Coon Creek, 1.3 mi downstream from Coon Rapids dam at Coon Rapids, 6.5 mi downstream from Anoka, and at mile 864.8 upstream from Ohio River.

DRAINAGE AREA.--19,100 mi², approximately.

PERIOD OF RECORD.--June 1931 to current year. Prior to October 1931 published as "at Coon Rapids, near Anoka."

GAGE.--Water-stage recorder. Datum of gage is 804.53 ft above sea level. Prior to June 14, 1932, at site 1.2 mi upstream at different datum.

REMARKS.--Records good except those for estimated days, which are fair. Discharge during period of backwater from ice, Dec. 6 to Mar. 12, furnished from Ford Plant Dam downstream from station adjusted for time of travel, leakage through dam, and diversions to St. Paul and Minneapolis waterworks. Flow slightly regulated by six reservoirs on headwaters; total usable capacity, 1,640,600 acre-ft. Diurnal regulation caused by Coon Rapids dam 1.3 mi. above station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6910	18500	8790	e8310	e6240	e6700	14400	29000	18100	8620	7140	3120
2	9490	18800	9080	e7910	e5820	e7400	15400	28200	17600	8980	7490	2960
3	12500	18600	9070	e6990	e5870	e6150	16500	26700	17200	9110	7200	3060
4	15700	18500	8550	e6610	e6100	e6770	16800	26000	16800	9070	6490	3380
5	17500	17900	8310	e6620	e5820	e7020	17100	25700	15400	8470	6580	3340
6	18400	17300	e5790	e6010	e6300	e7020	17700	25400	14600	8580	6060	2940
7	19000	17300	e5200	e5880	e6400	e6220	18500	24700	14700	8820	6200	2920
8	19500	17100	e6160	e6470	e6610	e5840	18400	24400	14000	8930	6040	3030
9	19900	16100	e4460	e7490	e6500	e6390	19000	23700	13500	8540	6400	2580
10	20400	16000	e4050	e7960	e6570	e7050	20200	23200	13700	8320	6390	3250
11	20500	14200	e4800	e7420	e6520	e7680	21900	22900	13300	8170	6960	4090
12	21100	13600	e6710	e7320	e6230	e7900	25000	22600	12800	8220	7270	3670
13	20700	12900	e7290	e7590	e6460	7150	27000	21700	11800	8660	7220	3610
14	20900	11900	e7320	e7500	e6510	7720	28000	21400	11400	8810	6860	3440
15	20300	11900	e8030	e5970	e6340	8260	30400	22500	10700	8730	6540	3480
16	19900	12300	e7680	e6410	e6600	8970	32900	21400	10400	9220	6390	3330
17	19500	12300	e7400	e7770	e6380	10200	34600	20900	10600	9120	6090	3030
18	18900	12400	e7680	e6100	e6540	11100	35100	21200	10400	10200	5590	3340
19	17700	12000	e8070	e5630	e6540	11700	35700	25400	10200	9730	5460	2850
20	17300	12100	e8130	e4720	e6480	12400	35800	27100	9650	9210	5460	2960
21	16200	11900	e7690	e6050	e6650	12800	35700	28200	10300	8970	4650	3360
22	15600	10300	e7740	e6640	e6530	13500	35700	28100	10300	8760	5030	3300
23	15500	9280	e7970	e6340	e6680	14200	36000	27500	9890	8780	4930	3290
24	15900	8040	e8250	e6320	e6810	15100	35200	27100	10000	8200	4210	3080
25	16200	8580	e7750	e6210	e6640	14400	34800	26500	9460	7700	4310	3100
26	16100	9130	e7540	e5970	e6660	13400	34000	25700	8990	7870	3730	3030
27	16500	8580	e8320	e6010	e6790	13300	33100	24700	9090	7530	3890	3040
28	17100	8050	e7860	e6180	e6580	13900	32000	23600	8600	7840	3780	3750
29	17300	7350	e7210	e6140	e5930	14500	31000	22000	8520	7920	3330	3560
30	17700	8880	e7790	e5940	---	14400	29900	20500	8540	7920	3160	3400
31	17900	---	e8190	e6030	---	14000	---	19300	---	7410	3500	---
TOTAL	538100	391790	228880	204510	186100	313140	817800	757300	360540	266410	174350	97290
MEAN	17360	13060	7383	6597	6417	10100	27260	24430	12020	8594	5624	3243
MAX	21100	18800	9080	8310	6810	15100	36000	29000	18100	10200	7490	4090
MIN	6910	7350	4050	4720	5820	5840	14400	19300	8520	7410	3160	2580
AC-FT	1067000	777100	454000	405600	369100	621100	1622000	1502000	715100	528400	345800	193000
CFSM	.91	.68	.39	.35	.34	.53	1.43	1.28	.63	.45	.29	.17
IN.	1.05	.76	.45	.40	.36	.61	1.59	1.47	.70	.52	.34	.19

e Estimated.

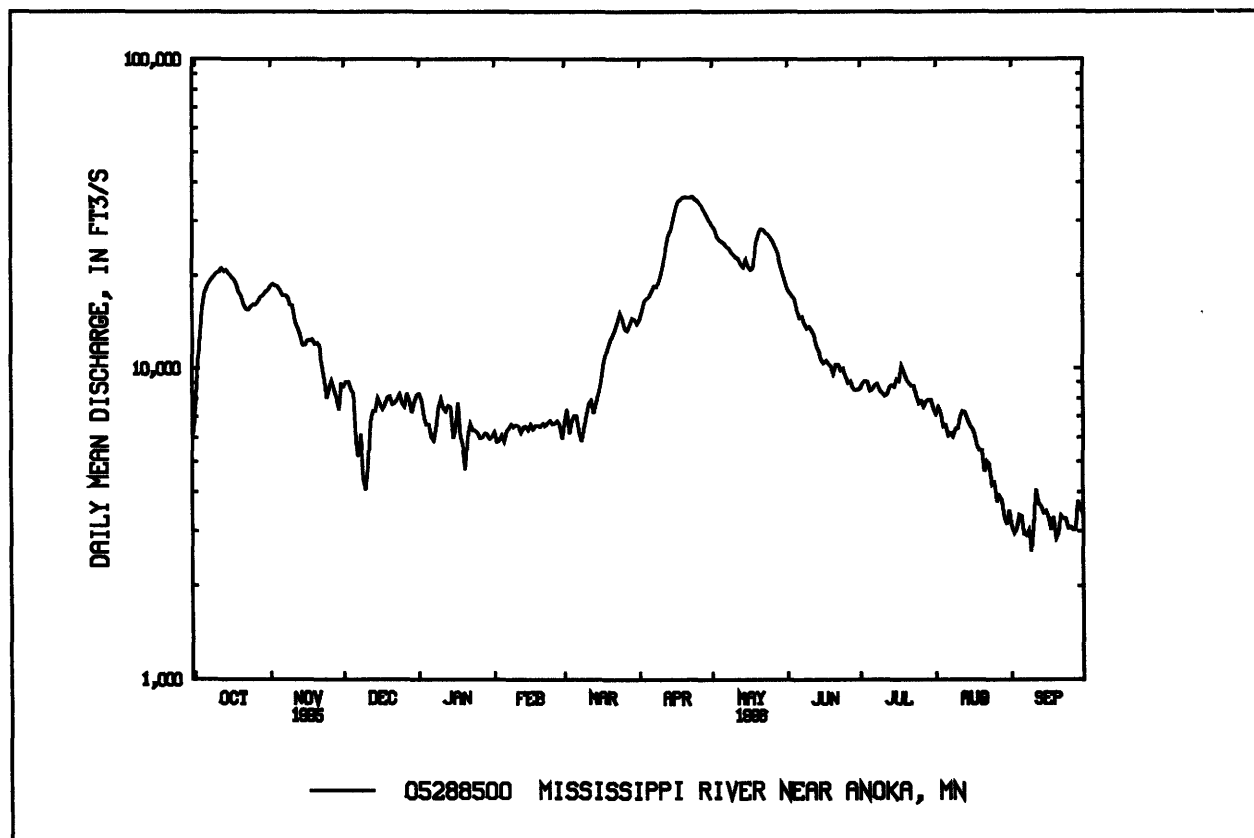
MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	6457	6189	4744	4200	4086	7296	17260	14890	11450	8524	5979	5814
MAX	21250	22800	10800	8304	9947	23410	42970	39760	29910	27240	22490	23570
(WY)	1987	1972	1972	1986	1966	1966	1969	1986	1943	1993	1972	1986
MIN	1128	1152	1006	935	1079	1602	3575	2796	1646	1022	715	888
(WY)	1937	1937	1935	1935	1933	1940	1959	1934	1934	1934	1934	1934

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1931 - 1996
ANNUAL TOTAL	4250640	4336210	
ANNUAL MEAN	11650	11850	8107
HIGHEST ANNUAL MEAN			17750
LOWEST ANNUAL MEAN			1603
HIGHEST DAILY MEAN	30200	Mar 21	36000
LOWEST DAILY MEAN	3380	Feb 10	2580
ANNUAL SEVEN-DAY MINIMUM	4310	Mar 4	3040
INSTANTANEOUS PEAK FLOW			37600
INSTANTANEOUS PEAK STAGE			10.85
INSTANTANEOUS LOW FLOW			1420 ^a
ANNUAL RUNOFF (AC-FT)	8431000	8601000	5873000
ANNUAL RUNOFF (CFSM)	.61	.62	.42
ANNUAL RUNOFF (INCHES)	8.28	8.45	5.77
10 PERCENT EXCEEDS	20600	23900	17700
50 PERCENT EXCEEDS	10300	8560	5600
90 PERCENT EXCEEDS	5050	4080	2060

^a Result of regulation.

[illegible]

DAY	MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN
	FEBRUARY				MARCH				APRIL				MAY		
1	---	---	---		---	---	---		---	---	---		---	---	---
2	---	---	---		---	---	---		---	---	---		---	---	---
3	---	---	---		---	---	---		---	---	---		---	---	---
4	---	---	---		---	---	---		---	---	---		---	---	---
5	---	---	---		---	---	---		---	---	---		---	---	---
6	---	---	---		---	---	---		---	---	---		---	---	---
7	---	---	---		---	---	---		---	---	---		11.5	10.0	10.5
8	---	---	---		---	---	---		---	---	---		12.5	11.0	11.5
9	---	---	---		---	---	---		---	---	---		13.0	12.0	12.5
10	---	---	---		---	---	---		---	---	---		13.0	12.0	12.5
11	---	---	---		---	---	---		---	---	---		12.5	12.0	12.5
12	---	---	---		---	---	---		---	---	---		13.0	12.0	12.5
13	---	---	---		---	---	---		---	---	---		13.5	12.5	13.0
14	---	---	---		---	---	---		---	---	---		13.5	12.0	12.5
15	---	---	---		---	---	---		---	---	---		13.0	12.0	12.5
16	---	---	---		---	---	---		---	---	---		14.5	13.0	13.5
17	---	---	---		---	---	---		---	---	---		16.0	13.0	15.0
18	---	---	---		---	---	---		---	---	---		18.0	16.0	17.0
19	---	---	---		---	---	---		---	---	---		18.0	17.5	17.5
20	---	---	---		---	---	---		---	---	---		18.5	17.5	18.0
21	---	---	---		---	---	---		---	---	---		19.0	18.0	18.5
22	---	---	---		---	---	---		---	---	---		19.0	18.0	18.5
23	---	---	---		---	---	---		---	---	---		19.0	18.0	18.5
24	---	---	---		---	---	---		---	---	---		18.5	17.0	17.5
25	---	---	---		---	---	---		---	---	---		17.5	16.0	16.5
26	---	---	---		---	---	---		---	---	---		16.5	15.5	16.0
27	---	---	---		---	---	---		---	---	---		16.5	15.5	16.0
28	---	---	---		---	---	---		---	---	---		16.0	15.0	15.5
29	---	---	---		---	---	---		---	---	---		17.0	15.5	16.5
30	---	---	---		---	---	---		---	---	---		18.0	16.5	17.5
31	---	---	---		---	---	---		---	---	---		18.5	17.5	18.0
MONTH	---	---	---		---	---	---		---	---	---		---	---	---

MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY-RECORDED VALUES

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE				JULY			AUGUST			SEPTEMBER		
1	18.5	17.5	18.0	27.0	25.5	26.0	24.5	22.5	23.5	25.0	23.5	24.5
2	19.0	17.5	18.5	26.5	25.0	25.5	25.5	24.0	24.5	25.0	23.5	24.0
3	18.5	17.0	18.0	26.5	25.0	25.5	24.0	23.5	23.5	26.0	23.0	24.5
4	18.5	16.5	17.5	26.5	25.0	26.0	24.0	23.0	23.5	26.5	24.5	25.5
5	---	---	---	27.0	25.5	26.5	25.0	23.0	24.0	26.5	24.5	25.5
6	---	---	---	27.0	26.0	26.5	27.5	24.0	25.5	26.0	24.5	25.0
7	---	---	---	26.0	25.0	25.5	27.5	25.5	26.5	26.0	24.0	25.0
8	---	---	---	25.5	23.5	24.5	27.0	24.5	26.0	24.5	22.5	23.5
9	---	---	---	23.5	22.5	23.0	26.0	23.5	25.0	---	---	---
10	---	---	---	24.0	22.5	23.5	24.5	24.0	24.0	24.0	22.0	23.0
11	---	---	---	24.0	23.0	23.0	25.5	23.5	24.5	23.0	21.0	22.5
12	---	---	---	24.0	23.0	23.5	26.0	24.0	25.0	21.0	19.0	20.0
13	---	---	---	23.5	22.5	23.0	26.0	25.0	25.5	20.0	18.5	19.0
14	---	---	---	24.0	23.0	23.5	25.5	23.5	24.5	19.5	17.5	18.5
15	24.5	23.5	24.0	24.5	23.5	24.0	24.0	22.5	23.5	20.5	18.5	19.5
16	23.5	23.0	23.0	25.5	24.0	25.0	25.0	23.0	24.0	20.5	19.0	19.5
17	23.0	20.5	21.5	25.5	25.0	25.5	25.5	24.0	24.5	19.5	18.0	19.0
18	20.5	20.0	20.0	27.0	25.0	26.0	25.5	24.0	24.5	20.0	17.5	18.5
19	21.0	20.0	20.5	26.5	25.0	26.0	24.0	23.5	24.0	19.5	18.0	18.5
20	22.5	20.0	21.5	25.0	24.0	24.5	25.0	22.5	23.5	18.5	17.5	18.0
21	22.0	21.0	21.5	25.5	24.0	25.0	25.5	23.5	24.5	17.5	16.5	17.0
22	22.0	20.5	21.5	25.5	25.0	25.0	26.0	24.5	25.0	18.5	16.5	17.5
23	21.0	20.0	20.5	25.0	24.0	24.5	25.5	23.5	24.5	19.0	17.5	18.0
24	21.0	19.5	20.5	24.5	23.5	24.0	25.5	23.5	24.5	19.0	17.0	17.5
25	---	---	---	24.0	22.5	23.5	26.0	23.5	25.0	18.0	16.5	17.5
26	---	---	---	24.5	23.0	24.0	25.5	24.0	24.5	17.0	15.5	16.0
27	26.5	23.5	25.0	24.5	23.5	24.0	24.5	22.5	23.5	15.5	14.5	15.0
28	27.5	26.0	27.0	23.5	22.5	23.0	24.5	22.0	23.5	16.0	14.0	15.0
29	28.5	27.5	28.0	22.5	22.0	22.5	25.0	23.0	24.0	16.0	14.5	15.5
30	28.0	27.0	27.5	22.5	21.0	22.0	25.5	23.5	24.5	16.5	15.0	16.0
31	---	---	---	24.5	21.5	23.0	26.0	24.0	25.0	---	---	---
MONTH	---	---	---	27.0	21.0	24.5	27.5	22.0	24.5	---	---	---

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN
	FEBRUARY				MARCH				APRIL				MAY		
1	---	---	---		---	---	---		---	---	---		---	---	---
2	---	---	---		---	---	---		---	---	---		---	---	---
3	---	---	---		---	---	---		---	---	---		---	---	---
4	---	---	---		---	---	---		---	---	---		---	---	---
5	---	---	---		---	---	---		---	---	---		---	---	---
6	---	---	---		---	---	---		---	---	---		---	---	---
7	---	---	---		---	---	---		---	---	---		306	259	286
8	---	---	---		---	---	---		---	---	---		300	280	290
9	---	---	---		---	---	---		---	---	---		316	290	306
10	---	---	---		---	---	---		---	---	---		324	314	319
11	---	---	---		---	---	---		---	---	---		326	306	318
12	---	---	---		---	---	---		---	---	---		335	319	328
13	---	---	---		---	---	---		---	---	---		347	332	340
14	---	---	---		---	---	---		---	---	---		354	338	347
15	---	---	---		---	---	---		---	---	---		362	335	344
16	---	---	---		---	---	---		---	---	---		349	338	344
17	---	---	---		---	---	---		---	---	---		354	343	349
18	---	---	---		---	---	---		---	---	---		364	341	353
19	---	---	---		---	---	---		---	---	---		379	332	343
20	---	---	---		---	---	---		---	---	---		345	334	340
21	---	---	---		---	---	---		---	---	---		356	345	351
22	---	---	---		---	---	---		---	---	---		375	356	360
23	---	---	---		---	---	---		---	---	---		366	353	359
24	---	---	---		---	---	---		---	---	---		363	350	358
25	---	---	---		---	---	---		---	---	---		378	356	366
26	---	---	---		---	---	---		---	---	---		379	371	375
27	---	---	---		---	---	---		---	---	---		384	374	379
28	---	---	---		---	---	---		---	---	---		390	374	383
29	---	---	---		---	---	---		---	---	---		399	384	391
30	---	---	---		---	---	---		---	---	---		399	388	394
31	---	---	---		---	---	---		---	---	---		404	390	399
MONTH	---	---	---		---	---	---		---	---	---		---	---	---

MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN
JUNE					JULY				AUGUST				SEPTEMBER		
1	407	384	402		464	427	439		377	324	336		357	344	350
2	406	384	399		520	454	491		341	324	331		373	352	357
3	405	393	400		480	403	430		---	---	---		377	312	363
4	401	393	398		410	393	400		---	---	---		363	350	357
5	---	---	---		554	369	407		---	---	---		359	344	352
6	---	---	---		374	363	369		---	---	---		366	352	360
7	---	---	---		374	354	360		---	---	---		369	355	361
8	---	---	---		378	359	368		---	---	---		374	364	368
9	---	---	---		380	362	373		---	---	---		---	---	---
10	---	---	---		363	359	360		---	---	---		371	363	367
11	---	---	---		361	354	359		---	---	---		369	362	366
12	---	---	---		356	353	354		---	---	---		375	367	371
13	---	---	---		357	353	355		---	---	---		381	371	376
14	---	---	---		359	355	357		---	---	---		383	373	379
15	534	428	458		361	337	354		339	331	335		382	370	377
16	463	442	448		349	335	344		334	328	331		395	368	377
17	444	435	440		357	349	352		331	324	328		468	375	385
18	444	437	439		367	347	353		329	323	326		386	370	379
19	452	442	445		355	347	351		331	328	330		399	377	383
20	463	444	454		358	354	356		331	322	327		396	378	383
21	515	458	467		361	354	358		333	323	326		392	377	386
22	646	473	562		362	352	355		335	323	330		385	370	379
23	609	485	542		387	352	366		342	306	334		380	364	374
24	572	488	502		352	333	343		345	335	340		380	362	371
25	---	---	---		346	330	333		349	336	344		381	357	371
26	---	---	---		357	322	335		350	342	345		382	372	377
27	473	450	462		339	321	332		356	347	352		387	378	382
28	454	449	452		344	330	335		359	336	355		383	358	370
29	454	443	452		357	337	346		367	357	362		358	332	344
30	446	433	439		368	342	353		372	348	358		334	313	324
31	---	---	---		---	---	---		358	345	352		---	---	---
MONTH	---	---	---		---	---	---		---	---	---		---	---	---

MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	8	148	17	832	8	190	15	337	10	168	10	181
2	19	481	17	869	7	172	15	320	10	157	12	240
3	30	996	14	726	7	171	15	283	10	158	13	224
4	43	1820	12	609	7	162	16	286	10	165	13	245
5	42	1980	11	518	7	157	16	286	10	157	13	254
6	41	2030	15	693	7	109	16	260	10	170	13	253
7	49	2490	12	577	8	112	16	254	10	173	13	223
8	34	1810	14	656	8	133	16	280	10	178	13	209
9	34	1850	19	846	8	96	16	324	10	175	13	228
10	28	1540	30	1280	8	87	16	344	9	160	13	251
11	33	1810	23	873	8	104	15	301	9	158	13	272
12	46	2600	14	518	9	163	12	237	9	151	13	279
13	32	1790	9	305	9	177	10	205	9	157	13	252
14	24	1340	6	190	9	178	10	202	9	158	13	272
15	22	1190	11	349	9	195	10	161	9	154	14	313
16	25	1330	7	249	10	207	10	173	9	160	18	438
17	24	1280	8	277	10	200	10	210	9	155	23	631
18	22	1140	10	328	10	207	10	165	9	159	27	824
19	21	991	10	308	11	240	10	152	9	159	32	996
20	16	738	9	298	11	241	10	127	9	157	28	950
21	20	870	9	302	11	228	10	163	9	162	29	991
22	17	700	10	274	12	251	10	179	9	159	23	824
23	13	539	10	251	12	258	10	171	9	162	28	1060
24	13	570	9	195	13	290	10	171	9	165	26	1060
25	11	477	9	208	13	272	10	168	9	161	20	778
26	12	513	9	222	13	265	10	161	9	162	20	724
27	15	646	9	208	14	314	10	162	9	165	19	693
28	11	488	8	174	14	297	10	167	9	160	22	821
29	15	681	8	159	14	273	10	166	9	144	24	952
30	10	490	8	192	15	315	10	160	---	---	27	1050
31	8	385	---	---	15	332	10	163	---	---	29	1080
TOTAL---		35713	---	13486	---	6396	---	6738	---	4669	---	17568

MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

[illegible]

MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE LAB	SPE-CIFIC CON-DUCT-ANCE LAB	PH WATER WHOLE FIELD (STAND-ARD UNITS)	PH WATER WHOLE LAB (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	
		(00061)	(00095)	(90095)	(00400)	(00403)		(00010)					(00025)
APR													
04...	1040	17400	358	383	7.8	7.6	1.0	--	11.9	44	15	6.4	
30...	1010	28600	251	260	8.1	7.8	8.5	734	10.7	33	11	4.4	
MAY													
22...	1050	--	300	310	8.0	7.9	18.0	739	9.4	38	12	5.0	
JUN													
14...	1010	--	379	377	8.1	8.1	23.5	745	8.0	46	17	6.9	
JUL													
16...	0945	--	313	308	8.1	8.1	24.0	740	8.1	36	14	6.4	
AUG													
14...	1045	--	316	313	8.2	8.1	25.0	740	7.9	36	13	6.8	
SEP													
12...	1045	--	342	353	8.4	8.1	19.5	744	8.5	42	15	8.0	
DATE		POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LITY WAT DIS TOT IT MG/L AS CACO3	ALKA-LITY LAB (MG/L AS CACO3)	CAR-BONATE WATER DIS IT MG/L AS CO3	BICAR-BONATE WATER DIS IT MG/L AS HCO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)
APR													
04...	4.5	154	162	0	188	13	13	0.10	13	226	0.020	1.20	
30...	2.5	107	116	0	130	8.3	6.2	<0.10	7.5	158	<0.010	0.200	
MAY													
22...	2.4	130	138	0	159	9.9	8.3	<0.10	6.7	200	0.010	0.220	
JUN													
14...	2.3	160	172	0	195	14	10	0.20	7.3	223	0.010	0.330	
JUL													
16...	1.8	145	142	0	177	9.4	7.2	0.10	9.6	191	0.010	0.330	
AUG													
14...	1.6	144	144	4	168	10	8.2	0.10	9.8	195	0.010	0.160	
SEP													
12...	1.9	148	159	0	181	13	9.9	0.10	11	217	0.020	0.350	
DATE		NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	SEDI-MENT, SUS-PENDE (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	CARBON, ORGANIC SUS-PENDE TOTAL (MG/L AS C)	
APR													
04...	0.290	1.0	1.1	0.160	0.100	0.090	19	81	260	47	1.0		
30...	0.030	0.60	0.70	0.050	<0.010	0.010	21	87	260	13	1.3		
MAY													
22...	0.020	0.70	0.90	0.060	0.050	0.030	21	83	110	6	0.80		
JUN													
14...	0.050	0.60	0.90	0.110	0.060	0.010	22	96	19	2	1.4		
JUL													
16...	0.040	0.60	0.60	0.040	0.030	0.030	25	91	57	3	0.80		
AUG													
14...	0.020	0.40	0.80	0.070	0.020	0.030	14	93	25	2	0.70		
SEP													
12...	<0.015	0.40	0.70	0.050	0.030	0.030	12	89	8	3	0.70		

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN

LOCATION.-- Lat 45°03'00", long 93°18'36", in NE¼NW¼ sec. 11, T.118 N., R.21 W., Hennepin County, Hydrologic Unit 07010206, at bridge over Shingle Creek at intersection of Queens Avenue North and 52nd Avenue North in Minneapolis.

DRAINAGE AREA.-- 28.2 mi².

PERIOD OF RECORD.-- May to September 1996.

GAGE.-- Water-stage recorder. Elevation of gage is 850 ft above mean sea level (from topographic map).

REMARKD.-- Records good.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	30	16	5.4	1.8
2	---	---	---	---	---	---	---	---	25	15	5.4	2.0
3	---	---	---	---	---	---	---	---	25	12	3.8	4.3
4	---	---	---	---	---	---	---	---	22	7.5	3.6	3.1
5	---	---	---	---	---	---	---	---	21	6.6	12	2.6
6	---	---	---	---	---	---	---	---	38	7.5	7.3	2.3
7	---	---	---	---	---	---	---	---	69	8.0	11	1.8
8	---	---	---	---	---	---	---	37	54	11	7.4	1.4
9	---	---	---	---	---	---	---	34	37	7.9	6.9	1.8
10	---	---	---	---	---	---	---	37	18	6.6	6.5	3.5
11	---	---	---	---	---	---	---	32	17	6.6	6.2	2.4
12	---	---	---	---	---	---	---	28	17	7.4	5.7	1.4
13	---	---	---	---	---	---	---	26	14	6.5	6.9	1.6
14	---	---	---	---	---	---	---	34	14	6.0	5.8	1.6
15	---	---	---	---	---	---	---	42	23	5.6	6.2	1
16	---	---	---	---	---	---	---	38	20	5.0	5.3	1.4
17	---	---	---	---	---	---	---	45	59	4.1	4.0	1.6
18	---	---	---	---	---	---	---	48	60	23	3.4	2.2
19	---	---	---	---	---	---	---	136	54	16	4.3	1.7
20	---	---	---	---	---	---	---	123	44	9.3	4.7	8.3
21	---	---	---	---	---	---	---	111	62	7.2	3.4	5.7
22	---	---	---	---	---	---	---	89	63	5.3	8.3	5.2
23	---	---	---	---	---	---	---	73	55	3.2	4.2	4.9
24	---	---	---	---	---	---	---	66	46	5.1	3.9	3.8
25	---	---	---	---	---	---	---	62	35	4.4	3.5	2.5
26	---	---	---	---	---	---	---	56	33	4.2	2.1	5.7
27	---	---	---	---	---	---	---	47	32	4.7	1.7	4.3
28	---	---	---	---	---	---	---	40	23	4.9	1.7	3.4
29	---	---	---	---	---	---	---	37	19	7.3	1.8	2.5
30	---	---	---	---	---	---	---	33	16	5.5	2.0	1.5
31	---	---	---	---	---	---	---	29	---	6.0	1.9	---
TOTAL	---	---	---	---	---	---	---	---	1045	245.4	156.3	87.7
MEAN	---	---	---	---	---	---	---	---	34.8	7.92	5.04	2.92
MAX	---	---	---	---	---	---	---	---	69	23	12	8.3
MIN	---	---	---	---	---	---	---	---	14	3.2	1.7	1.4
AC-FT-	--	---	---	---	---	---	---	---	2070	487	310	174

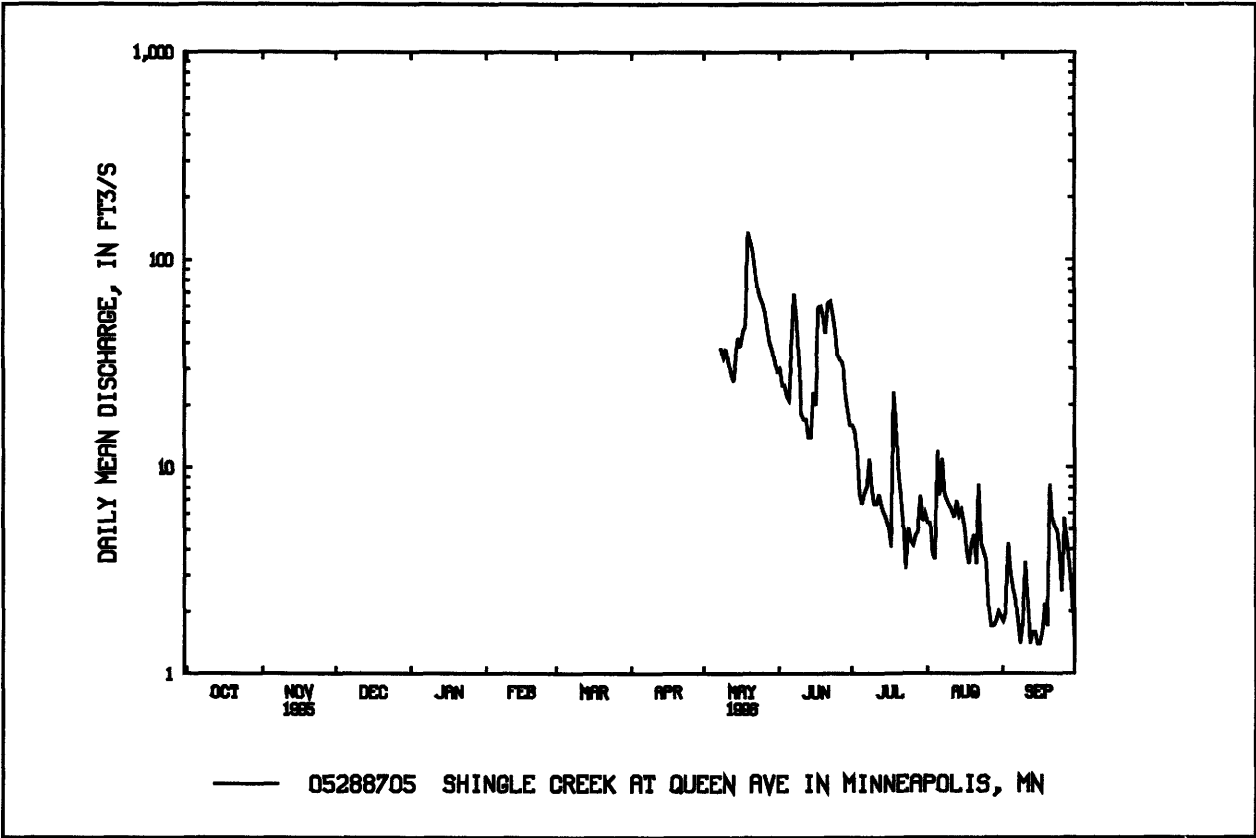
MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	---	---	---	---	---	---	---	---	---	7.92	5.04	2.92
MAX	---	---	---	---	---	---	---	---	---	7.92	5.04	2.92
(WY)	---	---	---	---	---	---	---	---	---	1996	1996	1996
MIN	---	---	---	---	---	---	---	---	---	7.92	5.04	2.92
(WY)	---	---	---	---	---	---	---	---	---	1996	1996	1996

SUMMARY STATISTICS	FOR 1996 WATER YEAR	
HIGHEST DAILY MEAN	136	May 19
LOWEST DAILY MEAN	1.4	Sep 8
INSTANTANEOUS PEAK FLOW	210	May 19
INSTANTANEOUS PEAK STAGE	12.13	May 19
INSTANTANEOUS LOW FLOW	.92	Sep 13



DAY	MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN
	FEBRUARY				MARCH				APRIL				MAY		
1	---	---	---		---	---	---		---	---	---		---	---	---
2	---	---	---		---	---	---		---	---	---		---	---	---
3	---	---	---		---	---	---		---	---	---		---	---	---
4	---	---	---		---	---	---		---	---	---		---	---	---
5	---	---	---		---	---	---		---	---	---		---	---	---
6	---	---	---		---	---	---		---	---	---		---	---	---
7	---	---	---		---	---	---		---	---	---		---	---	---
8	---	---	---		---	---	---		---	---	---		14.0	12.5	13.5
9	---	---	---		---	---	---		---	---	---		14.0	12.5	13.0
10	---	---	---		---	---	---		---	---	---		13.0	11.5	12.5
11	---	---	---		---	---	---		---	---	---		13.0	11.5	12.5
12	---	---	---		---	---	---		---	---	---		13.0	10.0	12.0
13	---	---	---		---	---	---		---	---	---		14.5	11.5	13.0
14	---	---	---		---	---	---		---	---	---		14.5	10.5	12.5
15	---	---	---		---	---	---		---	---	---		14.0	10.0	11.5
16	---	---	---		---	---	---		---	---	---		17.0	13.0	14.5
17	---	---	---		---	---	---		---	---	---		19.0	15.5	17.0
18	---	---	---		---	---	---		---	---	---		22.0	17.0	19.5
19	---	---	---		---	---	---		---	---	---		21.0	18.0	19.0
20	---	---	---		---	---	---		---	---	---		20.0	17.5	18.5
21	---	---	---		---	---	---		---	---	---		20.5	17.0	18.5
22	---	---	---		---	---	---		---	---	---		21.0	17.0	19.0
23	---	---	---		---	---	---		---	---	---		19.5	17.0	18.0
24	---	---	---		---	---	---		---	---	---		18.0	14.5	15.0
25	---	---	---		---	---	---		---	---	---		17.0	13.5	14.5
26	---	---	---		---	---	---		---	---	---		17.0	13.0	15.0
27	---	---	---		---	---	---		---	---	---		16.5	13.5	14.0
28	---	---	---		---	---	---		---	---	---		18.0	12.0	14.5
29	---	---	---		---	---	---		---	---	---		19.0	14.0	16.5
30	---	---	---		---	---	---		---	---	---		19.5	15.5	17.5
31	---	---	---		---	---	---		---	---	---		19.5	16.5	17.5
MONTH	---	---	---		---	---	---		---	---	---		---	---	---

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	17.5	15.5	16.5	---	---	---	23.5	20.0	21.5	24.0	19.0	21.0
2	17.5	15.5	16.5	---	---	---	23.5	20.0	21.5	23.5	20.5	22.5
3	17.5	13.5	15.5	---	---	---	23.5	20.0	21.5	25.5	20.5	23.5
4	16.0	13.0	14.5	---	---	---	23.0	20.5	21.5	26.0	22.0	24.0
5	16.5	15.0	15.5	---	---	---	25.5	21.0	23.0	25.5	22.5	24.0
6	18.0	15.0	16.0	---	---	---	27.0	23.0	24.5	25.0	22.0	23.5
7	19.0	14.5	16.5	---	---	---	26.5	23.5	25.0	24.0	20.5	22.5
8	21.5	15.5	18.0	---	---	---	25.0	22.5	24.0	20.5	18.0	19.5
9	22.5	17.5	20.0	---	---	---	24.5	21.0	23.0	23.0	16.0	19.5
10	---	---	---	---	---	---	23.0	21.0	22.0	---	---	---
11	---	---	---	---	---	---	24.5	21.0	22.5	21.5	17.0	18.5
12	---	---	---	21.5	18.0	20.0	26.0	21.0	23.0	17.5	12.0	15.0
13	---	---	---	21.5	19.0	20.5	26.5	22.5	24.0	---	---	---
14	---	---	---	22.0	19.0	20.5	24.0	21.5	22.5	18.5	10.5	14.0
15	23.5	20.5	22.0	23.0	19.5	21.5	24.5	20.5	22.0	17.0	15.0	15.5
16	21.0	19.5	20.0	25.0	20.0	22.5	25.0	21.0	22.5	18.5	14.0	15.5
17	19.5	18.0	18.5	---	---	---	26.0	20.5	23.0	15.5	12.5	14.5
18	18.0	17.0	17.5	26.5	21.5	24.5	24.0	20.5	22.5	18.0	13.5	16.0
19	20.0	17.0	18.0	26.0	23.0	24.0	23.5	21.0	22.0	19.5	13.5	15.5
20	23.0	18.0	20.0	24.0	20.5	22.5	25.5	20.5	22.5	17.5	15.5	16.0
21	22.5	19.0	20.0	24.5	21.5	23.0	26.0	20.5	23.0	17.0	15.0	15.5
22	21.5	18.0	19.5	---	---	---	25.5	22.5	24.0	18.0	14.5	16.0
23	20.5	17.5	18.5	---	---	---	26.0	21.0	23.0	17.5	15.5	16.0
24	20.5	17.0	18.5	---	---	---	25.0	20.5	22.5	17.5	13.5	15.0
25	22.0	17.5	20.0	23.5	19.0	21.0	27.0	21.0	23.5	16.0	14.0	15.0
26	24.5	19.5	21.5	23.0	18.5	21.0	23.5	19.5	22.0	14.5	13.5	14.0
27	26.0	21.5	24.0	23.0	19.5	21.0	24.0	16.5	19.5	13.5	12.5	13.0
28	26.0	22.5	24.5	22.5	19.5	20.5	23.5	16.0	20.0	15.5	11.5	13.0
29	26.5	25.0	25.5	20.5	18.5	19.5	24.5	17.5	21.0	15.0	11.5	13.0
30	---	---	---	22.0	17.5	19.5	24.0	19.0	21.5	16.0	12.0	13.5
31	---	---	---	22.5	19.0	20.5	24.0	19.5	21.5	---	---	---
MONTH	---	---	---	---	---	---	27.0	16.0	22.5	---	---	---

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT OUEEN AVE IN MINNEAPOLIS, MN.--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN		MAX	MIN	MEAN
	FEBRUARY				MARCH				APRIL				MAY		
1	---	---	---		---	---	---		---	---	---		---	---	---
2	---	---	---		---	---	---		---	---	---		---	---	---
3	---	---	---		---	---	---		---	---	---		---	---	---
4	---	---	---		---	---	---		---	---	---		---	---	---
5	---	---	---		---	---	---		---	---	---		---	---	---
6	---	---	---		---	---	---		---	---	---		---	---	---
7	---	---	---		---	---	---		---	---	---		---	---	---
8	---	---	---		---	---	---		---	---	---		10000	9910	9950
9	---	---	---		---	---	---		---	---	---		9990	9920	9950
10	---	---	---		---	---	---		---	---	---		9990	9940	9960
11	---	---	---		---	---	---		---	---	---		9940	9910	9930
12	---	---	---		---	---	---		---	---	---		9910	9900	9910
13	---	---	---		---	---	---		---	---	---		9900	9890	9900
14	---	---	---		---	---	---		---	---	---		10200	9870	9950
15	---	---	---		---	---	---		---	---	---		10000	10000	10000
16	---	---	---		---	---	---		---	---	---		10000	9980	9990
17	---	---	---		---	---	---		---	---	---		10200	10000	10000
18	---	---	---		---	---	---		---	---	---		10400	9990	10100
19	---	---	---		---	---	---		---	---	---		10900	10300	10600
20	---	---	---		---	---	---		---	---	---		10500	10500	10500
21	---	---	---		---	---	---		---	---	---		10500	10300	10400
22	---	---	---		---	---	---		---	---	---		10300	10200	10300
23	---	---	---		---	---	---		---	---	---		10200	10100	10200
24	---	---	---		---	---	---		---	---	---		10100	10100	10100
25	---	---	---		---	---	---		---	---	---		10100	10000	10100
26	---	---	---		---	---	---		---	---	---		10000	10000	10000
27	---	---	---		---	---	---		---	---	---		10000	9930	9960
28	---	---	---		---	---	---		---	---	---		9930	9890	9910
29	---	---	---		---	---	---		---	---	---		9890	9860	9880
30	---	---	---		---	---	---		---	---	---		9870	9830	9840
31	---	---	---		---	---	---		---	---	---		9830	9790	9810
MONTH	---	---	---		---	---	---		---	---	---		---	---	---

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	9940	9780	9810	---	---	---	900	841	867	1070	985	1050
2	9780	9740	9760	---	---	---	930	900	914	1060	1010	1040
3	9780	9720	9750	---	---	---	964	873	942	1050	487	900
4	9720	9710	9720	---	---	---	976	930	954	1070	935	1030
5	9730	9700	9700	---	---	---	965	300	750	1040	995	1030
6	10200	9700	9810	---	---	---	709	622	659	1030	971	998
7	10000	9950	10000	---	---	---	753	434	658	1040	983	1000
8	10000	9880	9940	---	---	---	765	642	721	1050	1010	1030
9	9880	9790	9830	---	---	---	732	677	712	1070	950	1030
10	---	---	---	---	---	---	770	715	734	---	---	---
11	---	---	---	---	---	---	773	742	760	1050	931	1010
12	---	---	---	1080	975	1020	828	773	812	1090	591	1040
13	---	---	---	1030	984	1020	865	821	838	---	---	---
14	---	---	---	1020	985	1000	898	855	883	1130	954	1060
15	760	529	694	1020	978	996	930	894	906	1060	1010	1040
16	775	688	721	1020	985	999	958	928	943	1060	963	1030
17	705	370	509	---	---	---	976	950	962	1050	968	1000
18	509	411	452	1020	260	746	1010	967	991	1020	931	988
19	551	509	536	708	563	671	1010	826	994	1040	933	1000
20	597	549	578	757	693	723	1030	691	907	1080	342	787
21	629	410	525	830	757	784	1050	834	1010	1050	563	814
22	517	433	469	---	---	---	1010	446	816	933	791	881
23	590	517	557	---	---	---	1020	874	929	830	491	713
24	653	590	620	---	---	---	947	898	922	716	522	669
25	708	653	674	781	581	722	978	918	952	719	667	691
26	749	648	693	809	775	791	957	917	938	685	376	536
27	715	648	680	956	792	897	964	843	920	709	586	661
28	747	670	717	849	814	837	961	858	913	675	506	612
29	752	722	738	868	461	742	982	873	942	765	548	663
30	---	---	---	863	647	824	1020	963	1000	798	765	783
31	---	---	---	879	651	834	1050	967	1020	---	---	---
MONTH	---	---	---	---	---	---	1050	300	880	---	---	---

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)
MAR												
13...	1050	45	1000	999	7.0	7.0	0.0	735	9.0	66	74	0
APR												
22...	1010	25	859	849	7.5	7.7	8.5	744	9.6	162	172	0
MAY												
17...	1040	47	770	753	7.6	7.6	15.5	736	7.3	178	182	0
JUN												
06...	1625	60	613	590	8.7	8.0	17.0	737	8.4	138	157	5
JUL												
11...	1010	7.4	1050	1030	7.4	7.6	18.0	742	6.4	267	259	0
AUG												
05...	0640	51	451	--	--	--	22.0	738	--	--	--	--
AUG												
05-05	0640	--	--	--	--	--	--	--	--	--	--	--
AUG												
05-05	0645	51	--	473	7.5	7.4	--	--	--	105	113	0
05...	0715	41	332	--	--	--	22.0	--	--	--	--	--
05...	0740	32	278	--	8.0	--	22.0	--	7.4	--	--	--
05...	0925	17	570	--	--	--	22.5	--	--	--	--	--
06...	2255	8.6	676	--	--	--	25.5	735	--	--	--	--
AUG												
06-07	2255	--	660	--	--	--	--	--	--	--	--	--
AUG												
06-07	2256	--	660	686	8.0	7.6	--	--	--	159	165	0
06...	2322	12	675	--	--	--	25.0	--	--	--	--	--
07...	0117	31	666	--	7.8	--	24.0	--	6.9	--	--	--
07...	0217	28	584	--	7.7	--	23.5	--	6.9	--	--	--
07...	0321	20	434	--	7.7	--	23.5	--	5.5	--	--	--
SEP												
03-03	0630	--	--	822	7.8	7.3	--	741	--	220	188	0
03...	0706	5.4	1020	--	--	--	22.0	--	--	--	--	--
SEP												
03-03	0706	--	--	--	--	--	--	741	--	220	--	0
03...	0728	9.8	782	--	7.6	--	21.5	--	4.8	--	--	--
03...	0748	10	961	--	7.5	--	21.5	--	4.1	--	--	--
03...	0918	8.6	912	--	7.5	--	21.0	--	4.0	--	--	--
03...	1240	5.4	842	--	7.5	--	23.5	741	3.3	--	--	--

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	BICAR- BONATE DIS IT FIELD MG/L AS HCO3 (00453)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS- (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	SOLIDS, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
MAR 13...	80	1.70	0.050	3.0	3.1	0.680	0.390	0.330	0.300	9.8	2.1	531
APR 22...	198	0.020	0.010	0.50	0.70	0.280	0.050	0.030	<0.010	8.0	1.2	479
MAY 17...	217	0.020	0.010	0.50	0.80	0.170	0.110	0.050	<0.010	6.5	0.80	449
JUN 06...	155	0.240	0.020	0.60	5.1	0.400	1.10	0.040	0.040	6.0	>10	376
JUL 11...	326	0.140	0.030	0.40	0.70	0.440	0.060	<0.010	0.010	5.4	1.3	616
AUG 05-05	128	0.110	0.020	0.50	1.4	0.210	0.150	0.020	0.030	6.6	3.0	274
AUG 06-07	194	0.110	0.030	0.50	1.2	0.590	0.070	<0.010	0.010	6.8	2.8	404
SEP 03-03	268	0.470	0.030	1.1	1.9	0.330	0.250	0.060	0.040	12	>5.0	482
SEP 03-03	268	--	--	--	--	--	--	--	--	--	--	--

DATE	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAR 13...	26	6.2	140	7.2	240	20	<0.10	4.7	310	320	28	94
APR 22...	68	18	72	3.9	130	54	0.10	7.5	200	390	7	97
MAY 17...	67	20	50	3.3	100	51	0.30	8.1	120	240	18	92
JUN 06...	59	15	32	3.4	63	49	0.20	9.9	25	170	650	91
JUL 11...	110	29	56	3.3	120	96	0.20	16	170	540	87	44
AUG 05-05	47	13	24	2.1	52	43	0.10	7.3	89	210	49	80
AUG 06-07	68	19	36	2.6	73	62	0.10	12	46	210	89	30
SEP 03-03	84	25	44	4.2	94	85	0.20	12	58	500	56	98

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFO- SMETHANE, WATER, DISS, REC (UG/L) (04095)	DI- BROMO- CHLORO- TETRA- CHLORO- ETHANE FORM TOTAL (UG/L) (32102)	DI- BROMO- METHANE TOTAL (UG/L) (32101)	CARBON- TETRA- CHLORO- ETHANE TOTAL (UG/L) (32103)	1,2-DI- CHLORO- ETHANE TOTAL (UG/L) (32104)
MAR 13...	--	--	--	--	--	--	--	--	--	--	--
APR 22...	<0.007	<0.002	0.014	E0.018	E0.006	<0.004	<0.003	--	--	--	--
MAY 17...	--	--	--	--	--	--	--	--	--	--	--
JUN 06...	--	--	--	--	--	--	--	--	--	--	--
JUL 11...	<0.007	<0.002	0.011	0.029	E0.005	<0.004	<0.003	--	--	--	--
AUG 05...	--	--	--	--	--	--	--	<0.100	<0.100	<0.050	<0.050
AUG 05-05	--	--	--	--	--	--	--	<0.200	<0.200	<0.100	<0.100
AUG 05-05	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	<0.200	<0.200	<0.100	<0.100
05...	--	--	--	--	--	--	--	<0.200	<0.200	<0.100	<0.100
05...	--	--	--	--	--	--	--	<0.400	<0.400	<0.200	<0.200
06...	--	--	--	--	--	--	--	<0.200	<0.200	<0.100	<0.100
AUG 06-07	--	--	--	--	--	--	--	<0.400	<0.400	<0.200	<0.200
AUG 06-07	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	<0.200	<0.200	<0.100	<0.100
07...	--	--	--	--	--	--	--	<0.400	<0.400	<0.200	<0.200
07...	--	--	--	--	--	--	--	<0.400	<0.400	<0.200	<0.200
07...	--	--	--	--	--	--	--	<0.400	<0.400	<0.200	<0.200
07...	--	--	--	--	--	--	--	<0.400	<0.400	<0.200	<0.200
SEP 03-03	--	--	--	--	--	--	--	<0.400	<0.400	<0.200	<0.200
03...	--	--	--	--	--	--	--	<0.400	<0.400	<0.200	<0.200
SEP 03-03	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	<0.400	<0.400	<0.200	<0.200
03...	--	--	--	--	--	--	--	<0.400	<0.400	<0.200	<0.200
03...	--	--	--	--	--	--	--	<0.400	<0.400	<0.200	<0.200
03...	--	--	--	--	--	--	--	<0.400	<0.400	<0.200	<0.200

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	CHLORO- DI- BROMO- METHANE	CHLORO- FORM	TOLUENE	BENZENE	ACRO- LEIN	ACRYLO- NITRILE	ALPHA BHC DIS- SOLVED	CHLORO- BENZENE	CHLORO- ETHANE	ETHYL- BENZENE	ETHANE HEXA- CHLORO- WATER RECOVER	METHYL- TRDBROMIDE
	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL
	(UG/L) (32105)	(UG/L) (32106)	(UG/L) (34010)	(UG/L) (34030)	(UG/L) (34210)	(UG/L) (34215)	(UG/L) (34253)	(UG/L) (34301)	(UG/L) (34311)	(UG/L) (34371)	(UG/L) (34396)	(UG/L) (34413)
MAR												
13...	--	--	--	--	--	--	--	--	--	--	--	--
APR												
22...	--	--	--	--	--	--	<0.002	--	--	--	--	--
MAY												
17...	--	--	--	--	--	--	--	--	--	--	--	--
JUN												
06...	--	--	--	--	--	--	--	--	--	--	--	--
JUL												
11...	--	--	--	--	--	--	<0.002	--	--	--	--	--
AUG												
05...	<0.100	<0.050	0.240	<0.050	1.30	<2.00	--	<0.050	0.100	<0.050	<0.050	<0.100
AUG												
05-05	<0.200	<0.100	E0.180	<0.100	<4.00	<4.00	--	<0.100	<0.200	<0.100	<0.100	<0.200
AUG												
05-05	--	--	--	--	--	--	--	--	--	--	--	--
05...	<0.200	<0.100	E0.190	<0.100	<4.00	<4.00	--	<0.100	<0.200	<0.100	<0.100	<0.200
05...	<0.200	<0.100	E0.190	<0.100	<4.00	<4.00	--	<0.100	<0.200	<0.100	<0.100	<0.200
05...	<0.400	<0.200	E0.140	<0.200	<8.00	<8.00	--	<0.200	<0.400	<0.200	<0.200	<0.400
06...	<0.200	<0.100	<0.100	<0.100	<4.00	<4.00	--	<0.100	<0.200	<0.100	<0.100	<0.200
AUG												
06-07	<0.400	<0.200	<0.200	<0.200	<8.00	<8.00	--	<0.200	<0.400	<0.200	<0.200	<0.400
AUG												
06-07	--	--	--	--	--	--	--	--	--	--	--	--
06...	<0.200	E0.040	0.120	<0.100	<4.00	<4.00	--	<0.100	<0.200	<0.100	<0.100	<0.200
07...	<0.400	<0.200	E0.120	<0.200	<8.00	<8.00	--	<0.200	<0.400	<0.200	<0.200	<0.400
07...	<0.400	<0.200	<0.200	<0.200	<8.00	<8.00	--	<0.200	<0.400	<0.200	<0.200	<0.400
07...	<0.400	<0.200	<0.200	<0.200	<8.00	<8.00	--	<0.200	<0.400	<0.200	<0.200	<0.400
SEP												
03-03	<0.400	<0.200	1.20	<0.200	<8.00	<8.00	--	<0.200	E0.100	<0.200	<0.200	<0.400
03...	<0.400	E0.140	7.40	E0.130	<8.00	<8.00	--	<0.200	E0.170	<0.200	<0.200	<0.400
SEP												
03-03	--	--	--	--	--	--	--	--	--	--	--	--
03...	<0.400	E0.030	3.10	<0.200	<8.00	<8.00	--	<0.200	E0.060	<0.200	<0.200	<0.400
03...	<0.400	<0.200	E0.380	<0.200	<8.00	<8.00	--	<0.200	<0.400	<0.200	<0.200	<0.400
03...	<0.400	<0.200	E0.400	<0.200	<8.00	<8.00	--	<0.200	E0.050	<0.200	<0.200	<0.400
03...	<0.400	<0.200	E0.370	<0.200	<8.00	<8.00	--	<0.200	<0.400	<0.200	<0.200	<0.400

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	ETHANE, BENZENE											
	METHYL-CHLORIDE	METHYL-CHLORIDE	TETRA-ETHYL-CHLORIDE	TRI-FLUORO-METHANE	1,1-DI-ETHANE	1,1-DI-ETHYL-CHLORIDE	1,1,1-TRI-ETHANE	1,1,2-TRI-ETHANE	1,1,2,2-TETRA-ETHANE	O-DI-CHLORO-WATER	1,2-DI-CHLORO-PROPANE	1,2-TRANS-DI-ETHYLENE
	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	REC	REC	TOTAL	TOTAL
	(UG/L) (34418)	(UG/L) (34423)	(UG/L) (34475)	(UG/L) (34488)	(UG/L) (34496)	(UG/L) (34501)	(UG/L) (34506)	(UG/L) (34511)	(UG/L) (34516)	(UG/L) (34536)	(UG/L) (34541)	(UG/L) (34546)
MAR 13...	--	--	--	--	--	--	--	--	--	--	--	--
APR 22...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 17...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 06...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 11...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 05...	0.150	<0.100	<0.050	<0.100	<0.050	<0.100	<0.050	<0.100	<0.100	<0.050	<0.050	<0.050
AUG 05-05	E0.080	<0.200	<0.100	<0.200	<0.100	<0.200	<0.100	<0.200	<0.200	<0.100	<0.100	<0.100
AUG 05-05	--	--	--	--	--	--	--	--	--	--	--	--
05...	E0.120	<0.200	E0.010	<0.200	<0.100	<0.200	<0.100	<0.200	<0.200	<0.100	<0.100	<0.100
05...	E0.070	<0.200	<0.100	<0.200	<0.100	<0.200	<0.100	<0.200	<0.200	<0.100	<0.100	<0.100
05...	<0.800	<0.400	<0.200	<0.400	<0.200	<0.400	<0.200	<0.400	<0.400	<0.200	<0.200	<0.200
06...	E0.070	<0.200	<0.100	<0.200	<0.100	<0.200	<0.100	<0.200	<0.200	<0.100	<0.100	<0.100
AUG 06-07	<0.800	<2.00	<0.200	<0.400	<0.200	<0.400	<0.200	<0.400	<0.400	<0.200	<0.200	<0.200
AUG 06-07	--	--	--	--	--	--	--	--	--	--	--	--
06...	0.100	<0.200	<0.100	<0.200	<0.100	<0.200	<0.100	<0.200	<0.200	<0.100	<0.100	<0.100
07...	<0.800	<1.10	<0.200	<0.400	<0.200	<0.400	<0.200	<0.400	<0.400	<0.200	<0.200	<0.200
07...	<0.800	<2.00	<0.200	<0.400	<0.200	<0.400	<0.200	<0.400	<0.400	<0.200	<0.200	<0.200
07...	<0.800	<1.50	<0.200	<0.400	<0.200	<0.400	<0.200	<0.400	<0.400	<0.200	<0.200	<0.200
SEP 03-03	E0.140	E0.200	E0.007	<0.400	<0.200	<0.400	<0.200	<0.400	<0.400	<0.200	<0.200	<0.200
03...	E0.400	E0.220	<0.200	<0.400	<0.200	<0.400	<0.200	<0.400	<0.400	<0.200	<0.200	<0.200
SEP 03-03	--	--	--	--	--	--	--	--	--	--	--	--
03...	E0.170	<0.400	<0.200	<0.400	<0.200	<0.400	<0.200	<0.400	<0.400	<0.200	<0.200	<0.200
03...	E0.120	E0.220	<0.200	<0.400	<0.200	<0.400	<0.200	<0.400	<0.400	<0.200	<0.200	<0.200
03...	E0.110	E0.250	<0.200	<0.400	<0.200	<0.400	<0.200	<0.400	<0.400	<0.200	<0.200	<0.200
03...	E0.130	E0.200	E0.010	<0.400	<0.200	<0.400	<0.200	<0.400	<0.400	<0.200	<0.200	<0.200

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	BENZENE 1,2,4- TRI- CHLORO- WAT (UG/L) (34551)	BENZENE 1,3-DI- CHLORO- WATER (UG/L) (34566)	BENZENE 1,4-DI- CHLORO- WATER (UG/L) (34571)	DI- CHLORO- FLUORO- TRDMETHANE (UG/L) (34668)	DI- CHLORO- NAPHTH- EALENE (UG/L) (34696)	TRANS- 1,3-DI- CHLORO- PROPENE (UG/L) (34699)	CIS 1,3-DI- CHLORO- PROPENE (UG/L) (34704)	VINYL CHLO- RIDE (UG/L) (39175)	TRI- CHLORO- ETHYL- ENE (UG/L) (39180)	P,P' DDE (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)
MAR 13...	--	--	--	--	--	--	--	--	--	--	--	--
APR 22...	--	--	--	--	--	--	--	--	--	<0.006	<0.004	<0.004
MAY 17...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 06...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 11...	--	--	--	--	--	--	--	--	--	<0.006	<0.004	<0.004
AUG 05...	<0.200	<0.050	<0.050	<0.200	<0.200	<0.100	<0.100	<0.100	<0.050	--	--	--
AUG 05-05	<0.400	<0.100	<0.100	<0.400	<0.400	<0.200	<0.200	<0.200	<0.100	--	--	--
AUG 05-05	--	--	--	--	--	--	--	--	--	--	--	--
05...	<0.400	<0.100	<0.100	<0.400	<0.400	<0.200	<0.200	<0.200	<0.100	--	--	--
05...	<0.400	<0.100	<0.100	<0.400	<0.400	<0.200	<0.200	<0.200	<0.100	--	--	--
05...	<0.800	<0.200	<0.200	<0.800	<0.800	<0.400	<0.400	<0.400	<0.200	--	--	--
06...	<0.400	<0.100	<0.100	<0.400	<0.400	<0.200	<0.200	<0.200	<0.100	--	--	--
AUG 06-07	<0.800	<0.200	<0.200	<0.800	<0.800	<0.400	<0.400	<0.400	<0.200	--	--	--
AUG 06-07	--	--	--	--	--	--	--	--	--	--	--	--
06...	<0.400	<0.100	<0.100	<0.400	<0.400	<0.200	<0.200	<0.200	<0.100	--	--	--
07...	<0.800	<0.200	<0.200	<0.800	<0.800	<0.400	<0.400	<0.400	<0.200	--	--	--
07...	<0.800	<0.200	<0.200	<0.800	<0.800	<0.400	<0.400	<0.400	<0.200	--	--	--
07...	<0.800	<0.200	<0.200	<0.800	<0.800	<0.400	<0.400	<0.400	<0.200	--	--	--
SEP 03-03	<0.800	<0.200	<0.200	<0.800	<0.800	<0.400	<0.400	<0.400	<0.200	--	--	--
03...	<0.800	<0.200	<0.200	<0.800	<0.800	<0.400	<0.400	<0.400	<0.200	--	--	--
SEP 03-03	--	--	--	--	--	--	--	--	--	--	--	--
03...	<0.800	<0.200	<0.200	<0.800	<0.800	<0.400	<0.400	<0.400	<0.200	--	--	--
03...	<0.800	<0.200	<0.200	<0.800	<0.800	<0.400	<0.400	<0.400	<0.200	--	--	--
03...	<0.800	<0.200	<0.200	<0.800	<0.800	<0.400	<0.400	<0.400	<0.200	--	--	--
03...	<0.800	<0.200	<0.200	<0.800	<0.800	<0.400	<0.400	<0.400	<0.200	--	--	--

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	HEXA- CHLORO- BUT- ADIENE TOTAL (UG/L) (39702)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ACETO- CHLOR, WATER FLTRD REC (UG/L) (49260)	METHYL ACRY- LATE WATER UNFLTRD RECOVER (UG/L) (49991)	PREH- NITENE WATER UNFLTRD RECOVER (UG/L) (49999)	ISO- DURENE WATER UNFLTRD RECOVER (UG/L) (50000)
MAR												
13...	--	--	--	--	--	--	--	--	--	--	--	--
APR												
22...	<0.001	0.006	<0.005	<0.004	<0.002	0.022	--	<0.002	<0.002	--	--	--
MAY												
17...	--	--	--	--	--	--	--	--	--	--	--	--
JUN												
06...	--	--	--	--	--	--	--	--	--	--	--	--
JUL												
11...	<0.001	0.004	<0.005	<0.004	0.022	0.020	--	<0.002	<0.002	--	--	--
AUG												
05...	--	--	--	--	--	--	<0.200	--	--	<2.00	<0.050	<0.050
AUG												
05-05	--	--	--	--	--	--	<0.400	--	--	<4.00	<0.100	<0.100
AUG												
05-05	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	<0.400	--	--	<4.00	<0.100	<0.100
05...	--	--	--	--	--	--	<0.400	--	--	<4.00	<0.100	<0.100
05...	--	--	--	--	--	--	<0.800	--	--	<8.00	<0.200	<0.200
06...	--	--	--	--	--	--	<0.400	--	--	<4.00	<0.100	<0.100
AUG												
06-07	--	--	--	--	--	--	<0.800	--	--	<8.00	<0.200	<0.200
AUG												
06-07	--	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	<0.400	--	--	<4.00	<0.100	<0.100
07...	--	--	--	--	--	--	<0.800	--	--	<8.00	<0.200	<0.200
07...	--	--	--	--	--	--	<0.800	--	--	<8.00	<0.200	<0.200
07...	--	--	--	--	--	--	<0.800	--	--	<8.00	<0.200	<0.200
07...	--	--	--	--	--	--	<0.800	--	--	<8.00	<0.200	<0.200
SEP												
03-03	--	--	--	--	--	--	E0.010	--	--	<8.00	<0.200	<0.200
03...	--	--	--	--	--	--	<0.800	--	--	<8.00	<0.200	<0.200
SEP												
03-03	--	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	<0.800	--	--	<8.00	<0.200	<0.200
03...	--	--	--	--	--	--	<0.800	--	--	<8.00	<0.200	<0.200
03...	--	--	--	--	--	--	<0.800	--	--	<8.00	<0.200	<0.200
03...	--	--	--	--	--	--	<0.800	--	--	<8.00	<0.200	<0.200

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	BROMO-ETHENE UNFLTRD (UG/L) (50002)	ETHER TERT-BUTYL DUNFLTRD (UG/L) (50004)	ETHER TERT-PENTYL DUNFLTRD (UG/L) (50005)	2BUTENEMETHAC-TRANS-1 DUNFLTRD (UG/L) (73547)	CARBON RYLATE DUNFLTRD (UG/L) (73570)	DI-SULFIDE WHOLE (UG/L) (77041)	ACETATE VINYL UNFLTRD (UG/L) (77057)	CIS-1,2-DI-CHLORO-ETHENE WATER (UG/L) (77093)	2-HEXA-NONE WATER (UG/L) (77103)	STYRENE TOTAL (UG/L) (77128)	O-XYLENE WHOLE (UG/L) (77135)	1,1-DI-CHLORO-PRO-PENE, WAT, WH TOTAL (UG/L) (77168)
MAR 13...	--	--	--	--	--	--	--	--	--	--	--	--
APR 22...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 17...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 06...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 11...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 05...	<0.100	<0.100	<0.100	<5.00	<1.00	0	<5.00	<0.050	<5	<0.050	<0.050	<0.050
AUG 05-05	<0.200	<0.200	<0.200	<10.0	<2.00	<0	<10.0	<0.100	<10	<0.100	<0.100	<0.100
AUG 05-05	--	--	--	--	--	--	--	--	--	--	--	--
AUG 05...	<0.200	<0.200	<0.200	<10.0	<2.00	<0	<10.0	<0.100	<10	<0.100	<0.100	<0.100
AUG 05...	<0.200	<0.200	<0.200	<10.0	<2.00	<0	<10.0	<0.100	<10	<0.100	<0.100	<0.100
AUG 05...	<0.400	<0.400	<0.400	<20.0	<4.00	<0	<20.0	<0.200	<20	<0.200	<0.200	<0.200
AUG 06...	<0.200	<0.200	<0.200	<10.0	<2.00	<0	<10.0	<0.100	<10	<0.100	<0.100	<0.100
AUG 06-07	<0.400	<0.400	<0.400	<20.0	<4.00	<0	<20.0	<0.200	<20	<0.200	<0.200	<0.200
AUG 06-07	--	--	--	--	--	--	--	--	--	--	--	--
AUG 06...	<0.200	<0.200	<0.200	<10.0	<2.00	<0	<10.0	<0.100	<10	<0.100	<0.100	<0.100
AUG 07...	<0.400	<0.400	<0.400	<20.0	<4.00	<0	<20.0	<0.200	<20	<0.200	<0.200	<0.200
AUG 07...	<0.400	<0.400	<0.400	<20.0	<4.00	<0	<20.0	<0.200	<20	<0.200	<0.200	<0.200
AUG 07...	<0.400	<0.400	<0.400	<20.0	<4.00	<0	<20.0	<0.200	<20	<0.200	<0.200	<0.200
SEP 03-03	<0.400	<0.400	<0.400	<20.0	<4.00	<0	<20.0	<0.200	E0	E0.020	<0.200	<0.200
SEP 03...	<0.400	<0.400	<0.400	<20.0	<4.00	E0	<20.0	<0.200	E0	E0.040	E0.120	<0.200
SEP 03-03	--	--	--	--	--	--	--	--	--	--	--	--
SEP 03...	<0.400	<0.400	<0.400	<20.0	<4.00	<0	<20.0	<0.200	<20	E0.020	<0.200	<0.200
SEP 03...	<0.400	<0.400	<0.400	<20.0	<4.00	<0	<20.0	<0.200	<20	E0.010	<0.200	<0.200
SEP 03...	<0.400	<0.400	<0.400	<20.0	<4.00	<0	<20.0	<0.200	<20	E0.010	<0.200	<0.200
SEP 03...	<0.400	<0.400	<0.400	<20.0	<4.00	<0	<20.0	<0.200	E0	E0.010	<0.200	<0.200

[illegible]

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	BENZENE	BENZENE	P-ISO-		123-TRI	ETHANE,		1,2,3-	1,2-		METHYL PROPENE	
	SEC	TERT-	PROPYL-	METHYL	CHLORO-	1112-		TRI-	DIBROMO	FREON-	TERT-	3-
	BUTYL-	BUTYL-	TOLUENE	IODIDE	PROPANE	TETRA-		CHLORO	ETHANE	113	BUTYL	CHLORO-
	WATER	WATER	WATER	WATER	WATER	CHLORO-	BENZENE	WATER	WATER	WATER	ETHER	WATER
UNFLTRD	UNFLTRD	WHOLE	UNFLTRD	WHOLE	WAT	UNFWAT,	WH	WHOLE	UNFLTRD	WAT	UNFWAT,	UNFLTRD
REC	REC	REC	RECOVER	TOTAL	REC	REC	REC	TOTAL	REC	REC	RECOVER	
(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	
(77350)	(77353)	(77356)	(77424)	(77443)	(77562)	(77613)	(77651)	(77652)	(78032)	(78109)		
MAR												
13...	--	--	--	--	--	--	--	--	--	--	--	
APR												
22...	--	--	--	--	--	--	--	--	--	--	--	
MAY												
17...	--	--	--	--	--	--	--	--	--	--	--	
JUN												
06...	--	--	--	--	--	--	--	--	--	--	--	
JUL												
11...	--	--	--	--	--	--	--	--	--	--	--	
AUG												
05...	<0.050	<0.050	<0.050	<0.05	<0.200	<0.050	<0.200	<0.100	<0.050	<0.100	<0.10	
AUG												
05-05	<0.100	<0.100	<0.100	<0.10	<0.400	<0.100	<0.400	<0.200	<0.100	<0.200	<0.20	
AUG												
05-05	--	--	--	--	--	--	--	--	--	--	--	
05...	<0.100	<0.100	<0.100	<0.10	<0.400	<0.100	<0.400	<0.200	<0.100	<0.200	<0.20	
05...	<0.100	<0.100	<0.100	<0.10	<0.400	<0.100	<0.400	<0.200	<0.100	<0.200	<0.20	
05...	<0.200	<0.200	<0.200	<0.20	<0.800	<0.200	<0.800	<0.400	<0.200	<0.400	<0.40	
06...	<0.100	<0.100	<0.100	<0.10	<0.400	<0.100	<0.400	<0.200	<0.100	<0.200	<0.20	
AUG												
06-07	<0.200	<0.200	<0.200	<0.20	<0.800	<0.200	<0.800	<0.400	<0.200	<0.400	<0.40	
AUG												
06-07	--	--	--	--	--	--	--	--	--	--	--	
06...	<0.100	<0.100	<0.100	<0.10	<0.400	<0.100	<0.400	<0.200	<0.100	<0.200	<0.20	
07...	<0.200	<0.200	<0.200	<0.20	<0.800	<0.200	<0.800	<0.400	<0.200	<0.400	<0.40	
07...	<0.200	<0.200	<0.200	<0.20	<0.800	<0.200	<0.800	<0.400	<0.200	<0.400	<0.40	
07...	<0.200	<0.200	<0.200	<0.20	<0.800	<0.200	<0.800	<0.400	<0.200	<0.400	<0.40	
07...	<0.200	<0.200	<0.200	<0.20	<0.800	<0.200	<0.800	<0.400	<0.200	<0.400	<0.40	
SEP												
03-03	<0.200	<0.200	<0.200	<0.20	<0.800	<0.200	E0.030	<0.400	<0.200	<0.400	<0.40	
03...	<0.200	<0.200	E0.040	<0.20	<0.800	<0.200	<0.800	<0.400	<0.200	<0.400	<0.40	
SEP												
03-03	--	--	--	--	--	--	--	--	--	--	--	
03...	<0.200	<0.200	E0.010	<0.20	<0.800	<0.200	<0.800	<0.400	<0.200	<0.400	<0.40	
03...	<0.200	<0.200	E0.010	<0.20	<0.800	<0.200	<0.800	<0.400	<0.200	<0.400	<0.40	
03...	<0.200	<0.200	<0.200	<0.20	<0.800	<0.200	<0.800	<0.400	<0.200	<0.400	<0.40	
03...	<0.200	<0.200	<0.200	<0.20	<0.800	<0.200	<0.800	<0.400	<0.200	<0.400	<0.40	

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	METHYL- ISO- BUTYL- KETONE WAT.WH. (UG/L) (81513)	ACETONE WATER WHOLE (UG/L) (81552)	BROMO- BENZENE WATER, WHOLE, (UG/L) (81555)	ETHER WATER, UNFLTRD (UG/L) (81576)	METH- ACRYLO- NITRITE WATER RECOVER (UG/L) (81593)	METHYL- KETONE WATER RECOVER (UG/L) (81595)	METHYL- METHAC- RYLATE WATER RECOVER (UG/L) (81597)	FURAN TETRA- HYDRO- WATER RECOVER (UG/L) (81607)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	DIBROMO CHLORO- PROPANE TOT.REC (UG/L) (82625)	2,6-DI- ETHYL ANILINE WAT.FLT 0.7 U GF, REC (UG/L) (82660)
MAR 13...	--	--	--	--	--	--	--	--	--	--	--
APR 22...	--	--	--	--	--	--	--	--	<0.004	--	<0.003
MAY 17...	--	--	--	--	--	--	--	--	--	--	--
JUN 06...	--	--	--	--	--	--	--	--	--	--	--
JUL 11...	--	--	--	--	--	--	--	--	<0.004	--	<0.003
AUG 05...	<5	8	<0.050	<0.10	<2.00	1	<1.00	<5.00	--	<0.500	--
AUG 05-05	<10	7	<0.100	<0.20	<4.00	<10	<2.00	<10.0	--	<1.00	--
AUG 05-05	--	--	--	--	--	--	--	--	--	--	--
05...	<10	8	<0.100	<0.20	<4.00	<10	<2.00	<10.0	--	<1.00	--
05...	<10	<10	<0.100	<0.20	<4.00	<10	<2.00	<10.0	--	<1.00	--
05...	<20	<20	<0.200	<0.40	<8.00	<20	<4.00	<20.0	--	<2.00	--
06...	<10	<10	<0.100	<0.20	<4.00	<10	<2.00	<10.0	--	<1.00	--
AUG 06-07	<20	E7	<0.200	<0.40	<8.00	<20	<4.00	<20.0	--	<2.00	--
AUG 06-07	--	--	--	--	--	--	--	--	--	--	--
06...	<10	<10	<0.100	<0.20	<4.00	<10	<2.00	<10.0	--	<1.00	--
07...	<20	10	<0.200	<0.40	<8.00	<20	<4.00	<20.0	--	<2.00	--
07...	<20	9	<0.200	<0.40	<8.00	<20	<4.00	<20.0	--	<2.00	--
07...	<20	9	<0.200	<0.40	<8.00	<20	<4.00	<20.0	--	<2.00	--
SEP 03-03	E0	20	<0.200	<0.40	<8.00	E3	<4.00	<20.0	--	<2.00	--
03...	E1	20	<0.200	<0.40	<8.00	5	<4.00	<20.0	--	<2.00	--
SEP 03-03	--	--	--	--	--	--	--	--	--	--	--
03...	E0	10	<0.200	<0.40	<8.00	E3	<4.00	<20.0	--	<2.00	--
03...	<20	7	<0.200	<0.40	<8.00	E1	<4.00	<20.0	--	<2.00	--
03...	E0	10	<0.200	<0.40	<8.00	E2	<4.00	<20.0	--	<2.00	--
03...	<20	20	<0.200	<0.40	<8.00	4	<4.00	<20.0	--	<2.00	--

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

[illegible]

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

[illegible]

MISSISSIPPI RIVER BASIN

05288705 SHINGLE CREEK AT QUEEN AVE IN MINNEAPOLIS, MN.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	META/ PARA- XYLENE WATER UNFLTRD REC (UG/L) (85795)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC (91063)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC (91065)	ETHANE 12DICL SURROG VOC REC (99832)	TOLUENE D8 SURROG VOC REC (99833)	BENZENE 14BRFL- SURROG VOC REC (99834)
MAR 13...	--	--	--	--	--	--	--	--	--	--	--
APR 22...	<0.003	<0.013	<0.001	<0.005	--	200	127	100	--	--	--
MAY 17...	--	--	--	--	--	--	--	--	--	--	--
JUN 06...	--	--	--	--	--	--	--	--	--	--	--
JUL 11...	<0.003	<0.013	<0.001	<0.005	--	117	135	120	--	--	--
AUG 05...	--	--	--	--	E0.080	--	--	--	108	97.0	94.0
AUG 05-05	--	--	--	--	<0.100	--	--	--	111	99.0	89.0
AUG 05-05	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	<0.100	--	--	--	103	98.0	90.0
05...	--	--	--	--	<0.100	--	--	--	110	101	93.0
05...	--	--	--	--	<0.200	--	--	--	106	100	88.0
06...	--	--	--	--	<0.100	--	--	--	112	99.0	81.0
AUG 06-07	--	--	--	--	<0.200	--	--	--	108	95.0	74.0
AUG 06-07	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	<0.100	--	--	--	105	93.0	77.0
07...	--	--	--	--	E0.110	--	--	--	105	96.0	75.0
07...	--	--	--	--	<0.200	--	--	--	109	95.0	74.0
07...	--	--	--	--	<0.200	--	--	--	114	98.0	75.0
SEP 03-03	--	--	--	--	<0.200	--	--	--	103	99.0	105
03...	--	--	--	--	E0.280	--	--	--	108	100	107
SEP 03-03	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	E0.120	--	--	--	109	99.0	106
03...	--	--	--	--	<0.200	--	--	--	107	99.0	105
03...	--	--	--	--	<0.200	--	--	--	107	100	105
03...	--	--	--	--	<0.200	--	--	--	109	101	107

MINNESOTA RIVER BASIN

05290000 LITTLE MINNESOTA RIVER NEAR PEEVER, SD

LOCATION.--Lat 45°36'05", long 96°52'18", in SW 1/4 sec. 13, T. 125 N., R. 50 W., Roberts County, Hydrologic Unit 07020001, on Sisseton Indian Reservation, on right bank 2 mi northwest of town of Browns Valley, MN, 5.3 mi northeast of Peever, 7.2 mi downstream from Jorgenson River, and 8 mi upstream from Big Stone Lake.

DRAINAGE AREA.--447 mi².

PERIOD OF RECORD.--October 1939 to September 1981, October 1989 to current year.

REVISED RECORDS.--WSP 1308: 1943(M).

GAGE.--Water-stage recorder. Datum of gage is 1,002.20 ft above sea level. Oct. 1, 1939, to Mar. 20, 1940, nonrecording gage at site 4.5 mi downstream at different datum. Mar. 21 to Apr. 12, 1940, nonrecording gage at site 100 ft downstream at present datum. April 13 to Aug. 27, 1940, nonrecording gage at present site and datum.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 450 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 12	0400	*816	5.10	May 20	0700	763	5.23

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	80	e14	e5.0	e3.6	e10	214	134	196	37	62	1.9
2	89	82	e14	e5.0	e3.6	e9.8	298	124	187	31	50	2.0
3	54	58	e14	e4.9	e3.6	e9.6	367	115	167	26	40	1.9
4	46	e58	e13	e4.8	e3.6	e9.4	422	112	159	23	32	1.8
5	73	e58	e12	e4.7	e3.6	e9.3	433	118	148	22	27	1.5
6	119	e57	e12	e4.7	e3.7	e9.1	442	148	138	26	22	1.4
7	113	e55	e12	e4.6	e3.8	e9.0	438	152	127	51	20	2.8
8	105	e50	e11	e4.5	e4.2	e9.0	487	150	120	74	17	1.8
9	110	e46	e9.0	e4.4	e4.9	e9.0	540	151	114	53	15	1.7
10	109	e37	e7.2	e4.4	e5.5	e9.6	622	157	106	45	14	1.5
11	100	e37	e6.5	e4.5	e6.3	e12	739	161	96	44	14	1.3
12	87	e37	e6.3	e4.7	e6.5	e20	807	148	84	43	13	1.3
13	78	e35	e6.2	e4.8	e6.5	e40	737	135	75	41	12	1.3
14	69	e34	e6.2	e5.0	e6.5	e70	585	134	66	36	10	1.3
15	62	e33	e6.1	e5.0	e6.5	e85	482	165	60	32	8.6	1.2
16	56	e32	e6.0	e4.8	e6.6	e90	421	183	55	28	7.6	1.1
17	51	e31	e6.0	e4.6	e6.7	e95	375	182	52	25	6.5	1.1
18	47	e30	e5.9	e4.4	e6.9	e95	342	281	48	37	5.4	1.2
19	43	e29	e5.8	e4.2	e7.3	e90	330	489	43	75	5.2	1.3
20	40	e28	e5.7	e4.1	e7.5	e75	318	740	39	67	4.6	1.6
21	37	e27	e5.6	e4.0	e7.8	e68	297	675	48	45	4.5	2.1
22	35	e26	e5.5	e3.9	e8.2	e63	272	632	57	37	5.2	2.1
23	36	e23	e5.4	e3.8	e8.5	e56	242	549	73	30	4.4	2.4
24	44	e20	e5.3	e3.7	e8.1	e50	215	455	109	25	3.4	2.5
25	59	e18	e5.2	e3.7	e9.3	e65	202	381	108	22	3.1	2.3
26	83	e17	e5.1	e3.6	e9.8	e75	192	330	74	19	2.8	3.2
27	104	e16	e5.1	e3.6	e10	e85	180	289	56	19	2.5	3.9
28	101	e15	e5.1	e3.6	e10	105	167	258	47	22	2.3	7.8
29	105	e15	e5.0	e3.6	e10	93	157	234	40	39	2.1	7.3
30	91	e15	e5.0	e3.6	---	136	145	204	42	111	2.1	6.6
31	84	---	e5.0	e3.0	---	177	---	189	---	94	2.0	---
TOTAL	2291	1099	236.2	133.2	189.1	1738.8	11468	8175	2734	1279	420.3	71.2
MEAN	73.9	36.6	7.62	4.30	6.52	56.1	382	264	91.1	41.3	13.6	2.37
MAX	119	82	14	5.0	10	177	807	740	196	111	62	7.8
MIN	35	15	5.0	3.0	3.6	9.0	145	112	39	19	2.0	1.1
AC-FT	4540	2180	469	264	375	3450	22750	16220	5420	2540	834	141
CFSM	.17	.08	.02	.01	.01	.13	.86	.59	.20	.09	.03	.01
IN.	.19	.09	.02	.01	.02	.14	.95	.68	.23	.11	.03	.01

e Estimated.

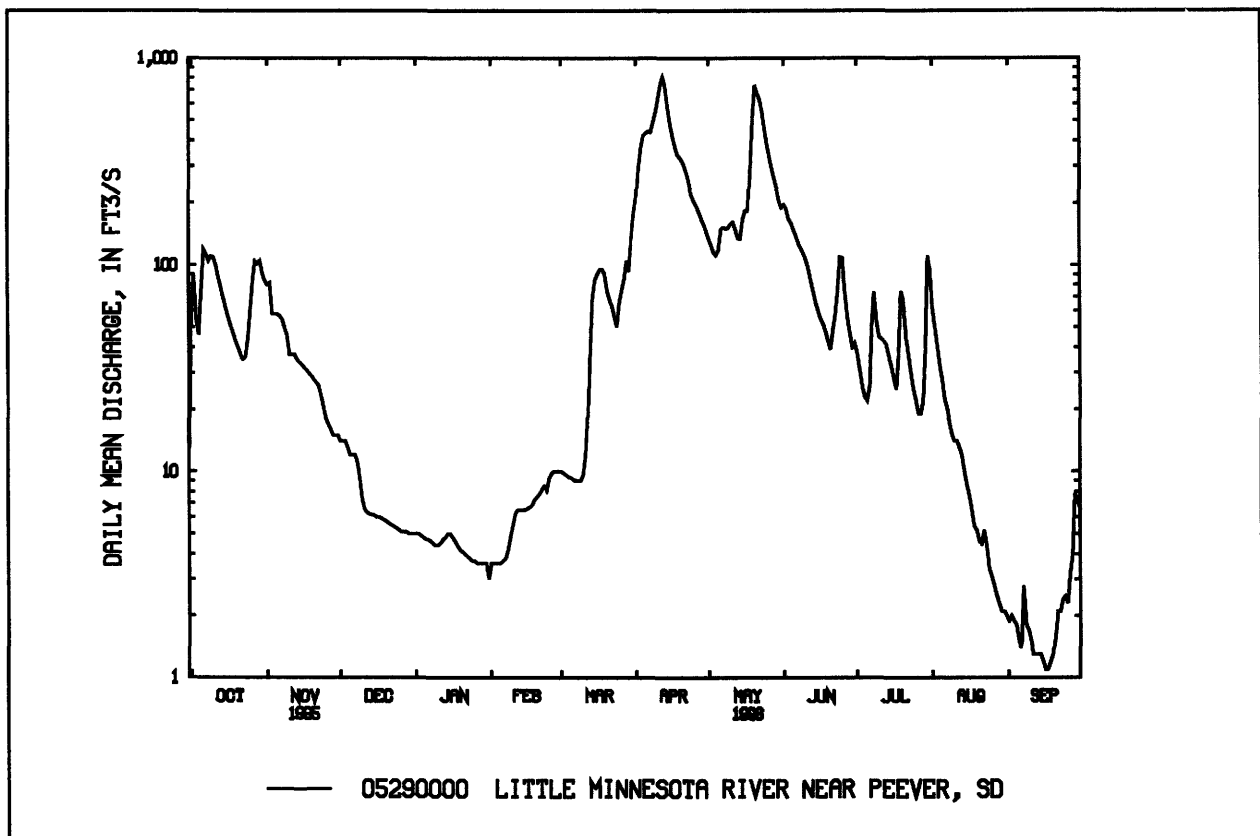
MINNESOTA RIVER BASIN

05290000 LITTLE MINNESOTA RIVER NEAR PEEVER, SD--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	5.44	5.48	2.92	1.48	2.68	109	206	94.6	75.0	55.8	13.0	4.46
MAX	73.9	36.6	18.2	11.4	21.8	573	1321	531	355	865	235	43.3
(WY)	1996	1996	1994	1994	1976	1943	1952	1962	1942	1993	1993	1993
MIN	.21	.25	.10	.000	.000	.51	2.89	2.20	.41	.041	.059	.074
(WY)	1940	1940	1940	1940	1940	1956	1981	1981	1976	1976	1976	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1940 - 1996	
ANNUAL TOTAL	44261.6		29834.8			
ANNUAL MEAN	121		81.5		48.0 ^a	
HIGHEST ANNUAL MEAN					153	
LOWEST ANNUAL MEAN					1.37	
HIGHEST DAILY MEAN	2700		807		5400	
LOWEST DAILY MEAN	3.5		1.1		.00 ^b	
ANNUAL SEVEN-DAY MINIMUM	3.6		1.2		.00	
INSTANTANEOUS PEAK FLOW			816		8900	
INSTANTANEOUS PEAK STAGE			9.46 ^c		13.58	
INSTANTANEOUS LOW FLOW			1.1		.00	
ANNUAL RUNOFF (AC-FT)	87790		59180		34800	
ANNUAL RUNOFF (CFSM)	.27		.18		.11	
ANNUAL RUNOFF (INCHES)	3.68		2.48		1.46	
10 PERCENT EXCEEDS	341		207		110	
50 PERCENT EXCEEDS	30		29		3.3	
90 PERCENT EXCEEDS	4.5		3.6		.30	

^a Median of annual mean discharges is 35 ft³/s.^b Many days, several years.^c Backwater from ice.

MINNESOTA RIVER BASIN

05291000 WHETSTONE RIVER NEAR BIG STONE CITY, SD

LOCATION.--Lat 45°17'32", long 96°29'14", in SE¹/₄NW¹/₄ sec.18, T.121 N., R.46 W., Grant County, Hydrologic Unit 07020001, on right bank 20 ft downstream from former highway bridge site, 1.5 mi west of Big Stone City, and 4.5 mi upstream from Big Stone Lake.

DRAINAGE AREA.--389 mi².

PERIOD OF RECORD.--March 1910 to November 1912 (no winter records), and March 1931 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 895: Drainage area. WSP 1308: 1932(M), 1935(M).

GAGE.--Water-stage recorder. Datum of gage is 996.96 ft in mean sea level, adjustment of 1912. Mar. 8, 1910, to Nov. 30, 1912, nonrecording gage 2 mi downstream at different datum. Mar. 18, 1931, to May 3, 1939, nonrecording gage, at site 20 ft upstream at present datum. May 4, 1939, to Nov. 8, 1952, water-stage recorder at site 80 ft down-stream at present datum.

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, about 26 ft in June 1919, present site and datum, from information by local resident, discharge 29,000 ft³/s, from dam break.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 02	0800	308	4.01	May 06	2300	384	3.97
Oct. 06	1500	356	4.23	May 11	0700	391	4.04
Oct. 10	0600	660	5.37	May 16	0300	379	4.02
Oct. 27	0400	994	6.31	May 18	2400	*1490	7.33
Apr. 02	2200	638	4.86	June 02	0900	666	5.28
Apr. 12	0900	626	4.81				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	176	309	e52	e21	e14	e72	435	149	312	48	44	17
2	291	312	e48	e21	e14	e71	594	143	594	47	38	16
3	200	224	e46	e21	e13	e70	606	146	349	44	34	15
4	148	223	e43	e21	e15	e68	472	151	235	43	31	15
5	167	197	e40	e21	e18	e67	408	197	189	42	33	15
6	319	185	e39	e20	e23	e65	374	311	163	41	35	14
7	275	184	e38	e20	e27	e62	384	340	146	42	32	20
8	204	161	e37	e20	e31	e61	410	282	136	41	29	19
9	346	175	e36	e20	e38	e62	412	276	129	40	26	17
10	587	153	e35	e20	e42	e64	461	332	117	36	25	21
11	349	118	e34	e21	e46	e66	529	376	107	35	25	20
12	219	e110	e33	e22	e48	e70	590	290	98	35	24	18
13	162	e105	e32	e21	e49	e80	470	225	91	33	23	17
14	131	e100	e31	e21	e49	e90	361	217	86	32	22	16
15	116	e95	e31	e20	e48	e100	322	292	82	31	21	15
16	108	e90	e30	e20	e47	e115	304	355	78	30	20	15
17	101	e85	e29	e19	e47	e120	298	284	76	30	20	14
18	96	e80	e28	e15	e48	e125	289	819	73	37	19	14
19	94	e76	e27	e13	e51	e127	287	1150	71	46	20	14
20	91	e72	e26	e14	e54	e130	283	889	69	43	20	17
21	89	e68	e26	e15	e57	e128	256	479	67	39	20	17
22	88	e65	e25	e17	e59	e124	229	311	67	35	22	18
23	93	e65	e25	e17	e63	e122	209	244	70	32	20	17
24	117	e69	e24	e17	e66	e118	196	208	80	31	19	17
25	165	e64	e23	e17	e68	e117	191	186	95	29	17	17
26	590	e58	e23	e16	e70	e120	181	172	88	29	17	21
27	930	e54	e23	e16	e72	e130	178	166	74	38	16	23
28	850	e56	e22	e16	e73	e160	e182	171	64	34	16	23
29	748	e61	e22	e15	e74	173	e175	181	57	53	20	29
30	484	e57	e22	e15	---	205	158	171	51	65	20	26
31	338	---	e22	e15	---	250	---	163	---	52	17	---
TOTAL	8672	3671	972	567	1324	3332	10244	9676	3914	1213	745	537
MEAN	280	122	31.4	18.3	45.7	107	341	312	130	39.1	24.0	17.9
MAX	930	312	52	22	74	250	606	1150	594	65	44	29
MIN	88	54	22	13	13	61	158	143	51	29	16	14
AC-FT	17200	7280	1930	1120	2630	6610	20320	19190	7760	2410	1480	1070
CFSM	.72	.31	.08	.05	.12	.28	.88	.80	.34	.10	.06	.05

e Estimated.

MINNESOTA RIVER BASIN

05291000 WHETSTONE RIVER NEAR BIG STONE CITY, S.D.--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	14.0	13.0	8.52	5.79	12.1	154	191	89.9	77.7	59.9	20.0	10.3
MAX	280	122	43.3	36.3	118	612	1386	491	478	885	327	77.0
(WY)	1996	1996	1972	1994	1984	1978	1952	1972	1984	1993	1991	1995
MIN	.60	.40	.20	.000	.000	2.85	3.63	.77	1.42	.035	.000	.36
(WY)	1932	1935	1935	1934	1934	1969	1934	1934	1936	1934	1934	1935

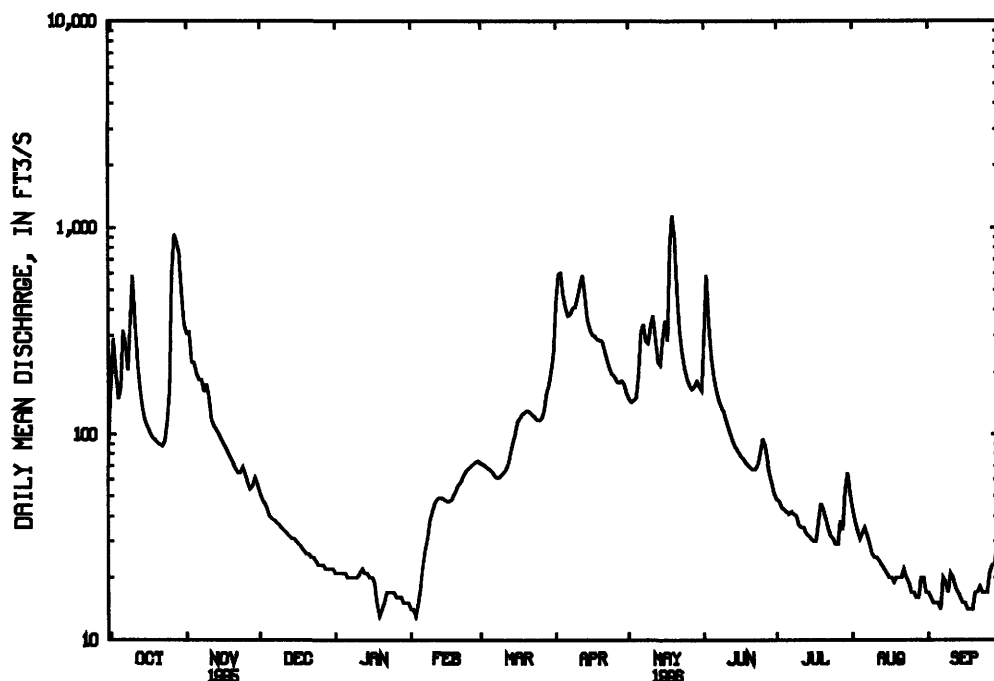
SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1910 - 1996	
ANNUAL TOTAL	82963		44867			
ANNUAL MEAN	227		123		56.4 ^a	
HIGHEST ANNUAL MEAN					201	
LOWEST ANNUAL MEAN					1.52	
HIGHEST DAILY MEAN	3500		Jul 6		1150	
LOWEST DAILY MEAN	17		Feb 12		May 19	
ANNUAL SEVEN-DAY MINIMUM	18		Feb 6		Jan 19, Feb 3	
INSTANTANEOUS PEAK FLOW					14	
INSTANTANEOUS PEAK STAGE					Jan 29	
INSTANTANEOUS LOW FLOW					May 18	
ANNUAL RUNOFF (AC-FT)	164600		88990		Mar 14	
ANNUAL RUNOFF (CFSM)	.58		.32		Jan 19	
10 PERCENT EXCEEDS	482		312		.00 ^c	
50 PERCENT EXCEEDS	100		61		.00	
90 PERCENT EXCEEDS	22		17		.15	

a Median of annual mean discharges is 37 ft³/s.

b Backwater from ice.

c Many days, several years.

d From floodmark.



— 05291000 WHETSTONE RIVER NEAR BIG STONE CITY, SD

MINNESOTA RIVER BASIN

05292000 MINNESOTA RIVER AT ORTONVILLE, MN

LOCATION.--Lat 45°17'44", long 96°26'38", in NE1/4,NW1/4, sec.16, T.121 N., R.46 W., Big Stone County, Hydrologic Unit 07020001, on left bank 400 ft downstream from bridge on U.S. Highway 12 and 1,300 ft downstream from dam at outlet of Big Stone Lake, at Ortonville.

DRAINAGE AREA.--1,160 mi², approximately.

PERIOD OF RECORD.--February 1938 to current year.

REVISED RECORDS.--WSP 895: 1939. WSP 1508: 1942 (yearly mean).

GAGE.--Water-stage recorder. Datum of gage is 956.38 ft above mean sea level. Prior to Mar. 31, 1939, nonrecording gage on downstream side of dam 1,300 ft upstream at datum 1.31 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Affected by regulation of Big Stone Lake.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	373	543	e120	e110	e103	e310	741	215	857	64	128	30
2	328	742	e118	e110	e102	e290	982	202	1050	68	117	29
3	378	524	e116	e110	e102	e270	1020	199	1170	112	105	29
4	285	416	e115	e110	e102	e260	900	199	708	152	102	29
5	244	371	e113	e110	e104	e250	788	199	598	118	124	27
6	250	357	e113	e110	e102	e230	769	199	600	58	107	26
7	252	370	e115	e110	e105	e220	784	199	547	42	126	29
8	252	328	e119	e110	145	e210	791	201	472	74	111	28
9	255	291	e115	e110	182	e200	866	208	427	87	108	29
10	580	380	e115	e110	182	196	971	213	373	64	105	31
11	583	236	e115	e109	182	197	1120	213	340	36	104	30
12	446	302	e115	e109	179	358	1220	213	262	36	94	28
13	462	286	e115	e109	175	1100	1130	213	193	34	86	27
14	458	266	e115	e109	166	1900	1000	212	144	33	69	26
15	379	259	e115	e109	166	1720	980	323	98	34	57	26
16	279	252	e115	e109	e166	1760	862	555	98	36	60	25
17	284	249	e113	e125	e166	1850	577	901	98	70	60	25
18	234	243	e112	e140	e166	1670	486	1800	98	159	58	24
19	440	244	e110	e120	213	1420	494	2150	95	226	57	24
20	526	173	e110	e109	290	1200	497	2060	92	218	60	23
21	270	123	e110	e109	309	1140	491	1610	89	219	57	23
22	231	e123	e110	e108	327	1100	494	1330	74	176	77	23
23	378	e123	e110	e107	346	1030	483	1120	61	100	67	23
24	337	e123	e110	e106	354	980	470	819	59	73	65	23
25	242	e123	e110	e105	364	722	512	622	57	96	64	27
26	407	123	e110	e105	e360	645	488	613	55	118	62	26
27	1010	e123	e110	e105	e350	640	473	604	59	111	58	25
28	1210	e123	e110	e105	e340	591	466	698	56	108	44	24
29	1030	e122	e110	e104	e330	538	313	808	56	122	32	23
30	714	e120	e110	e104	---	563	193	675	54	128	32	29
31	554	---	e110	e104	---	578	---	629	---	130	32	---
TOTAL	13671	8058	3504	3410	6178	24138	21361	20202	8940	3102	2428	791
MEAN	441	269	113	110	213	779	712	652	298	100	78.3	26.4
MAX	1210	742	120	140	364	1900	1220	2150	1170	226	128	31
MIN	231	120	110	104	102	196	193	199	54	33	32	23
AC-FT	27120	15980	6950	6760	12250	47880	42370	40070	17730	6150	4820	1570
CFSM	.38	.23	.10	.09	.18	.67	.61	.56	.26	.09	.07	.02

e Estimated.

MINNESOTA RIVER BASIN

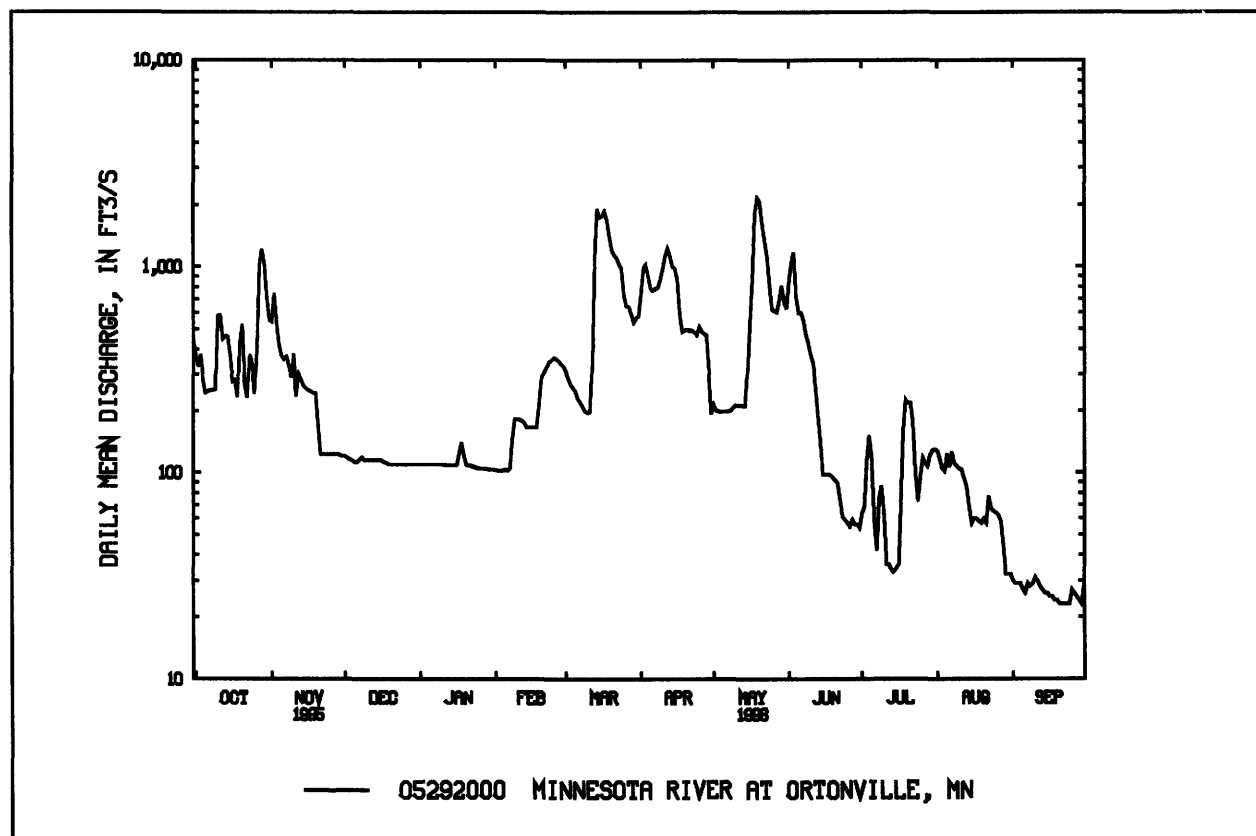
05292000 MINNESOTA RIVER AT ORTONVILLE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	30.6	20.4	19.2	20.0	26.4	196	440	257	186	162	77.5	34.9
MAX	441	269	194	164	213	1519	2195	887	1034	1781	1299	250
(WY)	1996	1996	1943	1943	1996	1994	1952	1986	1962	1993	1993	1942
MIN	.20	.20	.20	.17	.16	1.14	1.27	.91	1.30	1.11	.25	.18
(WY)	1939	1939	1939	1940	1940	1941	1941	1941	1977	1977	1959	1978

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1938 - 1996	
ANNUAL TOTAL	162968		115783		124 ^a	
ANNUAL MEAN	446		316		415	
HIGHEST ANNUAL MEAN					2.39	
LOWEST ANNUAL MEAN					1993	
HIGHEST DAILY MEAN	2460	Mar 28	2150	May 19	3050	Apr 13 1952
LOWEST DAILY MEAN	48	Sep 23	23	Sep 20-24,29	.00	Dec 13 1940
ANNUAL SEVEN-DAY MINIMUM	63	Feb 9	23	Sep 18	.08	Sep 12 1988
INSTANTANEOUS PEAK FLOW			2230	May 19	3060	Apr 13 1952
INSTANTANEOUS PEAK STAGE			8.63	May 19	12.92	Apr 13 1952
INSTANTANEOUS LOW FLOW			23	Sep 19,29	.00	Dec 13 1940
ANNUAL RUNOFF (AC-FT)	323200		229700		89870	
ANNUAL RUNOFF (CFSM)	.38		.27		.11	
10 PERCENT EXCEEDS	1360		830		340	
50 PERCENT EXCEEDS	199		148		17	
90 PERCENT EXCEEDS	66		35		1.1	

^a Median of annual mean discharges is 86 ft³/s.



MINNESOTA RIVER BASIN

05293000 YELLOW BANK RIVER NEAR ODESSA, MN

LOCATION.--Lat 45°13'35", long 96°21'12", in SW1/4SW1/4 sec. 6, T. 120 N., R. 45 W., Lac qui Parle County, Hydrologic Unit 07020001, on 1-ft bank 150 ft downstream from highway bridge, 2.5 mi southwest of Odessa, and 4.5 mi upstream from mouth.

DRAINAGE AREA.--398 mi².

PERIOD OF RECORD.--October 1939 to current year.

REVISED RECORDS.--WSP 1388: 1947(M), 1950.

REVISIONS.-- Daily-mean discharge for Sept. 30, 1995 changed to 105 ft³/s.

GAGE.--Water-stage recorder. Datum of gage is 953.34 ft above mean sea level (U.S. Army Corps of Engineers bench mark). Prior to Aug. 28, 1940, nonrecording gage at site 150 ft upstream at same datum.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft³/s and maximum(*).

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 02	1400	1620	9.60	Apr. 10	1000	478	5.40
Oct. 10	1630	895	7.36	May 11	1500	666	6.44
Mar. 15	2100	*3040	*12.95	May 20	1800	1020	7.78
Apr. 03	1400	556	5.85	June 02	2300	669	6.45

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	597	600	e121	e63	e32	e240	407	155	309	63	32	15
2	1450	565	e119	e62	e30	e220	496	149	540	59	27	15
3	1180	470	e115	e62	e30	e210	539	152	618	56	24	14
4	837	402	e111	e56	e29	e200	484	163	527	55	21	12
5	662	457	e102	e54	e29	e185	432	196	432	52	22	11
6	711	310	e99	e51	e29	e175	424	271	359	51	21	10
7	672	293	e97	e48	e29	e170	424	384	309	52	58	24
8	565	253	e95	e47	e30	e155	439	360	280	53	56	30
9	568	262	e93	e45	e33	e155	431	396	256	50	43	24
10	797	244	e92	e44	e34	e170	450	541	234	45	35	32
11	719	e235	e90	e43	e37	e190	431	633	200	41	31	25
12	571	e230	e89	e46	e38	e260	451	553	179	39	26	21
13	464	e230	e88	e49	e38	e640	436	431	158	38	22	21
14	386	e259	e87	e46	e80	e1500	395	379	142	35	19	18
15	319	236	e85	e43	e95	2920	383	394	126	34	16	16
16	275	e210	e83	e41	e100	2410	392	435	119	31	15	15
17	250	e205	e82	e40	e110	1810	418	408	117	30	13	13
18	238	e204	e80	e40	e110	1540	393	443	114	31	12	12
19	224	e200	e79	e40	e140	1170	362	795	106	35	13	12
20	209	e200	e78	e39	e150	936	343	964	106	49	14	15
21	196	e200	e77	e38	e160	915	313	746	98	45	15	17
22	186	e195	e76	e38	e165	844	281	542	96	37	21	17
23	180	e180	e75	e37	e180	731	258	449	93	33	19	22
24	191	e175	e74	e36	e220	631	252	394	94	30	17	23
25	283	e165	e73	e36	e250	528	242	356	95	27	18	21
26	527	e155	e72	e35	e265	e497	232	316	93	25	16	28
27	966	e150	e71	e35	e290	e470	226	292	86	22	15	33
28	1130	e140	e68	e35	e285	433	213	289	79	21	15	33
29	1200	e130	e68	e34	e265	444	171	309	73	35	16	41
30	963	e125	e68	e33	---	391	162	305	68	47	24	38
31	704	---	e67	e33	---	338	---	273	---	39	19	---
TOTAL	18220	7680	2674	1349	3283	21478	10880	12473	6106	1260	715	628
MEAN	588	256	86.3	43.5	113	693	363	402	204	40.6	23.1	20.9
MAX	1450	600	121	63	290	2920	539	964	618	63	58	41
MIN	180	125	67	33	29	155	162	149	68	21	12	10
AC-FT	36140	15230	5300	2680	6510	42600	21580	24740	12110	2500	1420	1250
CFSM	1.48	.64	.22	.11	.28	1.74	.91	1.01	.51	.10	.06	.05

e Estimated.

MINNESOTA RIVER BASIN

05293000 YELLOW BANK RIVER NEAR ODESSA, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1996, BY WATER YEAR (WY)

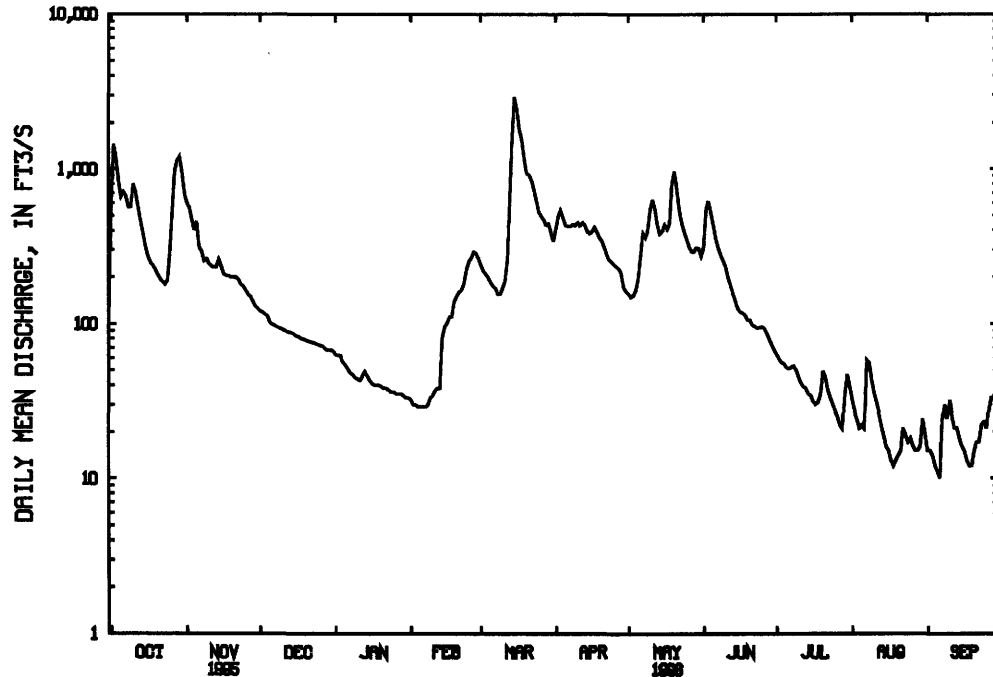
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	24.5	22.4	11.6	7.08	14.0	171	245	108	106	67.8	31.3	17.4
MAX	588	256	86.3	68.0	117	693	1341	652	577	741	281	273
(WY)	1996	1996	1996	1994	1984	1996	1952	1972	1992	1993	1991	1985
MIN	.31	.44	.32	.090	.001	1.59	9.13	2.94	1.83	.27	.088	.083
(WY)	1941	1977	1977	1977	1977	1965	1981	1981	1976	1976	1976	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1940 - 1996
ANNUAL TOTAL	96004	86746	
ANNUAL MEAN	263	237	69.0 ^a
HIGHEST ANNUAL MEAN			237
LOWEST ANNUAL MEAN			3.98
HIGHEST DAILY MEAN	2680	Apr 20	6640
LOWEST DAILY MEAN	17	Feb 2	.00 ^b
ANNUAL SEVEN-DAY MINIMUM	18	Jan 27	.00
INSTANTANEOUS PEAK FLOW		3040	6970
INSTANTANEOUS PEAK STAGE		12.95	19.07 ^c
INSTANTANEOUS LOW FLOW		9.0	.00
ANNUAL RUNOFF (AC-FT)	190400	172100	49980
ANNUAL RUNOFF (CFSM)	.66	.60	.17
10 PERCENT EXCEEDS	625	557	11
90 PERCENT EXCEEDS	18	21	1.0

a Median of annual mean discharges is 52 ft³/s.

b Many days, several years.

c From floodmark.



— 05293000 YELLOW BANK RIVER NEAR ODESSA, MN

MINNESOTA RIVER BASIN

05294000 POMME DE TERRE RIVER AT APPLETON, MN

LOCATION.--Lat 45°12'10", long 96°01'20", in SW¹/₄NW¹/₄ sec.14, T.120 N., R.43 W., Swift County, Hydrologic Unit 07020002, on left bank 60 ft upstream from bridge on U.S. Highway 59 and State Highway 119 at Appleton and 8 mi upstream from mouth.

DRAINAGE AREA.--905 mi², approximately.

PERIOD OF RECORD.--March 1931 to September 1935 (no winter records), October 1935 to current year. Prior to October 1953, published as "near Appleton."

REVISED RECORDS.--WSP 1308: 1931(M), 1937(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 978.00 ft above mean sea level. Prior to Dec. 22, 1952, nonrecording gage at site 4 mi upstream at datum 25.17 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow affected by lakes above station. Occasional regulation at low flow by old milldam 500 ft upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*)

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 03	0030	928	6.28	Apr. 06	1600	1130	6.58
Oct. 11	0530	718	5.94	June 05	0300	642	5.80
Oct. 30	1730	883	6.21	June 24	1200	261	4.94
Nov. 08	1030	729	5.96	July 09	1000	208	4.78
Nov. 13	2130	498	5.52	July 19	0700	202	4.76
Nov. 30	1730	295	5.04	Aug. 08	0400	244	4.89
Mar. 18	1200	*1390	*6.95				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	569	704	255	e120	e94	e109	825	481	504	165	135	56
2	839	704	251	e119	e90	e109	878	474	512	159	122	56
3	883	698	234	e116	e96	e110	913	456	560	156	112	54
4	741	527	223	e114	e86	e110	930	440	619	150	105	52
5	629	549	194	e112	e88	e110	978	436	641	144	102	51
6	576	623	161	e119	e92	e110	1050	459	625	149	104	59
7	549	669	155	e121	e94	e112	1060	464	578	147	180	76
8	510	632	156	e120	e98	e125	1020	471	516	171	231	72
9	521	534	139	e117	e100	e128	1000	478	456	203	183	70
10	644	471	138	e112	e103	e125	952	499	403	181	153	75
11	703	332	e137	e110	e103	e125	911	515	370	159	140	70
12	643	319	e135	e110	e103	136	937	498	355	156	130	66
13	586	426	e133	e110	e102	203	936	474	341	149	120	64
14	543	445	e132	e110	e102	382	897	466	319	144	113	63
15	506	449	e130	e110	e102	672	865	497	291	143	109	59
16	468	399	e130	e100	e102	904	842	549	271	140	105	58
17	424	376	e130	e90	e102	1280	815	586	259	132	100	57
18	393	359	e130	e70	e109	1230	779	623	249	159	95	56
19	381	345	e128	26	e105	969	749	725	239	189	91	56
20	368	340	e126	29	e103	876	728	815	228	175	90	56
21	349	322	e125	33	e103	824	705	910	223	181	88	66
22	329	241	e124	33	e103	819	674	908	230	164	89	63
23	314	209	e123	45	e104	892	648	875	242	145	83	66
24	342	195	e122	82	e105	923	624	813	256	133	79	69
25	426	e190	e121	e105	e110	722	603	749	251	123	75	73
26	553	e185	e121	e110	e112	730	584	687	231	118	73	74
27	606	e180	e120	e108	e113	590	561	635	210	115	70	72
28	622	177	e120	e107	e111	552	536	594	192	111	66	71
29	643	199	e120	e103	e110	628	509	554	181	167	62	67
30	689	264	e122	e100	---	699	487	517	171	172	59	64
31	703	---	e125	e96	---	717	---	493	---	153	58	---
TOTAL	17052	12063	4560	2957	2945	16021	23996	18141	10523	4753	3322	1911
MEAN	550	402	147	95.4	102	517	800	585	351	153	107	63.7
MAX	883	704	255	121	113	1280	1060	910	641	203	231	76
MIN	314	177	120	26	86	109	487	436	171	111	58	51
AC-FT	33820	23930	9040	5870	5840	31780	47600	35980	20870	9430	6590	3790
CFSM	.61	.44	.16	.11	.11	.57	.88	.65	.39	.17	.12	.07

e Estimated.

MINNESOTA RIVER BASIN

05294000 POMME DE TERRE RIVER AT APPLETON, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1996, BY WATER YEAR (WY)

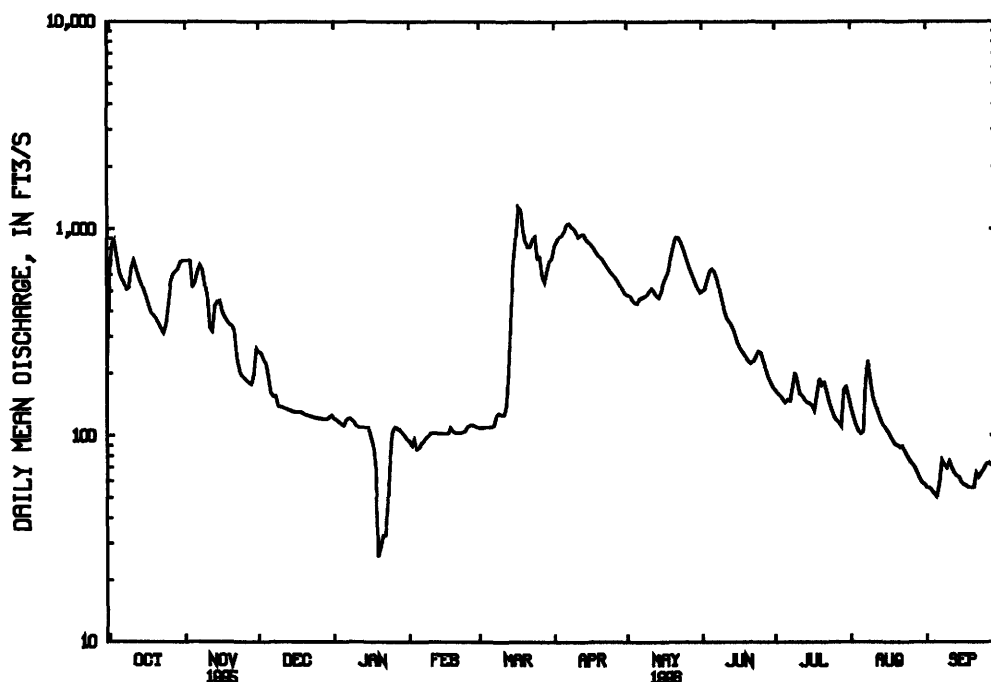
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	66.9	62.5	41.7	27.0	25.5	163	366	204	164	142	76.0	55.1
MAX	550	402	182	141	147	675	1587	846	516	1382	752	331
(WY)	1996	1996	1987	1987	1987	1995	1969	1969	1965	1993	1993	1976
MIN	.000	3.52	1.00	.000	.000	2.04	20.9	8.09	2.17	.45	.095	.047
(WY)	1989	1989	1937	1937	1936	1969	1934	1934	1933	1988	1988	1978

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1931 - 1996
ANNUAL TOTAL	148268	118244	
ANNUAL MEAN	406	323	123 ^a
HIGHEST ANNUAL MEAN			363
LOWEST ANNUAL MEAN			21.1
HIGHEST DAILY MEAN	1790	Mar 29	5210
LOWEST DAILY MEAN	53	Jan 4	.00 ^b
ANNUAL SEVEN-DAY MINIMUM	53	Jan 4	.00
INSTANTANEOUS PEAK FLOW		1390	5520
INSTANTANEOUS PEAK STAGE		6.95	14.58 ^c
ANNUAL RUNOFF (AC-FT)	294100	234500	89470
ANNUAL RUNOFF (CFSM)	.45	.36	.14
10 PERCENT EXCEEDS	899	743	283
50 PERCENT EXCEEDS	322	173	48
90 PERCENT EXCEEDS	56	72	6.3

a Median of annual mean discharges is 94 ft³/s.

b Many days, several years.

c Backwater from ice.



— 05294000 POMME DE TERRE RIVER AT APPLETON, MN

MINNESOTA RIVER BASIN

05300000 LAC QUI PARLE RIVER NEAR LAC QUI PARLE, MN

LOCATION.--Lat 44°59'42", long 95°55'09", in SW1/4SW1/4 sec.27, T.118 N., R.42 W., Lac qui Parle County, Hydrologic Unit 07020003, on right bank 40 ft downstream from highway bridge and 0.5 mi southwest of city of Lac qui Parle.

DRAINAGE AREA.--983 mi².

PERIOD OF RECORD.--April 1910 to November 1914; March 1931 to current year (winter records incomplete prior to 1934). Published as "at Lac qui Parle," 1910-14.

REVISED RECORDS.--WSP 1308: 1912(M), 1935(M).

GAGE.--Water-stage recorder. Datum of gage is 951.98 ft above mean sea level (Minnesota Department of Transportation benchmark). Apr. 27, 1910, to Nov. 15, 1914, nonrecording gage at site 2 mi downstream at different datum. Mar. 17, 1931, to Mar. 9, 1937, nonrecording gage at site 40 ft upstream at present datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	332	600	e200	e97	e46	e70	1390	427	988	159	41	22
2	776	586	e199	e94	e45	e70	1550	408	984	146	38	19
3	1240	557	e197	e92	e45	e70	1340	423	1100	134	34	17
4	1300	442	e196	e90	e44	e70	1280	455	1080	126	30	16
5	1120	506	e195	e88	e44	e70	1190	545	980	119	30	14
6	933	540	e192	e86	e45	e70	1180	587	897	114	30	14
7	885	525	e188	e85	e47	e71	1090	641	884	109	32	14
8	847	475	e184	e84	e48	e80	993	708	848	107	60	14
9	819	484	e180	e84	e49	e94	842	763	799	97	66	16
10	792	476	e175	e84	e50	e105	782	949	723	89	78	19
11	795	462	e168	e84	e50	e115	759	1030	642	84	76	23
12	753	e450	e162	e82	e49	e150	744	997	569	80	66	24
13	660	e430	e160	e80	e50	e240	739	892	500	76	61	24
14	582	e410	e155	e80	e50	e300	732	819	442	75	56	22
15	529	e400	e150	e88	e51	e350	726	808	393	75	53	20
16	485	392	e148	e88	e54	e380	922	815	364	72	48	17
17	445	350	e142	e86	e56	e420	933	828	361	68	42	12
18	411	339	e139	e82	e58	e450	1060	777	363	64	37	12
19	380	323	e135	e78	e61	e460	1020	1220	373	61	e35	13
20	349	315	e132	e74	e63	e430	940	1450	358	57	e36	18
21	322	306	e130	e70	e66	e420	883	1700	328	55	37	22
22	297	253	e127	e67	e71	e420	817	1730	299	53	36	26
23	290	e230	e120	e64	e74	e370	738	1520	279	53	37	32
24	305	e225	e119	e60	e76	e370	676	1260	266	54	85	46
25	375	e220	e115	e56	e77	e420	627	1050	259	52	88	50
26	437	e215	e109	e53	e74	e500	587	928	255	50	68	60
27	495	e212	e104	e51	e73	e560	551	842	229	48	56	67
28	582	e210	e101	e49	e72	e740	525	825	203	46	45	64
29	654	e203	e100	e48	e71	1030	488	874	184	44	37	64
30	680	e201	e99	e47	---	1240	454	1010	165	45	31	74
31	631	---	e98	e46	---	1260	---	1030	---	45	27	---
TOTAL	19501	11337	4619	2317	1659	11395	26558	28311	16115	2457	1496	855
MEAN	629	378	149	74.7	57.2	368	885	913	537	79.3	48.3	28.5
MAX	1300	600	200	97	77	1260	1550	1730	1100	159	88	74
MIN	290	201	98	46	44	70	454	408	165	44	27	12
AC-FT	38680	22490	9160	4600	3290	22600	52680	56150	31960	4870	2970	1700
CFSM	.64	.38	.15	.08	.06	.37	.90	.93	.55	.08	.05	.03

e Estimated.

MINNESOTA RIVER BASIN

05300000 LAC QUI PARLE RIVER NEAR LAC QUI PARLE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 1996, BY WATER YEAR (WY)

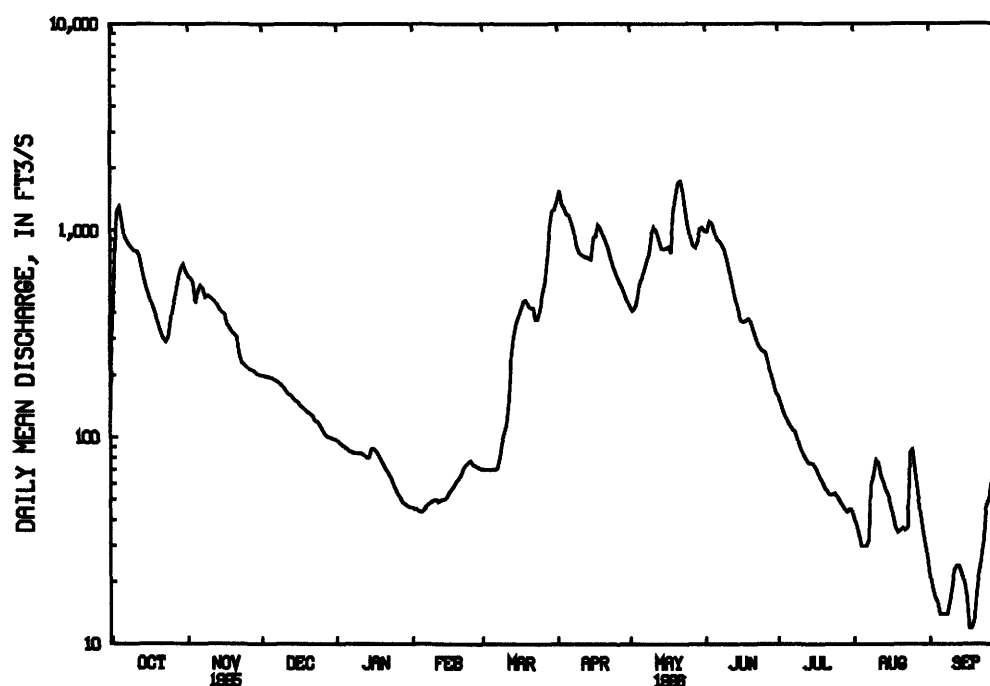
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	41.5	45.6	23.6	10.9	19.0	297	539	239	273	143	75.8	38.1
MAX	629	378	149	88.1	140	1634	3578	1264	1762	1613	765	535
(WY)	1996	1996	1996	1994	1984	1985	1969	1995	1984	1993	1953	1985
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1932	1932	1932	1932	1934	1934	1934	1934	1934	1934	1931	1931

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1910 - 1996	
ANNUAL TOTAL	181233		126620		154 ^a	
ANNUAL MEAN	497		346		625	
HIGHEST ANNUAL MEAN					1993	
LOWEST ANNUAL MEAN					1934	
HIGHEST DAILY MEAN	3760	Apr 22	1730	May 22	16000	Apr 10 1969
LOWEST DAILY MEAN	25	Feb 5	12	Sep 17-18	.00	Jul 15 1931
ANNUAL SEVEN-DAY MINIMUM	25	Feb 5	15	Sep 3	.00	Jul 15 1931
INSTANTANEOUS PEAK FLOW			1890	Apr 2	17100	Apr 10 1969
INSTANTANEOUS PEAK STAGE			10.63 ^b	Mar 19	19.37 ^c	Apr 9 1965
INSTANTANEOUS LOW FLOW			12	Sep 16	.00	Jul 15 1931
ANNUAL RUNOFF (AC-FT)	359500		251200		111300	
ANNUAL RUNOFF (CFSM)	.51		.35		.16	
10 PERCENT EXCEEDS	1300		929		344	
50 PERCENT EXCEEDS	297		161		20	
90 PERCENT EXCEEDS	27		37		.47	

a Median of annual mean discharges is 113 ft³/s.

b Backwater from ice.

c From floodmark (backwater from ice).



— 05300000 LAC QUI PARLE RIVER NEAR LAC QUI PARLE, MN

MINNESOTA RIVER BASIN

05304500 CHIPPEWA RIVER NEAR MILAN, MN

LOCATION.--Lat 45°06'39", long 95°47'57", in SE¼,SE¼, sec.16, T.119 N., R.41 W., Chippewa County, Hydrologic Unit 07020005, on right bank 800 ft upstream from bridge on State Highway 40, 2.0 mi upstream from small tributary, and 5.5 mi east of Milan.

DRAINAGE AREA.--1,870 mi², approximately.

PERIOD OF RECORD.--March 1937 to current year.

REVISED RECORDS.--WSP 1145: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 959.69 ft above mean sea level. Prior to June 15, 1942, nonrecording gage on bridge 800 ft downstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow regulated by several small lakes upstream from gage.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft³/s, and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 01	1800	*4000	*8.41	May 19	1700	3640	7.90
Oct.. 25	2200	1720	4.94	July 18	2100	738	3.25
Apr. 07	2100	3520	7.72	July 29	0600	807	3.40
Apr. 17	0400	3230	7.29	Aug. 05	2100	575	3.01

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3720	1440	e725	e360	e307	e283	e1750	1680	1580	732	491	195
2	3780	1490	e700	e358	e306	e283	e2100	1630	1630	687	474	185
3	3350	1430	e665	e352	e305	e284	2290	1600	1550	662	450	180
4	2950	1390	e640	e350	e304	e286	2330	1550	1530	645	429	171
5	2690	1320	e610	e348	e303	e288	2340	1570	1500	620	474	168
6	2540	1290	e580	e345	e301	e290	2450	1660	1470	608	534	162
7	2370	1250	e550	e343	e300	e292	2970	1630	1470	614	526	165
8	2210	1190	e535	e341	e298	e295	2680	1620	1480	601	511	191
9	2460	1200	e520	e340	e295	e295	2380	1640	1400	582	486	197
10	2510	1180	e510	e339	e292	e300	2410	1760	1330	564	462	201
11	2290	1020	e500	e338	e290	e350	2480	1770	1260	560	454	200
12	2070	965	e490	e337	e288	e450	2500	1690	1190	562	438	190
13	1930	e950	e475	e334	e286	e860	2400	1610	1130	547	408	185
14	1800	e960	e465	e332	e283	e1100	2340	1600	1070	541	374	177
15	1690	e960	e455	e330	e283	e1270	2380	1820	1020	528	350	174
16	1600	e900	e445	e328	e282	e1500	2870	1870	995	530	329	170
17	1540	e850	e435	e326	e282	e1550	3130	1830	994	496	314	166
18	1460	e810	e430	e324	e282	e1650	2830	1950	1000	628	297	160
19	1370	e780	e425	e322	e281	e1600	2660	3400	989	692	284	159
20	1300	e770	e420	e321	e281	e1550	2530	3380	951	590	280	165
21	1260	e760	e410	e320	e280	e1470	2400	2880	923	548	292	171
22	1220	e760	e405	e320	e281	e1400	2280	2470	1070	517	325	179
23	1200	e740	e400	e319	e281	e1380	2180	2240	1070	491	311	179
24	1360	e710	e395	e318	e281	e1330	2100	2070	1030	468	289	179
25	1660	e690	e390	e317	e282	e1350	2050	1930	1010	437	269	175
26	1680	e660	e385	e316	e282	e1280	1990	1840	981	416	253	181
27	1620	e640	e380	e314	e283	e1150	1910	1750	932	406	240	193
28	1570	e660	e375	e312	e283	e1130	1850	1690	875	489	230	202
29	1520	e720	e370	e310	e283	e1200	1790	1610	819	752	219	202
30	1480	e740	e370	e309	---	e1300	1730	1540	776	618	212	202
31	1440	---	e365	e308	---	e1500	---	1490	---	537	202	---
TOTAL	61640	29225	14820	10231	8385	29266	70100	58770	35025	17668	11207	5424
MEAN	1988	974	478	330	289	944	2337	1896	1167	570	362	181
MAX	3780	1490	725	360	307	1650	3130	3400	1630	752	534	202
MIN	1200	640	365	308	280	283	1730	1490	776	406	202	159
AC-FT	122300	57970	29400	20290	16630	58050	139000	116600	69470	35040	22230	10760
CFSM	1.06	.52	.26	.18	.15	.50	1.25	1.01	.62	.30	.15	.10
IN.	1.23	.58	.29	.20	.17	.58	1.39	1.17	.70	.35	.22	.11

e Estimated.

MINNESOTA RIVER BASIN

05304500 CHIPPEWA RIVER NEAR MILAN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1996, BY WATER YEAR (WY)

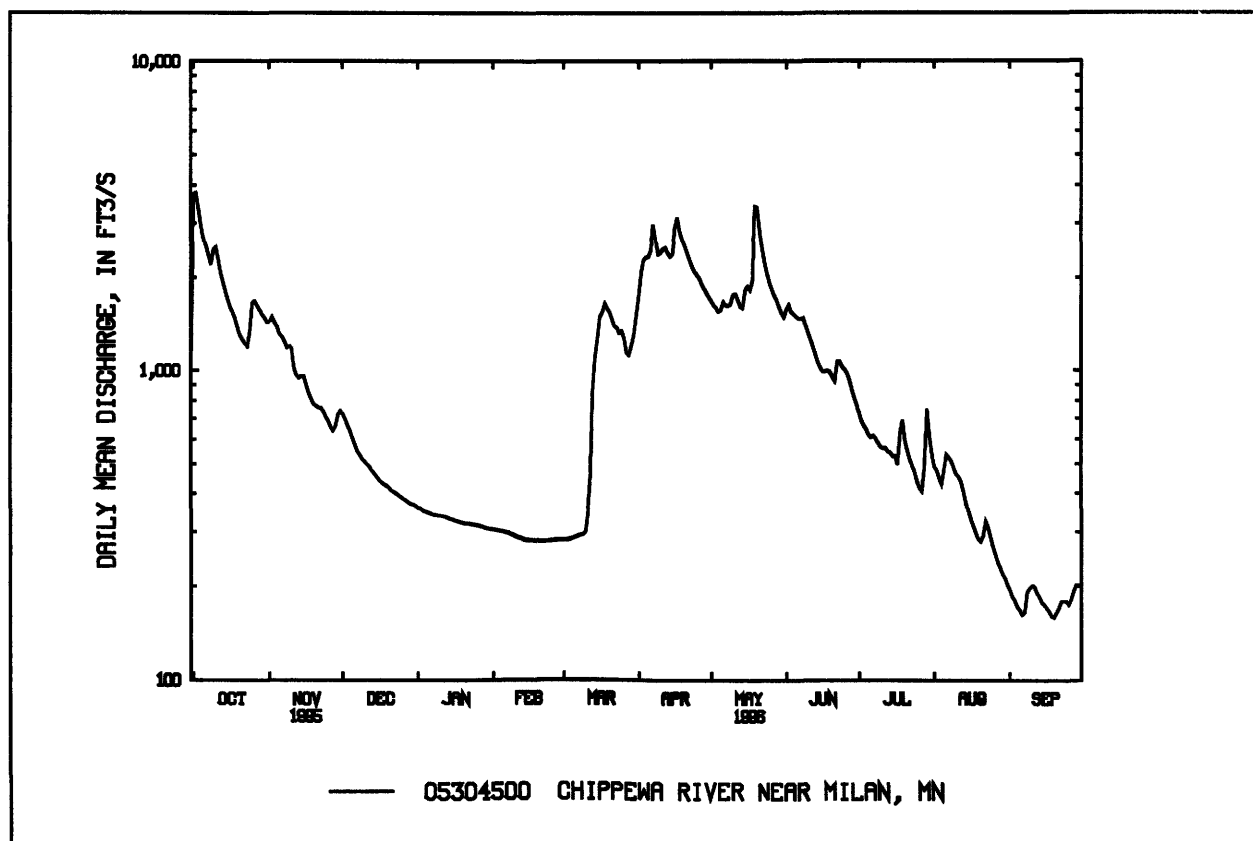
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	233	192	118	68.6	64.9	404	977	658	579	449	258	216
MAX	1996	1318	655	425	404	2141	3661	2462	2248	2507	2183	2273
(WY)	1985	1985	1985	1987	1987	1985	1952	1986	1984	1995	1993	1986
MIN	5.51	8.67	4.77	.094	.000	2.92	90.9	81.6	36.8	15.1	6.19	3.50
(WY)	1977	1977	1977	1940	1940	1965	1959	1939	1940	1940	1976	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1938 - 1996	
ANNUAL TOTAL	405955		351761			
ANNUAL MEAN	1112		961		352 ^a	
HIGHEST ANNUAL MEAN					1307	
LOWEST ANNUAL MEAN					45.4	
HIGHEST DAILY MEAN	8160		3780		10100	
LOWEST DAILY MEAN	187		159		.00 ^b	
ANNUAL SEVEN-DAY MINIMUM	190		166		.00	
INSTANTANEOUS PEAK FLOW			4000		11400	
INSTANTANEOUS PEAK STAGE			9.68 ^c		15.45	
INSTANTANEOUS LOW FLOW			155		.00	
ANNUAL RUNOFF (AC-FT)	805200		697700		255100	
ANNUAL RUNOFF (CFSM)	.59		.51		.19	
ANNUAL RUNOFF (INCHES)	8.08		7.00		2.56	
10 PERCENT EXCEEDS	1940		2190		962	
50 PERCENT EXCEEDS	897		619		130	
90 PERCENT EXCEEDS	200		264		15	

a Median of annual mean discharges is 273 ft³/s.

b Many days in 1940.

c Backwater from ice.



MINNESOTA RIVER BASIN

05311000 MINNESOTA RIVER AT MONTEVIDEO, MN

LOCATION.--Lat 44°56'00", long 95°44'00", in NW¹/₄NW¹/₄ sec.19, T.117 N., R.40 W., Yellow Medicine County, Hydrologic Unit 07020004, on right bank 100 ft upstream from bridge on U.S. Highway 212, at Montevideo, and 400 ft downstream from Chippewa River.

DRAINAGE AREA.--6,180 mi², approximately.

PERIOD OF RECORD.--July 1909 to September 1917, October 1917 to September 1929 (no winter records), October 1929 to current year. Prior to October 1939, published as "near Montevideo." Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1035: 1919(M). WSP 1085: 1935-36. WSP 1508: 1912, 1925(M), 1929(M).

GAGE.--Water-stage recorder. Datum of gage is 909.12 ft above mean sea level. July 22, 1909, to Feb. 4, 1932, nonrecording gage at bridge 600 ft downstream at present datum. Feb. 5, 1932, to Nov. 26, 1934, nonrecording gage at bridge 100 ft downstream at present datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair to poor. Flow regulated by Big Stone Lake since Apr. 17, 1937, Lac qui Parle since Jan. 1938, and Marsh Lake since Nov. 1, 1939.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1060	3750	3010	e1120	e700	e1410	6740	5580	6560	2600	906	446
2	1740	4620	3020	e1100	e680	e1400	5520	5220	6590	1990	959	360
3	2510	5790	3030	e1090	e670	e1390	4780	4870	6570	1680	848	340
4	3010	6040	3030	e1050	e660	e1380	4750	4540	6380	1290	739	353
5	3270	5800	2980	e1030	e640	e1390	5300	4400	6110	1190	727	280
6	3410	5520	2920	e1030	e630	e1600	6020	4270	5960	1030	622	235
7	3320	5340	2600	e1040	e620	e2000	6500	4180	6030	996	807	188
8	3370	5070	2340	e1120	e620	e2400	7290	4170	6020	980	825	211
9	3580	4510	e2250	e1200	e620	e2300	7680	4180	5900	983	751	215
10	3870	3900	e2150	e1210	e620	e2150	7780	4190	5690	1020	1110	204
11	4150	3390	e2100	e1250	e630	1950	7850	4180	5730	1010	1180	182
12	4350	3300	e2200	e1170	e640	1820	7850	4190	5690	1010	1250	179
13	4590	3250	e2320	e1100	e650	2010	7850	4190	5350	1140	1190	180
14	4900	3220	e2250	e1050	e660	2530	7740	4200	4350	1190	712	181
15	5050	3260	e2220	e1000	e680	3020	7680	4200	3600	1160	626	183
16	5010	3290	e2150	e950	e720	3360	7910	3990	3290	1050	590	184
17	4920	3340	e2050	e930	e740	3910	8310	3700	3200	868	652	186
18	4820	3340	e1980	e910	e780	4590	8980	3580	3200	848	629	163
19	4420	3320	e1900	e890	e830	5440	9290	3950	3240	896	648	204
20	4050	3270	e1820	e880	e900	6780	9200	4750	3260	799	566	238
21	3680	3190	e1720	e870	e1000	7920	9040	4560	3160	683	516	260
22	3410	3110	e1610	e860	e1200	8690	8640	4810	3130	652	396	287
23	3370	2920	e1570	e840	e1500	9090	8440	5810	3160	720	318	291
24	3490	2910	e1500	e820	e1520	9100	7970	5980	3160	781	510	298
25	3540	2920	e1450	e800	e1540	e9400	7720	6050	3170	717	683	303
26	3590	2960	e1380	e790	e1510	e9600	7580	6270	3190	719	664	324
27	3600	3010	e1330	e780	e1490	9230	7100	6370	3180	852	695	305
28	3580	3160	e1210	e760	e1470	8410	6650	6510	3130	901	716	303
29	3470	3320	e1190	e750	e1450	7620	6190	6500	3100	1020	695	302
30	3410	3090	e1170	e730	---	7130	5880	6440	3010	1130	680	285
31	3380	---	e1150	e710	---	6840	---	6390	---	946	621	---
TOTAL	113920	113910	63600	29830	26370	145860	220230	152220	134110	32851	22831	7670
MEAN	3675	3797	2052	962	909	4705	7341	4910	4470	1060	736	256
MAX	5050	6040	3030	1250	1540	9600	9290	6510	6590	2600	1250	446
MIN	1060	2910	1150	710	620	1380	4750	3580	3010	652	318	163
AC-FT	226000	225900	126200	59170	52300	289300	436800	301900	266000	65160	45290	15210
CFSM	.59	.61	.33	.16	.15	.76	1.19	.79	.72	.17	.12	.04
IN	.69	.69	.38	.18	.16	.88	1.33	.92	.81	.20	.14	.05

e Estimated.

MINNESOTA RIVER BASIN

05311000 MINNESOTA RIVER AT MONTEVIDEO, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1996, BY WATER YEAR (WY)

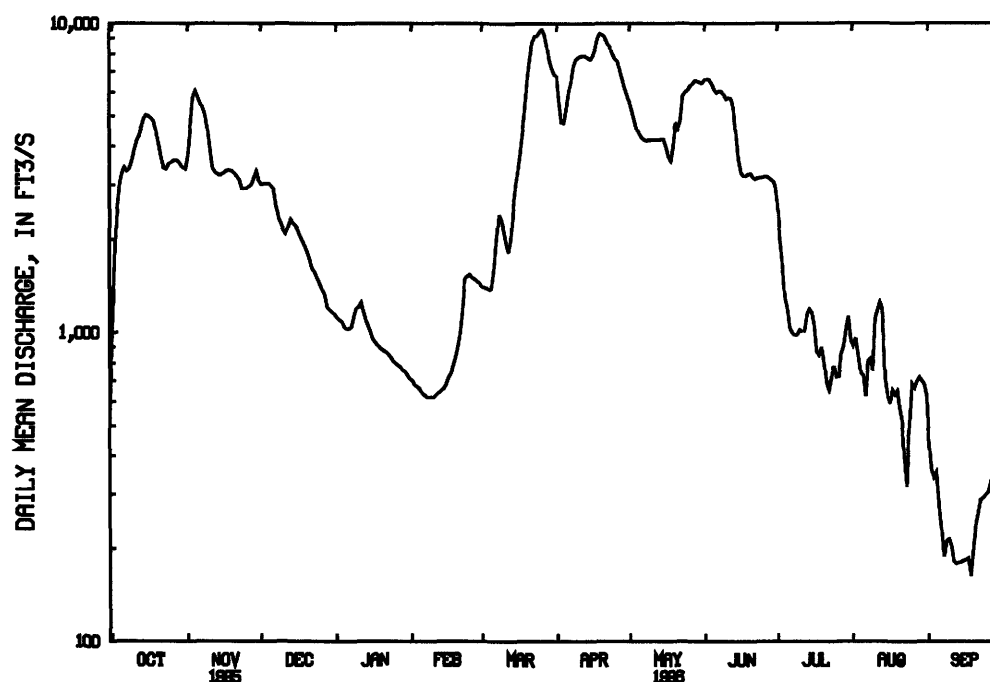
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	354	359	267	173	193	924	2572	1533	1301	1120	576	340
MAX	3675	3797	2052	962	909	5363	12550	7315	5088	7853	7084	2613
(WY)	1996	1996	1996	1996	1996	1994	1952	1986	1984	1993	1993	1986
MIN	.76	1.61	2.35	1.57	1.06	5.06	7.82	3.13	1.40	1.89	.60	.57
(WY)	1934	1935	1935	1934	1937	1934	1934	1934	1934	1933	1933	1933

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1909 - 1996	
ANNUAL TOTAL	1254137		1063402			
ANNUAL MEAN	3436		2905		854 ^a	
HIGHEST ANNUAL MEAN					2961	
LOWEST ANNUAL MEAN					4.43	
HIGHEST DAILY MEAN	10100	Apr 5	9600	Mar 26	34400	Apr 13 1969
LOWEST DAILY MEAN	229	Feb 1	163	Sep 18	.00 ^b	Aug 14 1933
ANNUAL SEVEN-DAY MINIMUM	231	Jan 30	179	Sep 12	.00	Jul 5 1934
INSTANTANEOUS PEAK FLOW			9830	Apr 20	35100	Apr 12 1969
INSTANTANEOUS PEAK STAGE			15.45	Apr 20	21.68 ^c	Apr 12 1969
ANNUAL RUNOFF (AC-FT)	2488000		2109000		618400	
ANNUAL RUNOFF (CFSM)	.56		.47		.14	
ANNUAL RUNOFF (INCHES)	7.55		6.40		1.88	
10 PERCENT EXCEEDS	7650		6560		2150	
50 PERCENT EXCEEDS	3200		2210		240	
90 PERCENT EXCEEDS	280		611		34	

a Median of annual mean discharges is 613 ft³/s.

b Occurred several days in 1933, 1934, and 1936.

c From highwater mark.



— 05311000 MINNESOTA RIVER AT MONTEVIDEO, MINN

MINNESOTA RIVER BASIN

05313500 YELLOW MEDICINE RIVER NEAR GRANITE FALLS, MN

LOCATION.--Lat 44°43'18", long 95°31'07", in SW¼ sec.35, T.115 N., R.39 W., Yellow Medicine County, Hydrologic Unit 07020004, on right bank 50 ft downstream from highway bridge, 6 mi upstream from mouth, and 8 mi south of town of Granite Falls.

DRAINAGE AREA.--653 mi².

PERIOD OF RECORD.--March 1931 to September 1935 (no winter records), October 1935 to September 1938, October 1939 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1508: 1931, 1934(M), 1937(M), 1946(M), 1950(M).

GAGE.--Water-stage recorder. Datum of gage is 960.64 ft above mean sea level. Mar. 16, 1931, to June 13, 1938, nonrecording gage, on bridge 50 ft upstream at present datum. Oct. 12, 1939, to Nov. 30, 1952, nonrecording gage 500 ft downstream at present datum.

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1919 reached a stage of 17.5 ft, from information by local residents, discharge, 25,200 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 03	2300	955	4.75	May 21	1000	814	4.53
Oct. 29	2000	820	4.54	May 30	1500	*1320	5.32
Dec. 02	1800	463	3.88	June 19	1900	494	3.92
Apr. 02	1400	961	4.78				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	223	638	429	e168	16	e98	795	292	930	216	38	20
2	609	590	440	e162	16	e97	912	289	799	177	36	19
3	916	566	441	e153	17	e96	900	285	733	172	30	19
4	915	480	426	e148	18	e95	819	288	667	152	29	18
5	774	454	395	e142	23	e94	717	307	605	146	34	16
6	675	479	354	e138	40	e94	646	319	569	145	84	17
7	629	468	319	e132	e48	e95	645	329	635	141	130	18
8	626	449	280	e128	e56	e96	616	348	662	129	134	18
9	645	440	e255	e125	e60	e98	573	391	623	123	136	17
10	722	428	e250	e122	e62	e104	571	493	544	117	113	15
11	758	386	e240	e119	e60	e110	525	536	481	100	85	14
12	701	349	e235	e114	e58	e118	473	524	429	95	65	13
13	618	370	e232	e110	e57	e124	465	483	387	94	53	14
14	544	383	e230	e108	e55	e140	458	450	356	92	46	13
15	483	357	e220	e104	e53	e160	443	428	339	98	41	13
16	439	339	e218	e120	e54	e180	434	439	335	80	42	12
17	403	328	e212	e122	e56	e190	446	437	343	82	37	12
18	372	320	e210	e121	e60	e200	468	415	404	73	31	13
19	351	316	e209	e100	e66	e210	452	562	482	67	37	15
20	328	315	e206	40	e72	e205	459	664	460	62	38	14
21	311	304	e204	32	e84	e203	467	802	418	57	47	16
22	301	298	e202	30	e96	e202	443	746	383	59	95	16
23	293	312	e200	28	e102	e200	408	628	366	55	98	18
24	309	345	e198	25	e106	e200	385	551	345	51	77	18
25	378	314	e195	23	e104	e200	370	552	331	46	45	18
26	462	345	e192	23	e102	e200	338	551	318	46	34	e19
27	593	296	e190	22	e101	e210	327	546	296	45	30	20
28	706	313	e195	22	e100	e300	326	652	267	43	28	18
29	792	355	e199	21	e99	365	319	1000	254	47	25	19
30	804	411	e185	19	---	446	306	1280	236	47	22	23
31	716	---	e170	17	---	585	---	1160	---	44	22	---
TOTAL	17396	11748	7931	2738	1841	5715	15506	16747	13997	2901	1762	495
MEAN	561	392	256	88.3	63.5	184	517	540	467	93.6	56.8	16.5
MAX	916	638	441	168	106	585	912	1280	930	216	136	23
MIN	223	296	170	17	16	94	306	285	236	43	22	12
AC-FT	34500	23300	15730	5430	3650	11340	30760	33220	27760	5750	3490	982
CFSM	.86	.60	.39	.14	.10	.28	.79	.83	.71	.14	.09	.03
IN.	.99	.67	.45	.16	.10	.33	.88	.95	.80	.17	.10	.03

e Estimated.

MINNESOTA RIVER BASIN

05313500 YELLOW MEDICINE RIVER NEAR GRANITE FALLS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1996, BY WATER YEAR (WY)

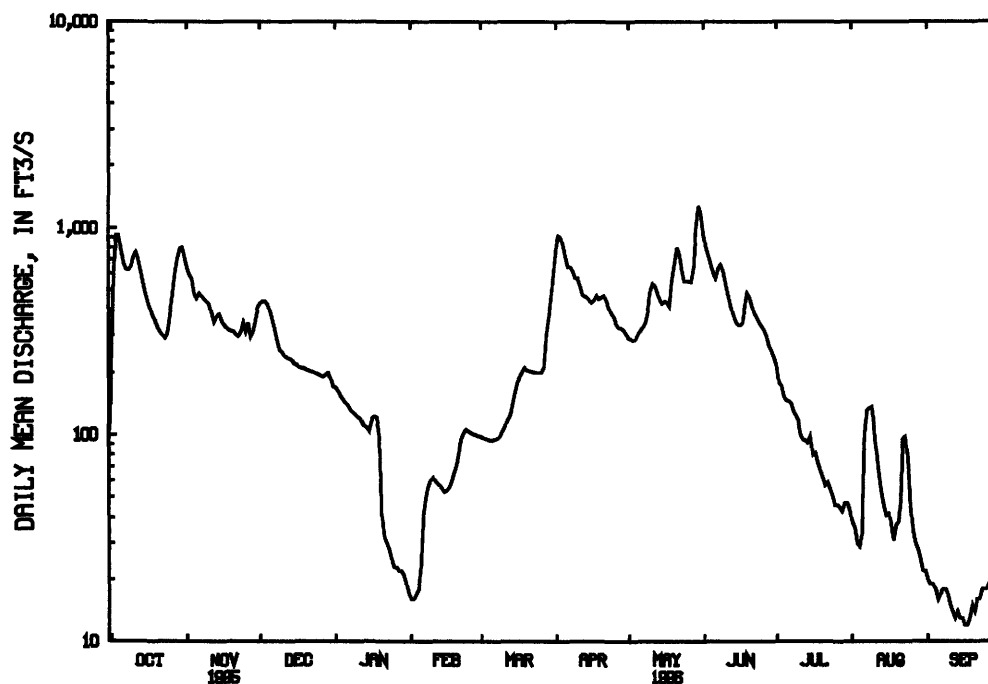
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	43.7	45.5	27.7	13.6	16.8	218	460	200	283	140	69.2	43.4
MAX	561	392	256	88.3	97.1	933	3302	1087	2484	1600	510	1005
(WY)	1996	1996	1996	1996	1966	1986	1969	1944	1984	1993	1953	1986
MIN	1.41	1.60	1.39	.90	.12	3.67	2.58	1.18	1.18	.34	.38	.47
(WY)	1937	1938	1936	1948	1959	1975	1934	1934	1934	1933	1934	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1931 - 1996	
ANNUAL TOTAL	152852		98777			
ANNUAL MEAN	419		270		139 ^a	
HIGHEST ANNUAL MEAN					566	
LOWEST ANNUAL MEAN					8.32	
HIGHEST DAILY MEAN	3070		1280		16400	
LOWEST DAILY MEAN	27		12		.00 ^b	
ANNUAL SEVEN-DAY MINIMUM	28		13		.00	
INSTANTANEOUS PEAK FLOW			1330		17200	
INSTANTANEOUS PEAK STAGE			5.55 ^c		14.90	
INSTANTANEOUS LOW FLOW			11		.00	
ANNUAL RUNOFF (AC-FT)	303200		195900		100800	
ANNUAL RUNOFF (CFSM)	.64		.41		.21	
ANNUAL RUNOFF (INCHES)	8.71		5.63		2.90	
10 PERCENT EXCEEDS	969		624		310	
50 PERCENT EXCEEDS	287		202		19	
90 PERCENT EXCEEDS	31		22		2.3	

a Median of annual mean discharges is 86 ft³/s.

b Many days, several years.

c Backwater from ice.



— 05313500 YELLOW MEDICINE RIVER NEAR GRANITE FALLS, MN

MINNESOTA RIVER BASIN

05315000 REDWOOD RIVER NEAR MARSHALL, MN

LOCATION.--Lat 44°25'49", long 95°50'43", in SE $\frac{1}{4}$ /SW $\frac{1}{4}$ sec. 12, T.111 N., R.42 W., Lyon County, Hydrologic Unit 07020006, on right bank 2.0 mi upstream from Redwood River diversion structure on southwest edge of town of Marshall, MN. Prior to Apr. 10, 1980, at site 5 mi downstream.

DRAINAGE AREA.--259 mi².

PERIOD OF RECORD.--March 1940 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WDR MN-89-2: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,188.23 ft above mean sea level. March 1940 to April 9, 1980, nonrecording gage 5.0 mi downstream from present site at datum 43.35 ft lower (crest-stage gage added June 12, 1968). Since March 1964, nonrecording gage and crest-stage gage on diversion channel 1.5 mi downstream at datum 1,100.00 ft above sea level.

REMARKS.--Records good except those for estimated daily discharges which are poor. Water diverted at medium and high stages into diversion channel 2.0 mi below station. Diversion began Mar. 18, 1964. Unknown amount of natural diversion into Cottonwood River basin occurs at extremely high stages 0.8 mi below station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	326	314	e170	e37	e18	e83	e240	110	351	100	26	9.6
2	398	306	e168	e36	e18	e82	261	110	317	100	27	11
3	363	226	e158	e34	e19	e82	281	113	297	93	21	12
4	340	256	e132	e33	e20	e86	213	127	286	96	21	11
5	342	262	e120	e32	e21	e88	198	136	272	90	27	10
6	344	250	e108	e31	e23	e94	187	136	334	87	23	11
7	326	257	e94	e29	e26	e98	175	135	339	79	20	12
8	308	252	e92	e29	e30	e106	158	157	295	79	21	12
9	387	243	e88	e29	e36	e112	147	198	268	75	22	11
10	417	237	e85	e30	e45	e120	142	201	248	70	23	12
11	382	169	e83	e30	e58	e128	149	196	218	66	27	11
12	360	247	e78	e29	e66	e136	150	189	195	60	38	10
13	334	223	e75	e27	e78	e150	146	179	178	55	22	11
14	318	201	e73	e25	e82	e160	141	175	158	54	23	9.8
15	288	189	e70	e24	e92	e158	142	177	149	54	14	9.6
16	264	187	e68	e23	e86	e156	143	175	162	54	12	10
17	251	186	e66	e23	e80	e154	130	168	218	54	12	10
18	222	184	e64	e22	e74	e146	159	163	237	51	13	9.1
19	205	182	e62	e19	e70	e136	172	181	217	42	14	11
20	191	183	e60	e17	e68	e122	162	183	200	40	12	14
21	193	148	e57	e16	e78	e114	160	168	190	38	16	14
22	183	97	e55	e15	e90	e106	146	156	175	38	13	12
23	186	e170	e53	e15	e96	e100	145	161	165	33	11	12
24	204	e168	e51	e17	e88	e104	142	172	159	33	12	10
25	257	e158	e49	e19	e86	e120	139	188	144	33	11	11
26	361	e151	e47	e20	e85	e135	140	229	136	31	10	13
27	404	e150	e46	e20	e84	e150	132	283	122	34	11	12
28	412	e149	e44	e19	e84	e165	131	490	99	31	10	13
29	383	e150	e43	e19	e83	e185	123	433	89	29	10	15
30	334	e160	e40	e18	---	e200	110	360	89	29	10	14
31	320	---	e38	e18	---	e210	---	339	---	25	9.4	---
TOTAL	9603	6055	2437	755	1784	3986	4864	6188	6307	1753	541.4	343.1
MEAN	310	202	78.6	24.4	61.5	129	162	200	210	56.5	17.5	11.4
MAX	417	314	170	37	96	210	281	490	351	100	38	15
MIN	183	97	38	15	18	82	110	110	89	25	9.4	9.1
AC-FT	19050	12010	4830	1500	3540	7910	9650	12270	12510	3480	1070	681
CFSM	1.20	.78	.30	.09	.24	.50	.63	.77	.81	.22	.07	.04

e Estimated.

MINNESOTA RIVER BASIN

05315000 REDWOOD RIVER NEAR MARSHALL, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1996, BY WATER YEAR (WY)

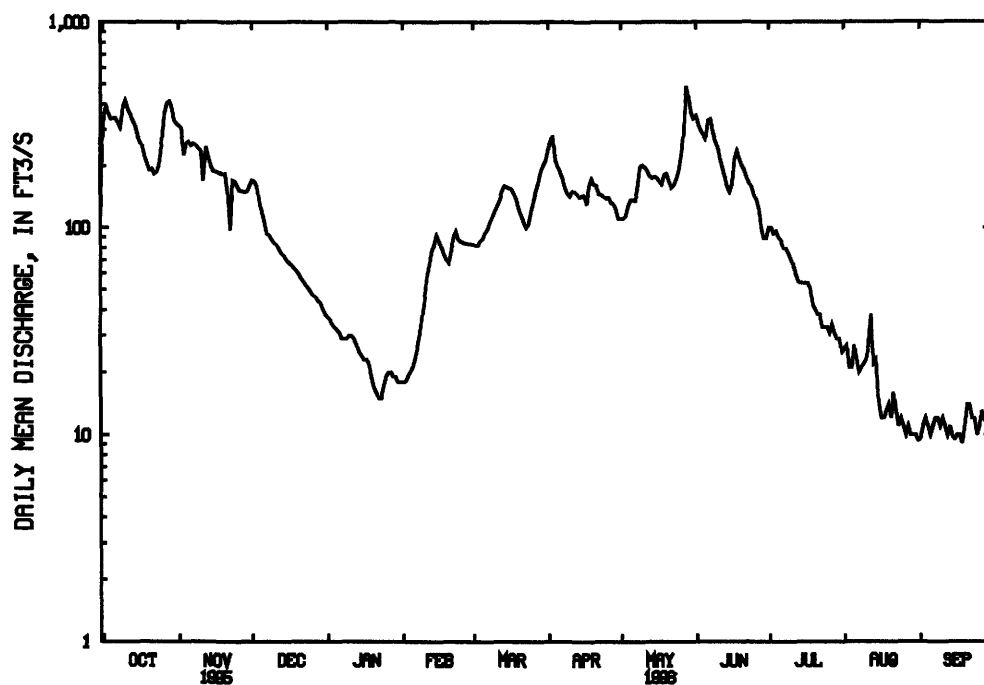
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	28.2	25.9	14.4	8.37	14.9	121	217	121	119	69.8	34.7	26.8
MAX	310	202	82.3	59.4	101	571	1152	1205	936	1161	610	292
(WY)	1996	1996	1994	1994	1983	1983	1969	1993	1993	1993	1993	1986
MIN	.029	.58	.87	.000	.090	2.70	7.36	3.90	.83	.058	.042	.007
(WY)	1977	1977	1977	1977	1979	1965	1990	1981	1976	1976	1941	1941

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1940 - 1996	
ANNUAL TOTAL	88298		44616.5			
ANNUAL MEAN	242		122		67.4 ^a	
HIGHEST ANNUAL MEAN					421	
LOWEST ANNUAL MEAN					5.13	
HIGHEST DAILY MEAN	1350	Apr 20	490	May 28	5300	May 9 1993
LOWEST DAILY MEAN	21	Jan 12	9.1	Sep 18	.00 ^b	Jul 28 1940
ANNUAL SEVEN-DAY MINIMUM	21	Jan 12	9.9	Sep 12	.00	Jul 28 1940
INSTANTANEOUS PEAK FLOW			542	May 29	6380	May 9 1993
INSTANTANEOUS PEAK STAGE			13.89 ^c	Mar 12	17.00	May 9 1993
INSTANTANEOUS LOW FLOW			8.5	Aug 31	.00	Jul 28 1940
ANNUAL RUNOFF (AC-FT)	175100		88500		48850	
ANNUAL RUNOFF (CFSM)	.93		.47		.26	
10 PERCENT EXCEEDS	571		275		159	
50 PERCENT EXCEEDS	158		96		11	
90 PERCENT EXCEEDS	45		13		1.9	

a Median of annual mean discharges is 43 ft³/s.

b Many days, several years.

c Backwater from ice.



— 05315000 REDWOOD RIVER NEAR MARSHALL, MN

MINNESOTA RIVER BASIN

05316500 REDWOOD RIVER NEAR REDWOOD FALLS, MN

LOCATION.--Lat 44°31'25", long 95°10'20", in SE 1/4 NE 1/4 sec.9, T.112 N., R.36 W., Redwood County, Hydrologic Unit 07020006, on right bank 4 ft upstream from highway bridge, 3 mi west of town of Redwood Falls, and 8.5 mi upstream from mouth.

DRAINAGE AREA.--629 mi².

PERIOD OF RECORD.--July 1909 to September 1914 (no winter records except 1911-12). August 1930 to September 1935 (no winter records), October 1935 to current year.

REVISED RECORDS.--WDR MN-89-2: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 972.33 ft above sea level. July 1909 to September 1914, nonrecording gage at bridge 20 ft downstream at datum 0.22 ft lower. August 1930 to Oct. 25, 1949, nonrecording gage, at bridge 20 ft downstream at present datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Natural discharge affected by unknown amount of interbasin flow between Yellow Medicine, Redwood, and Cottonwood River basins during extreme floods.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 11	0900	634	3.55	May 29	0400	*973	4.27
Oct. 28	0400	616	3.51	June 06	2000	874	4.06
Apr. 02	1400	968	4.26	June 17	1300	963	4.25
May 10	2400	498	3.26				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	506	544	e315	e117	e36	e115	751	216	846	223	61	32
2	553	515	e325	e110	e35	e113	835	214	775	212	57	31
3	606	455	e320	e106	e37	e111	923	239	722	206	55	29
4	593	454	e290	e102	e39	e110	860	258	668	192	57	28
5	546	414	e270	e98	e42	e108	666	276	627	181	66	27
6	532	485	e255	e93	e52	e107	583	292	738	178	76	26
7	545	485	e245	e88	e62	e106	554	297	856	172	81	26
8	539	477	e230	e85	e72	e106	440	327	812	175	68	31
9	557	468	e225	e83	e84	e114	383	399	741	153	61	30
10	599	470	e218	e81	e92	e120	377	464	670	139	55	30
11	630	e460	e212	e78	e100	e140	403	495	607	125	53	28
12	600	e440	e209	e76	e108	e160	416	476	546	119	55	26
13	555	e425	e206	e75	e110	e180	378	455	485	114	54	26
14	517	407	e202	e73	e106	e200	365	438	432	110	53	25
15	484	380	e200	e71	e100	e230	352	436	412	108	63	24
16	448	364	e195	e69	e95	e250	353	431	451	100	54	24
17	423	351	e190	e67	e94	e270	360	424	898	93	45	22
18	e385	342	e189	e64	e95	e280	357	414	828	90	40	22
19	374	334	e186	53	e98	e270	348	426	725	88	41	23
20	351	325	e184	46	e105	e260	351	460	652	83	41	25
21	336	316	e182	42	e113	e240	337	469	588	80	51	27
22	314	284	e180	41	e122	e230	320	464	542	78	118	35
23	309	e283	e176	45	e137	e230	300	425	516	74	129	31
24	436	e282	e172	52	e140	e235	287	401	486	72	79	27
25	532	e280	e170	e52	e135	e240	283	405	458	70	60	26
26	546	e275	e162	e52	e128	e260	266	425	388	67	61	28
27	587	e265	e150	e51	e120	300	258	479	342	66	51	32
28	615	e265	e142	e49	e119	326	237	852	304	91	46	40
29	616	e270	e133	e46	e117	437	228	969	272	82	40	33
30	599	e280	e128	e42	---	674	222	963	246	69	37	31
31	561	---	e122	e38	---	703	---	926	---	67	33	---
TOTAL	15794	11395	6383	2145	2693	7225	12793	14215	17633	3677	1841	845
MEAN	509	380	206	69.2	92.9	233	426	459	588	119	59.4	28.2
MAX	630	544	325	117	140	703	923	969	898	223	129	40
MIN	309	265	122	38	35	106	222	214	246	66	33	22
AC-FT	31330	22600	12660	4250	5340	14330	25370	28200	34980	7290	3650	1680
CFSM	.81	.60	.33	.11	.15	.37	.68	.73	.93	.19	.09	.04
IN.	.93	.67	.38	.13	.16	.43	.76	.84	1.04	.22	.11	.05

e Estimated.

MINNESOTA RIVER BASIN

05316500 REDWOOD RIVER NEAR REDWOOD FALLS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	57.6	59.8	34.0	16.2	20.6	231	409	217	260	147	78.4	52.2
MAX	509	541	245	104	167	1289	2880	1530	2724	1994	934	673
(WY)	1996	1980	1983	1994	1983	1983	1969	1993	1993	1993	1993	1986
MIN	.84	.96	.46	.19	.20	1.54	14.6	2.75	1.01	.44	.51	.31
(WY)	1937	1936	1936	1940	1937	1965	1934	1934	1934	1934	1934	1976

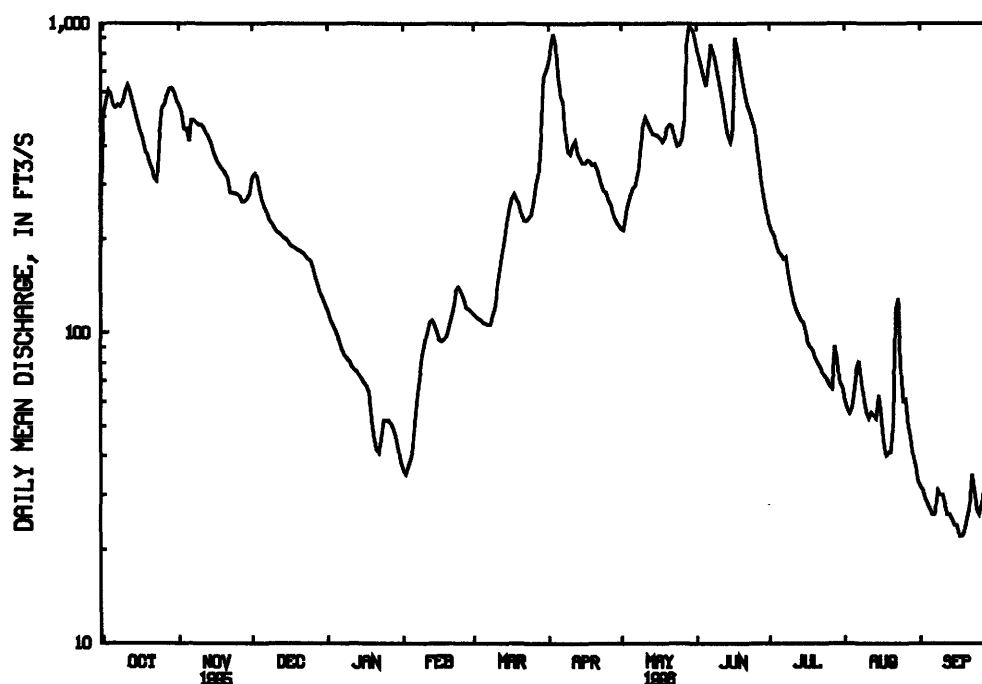
SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1909 - 1996	
ANNUAL TOTAL	164178		96639			
ANNUAL MEAN	450		264		146 ^a	
HIGHEST ANNUAL MEAN					789	
LOWEST ANNUAL MEAN					10.8	
HIGHEST DAILY MEAN	2970	Apr 22	969	May 29	13200	Apr 9 1969
LOWEST DAILY MEAN	34	Feb 6	22	Sep 17,18	.00 ^b	Jan 17 1940
ANNUAL SEVEN-DAY MINIMUM	35	Jan 31	24	Sep 14	.01	Jan 25 1940
INSTANTANEOUS PEAK FLOW			973	May 29	19700	Jun 18 1957
INSTANTANEOUS PEAK STAGE			5.70 ^c	Nov 12	15.92 ^d	Jun 18 1957
INSTANTANEOUS LOW FLOW			22	Sep 17	.00 ^b	Jan 17 1940
ANNUAL RUNOFF (AC-FT)	325600		191700		106000	
ANNUAL RUNOFF (CFSM)	.72		.42		.23	
ANNUAL RUNOFF (INCHES)	9.71		5.72		3.16	
10 PERCENT EXCEEDS	1100		584		317	
50 PERCENT EXCEEDS	309		207		26	
90 PERCENT EXCEEDS	54		40		2.1	

a Median of annual mean discharges is 95 ft³/s.

b Occurred several days in 1940 and 1959.

c Backwater from ice.

d From floodmark.



— 05316500 REDWOOD RIVER NEAR REDWOOD FALLS, MN

MINNESOTA RIVER BASIN

05317000 COTTONWOOD RIVER NEAR NEW ULM, MN

LOCATION.--Lat 44°17'29", long 94°26'24", in SW¼/NE¼ sec.33, T.110 N., R.30 W., Brown County, Hydrologic Unit 07020008, on left bank 600 ft upstream from highway bridge, 1.8 mi south of New Ulm, and 3.2 mi upstream from mouth.

DRAINAGE AREA.--1,280 mi² (approximately).

PERIOD OF RECORD.--July 1909 to December 1913, March 1931 to March 1938, August 1938 to current year (winter records incomplete prior to 1936).

REVISED RECORDS.--WSP 355: 1912.

GAGE.--Water-stage recorder. Datum of gage is 796.83 ft above mean sea level. July 1, 1909, to Dec. 13, 1913, nonrecording gage at site 2.7 mi upstream at different datum. Mar. 15, 1931, to Mar. 31, 1938, nonrecording gage 2.2 mi upstream at datum 11.41 ft higher. Aug. 23, 1938, to June 25, 1948, nonrecording gage at present site and datum.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 01	--	e2410	8.61	June 08	0300	1750	7.72
May 30	0100	2080	8.20	June 19	1400	*6580	*13.18

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	683	935	475	e180	e83	e380	e2410	453	1690	942	318	177
2	774	953	e600	e175	e83	e360	2400	449	1490	851	272	164
3	982	952	e660	e170	e83	e340	2240	456	1320	807	239	156
4	976	881	e640	e165	e84	e330	1950	475	1180	790	219	147
5	896	778	e550	e160	e86	e310	1530	523	1110	743	229	140
6	823	807	496	e155	e88	e290	1200	555	1220	705	223	137
7	768	900	413	e150	e94	e270	1090	563	1510	686	277	134
8	740	e890	388	e148	e110	e260	998	596	1670	699	333	130
9	802	e850	e385	e142	e120	e240	914	629	1380	745	355	126
10	890	e830	e380	e140	e125	e230	858	755	1210	680	295	128
11	884	e790	e400	e135	e135	e240	858	955	1090	605	259	129
12	844	e760	e390	e130	e140	e245	890	1080	986	543	232	128
13	784	e730	e375	e128	e140	e250	890	1070	897	498	222	125
14	726	e700	e365	e124	e142	e270	801	1000	813	468	215	117
15	677	e670	e340	e120	e145	e280	740	958	748	438	200	113
16	632	e650	e325	e118	e150	e290	699	939	763	403	185	112
17	603	e630	e310	e112	e152	e310	685	910	2190	356	171	109
18	576	e610	e300	e110	e157	e320	688	875	5270	333	161	106
19	547	e590	e285	e108	e175	e330	695	855	6440	311	157	105
20	508	e560	e270	e102	e230	e330	693	834	6270	305	154	109
21	491	e540	e260	e99	e300	e325	677	883	5370	292	155	109
22	474	e480	e250	e97	e370	e310	645	901	4210	274	271	112
23	500	e420	e240	e94	e420	e305	613	853	3430	256	513	111
24	e800	e350	e235	e92	e470	e300	591	807	2730	246	645	108
25	e1150	e400	e230	e90	e480	e300	583	786	2230	236	433	109
26	e1270	e350	e220	e88	e450	e310	570	771	1880	221	348	117
27	e1250	e320	e210	e86	e420	e350	535	819	1620	224	291	117
28	e1230	e310	e200	e85	e420	e500	507	1220	1410	272	263	115
29	1140	320	e190	e85	e410	e684	479	1990	1230	522	238	117
30	1030	374	e188	e84	---	e968	467	2040	1070	494	211	118
31	949	---	e185	e84	---	e1740	---	1870	---	395	191	---
TOTAL	25399	19330	10755	3756	6262	11967	28896	27870	64427	15340	8275	3725
MEAN	819	644	347	121	216	386	963	899	2148	495	267	124
MAX	1270	953	660	180	480	1740	2410	2040	6440	942	645	177
MIN	474	310	185	84	83	230	467	449	748	221	154	105
AC-FT	50380	38340	21330	7450	12420	23740	57320	55280	127800	30430	16410	7390
CFM	.64	.50	.27	.09	.17	.30	.75	.70	1.68	.39	.21	.10

e Estimated.

MINNESOTA RIVER BASIN

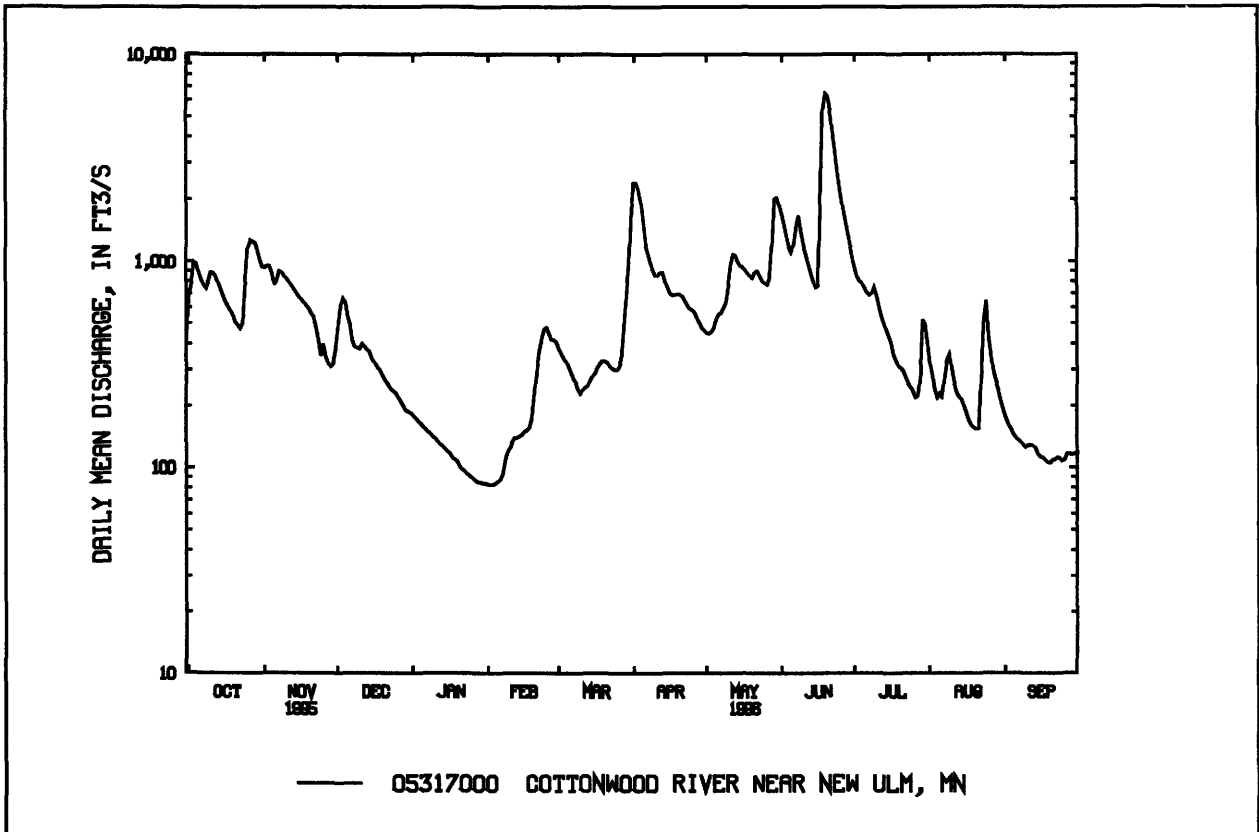
05317000 COTTONWOOD RIVER NEAR NEW ULM, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	179	156	103	54.2	94.2	622	972	573	618	348	186	156
MAX	3208	1099	572	282	628	2236	7075	3497	5831	3815	1791	2438
(WY)	1969	1980	1980	1992	1983	1983	1969	1993	1993	1993	1993	1986
MIN	4.57	7.97	5.77	1.61	1.47	13.9	40.0	7.57	8.58	4.37	1.05	3.28
(WY)	1934	1940	1936	1940	1940	1965	1959	1934	1911	1934	1934	1933

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR			FOR 1996 WATER YEAR			WATER YEARS 1909 - 1996		
ANNUAL TOTAL	306281			226002			366a		
ANNUAL MEAN	839			617			1796		
HIGHEST ANNUAL MEAN							1796		
LOWEST ANNUAL MEAN							41.1		
HIGHEST DAILY MEAN	4660			Apr 20			27100		
LOWEST DAILY MEAN	68			Feb 20			.60		
ANNUAL SEVEN-DAY MINIMUM	71			Feb 17			.64		
INSTANTANEOUS PEAK FLOW				6580			Jun 19		
INSTANTANEOUS PEAK STAGE				13.18			Jun 19		
INSTANTANEOUS LOW FLOW				83			Feb 1		
ANNUAL RUNOFF (AC-FT)	607500			448300			265000		
ANNUAL RUNOFF (CFSM)	.66			.48			.29		
10 PERCENT EXCEEDS	2020			1160			831		
50 PERCENT EXCEEDS	630			406			77		
90 PERCENT EXCEEDS	88			117			11		

a Median of annual mean discharges is 236 ft³/s.



MINNESOTA RIVER BASIN

05317200 LITTLE COTTONWOOD RIVER NEAR COURTLAND, MN

LOCATION.--Lat 44°14'47", long 94°20'19", in SW1/4, NE1/4, sec.17, T.109 N., R.29 W., Blue Earth County, Hydrologic Unit 07020007, on right bank 30 ft downstream from bridge on State Highway 68, 0.7 mi above mouth, 1.5 mi south of Courtland.

DRAINAGE AREA.--230 mi², approximately.

PERIOD OF RECORD.--October 1973 to current year. September 1969 to September 1973, operated as a low-flow station only.

GAGE.--Water-stage recorder. Datum of gage is 788.25 ft above mean sea level.

REMARKS.--Records fair except those for estimated days, which are poor.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 9	1400	187	4.37	Apr. 4	0230	419	5.41
Nov. 2	0830	234	4.67	May 28	1000	205	4.39
Mar. 1	0030	544	6.14	June 17	1130	*1470a	--
Mar. 25	0930	457	5.64	July 28	1430	324	5.41

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e70	185	90	40	e17	340	280	135	174	114	58	43
2	e90	227	89	e39	e16	289	352	130	171	93	45	37
3	e110	197	93	e38	e14	287	395	137	159	86	40	34
4	e140	174	82	e37	e12	215	404	141	146	79	38	32
5	149	166	87	e37	e13	163	365	141	137	74	42	31
6	156	174	55	e36	e14	142	319	142	166	68	42	30
7	159	170	57	e36	14	176	273	140	175	92	76	27
8	151	160	71	e35	14	175	242	141	152	83	81	24
9	179	158	32	e34	15	134	221	141	140	82	61	24
10	174	157	41	34	15	115	207	154	135	81	52	24
11	165	133	58	33	17	115	199	163	121	75	46	24
12	158	133	49	32	19	153	193	163	98	70	41	24
13	152	145	48	32	19	194	191	162	74	60	37	24
14	144	138	49	33	20	203	185	161	53	54	35	23
15	135	131	48	e33	23	194	184	165	36	52	32	23
16	126	124	49	33	e24	191	182	166	33	50	29	24
17	119	120	49	33	26	194	178	163	e1470	42	27	23
18	110	117	49	e32	27	199	178	156	e625	40	25	23
19	106	114	49	e32	28	199	179	159	321	49	25	23
20	100	114	49	e31	50	189	178	160	278	47	26	24
21	95	108	49	e30	85	186	175	154	290	42	27	23
22	91	92	48	30	131	175	173	150	335	41	79	23
23	101	65	48	28	203	173	168	148	361	34	125	22
24	193	66	48	25	238	191	164	145	352	35	108	22
25	181	111	47	23	264	241	160	140	322	31	104	21
26	172	100	46	22	260	124	155	138	288	29	114	21
27	178	82	45	22	282	131	152	144	251	30	98	21
28	186	68	44	22	272	186	146	199	208	217	76	22
29	188	85	42	21	331	270	141	185	168	141	63	25
30	184	92	41	20	---	293	138	176	134	89	55	24
31	178	---	40	e18	---	266	---	176	---	74	48	---
TOTAL	4440	3906	1692	951	2463	6103	6477	4775	7373	2154	1755	765
MEAN	143	130	54.6	30.7	84.9	197	216	154	246	69.5	56.6	25.5
MAX	193	227	93	40	331	340	404	199	1470	217	125	43
MIN	70	65	32	18	12	115	138	130	33	29	25	21
AC-FT	8810	7750	3360	1890	4890	12110	12850	9470	14620	4270	3480	1520
CFSM	.62	.57	.24	.13	.37	.86	.94	.67	1.07	.30	.25	.11
IN.	.72	.63	.27	.15	.40	.99	1.05	.77	1.19	.35	.28	.12

a Estimated, maximum daily.

e Estimated.

MINNESOTA RIVER BASIN

05317200 LITTLE COTTONWOOD RIVER NEAR COURTLAND, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	43.8	46.9	27.6	14.9	22.3	123	165	122	139	86.0	55.9	46.0
MAX	163	134	118	80.1	105	360	463	418	750	553	248	262
(WY)	1987	1983	1992	1992	1983	1992	1983	1993	1993	1993	1993	1986
MIN	.75	.70	.21	.15	.38	5.79	9.64	4.17	2.39	.63	.81	.54
(WY)	1976	1977	1977	1977	1977	1975	1990	1981	1976	1988	1976	1976

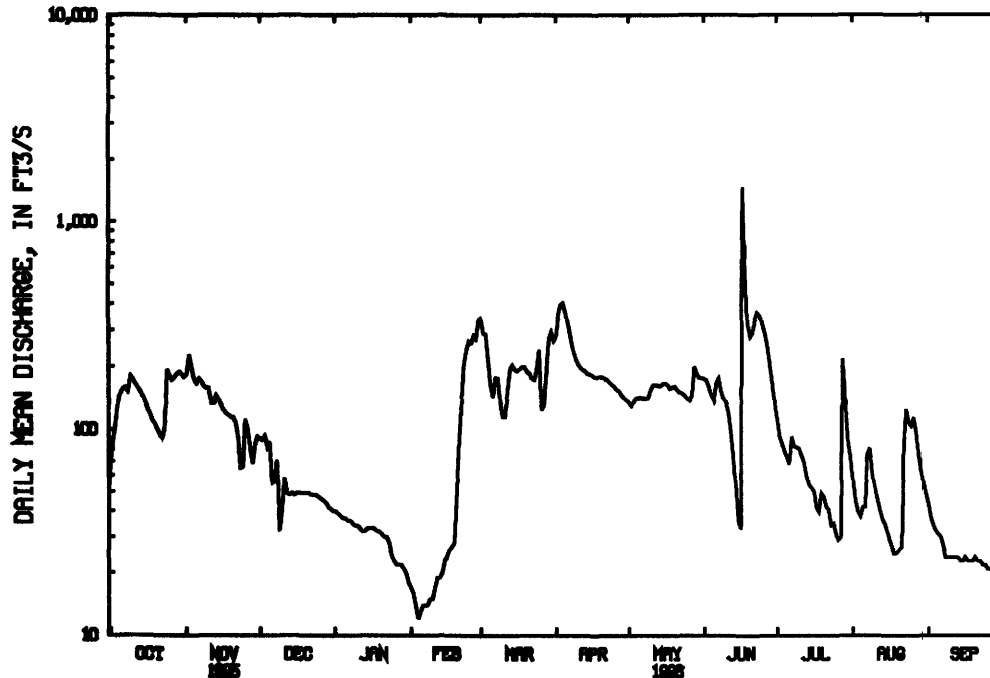
SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1974 - 1996	
ANNUAL TOTAL	43652		42854			
ANNUAL MEAN	120		117		74.5	
HIGHEST ANNUAL MEAN					239	
LOWEST ANNUAL MEAN					9.18	
HIGHEST DAILY MEAN	387	Apr 19	1470 ^a	Jun 17	2850	Jun 20 1973
LOWEST DAILY MEAN	11	Feb 15	12 ^b	Feb 4	.02	Sep 12 1977
ANNUAL SEVEN-DAY MINIMUM	11	Feb 15	14	Feb 3	.08	Sep 11 1977
INSTANTANEOUS PEAK FLOW			1470 ^{a,c}	Jun 17	3520	Jun 20 1973
INSTANTANEOUS PEAK STAGE			8.02 ^d	Jun 17	10.45	Jun 20 1973
INSTANTANEOUS LOW FLOW			12	Feb 4	.01	Sep 17 1977
ANNUAL RUNOFF (AC-FT)	86580		85000		53990	
ANNUAL RUNOFF (CFSM)	.52		.51		.32	
ANNUAL RUNOFF (INCHES)	7.06		6.93		4.40	
10 PERCENT EXCEEDS	242		210		197	
50 PERCENT EXCEEDS	101		98		26	
90 PERCENT EXCEEDS	20		24		1.2	

a Estimated value.

b Backwater from ice.

c Maximum daily.

d Maximum recorded, was probably higher.



— 05317200 LITTLE COTTONWOOD RIVER NEAR COURTLAND, MN

MINNESOTA RIVER BASIN

05319500 WATONWAN RIVER NEAR GARDEN CITY, MN

LOCATION.--Lat 44°02'47", long 94°11'43", in SW 1/4 NE 1/4, sec.28, T.107 N., R.28 W., Blue Earth County, Hydrologic Unit 07020010, on left bank 25 ft downstream from bridge on County Highway 13, 1.5 miles west of Garden City, 7.3 mi upstream from mouth, and 9.2 mi downstream from Perch Creek.

DRAINAGE AREA.--812 mi².

PERIOD OF RECORD.--March 1940 to September 1945, September 1976 to current year. 1953, 1960, 1961, and 1969 (one or more discharge measurements each year).

REVISED RECORDS.--WDR MN-78-2: 1977.

GAGE.--Water-stage recorder. Datum of gage is 905.05 ft above mean sea level. Prior to September 30, 1945, nonrecording gage at site 200 ft upstream and at datum 0.17 ft higher.

REMARKS.--Records good except those for the periods of estimated daily discharge, which are poor.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 7, 1965, reached a stage of 18.89 ft at datum 0.17 ft higher, from floodmarks discharge, 19,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 900 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 04	0100	975	3.55	June 20	1600	*4820	*9.44
Apr. 02	1800	1960	5.34	Aug. 26	0600	1850	5.16
May 30	0800	960	3.52				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	517	e225	e88	e65	e460	1570	273	779	1040	266	632
2	169	679	e220	e90	e62	e420	1900	e283	699	952	205	512
3	e241	911	e210	e88	e58	e400	1780	e293	639	938	169	430
4	e232	962	e200	e90	e56	e380	1460	e310	591	884	147	375
5	e231	e827	e197	e86	e55	e370	1130	e332	541	798	141	432
6	e211	e795	e182	e78	e56	e380	867	e374	578	711	141	441
7	e218	730	e180	e74	e55	e390	722	e367	704	665	155	412
8	225	670	e175	e80	e57	e400	623	e376	857	603	226	372
9	280	630	e170	e86	e60	e410	543	e319	868	541	265	332
10	303	602	e160	e86	e68	e440	493	e371	776	473	219	300
11	332	547	e155	e86	e98	e500	e465	e485	679	417	196	269
12	332	460	e150	e86	e130	e520	464	e543	604	376	220	238
13	304	511	e145	e88	e190	e560	467	e520	535	348	200	217
14	289	496	e140	e91	e250	e570	436	e508	470	318	176	194
15	268	459	e133	e92	e310	e580	406	e478	423	293	154	171
16	256	441	e129	e92	e340	e580	e396	e494	405	270	135	154
17	244	424	e122	e92	e370	e580	e382	e476	1360	244	120	141
18	228	413	e118	e90	e390	e570	316	e464	2680	225	108	131
19	219	401	e116	e88	e410	e560	331	385	3580	206	105	124
20	210	395	e112	e84	e420	e520	332	466	4670	186	106	121
21	e197	382	e108	e80	e410	e480	346	676	4640	167	111	121
22	e171	329	e103	e78	e410	e420	348	680	4260	155	149	118
23	e193	262	e98	e76	e409	378	347	676	3770	143	745	117
24	286	260	e95	e76	e420	502	344	572	3370	134	1320	117
25	545	361	e94	e74	e450	513	339	536	2980	122	1560	116
26	776	e300	e95	e73	e500	428	e349	516	2580	112	1760	116
27	806	e280	e96	e72	e520	474	e268	508	2180	104	1710	119
28	722	260	e94	e72	e520	514	272	575	1800	129	1580	126
29	633	e250	e92	e72	e500	749	259	836	1480	289	1270	144
30	557	e240	e90	e71	---	1070	267	952	1240	372	1010	153
31	511	---	e90	e70	---	1260	---	883	---	342	790	---
TOTAL	10247	14794	4294	2549	7639	16378	18222	15527	50738	12557	15459	7245
MEAN	331	493	139	82.2	263	528	607	501	1691	405	499	241
MAX	806	962	225	92	520	1260	1900	952	4670	1040	1760	632
MIN	58	240	90	70	55	370	259	273	405	104	105	116
AC-FT	20320	29340	8520	5060	15150	32490	36140	30800	100600	24910	30660	14370
CFSM	.41	.61	.17	.10	.32	.65	.75	.62	2.08	.50	.61	.30

e Estimated.

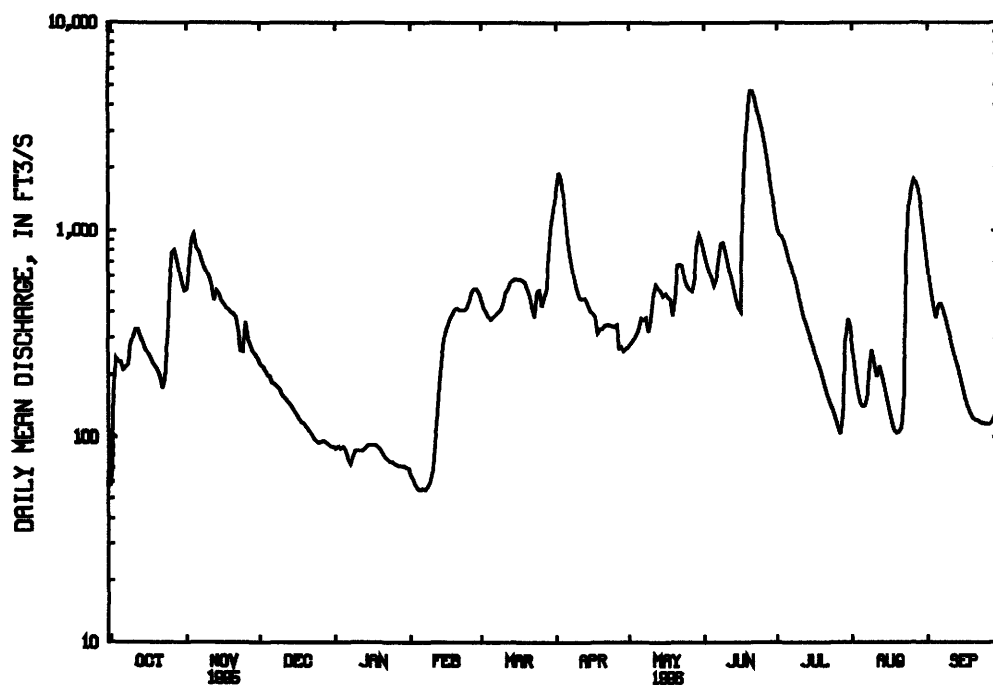
MINNESOTA RIVER BASIN

05319500 WATONWAN RIVER NEAR GARDEN CITY, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	205	239	143	69.4	103	581	850	613	899	440	253	214
MAX	686	826	530	319	626	2105	2696	2025	4494	2389	1095	819
(WY)	1993	1993	1992	1992	1983	1992	1993	1993	1993	1993	1979	1993
MIN	5.37	7.69	3.76	2.70	2.39	19.3	33.7	16.1	17.3	8.27	6.56	3.63
(WY)	1990	1977	1990	1977	1977	1940	1990	1940	1989	1940	1989	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1940 - 1996	
ANNUAL TOTAL	197355		175649		398	
ANNUAL MEAN	541		480		1330	
HIGHEST ANNUAL MEAN					1993	
LOWEST ANNUAL MEAN					43.7	
HIGHEST DAILY MEAN	2280		Mar 31		13400	
LOWEST DAILY MEAN	42		Sep 18		1.8	
ANNUAL SEVEN-DAY MINIMUM	50		Sep 12		1.9	
INSTANTANEOUS PEAK FLOW			4820		Jun 20	
INSTANTANEOUS PEAK STAGE			9.44		Jun 20	
INSTANTANEOUS LOW FLOW			53		Oct 1	
ANNUAL RUNOFF (AC-FT)	391500		348400		288000	
ANNUAL RUNOFF (CFSM)	.67		.59		.49	
10 PERCENT EXCEEDS	1390		872		1060	
50 PERCENT EXCEEDS	304		339		137	
90 PERCENT EXCEEDS	65		90		11	



— 05319500 WATONWAN RIVER NEAR GARDEN CITY, MN

MINNESOTA RIVER BASIN

05320000 BLUE EARTH RIVER NEAR RAPIDAN, MN

LOCATION.--Lat 44°05'44", long 94°06'33", in SE 1/4, SE 1/4, sec. 6, T. 107 N., R. 27 W., Blue Earth County, Hydrologic Unit 07020009, on left bank 0.2 mi downstream from powerplant (reactivated in 1984) operated by Rapidan Redevelopment Limited Partnership, 2 mi west of Rapidan, 3.5 mi downstream from Watonwan River, and 7.8 mi upstream from Le Sueur River.

DRAINAGE AREA.--2,430 mi², approximately.

PERIOD OF RECORD.--July 1909 to November 1910 (published as "at Rapidan Mills," no winter records), October 1939 to September 1945, July 1949 to current year.

REVISED RECORDS.--WSP 895: Drainage area. WSP 1508: 1910.

GAGE.--Water-stage recorder. Datum of gage is 807.83 ft above mean sea level. July 20, 1909, to Apr. 28, 1910, nonrecording gage at site 0.2 mi upstream at different datum. Apr. 29 to Nov. 12, 1910, nonrecording gage at site 800 ft upstream at different datum. Oct. 4 to Nov. 14, 1939, nonrecording gage at present site and datum.

REMARKS.--Records good except those for estimated periods, which are fair..

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	DAILY MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	227	1450	853	376	e105	1390	3830	1100	2860	2780	529	1460
2	194	1520	884	341	e96	1230	4270	1080	2310	2500	516	1200
3	407	1940	951	e360	e100	1140	4020	1080	2300	2460	284	969
4	391	2120	878	e335	e105	1040	3570	1050	2020	2190	286	917
5	427	1970	837	e332	e115	934	3010	1060	2000	2090	270	748
6	450	1770	624	e330	e150	856	2480	1060	1840	1800	365	864
7	453	1710	582	e329	e140	874	2150	1070	2010	1780	254	819
8	460	1640	536	e327	e125	836	1920	1060	2160	1620	497	586
9	643	1590	494	e340	e140	755	1730	1070	2190	1680	722	688
10	719	1510	508	337	e170	612	1580	1110	2110	1610	412	447
11	823	1280	628	337	e195	565	1470	1170	1820	1370	393	677
12	845	1310	614	329	e220	600	1410	1260	1860	1160	532	602
13	635	1180	595	320	e230	675	1380	1260	1730	1160	356	518
14	688	1250	395	320	e240	785	1310	1250	1360	1060	354	241
15	679	1230	499	e300	e250	941	1260	1220	1410	963	452	393
16	662	1230	492	e295	e270	1090	1240	1220	1450	855	240	394
17	589	1010	542	e305	e320	1150	1260	1210	3110	778	221	293
18	592	1100	486	e295	e450	1180	1290	888	5540	767	223	309
19	580	1080	520	e270	e600	1150	1290	1140	6970	736	264	302
20	530	1010	493	e270	e700	1060	1280	1370	8100	534	451	306
21	487	987	494	e230	e900	1020	1290	1380	8130	517	197	242
22	487	930	471	e210	e1200	964	1310	1430	7520	588	182	196
23	574	529	455	e210	1430	920	1420	1480	6910	308	787	196
24	848	479	473	e220	1550	1100	1410	1490	6390	459	1620	266
25	994	573	477	e230	1720	832	1440	1490	5950	369	2050	269
26	1500	846	403	e205	1810	726	1400	1540	5510	302	2610	206
27	1780	963	416	e170	1810	936	1350	1780	4770	304	2830	208
28	1630	691	427	e155	1750	1210	1260	2150	4350	303	3610	214
29	1500	524	415	e140	1580	1640	1180	2270	3580	471	2910	260
30	1450	706	402	e125	---	2200	1140	2960	3280	751	2180	292
31	1320	---	380	e115	---	3330	---	3060	---	482	1860	---
TOTAL	23564	36128	17224	8458	18471	33741	54950	43758	111540	34747	28457	15082
MEAN	760	1204	556	273	637	1088	1832	1412	3718	1121	918	503
MAX	1780	2120	951	376	1810	3330	4270	3060	8130	2780	3610	1460
MIN	194	479	380	115	96	565	1140	888	1360	302	182	196
AC-FT	46740	71660	34160	16780	36640	66930	109000	86790	221200	68920	56440	29920
CFSM	.31	.50	.23	.11	.26	.45	.75	.58	1.53	.46	.38	.21
IN.	.36	.55	.26	.13	.28	.52	.84	.67	1.71	.53	.44	.23

e Estimated.

MINNESOTA RIVER BASIN

05320000 BLUE EARTH RIVER NEAR RAPIDAN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1996, BY WATER YEAR (WY)

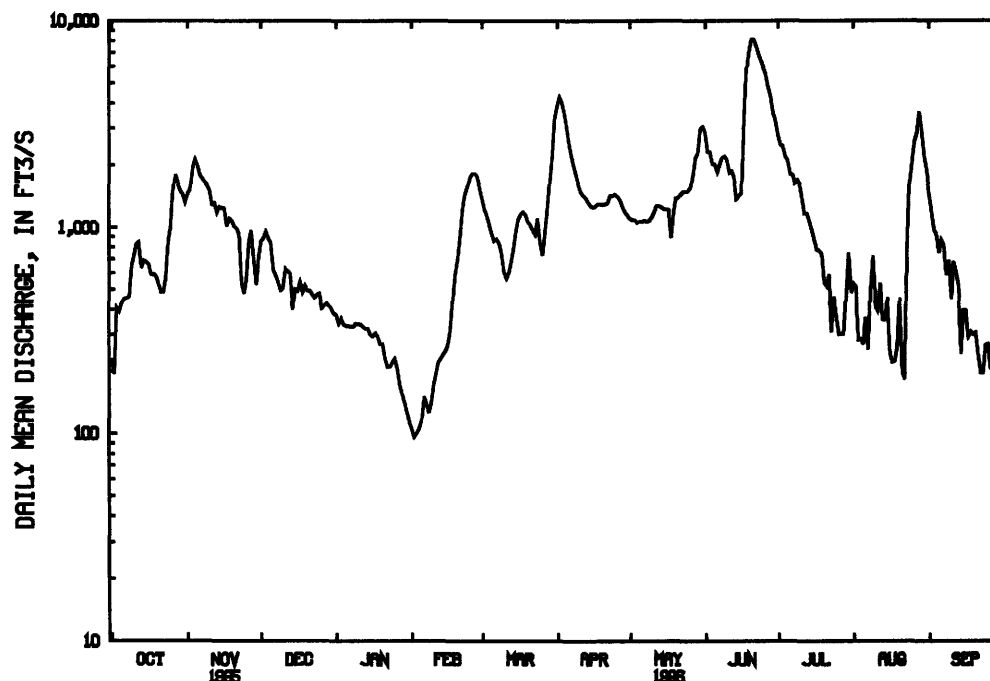
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	564	545	345	204	251	1389	2640	1704	2108	1306	695	540
MAX	5121	2878	1724	1093	1793	6277	13230	5775	11700	8540	5541	4313
(WY)	1969	1993	1992	1992	1983	1983	1965	1991	1993	1993	1979	1993
MIN	22.5	26.7	16.0	14.8	14.2	92.4	142	53.4	110	30.9	37.7	22.1
(WY)	1940	1940	1956	1977	1959	1968	1977	1940	1976	1940	1976	1976

SUMMARY STATISTICS FOR 1995 CALENDAR YEAR FOR 1996 WATER YEAR WATER YEARS 1909 - 1996

ANNUAL TOTAL	601995	426120	
ANNUAL MEAN	1649	1164	1042
HIGHEST ANNUAL MEAN			4518
LOWEST ANNUAL MEAN			105
HIGHEST DAILY MEAN	6010	Apr 16	8130
LOWEST DAILY MEAN	106	Feb 19	96
ANNUAL SEVEN-DAY MINIMUM	126	Feb 15	109
INSTANTANEOUS PEAK FLOW			8700
INSTANTANEOUS PEAK STAGE			8.08
INSTANTANEOUS LOW FLOW			96 ^b
ANNUAL RUNOFF (AC-FT)	1194000	845200	755100
ANNUAL RUNOFF (CFSM)	.68	.48	.43
ANNUAL RUNOFF (INCHES)	9.22	6.52	5.83
10 PERCENT EXCEEDS	4380	2190	2720
50 PERCENT EXCEEDS	1010	855	348
90 PERCENT EXCEEDS	203	240	40

a From floodmark.

b Estimated daily flow, backwater from ice.



— 05320000 BLUE EARTH RIVER NEAR RAPIDAN, MN

MINNESOTA RIVER BASIN

05320270 LITTLE COBB RIVER NEAR BEAUFORD, MN

LOCATION.--Lat 43°59'48", long 93°54'30", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.11, T.106 N., R.26 W., Blue Earth County, Hydrologic Unit 07020011, on left bank at downstream end of bridge on County Road No. 16, 1.6 mi upstream from mouth, 2.6 mi east of Beauford, and 5.3 mi northeast of Mapleton.

DRAINAGE AREA.--304 mi².

PERIOD OF RECORD.--April to September 1996.

GAGE.--Water-stage recorder. Elevation of gage is 980 ft above sea level (from topographic map).

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	e200	68	62	82	e8.4	44
2	---	---	---	---	---	---	e210	64	60	74	e7.8	36
3	---	---	---	---	---	---	e205	62	58	66	e7.5	30
4	---	---	---	---	---	---	e195	60	54	59	e7.0	25
5	---	---	---	---	---	---	e185	63	52	53	e8.5	20
6	---	---	---	---	---	---	e170	71	64	e50	e10	17
7	---	---	---	---	---	---	e160	71	87	e47	e12	14
8	---	---	---	---	---	---	e148	72	94	e45	e15	12
9	---	---	---	---	---	---	e125	73	94	e42	e19	11
10	---	---	---	---	---	---	e115	76	90	35	38	9.6
11	---	---	---	---	---	---	107	80	85	32	48	8.4
12	---	---	---	---	---	---	102	79	80	30	30	7.4
13	---	---	---	---	---	---	98	76	72	27	23	6.8
14	---	---	---	---	---	---	93	74	64	25	16	6.4
15	---	---	---	---	---	---	91	76	59	22	12	5.3
16	---	---	---	---	---	---	93	81	68	20	9.7	6.8
17	---	---	---	---	---	---	93	82	323	e18	8.0	4.1
18	---	---	---	---	---	---	93	81	397	e17	6.7	3.3
19	---	---	---	---	---	---	95	92	393	e16	11	3.1
20	---	---	---	---	---	---	100	101	404	e15	24	4.4
21	---	---	---	---	---	---	102	100	406	e13	12	3.9
22	---	---	---	---	---	---	102	96	364	e12	25	3.9
23	---	---	---	---	---	---	99	91	310	e11	32	3.4
24	---	---	---	---	---	---	95	86	256	e10	24	3.0
25	---	---	---	---	---	---	92	82	207	e9.2	17	2.5
26	---	---	---	---	---	---	91	77	169	e8.5	111	3.5
27	---	---	---	---	---	---	84	74	140	e8.0	141	3.3
28	---	---	---	---	---	---	78	77	120	e8.0	115	3.1
29	---	---	---	---	---	---	73	75	105	e8.2	94	3.0
30	---	---	---	---	---	---	70	70	92	e8.5	70	2.6
31	---	---	---	---	---	---	---	65	---	e8.6	54	---
TOTAL	---	---	---	---	---	---	3564	2395	4829	880.0	1016.6	306.8
MEAN	---	---	---	---	---	---	119	77.3	161	28.4	32.8	10.2
MAX	---	---	---	---	---	---	210	101	406	82	141	44
MIN	---	---	---	---	---	---	70	60	52	8.0	6.7	2.5
AC-FT	---	---	---	---	---	---	7070	4750	9580	1750	2020	609

e Estimated.

MINNESOTA RIVER BASIN

05320270 LITTLE COBB RIVER NEAR BEAUFORD, MN--Continued

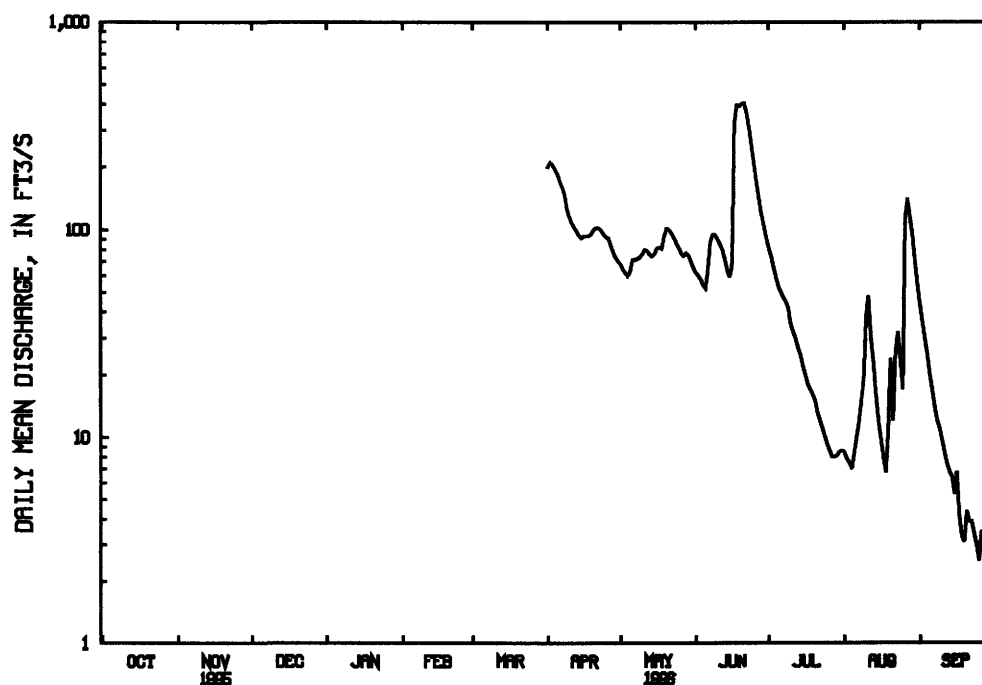
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	---	---	---	---	---	---	119	77.3	161	28.4	32.8	10.2
MAX	---	---	---	---	---	---	119	77.3	161	28.4	32.8	10.2
(WY)	---	---	---	---	---	---	1996	1996	1996	1996	1996	1996
MIN	---	---	---	---	---	---	119	77.3	161	28.4	32.8	10.2
(WY)	---	---	---	---	---	---	1996	1996	1996	1996	1996	1996

SUMMARY STATISTICS

FOR 1996 WATER YEAR

HIGHEST DAILY MEAN	406	Jun 21
LOWEST DAILY MEAN	2.5	Sep 25
INSTANTANEOUS PEAK FLOW	414	Jun 21
INSTANTANEOUS PEAK STAGE	9.01	Jun 21
INSTANTANEOUS LOW FLOW	2.10	Sep 19



— 05320270 LITTLE COBB RIVER NEAR BEAUFORD, MN

MINNESOTA RIVER BASIN

05320270 LITTLE COBB RIVER NEAR BEAUFORD, MN--Continued
(National Water-Quality Assessment Station)

WATER QUALITY RECORDS

PERIOD OF RECORD.-- April to September 1996.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April to September 1996.

WATER TEMPERATURES: April to September 1996.

INSTRUMENTATION.-- Water-quality monitor since April 1996.

REMARKS.--Letter E indicates estimated value.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum (recorded), 696 us/cm, May 27; minimum (recorded), 249 us/cm, Aug. 10.

WATER TEMPERATURES: Maximum (recorded), 29.5 °C, July 18; minimum (recorded), 2.0 °C, Apr. 15.

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	---	---	---	---	---	---	672	651	662
2	---	---	---	---	---	---	---	---	---	664	652	659
3	---	---	---	---	---	---	---	---	---	674	654	663
4	---	---	---	---	---	---	---	---	---	675	651	664
5	---	---	---	---	---	---	---	---	---	652	637	646
6	---	---	---	---	---	---	---	---	---	653	636	646
7	---	---	---	---	---	---	---	---	---	666	638	654
8	---	---	---	---	---	---	---	---	---	659	637	651
9	---	---	---	---	---	---	---	---	---	660	649	655
10	---	---	---	---	---	---	---	---	---	672	648	659
11	---	---	---	---	---	---	---	---	---	686	672	678
12	---	---	---	---	---	---	543	528	533	690	657	679
13	---	---	---	---	---	---	547	526	538	683	652	672
14	---	---	---	---	---	---	590	547	577	660	645	654
15	---	---	---	---	---	---	575	549	561	661	645	654
16	---	---	---	---	---	---	599	563	586	661	650	657
17	---	---	---	---	---	---	629	595	616	666	650	661
18	---	---	---	---	---	---	619	596	609	660	631	649
19	---	---	---	---	---	---	615	596	607	653	634	646
20	---	---	---	---	---	---	623	603	616	667	653	661
21	---	---	---	---	---	---	641	623	632	667	661	663
22	---	---	---	---	---	---	645	617	631	671	658	666
23	---	---	---	---	---	---	638	610	624	679	659	669
24	---	---	---	---	---	---	635	577	611	679	660	669
25	---	---	---	---	---	---	608	584	599	683	669	676
26	---	---	---	---	---	---	633	607	619	689	683	686
27	---	---	---	---	---	---	657	633	648	696	678	689
28	---	---	---	---	---	---	672	649	660	687	652	671
29	---	---	---	---	---	---	666	652	658	673	658	666
30	---	---	---	---	---	---	677	658	668	683	660	674
31	---	---	---	---	---	---	---	---	---	667	646	661
MONTH	---	---	---	---	---	---	---	---	---	696	631	663

MINNESOTA RIVER BASIN
05320270 LITTLE COBB RIVER NEAR BEAUFORD, MN--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	652	644	649	549	537	544	546	525	538	671	636	649
2	659	651	656	539	532	535	---	---	---	658	638	652
3	656	649	652	550	536	543	---	---	---	657	639	647
4	656	643	651	548	541	544	---	---	---	650	604	632
5	659	640	651	566	538	550	518	275	487	639	598	618
6	643	624	637	564	526	547	516	472	496	642	609	628
7	624	600	613	551	526	535	491	407	460	625	602	614
8	654	608	633	559	536	548	503	458	487	639	618	632
9	660	645	654	561	548	554	523	482	507	656	613	637
10	650	632	641	580	553	566	518	249	430	634	614	623
11	632	624	627	581	560	568	550	340	450	633	618	626
12	631	600	616	586	557	572	564	531	552	644	621	635
13	645	631	637	557	528	541	589	563	576	653	625	641
14	649	634	642	555	536	546	613	584	596	647	633	641
15	655	628	647	555	535	543	624	609	615	639	629	632
16	637	619	630	582	536	547	629	600	617	630	616	624
17	619	264	403	557	538	546	636	605	624	631	616	623
18	495	420	466	558	544	552	640	594	622	634	605	621
19	519	495	508	561	551	556	622	481	584	629	569	603
20	535	519	527	564	552	558	590	421	479	577	514	538
21	549	534	542	567	531	550	602	552	586	597	552	575
22	564	549	557	566	533	547	605	551	575	604	559	582
23	565	557	559	564	518	545	630	561	607	596	563	578
24	568	558	564	562	517	541	630	585	604	596	557	577
25	572	564	568	559	515	537	632	616	625	604	569	587
26	566	545	556	561	512	535	628	260	445	585	566	576
27	559	545	552	552	521	533	592	509	559	615	583	607
28	561	543	551	548	513	526	633	592	617	626	610	618
29	559	550	554	549	536	542	646	633	642	627	613	619
30	560	549	556	547	534	539	665	641	653	619	605	614
31	---	---	---	543	532	537	673	657	666	---	---	---
MONTH	660	264	590	586	512	546	---	---	---	671	514	615

MINNESOTA RIVER BASIN

05320270 LITTLE COBB RIVER NEAR BEAUFORD, MN--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	---	---	---	---	---	---	13.5	8.5	11.0
2	---	---	---	---	---	---	---	---	---	12.0	9.5	10.0
3	---	---	---	---	---	---	---	---	---	11.0	8.5	10.0
4	---	---	---	---	---	---	---	---	---	14.0	9.5	11.5
5	---	---	---	---	---	---	---	---	---	13.0	11.5	12.5
6	---	---	---	---	---	---	---	---	---	12.0	9.5	10.5
7	---	---	---	---	---	---	---	---	---	12.5	8.0	10.5
8	---	---	---	---	---	---	---	---	---	12.5	11.0	11.5
9	---	---	---	---	---	---	---	---	---	12.5	11.5	12.0
10	---	---	---	---	---	---	---	---	---	12.0	11.0	11.5
11	---	---	---	---	---	---	---	---	---	12.0	10.0	11.0
12	---	---	---	---	---	---	10.5	6.0	8.0	13.0	8.5	10.5
13	---	---	---	---	---	---	6.0	4.0	5.0	15.0	9.5	12.5
14	---	---	---	---	---	---	5.0	3.0	4.0	14.0	11.5	12.0
15	---	---	---	---	---	---	7.0	2.0	4.5	13.5	11.0	12.0
16	---	---	---	---	---	---	9.5	3.5	6.5	16.0	12.5	14.0
17	---	---	---	---	---	---	12.5	6.0	9.0	22.0	15.5	18.5
18	---	---	---	---	---	---	12.0	10.0	11.0	23.5	19.0	21.5
19	---	---	---	---	---	---	12.0	8.5	10.5	22.5	19.5	20.5
20	---	---	---	---	---	---	11.0	8.5	9.5	19.5	17.0	18.0
21	---	---	---	---	---	---	9.0	7.0	8.0	19.5	15.5	17.5
22	---	---	---	---	---	---	10.0	7.0	8.5	19.0	16.0	17.5
23	---	---	---	---	---	---	11.5	6.5	9.0	18.0	16.0	17.0
24	---	---	---	---	---	---	14.0	9.0	11.0	16.0	14.0	14.5
25	---	---	---	---	---	---	14.0	11.5	12.5	14.0	11.5	12.5
26	---	---	---	---	---	---	12.5	8.5	10.5	11.5	10.5	11.0
27	---	---	---	---	---	---	12.0	8.0	10.0	10.5	9.5	10.0
28	---	---	---	---	---	---	12.5	8.5	10.5	14.5	9.0	11.5
29	---	---	---	---	---	---	12.0	9.0	10.0	17.5	12.0	14.5
30	---	---	---	---	---	---	12.0	7.0	9.5	20.0	14.5	17.0
31	---	---	---	---	---	---	---	---	---	18.5	15.5	17.0
MONTH	---	---	---	---	---	---	---	---	---	23.5	8.0	13.5

MINNESOTA RIVER BASIN

05320270 LITTLE COBB RIVER NEAR BEAUFORD, MN--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	18.0	16.5	17.0	26.0	22.5	24.0	27.5	19.5	22.5	23.5	20.0	22.0
2	17.5	15.0	16.5	25.0	21.0	23.0	---	---	---	24.0	21.0	22.5
3	16.5	14.0	15.0	24.5	21.0	23.0	---	---	---	24.5	22.0	23.5
4	17.5	13.0	15.0	25.5	22.0	23.5	---	---	---	26.0	22.0	24.0
5	16.5	14.0	15.0	26.5	21.5	24.0	26.0	21.0	23.0	26.0	22.5	24.5
6	16.0	14.5	15.5	25.5	23.0	24.0	29.0	22.5	25.5	25.5	22.0	23.5
7	17.0	14.0	15.5	26.0	21.5	24.0	27.0	23.5	25.0	24.0	21.5	22.5
8	19.0	14.0	16.5	25.0	21.5	22.5	26.0	21.5	24.0	22.0	20.5	21.5
9	21.5	16.0	19.0	22.5	19.5	21.0	25.0	20.5	23.0	22.5	17.5	20.0
10	23.5	18.5	20.5	23.5	18.5	21.0	24.5	19.0	21.0	21.5	18.5	20.0
11	24.0	20.0	22.0	22.5	19.5	20.5	23.0	18.0	20.0	20.5	17.5	18.5
12	26.0	21.0	23.5	24.0	19.0	21.0	24.5	19.5	22.0	18.5	15.5	16.5
13	26.5	22.0	24.5	22.5	19.5	21.5	26.0	21.5	23.5	16.5	13.5	15.0
14	26.5	22.0	24.0	22.5	19.5	21.5	24.5	22.0	23.0	15.5	12.0	14.0
15	25.5	22.0	24.0	25.0	20.0	22.5	23.5	19.5	21.5	15.5	13.5	14.5
16	24.0	20.5	22.0	26.5	21.0	23.5	23.0	19.0	21.0	16.0	14.5	15.5
17	20.5	16.5	18.0	27.0	23.0	25.0	23.5	19.0	21.5	16.5	14.0	15.0
18	16.5	16.0	16.0	29.5	25.5	27.0	23.5	20.0	21.5	17.0	13.5	15.0
19	17.0	16.0	16.5	28.0	23.5	25.0	22.0	21.0	21.5	15.5	13.5	14.5
20	19.5	17.0	18.0	24.5	21.5	23.0	23.5	19.0	21.0	15.5	14.5	15.0
21	21.0	19.0	20.0	24.5	22.0	23.5	26.0	20.5	22.5	15.0	14.5	15.0
22	20.5	19.5	20.0	25.0	22.0	23.5	25.0	21.5	22.5	15.0	13.5	14.5
23	20.5	19.0	20.0	24.5	20.5	22.5	23.0	18.0	20.5	16.5	14.5	15.5
24	21.5	19.5	20.5	24.0	20.5	22.0	23.5	19.0	21.5	15.5	13.0	14.0
25	23.0	20.5	21.5	22.5	19.5	21.0	25.5	20.5	22.5	14.5	13.0	14.0
26	25.0	22.0	23.5	24.5	19.0	21.5	24.0	19.0	20.0	14.0	13.0	13.5
27	26.5	23.5	25.0	22.5	21.0	22.0	19.5	17.5	18.5	13.0	11.5	12.0
28	28.0	24.5	26.0	21.5	20.0	20.5	21.0	18.0	19.5	13.0	11.0	12.0
29	29.0	25.5	27.0	21.5	19.5	20.5	22.5	19.0	20.5	13.5	12.0	13.0
30	28.0	24.5	26.0	22.0	18.5	20.5	23.0	19.5	21.0	15.5	12.0	13.5
31	---	---	---	23.0	19.0	21.0	23.0	19.5	21.5	---	---	---
MONTH	29.0	13.0	20.0	29.5	18.5	22.5	---	---	---	26.0	11.0	17.0

MINNESOTA RIVER BASIN

05320270 LITTLE COBB RIVER NEAR BEAUFORD, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LITY LAE (MG/L AS CACO3) (90410)
MAR 14...	1200	103	376	389	7.0	7.4	0.0	739	9.2	152	159
APR 24...	1150	97	638	635	8.3	8.2	10.0	733	12.4	252	269
MAY 28...	1245	77	660	654	8.0	8.1	10.5	740	10.3	263	286
JUN 12...	1220	82	614	607	7.9	7.7	22.0	735	7.7	238	247
17...	1310	347	402	413	7.3	7.6	17.5	734	7.1	126	134
JUL 09...	1235	43	556	555	8.1	8.2	20.0	741	8.3	222	237
AUG 07...	1130	12	469	465	7.9	7.8	24.0	740	5.5	195	202
26...	1310	155	397	393	7.8	7.5	19.0	740	7.3	141	159
SEP 03...	1300	32	650	640	8.2	8.2	23.0	738	8.6	261	290

DATE	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)
MAR 14...	0	184	0.600	0.050	1.5	1.5	2.60	0.370	0.370	0.290	8.4
APR 24...	5	307	0.020	0.030	0.50	1.3	7.50	0.100	0.010	<0.010	6.3
MAY 28...	0	321	0.020	0.060	0.60	1.1	6.90	0.110	0.030	<0.010	5.3
JUN 12...	0	290	0.040	0.110	0.50	1.6	7.80	0.220	<0.010	<0.010	4.9
17...	0	154	0.200	0.090	1.0	3.0	13.0	0.700	0.350	0.270	6.8
JUL 09...	0	271	0.030	0.060	0.50	1.1	5.70	0.150	0.030	0.060	5.7
AUG 07...	0	238	0.040	0.020	0.50	0.80	0.400	0.100	0.060	0.090	5.8
26...	0	175	0.060	0.030	0.70	2.4	5.50	0.650	0.290	0.340	7.1
SEP 03...	0	318	<0.020	0.030	0.70	1.0	2.70	0.230	0.120	0.130	7.9

MINNESOTA RIVER BASIN

05320270 LITTLE COBB RIVER NEAR BEAUFORD, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
MAR 14...	1.0	241	47	15	5.9	3.7	9.9	21	0.20	13	49
APR 24...	3.3	370	80	27	9.7	1.9	15	37	0.40	12	6
MAY 28...	1.9	404	84	30	11	1.7	15	31	0.50	14	8
JUN 12...	4.6	384	73	30	11	1.7	14	28	0.50	14	5
17...	>5.0	280	47	16	4.7	3.3	9.1	12	0.30	21	36
JUL 09...	2.5	339	63	27	10	3.0	14	22	0.50	25	5
AUG 07...	1.0	285	50	22	10	2.0	17	20	0.40	20	7
26...	>5.0	258	48	16	5.2	2.6	8.2	13	0.30	23	8
SEP 03...	0.20	419	84	30	12	2.6	16	34	0.50	33	<3

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER, DISS, REC (UG/L) (04095)	ALPHA BHC DIS- SOLVED (UG/L) (34253)
MAR 14...	93	26	89	--	--	--	--	--	--	--	--
APR 24...	18	126	74	<0.007	<0.002	<0.005	<0.018	E0.020	<0.004	<0.003	<0.002
MAY 28...	44	68	75	<0.007	<0.002	<0.005	<0.018	E0.019	0.010	<0.003	<0.002
JUN 12...	11	218	90	<0.007	<0.002	<0.005	<0.018	E0.032	0.015	<0.003	<0.002
17...	78	556	97	E0.005	<0.002	0.010	E0.011	E0.140	0.480	<0.003	<0.002
JUL 09...	7	97	90	<0.007	<0.002	<0.005	<0.018	E0.025	0.008	<0.003	<0.002
AUG 07...	16	50	95	<0.007	<0.002	<0.005	E0.016	E0.018	<0.004	<0.003	<0.002
26...	42	491	99	<0.007	<0.002	<0.005	0.039	E0.020	<0.004	<0.003	<0.002
SEP 03...	26	158	79	<0.007	<0.002	<0.005	0.030	E0.024	<0.004	<0.003	<0.002

MINNESOTA RIVER BASIN

05320270 LITTLE COBB RIVER NEAR BEAUFORD, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ACETO- CHLOR, WATER FLTRD REC (UG/L) (49260)
MAR 14...	--	--	--	--	--	--	--	--	--	--	--
APR 24...	<0.006	<0.004	<0.004	<0.001	0.092	<0.005	<0.004	<0.002	0.066	0.010	0.010
MAY 28...	<0.006	<0.004	<0.004	<0.001	0.110	<0.005	<0.004	<0.002	0.064	0.017	0.290
JUN 12...	<0.006	<0.004	<0.004	<0.001	0.200	<0.005	<0.004	<0.002	0.230	0.035	0.140
17...	<0.006	<0.004	<0.004	0.009	0.420	<0.005	<0.004	<0.002	3.60	0.300	10.0
JUL 09...	<0.006	<0.004	<0.004	<0.001	0.055	<0.005	<0.004	<0.002	0.160	0.006	0.020
AUG 07...	<0.006	<0.004	<0.004	<0.001	0.027	<0.005	<0.004	<0.002	0.193	<0.002	0.063
26...	<0.006	<0.004	<0.004	<0.001	0.116	<0.005	<0.004	<0.002	0.178	0.016	0.191
SEP 03...	<0.006	<0.004	<0.004	<0.001	0.150	<0.005	<0.004	<0.002	0.100	<0.002	0.019
DATE	METRI- BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	TEBU- THURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)
MAR 14...	--	--	--	--	--	--	--	--	--	--	--
APR 24...	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	E0.003	<0.004	<0.010
MAY 28...	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	0.013	<0.004	<0.010
JUN 12...	<0.004	<0.003	E0.002	<0.004	<0.002	<0.007	<0.002	<0.006	0.011	<0.004	<0.010
17...	<0.004	0.006	0.035	<0.004	<0.002	<0.007	<0.002	<0.006	0.006	<0.004	<0.010
JUL 09...	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
AUG 07...	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
26...	<0.004	<0.003	0.006	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
SEP 03...	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010

MINNESOTA RIVER BASIN

05320270 LITTLE COBB RIVER NEAR BEAUFORD, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)
MAR 14...	--	--	--	--	--	--	--	--	--	--
APR 24...	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
MAY 28...	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
JUN 12...	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
JUN 17...	<0.004	0.020	<0.002	E0.015	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
JUL 09...	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
AUG 07...	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
AUG 26...	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
SEP 03...	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
DATE	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC PERCENT (91063)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT (91065)
MAR 14...	--	--	--	--	--	--	--	--	--	--
APR 24...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	122	90.0
MAY 28...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	151	121	96.8
JUN 12...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	147	138	112
JUN 17...	<0.002	<0.002	0.170	0.010	<0.013	<0.001	<0.005	108	116	109
JUL 09...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	116	116	107
AUG 07...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	105	127	121
AUG 26...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	112	117	101
SEP 03...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	111	116	101

MINNESOTA RIVER BASIN

05320500 LE SUEUR RIVER NEAR RAPIDAN, MN

LOCATION.--Lat 44°06'40", long 94°02'28", in SW¹/₄ sec.35, T.108 N., R.27 W., Blue Earth County, Hydrologic Unit 07020011, on right bank 600 ft downstream from highway bridge, 1.8 mi northeast of Rapidan, and 2.3 mi upstream from mouth.

DRAINAGE AREA.--1,100 mi², approximately.

PERIOD OF RECORD.--October 1939 to September 1945, July 1949 to current year.

GAGE.--Water-stage recorder. Datum of gage is 775.76 ft above mean sea level. Prior to Nov. 15, 1939, nonrecording gage at same site and datum.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 09	2000	1580	4.18	Apr. 01	1800	3860	6.67
Oct. 26	0500	1910	4.58	June 17	1400	*6960	*9.18
Nov. 04	0500	2020	4.71	Aug. 26	0800	1350	3.89

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	262	1350	432	e195	e90	e580	3480	e550	786	1110	100	271
2	276	1880	434	e195	e88	e540	3350	534	743	989	87	230
3	355	1940	426	e190	e90	e500	3060	557	660	902	81	313
4	376	1870	371	e190	e94	e460	2650	498	606	821	77	194
5	421	1700	395	e185	e97	e430	2210	560	579	741	90	178
6	838	1570	279	e185	e100	e390	1820	706	753	703	87	161
7	1130	1440	247	e180	e110	e370	1530	e730	932	700	129	140
8	1310	1290	e270	e180	e120	e360	1280	749	1000	652	155	128
9	1500	1170	e290	e175	e130	e370	1090	745	1020	609	146	116
10	1480	1080	e290	e170	e150	e410	947	e730	964	533	170	111
11	1340	945	e280	e170	e190	e460	876	758	880	390	240	106
12	1210	847	e270	e165	e200	e540	840	749	793	358	200	89
13	1060	818	e260	e160	e200	e580	807	e729	734	326	177	87
14	923	770	e250	e160	e200	e540	769	e683	682	309	154	87
15	820	714	e240	e160	e200	e660	776	e648	595	299	134	82
16	738	681	e235	e155	e210	e680	827	e708	688	282	114	74
17	673	643	e230	e150	e230	e660	853	e735	5460	246	99	67
18	608	608	e230	e145	e260	e600	868	e720	6320	232	87	63
19	573	590	e225	e140	e300	e550	868	e832	5470	222	196	57
20	537	568	e225	e140	e330	e500	879	e891	4600	210	221	66
21	510	546	e220	e135	e430	e470	896	e941	4000	197	151	69
22	487	470	e215	e130	e550	e460	896	e793	3530	180	149	67
23	593	399	e210	e125	e680	e460	891	e1020	3130	160	173	62
24	1410	353	e210	e125	e810	e460	844	e910	2800	150	171	57
25	1780	520	e205	e120	e800	e470	839	e846	2430	140	143	61
26	1810	514	e205	e115	e750	e520	781	e796	2110	129	928	61
27	1690	495	e200	e110	e680	e640	733	e773	1830	122	1100	61
28	1570	447	e200	e105	e630	e900	682	e806	1620	122	882	57
29	1460	352	e200	e100	e600	1910	624	859	1460	118	645	61
30	1340	401	e195	e97	---	2800	e590	866	1260	118	457	64
31	1230	---	e195	e94	---	2940	---	841	---	109	344	---
TOTAL	30310	26971	8134	4646	9319	22310	37556	23263	58435	12179	7887	3240
MEAN	978	899	262	150	321	720	1252	750	1948	393	254	108
MAX	1810	1940	434	195	810	2940	3480	1020	6320	1110	1100	313
MIN	262	352	195	94	88	360	590	498	579	109	77	57
AC-FT	60120	53500	16130	9220	18480	44250	74490	46140	115900	24140	15640	6430
CFSM	.88	.81	.24	.14	.29	.65	1.13	.68	1.75	.35	.23	.10

e Estimated.

MINNESOTA RIVER BASIN

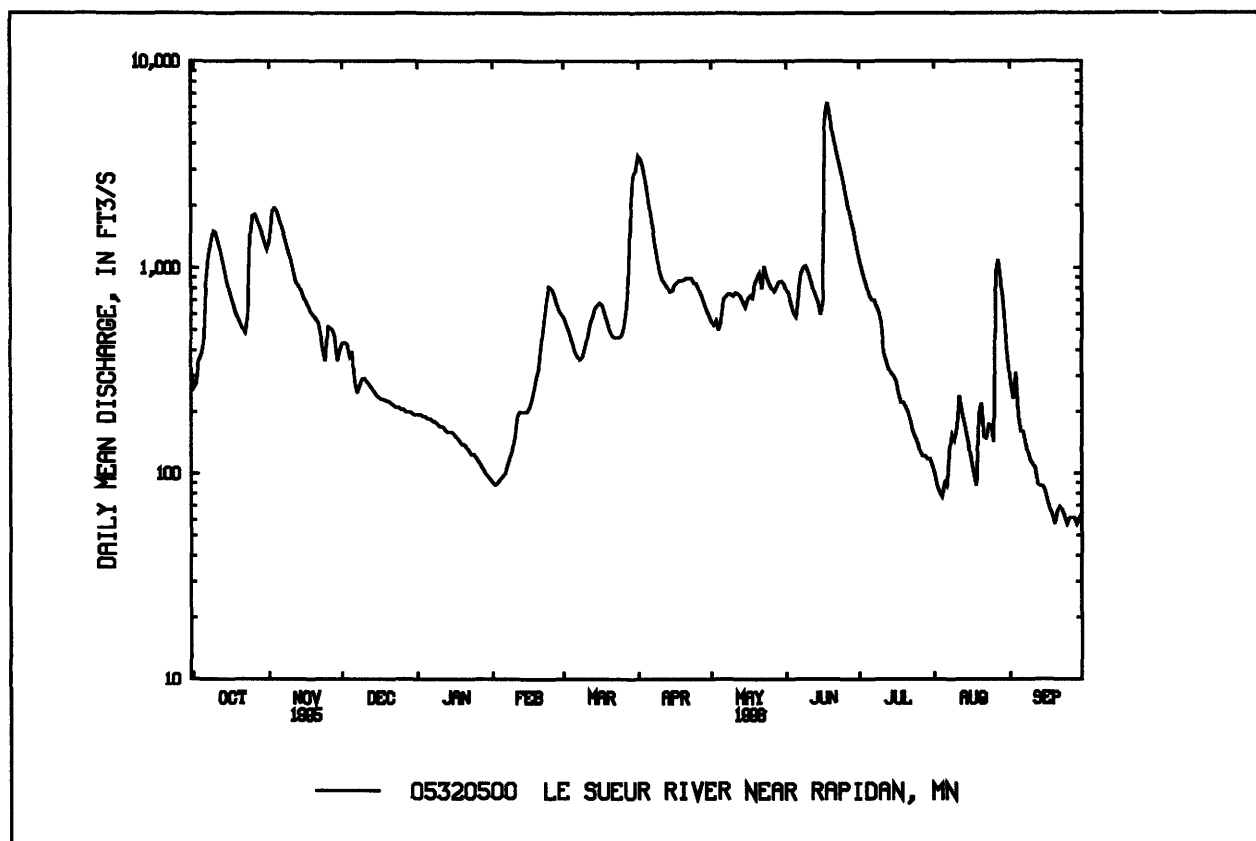
05320500 LE SUEUR RIVER NEAR RAPIDAN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	333	274	149	82.7	127	802	1329	908	966	615	414	255
MAX	3300	1561	698	493	1299	3465	6563	3706	3913	2760	3656	1526
(WY)	1969	1993	1992	1992	1984	1983	1965	1960	1993	1993	1993	1993
MIN	7.41	11.1	5.04	2.96	1.68	33.0	48.3	18.8	40.4	20.6	8.20	7.55
(WY)	1990	1956	1959	1957	1959	1964	1957	1940	1950	1988	1989	1976

SUMMARY STATISTICS FOR 1995 CALENDAR YEAR FOR 1996 WATER YEAR WATER YEARS 1940 - 1996

ANNUAL TOTAL	360039		244223									
ANNUAL MEAN	986		667						523			
HIGHEST ANNUAL MEAN									2035			1993
LOWEST ANNUAL MEAN									51.4			1977
HIGHEST DAILY MEAN	4520		Aug 9		6320		Jun 18		23400		Apr 8	1965
LOWEST DAILY MEAN	80		Feb 12		57		Sep 19		1.6		Feb 9	1959
ANNUAL SEVEN-DAY MINIMUM	81		Feb 12		60		Sep 23		1.6		Feb 9	1959
INSTANTANEOUS PEAK FLOW					6960		Jun 17		24700		Apr 8	1965
INSTANTANEOUS PEAK STAGE					9.18		Jun 17		22.72 ^a		May 22	1960
INSTANTANEOUS LOW FLOW					51		Sep 29		1.6		Feb 9	1959
ANNUAL RUNOFF (AC-FT)	714100				484400				379100			
ANNUAL RUNOFF (CFSM)	.89				.60				.47			
10 PERCENT EXCEEDS	2340				1420				1450			
50 PERCENT EXCEEDS	673				470				147			
90 PERCENT EXCEEDS	94				103				16			

^a From floodmark.

MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MN

LOCATION(REVISED).--Lat 44°10'08", long 94°00'11", in SE¹/₄SW¹/₄ sec. 7, T. 108 N., R. 26 W., Blue Earth County, Hydrologic Unit 07020007, on right bank 300 ft downstream from Memorial bridge in Mankato, 2.0 mi downstream from Blue Earth River and at mile 106.2 upstream from Mississippi River.

DRAINAGE AREA.--14,900 mi², approximately.

PERIOD OF RECORD.--May 1903 to current year (no winter records 1904, 1906-10, 1918-29). Monthly discharge only for some periods, published in WSP 1308. Published as "near Mankato": 1903-21.

REVISED RECORDS.--WSP 875: 1917. WSP 955: Drainage area. WSP 1085: 1929. WSP 1238: 1903, 1908, 1919. WSP 1508: 1916(M), 1918(M), 1926(M), 1928, 1930, 1932(M), 1938(M). WDR-MN-76-1: 1881(M).

GAGE.--Water-stage recorder. Datum of gage is 747.92 ft above sea level. Prior to Oct. 19, 1921, nonrecording gage, at site 1.8 mi upstream at datum 6.4 ft higher. Mar. 15, 1922, to Nov. 30, 1924, nonrecording gage, and Dec. 1, 1924 to May 24, 1971, recorder at site 0.2 mi upstream at present datum. May 25, 1971 to Aug. 14, 1977, recorder at site 0.5 mi upstream at present datum. Aug. 14, 1977 to July 27, 1978, nonrecording gage; and from July 28, 1978 to Sept. 30, 1993, recording gage at site 0.7 mi upstream of present site.

REMARKS.--Records fair.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, 29.9 ft, Apr. 26, 1881, near present site and datum, from floodmark (discharge, 110,000 ft³/s).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2490	10600	e5200	e2700	e1500	e2200	19800	10500	13500	10600	2930	3290
2	2860	11600	e5100	e2700	e1490	e2180	20700	10100	13100	9820	2810	3440
3	3870	12000	e5000	e2700	e1480	e2150	20700	9860	13000	9230	2510	3360
4	4950	11900	e4800	e2600	e1470	e2120	20100	9580	12700	8580	2230	2550
5	5610	11400	e4700	e2500	e1480	e2100	18600	9440	12600	7850	2230	2170
6	6580	10800	e4600	e2400	e1500	e2050	16800	9330	12600	7030	2220	2020
7	7210	10700	e4400	e2350	e1510	e2020	15200	9190	12900	6550	2340	1900
8	7620	10400	e4300	e2300	1520	e2020	13900	9110	13400	6120	2390	1720
9	8390	10300	e4100	e2200	e1520	e2400	12800	9000	13700	5980	2970	1650
10	8780	10400	e4000	e2150	e1510	e3100	11900	9220	13500	5710	3720	1430
11	8920	9840	e3800	e2080	e1510	e4600	11400	9410	13000	5250	3640	1470
12	8730	9450	e3600	2030	e1510	e5200	11200	9620	12600	4660	3210	1460
13	8700	9590	e3400	e2000	e1560	e5600	11200	9710	12000	4430	2860	1390
14	8660	9320	e3300	e2000	e1530	e5800	11200	9730	11200	4200	2730	1150
15	8620	8920	e3250	e1980	e1520	e6100	11500	9770	10600	3980	2690	1140
16	8520	8580	e3100	e1950	e1510	e6400	11700	9780	10500	3820	2450	1180
17	8370	8020	e3100	e1920	e1500	e6600	11800	9730	20800	3650	2160	1060
18	8260	7790	e3000	e1900	e1500	e6800	11800	9540	24000	3550	1880	1020
19	8170	7570	e3000	e1880	e1500	e7100	11800	9700	26000	3460	1880	1020
20	8040	7380	e2900	e1860	e1600	e7300	11900	10100	27600	2990	2050	1040
21	7870	7200	e2900	e1820	e1700	e7500	12000	10100	27700	2810	1800	1030
22	7650	6860	e2900	e1790	e1850	e7600	12200	10100	26400	2800	1960	950
23	7950	6450	e2900	e1750	e2100	e7600	12300	10400	24300	2520	2870	952
24	9440	5860	e2900	e1740	e2400	e7800	12300	10900	22200	2420	3980	964
25	10200	e5950	e2900	e1720	e2400	e8500	12500	11200	19900	2270	4560	1030
26	10700	e5950	e2850	e1700	e2350	e9500	12500	11200	17800	2120	5730	1050
27	11200	e5900	e2850	e1630	e2300	10000	12300	11300	15900	2100	5690	1050
28	11100	e5800	e2850	e1580	e2250	11300	11700	11900	14400	2200	6310	1050
29	10800	e5300	e2750	e1530	e2220	13900	11300	12100	12900	2510	5530	1090
30	10600	e5250	e2750	e1520	---	16300	10900	13200	11600	3090	4440	1130
31	10300	---	e2700	e1520	---	18200	---	13600	---	3010	3750	---
TOTAL	251160	257080	109900	62500	49790	202040	406000	318420	492400	145310	98520	45756
MEAN	8102	8569	3545	2016	1717	6517	13530	10270	16410	4687	3178	1525
MAX	11200	12000	5200	2700	2400	18200	20700	13600	27700	10600	6310	3440
MIN	2490	5250	2700	1520	1470	2020	10900	9000	10500	2100	1800	950
AC-FT	498200	509900	218000	124000	98760	400700	805300	631600	976700	288200	195400	90760
CFSM	.54	.58	.24	.14	.12	.44	.91	.69	1.10	.31	.21	.10

e Estimated.

MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MN--Continued

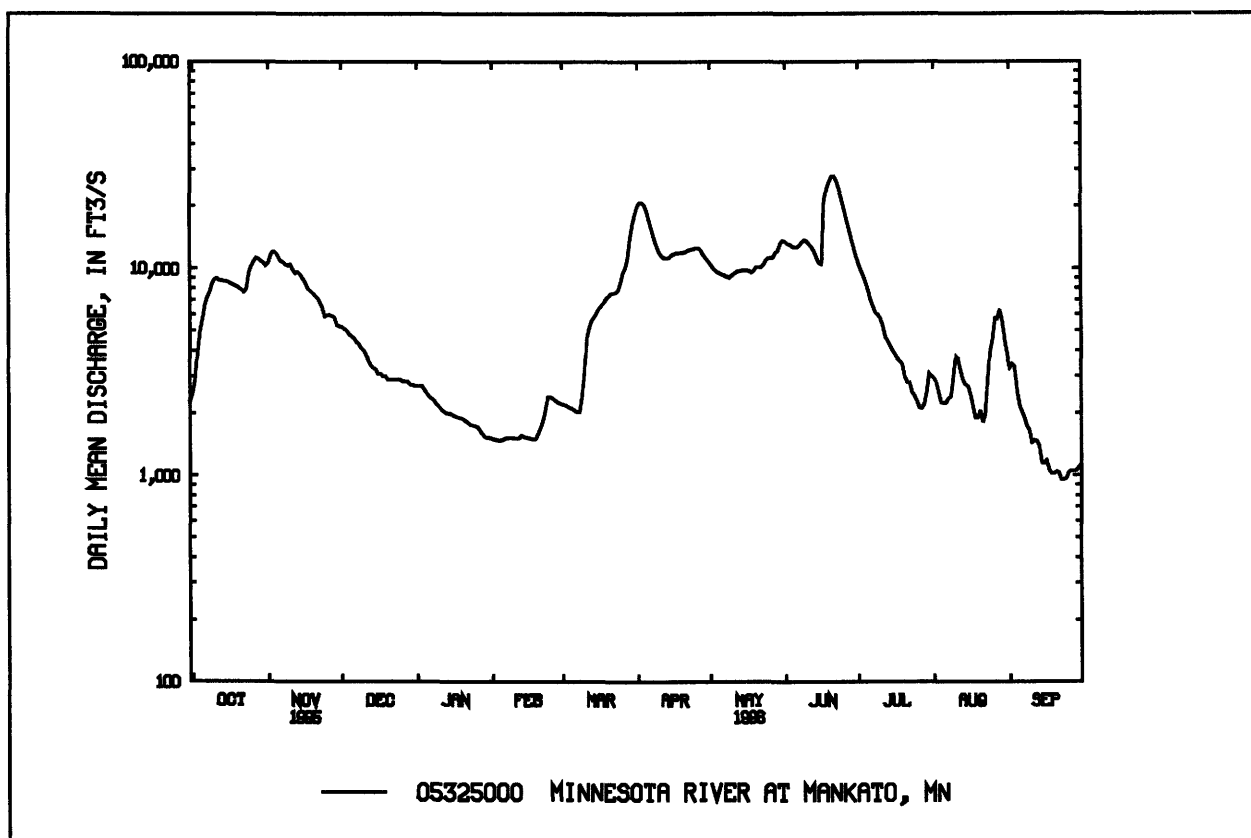
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1639	1540	995	617	740	4433	8921	5658	6077	4453	2341	1661
MAX	14600	8569	4770	3009	4505	18230	44780	22540	34230	33130	23520	11070
(WY)	1969	1996	1983	1992	1983	1983	1969	1993	1993	1993	1993	1993
MIN	66.1	83.5	80.9	61.5	58.4	132	609	101	194	58.3	37.4	55.6
(WY)	1934	1934	1934	1940	1940	1934	1931	1934	1934	1934	1934	1934

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1903 - 1996
ANNUAL TOTAL	3308410	2438876	
ANNUAL MEAN	9064	6664	3398 ^a
HIGHEST ANNUAL MEAN			14890
LOWEST ANNUAL MEAN			136
HIGHEST DAILY MEAN	27500	Apr 24	27700
LOWEST DAILY MEAN	930	Feb 18	950
ANNUAL SEVEN-DAY MINIMUM	930	Feb 18	997
INSTANTANEOUS PEAK FLOW			28000
INSTANTANEOUS PEAK STAGE			18.74
INSTANTANEOUS LOW FLOW			933
ANNUAL RUNOFF (AC-FT)	6562000	4838000	2462000
ANNUAL RUNOFF (CFSM)	.61	.45	.23
10 PERCENT EXCEEDS	19200	12600	8930
50 PERCENT EXCEEDS	8170	5200	1210
90 PERCENT EXCEEDS	1230	1520	185

a Median of annual mean discharges is 2660 ft³/s.

b Minimum observed.



MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1963-66, 1968 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: October 1967 to September 30, 1981 October 1982 to current year (fragmentary records).

SUSPENDED-SEDIMENT DISCHARGE: October 1967 to current year.

REMARKS.--Sediment samples were collected approximately daily by an observer during the open-water period. In general, daily concentration and loads for the open-water period are considered good. During the winter period, daily sediment concentrations and loads are based primarily on concentrations of sediment in samples that were collected monthly and on daily water-discharge records. Sediment records for the winter period are considered fair. Water temperatures were obtained by the observer approximately daily during the open-water period and monthly by U.S. Geological Survey personnel during the winter period. Some temperatures are not published because of questionable values.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum observed, 31.0°C, July 4-9, 1989; minimum observed, 0.0°C on many days each year.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 2850 mg/L, Aug. 7, 1968; minimum daily mean, 9 mg/L, Jan. 15-19, 1991.

SEDIMENT LOADS: Maximum daily, 414,000 tons, June 21, 1993; minimum daily, 5.2 tons, Nov. 6, 1976.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum observed, 29.5°C, Aug. 6; min. obs., 3.0°C, Nov. 9, 17, Apr. 4. Assumed to be 0.0°C, many days during winter.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 1100 mg/L, June 17; minimum daily mean, 85 mg/L, Sep. 21-23.

SEDIMENT LOADS: Maximum daily, 61,800 tons, June 17; minimum daily, 218 tons, Sept. 22, 23.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.5	5.0	---	---	---	---	4.5	13.5	---	25.0	25.5	---
2	16.5	---	---	---	---	---	5.5	11.5	---	26.0	26.5	---
3	16.0	---	---	---	---	---	4.0	12.0	16.0	24.0	---	25.5
4	15.0	---	---	---	---	---	3.0	---	18.0	---	---	27.0
5	14.0	---	---	---	---	---	4.0	---	17.5	26.0	27.0	27.0
6	---	4.5	---	---	---	---	---	---	18.5	---	29.5	27.0
7	11.5	---	---	---	---	---	---	---	19.0	---	27.0	---
8	---	---	---	---	---	---	6.5	---	---	25.0	28.0	---
9	14.0	3.0	---	---	---	---	8.5	---	---	24.0	27.0	25.0
10	14.0	---	---	---	---	---	10.0	---	23.5	25.0	---	24.0
11	15.0	---	---	---	---	---	13.0	---	25.0	23.0	---	21.5
12	16.5	---	---	---	---	---	7.5	---	26.5	23.5	26.5	19.5
13	15.0	---	---	---	---	---	---	14.5	27.0	---	27.5	---
14	---	---	---	---	---	---	---	12.5	27.5	---	25.0	---
15	---	---	---	---	---	---	8.5	14.0	---	24.5	26.0	---
16	13.5	---	---	---	---	---	10.5	---	---	26.0	25.5	19.0
17	14.5	3.0	---	---	---	---	12.5	20.5	20.5	27.5	---	19.0
18	12.0	---	---	---	---	---	11.5	---	18.5	29.0	---	20.0
19	11.5	---	---	---	---	---	12.0	---	19.0	26.0	24.0	18.5
20	8.5	---	---	---	---	---	---	21.5	19.5	---	26.0	17.5
21	---	---	---	---	---	---	---	21.5	20.5	---	27.5	---
22	---	---	---	---	---	---	10.0	20.0	---	27.0	---	---
23	7.0	---	---	---	---	---	11.0	19.0	---	27.0	25.0	---
24	9.0	---	---	---	---	---	12.5	18.5	23.5	24.5	---	---
25	10.0	---	---	---	---	---	12.5	---	24.0	25.0	---	---
26	9.5	---	---	---	---	---	12.0	---	25.5	26.0	23.5	---
27	8.5	---	---	---	---	---	---	---	27.5	---	21.5	---
28	---	---	---	---	---	4.0	---	16.0	25.0	---	23.5	---
29	---	---	---	---	---	3.5	12.0	17.0	---	24.0	23.0	---
30	6.5	---	---	---	---	---	13.5	18.5	---	24.5	24.5	19.5
31	6.0	---	---	---	---	---	---	18.5	---	25.0	---	---

MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	153	1040	241	6910	165	2320	135	984	100	378	158	939
2	165	1290	249	7790	160	2250	135	984	110	416	162	954
3	296	3130	230	7440	160	2250	130	948	115	435	163	946
4	319	4270	212	6810	160	2250	130	913	120	454	163	933
5	361	5460	195	6020	160	2250	125	844	130	491	164	930
6	436	7740	183	5320	160	2250	125	810	140	529	164	908
7	431	8390	199	5750	160	2120	120	761	145	548	165	900
8	415	8520	223	6250	160	1860	120	745	150	567	166	905
9	394	8930	197	5480	160	1770	118	701	150	571	167	1080
10	376	8920	193	5430	160	1730	116	673	150	587	170	1420
11	389	9360	201	5350	155	1590	114	646	150	587	172	2140
12	413	9730	209	5340	155	1510	112	629	150	587	172	2410
13	454	10600	218	5640	155	1420	110	624	148	599	175	2650
14	397	9280	227	5700	155	1380	108	612	148	587	175	2740
15	336	7830	236	5680	155	1360	106	601	148	579	180	2960
16	285	6560	246	5690	150	1260	104	590	147	576	185	3200
17	241	5460	242	5230	150	1260	102	578	148	579	190	3390
18	202	4510	227	4770	150	1210	100	513	150	591	195	3580
19	173	3800	226	4610	150	1210	100	499	150	607	200	3830
20	207	4500	225	4480	150	1170	100	499	151	652	220	4340
21	219	4660	224	4350	145	1140	100	486	152	698	248	5020
22	214	4430	223	4130	145	1140	100	459	153	764	280	5760
23	215	4610	222	3860	145	1140	99	441	153	868	295	6050
24	294	7490	221	3500	145	1140	99	428	153	991	310	6530
25	364	10000	210	3370	145	1140	99	414	154	998	326	7490
26	412	11900	205	3290	140	1080	98	397	154	977	343	8810
27	307	9290	200	3190	140	1080	98	384	155	963	361	9750
28	279	8350	190	2980	140	1080	98	384	155	942	391	11900
29	282	8220	180	2580	140	1040	98	384	155	929	590	22100
30	280	8000	170	2410	140	1040	98	370	---	---	703	30900
31	201	5590	---	---	140	1020	98	370	---	---	765	37600
TOTAL	---	211860	---	149350	---	46460	---	18671	---	19050	---	193065

MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	822	43900	113	3200	273	9940	253	7260	143	1150	370	3340
2	750	41900	133	3590	247	8730	329	8710	177	1360	459	4320
3	535	29900	150	3990	225	7900	359	8940	179	1230	487	4470
4	442	24000	103	2660	230	7890	362	8390	160	974	219	1530
5	373	18700	103	2620	248	8450	364	7710	144	876	169	1000
6	306	13900	103	2590	298	10100	347	6590	150	909	141	776
7	219	8970	100	2480	271	9440	326	5770	143	914	120	619
8	161	6030	95	2340	259	9360	306	5060	136	889	114	537
9	149	5160	93	2260	238	8800	285	4610	147	1200	108	487
10	161	5190	128	3190	234	8540	263	4060	157	1590	120	463
11	141	4330	102	2590	306	10700	269	3820	150	1500	130	519
12	160	4830	117	3040	278	9390	222	2800	142	1250	125	496
13	158	4790	140	3670	249	8080	227	2730	128	1000	120	450
14	146	4400	168	4410	261	7890	238	2720	128	960	115	360
15	136	4200	140	3690	250	7150	249	2700	110	811	110	339
16	157	4970	135	3560	400	11300	228	2380	100	670	107	344
17	144	4590	97	2550	1100	61800	182	1820	120	706	105	301
18	167	5310	105	2700	917	59400	169	1640	130	667	100	275
19	134	4260	114	2990	585	41100	191	1810	169	868	95	262
20	122	3930	132	3610	452	33700	173	1420	261	1460	90	253
21	133	4300	156	4270	367	27400	166	1280	157	768	85	236
22	142	4630	255	6970	388	27700	161	1230	138	737	85	218
23	122	4050	279	7830	380	24900	174	1200	178	1400	85	218
24	128	4250	271	7990	371	22200	144	957	288	3120	86	224
25	135	4550	264	7990	356	19100	165	1030	436	5400	88	245
26	143	4840	257	7770	392	18800	140	814	618	9570	90	255
27	144	4790	250	7640	363	15600	143	819	407	6250	92	261
28	137	4330	244	7830	342	13300	161	968	366	6220	94	266
29	130	3970	242	7910	316	11000	178	1230	352	5250	96	283
30	120	3530	314	11200	279	8730	165	1400	252	3030	98	299
31	---	---	340	12500	---	---	145	1200	298	3050	---	---
TOTAL	---	286500	---	151630	---	528390	---	103068	---	65779	---	23646
YEAR	1797469											

PARTICLE-SIZE DISTRIBUTION OF BED-MATERIAL SEDIMENT, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	NUMBER OF SAM- PLING POINTS (COUNT)	BED MAT. SIEVE DIAM. % FINER THAN (00063) (80164)	BED MAT. SIEVE DIAM. % FINER THAN (80165)	BED MAT. SIEVE DIAM. % FINER THAN (80166)	BED MAT. SIEVE DIAM. % FINER THAN (80167)	BED MAT. SIEVE DIAM. % FINER THAN (80168)	BED MAT. SIEVE DIAM. % FINER THAN (80169)	BED MAT. SIEVE DIAM. % FINER THAN (80170)	BED MAT. SIEVE DIAM. % FINER THAN (80171)	BED MAT. SIEVE DIAM. % FINE THAN (80172)
APR 05...	1400	--	0	0	6	39	67	80	89	96	100

MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	RESIDUE VOLA- TILE, SUS- PENDED (MG/L) (00535)
MAR									
21...	1110	7500	552	7.4	0.5	748	14.6	115	107
APR									
03...	1545	20800	530	8.6	2.5	737	14.7	210	18
10...	1010	12100	830	7.7	6.0	736	11.8	64	16
18...	1115	11900	723	8.6	9.5	738	12.9	70	1
MAY									
03...	1315	9970	774	8.6	11.0	746	12.0	74	25
14...	1615	9820	862	8.4	12.5	742	12.0	72	30
22...	1410	10200	940	8.4	20.0	741	10.6	54	4
31...	1515	13800	953	8.1	17.5	745	8.5	98	58
JUN									
10...	1530	13600	931	7.1	19.0	742	8.2	83	21
18...	1530	24700	562	8.1	19.0	738	7.5	580	48
25...	0850	20400	935	7.8	21.5	746	11.2	174	48
JUL									
10...	1050	5700	894	8.2	22.5	750	7.2	144	24
24...	1050	2390	860	8.2	23.0	743	7.6	65	12
AUG									
01...	1150	2910	750	8.3	23.5	747	11.9	104	34
13...	1100	2810	791	7.8	24.5	745	6.8	108	26
23...	1500	3070	796	8.4	25.0	752	10.3	140	30
27...	1345	5730	657	8.2	23.5	748	7.8	220	42
29...	1650	5250	677	8.3	24.0	751	9.6	214	34
SEP									
10...	1820	1390	803	8.4	22.5	747	11.9	30	16
DATE		NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
MAR									
21...	0.100	2.10	0.420	0.400	0.250	192	--	--	
APR									
03...	0.060	3.50	0.300	0.290	0.180	467	5.90	0.300	
10...	0.020	2.10	0.130	0.230	0.110	226	15.0	0.800	
18...	0.010	2.20	<0.015	0.250	0.010	156	39.0	1.30	
MAY									
03...	0.010	1.70	<0.015	0.250	<0.010	236	16.0	<0.100	
14...	0.020	3.80	<0.015	0.110	<0.010	121	11.0	<0.100	
22...	0.030	3.20	0.020	0.140	<0.010	309	29.0	1.20	
31...	0.030	5.90	0.020	0.080	0.050	248	7.50	0.700	
JUN									
10...	0.040	5.90	0.050	0.200	0.040	299	13.0	0.800	
18...	0.080	9.70	0.130	0.250	0.160	904	--	--	
25...	0.080	8.60	0.060	0.190	0.120	321	7.20	0.700	
JUL									
10...	0.020	5.30	0.040	0.270	0.140	245	10.0	0.600	
24...	0.020	1.50	0.040	0.160	0.010	144	14.0	1.00	
AUG									
01...	0.020	2.00	0.050	0.060	0.070	129	31.0	1.50	
13...	0.030	3.10	0.030	0.150	0.120	118	24.0	2.10	
23...	0.020	0.840	0.030	0.070	0.040	216	68.0	5.70	
27...	0.030	4.50	0.020	0.260	0.110	369	28.0	1.80	
29...	0.030	5.60	0.020	0.330	0.110	360	24.0	1.50	
SEP									
10...	0.020	1.50	<0.015	0.090	0.020	63	28.0	1.50	

MINNESOTA RIVER BASIN

05327000 HIGH ISLAND CREEK NEAR HENDERSON, MN

LOCATION.--Lat 44°34'19", long 93°55'18", in NE 1/4 NW 1/4 sec. 26, T. 113 N., R. 26 W., Sibley County, Hydrologic Unit 07020012, on left bank 20 ft downstream from bridge on County Road 6, 1.6 mi upstream from mouth, and 3.1 mi north of Henderson.

DRAINAGE AREA.--237 mi².

PERIOD OF RECORD.--October 1973 to current year. May 1970 to September 1973, operated as a low-flow station only.

REVISED RECORDS.--WDR-MN-80-2: 1974-75, 1977-79.

GAGE.--Water-stage recorder. Datum of gage is 728.56 ft above mean sea level.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 12	1800	343	4.27	Mar. 27	1400	486	4.77
Mar. 25	0900	*964	*6.19	June 21	1530	336	4.20

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	163	e43	e20	e15	e42	434	121	110	84	5.0	2.0
2	66	194	e43	e20	e15	e40	450	121	106	77	4.2	1.9
3	80	174	e43	e19	e14	e33	436	137	106	70	3.8	1.9
4	80	149	e42	e19	e14	e29	374	138	103	65	3.6	1.9
5	75	153	e41	e19	e14	21	373	141	111	58	5.3	2.1
6	79	162	e39	e18	e14	e16	389	150	152	54	5.6	2.2
7	89	154	e35	e18	e13	e16	377	154	153	60	8.2	2.2
8	90	138	e35	e18	e14	e14	342	161	178	54	6.4	2.2
9	105	133	e34	e18	e20	e12	309	166	179	49	5.1	2.1
10	115	130	e32	e18	e18	13	278	198	142	43	6.7	2.0
11	117	93	e30	e18	e18	19	274	210	128	38	5.4	2.0
12	121	114	e30	e17	e17	164	262	201	109	35	4.5	2.0
13	114	116	e30	e17	e17	269	249	189	99	32	4.3	2.0
14	106	105	e29	e17	17	295	246	183	90	30	3.9	2.4
15	99	98	e28	e18	e17	252	237	220	83	26	3.6	2.4
16	92	93	e27	e19	e17	251	229	217	80	24	3.3	2.4
17	82	91	e27	e19	e17	239	212	215	131	21	3.2	2.3
18	73	88	e25	e18	e16	249	206	215	179	19	2.7	2.2
19	67	84	e24	e18	16	259	214	247	234	15	3.9	2.1
20	63	81	e23	e17	16	264	219	253	276	12	3.8	2.8
21	60	63	e22	e17	16	e279	215	241	322	11	3.1	2.7
22	58	70	e22	e17	16	378	207	232	332	11	3.1	3.4
23	71	57	e22	e17	17	423	191	218	318	8.9	2.7	3.1
24	134	71	e21	e17	e60	452	180	198	276	7.5	2.4	2.9
25	151	86	e20	e16	e180	e680	169	187	225	6.5	2.2	2.7
26	157	68	e20	e17	e200	283	159	181	176	6.2	3.7	2.9
27	160	54	e20	e17	e107	e220	153	154	141	5.8	3.3	3.0
28	183	e49	e19	e16	e55	213	143	146	120	5.9	2.9	3.1
29	191	e46	e19	e16	e45	314	136	136	107	5.6	2.4	2.9
30	173	e45	e19	e16	---	489	127	127	94	5.7	2.2	2.7
31	161	---	e19	e15	---	457	---	119	---	6.1	2.1	---
TOTAL	3254	3122	883	546	1015	6685	7790	5576	4860	946.2	122.6	72.5
MEAN	105	104	28.5	17.6	35.0	216	260	180	162	30.5	3.95	2.42
MAX	191	194	43	20	200	680	450	253	332	84	8.2	3.4
MIN	42	45	19	15	13	12	127	119	80	5.6	2.1	1.9
AC-FT	6450	6190	1750	1080	2010	13260	15450	11060	9640	1880	243	144
CFSM	.44	.44	.12	.07	.15	.91	1.10	.76	.68	.13	.02	.01
IN.	.51	.49	.14	.09	.16	1.05	1.22	.88	.76	.15	.02	.01

e Estimated.

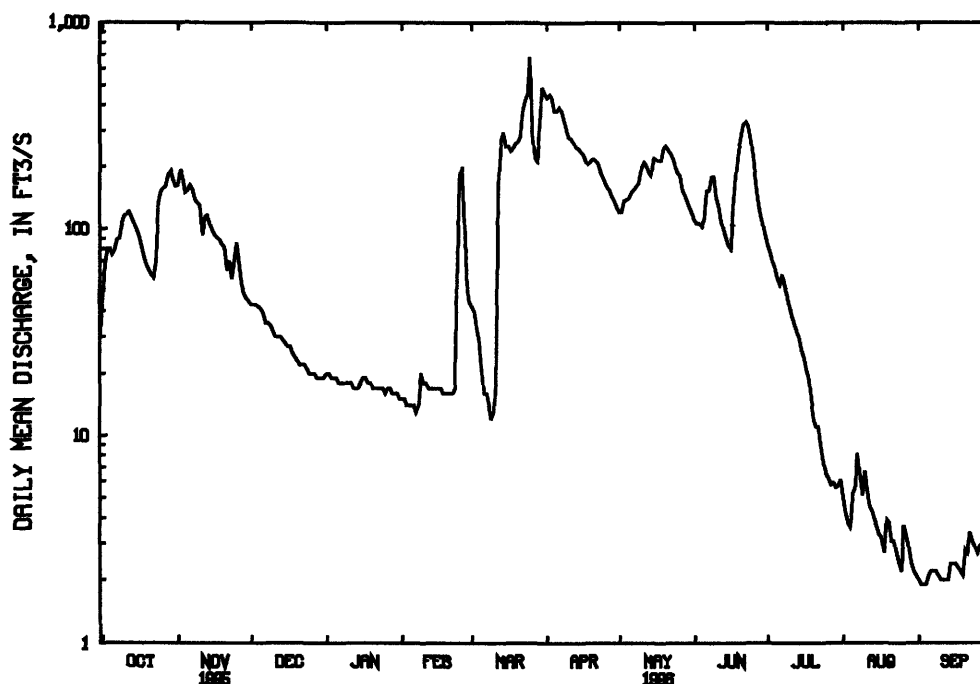
MINNESOTA RIVER BASIN

05327000 HIGH ISLAND CREEK NEAR HENDERSON, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	82.7	67.6	37.5	16.3	21.6	168	243	158	175	119	73.6	110
MAX	298	219	111	72.5	121	547	593	506	991	989	353	592
(WY)	1986	1993	1983	1992	1984	1992	1983	1993	1993	1993	1993	1991
MIN	1.51	2.11	1.37	.98	1.28	6.27	6.69	3.32	1.58	.80	1.16	1.18
(WY)	1990	1990	1976	1977	1989	1975	1990	1976	1976	1976	1976	1974

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1974 - 1996
ANNUAL TOTAL	46086	34872.3	
ANNUAL MEAN	126	95.3	103
HIGHEST ANNUAL MEAN			346
LOWEST ANNUAL MEAN			9.23
HIGHEST DAILY MEAN	710	Mar 27	2190
LOWEST DAILY MEAN	10	Feb 16	.46
ANNUAL SEVEN-DAY MINIMUM	11	Feb 14	.59
INSTANTANEOUS PEAK FLOW		964	2750
INSTANTANEOUS PEAK STAGE		6.19	9.72
INSTANTANEOUS LOW FLOW		1.8	.20 ^a
ANNUAL RUNOFF (AC-FT)	91410	69170	74870
ANNUAL RUNOFF (CFSM)	.53	.40	.44
ANNUAL RUNOFF (INCHES)	7.23	5.47	5.92
10 PERCENT EXCEEDS	340	246	300
50 PERCENT EXCEEDS	73	47	31
90 PERCENT EXCEEDS	18	3.1	1.8

^a Result of freezeup.

05327000 HIGH ISLAND CREEK NEAR HENDERSON, MN

MINNESOTA RIVER BASIN

05330000 MINNESOTA RIVER NEAR JORDAN, MN

LOCATION.--Lat 44°41'35", long 93°38'30", in NW¼SW¼ sec.7, T.114 N., R.23 W., Carver County, Hydrologic Unit 07020012, on pier at center downstream side of bridge, 1.5 mi northwest of Jordan, and at mile 39.4 upstream from Mississippi River.

DRAINAGE AREA.--16,200 mi², approximately.

PERIOD OF RECORD.--September 1934 to current year. Prior to Oct. 1, 1966, published as "near Carver, Minn".

REVISED RECORDS.--WSP 955: Drainage area. WSP 1508: 1935. WDR MN-87-2: 1976 (cal. yr. summary).

GAGE.--Water-stage recorder. Datum of gage is 690.00 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1966, water-stage recorder 2.8 mi downstream with auxiliary nonrecording gage at present site and present datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	DAILY MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2740	11200	e6000	e3100	e1500	e2300	16900	11900	13300	16000	3300	4150
2	2920	11400	e6000	e3100	e1500	e2300	18300	11500	13500	13400	3130	3740
3	3320	12100	e5800	e3100	e1500	e2260	19600	11300	13500	11600	3060	3510
4	3990	12500	e5800	e3060	e1500	e2250	20800	11100	13300	10300	2940	3910
5	4940	12600	e5600	e2950	e1500	e2250	21700	10900	13200	9440	2710	3160
6	5720	12400	e5400	e2800	e1500	e2200	21900	10700	13300	8630	2620	2780
7	6660	11900	e5200	e2600	e1500	e2100	22300	10500	13600	7910	2610	2510
8	7390	11600	e5000	e2500	e1510	e2080	20600	10400	13800	7310	2670	2400
9	7890	11300	e4700	e2400	e1520	e2080	19200	10300	13900	6710	2610	2280
10	8570	11200	e4500	e2310	e1550	e2100	17500	10300	14000	6370	2930	2090
11	9030	11000	e4300	e2290	e1550	e3000	15700	10600	14000	6080	3650	2010
12	9120	10600	e4100	e2280	e1550	e4400	14300	10800	13800	5650	3870	1850
13	9020	10100	e3800	e2200	e1600	e5400	13500	10800	13400	5120	3550	1890
14	8870	10100	e3700	e2250	e1600	e5800	13000	10800	12900	4890	3220	1830
15	8780	9870	e3600	e2200	e1600	e6100	12800	11000	12100	4690	2990	1730
16	8740	9540	e3500	e2250	e1600	e6300	12800	11100	11500	4440	2920	1550
17	8660	9190	e3500	e2230	e1600	e6600	12900	11100	11700	4260	2850	1560
18	8500	8960	e3400	e2200	e1600	e6800	13100	11000	14600	4090	2590	1510
19	8310	8690	e3400	e2120	e1650	e7000	13100	11200	18100	3940	2360	1430
20	8170	8470	e3300	e2100	e1650	e7300	13100	11400	21900	3790	2230	1430
21	8030	8100	e3300	e2100	e1700	e7500	13100	11600	26400	3520	2310	1420
22	7910	7790	e3300	e2100	e1800	e7600	13100	11500	29600	3270	2290	1410
23	7980	7390	e3300	e2100	e1900	e7600	13100	11400	31200	3140	2160	1380
24	8710	7090	e3300	e2000	e2000	e7800	13100	11500	31100	3050	2600	1330
25	9890	e6800	e3300	e2000	e2200	e7800	13200	11700	29700	2820	3590	1310
26	10900	e6600	e3300	e1900	e2400	e7700	13200	11900	27900	2750	4430	1350
27	11200	e6600	e3200	e1900	e2400	e7700	13200	12000	25600	2590	5280	1400
28	11500	e6400	e3200	e1800	e2300	e8500	13100	12000	22900	2510	5620	1390
29	11600	e6200	e3200	e1700	e2300	e10000	12800	12200	20700	2530	6000	1390
30	11500	e6200	e3200	e1600	---	e14000	12400	12300	18600	2720	5760	1380
31	11300	---	e3200	e1500	---	15600	---	12700	---	3090	4900	---
TOTAL	251860	283890	126400	70740	50080	182420	463400	349500	543100	176610	103750	61080
MEAN	8125	9463	4077	2282	1727	5885	15450	11270	18100	5697	3347	2036
MAX	11600	12600	6000	3100	2400	15600	22300	12700	31200	16000	6000	4150
MIN	2740	6200	3200	1500	1500	2080	12400	10300	11500	2510	2160	1310
AC-FT	499600	563100	250700	140300	99330	361800	919200	693200	1077000	350300	205800	121200
CFSM	.50	.58	.25	.14	.11	.36	.95	.70	1.12	.35	.21	.13
IN.	.58	.65	.29	.16	.11	.42	1.06	.80	1.25	.41	.24	.14

e Estimated.

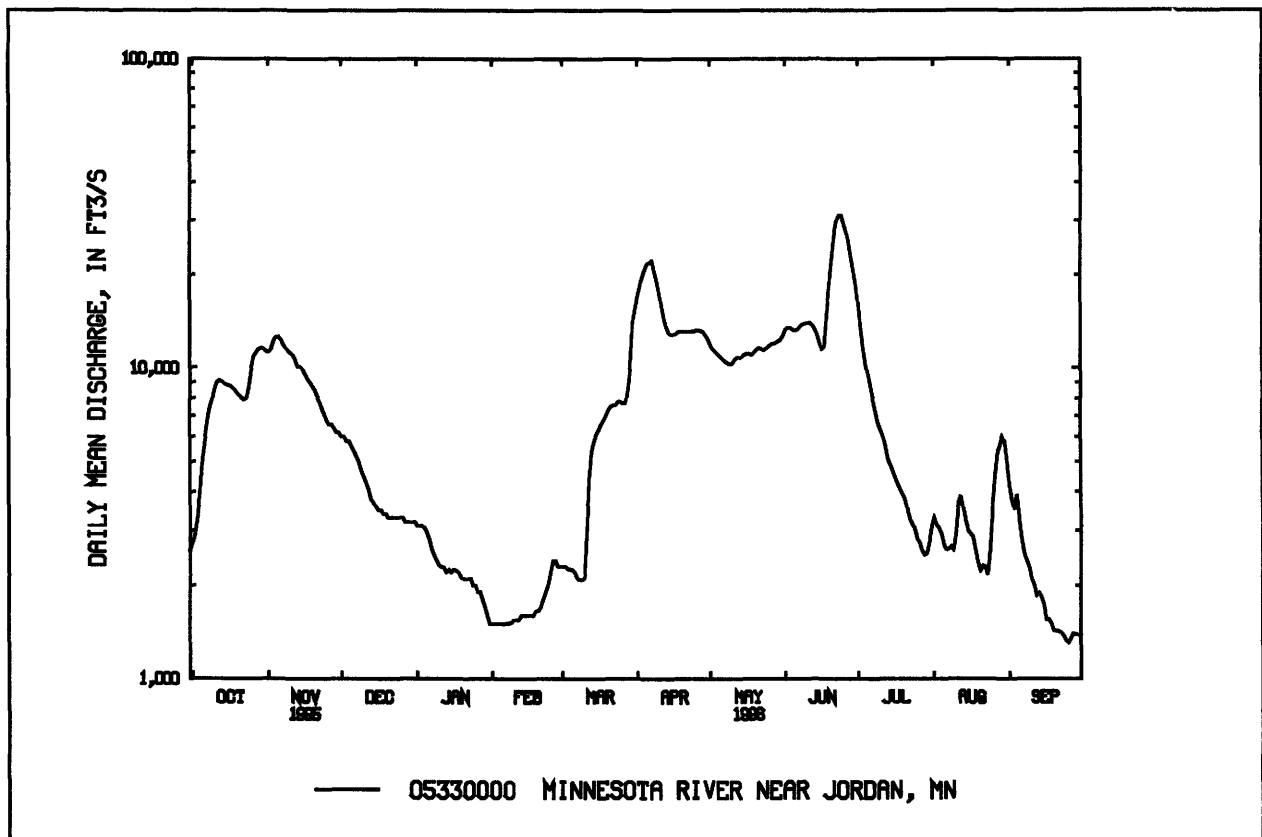
MINNESOTA RIVER BASIN

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1935 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2238	2127	1466	888	939	5080	11680	7772	7630	5724	3268	2298
MAX	16030	9463	5216	3344	3992	21170	48210	25510	41460	38640	25660	14460
(WY)	1969	1996	1983	1992	1983	1983	1969	1993	1993	1993	1993	1993
MIN	167	178	158	111	130	322	926	923	633	279	178	183
(WY)	1935	1935	1977	1940	1940	1940	1959	1959	1976	1936	1936	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1935 - 1996
ANNUAL TOTAL	3552500	2662830	
ANNUAL MEAN	9733	7275	4266 ^a
HIGHEST ANNUAL MEAN			16910
LOWEST ANNUAL MEAN			687
HIGHEST DAILY MEAN	29600	Apr 26	31200
LOWEST DAILY MEAN	1250	Feb 15	1310
ANNUAL SEVEN-DAY MINIMUM	1250	Feb 15	1360
INSTANTANEOUS PEAK FLOW			31500
INSTANTANEOUS PEAK STAGE			24.99
INSTANTANEOUS LOW FLOW			79
ANNUAL RUNOFF (AC-FT)	7046000	5282000	3090000
ANNUAL RUNOFF (CFSM)	.60	.45	.26
ANNUAL RUNOFF (INCHES)	8.16	6.11	3.58
10 PERCENT EXCEEDS	20300	13500	11500
50 PERCENT EXCEEDS	8710	5630	1740
90 PERCENT EXCEEDS	1460	1650	303

^a Median of annual mean discharges is 3440 ft³/s.

MINNESOTA RIVER BASIN

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued
(National Stream-Quality Accounting Network Station)
(National Water-Quality Assessment Station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1952, 1963-69, 1972 to current year.

REMARKS.--Letter E indicates estimated value.

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL STREAM-QUALITY ACCOUNTING NETWORK

WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
------	------	-----------------------------------------------------------------------	---------------------------------------------------------------------	---------------------------------------------------------------------	----------------------------------------------------------------------	--------------------------------------------------------------------	-------------------------------------------------	-----------------------------------------	-----------------------------------------------------------------	------------------------------------------------	---------------------------------------------------------	-----------------------------------------------------------------

NOV	01...	1230	11200	1080	974	7.6	8.2	2.5	5.2	--	13.7	110	51
APR	03...	1200	20800	486	514	7.8	7.5	3.0	65	--	11.7	60	22
	16...	1337	12700	710	719	8.1	8.1	5.5	25	746	11.6	83	33
SEP	05...	1230	3070	635	634	7.8	7.9	24.0	160	740	6.0	70	30

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LITY WAT DIS TOT IT FIELD (MG/L AS CACO3) (39086)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CAR- BONATE WATER DIS IT FIELD (MG/L AS CO3) (00452)	BICAR- BONATE WATER DIS IT FIELD (MG/L AS HCO3) (00453)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)
------	---------------------------------------------------------	----------------------------------------------------------------	---------------------------------------------------------------------------------	----------------------------------------------------------	------------------------------------------------------------------------------	---------------------------------------------------------------------------------	----------------------------------------------------------	----------------------------------------------------------------	---------------------------------------------------------------	--------------------------------------------------------------	-------------------------------------------------------------------------------	--------------------------------------------------------------------------

NOV	01...	20	4.5	292	304	0	356	210	21	0.40	21	725	0.01C
APR	03...	9.1	5.9	154	162	0	188	71	13	0.20	15	319	0.06C
	16...	15	5.2	220	--	0	268	140	16	0.30	14	469	0.01C
SEP	05...	16	4.2	206	--	0	251	110	18	0.30	18	422	0.05C

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- ONIA DIS- SOLVED (MG/L AS N) (00623)	NITRO- GEN,AM- ONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTH- DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)
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NOV	01...	7.30	<0.015	0.60	1.0	0.210	0.060	0.060	6.5	1.2	126	77	<10
APR	03...	4.00	0.300	1.1	1.4	0.300	0.170	0.170	8.0	4.0	242	78	<10
	16...	2.40	<0.015	0.60	1.0	0.220	0.110	0.072	6.2	4.0	142	81	4
SEP	05...	2.80	0.070	0.50	1.1	0.250	0.080	0.098	4.7	0.50	--	--	7

MINNESOTA RIVER BASIN

05330000- MINNESOTA RIVER NEAR JORDAN, MN--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL STREAM-QUALITY ACCOUNTING NETWORK

WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)
NOV 01...	2	72	<0.5	--	<1.0	<5	<3	1	<3	<1	43	5
APR 03...	<1	45	0.8	--	<1.0	<5	<3	1	16	<1	17	44
16...	2	50	<1	40	<1.0	2	<1	2	5	<1	27	4
SEP 05...	3	69	<1	80	<1.0	1	<1	3	5	<1	25	1

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	ANTI- MONY, DIS- SOLVED (UG/L AS SB) (01095)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)
NOV 01...	<10	2	2	<1.0	430	<6	5	--	--	<0.007	<0.002	<0.005
APR 03...	<10	6	<1	<1.0	180	<6	6	--	--	<0.007	<0.002	<0.005
16...	2	3	1	<1.0	280	<6	24	<1	8.0	<0.007	<0.002	E0.005
SEP 05...	4	4	2	<1.0	260	<6	4	<1	7.0	<0.007	<0.002	<0.005

DATE	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFO S WAT- ER, DISS REC (UG/L) (04095)	ALKA- LITY FET LAB CACO3 (MG/L) (29801)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	MALA- THION, DIS- SOLVED (UG/L) (39532)
NOV 01...	E0.009	E0.016	0.013	<0.003	--	<0.002	<0.006	<0.004	<0.004	<0.001	0.046	<0.005
APR 03...	<0.018	E0.019	0.018	<0.003	--	<0.002	<0.006	<0.004	<0.004	<0.001	1.40	<0.005
16...	<0.018	E0.012	0.014	<0.003	230	<0.002	<0.006	<0.004	<0.004	<0.001	0.290	<0.005
SEP 05...	0.023	E0.024	0.018	<0.003	210	<0.002	<0.006	<0.004	<0.004	<0.001	0.130	<0.005

MINNESOTA RIVER BASIN

05330000- MINNESOTA RIVER NEAR JORDAN, MN--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL STREAM-QUALITY ACCOUNTING NETWORK

WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	PARATHION, DIS- SOLVED (UG/L) (39542)	DI-AZINON, DIS- SOLVED (UG/L) (39572)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ACETO-CHLOR, WATER, FLTRD REC (UG/L) (49260)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U (UG/L) (82660)	TRI-FLUR-ALIN WAT FLT 0.7 U (UG/L) (82661)	ETHAL-FLUR-ALIN WAT FLT 0.7 U (UG/L) (82663)	PHORATE WATER FLTRD GF, REC (UG/L) (82664)	TER-BACIL WATER FLTRD GF, REC (UG/L) (82665)	LIN-URON WATER FLTRD GF, REC (UG/L) (82666)
NOV 01...	<0.004	<0.002	0.072	0.007	E0.004	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002
APR 03...	<0.004	<0.002	0.089	0.016	0.041	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002
16...	<0.004	<0.002	0.057	0.009	0.020	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002
SEP 05...	<0.004	<0.002	0.101	<0.002	0.012	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002
DATE	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
NOV 01...	<0.006	<0.008	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001
APR 03...	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001
16...	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	0.012	<0.017	<0.001
SEP 05...	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001
DATE	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL-AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	DIAZ-INON D10 SRG WAT FLT 0.7 U GF, REC (UG/L) (91063)	TERBUTH YLAZINE WAT FLT 0.7 U GF, REC (UG/L) (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC (UG/L) (91065)
NOV 01...	<0.004	<0.003	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	110	118	120
APR 03...	<0.004	<0.003	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	96.8	112	110
16...	<0.004	E0.008	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	119	124	120
SEP 05...	<0.004	<0.003	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	119	124	90.2

MINNESOTA RIVER BASIN

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL WATER-QUALITY ASSESSMENT PROGRAM

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: June to September 1996.

WATER TEMPERATURES: June to September 1996.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum, 27.0°C, June 30; minimum, 13.5°C, Sep. 28

SPECIFIC CONDUCTANCE: Maximum, 1030 us/cm, June 14-16; minimum, 628 us/cm, June 19.

REMARKS.-- Electronic data logger and water temperature/ specific conductance probe installed June 13, 1996.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	---	---	---	27.0	26.0	26.5	24.0	22.5	23.0	24.0	23.0	23.5
2	---	---	---	26.0	25.5	26.0	25.0	23.5	24.0	24.0	23.5	23.5
3	---	---	---	25.5	25.0	25.0	24.5	24.0	24.5	24.5	23.5	24.0
4	---	---	---	25.5	24.5	25.0	24.5	24.0	24.5	25.0	24.0	24.5
5	---	---	---	26.0	24.5	25.5	25.0	24.0	24.5	25.0	23.5	24.5
6	---	---	---	25.5	25.5	25.5	26.5	24.5	25.5	25.5	24.5	25.0
7	---	---	---	25.5	25.0	25.5	27.0	25.5	26.0	25.0	24.5	25.0
8	---	---	---	25.5	24.5	25.0	27.0	25.5	26.0	24.5	23.5	24.0
9	---	---	---	24.5	23.5	24.0	26.5	25.0	25.5	24.0	22.5	23.0
10	---	---	---	23.5	23.0	23.0	25.5	24.0	25.0	24.0	22.5	23.0
11	---	---	---	23.5	22.5	22.5	25.0	24.0	24.5	23.0	21.5	22.5
12	---	---	---	23.0	22.0	22.5	25.0	24.0	24.5	21.5	20.0	20.5
13	25.0	23.5	24.5	22.5	17.5	19.0	25.5	24.5	25.0	20.0	18.5	19.0
14	25.0	24.0	24.5	18.0	16.5	17.5	25.5	24.5	25.0	19.0	17.5	18.0
15	25.0	25.0	25.0	23.5	17.5	21.0	25.0	24.0	24.5	18.5	17.5	18.0
16	25.0	24.5	25.0	24.5	22.5	23.5	25.0	24.0	24.5	18.0	17.0	17.5
17	24.5	22.5	23.5	25.0	23.5	24.0	25.0	23.5	24.5	17.5	17.0	17.5
18	22.5	19.5	20.5	26.0	24.5	25.5	24.5	24.0	24.5	18.0	16.5	17.5
19	19.5	19.0	19.0	26.0	25.5	26.0	24.0	23.5	23.5	17.5	17.0	17.5
20	20.0	19.0	19.5	25.5	25.0	25.5	24.5	22.5	23.5	17.5	17.0	17.0
21	20.5	20.0	20.0	25.5	25.0	25.5	25.0	23.0	24.0	17.0	16.5	17.0
22	20.5	20.0	20.5	25.5	25.0	25.0	25.0	24.0	24.5	17.5	16.0	16.5
23	21.0	20.5	20.5	25.0	24.5	25.0	25.0	23.5	24.0	17.5	16.5	17.0
24	21.5	21.0	21.0	24.5	24.0	24.0	25.0	23.5	24.5	17.0	16.0	16.5
25	22.5	21.0	21.5	24.5	23.0	24.0	25.5	24.0	24.5	16.5	16.0	16.0
26	23.5	22.0	23.0	24.0	23.0	23.5	25.5	24.0	24.5	16.0	15.0	15.5
27	25.0	23.5	24.0	26.0	17.5	19.5	24.0	23.5	24.0	15.0	14.5	14.5
28	26.0	24.5	25.0	18.5	17.0	17.5	23.5	22.5	23.0	15.0	13.5	14.5
29	27.0	26.0	26.5	23.0	17.5	20.5	23.0	22.5	22.5	15.0	14.0	14.5
30	27.0	26.5	27.0	23.0	21.5	22.5	23.0	22.0	22.5	15.5	14.5	15.0
31	---	---	---	23.5	22.0	23.0	23.5	22.5	23.0	---	---	---
MONTH	---	---	---	27.0	16.5	23.5	27.0	22.0	24.5	25.5	13.5	19.5

MINNESOTA RIVER BASIN

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL WATER-QUALITY ASSESSMENT PROGRAM

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	---	---	---	954	848	927	820	753	780	825	732	777
2	---	---	---	941	815	887	807	765	793	837	820	827
3	---	---	---	932	880	914	843	769	825	827	747	787
4	---	---	---	921	806	861	820	763	781	---	---	---
5	---	---	---	884	808	826	845	744	817	---	---	---
6	---	---	---	914	852	881	832	776	804	---	---	---
7	---	---	---	951	914	937	872	767	842	---	---	---
8	---	---	---	951	915	929	860	782	835	---	---	---
9	---	---	---	916	882	898	832	738	791	768	740	751
10	---	---	---	883	872	877	791	727	765	835	742	775
11	---	---	---	872	866	868	797	731	765	839	758	800
12	---	---	---	870	865	867	867	777	822	---	---	---
13	1010	989	998	870	859	863	872	791	857	---	---	---
14	1030	1010	1020	872	860	867	791	743	755	---	---	---
15	1030	1010	1030	903	872	888	788	686	712	---	---	---
16	1030	1010	1030	918	902	909	800	648	767	---	---	---
17	1020	934	1000	922	912	919	833	789	815	852	770	779
18	934	609	734	921	913	917	789	718	745	794	775	786
19	641	613	628	915	902	909	824	759	795	776	744	767
20	671	630	641	902	887	894	911	787	846	---	---	---
21	659	638	647	892	877	886	859	761	819	---	---	---
22	691	658	673	905	857	884	801	740	775	---	---	---
23	736	691	711	905	878	888	844	772	810	---	---	---
24	786	736	760	894	859	872	874	830	850	---	---	---
25	836	783	810	874	828	853	867	852	857	---	---	---
26	876	836	855	869	850	860	790	728	764	---	---	---
27	902	873	886	913	806	829	792	702	750	880	871	875
28	925	897	910	815	804	811	---	---	---	881	853	870
29	936	922	930	832	812	824	---	---	---	874	852	863
30	943	933	937	829	819	823	685	671	676	889	856	878
31	---	---	---	827	772	818	732	679	703	---	---	---
MONTH	---	---	---	954	772	877	---	---	---	---	---	---

MINNESOTA RIVER BASIN

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL WATER-QUALITY ASSESSMENT PROGRAM

WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)
MAR												
12...	1205	4300	930	950	7.3	7.7	0.0	740	10.7	289	304	0
APR												
03...	1130	20800	486	513	7.8	7.6	3.0	735	11.7	154	162	0
MAY												
21...	1310	11700	908	887	8.1	8.1	20.0	728	8.4	266	252	3
JUN												
13...	1055	13400	991	960	8.0	8.1	23.5	745	7.4	261	278	0
20...	1105	21600	652	648	7.8	7.5	19.0	741	6.5	183	197	0
JUL												
17...	1210	4270	905	889	8.1	8.0	23.5	740	9.1	259	289	0
AUG												
12...	1215	3870	802	795	8.3	8.1	24.0	747	8.3	224	231	0
SEP												
05...	1145	3070	634	630	7.8	7.8	24.0	740	6.0	176	200	0

DATE	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITRO- GEN, DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- ONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN,AM- ONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	SUS- PENDE TOTAL (MG/L AS C) (00689)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
MAR												
12...	353	0.370	0.040	1.2	1.4	2.60	0.260	0.200	0.170	7.6	0.80	656
APR												
03...	188	0.310	0.060	1.0	1.5	3.70	0.460	0.190	0.180	8.2	3.8	324
MAY												
21...	318	0.020	0.080	0.70	1.2	3.70	0.130	0.030	<0.010	6.3	3.2	615
JUN												
13...	318	0.030	0.030	0.50	1.0	5.30	0.160	0.050	0.050	6.2	1.4	690
20...	223	0.090	0.100	0.90	1.3	9.50	0.260	0.150	0.130	6.7	2.2	448
JUL												
17...	316	0.040	0.020	0.40	1.2	3.30	0.210	0.050	0.060	5.4	--	599
AUG												
12...	273	0.080	0.020	0.60	1.7	1.10	0.290	0.040	0.060	5.8	2.7	530
SEP												
05...	215	0.080	0.060	0.50	1.6	2.80	0.460	0.080	0.100	4.9	>5.0	394

MINNESOTA RIVER BASIN

05330000- MINNESOTA RIVER NEAR JORDAN, MN--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL WATER-QUALITY ASSESSMENT PROGRAM

WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAR 12...	110	49	23	7.4	21	200	0.30	21	18	41	184	27
APR 03...	58	22	8.9	5.5	13	72	0.20	15	30	43	242	78
MAY 21...	87	45	18	4.1	20	200	0.30	6.7	3	<1	181	86
JUN 13...	110	53	21	4.2	18	220	0.40	13	<3	2	200	76
20...	72	28	10	4.1	14	93	0.30	19	12	18	332	75
JUL 17...	98	45	21	3.9	22	160	0.40	20	<3	2	253	75
AUG 12...	76	40	22	5.0	22	170	0.30	17	<3	2	230	98
SEP 05...	68	29	15	4.1	17	100	0.30	18	<3	1	511	99

DATE	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	BRO- MACIL, WATER, DISS, REC (UG/L) (04029)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER, DISS, REC (UG/L) (04095)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	DICAMBALINURON WATER, FLTRD, GF 0.7U REC (UG/L) (38442)	NURON WATER, FLTRD, GF 0.7U REC (UG/L) (38478)
MAR 12...	--	--	--	--	--	--	--	--	--	--	--	--
APR 03...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 21...	0.008	<0.002	--	<0.005	E0.010	E0.018	0.032	<0.003	<0.002	<0.006	--	--
JUN 13...	E0.005	<0.002	--	0.010	E0.014	E0.029	0.880	<0.003	<0.002	<0.006	--	--
20...	0.015	<0.002	--	E0.003	0.022	E0.080	1.00	<0.003	<0.002	<0.006	--	--
JUL 17...	<0.007	<0.002	<0.035	<0.005	E0.017	E0.022	0.065	<0.003	<0.002	<0.006	<0.035	<0.018
AUG 12...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 05...	<0.007	<0.002	--	<0.005	0.023	E0.013	0.015	<0.003	<0.002	<0.006	--	--

MINNESOTA RIVER BASIN

05330000- MINNESOTA RIVER NEAR JORDAN, MN--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL WATER-QUALITY ASSESSMENT PROGRAM

WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	MCPA, WATER, FLTRD, GF 0.7U REC (UG/L) (38482)	MCPB, WATER, FLTRD, GF 0.7U REC (UG/L) (38487)	METHIO- CARB, WATER, FLTRD, GF 0.7U REC (UG/L) (38501)	PRO- POXUR, WATER, FLTRD, GF 0.7U REC (UG/L) (38538)	BENTA- ZON, WATER, FLTRD, GF 0.7U REC (UG/L) (38711)	2,4-DB WATER, FLTRD, GF 0.7U REC (UG/L) (38746)	FLUO- METURONOXAMYL, WATER, FLTRD, GF 0.7U REC (UG/L) (38811)	WATER, FLTRD, GF 0.7U REC (UG/L) (38866)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)
MAR 12...	--	--	--	--	--	--	--	--	--	--	--	--
APR 03...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 21...	--	--	--	--	--	--	--	--	<0.004	<0.004	<0.001	0.260
JUN 13...	--	--	--	--	--	--	--	--	<0.004	<0.004	<0.001	0.250
JUN 20...	--	--	--	--	--	--	--	--	<0.004	<0.004	<0.001	1.30
JUL 17...	<0.050	<0.035	<0.026	<0.035	0.240	<0.035	<0.035	<0.018	<0.004	<0.004	<0.001	0.087
AUG 12...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 05...	--	--	--	--	--	--	--	--	<0.004	<0.004	<0.001	0.107

DATE	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	2,4-D, DIS- SOLVED (UG/L) (39732)	2,4,5-T DIS- SOLVED (UG/L) (39742)	SILVEX, DIS- SOLVED (UG/L) (39762)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	TRI- CLOPYR, WATER, FLTRD, GF 0.7U REC (UG/L) (49235)	PRO- PHAM, WATER, FLTRD, GF 0.7U REC (UG/L) (49236)	ACETO- CHLOR, WATER, FLTRD, REC (UG/L) (49260)	PIC- LORAM, WATER, FLTRD, GF 0.7U REC (UG/L) (49291)
MAR 12...	--	--	--	--	--	--	--	--	--	--	--	--
APR 03...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 21...	<0.005	<0.004	<0.002	0.070	--	--	--	0.018	--	--	0.200	--
JUN 13...	<0.005	<0.004	<0.002	0.410	--	--	--	0.150	--	--	0.170	--
JUN 20...	<0.005	<0.004	<0.002	1.80	--	--	--	0.490	--	--	1.50	--
JUL 17...	<0.005	<0.004	<0.002	0.160	<0.035	<0.035	<0.021	0.008	<0.050	<0.035	0.016	<0.050
AUG 12...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 05...	<0.005	<0.004	<0.002	0.113	--	--	--	<0.002	--	--	0.012	--

MINNESOTA RIVER BASIN

05330000- MINNESOTA RIVER NEAR JORDAN, MN--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL WATER-QUALITY ASSESSMENT PROGRAM*

WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	ORY-ZALIN, WATER, FLTRD, GF 0.7U REC (UG/L) (49292)	NORFLURAZON, WATER, FLTRD, GF 0.7U REC (UG/L) (49293)	NEB-URON, WATER, FLTRD, GF 0.7U REC (UG/L) (49294)	1-NAPHTHOL, WATER, FLTRD, GF 0.7U REC (UG/L) (49295)	METH-OMYL, WATER, FLTRD, GF 0.7U REC (UG/L) (49296)	FEN-URON, WATER, FLTRD, GF 0.7U REC (UG/L) (49297)	ESFEN-VAL-ERATE, WAT,FLT GF 0.7U REC (UG/L) (49298)	DNOC WAT,FLT GF 0.7U REC (UG/L) (49299)	DIURON, WATER, FLTRD, GF 0.7U REC (UG/L) (49300)	DINOSEB WATER, FLTRD, GF 0.7U REC (UG/L) (49301)	DICHLORPROP, WATER, FLTRD, GF 0.7U REC (UG/L) (49302)	DICHLORBENIL, WATER, FLTRD, GF 0.7U REC (UG/L) (49303)	
	JUL 17...	<0.019	<0.024	<0.015	<0.007	<0.017	<0.013	<0.019	<0.035	<0.020	<0.035	<0.032	<0.020
	DATE	DACTHALMONO-ACID, WAT,FLT GF 0.7U REC (UG/L) (49304)	CLOPYRALID, WATER, FLTRD, GF 0.7U REC (UG/L) (49305)	CHLOROTHALONIL, WAT,FLT GF 0.7U REC (UG/L) (49306)	CHLOR-AMBEN, WATER, FLTRD, GF 0.7U REC (UG/L) (49307)	3HYDRXYCARBO-FURAN WAT,FLT GF 0.7U REC (UG/L) (49308)	CARBO-FURAN, WATER, FLTRD, GF 0.7U REC (UG/L) (49309)	CARBARYL, WATER, FLTRD, GF 0.7U REC (UG/L) (49310)	BRO-MOXYNIL WATER, FLTRD, GF 0.7U REC (UG/L) (49311)	ALDI-CARB, WATER, FLTRD, GF 0.7U REC (UG/L) (49312)	ALDI-CARB SULFONE WAT,FLT GF 0.7U REC (UG/L) (49313)	ALDICARB SULFOXIDE, WAT,FLT GF 0.7U REC (UG/L) (49314)	
	JUL 17...	<0.017	<0.050	<0.035	<0.011	<0.014	<0.028	<0.008	<0.035	<0.016	<0.016	<0.021	
DATE	ACIFLUORFEN WATER, FLTRD, GF 0.7U REC (UG/L) (49315)	METRI-BUZIN WATER DISSOLV (UG/L) (82630)	2,6-DI-ETHYL ANILINE WAT FLT GF, REC (UG/L) (82660)	TRI-FLUR-ALIN WAT FLT GF, REC (UG/L) (82661)	ETHAL-FLUR-ALIN WAT FLT GF, REC (UG/L) (82663)	PHORATE WATER FLTRD GF, REC (UG/L) (82664)	TER-BACIL WATER FLTRD GF, REC (UG/L) (82665)	LIN-URON WATER FLTRD GF, REC (UG/L) (82666)	METHYL-PARA-THION WAT FLT GF, REC (UG/L) (82667)	EPTC WATER FLTRD GF, REC (UG/L) (82668)	PEB-ULATIN WATER FILTRD GF, REC (UG/L) (82669)		
	MAY 21...	--	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	0.045	<0.004	
	JUN 13...	--	<0.004	<0.003	0.003	<0.004	<0.002	<0.007	<0.002	<0.006	0.015	<0.004	
	JUN 20...	--	0.048	<0.003	0.015	<0.004	<0.002	<0.007	<0.002	<0.006	0.044	<0.004	
JUL 17...	<0.035	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004		
SEP 05...	--	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004		

MINNESOTA RIVER BASIN

05330000- MINNESOTA RIVER NEAR JORDAN, MN--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL WATER-QUALITY ASSESSMENT PROGRAM

WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)
MAY 21...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
JUN 13...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
JUN 20...	<0.010	<0.004	<0.003	<0.002	E0.160	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
JUL 17...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
SEP 05...	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
DATE	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC PERCENT (91063)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT (91065)	BDMC, SURROG, WATER, UNFLTRD REC PERCENT (99835)
MAR 12...	--	--	--	--	--	--	--	--	--	--	--
APR 03...	--	--	--	--	--	--	--	--	--	--	--
MAY 21...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	182	146	114	--
JUN 13...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	144	140	110	--
JUN 20...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	116	121	116	--
JUL 17...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	120	122	113	E94.0
AUG 12...	--	--	--	--	--	--	--	--	--	--	--
SEP 05...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	95.2	103	86.0	--

MISSISSIPPI RIVER MAIN STEM

05331000 MISSISSIPPI RIVER AT ST. PAUL, MN

LOCATION.--LAT 44°56'40", long 93°05'20", inSE¼NE¼ sec. 6, T. 28 N., R. 22 W., Ramsey County, Hydrologic Unit 07010206, on left bank in St. Paul, 300 ft upstream from Robert Street Bridge, 6 mi downstream from Minnesota River, and at mile 839.3 upstream from Ohio River.

DRAINAGE AREA.--36,800 mi², approximately.

PERIOD OF RECORD.--Water year 1867-69, 1872-92 (annual maximums), March 1892 to current year (prior to 1901, fragmentary during some winters). Records prior to March 1892, published in the 19th Annual Report, Part 4, have been found to be unreliable and should not be used. Monthly discharge only for some periods, published in WSP 1308. Gage-height records (winter records incomplete) collected at same site since 1866 are contained in reports of U.S. Weather Bureau, War Department and Mississippi River Commission.

REVISED RECORDS.--WSP 285: 1892-96. WSP 715: Drainage area. WSP 875: 1938. WSP 895: 1939. WSP 1308: 1867(M). WSP 1508: 1897, 1898(M). 1903(M), 1917-18(M). 1928(M), 1929. WRD MN-74: 1973.

GAGE.--Water-stage recorder. Datum of gage is 683.62 ft above mean sea level. Prior to Mar. 18, 1925, nonrecording gage at several sites within 300 ft of present site at present datum. Since September 1938, auxiliary water-stage recorder 5.6 mi downstream.

REMARKS.--Records good. Slight regulation except during extreme floods by reservoirs on headquarters and by power plants. Beginning July 20, 1939, sewage from Minneapolis and St. Paul, which formerly entered above station, was diverted to a sewage-disposal plant, thence to river below station. Figures do not include this diversion.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8390	31600	e15300	e11400	e7660	e8190	30500	43700	34000	29300	10000	8390
2	9440	31400	e15000	e11500	e7820	e8980	32000	42900	33200	26500	10100	7210
3	12200	31300	e15200	e11000	e7240	e9680	33800	41600	32500	24300	10700	6860
4	15400	31900	e15000	e10100	e7290	e8430	35000	40200	32100	22500	10200	6740
5	19000	32200	e14500	e9730	e7520	e9010	36300	39800	31400	20700	9460	6900
6	22000	31100	e14000	e9700	e7230	e9250	37300	39000	30500	18100	9430	7170
7	24900	30600	e11400	e8980	e7720	e9250	39000	38100	31100	17400	8660	6000
8	26300	30100	e10600	e8690	e7830	e8400	39500	37600	30300	16900	8720	5610
9	27800	29100	e11300	e9070	e8000	e7960	39600	36700	29600	16400	8540	5420
10	28500	27800	e9260	e9980	e7920	e8450	39600	36000	29500	15400	8970	4850
11	29600	27600	e8610	e10300	e8000	e9100	39900	35800	29100	14800	8890	5390
12	30300	25600	e9170	e9690	e7960	e9730	40900	35800	28800	14300	9810	6120
13	30200	24600	e10900	e9570	e7700	e11100	42200	35700	27600	13900	10800	5620
14	29800	23400	e11300	e9830	e7930	12700	42500	35700	26500	13800	11000	5480
15	29300	22400	e11200	e9650	e7980	13700	43700	35800	25500	13700	10300	5130
16	29000	22100	e11800	e8180	e7920	14500	45600	35700	24300	13400	9670	5230
17	28700	22200	e11300	e8570	e8180	15400	47600	35600	24900	13700	9260	5010
18	28100	21900	e10900	e9980	e7930	17000	48700	35800	24800	13400	8880	4630
19	26900	21700	e11200	e8300	e8100	18100	49400	38800	26800	14200	8310	4760
20	26200	21000	e11500	e7800	e8090	18900	50000	41000	28200	13700	7950	4230
21	26100	20900	e11600	e6900	e8020	19900	50100	41600	31200	13100	7690	4330
22	24900	20300	e11000	e8190	e8240	20500	50100	42800	33600	12700	6730	4660
23	25200	18300	e11100	e8740	e8130	21300	50500	41400	35100	12200	7210	4590
24	26300	16900	e11300	e8450	e8370	22100	50200	41800	37700	12000	7090	4560
25	26900	15300	e11600	e8430	e8550	23200	49800	41500	39000	11200	6230	4350
26	28100	e15600	e11100	e8270	e8480	22500	48800	40900	38700	10700	6780	4390
27	28900	e15900	e10900	e7910	e8710	21300	48400	40100	37700	10600	7690	4270
28	30100	e15400	e11700	e7960	e9160	21300	47200	39000	35800	10200	9200	4230
29	30300	e14600	e11100	e8030	e8950	22700	46500	37500	33800	10300	9420	4930
30	30600	e13800	e10400	e7980	---	24900	45100	36100	31300	10300	9360	4780
31	30900	---	e11000	e7670	---	29400	---	35100	---	10400	8940	---
TOTAL	790330	706600	362240	280550	232630	476930	1299800	1199100	934600	470100	275990	161840
MEAN	25490	23550	11690	9050	8022	15380	43330	38680	31150	15160	8903	5395
MAX	30900	32200	15300	11500	9160	29400	50500	43700	39000	29300	11000	8390
MIN	8390	13800	8610	6900	7230	7960	30500	35100	24300	10200	6230	4230
AC-FT	1568000	1402000	718500	556500	461400	946000	2578000	2378000	1854000	932400	547400	321000
CFSM	.69	.64	.32	.25	.22	.42	1.18	1.05	.85	.41	.24	.15
IN.	.80	.71	.37	.28	.24	.48	1.31	1.21	.94	.48	.28	.16

e Estimated.

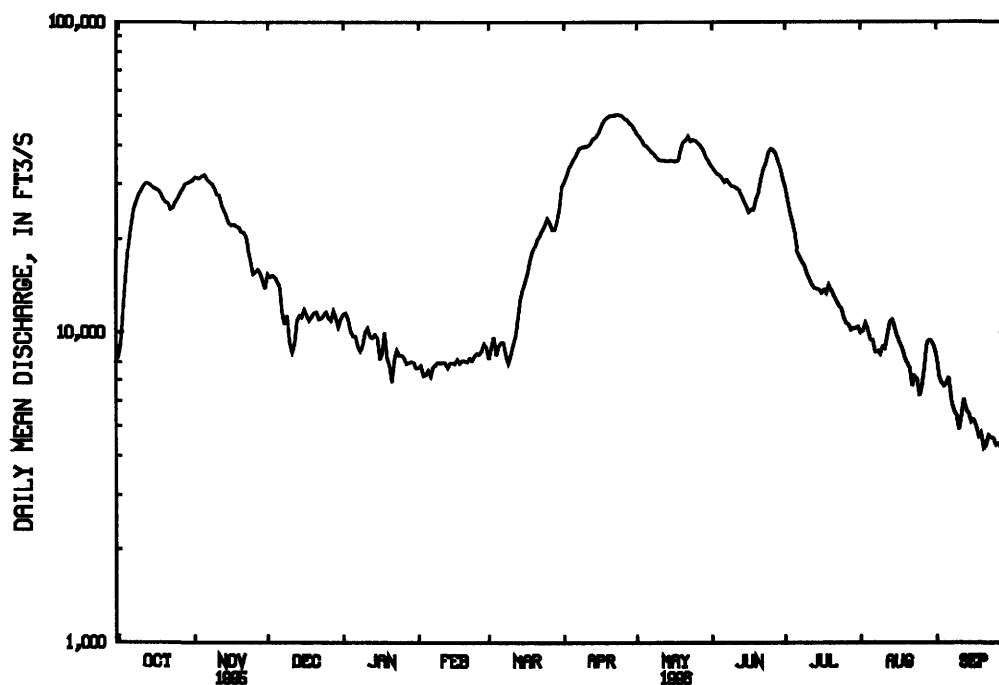
MISSISSIPPI RIVER MAIN STEM

05331000 MISSISSIPPI RIVER AT ST. PAUL, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1892 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	8587	7751	5543	4518	4449	11020	25310	20680	18100	14140	8797	8072
MAX	38210	27660	16080	11500	14700	43240	91610	66470	57170	73590	42550	34380
(WY)	1987	1972	1983	1983	1966	1983	1969	1986	1993	1993	1993	1986
MIN	1289	1348	1277	1097	1300	1757	3421	3085	1980	1272	864	1143
(WY)	1937	1937	1935	1935	1895	1940	1895	1934	1934	1934	1934	1934

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1892 - 1996
ANNUAL TOTAL	8041070	7190710	
ANNUAL MEAN	22030	19650	11480
HIGHEST ANNUAL MEAN			29580
LOWEST ANNUAL MEAN			1935
HIGHEST DAILY MEAN	53700	Apr 28	171000
LOWEST DAILY MEAN	4670	Feb 11	632
ANNUAL SEVEN-DAY MINIMUM	5600	Mar 5	741
INSTANTANEOUS PEAK FLOW		50800	Apr 23
INSTANTANEOUS PEAK STAGE		10.39	Apr 23
ANNUAL RUNOFF (AC-FT)	15950000	14260000	8314000
ANNUAL RUNOFF (CFSM)	.60	.53	.31
ANNUAL RUNOFF (INCHES)	8.13	7.27	4.24
10 PERCENT EXCEEDS	41400	39100	27200
50 PERCENT EXCEEDS	20000	13900	7030
90 PERCENT EXCEEDS	6740	7240	2690



— 05331000 MISSISSIPPI RIVER AT ST. PAUL, MN

MISSISSIPPI RIVER MAIN STEM

05331580 MISSISSIPPI RIVER BELOW LOCK AND DAM 2, AT HASTINGS, MN

LOCATION.--Lat 44°44'48", long 92°51'08", SE 1/4 SE 1/4 sec.21, T.115 N., R.17 W., Dakota County, Hydrologic Unit 07010206, near bridge on U.S. Highway 61 in Hastings, 1.2 mi downstream from Lock and Dam 2, 2.5 mi upstream from St. Croix River, and at mile 813.8 upstream from Ohio River.

DRAINAGE AREA.--37,050 mi².

PERIOD OF RECORD.--October to September 1996.

REMARKS.--Water-discharge computed on the basis of routed discharge for Mississippi River at St. Paul (station 05331000) adjusted for inflow and travel time.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

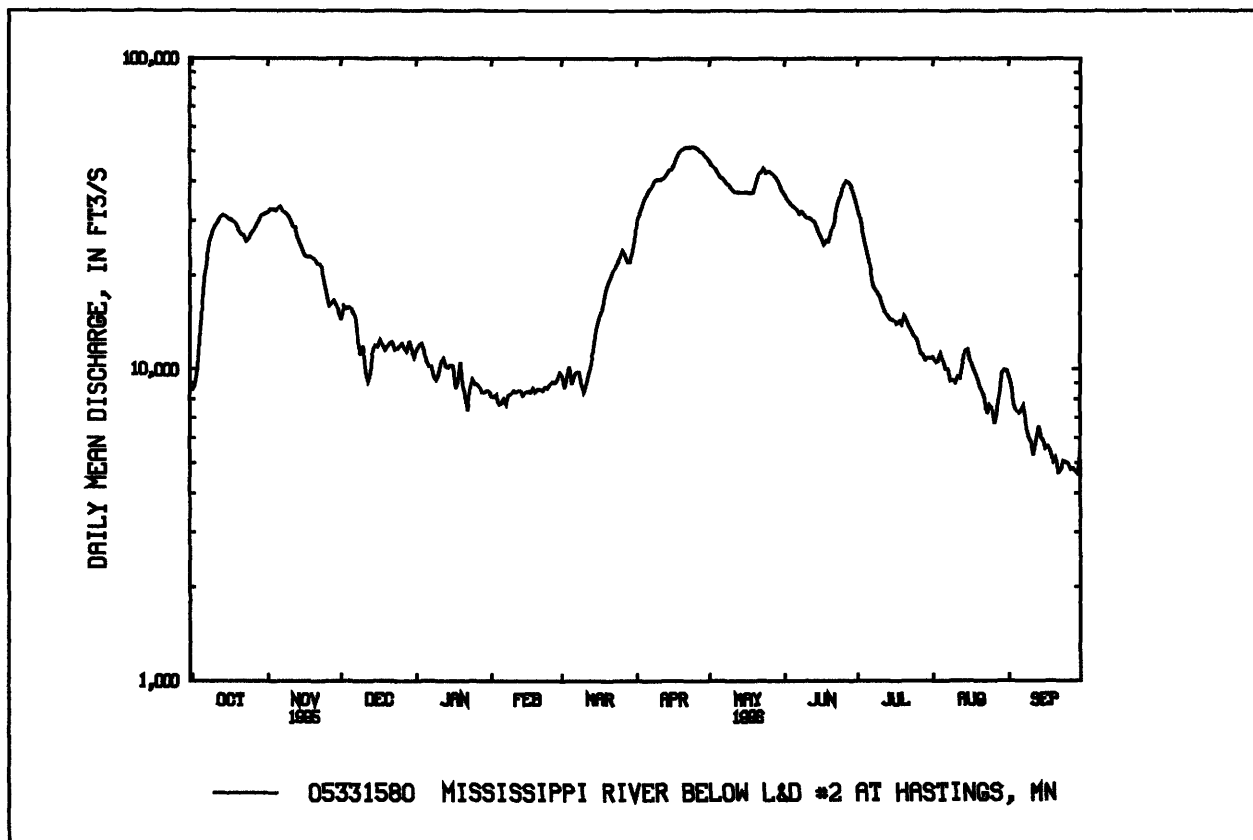
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8590	31900	e14400	e11500	e8150	e9470	30300	46400	36200	32300	10900	9420
2	8900	32600	e15900	e11900	e8140	e8690	31500	44900	35000	30200	10500	8750
3	10000	32400	e15600	e12100	e8300	e9490	33000	44200	34200	27400	10600	7680
4	12800	32300	e15800	e11500	e7710	e10200	34800	42800	33500	25100	11200	7340
5	16000	32900	e15600	e10600	e7760	e8940	36000	41400	33100	23300	10700	7210
6	19800	33200	e15100	e10200	e8000	e9520	37400	41000	32400	21400	10000	7370
7	22800	32100	e14600	e10200	e7700	e9760	38400	40200	31500	18800	9990	7640
8	25700	31600	e12000	e9480	e8220	e9760	40100	39200	32100	18100	9180	6430
9	27200	31100	e11100	e9190	e8300	e8890	40700	38700	31200	17600	9230	6040
10	28700	30000	e11900	e9580	e8510	e8440	40700	37900	30500	17100	9040	5860
11	29400	28700	e9770	e10500	e8420	e8940	40700	37100	30400	16000	9460	5280
12	30500	28500	e9120	e10800	e8490	e9650	41100	36900	30000	15400	9380	5820
13	31200	26400	e9690	e10200	e8460	e10300	42100	36900	29700	14900	10400	6570
14	31100	25400	e11500	e10100	e8200	11700	43400	36800	28500	14500	11400	6050
15	30700	24200	e11900	e10300	e8420	13300	43700	36800	27400	14400	11600	5890
16	30200	23200	e11800	e10200	e8470	14300	44900	36900	26300	14300	10800	5540
17	29900	22900	e12400	e8670	e8410	15100	46900	36800	25100	14000	10200	5660
18	29600	23000	e11900	e9100	e8670	16000	48900	36700	25800	14300	9740	5430
19	29000	22700	e11500	e10500	e8410	17700	50100	36900	25700	14000	9350	5040
20	27800	22500	e11800	e8800	e8620	18800	50800	40000	27700	14800	8780	5190
21	27100	21800	e12100	e8280	e8600	19600	51400	42200	29100	14300	8410	4640
22	26900	21700	e12200	e7360	e8510	20600	51500	42800	32200	13700	8180	4740
23	25700	21100	e11500	e8680	e8750	21300	51500	44000	34600	13300	7190	5070
24	26100	19000	e11600	e9240	e8670	22100	51900	42600	36100	12800	7670	5010
25	27200	17600	e11800	e8940	e8930	22900	51600	43000	38800	12600	7530	4980
26	27800	e15900	e12100	e8920	e9080	24000	51200	42700	40100	11800	6660	4770
27	29000	e16200	e11600	e8760	e8990	23300	50100	42000	39800	11200	7240	4810
28	29900	e16600	e11400	e8390	e9220	22100	49700	41300	38800	11100	8170	4680
29	31100	e16000	e12300	e8390	e9680	22100	48500	40200	36900	10700	9720	4620
30	31300	e15200	e11600	e8520	---	23500	47700	38600	34800	10900	9940	5340
31	31600	---	e10900	e8460	---	25800	---	37200	---	10800	9880	---
TOTAL	793590	748700	382480	299360	245790	476250	1320600	1245100	967500	511100	293040	178870
MEAN	25600	24960	12340	9657	8476	15360	44020	40160	32250	16490	9453	5962
MAX	31600	33200	15900	12100	9680	25800	51900	46400	40100	32300	11600	9420
MIN	8590	15200	9120	7360	7700	8440	30300	36700	25100	10700	6660	4620
AC-FT	1574000	1485000	758600	593800	487500	944600	2619000	2470000	1919000	1014000	581200	354800
CFSM	.69	.67	.33	.26	.23	.41	1.19	1.08	.87	.44	.25	.16
IN.	.80	.75	.38	.30	.25	.48	1.32	1.25	.97	.51	.29	.18

e Estimated.

MISSISSIPPI RIVER MAIN STEM

05331580 MISSISSIPPI RIVER BELOW LOCK AND DAM 2, AT HASTINGS, MN--Continued



MISSISSIPPI RIVER MAIN STEM

05331580 MISSISSIPPI RIVER BELOW LOCK AND DAM 2, AT HASTINGS, MN--Continued
(National Stream-Quality Accounting Network)
(National Water-Quality Assessment Station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1995 to September 1996, NASQAN discontinued.

NASQAN samples previously collected at Mississippi River at Ninninger (station no. 05331570), September 1977 to September 1995.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: May 1996 to September 1996.

REMARKS.-- Water-quality monitor since May 1996.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum, 28.0°C, June 29, 30, 1996; minimum, 11.5°C, May 12, 1996.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum 28.0°C, June 29, 30; minimum, 11.5°C, May 12.

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL STREAM-QUALITY ACCOUNTING NETWORK

WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
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OCT

02...	1230	8900	555	545	8.3	8.0	16.5	19	--	9.2	54	24
31...	1300	31600	739	586	7.6	8.1	2.0	15	750	14.8	69	28

APR

26...	1015	51200	414	430	8.3	8.0	9.0	26	738	10.5	49	17
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MAY

15...	1315	36800	500	506	8.2	8.0	12.5	3.9	736	10.4	55	22
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SEP

10...	1230	5860	654	650	8.1	8.1	23.5	20	746	5.9	65	26
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DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	ALKA- LITY WAT.DIS FET LAB CACO3 (MG/L) (29801)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
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OCT

02...	21	3.7	185	196	--	0	226	59	28	0.20	10	335
31...	14	3.6	196	209	--	0	239	74	18	0.30	15	390

APR

26...	9.4	3.8	141	--	150	0	172	50	13	0.20	8.2	259
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MAY

15...	13	3.1	161	--	170	0	196	65	16	0.20	6.2	317
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SEP

10...	22	3.8	207	--	220	0	253	75	30	0.40	16	399
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DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- ONIA DIS- SOLVED (MG/L AS N) (00623)	NITRO- GEN,AM- ONIA + TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTH- DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
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OCT

02...	0.020	0.980	0.020	0.50	0.90	0.220	0.120	0.110	7.0	2.7	--	--
31...	0.010	3.20	0.030	0.70	0.90	0.170	0.090	0.080	9.3	1.1	35	96

APR

26...	0.020	0.930	<0.015	0.60	1.1	0.210	0.040	0.033	9.1	4.3	130	97
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MAY

15...	0.020	1.40	0.030	0.60	1.0	0.150	0.050	0.032	8.3	2.6	31	97
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SEP

10...	0.120	2.30	0.290	0.80	1.2	0.240	0.150	0.150	6.3	2.7	37	98
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MISSISSIPPI RIVER MAIN STEM

05331580 MISSISSIPPI RIVER BELOW LOCK AND DAM 2, AT HASTINGS, MN.--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL STREAM-QUALITY ACCOUNTING NETWORK

WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)
OCT												
02...	10	2	50	<0.5	--	<1.0	<5	<3	1	6	<1	13
31...	<10	1	54	<0.5	--	<1.0	<5	<3	2	46	<1	18
APR												
26...	10	<1	44	<1	40	<1.0	2	<1	2	130	<1	11
MAY												
15...	6	<1	47	<1	40	<1.0	<1	<1	2	43	<1	15
SEP												
10...	1	3	65	<1	70	<1.0	<1	<1	2	3	<1	17

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	ANTI- MONY, DIS- SOLVED (UG/L AS SB) (01095)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)
OCT												
02...	1	<10	2	<1	<1.0	170	<6	<3	--	--	<0.007	<0.002
31...	13	<10	2	1	<1.0	210	<6	<3	--	--	<0.007	<0.002
APR												
26...	33	1	3	<1	<1.0	130	<6	55	<1	3.0	<0.007	<0.002
MAY												
15...	27	2	3	<1	<1.0	160	<6	7	<1	4.0	<0.007	<0.002
SEP												
10...	3	4	3	2	<1.0	210	<6	3	<1	5.0	<0.007	<0.002

DATE	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER, DISS, REC (UG/L) (04095)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	MALA- THION, DIS- SOLVED (UG/L) (39532)
OCT												
02...	0.013	0.019	E0.013	E0.034	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	0.015	<0.005
31...	<0.005	E0.007	E0.011	0.013	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	0.032	<0.005
APR												
26...	<0.005	E0.004	E0.010	0.011	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	0.083	<0.005
MAY												
15...	<0.005	E0.006	E0.008	0.013	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	0.095	<0.005
SEP												
10...	<0.005	E0.013	E0.016	0.015	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	0.054	<0.005

MISSISSIPPI RIVER MAIN STEM

05331580 MISSISSIPPI RIVER BELOW LOCK AND DAM 2, AT HASTINGS, MN.--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL STREAM-QUALITY ACCOUNTING NETWORK

WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ACETO- CHLOR, WATER FLTRD REC (UG/L) (49260)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)
OCT												
02...	<0.004	<0.002	0.054	0.004	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002
31...	<0.004	<0.002	0.055	0.005	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002
APR												
26...	<0.004	<0.002	0.043	<0.002	0.009	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002
MAY												
15...	<0.004	<0.002	0.032	0.006	0.042	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002
SEP												
10...	<0.004	<0.002	0.072	<0.002	0.016	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002
	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	TEBU- THURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
OCT												
02...	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001
31...	<0.006	E0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001
APR												
26...	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001
MAY												
15...	<0.006	0.021	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001
SEP												
10...	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001
	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC (UG/L) (91063)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC (UG/L) (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC (UG/L) (91065)
OCT												
02...	<0.004	<0.003	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	101	125	82.0
31...	<0.004	<0.003	<0.002	E0.000	<0.004	<0.003	<0.013	<0.001	<0.005	109	118	120
APR												
26...	<0.004	<0.003	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	93.4	106	91.0
MAY												
15...	<0.004	<0.003	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	91.5	115	111
SEP												
10...	<0.004	<0.003	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	105	128	97.6

MISSISSIPPI RIVER MAIN STEM

05331580 MISSISSIPPI RIVER BELOW LOCK AND DAM 2, AT HASTINGS, MN.--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL WATER-QUALITY ASSESSMENT PROGRAM

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	16.5	15.0	15.5	27.5	20.5	24.5	23.0	22.0	22.5	25.0	24.5	24.5
2	16.5	15.0	16.0	27.0	20.5	24.0	23.0	22.0	22.5	25.0	24.5	24.5
3	17.5	15.5	17.0	27.0	20.5	24.0	23.0	22.5	23.0	25.5	24.5	25.0
4	18.5	16.0	17.5	27.0	20.0	24.0	24.0	22.5	23.5	25.0	24.5	25.0
5	17.5	16.5	17.0	27.0	20.5	24.0	24.5	23.5	24.0	24.5	23.5	24.0
6	17.5	17.0	17.0	27.0	21.0	24.0	24.0	23.5	24.0	24.0	23.5	24.0
7	17.5	17.0	17.5	27.0	21.5	24.5	24.0	23.5	23.5	24.5	24.0	24.5
8	18.5	17.5	18.0	26.5	22.0	24.5	23.5	23.5	23.5	25.0	24.0	24.5
9	17.5	17.0	17.0	26.0	23.0	24.5	25.0	23.5	24.5	25.5	24.5	25.0
10	18.0	16.5	17.0	26.5	23.5	25.0	26.0	24.5	25.0	25.0	22.0	24.5
11	18.0	16.5	17.0	25.0	23.0	24.0	26.5	26.0	26.0	25.0	22.0	24.0
12	17.5	17.0	17.0	24.0	22.5	23.5	26.0	25.0	25.5	24.5	20.5	22.5
13	18.0	17.0	17.5	25.0	23.0	23.5	25.5	24.5	25.0	24.0	19.5	22.0
14	18.0	17.0	17.5	25.0	23.0	24.0	25.5	24.5	25.0	24.5	18.5	21.5
15	20.0	17.0	18.0	24.5	22.0	23.0	25.0	25.0	25.0	25.5	18.5	21.5
16	20.0	18.5	19.0	25.0	22.5	23.5	25.5	24.5	25.0	25.0	18.5	22.0
17	21.0	19.5	20.5	25.5	23.0	23.5	25.5	25.0	25.0	25.0	19.0	22.0
18	21.0	20.0	21.0	26.5	23.0	24.0	26.0	25.0	25.5	25.5	18.5	22.0
19	23.0	21.0	22.0	26.5	23.5	24.5	26.0	25.0	25.5	25.5	18.5	22.0
20	24.5	22.0	23.0	25.5	23.5	24.5	25.0	24.0	24.5	25.0	18.0	21.5
21	24.5	23.0	23.5	25.5	24.0	25.0	24.5	23.5	24.0	24.0	18.5	21.0
22	25.0	23.5	24.5	25.5	24.5	25.0	24.5	24.0	24.0	23.5	18.0	20.5
23	26.0	24.0	25.0	26.5	24.0	25.0	25.0	24.5	25.0	18.0	17.0	17.5
24	25.0	24.5	24.5	26.5	24.0	25.0	25.5	25.0	25.0	17.5	17.0	17.0
25	24.5	24.0	24.5	25.5	23.5	24.5	25.0	24.5	24.5	17.5	16.5	17.0
26	24.5	23.0	24.0	25.0	23.0	24.0	24.5	24.0	24.0	17.5	17.0	17.5
27	23.0	22.0	22.5	25.5	23.5	24.5	24.0	23.5	23.5	17.5	17.0	17.0
28	26.5	21.5	23.5	25.5	24.0	24.5	24.5	24.0	24.5	17.5	17.0	17.0
29	28.0	21.5	24.5	24.5	23.5	24.0	25.0	24.0	24.5	17.0	16.5	17.0
30	28.0	20.5	24.5	24.0	23.5	23.5	25.5	25.0	25.0	16.5	15.5	16.0
31	---	---	---	23.5	23.0	23.0	25.0	24.0	24.5	---	---	---
MONTH	28.0	15.0	20.0	27.5	20.0	24.0	26.5	22.0	24.5	25.5	15.5	21.5

MISSISSIPPI RIVER MAIN STEM

05331580 MISSISSIPPI RIVER BELOW LOCK AND DAM 2, AT HASTINGS, MN.--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL WATER-QUALITY ASSESSMENT PROGRAM

WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	ALKA- LITY WAT DIS TOT IT MG/L AS CACO3 (39086)	ALKA- LITY LAB (MG/L AS CACO3) (90410)
MAR 20...	1100	18800	500	510	7.6	7.8	0.5	--	13.3	174	183
APR 18...	0915	48900	419	419	7.8	7.6	6.0	--	11.9	147	153
MAY 15...	1320	36800	500	509	8.2	8.0	12.5	736	10.4	189	170
JUN 19...	0930	25700	731	489	8.1	8.1	21.5	739	6.5	199	88
JUL 22...	1130	13700	535	526	8.1	8.1	25.0	745	7.8	172	183
AUG 13...	1040	10400	546	543	8.2	8.0	25.0	748	101	168	183
SEP 10...	1000	5860	642	647	8.2	8.0	23.5	746	5.9	207	214

DATE	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)
MAR 20...	0	212	0.460	0.060	1.1	1.3	2.00	0.260	0.190	0.170	7.0
APR 18...	0	179	0.070	0.020	0.70	0.90	0.850	0.180	0.070	0.050	8.3
MAY 15...	4	161	0.020	0.020	0.60	1.1	1.40	0.160	0.030	0.020	8.8
JUN 19...	0	243	0.170	0.060	0.80	1.1	2.60	0.220	0.110	0.100	7.2
JUL 22...	0	210	0.050	0.040	0.70	0.70	1.60	0.160	0.150	0.120	8.1
AUG 13...	0	205	0.080	0.040	0.50	1.1	0.960	0.270	0.090	0.120	8.4
SEP 10...	0	253	0.250	0.130	0.80	1.2	2.20	0.240	0.160	0.190	7.2

DATE	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C) (00689)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
MAR 20...	0.90	322	57	21	14	4.8	20	51	0.20	13	58
APR 18...	2.8	244	49	18	9.6	4.4	13	43	0.20	11	260
MAY 15...	2.2	296	57	24	13	3.0	16	64	0.20	6.4	68
JUN 19...	0.80	472	--	--	--	<0.10	20	130	0.30	--	--
JUL 22...	1.3	319	57	22	15	2.7	20	58	0.30	13	150
AUG 13...	1.8	336	53	24	20	3.3	24	60	0.30	12	6
SEP 10...	1.7	402	67	28	23	3.7	30	75	0.40	17	3

MISSISSIPPI RIVER MAIN STEM

05331580 MISSISSIPPI RIVER BELOW LOCK AND DAM 2, AT HASTINGS, MN.--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL WATER-QUALITY ASSESSMENT PROGRAM

WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	MANGANESE, DIS-SOLVED (UG/L AS MN) (01056)	SEDIMENT, SUSPENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	PROP. CHLOR. WATER, DISS, REC (UG/L) (04024)	BUTYLATE, WATER, DISS, REC (UG/L) (04028)	SILICAZINE, WATER, DISS, REC (UG/L) (04035)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	CYANAZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER, DISS, REC (UG/L) (04095)	ALPHA BHC DIS-SOLVED (UG/L) (34253)
MAR 20...	83	20	95	--	--	--	--	--	--	--	--
APR 18...	35	57	97	<0.007	<0.002	<0.005	<0.018	E0.011	0.010	<0.003	<0.002
MAY 15...	34	46	97	<0.007	<0.002	<0.005	<0.018	E0.012	0.013	<0.003	<0.002
JUN 19...	--	67	99	<0.007	<0.002	0.008	E0.014	E0.023	0.190	<0.003	<0.002
JUL 22...	36	49	99	<0.007	<0.002	<0.005	E0.012	E0.015	0.037	<0.003	<0.002
AUG 13...	58	--	92	<0.007	<0.002	0.009	0.027	E0.013	0.028	<0.003	<0.002
SEP 10...	6	37	98	<0.007	<0.002	E0.005	0.019	E0.017	0.014	<0.003	<0.002
DATE	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	LINDANE DIS-SOLVED (UG/L) (39341)	DI-ELDRIN DIS-SOLVED (UG/L) (39381)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	MALA-THION, DIS-SOLVED (UG/L) (39532)	PARA-THION, DIS-SOLVED (UG/L) (39542)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	ALA-CHLOR, WATER, DISS, REC (UG/L) (46342)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)
MAR 20...	--	--	--	--	--	--	--	--	--	--	--
APR 18...	<0.006	<0.004	<0.004	<0.001	0.150	<0.005	<0.004	<0.002	0.044	<0.002	<0.002
MAY 15...	<0.006	<0.004	<0.004	<0.001	0.089	<0.005	<0.004	<0.002	0.057	0.006	0.042
JUN 19...	<0.006	<0.004	<0.004	<0.001	0.100	<0.005	<0.004	<0.002	0.190	0.024	0.051
JUL 22...	<0.006	<0.004	<0.004	<0.001	0.030	<0.005	<0.004	0.009	0.088	<0.002	<0.002
AUG 13...	<0.006	<0.004	<0.004	<0.001	0.034	<0.005	<0.004	<0.002	0.067	<0.002	<0.002
SEP 10...	<0.006	<0.004	<0.004	<0.001	0.060	<0.005	<0.004	<0.002	0.078	<0.002	0.014
DATE	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI-ETHYL ANILINE WAT FLT GF, REC (UG/L) (82660)	TRI-FLUR-ALIN WAT FLT GF, REC (UG/L) (82661)	ETHAL-FLUR-ALIN WAT FLT GF, REC (UG/L) (82663)	PHORATE WATER FLTRD GF, REC (UG/L) (82664)	TER-BACIL WATER FLTRD GF, REC (UG/L) (82665)	LIN-URON WATER FLTRD GF, REC (UG/L) (82666)	METHYL PARA-THION WAT FLT GF, REC (UG/L) (82667)	EPTC WATER FLTRD GF, REC (UG/L) (82668)	PEB-ULATE WATER FILTRD GF, REC (UG/L) (82669)	TEBU-THIURON WATER FLTRD GF, REC (UG/L) (82670)
MAR 20...	--	--	--	--	--	--	--	--	--	--	--
APR 18...	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	E0.004	<0.004	<0.010
MAY 15...	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	0.023	<0.004	<0.010
JUN 19...	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	E0.003	<0.004	<0.010
JUL 22...	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
AUG 13...	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
SEP 10...	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010

MISSISSIPPI RIVER MAIN STEM

05331580 MISSISSIPPI RIVER BELOW LOCK AND DAM 2, AT HASTINGS, MN.--Continued

WATER-QUALITY DATA COLLECTED THROUGH THE NATIONAL WATER-QUALITY ASSESSMENT PROGRAM

WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD FLTRD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)
MAR 20...	--	--	--	--	--	--	--	--	--	--
APR 18...	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
MAY 15...	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
JUN 19...	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
JUL 22...	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
AUG 13...	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
SEP 10...	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
DATE	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT FLTRD 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT FLTRD 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT FLTRD 0.7 U GF, REC (UG/L) (82687)	DIAZ- INON D10 SRG WAT FLT FLTRD 0.7 U GF, REC (UG/L) (91063)	TERBUTH YLAZINE SURROGT WAT FLT FLTRD 0.7 U GF, REC (UG/L) (91064)	HCH ALPHA D6 SRG WAT FLT FLTRD 0.7 U GF, REC (UG/L) (91065)
MAR 20...	--	--	--	--	--	--	--	--	--	--
APR 18...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	125	100
MAY 15...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	162	147	119
JUN 19...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	106	121	110
JUL 22...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	128	130	107
AUG 13...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	130	124	106
SEP 10...	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	104	125	93.9

ST. CROIX RIVER BASIN

05336700 KETTLE RIVER BELOW SANDSTONE, MN

LOCATION.--Lat 46°06'20", long 92°51'50", in NW¼SW¼ sec.22, T.42 N., R.20 W., Pine County, Hydrologic Unit 07030003, on Sandstone Federal Correctional Institution property, on left bank, about 1.8 mi south of Sandstone.

DRAINAGE AREA.--863 mi².

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 931.50 ft above mean sea level. (Minnesota Department of Transportation bench mark).

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1965 reached a stage of 12.96 ft, from flood marks, discharge, 13,400 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft³/s and maximum (*)

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 20	1700	*9290	*10.84	June 27	1730	6170	9.08

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	863	1940	337	e265	e190	e200	523	2240	449	2580	613	202
2	1720	1780	332	e260	e180	e200	549	1930	429	1880	571	233
3	1680	1640	326	e255	e185	e200	560	1680	442	1460	532	291
4	1950	1440	338	e250	e195	e200	557	1480	472	1150	501	349
5	1840	1250	326	e240	e200	e200	582	1370	481	928	489	327
6	1730	1180	e270	e230	e205	e200	593	1290	500	794	493	293
7	2090	1120	e250	e225	e210	e200	598	1210	534	720	500	272
8	2290	981	e240	e220	e215	e205	635	1130	530	647	509	258
9	2010	858	e240	e215	e220	e210	744	1060	488	618	512	252
10	1870	818	e240	e210	e225	e225	1110	1070	443	592	500	243
11	1670	683	e240	e210	e230	e250	2280	1090	402	577	491	228
12	1470	646	e240	e210	e235	e270	3890	1030	367	770	477	212
13	1300	633	e245	e205	e240	e300	3990	948	335	1090	466	202
14	1150	604	e245	e210	e240	e330	3940	905	308	1190	454	187
15	1020	557	e250	e210	e235	e360	4320	e1100	288	1150	431	179
16	907	522	e255	e215	e235	e405	4950	1300	290	1040	410	171
17	809	502	e260	e220	e235	444	5840	1180	306	914	384	162
18	731	489	e260	e220	e235	465	6990	e1300	306	906	360	158
19	679	471	e265	e220	e235	523	8490	e1400	304	1020	342	155
20	652	461	e270	e220	e235	576	9160	e1500	295	1080	329	151
21	624	402	e275	e220	e240	621	8880	e1500	281	1010	316	152
22	616	389	e275	e215	e240	633	7840	e1400	294	935	308	185
23	646	378	e280	e215	e240	572	6570	e1250	317	859	293	177
24	1050	386	e280	e210	e235	554	5460	1070	332	813	277	165
25	1850	409	e280	e205	e230	493	4610	926	337	802	256	157
26	1960	349	e280	e205	e220	e465	4340	822	893	761	246	163
27	1950	380	e275	e200	e210	e460	4280	732	5370	724	233	188
28	2590	350	e270	e200	e205	516	3770	658	5400	713	219	222
29	2910	365	e270	e195	e200	516	3190	592	4150	711	212	243
30	2550	358	e270	e195	---	517	2680	534	3530	694	208	247
31	2170	---	e265	e190	---	504	---	488	---	661	206	---
TOTAL	47347	22341	8449	6760	6400	11814	111921	36185	28873	29789	12138	6424
MEAN	1527	745	273	218	221	381	3731	1167	962	961	392	214
MAX	2910	1940	338	265	240	633	9160	2240	5400	2580	613	349
MIN	616	349	240	190	180	200	523	488	281	577	206	151
AC-FT	93910	44310	16760	13410	12690	23430	222000	71770	57270	59090	24080	12740
CFSM	1.77	.86	.32	.25	.26	.44	4.32	1.35	1.12	1.11	.45	.25
IN.	2.04	.96	.36	.29	.28	.51	4.82	1.56	1.24	1.28	.52	.28

e Estimated.

ST. CROIX RIVER BASIN

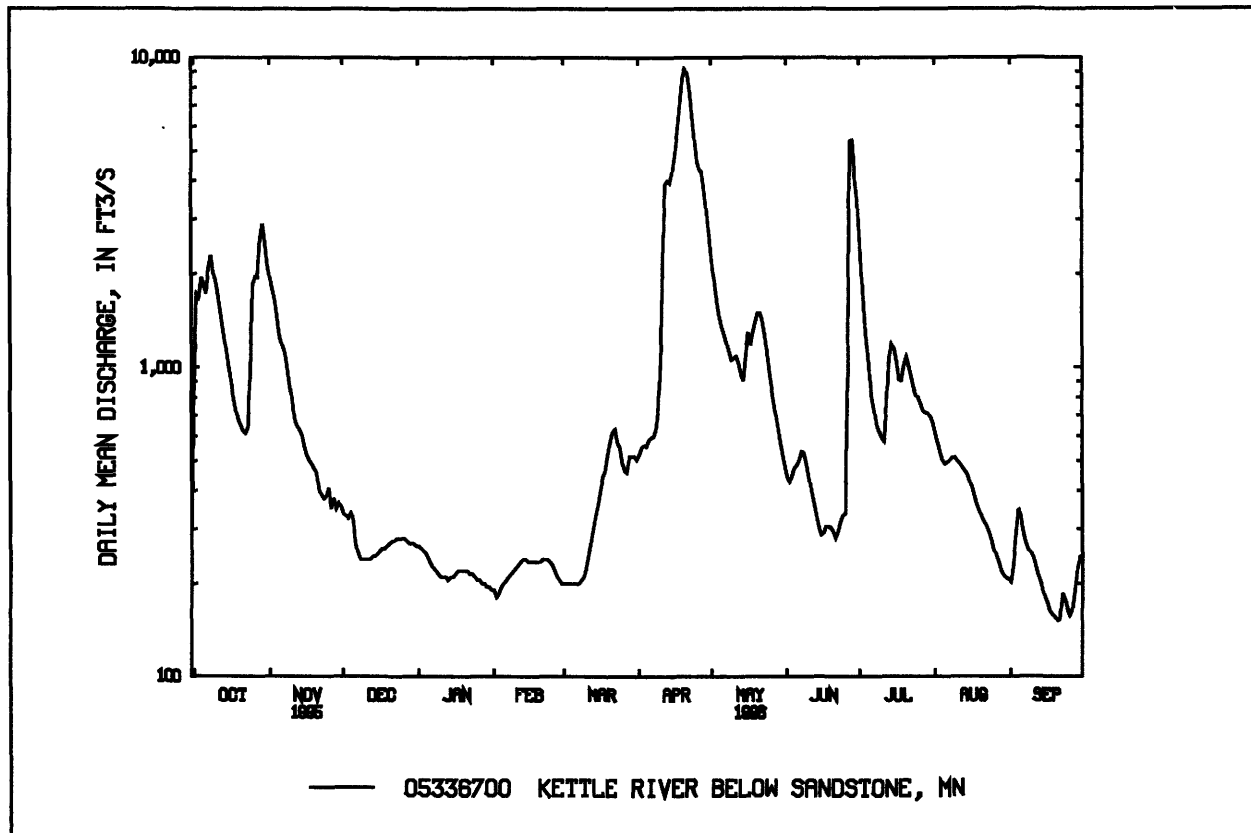
05336700 KETTLE RIVER BELOW SANDSTONE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	773	591	277	181	173	537	2346	1284	900	674	399	572
MAX	2652	2414	652	411	417	1742	4653	3168	2799	2869	2094	3065
(WY)	1969	1972	1984	1984	1984	1973	1969	1986	1993	1972	1972	1986
MIN	80.6	85.8	98.3	77.3	98.5	141	435	222	131	110	86.4	71.3
(WY)	1977	1977	1977	1971	1977	1980	1977	1980	1988	1988	1976	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1968 - 1996
ANNUAL TOTAL	292992	328441	
ANNUAL MEAN	803	897	726
HIGHEST ANNUAL MEAN			1390
LOWEST ANNUAL MEAN			254
HIGHEST DAILY MEAN	5120	Aug 26	9160
LOWEST DAILY MEAN	163	Jul 1	151
ANNUAL SEVEN-DAY MINIMUM	170	Jun 26	161
INSTANTANEOUS PEAK FLOW		9290	Apr 20
INSTANTANEOUS PEAK STAGE		10.84	Apr 20
INSTANTANEOUS LOW FLOW		149	Sep 20
ANNUAL RUNOFF (AC-FT)	581100	651500	525700
ANNUAL RUNOFF (CFSM)	.93	1.04	.84
ANNUAL RUNOFF (INCHES)	12.63	14.16	11.42
10 PERCENT EXCEEDS	1990	1940	1780
50 PERCENT EXCEEDS	414	446	292
90 PERCENT EXCEEDS	190	205	129

a Result of freezeup.



ST. CROIX RIVER BASIN

05337400 KNIFE RIVER NEAR MORA, MN

LOCATION.--Lat 45°55'12", long 93°18'26", in SW1/4SW1/4, sec.26, T.40 N., R.24 W., Kanabec County, Hydrologic Unit 07030004, on left bank 400 ft upstream from bridge on County Highway 77, 1.1 mi upstream from mouth and 2.5 mi north of Mora.

DRAINAGE AREA.--102 mi².

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1969-74; July 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is 991.20 ft above mean sea level (Kanabec County bench mark).

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 26, 1972, reached a stage of 14.0 ft, from information by local resident (discharge not determined).

Result of dam failure and backwater from collapsed bridge.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 12	1700	836	4.93	Apr. 19	2100	*1130	*5.40

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53	209	29	25	e16	39	65	160	41	24	7.0	2.0
2	66	177	29	e25	e15	37	70	141	40	36	6.3	4.7
3	83	168	28	e25	e15	36	77	129	40	28	5.7	7.0
4	97	148	33	e24	e15	37	84	119	34	24	5.2	7.4
5	106	131	35	e24	e15	38	87	126	29	19	5.8	6.4
6	98	118	e34	e24	e14	34	93	127	33	23	6.2	5.1
7	90	108	33	e24	e15	32	101	129	33	29	9.7	4.8
8	84	94	35	e23	e15	32	112	126	26	24	8.1	5.5
9	92	89	42	e23	e17	32	140	124	23	23	6.7	4.4
10	91	83	45	e23	e19	32	235	145	22	16	5.6	3.9
11	88	75	47	e23	e20	31	480	153	20	16	4.9	4.4
12	82	69	47	e23	e22	28	777	147	18	27	4.2	3.6
13	77	62	e46	e23	e23	25	704	129	20	26	4.0	3.0
14	73	57	e45	e22	e25	26	651	133	16	24	4.2	2.6
15	66	52	e44	e22	e26	29	615	183	18	21	4.1	2.4
16	58	48	e42	e22	e28	33	625	227	21	18	3.5	2.2
17	52	48	e41	e21	e29	39	684	222	24	15	2.8	2.3
18	52	46	e40	e21	e29	45	843	199	19	14	2.7	2.5
19	48	44	e39	e20	e29	50	1080	296	15	14	3.1	2.2
20	50	44	37	e20	e29	54	1040	341	14	10	3.2	2.3
21	45	42	37	e19	30	61	829	285	17	7.4	3.3	2.4
22	39	40	35	e19	30	64	647	231	20	8.2	3.9	2.4
23	61	e39	32	e18	35	69	502	186	19	7.2	3.8	2.3
24	106	e36	28	e18	33	82	421	145	19	11	2.7	2.6
25	161	33	e28	e18	33	79	364	114	18	12	2.4	2.7
26	185	36	28	e17	40	72	321	98	27	8.2	2.7	3.7
27	209	36	26	e17	43	69	272	86	32	8.9	2.7	6.7
28	261	e35	e27	e17	43	63	243	76	30	14	2.1	7.2
29	299	e33	e27	e16	39	61	214	58	32	12	2.0	7.5
30	271	e31	e26	e16	---	62	185	47	30	8.9	2.0	7.6
31	232	---	e26	e16	---	63	---	43	---	8.6	2.0	---
TOTAL	3375	2231	1091	648	742	1454	12561	4725	750	537.4	132.6	123.8
MEAN	109	74.4	35.2	20.9	25.6	46.9	419	152	25.0	17.3	4.28	4.13
MAX	299	209	47	25	43	82	1080	341	41	36	9.7	7.6
MIN	39	31	26	16	14	25	65	43	14	7.2	2.0	2.0
AC-FT	6690	4430	2160	1290	1470	2880	24910	9370	1490	1070	263	246
CFSM	1.07	.73	.35	.20	.25	.46	4.10	1.49	.25	.17	.04	.04
IN.	1.23	.81	.40	.24	.27	.53	4.58	1.72	.27	.20	.05	.05

e Estimated.

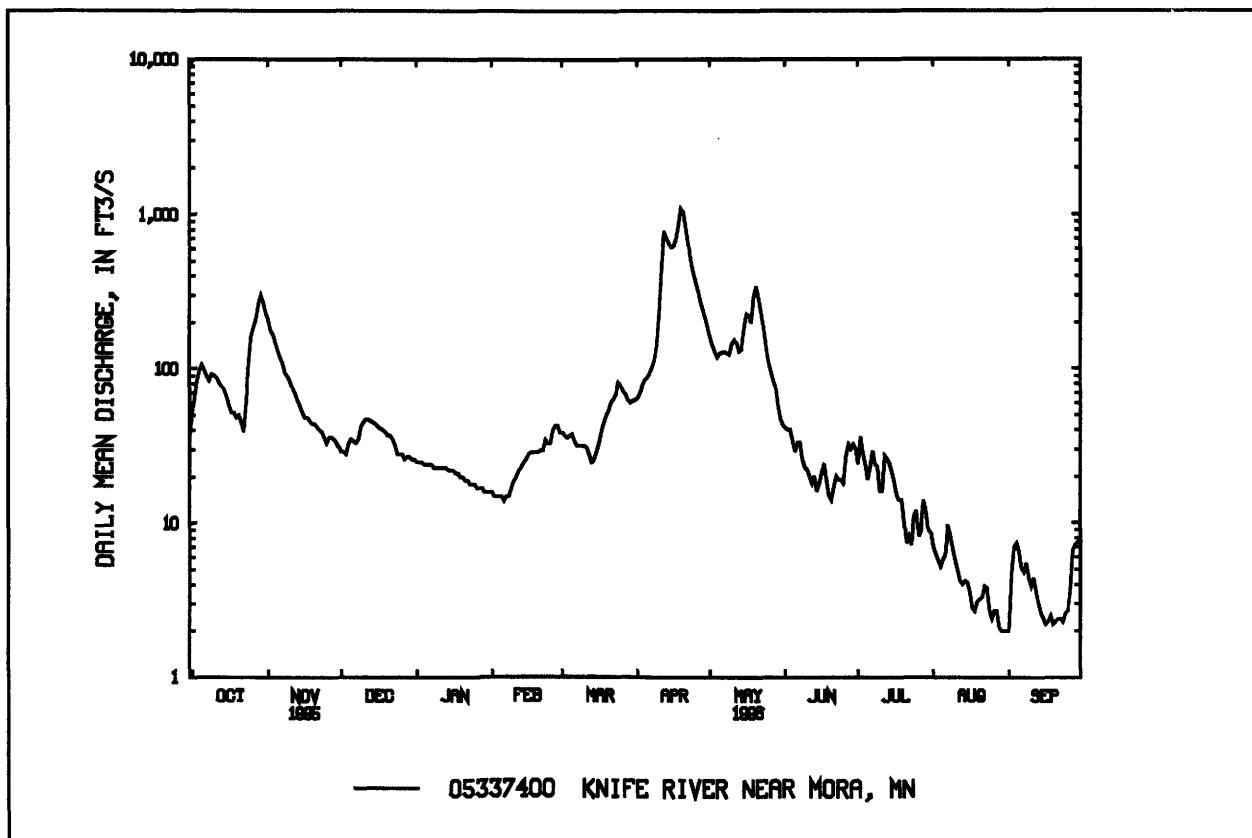
ST. CROIX RIVER BASIN

05337400 KNIFE RIVER NEAR MORA, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	53.1	41.9	25.7	13.5	13.9	72.1	228	108	61.7	54.9	31.7	38.4
MAX	242	206	109	28.8	48.9	238	472	338	233	171	218	257
(WY)	1985	1978	1978	1984	1984	1983	1986	1986	1984	1975	1995	1986
MIN	1.84	1.38	1.17	1.14	1.16	14.3	30.5	12.5	3.06	.98	1.86	2.15
(WY)	1977	1990	1990	1977	1990	1975	1977	1980	1988	1988	1976	1987

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1974 - 1996
ANNUAL TOTAL	34312.1	28370.8	
ANNUAL MEAN	94.0	77.5	62.1
HIGHEST ANNUAL MEAN			135
LOWEST ANNUAL MEAN			16.8
HIGHEST DAILY MEAN	1380	Aug 27	1080
LOWEST DAILY MEAN	5.7	Jul 2	2.0
ANNUAL SEVEN-DAY MINIMUM	8.1	Jun 28	2.2
INSTANTANEOUS PEAK FLOW			1130
INSTANTANEOUS PEAK STAGE			5.40
INSTANTANEOUS LOW FLOW			1.9
ANNUAL RUNOFF (AC-FT)	68060	56270	45020
ANNUAL RUNOFF (CFSM)	.92	.76	.61
ANNUAL RUNOFF (INCHES)	12.51	10.35	8.28
10 PERCENT EXCEEDS	251	184	148
50 PERCENT EXCEEDS	44	31	21
90 PERCENT EXCEEDS	10	4.2	4.8



ST. CROIX RIVER BASIN

05338500 SNAKE RIVER NEAR PINE CITY, MN

LOCATION.--Lat 45°50'30", long 92°56'00", in SE 1/4 NW 1/4 sec. 26, T. 39 N., R. 21 W., Pine County, Hydrologic Unit 07030004, on left bank at site of former powerplant and dam, 0.5 mi downstream from Cross Lake and 1.5 mi northeast of Pine City.

DRAINAGE AREA.--958 mi².

PERIOD OF RECORD.--June 1913 to September 1917, July 1951 to Sept. 1981, Oct. 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 919.00 ft above mean sea level. June 25, 1913, to Sept. 30, 1917, nonrecording gage at site 500 ft downstream at different datum. July 1 to Oct. 28, 1951, nonrecording gage at present site and datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	493	1780	360	e258	e146	e192	806	2740	663	504	225	63
2	498	1800	356	e255	e147	e188	860	2330	599	527	206	68
3	629	1760	357	e252	e148	e188	944	1990	545	509	189	75
4	723	1670	340	e250	e150	e190	1030	1690	468	486	176	81
5	783	1570	e330	e248	e152	e192	1110	1500	420	452	193	81
6	881	1460	e328	e245	e154	e195	1220	1380	402	406	177	83
7	913	1360	e325	e243	e156	e200	1370	1300	370	377	189	87
8	918	1240	e320	e230	e158	e210	1550	1250	361	338	166	83
9	963	1120	e316	e222	e160	e225	1800	1210	345	312	149	81
10	997	1050	e313	e225	e160	e235	2220	1180	329	286	147	85
11	1010	934	e310	e230	e162	e250	2740	1180	312	285	154	86
12	1010	823	e307	e235	e164	e270	3210	1170	298	323	148	68
13	998	761	e303	e235	e170	e285	3640	1170	274	308	134	62
14	971	742	e300	e230	e178	e305	4120	1160	241	344	132	63
15	888	715	e298	e225	e185	e325	4660	1220	226	379	111	62
16	827	652	e294	e215	e192	362	5090	1280	231	378	106	60
17	804	619	e291	e205	e200	403	5280	1360	229	396	100	61
18	741	588	e290	e190	e204	446	5440	1480	230	415	92	61
19	725	560	e288	e180	e212	504	5920	1720	229	358	97	60
20	680	557	e286	e170	e214	566	6300	1880	225	325	100	65
21	637	509	e283	e167	e217	643	6640	2070	227	315	94	74
22	598	453	e280	e164	e214	704	6930	2200	232	304	104	89
23	575	429	e278	e158	e210	766	7040	2220	230	266	96	85
24	737	408	e276	e154	e207	826	6840	2160	239	258	89	91
25	839	415	e273	e150	e198	828	6420	2020	230	233	79	79
26	990	431	e270	e148	e193	803	5760	1780	284	209	70	83
27	1200	427	e268	e146	e190	783	5010	1510	337	210	70	112
28	1380	402	e266	e145	e188	767	4320	1270	379	239	72	111
29	1510	372	e264	e146	e186	756	3720	1070	476	228	68	97
30	1620	361	e262	e146	---	742	3200	905	490	233	70	88
31	1710	---	e260	e146	---	758	---	758	---	234	67	---
TOTAL	28248	25968	9292	6213	5215	14107	115190	48153	10121	10437	3870	2344
MEAN	911	866	300	200	180	455	3840	1553	337	337	125	78.1
MAX	1710	1800	360	258	217	828	7040	2740	663	527	225	112
MIN	493	361	260	145	146	188	806	758	225	209	67	60
AC-FT	56030	51510	18430	12320	10340	27980	228500	95510	20070	20700	7680	4650
CFSM	.95	.90	.31	.21	.19	.48	4.01	1.62	.35	.35	.13	.08
IN.	1.10	1.01	.36	.24	.20	.55	4.47	1.87	.39	.41	.15	.09

e Estimated.

ST. CROIX RIVER BASIN

05338500 SNAKE RIVER NEAR PINE CITY, MN--Continued

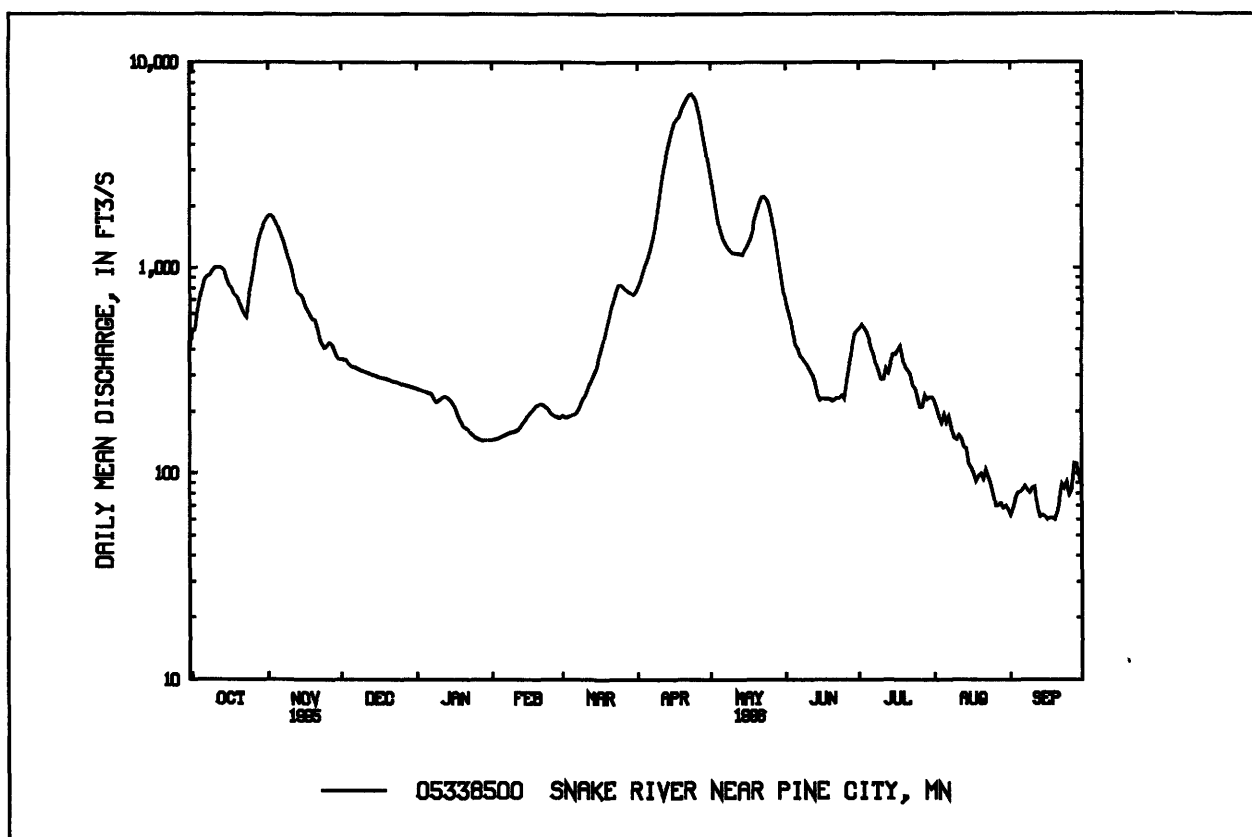
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	423	411	212	129	127	478	2031	1174	835	727	335	317
MAX	3130	2310	837	343	549	2658	4975	2726	2775	3400	2018	1201
(WY)	1969	1972	1978	1966	1966	1966	1965	1979	1967	1952	1972	1951
MIN	47.1	59.9	36.1	29.3	33.4	61.5	172	206	193	100	34.9	37.8
(WY)	1977	1977	1977	1977	1977	1965	1959	1977	1992	1961	1976	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1913 - 1996	
ANNUAL TOTAL	308146		279158			
ANNUAL MEAN	844		763		596 ^a	
HIGHEST ANNUAL MEAN					1223	
LOWEST ANNUAL MEAN					177	
HIGHEST DAILY MEAN	3920		7040		14200	
LOWEST DAILY MEAN	131		60		26	
ANNUAL SEVEN-DAY MINIMUM	136		61		28	
INSTANTANEOUS PEAK FLOW			7350		14300	
INSTANTANEOUS PEAK STAGE			7.57		10.38	
INSTANTANEOUS LOW FLOW			52		5.5 ^b	
ANNUAL RUNOFF (AC-FT)	611200		553700		431500	
ANNUAL RUNOFF (CFSM)	.88		.80		.62	
ANNUAL RUNOFF (INCHES)	11.97		10.84		8.45	
10 PERCENT EXCEEDS	2120		1710		1480	
50 PERCENT EXCEEDS	538		309		223	
90 PERCENT EXCEEDS	170		93		74	

a Median of annual mean discharges is 530 ft³/s.

b Result of dam rehabilitation.



ST. CROIX RIVER BASIN

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI

LOCATION.--Lat 45°24'25", long 92°38'49", in SW¹/₄NW¹/₄ sec.30, T.34 N., R.18 W., Polk County, Hydrologic Unit 07030005, St. Croix National Scenic Riverway, on left bank, 1,500 ft downstream from powerplant of Northern States Power Co., in St. Croix Falls, and at mile 52.2.

DRAINAGE AREA.--6,240 mi².

PERIOD OF RECORD.--January 1902 to current year. Prior to January 1910, monthly discharge only, published in WSP 1308. Prior to October 1939, published as "near St. Croix Falls."

REVISED RECORDS.--WSP 1115: 1929. WDR WI-82-1: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 689.94 ft above mean sea level. Prior to July 1905, gage heights and discharge measurements were used by Loweth and Wolff, consulting engineers of St. Paul, Minn., to determine the flow. July 1905 to February 1940, records were computed from power generation at the St. Croix Falls Powerplant. February 1940 to Sept. 30, 1979, water-stage recorder at site 300 ft downstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Diurnal fluctuation caused by St. Croix Falls Powerplant 1,500 ft upstream. Gage-height telemeter and data-collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4080	11900	3860	3340	3190	3600	6270	15300	6230	10400	5070	2180
2	5170	11500	3690	3350	3370	3300	6640	13700	5760	9320	4680	1970
3	6410	11200	4120	3510	3000	3000	7040	12300	5390	8310	4330	2420
4	7260	10500	4110	3560	3210	3320	7150	11000	5510	7440	3580	3650
5	7700	9570	3950	3590	3040	3450	7150	10100	5220	6980	3970	4610
6	7900	9180	3650	3130	3040	3250	7310	9970	5500	5940	3740	5340
7	7980	8710	3280	3040	3050	3280	7940	10300	5210	5650	4230	4710
8	8850	8460	3150	3330	2930	3470	8360	8580	5120	6230	4030	4370
9	9450	7760	2840	3090	3200	3190	9300	7380	4710	6010	4060	4330
10	9490	7420	2980	3140	2850	3100	11100	8760	4610	5470	3700	4530
11	9280	6660	3200	3040	2970	2990	13700	8640	4080	4920	3310	4110
12	8630	5520	3330	3190	3110	3400	16000	8990	3990	5110	2980	3870
13	8210	5050	3340	3280	3120	3550	19300	8070	3720	5400	3130	3800
14	7760	5310	3440	3020	3030	3700	20400	7840	3540	6980	3420	3310
15	6940	5640	3460	3150	3200	4200	20700	7910	3430	7190	3090	3020
16	6710	6150	3530	3370	3110	4420	21400	7930	3440	7180	3390	3000
17	6540	5900	3480	3100	3240	5190	22600	8100	3750	5860	2860	2920
18	5780	5560	3680	3210	3190	5760	24800	7780	3810	6390	3120	2800
19	5320	5110	3820	3450	3220	5500	28000	12000	3810	5580	3310	2620
20	5450	4890	3570	3160	3060	5890	31800	13600	3830	6560	3220	2730
21	4970	4850	3510	2830	3140	5400	34400	14100	3800	7650	2970	2540
22	4760	4090	3670	2970	3160	6150	35600	13000	3940	7890	3060	2060
23	5480	3090	3450	3180	3310	6080	34500	12800	3860	7290	3040	2680
24	6450	2690	3370	3300	3230	6230	31600	12300	4180	7130	2420	2900
25	7680	3110	3370	3260	3200	5250	28800	11800	3940	6930	2620	2970
26	9970	3560	3370	3180	3460	5690	26300	10400	4190	6170	2590	2780
27	10800	3860	3600	3170	3460	5070	24100	9620	7160	5910	2410	3080
28	11500	3200	3540	3230	3380	5660	22400	8680	13400	6000	2480	2970
29	12500	2910	3440	2990	3300	5490	20200	7920	14800	6060	2430	3290
30	13000	3040	3440	3320	---	6030	17800	7400	12600	5510	2360	3030
31	12300	---	3350	3220	---	5950	---	6520	---	5590	2220	---
TOTAL	244320	186390	108590	99700	91770	140560	572660	312790	162530	205050	101820	98590
MEAN	7881	6213	3503	3216	3164	4534	19090	10090	5418	6615	3285	3286
MAX	13000	11900	4120	3590	3460	6230	35600	15300	14800	10400	5070	5340
MIN	4080	2690	2840	2830	2850	2990	6270	6520	3430	4920	2220	1970
AC-FT	484600	369700	215400	197800	182000	278800	1136000	620400	322400	406700	202000	195600
CFSM	1.26	1.00	.56	.52	.51	.73	3.06	1.62	.87	1.06	.53	.53
IN.	1.46	1.11	.65	.59	.55	.84	3.41	1.86	.97	1.22	.61	.59

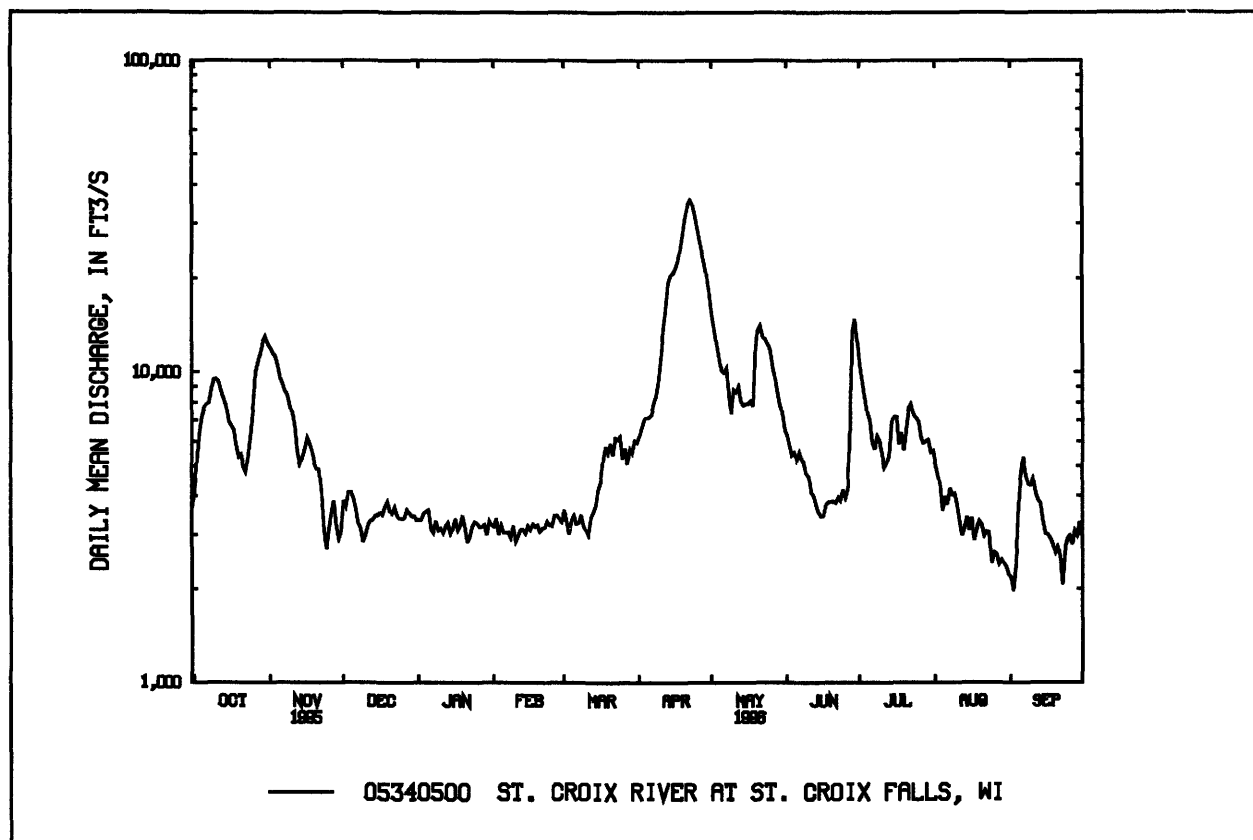
ST. CROIX RIVER BASIN

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1902 - 1996, BY WATER YEAR (WY)

MEAN	3711	3445	2526	2138	2101	4237	10230	7491	5704	4136	2860	3401
MAX	14270	11910	5821	4279	6021	14420	22320	21840	19510	17260	9777	14590
(WY)	1969	1972	1984	1984	1984	1945	1952	1950	1944	1952	1955	1941
MIN	1380	1342	1287	1157	1257	1538	2212	2430	1481	1014	839	1152
(WY)	1933	1911	1911	1911	1913	1912	1902	1934	1934	1934	1934	1933

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1902 - 1996	
ANNUAL TOTAL	2226640		2324770			
ANNUAL MEAN	6100		6352		4341	
HIGHEST ANNUAL MEAN					8569	1986
LOWEST ANNUAL MEAN					1754	1974
HIGHEST DAILY MEAN	23600	Mar 21	35600	Apr 22	53900	May 8 1950
LOWEST DAILY MEAN	1930	Feb 12	1970	Sep 2	75	Jul 17 1910
ANNUAL SEVEN-DAY MINIMUM	2050	Feb 12	2290	Aug 27	754	Jul 29 1974
INSTANTANEOUS PEAK FLOW			35600	Apr 22	54900	May 8 1950
INSTANTANEOUS PEAK STAGE			16.67 ^a	Apr 22	25.19	May 8 1950
ANNUAL RUNOFF (AC-FT)	4417000		4611000		3145000	
ANNUAL RUNOFF (CFSM)	.98		1.02		.70	
ANNUAL RUNOFF (INCHES)	13.27		13.86		9.45	
10 PERCENT EXCEEDS	12300		11800		9100	
50 PERCENT EXCEEDS	4760		4210		2760	
90 PERCENT EXCEEDS	2320		3000		1560	

^a Inside gage reading, outside gage (crest-stage gage) read 16.94 ft.

MISSISSIPPI RIVER MAIN STEM

05344500 MISSISSIPPI RIVER AT PRESCOTT, WI

LOCATION.--Lat 44°44'45", long 92°48'00", in sec.9, T.26 N., R.20 W., Pierce County, Hydrologic Unit 07040001, on left bank at Prescott, 200 ft downstream from St. Croix River, 300 ft south of Chicago, Burlington & Quincy Railroad bridge, 800 ft south of bridge on U.S. Highway 10, and at mile 811.4 upstream from Ohio River.

DRAINAGE AREA.--44,800 mi², approximately.

PERIOD OF RECORD.--June 1928 to current year.

REVISED RECORDS.--WSP 1508: 1941. WRD MN-74: 1973.

GAGE.--Water-stage recorder. Datum of gage is 649.50 ft above sea level. Prior to Aug. 2, 1932, nonrecording gage at railroad bridge 300 ft upstream at following datums: June 3, 1928, to Sept. 30, 1929, 19.27 ft higher; Oct. 1, 1929, to Sept. 30, 1930, 17.68 ft higher; Oct. 1, 1930, to Aug. 1, 1932, 19.28 ft higher. Aug. 2, 1932, to Oct. 30, 1938, water-stage recorder at present site at datum 19.28 ft higher; Nov. 1, 1938, to Sept. 7, 1971, water-stage recorder at present site at datum 50.0 ft lower.

REMARKS.--Records good except those for estimated daily discharge, which are fair. Some regulation by reservoirs, navigation dams, and powerplants at low and medium stages. Discharges below a stage of 26.7 ft. are computed by routing flows from the Mississippi River at St. Paul (05331000) and St. Croix River at St. Croix Falls, WI (05340500).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12800	40800	e18200	e15600	e12000	e13300	33800	62200	39000	40900	17200	12100
2	13800	41300	e20800	e16000	e11900	e13000	34900	58700	37600	37900	16400	11400
3	16200	40700	e20000	e16200	e12300	e13500	36900	56600	36400	34500	16100	10200
4	20200	39900	e20900	e15700	e11300	e13800	38500	53500	35100	31600	16300	9770
5	24500	40200	e20500	e14800	e11600	e12900	40400	50900	34400	28900	15000	11500
6	28400	39700	e19800	e14500	e11700	e13600	41800	48700	34200	27000	14600	12600
7	30100	38400	e18900	e14000	e11300	e13600	43300	47600	34200	25700	14400	13600
8	31000	37100	e15800	e13100	e11900	e13600	45000	46300	33600	24100	14100	11800
9	33100	35900	e14900	e13200	e11800	e13000	45700	44600	32700	23400	14000	11000
10	34500	35100	e15300	e13300	e12300	e12300	46700	43000	32100	22600	13800	10800
11	35500	33900	e13300	e14300	e11900	e12700	48900	41800	31500	22300	13800	10400
12	35700	31700	e12900	e14600	e12100	e13300	51600	41400	30800	21100	13300	10500
13	36200	30400	e13700	e14100	e12200	e14400	55400	41100	30800	20900	14000	11000
14	36200	28800	e15500	e14000	e11900	e16000	59300	40000	29300	20800	15200	10400
15	35400	28100	e16000	e14000	e12100	17800	62300	39800	28300	22300	15600	9740
16	34300	27900	e15900	e13900	e12300	19300	64300	40300	27800	22500	14600	9120
17	34000	27900	e16600	e12700	e12100	24000	67000	39200	27300	22100	14200	9210
18	33300	27600	e16000	e12800	e12600	25400	68900	39500	27800	21000	13200	8820
19	32000	27300	e15900	e14500	e12200	26600	71500	41000	27700	21200	13000	8290
20	31000	26700	e16400	e12800	e12500	27200	74600	45000	29200	21200	12700	8260
21	29500	25600	e16400	e12100	e12300	28000	77300	49600	30500	21700	12200	7800
22	29000	24900	e16400	e10800	e12300	28800	80400	52500	32400	22300	11700	7710
23	29000	23800	e16000	e12400	e12600	29600	81700	53200	34000	22000	10800	7630
24	30200	22900	e15800	e13100	e12600	31600	81900	52400	35400	20800	11300	8260
25	30500	20800	e15900	e12900	e12800	33200	80000	51900	37200	20500	10500	8440
26	32200	19800	e16200	e12800	e13000	32900	75600	51000	38300	19500	9830	8270
27	34400	e20600	e15700	e12600	e13100	32000	73000	49100	38600	18100	10400	8140
28	36900	e21300	e15700	e12200	e13400	31200	70900	47400	39400	17800	11100	8240
29	38400	e20000	e16400	e12300	e13600	32300	68300	45100	41900	17400	12700	8090
30	39200	e18900	e15800	e12100	---	32900	65700	42300	42600	17700	12900	9220
31	40000	---	e15100	e12400	---	33700	---	40200	---	17100	12800	---
TOTAL	957500	898000	512700	419800	355700	675500	1785600	1455900	1010100	726900	417730	292310
MEAN	30890	29930	16540	13540	12270	21790	59520	46960	33670	23450	13480	9744
MAX	40000	41300	20900	16200	13600	33700	81900	62200	42600	40900	17200	13600
MIN	12800	18900	12900	10800	11300	12300	33800	39200	27300	17100	9830	7630
AC-FT	1899000	1781000	1017000	832700	705500	1340000	3542000	2888000	2004000	1442000	828600	579800
CFSM	.69	.67	.37	.30	.27	.49	1.33	1.05	.75	.52	.30	.22
IN.	.80	.75	.43	.35	.30	.56	1.48	1.21	.84	.60	.35	.24

e Estimated.

MISSISSIPPI RIVER MAIN STEM

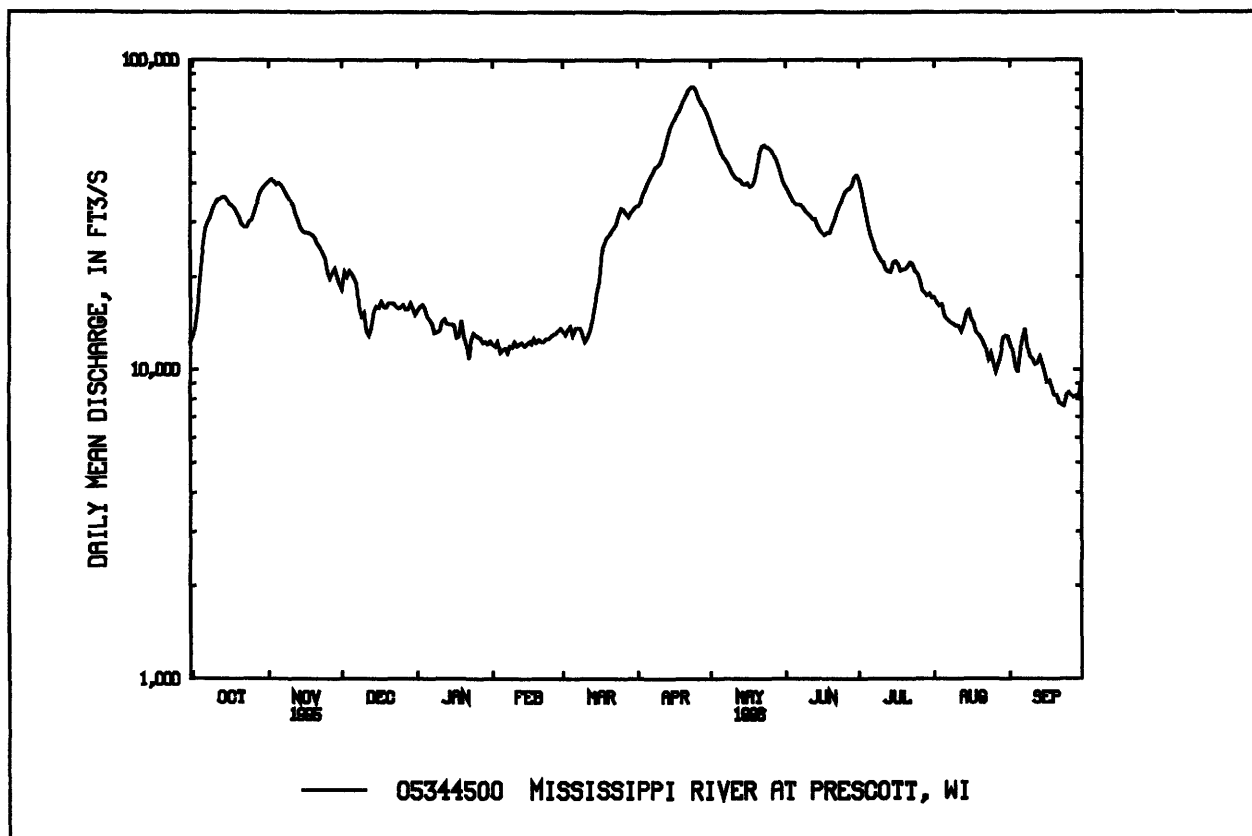
05344500 MISSISSIPPI RIVER AT PRESCOTT, WI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	13580	13150	9814	8196	8046	17170	40410	32050	25810	20200	13240	12880
MAX	49740	40360	21460	16060	21390	55010	117600	90100	69890	87420	48350	45950
(WY)	1987	1972	1983	1983	1966	1983	1965	1986	1993	1993	1993	1986
MIN	3526	3874	3379	3153	3519	4369	7215	6304	4185	3197	2366	3002
(WY)	1933	1977	1934	1935	1934	1934	1931	1931	1934	1934	1934	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1928 - 1996
ANNUAL TOTAL	10184930	9507740	
ANNUAL MEAN	27900	25980	17920 ^a
HIGHEST ANNUAL MEAN			38540
LOWEST ANNUAL MEAN			4367
HIGHEST DAILY MEAN	64900	Apr 27	81900
LOWEST DAILY MEAN	7660	Feb 12	7630
ANNUAL SEVEN-DAY MINIMUM	8700	Feb 12	8040
INSTANTANEOUS PEAK FLOW			82600
INSTANTANEOUS PEAK STAGE			34.46
ANNUAL RUNOFF (AC-FT)	20200000	18860000	12980000
ANNUAL RUNOFF (CFSM)	.62	.58	.40
ANNUAL RUNOFF (INCHES)	8.46	7.89	5.44
10 PERCENT EXCEEDS	52100	46400	39200
50 PERCENT EXCEEDS	27500	20800	11700
90 PERCENT EXCEEDS	10100	11700	5060

^a Median of annual mean discharges is 18030 ft³/s.



VERMILLION RIVER BASIN

05345000 VERMILLION RIVER NEAR EMPIRE, MN

LOCATION.--Lat 44°40'00", long 93°03'17", in SW¹/₄NW¹/₄ sec.24, T.114 N., R.19 W., Dakota County, Hydrologic Unit 07040001, on right bank and just downstream from County Road 79, 2 mi west of Empire and 4 mi northeast of Farmington.

DRAINAGE AREA.--110 mi².

PERIOD OF RECORD.--May 1942 to June 1945 (no record during July, August, and September 1944), September 1969 to September 1973 (discharge measurements only), October 1973 to current year. Prior to October 1975 published as "near Empire City".

GAGE.--Water-stage recorder. Datum of gage is 851.99 ft above mean sea level (levels by U.S. Army Corps of Engineers). April 12, 1942, to June 30, 1944, and October 1, 1944, to July 7, 1945, nonrecording gage at same site and present datum.

REMARKS.--Records good. Some regulation at low-flow by sewage plant upstream.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1965, reached a stage of 7.5 ft, from information by local resident, discharge 6,200 ft³/s, from rating extended above 2,100 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 08	2030	*341	*5.89	June 07	2000	210	4.98
Apr. 04	0230	255	5.38				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	84	52	e36	e29	57	173	84	69	72	38	37
2	46	103	51	e36	e28	55	200	80	70	69	37	38
3	55	98	50	e36	e28	e52	235	95	69	67	36	38
4	50	83	49	e36	e30	50	238	92	67	64	36	37
5	48	80	48	e35	e38	49	182	94	67	61	41	36
6	77	79	44	e35	e39	48	160	101	109	60	39	35
7	78	78	e42	e34	40	48	145	97	185	66	42	35
8	62	71	e43	e35	42	e47	133	94	177	61	39	36
9	69	70	e41	e35	43	49	130	96	124	60	37	35
10	67	70	e40	e35	44	50	131	112	107	57	37	36
11	59	64	e38	e36	44	54	141	115	96	57	37	35
12	57	64	e37	e36	44	110	146	105	88	59	36	35
13	56	63	e39	e37	44	234	134	97	82	59	34	35
14	57	60	e38	e37	45	319	122	97	76	58	34	37
15	55	59	e36	e35	44	279	121	114	73	57	34	38
16	55	60	e35	e36	44	206	123	110	85	54	34	37
17	56	60	e35	e36	45	195	120	101	102	51	33	37
18	54	59	e36	e35	45	173	120	97	119	50	32	37
19	54	59	e37	e35	45	143	124	123	113	46	38	37
20	54	59	e37	e34	46	120	123	134	103	46	65	42
21	55	56	e37	e33	46	107	117	106	99	45	43	42
22	55	54	e36	e33	46	104	118	97	106	45	41	41
23	71	53	e36	e34	49	100	111	90	100	44	39	40
24	116	51	e36	e34	59	97	110	85	100	43	38	39
25	108	52	e36	e33	77	85	111	81	91	43	37	39
26	84	53	e36	e33	93	75	103	79	84	41	84	44
27	78	54	e35	e32	75	74	97	76	78	41	81	46
28	90	51	e35	e32	66	76	92	77	73	41	51	44
29	96	51	e36	e32	70	88	89	73	74	42	43	42
30	84	51	e37	e31	---	115	89	70	77	41	40	42
31	77	---	e37	e30	---	138	---	68	---	39	39	---
TOTAL	2069	1949	1225	1067	1388	3397	4038	2940	2863	1639	1295	1152
MEAN	66.7	65.0	39.5	34.4	47.9	110	135	94.8	95.4	52.9	41.8	38.4
MAX	116	103	52	37	93	319	238	134	185	72	84	46
MIN	46	51	35	30	28	47	89	68	67	39	32	35
AC-FT	4100	3870	2430	2120	2750	6740	8010	5830	5680	3250	2570	2280

e Estimated.

VERMILLION RIVER BASIN

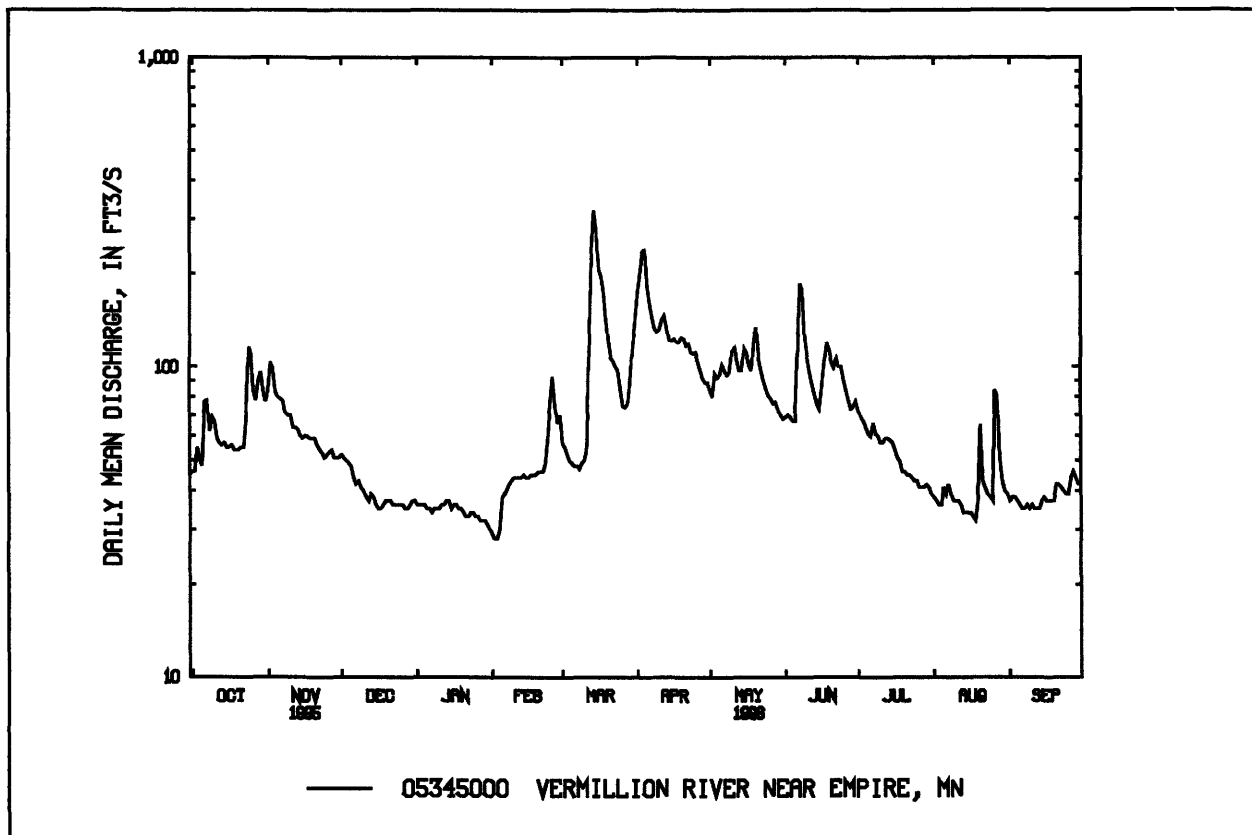
05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	52.6	47.1	37.5	29.5	33.9	98.1	99.7	88.1	86.3	59.0	49.5	63.4
MAX	160	133	79.5	52.6	85.2	199	244	223	290	203	180	310
(WY)	1995	1993	1993	1993	1984	1983	1983	1986	1993	1993	1993	1992
MIN	14.9	15.6	12.4	11.0	13.1	25.4	35.2	29.3	23.0	16.0	14.3	14.6
(WY)	1977	1977	1977	1977	1977	1975	1977	1977	1988	1988	1976	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1943 - 1996
ANNUAL TOTAL	28233	25022	
ANNUAL MEAN	77.4	68.4	61.9
HIGHEST ANNUAL MEAN			142
LOWEST ANNUAL MEAN			23.6
HIGHEST DAILY MEAN	341	Mar 13	319
LOWEST DAILY MEAN	35	Dec 16	28g
ANNUAL SEVEN-DAY MINIMUM	36	Dec 22	30
INSTANTANEOUS PEAK FLOW			341
INSTANTANEOUS PEAK STAGE			5.89
INSTANTANEOUS LOW FLOW			28g
ANNUAL RUNOFF (AC-FT)	56000	49630	44860
ANNUAL RUNOFF (CFSM)	.18	.15	.14
ANNUAL RUNOFF (INCHES)	2.38	2.11	1.90
10 PERCENT EXCEEDS	126	117	121
50 PERCENT EXCEEDS	61	54	41
90 PERCENT EXCEEDS	41	35	20

a Estimated, backwater from ice.



CANNON RIVER BASIN

05353800 STRAIGHT RIVER NEAR FARIBAULT, MN

LOCATION.--Lat 44°15'29", long 93°13'51", in NW¼SE¼, sec.9, T.109 N., R.20 W., Rice County, Hydrologic Unit 07040002, on right bank 15 ft downstream from highway bridge, 2.8 mi upstream from Falls Creek and 3.2 mi southeast of Faribault.

DRAINAGE AREA.--442 mi².

PERIOD OF RECORD.--October 1965 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,034.58 ft above mean sea level.

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

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Mar. 26	1200	1850	7.46	Mar. 30	0400	*2700	*8.52

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	97	357	e120	e75	e60	e125	1710	256	213	248	61	104
2	106	544	e115	e74	e55	e122	1370	244	217	240	59	93
3	151	666	e110	e73	e52	e120	1140	279	240	224	56	93
4	186	582	e108	e72	e52	e118	862	272	234	205	52	91
5	172	477	e105	e71	e53	e119	650	294	227	188	111	85
6	241	419	e103	e70	e54	e119	540	307	346	179	89	79
7	332	384	e100	e70	e56	e120	474	303	428	181	156	76
8	328	341	e98	e69	e60	e121	426	304	406	162	103	74
9	302	317	e99	e69	e66	e125	385	303	338	151	90	74
10	287	311	e99	e68	e74	e130	363	314	288	139	84	72
11	273	274	e98	e67	e80	e140	376	311	259	128	82	68
12	245	303	e96	e69	e85	e155	377	293	237	129	72	63
13	223	251	e94	e70	e87	e170	372	274	224	121	68	53
14	208	229	e93	e70	e89	e190	345	274	197	114	61	49
15	191	220	e95	e68	e90	e200	344	313	178	120	56	45
16	179	215	e91	e67	e88	e210	386	348	196	108	53	43
17	169	211	e90	e67	e90	e205	397	349	e700	101	49	42
18	163	205	e89	e74	e95	e205	375	331	e1420	95	47	42
19	156	197	e88	e71	e100	e210	380	356	1280	92	46	53
20	150	193	e86	e70	e105	e220	442	354	1160	81	60	50
21	143	180	e85	e70	e110	e235	469	335	1080	75	53	50
22	134	e174	e84	e70	e120	e260	451	300	875	71	71	57
23	198	e165	e83	e69	e130	289	434	279	772	70	64	49
24	403	e160	e82	e68	e135	761	420	260	584	67	58	49
25	546	e155	e81	e67	e130	1040	395	242	543	65	49	43
26	502	e150	e80	e67	e130	888	365	228	466	63	350	53
27	411	e145	e79	e66	e130	818	334	220	399	60	365	56
28	373	e135	e78	e66	e125	748	306	237	345	61	237	54
29	351	e130	e78	e65	e125	1560	288	236	306	61	169	51
30	338	e125	e77	e65	---	2540	272	227	278	60	137	48
31	318	---	e76	e63	---	2020	---	215	---	71	117	---
TOTAL	7876	8215	2860	2140	2626	14283	15448	8858	14436	3730	3125	1859
MEAN	254	274	92.3	69.0	90.6	461	515	286	481	120	101	62.0
MAX	546	666	120	75	135	2540	1710	356	1420	248	365	104
MIN	97	125	76	63	52	118	272	215	178	60	46	42
AC-FT	15620	16290	5670	4240	5210	28330	30640	17570	28630	7400	6200	3690
CFSM	.57	.62	.21	.16	.20	1.04	1.17	.65	1.09	.27	.23	.14
IN.	.66	.69	.24	.18	.22	1.20	1.30	.75	1.21	.31	.26	.16

e Estimated.

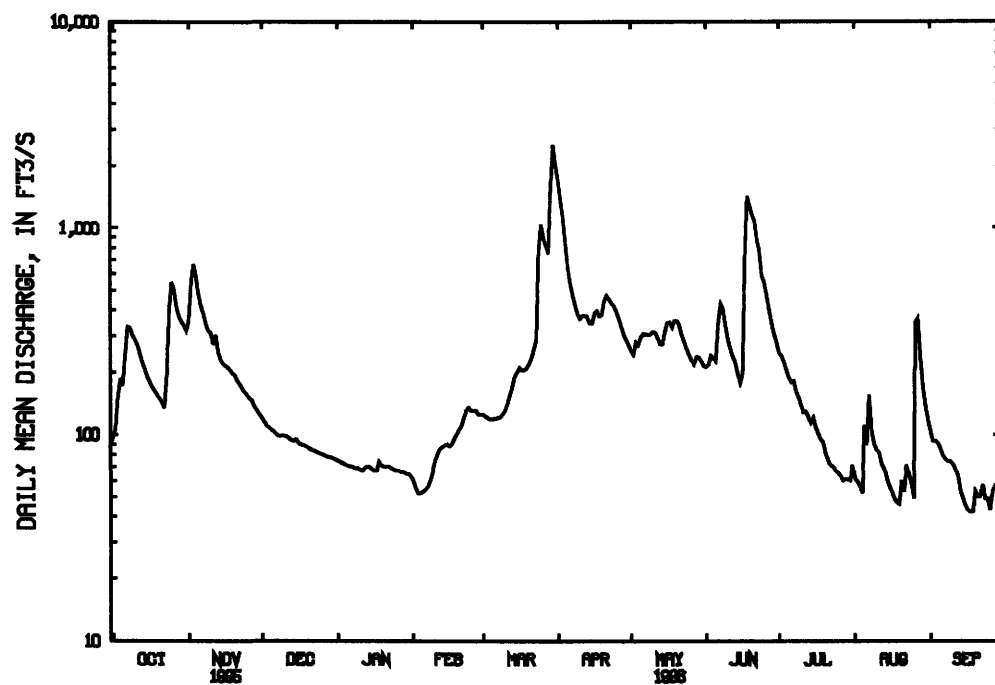
CANNON RIVER BASIN

05353800 STRAIGHT RIVER NEAR FARIBAULT, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	231	196	120	68.6	111	522	620	430	372	290	216	174
MAX	831	595	336	167	837	1270	1912	1224	1399	1027	1136	645
(WY)	1969	1971	1983	1992	1984	1973	1993	1973	1993	1993	1979	1993
MIN	17.0	15.1	11.0	11.0	12.9	26.4	70.2	58.1	45.8	26.2	16.2	16.0
(WY)	1977	1977	1977	1977	1968	1968	1977	1976	1976	1988	1976	1976

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1966 - 1996	
ANNUAL TOTAL	100243		85456			
ANNUAL MEAN	275		233		280	
HIGHEST ANNUAL MEAN					754	
LOWEST ANNUAL MEAN					43.9	
HIGHEST DAILY MEAN	1370		2540		5410	
LOWEST DAILY MEAN	43		42		11	
ANNUAL SEVEN-DAY MINIMUM	45		46		11	
INSTANTANEOUS PEAK FLOW			2700		6030	
INSTANTANEOUS PEAK STAGE			8.52		12.74	
INSTANTANEOUS LOW FLOW			41		10	
ANNUAL RUNOFF (AC-FT)	198800		169500		202700	
ANNUAL RUNOFF (CFSM)	.62		.53		.63	
ANNUAL RUNOFF (INCHES)	8.44		7.19		8.60	
10 PERCENT EXCEEDS	595		427		696	
50 PERCENT EXCEEDS	173		136		120	
90 PERCENT EXCEEDS	62		60		29	



— 05353800 STRAIGHT RIVER NEAR FARIBAULT, MN

CANNON RIVER BASIN

05355200 CANNON RIVER AT WELCH, MN

LOCATION.--Lat 44°33'50", long 92°43'55", in NW¼SW¼ sec. 27, T. 113 N., R. 16 W., Goodhue County, on right bank 0.3 mile downstream from highway bridge at Welch and 1.8 miles upstream from Belle Creek.

DRAINAGE AREA.--1,320 mi², approximately.

PERIOD OF RECORD.--June 1909 to January 1914 (no winter records 1909-11), November 1930 to September 1971, October 1972 to September 1987 (annual maximum only), October 1991 to current year.

REVISED RECORDS.--WSP 1308: 1912(M). WSP 1508: 1933. WSP 1914: 1960.

GAGE.--Water-stage recorder. Datum of gage is 699.16 ft above mean sea level. Prior to Nov. 11, 1930, nonrecording gage on highway bridge at site 0.3 mile upstream at datum 3.00 ft lower. Nov. 11, 1930, to Oct. 11, 1938, water-stage recorder at site 0.3 mile upstream at present datum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, 17.1 ft, present datum, in April 1888, from floodmark at mill about 2,400 ft upstream.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	404	1200	781	411	e330	914	3920	814	724	891	278	350
2	387	1360	679	403	e330	866	3670	779	773	832	278	339
3	527	1510	640	389	e330	807	3200	855	719	712	227	353
4	506	1490	606	406	e315	720	2690	906	709	618	235	326
5	542	1430	493	435	e355	681	2340	873	691	595	301	316
6	741	1340	584	e405	e350	666	1880	880	833	571	311	294
7	744	1290	455	e410	e360	667	1770	923	880	566	462	284
8	781	1180	498	e420	e370	613	1590	939	907	573	390	291
9	841	1180	e560	e430	e375	437	1540	959	933	531	346	296
10	807	1180	e530	e410	e450	439	1500	1090	813	517	300	291
11	791	1100	e530	e390	e620	533	1420	1030	761	503	308	280
12	782	1040	e520	e390	735	974	1430	992	708	522	307	263
13	771	1010	e500	e400	776	1410	1400	958	677	515	293	204
14	702	978	e490	e400	784	1450	1340	920	622	480	274	244
15	673	949	e480	e430	752	1490	1330	1010	620	499	245	267
16	624	929	e455	e425	710	1380	1280	1020	570	449	230	245
17	636	912	e460	e410	733	1510	1300	1030	826	413	238	232
18	523	884	e460	e390	613	1480	1270	1070	1800	408	238	233
19	577	832	e455	e365	e580	1320	1300	1200	2080	349	231	221
20	480	674	454	e355	e520	1210	1270	1270	2140	353	265	243
21	519	754	444	e350	e440	1000	1310	1160	2120	355	230	297
22	497	765	437	e350	391	956	1300	1080	2060	331	256	280
23	627	686	426	e345	410	959	1180	966	1840	305	259	237
24	948	581	424	e350	492	1160	1130	925	1560	274	247	262
25	1120	678	409	e355	732	1870	1170	910	1420	307	245	243
26	1180	765	399	e350	877	1790	1070	896	1260	306	303	246
27	1170	796	411	e350	998	1800	1040	799	1190	300	490	280
28	1170	576	e380	e340	1020	1800	970	844	1000	272	637	265
29	1160	616	e385	e350	973	1680	906	811	915	243	488	235
30	1130	649	395	e345	---	3380	851	770	859	280	389	241
31	1090	---	404	e335	---	4510	---	720	---	300	378	---
TOTAL	23450	29334	15144	11894	16721	40472	48367	29399	33010	14170	9679	8158
MEAN	756	978	489	384	577	1306	1612	948	1100	457	312	272
MAX	1180	1510	781	435	1020	4510	3920	1270	2140	891	637	353
MIN	387	576	380	335	315	437	851	720	570	243	227	204
AC-FT	46510	58180	30040	23590	33170	80280	95940	58310	65480	28110	19200	16180
CFSM	.57	.74	.37	.29	.44	.99	1.22	.72	.83	.35	.24	.21
IN.	.66	.83	.43	.34	.47	1.14	1.36	.83	.93	.40	.27	.23

e Estimated.

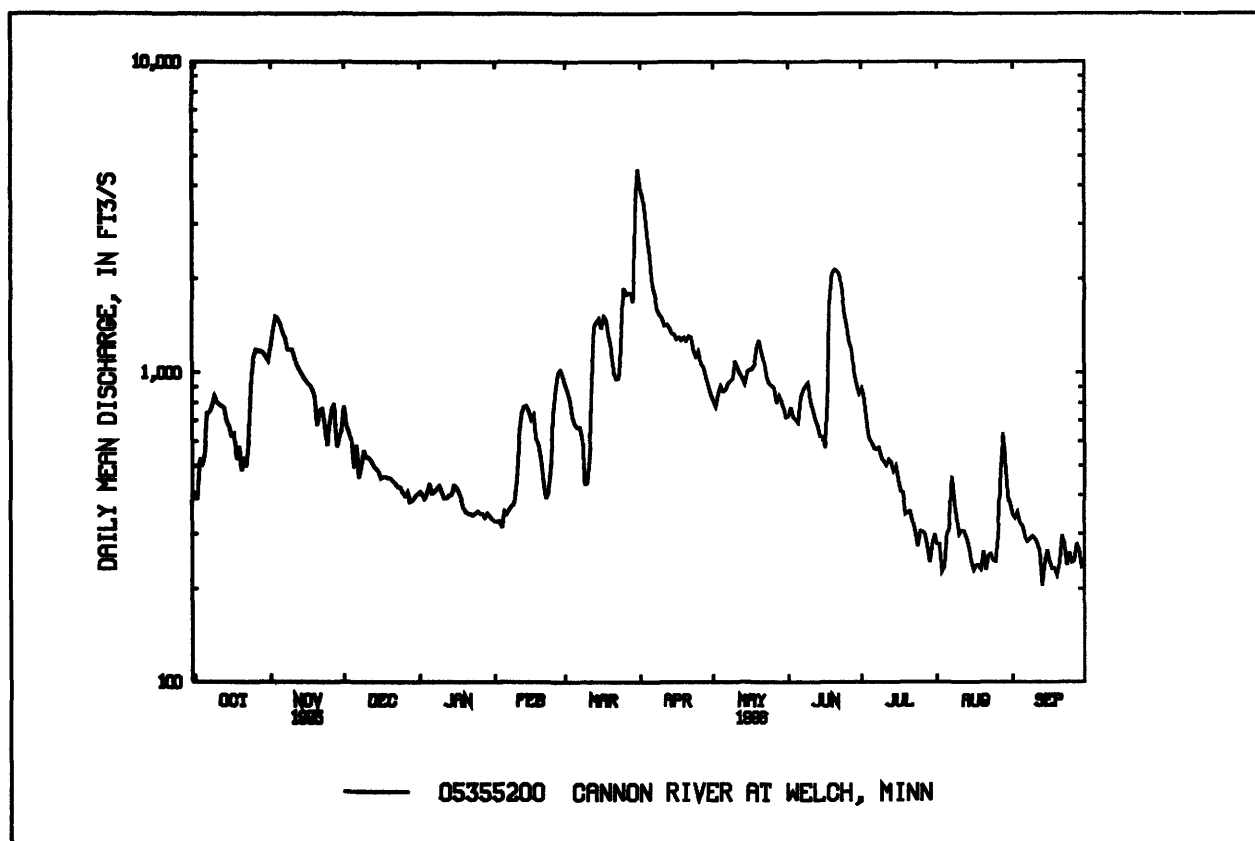
CANNON RIVER BASIN

05355200 CANNON RIVER AT WELCH, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	372	356	277	230	288	966	1311	727	748	527	400	363
MAX	1806	1708	1105	662	1141	2627	8240	2966	4144	3343	2951	1823
(WY)	1969	1971	1992	1992	1966	1992	1965	1944	1993	1993	1993	1993
MIN	65.5	78.8	75.0	76.9	110	149	145	84.9	80.0	71.2	78.1	72.8
(WY)	1934	1934	1938	1938	1913	1911	1911	1934	1934	1934	1936	1933

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1909 - 1996	
ANNUAL TOTAL	273179		279798			
ANNUAL MEAN	748		764		569	
HIGHEST ANNUAL MEAN					2132	
LOWEST ANNUAL MEAN					137	
HIGHEST DAILY MEAN	2210		4510		28700	
LOWEST DAILY MEAN	200		204		19	
ANNUAL SEVEN-DAY MINIMUM	205		235		42	
INSTANTANEOUS PEAK FLOW			4700		36100	
INSTANTANEOUS PEAK STAGE			7.56		14.01	
INSTANTANEOUS LOW FLOW			175 ^a		2.5	
ANNUAL RUNOFF (AC-FT)	541900		555000		412200	
ANNUAL RUNOFF (CFSM)	.57		.58		.43	
ANNUAL RUNOFF (INCHES)	7.70		7.89		5.86	
10 PERCENT EXCEEDS	1330		1390		1230	
50 PERCENT EXCEEDS	649		620		257	
90 PERCENT EXCEEDS	310		280		98	

^a Result of regulation.

ZUMBRO RIVER BASIN

05372995 SOUTH FORK ZUMBRO RIVER AT ROCHESTER, MN

LOCATION.--Lat 44°03'42", long 92°27'58", in NW¹/₄NE¹/₄ sec.23, T.107 N., R.14 W., Olmsted County, Hydrologic Unit 07040004, on left bank 50 ft downstream from 37th Street bridge, 0.2 mi upstream from sewer plant, and 2.0 mi downstream from Silver Lake Dam.

DRAINAGE AREA.--303 mi².

PERIOD OF RECORD.--March 1981 to current year.

GAGE.--Water-stage recorder. Datum of gage is 950.00 ft above mean sea level.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Slight regulation at times from Silver Lake.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 6, 1978, reached a stage of about 28.0 ft, on upstream side of bridge, discharge 30 500 ft³/s. This is the highest known stage since at least 1908.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 25	1100	*3510	*2.94	June 18	1000	2330	8.03
June 11	0900	1510	6.61	Aug. 19	1800	1520	6.63

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	74	176	93	59	56	224	507	170	165	250	76	62
2	85	198	93	58	51	194	431	173	150	252	73	61
3	85	226	91	58	49	156	404	181	162	242	72	60
4	77	202	84	59	47	151	358	162	156	221	66	59
5	102	181	83	53	47	144	307	169	183	211	94	59
6	118	170	59	49	47	124	280	154	282	201	77	54
7	109	163	72	47	48	105	265	151	340	188	153	52
8	113	148	76	44	66	100	252	150	293	166	94	50
9	116	140	59	44	66	100	240	149	247	155	81	51
10	105	145	68	45	71	101	229	157	223	144	76	49
11	103	122	61	47	66	120	229	147	419	144	74	49
12	99	117	58	48	65	235	230	138	297	185	71	49
13	92	134	58	52	69	609	231	133	268	140	68	47
14	88	125	61	56	76	753	220	163	227	130	68	45
15	88	119	65	57	77	532	216	159	207	128	66	45
16	88	119	65	58	77	413	215	161	298	118	62	45
17	81	116	65	68	77	391	215	158	874	115	59	45
18	80	116	65	112	70	342	224	154	1930	114	58	44
19	79	116	65	86	77	277	226	149	1270	106	266	44
20	77	115	65	82	85	236	256	144	833	102	137	67
21	77	108	65	65	78	209	282	132	681	100	96	52
22	76	83	63	65	83	201	280	125	567	98	102	54
23	136	84	66	65	123	192	269	125	511	90	83	50
24	189	85	65	65	215	763	258	116	483	87	77	50
25	117	101	62	65	573	2890	252	120	413	86	76	47
26	138	103	65	65	783	1080	236	119	368	81	111	60
27	141	99	64	61	558	567	215	121	335	84	88	73
28	158	69	54	60	277	512	201	122	306	82	80	58
29	143	81	59	62	228	900	187	128	302	78	73	54
30	145	93	59	89	---	879	184	120	270	77	69	51
31	145	---	59	57	---	660	---	113	---	76	68	---
TOTAL	3324	3854	2087	1901	4205	14160	7899	4463	13060	4251	2714	1586
MEAN	107	128	67.3	61.3	145	457	263	144	435	137	87.5	52.9
MAX	189	226	93	112	783	2890	507	181	1930	252	266	73
MIN	74	69	54	44	47	100	184	113	150	76	58	44
AC-FT	6590	7640	4140	3770	8340	28090	15670	8850	25900	8430	5380	3150
CFSM	.35	.42	.22	.20	.48	1.51	.87	.48	1.44	.45	.29	.17

e Estimated.

ZUMBRO RIVER BASIN

05372995 SOUTH FORK ZUMBRO RIVER AT ROCHESTER, MN--Continued

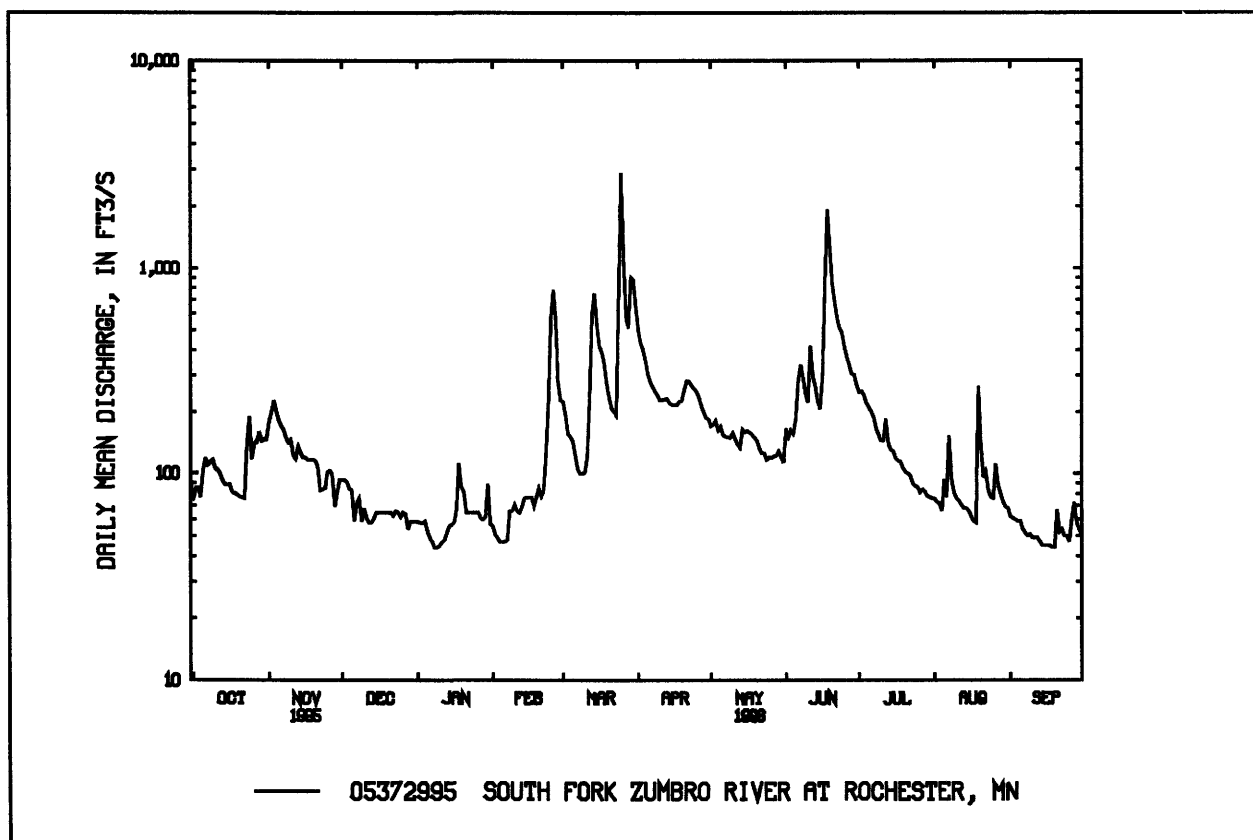
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1981 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	171	155	128	79.8	127	390	408	310	242	221	162	186
MAX	824	338	358	167	454	760	1211	617	1014	663	501	1075
(WY)	1987	1992	1992	1983	1984	1983	1993	1991	1993	1993	1990	1986
MIN	20.0	24.5	21.0	22.5	23.8	165	106	88.3	49.0	23.2	24.6	31.5
(WY)	1990	1990	1990	1990	1990	1987	1981	1989	1989	1988	1988	1988

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1981 - 1996
ANNUAL TOTAL	56549	63504	
ANNUAL MEAN	155	174	216
HIGHEST ANNUAL MEAN			431
LOWEST ANNUAL MEAN			87.3
HIGHEST DAILY MEAN	1030	Mar 12	2890
LOWEST DAILY MEAN	43	Feb 15	44a
ANNUAL SEVEN-DAY MINIMUM	45	Feb 12	45
INSTANTANEOUS PEAK FLOW			3510
INSTANTANEOUS PEAK STAGE			9.66
INSTANTANEOUS LOW FLOW			44a
ANNUAL RUNOFF (AC-FT)	112200	126000	156700
ANNUAL RUNOFF (CFSM)	.51	.57	.71
10 PERCENT EXCEEDS	299	303	478
50 PERCENT EXCEEDS	112	105	121
90 PERCENT EXCEEDS	58	54	42

a Also occurred Jan. 9 and Sep. 18-19.

b Result of regulation.



WHITEWATER RIVER BASIN

05376800 WHITEWATER RIVER NEAR BEAVER, MN

LOCATION.--Lat 44° 00'19", long 92° 00'19", in SW 1/4, SE 1/4, sec. 15, T. 108 N., R. 10 W., Winona County, Hydrologic Unit 07040003, on left bank at downstream side of bridge on County Road No. 30, 0.5 mi above mouth of Beaver Creek, and 4.7 mi north of Elba.

PERIOD OF RECORD.--May 1975 to September 1985, May 1991 to July 1993, October 1993 to current.

GAGE.--Water-stage recorder. Datum of gage is 692.01 ft above mean sea level. Prior to Oct. 1, 1976, at datum 2.00 ft higher.

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1939, 19,200 ft³/s, June 21, 1974, gage height, 13.00 ft, present datum, determined by contracted opening measurement.

EXTREMES FOR CURRENT RECORD.--Peak discharge greater than base discharge of 2,000 ft³/s and maximum (*).

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 13	2030	2230	7.73	Mar. 25	0700	*6730	*11.54
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996							
DAILY MEAN VALUES DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996							
1	138	147	133	117	e105	269	328
2	130	153	131	116	e103	246	291
3	131	153	131	113	e102	234	280
4	134	148	130	e112	e101	235	259
5	135	147	130	e110	e100	220	238
6	149	147	124	e110	e100	213	227
7	148	146	134	e130	e102	200	222
8	145	144	128	e145	e112	207	214
9	145	143	e125	e160	e135	214	203
10	142	144	e127	e150	e158	198	207
11	141	141	e130	128	e177	199	213
12	138	139	e125	113	176	470	214
13	138	139	e120	112	176	1150	204
14	136	138	e138	111	176	854	188
15	135	137	154	108	173	460	180
16	134	137	144	111	168	343	185
17	133	137	124	114	173	311	177
18	132	136	116	e114	168	268	175
19	134	136	117	e111	174	230	182
20	134	136	116	e110	174	202	179
21	134	135	115	e109	177	185	179
22	135	132	115	e109	177	178	175
23	141	132	115	e108	190	173	171
24	148	130	115	e107	314	616	166
25	145	132	115	e106	610	3030	170
26	141	133	115	e105	674	572	175
27	140	137	114	e104	447	362	161
28	147	129	e120	e109	319	366	158
29	145	133	e123	e108	277	574	155
30	144	132	118	e107	---	662	156
31	142	---	118	e105	---	428	---
TOTAL	4314	4173	3860	3572	6038	13869	6032
MEAN	139	139	125	115	208	447	201
MAX	149	153	154	160	674	3030	328
MIN	130	129	114	104	100	173	155
AC-FT	8560	8280	7660	7090	11980	27510	11960
CFSM	.51	.51	.46	.43	.77	1.65	.74
IN.	.59	.57	.53	.49	.83	1.90	.83

e Estimated.

WHITEWATER RIVER BASIN

05376800 WHITEWATER RIVER NEAR BEAVER, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1996, BY WATER YEAR (WY)

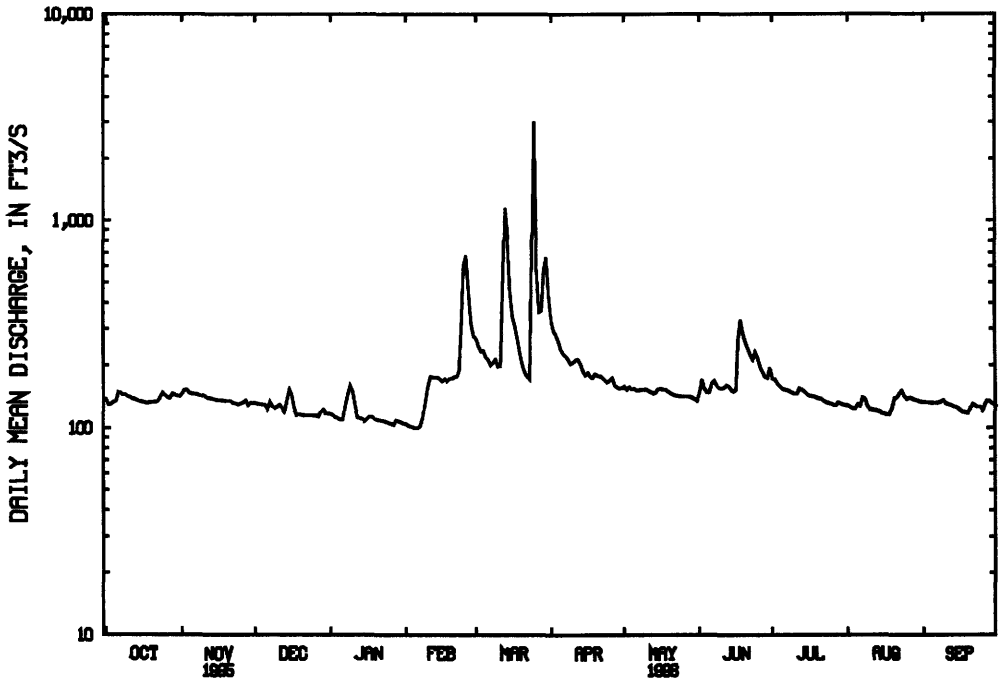
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	142	155	141	125	149	274	200	181	175	221	147	143
MAX	223	288	235	188	236	512	282	255	240	973	205	230
(WY)	1994	1992	1992	1980	1985	1985	1992	1984	1980	1978	1979	1978
MIN	88.0	84.8	77.0	80.6	59.7	84.2	92.9	89.6	112	92.1	87.1	87.5
(WY)	1978	1978	1977	1978	1978	1978	1977	1977	1976	1977	1977	1977

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1975 - 1996
ANNUAL TOTAL	58564	64546	
ANNUAL MEAN	160	176	168a
HIGHEST ANNUAL MEAN			203
LOWEST ANNUAL MEAN			103
HIGHEST DAILY MEAN	1020	Mar 12	3030
LOWEST DAILY MEAN	111	Feb 1	100b
ANNUAL SEVEN-DAY MINIMUM	111	Feb 1	102b
INSTANTANEOUS PEAK FLOW		6370	Mar 25
INSTANTANEOUS PEAK STAGE		11.54	Mar 25
INSTANTANEOUS LOW FLOW			53
ANNUAL RUNOFF (AC-FT)	116200	128000	121900
ANNUAL RUNOFF (CFSM)	.59	.65	.62
ANNUAL RUNOFF (INCHES)	8.04	8.86	8.44
10 PERCENT EXCEEDS	224	230	237
50 PERCENT EXCEEDS	142	142	144
90 PERCENT EXCEEDS	112	115	94

a Median of annual mean discharges is 176 ft³/s.

b Estimated, backwater from ice.

c Occurred Feb. 20 to Mar. 20, 1978.



05376800 WHITEWATER RIVER NEAR BEAVER, MN

MISSISSIPPI RIVER MAIN STEM
05378500 MISSISSIPPI RIVER AT WINONA, MN

LOCATION.--Lat 44°03'21", long 91°38'16", in sec.23, T.107 N., R.7 W., Winona County, Hydrologic Unit 07040003, on right bank at Winona pumping station in Winona, 9.5 mi upstream from Trempealeau River, and at mile 725.7 upstream from the Ohio River.

DRAINAGE AREA.--59,200 mi², approximately.

PERIOD OF RECORD.--June 1928 to current year. Gage-height records collected in this vicinity since 1878 are contained in reports of Mississippi River Commission.

GAGE.--Water-stage recorder. Datum of gage is 639.64 ft above mean sea level. June 10, 1928, to Apr. 15, 1931, nonrecording gage at site 800 ft upstream. Prior to Oct. 1, 1929, at datum 0.20 ft higher and Oct. 1, 1929, to Apr. 15, 1931, at datum 0.12 ft lower. Apr. 16, 1931, to Nov. 12, 1934, nonrecording gage at present site and datum. Since Mar. 31, 1937, auxiliary water-stage recorder 2.7 mi upstream at tailwater of navigation dam 5A.

REMARKS.--Records good except those for estimated days, which are fair. Some regulation by reservoirs, navigation dams, and powerplants at low and medium stages. Flood flow not materially affected by artificial storage. Daily discharges for some days provided by the U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Minimum gage height, -3.38 ft, Aug. 31, 1934 (prior to dam construction in 1936); minimum gage height since 1938, after completion of dam, 1.95 ft, Jan. 27, 1944.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 18, 1880, reached an elevation of 657.14 ft, discharge, 172,000 ft³/s, from information by U.S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17800	62900	24300	e26700	e26600	e31900	61100	107000	64400	63900	31800	20600
2	19900	62700	29300	e27600	e23500	e34400	61500	99600	63500	64700	31200	18700
3	21800	63700	36300	e27700	e24200	e35100	60700	95500	61800	63800	30900	16900
4	25500	64200	41800	e27600	e24600	e33900	60500	90200	56200	60900	29000	16700
5	30200	64400	38300	e26000	e24800	e33000	63100	87100	53900	55000	26300	16700
6	35400	65000	29800	e23700	e24400	e35300	65500	84300	53700	51300	29600	19100
7	39200	65200	23000	e20700	e24000	e35500	65300	80600	54500	47500	29700	22200
8	41000	64500	24100	e20300	e23700	e33000	65900	78700	54200	44700	27900	22700
9	45000	62200	18100	e22000	e23700	e30900	66500	76700	53000	42600	25300	22500
10	51900	54800	e19100	e24200	e23900	e29400	67100	74600	51600	40600	23700	20600
11	56200	56800	e16900	e25900	e24900	e27600	67800	72300	50700	37900	24200	19100
12	58300	53600	e19400	e26100	e25900	e28200	69600	69100	49800	38100	24600	19800
13	59900	51300	e25200	e26000	e26000	39100	71900	67200	48200	37400	24500	18700
14	59900	51500	e29700	e25700	e27700	39700	76100	67300	47100	35300	24500	18000
15	60100	50600	e30100	e26200	e28100	42200	84200	66000	46200	33400	23900	17600
16	56300	49900	e30200	e27000	e29000	42600	94800	65200	44700	34400	21100	15800
17	51300	51700	e30200	e26900	e28900	42000	99800	64700	45300	34500	21700	14800
18	49600	47900	e29600	e28700	e29600	41500	101000	63600	45300	35400	21900	15600
19	49500	49100	e29800	e18200	e27900	42900	103000	63600	46400	35700	21400	16400
20	48600	46200	e29800	e17400	e27100	e44200	105000	63400	48700	35500	21900	17100
21	46400	47100	e29800	e18800	e28100	e45000	109000	63600	49700	34400	21000	16900
22	42000	46000	e29800	e21500	e29600	e46000	119000	66000	51700	35500	19900	17200
23	39900	42000	e29800	e21500	e31900	47800	131000	68200	51600	37500	16800	17500
24	41400	38100	e29700	e26300	e31600	49500	141000	72600	51500	35400	16200	16400
25	40400	34800	e29500	e27400	e32500	52700	143000	75000	53100	35000	17800	16000
26	43600	35700	e29000	e28400	e33700	56600	140000	75600	54700	34900	21700	16400
27	48900	34600	e28400	e27900	e34400	62900	134000	74800	56000	34100	23200	15800
28	52400	27200	e27800	e27700	e32500	55700	125000	72500	55400	32900	22700	16200
29	59600	26300	e26700	e27400	e29400	52000	118000	70100	55700	33000	22200	18600
30	62200	21100	e26600	e27300	---	53400	112000	69500	62900	32500	22300	2^400
31	62900	---	e26500	e27200	---	59200	---	67600	---	32000	21700	---
TOTAL	1417100	1491100	868600	776000	802200	1303200	2782400	2312200	1581500	1269800	740600	541000
MEAN	45710	49700	28020	25030	27660	42040	92750	74590	52720	40960	23890	18030
MAX	62900	65200	41800	28700	34400	62900	143000	107000	64400	64700	31800	22700
MIN	17800	21100	16900	17400	23500	27600	60500	63400	44700	32000	16200	14800
AC-FT	2811000	2958000	1723000	1539000	1591000	2585000	5519000	4586000	3137000	2519000	1469000	1073000
CFSM	.77	.84	.47	.42	.47	.71	1.57	1.26	.89	.69	.40	.30

e Estimated.

MISSISSIPPI RIVER MAIN STEM

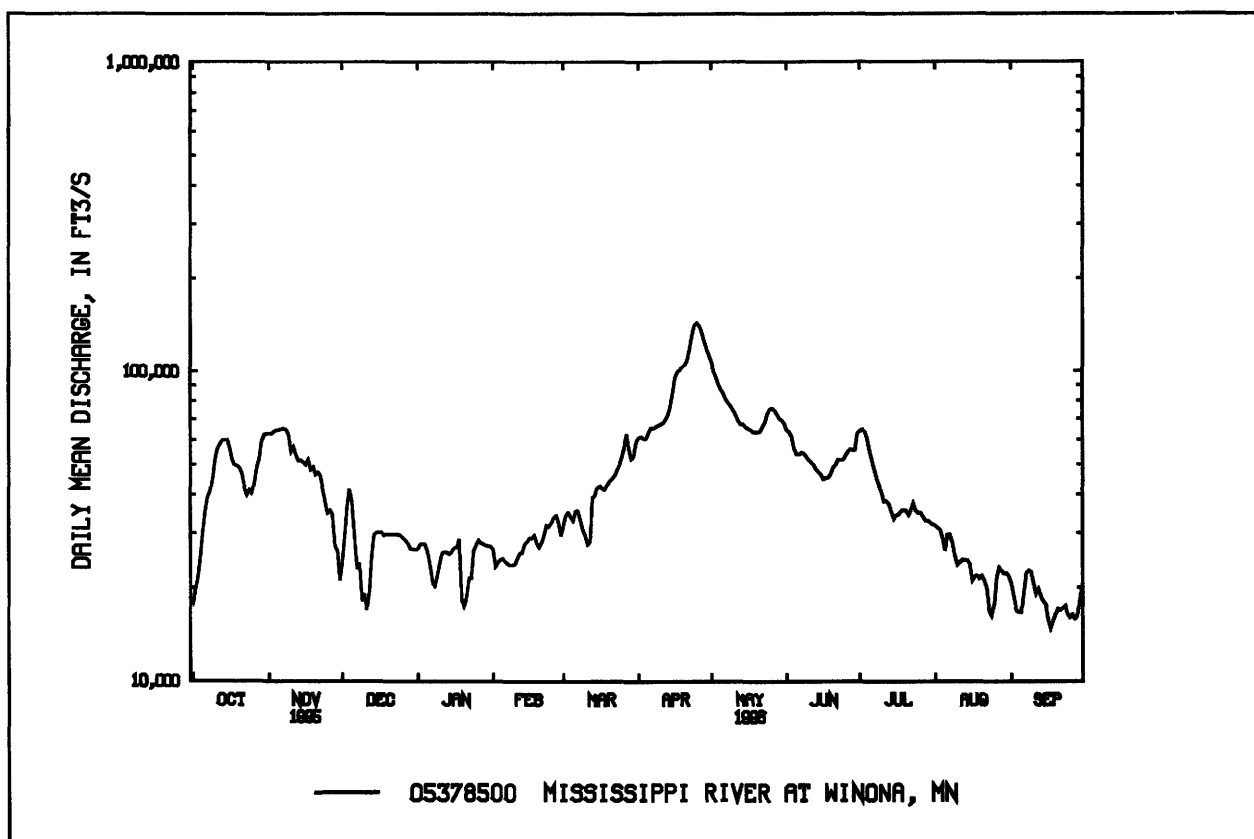
05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	22610	22600	17350	15060	15240	30320	60260	48550	39290	31260	21120	22390
MAX	85950	50040	40440	30480	35900	86420	152600	111500	100200	118800	67560	69490
(WY)	1987	1972	1992	1983	1984	1983	1965	1986	1993	1993	1993	1986
MIN	6774	7367	6286	6742	7874	9023	12810	11930	8450	7063	5391	6790
(WY)	1934	1934	1934	1940	1977	1934	1931	1931	1934	1934	1934	1933

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1928 - 1996
ANNUAL TOTAL	15195800	15885700	
ANNUAL MEAN	41630	43400	28870
HIGHEST ANNUAL MEAN			56850
LOWEST ANNUAL MEAN			9742
HIGHEST DAILY MEAN	83700	Apr 27	143000
LOWEST DAILY MEAN	10800	Mar 9	14800
ANNUAL SEVEN-DAY MINIMUM	11300	Mar 5	16300
INSTANTANEOUS PEAK FLOW			144000
INSTANTANEOUS PEAK STAGE			14.97
INSTANTANEOUS LOW FLOW			10700 _b
ANNUAL RUNOFF (AC-FT)	30140000	31510000	20910000
ANNUAL RUNOFF (CFSM)	.70	.73	.49
10 PERCENT EXCEEDS	70400	69500	60000
50 PERCENT EXCEEDS	38500	35400	20600
90 PERCENT EXCEEDS	14000	19900	9870

- a From floodmark.
b Minimum observed.
c Result of ice jam.



MISSISSIPPI RIVER MAIN STEM

05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.-- Daily sediment, temperature, and specific conductance station, water years 1976 to 88. Periodic sediment station, water years 1989 to current.

REMARKS.-- Suspended-sediment samples were collected at five points in a river cross-section.

SUSPENDED-SEDIMENT CONCENTRATIONS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDI- MENT SUS- SPENDED MG/L (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
APR 23...	1500	133,000	92	--
SEP 25...	1325	16,900	14	99

PARTICLE-SIZE DISTRIBUTION OF BED-MATERIAL SEDIMENT, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	NUMBER OF SAM- PLING POINTS (COUNT)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.00 MM (80172)
APR 23...	1510	5	0	0.7	31	84	95	96	96	100

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ROOT RIVER BASIN

05385000 ROOT RIVER NEAR HOUSTON, MN

LOCATION.--43°46'07", long 91°34'11", in SW1/4NW1/4, sec.33, T.104 N., R.6 W., Houston County, Hydrologic Unit 07040008, on right bank 0.2 mi north of Houston and 1.6 mi upstream from South Fork and 18.2 mi upstream from mouth.

DRAINAGE AREA.--1,270 mi², approximately.

PERIOD OF RECORD.--May 1909 to September 1917, May to November 1929, March 1930 to 1983, 1991 to current year. Operated as high-flow partial-record station October 1983 to September 1990. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 895: Drainage area. WSP 1508: 1911-12. WSP 1628: 1948(P).

GAGE.--Water-stage recorder. Datum of gage is 667.00 ft above mean sea level. May 28, 1909, to Sept. 30, 1917, nonrecording gage at site 1.3 mi downstream at different datum. May 4, 1929, to Sept. 27, 1933, nonrecording gage and Sept. 28, 1933 to June 26, 1980, recording gage at site 0.9 mi upstream at datum 671.86 ft.

REMARKS.--Records good except those for estimated daily discharges, which are fair to poor. Slight diurnal fluctuation at low flows caused by powerplants above station.

EXTREME FOR CURRENT YEAR.--Peak discharges above base of 5,000 ft³/s and maximum (*).

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 25	2100	*8710	*12.88				

(No other peaks above base).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e565	605	534	e440	e395	887	1560	702	627	965	535	463
2	e560	646	526	e440	e390	848	1360	685	688	926	532	455
3	e580	646	509	e390	e385	e840	1220	674	731	903	523	451
4	e600	648	505	e410	e390	e840	1110	659	764	878	524	452
5	e580	655	484	e390	e395	e860	1010	636	767	838	531	450
6	e600	650	450	e390	e405	e890	918	671	787	813	537	451
7	e700	645	422	e390	e415	e950	863	656	821	789	579	443
8	e700	628	e430	e410	e430	e1070	825	655	909	765	582	440
9	e630	607	e450	e441	e455	e1200	786	637	1030	738	529	442
10	e640	591	e455	e450	e485	e1220	765	630	943	716	498	444
11	e610	591	e495	e455	e530	e1300	746	623	892	697	480	444
12	e590	561	e500	e455	e570	e2000	745	617	856	710	480	444
13	e570	545	e500	e460	e617	2210	745	613	922	703	479	446
14	e560	567	e490	e465	e625	3190	745	615	910	695	469	440
15	e550	571	e480	e465	e650	2440	742	626	880	679	467	436
16	e540	559	e455	e465	e660	1770	729	628	867	662	457	436
17	e530	556	e445	e470	e670	1470	708	619	955	653	453	437
18	e527	548	e440	e480	e670	1350	694	618	2070	644	452	434
19	530	543	e440	e475	e680	1160	702	625	3430	631	456	429
20	530	539	e435	e470	e700	997	706	623	3070	612	476	427
21	528	534	e440	e460	e760	878	722	616	2340	604	470	428
22	526	521	e435	e455	e860	797	821	616	1950	592	482	428
23	551	488	e430	e450	e1020	768	855	610	1710	583	484	432
24	625	471	e425	e450	e1250	830	830	600	1590	575	520	430
25	623	504	e425	e450	e1370	6310	825	588	1460	563	505	420
26	612	527	e425	e445	e1350	6060	795	588	1340	554	502	423
27	605	539	e420	e430	e1150	2370	767	590	1240	547	506	450
28	605	495	e400	e425	e1000	1660	739	592	1160	560	489	450
29	605	448	e410	e420	e950	1540	718	599	1080	548	487	435
30	600	490	e415	e410	---	1970	714	618	1020	544	478	424
31	596	---	e420	e400	---	2020	---	623	---	541	466	---
TOTAL	18168	16918	14090	13606	20227	52695	25465	19452	37809	21228	15428	13184
MEAN	586	564	455	439	697	1700	849	627	1260	685	498	439
MAX	700	655	534	480	1370	6310	1560	702	3430	965	582	463
MIN	526	448	400	390	385	768	694	588	627	541	452	420
AC-FT	36040	33560	27950	26990	40120	104500	50510	38580	74990	42110	30600	26150
CFSM	.46	.44	.36	.35	.55	1.34	.67	.49	.99	.54	.39	.35
IN.	.53	.50	.41	.40	.59	1.54	.75	.57	1.11	.62	.45	.39

e Estimated.

ROOT RIVER BASIN

05385000 ROOT RIVER NEAR HOUSTON, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 1996, BY WATER YEAR (WY)

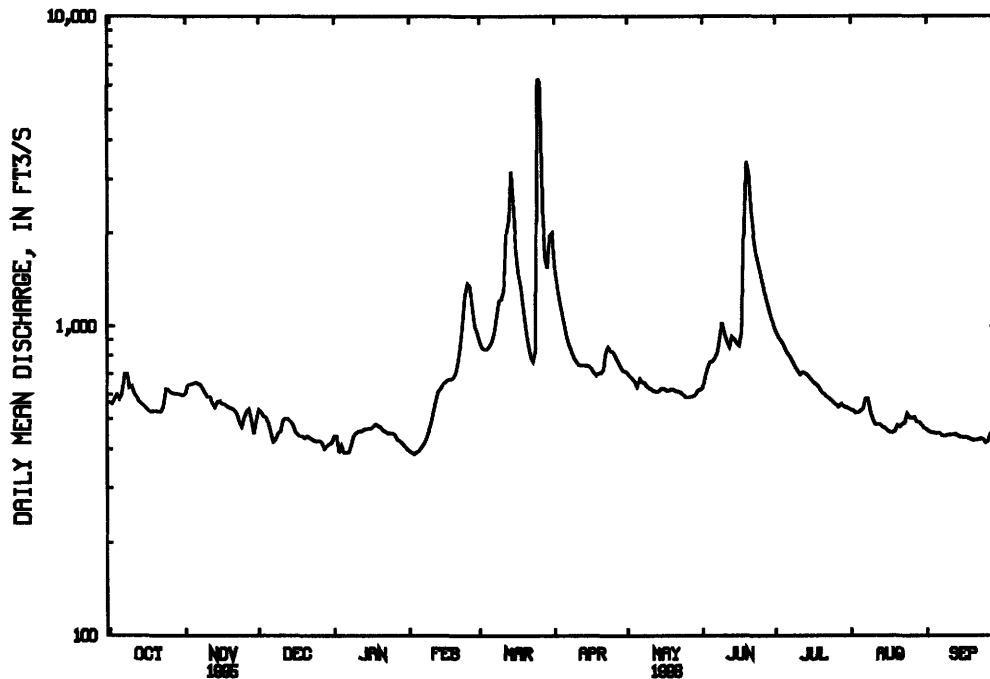
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	513	512	429	408	483	1400	1185	820	889	776	638	565
MAX	1465	1494	1671	1152	1427	3512	4963	2440	2803	3252	2257	2105
(WY)	1974	1983	1992	1973	1966	1961	1965	1973	1974	1978	1993	1938
MIN	193	218	189	172	168	251	274	234	261	236	231	243
(WY)	1934	1934	1934	1959	1959	1931	1931	1934	1934	1964	1958	1933

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1910 - 1996	
ANNUAL TOTAL	300045		268270			
ANNUAL MEAN	822		733		724	
HIGHEST ANNUAL MEAN					1590	
LOWEST ANNUAL MEAN					294	
HIGHEST DAILY MEAN	5120	Mar 12	6310	Mar 25	31100	Apr 1 1952
LOWEST DAILY MEAN	250	Jan 4	385	Feb 3	82	Nov 28 1937
ANNUAL SEVEN-DAY MINIMUM	251	Jan 4	394	Jan 31	113	Dec 25 1933
INSTANTANEOUS PEAK FLOW			8710	Mar 25	37000	Apr 1 1952
INSTANTANEOUS PEAK STAGE			12.88	Mar 25	18.32 ^a	Mar 2 1965
INSTANTANEOUS LOW FLOW			385 ^b	Feb 3	65 ^c	Dec 26 1933
ANNUAL RUNOFF (AC-FT)	595100		532100		524700	
ANNUAL RUNOFF (CFSM)	.65		.58		.57	
ANNUAL RUNOFF (INCHES)	8.79		7.86		7.75	
10 PERCENT EXCEEDS	1410		1120		1280	
50 PERCENT EXCEEDS	660		591		460	
90 PERCENT EXCEEDS	421		430		260	

a Backwater from ice.

b Minimum daily, backwater from ice.

c Also occurred Feb. 25, 1935.



— 05385000 ROOT RIVER NEAR HOUSTON, MN

IOWA RIVER BASIN

05457000 CEDAR RIVER NEAR AUSTIN, MN

LOCATION.--Lat 43°38'11", long 92°58'26", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.15, T.102 N., R.18 W., Mower County, Hydrologic Unit 07080201, on left bank 20 $\frac{1}{2}$ ft upstream from abandoned powerhouse, 500 ft downstream from highway bridge, 1.1 mi downstream from Turtle Creek, and 1.1 mi south of Austin.

DRAINAGE AREA.--425 mi².

PERIOD OF RECORD.--May 1909 to September 1914, October 1944 to current year.

REVISED RECORDS.--WSP 1145: 1945, 1948.

GAGE.--Water-stage recorder. Datum of gage is 1,162.10 ft above mean sea level. May 1909 to April 1912, nonrecording gage in tailwater of powerplant 200 ft downstream at datum 3.1 ft lower. May 1912 to September 1914, nonrecording gage on highway bridge 500 ft downstream at datum 1.1 ft lower.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 25	0600	2380	7.84	June 19	0800	*2640	*8.30

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	106	276	130	89	e70	316	827	266	307	255	68	62
2	108	395	129	89	e65	e200	651	245	483	241	67	61
3	115	463	127	88	e65	e180	573	242	504	219	62	66
4	109	398	118	90	e67	e180	465	234	443	200	61	64
5	121	339	117	e88	e64	169	355	223	388	184	95	62
6	144	309	105	e88	e64	153	311	212	571	169	86	60
7	168	282	e103	e87	e61	e148	289	208	794	159	120	59
8	170	245	106	e86	e67	e145	271	220	585	149	95	72
9	172	230	e114	e85	e87	e143	259	220	468	134	82	68
10	174	234	e111	84	e106	140	248	221	402	121	77	74
11	170	183	e114	82	e133	146	254	210	386	116	82	72
12	163	195	e111	81	163	223	265	198	365	117	83	64
13	156	197	e106	86	175	355	268	192	347	110	75	62
14	152	180	e100	84	174	467	250	197	287	106	71	59
15	145	170	e106	85	174	447	251	211	255	103	67	57
16	139	166	e102	84	169	377	269	215	283	96	63	59
17	133	163	104	e83	149	355	263	220	630	92	61	59
18	127	158	104	e83	138	310	270	224	1890	92	58	58
19	126	154	103	e82	134	243	301	258	2400	86	84	58
20	124	155	102	e81	146	204	461	236	1550	82	79	81
21	120	137	100	e80	177	182	548	221	1090	81	69	72
22	115	131	97	e79	206	187	535	203	837	80	87	75
23	176	125	95	e78	277	182	525	203	698	78	71	73
24	296	175	91	e77	483	460	460	201	665	76	64	68
25	380	141	98	e76	936	b1840	428	218	557	71	59	63
26	332	142	93	e75	1060	b1170	393	220	473	68	146	70
27	296	136	90	e73	838	792	344	238	407	66	103	81
28	272	109	92	e73	468	639	310	319	355	74	88	75
29	252	140	88	e70	344	1460	292	334	318	78	76	68
30	252	125	89	e70	---	1750	281	304	280	72	69	66
31	249	---	89	e71	---	1220	---	275	---	70	65	---
TOTAL	5562	6253	3234	2527	7060	15123	11217	7188	19018	3645	2433	1988
MEAN	179	208	104	81.5	243	477	374	232	634	118	78.5	66.3
MAX	380	463	130	90	1060	1840	334	2400	255	146	81	
MIN	106	109	88	70	61	140	248	192	255	66	58	57
AC-FT	11030	12400	6410	5010	14000	29320	22250	14260	37720	7230	4830	3940
CFM	.42	.49	.25	.19	.57	1.12	.88	.55	1.49	.28	.18	.16
IN.	.49	.55	.28	.22	.62	1.29	.98	.63	1.66	.32	.21	.17

e Estimated.

IOWA RIVER BASIN

05457000 CEDAR RIVER NEAR AUSTIN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	165	159	106	74.3	104	473	510	300	285	244	184	149
MAX	884	997	431	261	701	1428	2011	1222	1624	1456	1720	734
(WY)	1974	1910	1992	1973	1984	1973	1993	1991	1993	1978	1993	1993
MIN	37.3	35.7	26.6	26.5	25.0	53.3	52.9	67.9	48.9	22.6	32.3	30.9
(WY)	1959	1959	1913	1913	1913	1968	1911	1910	1950	1911	1948	1911

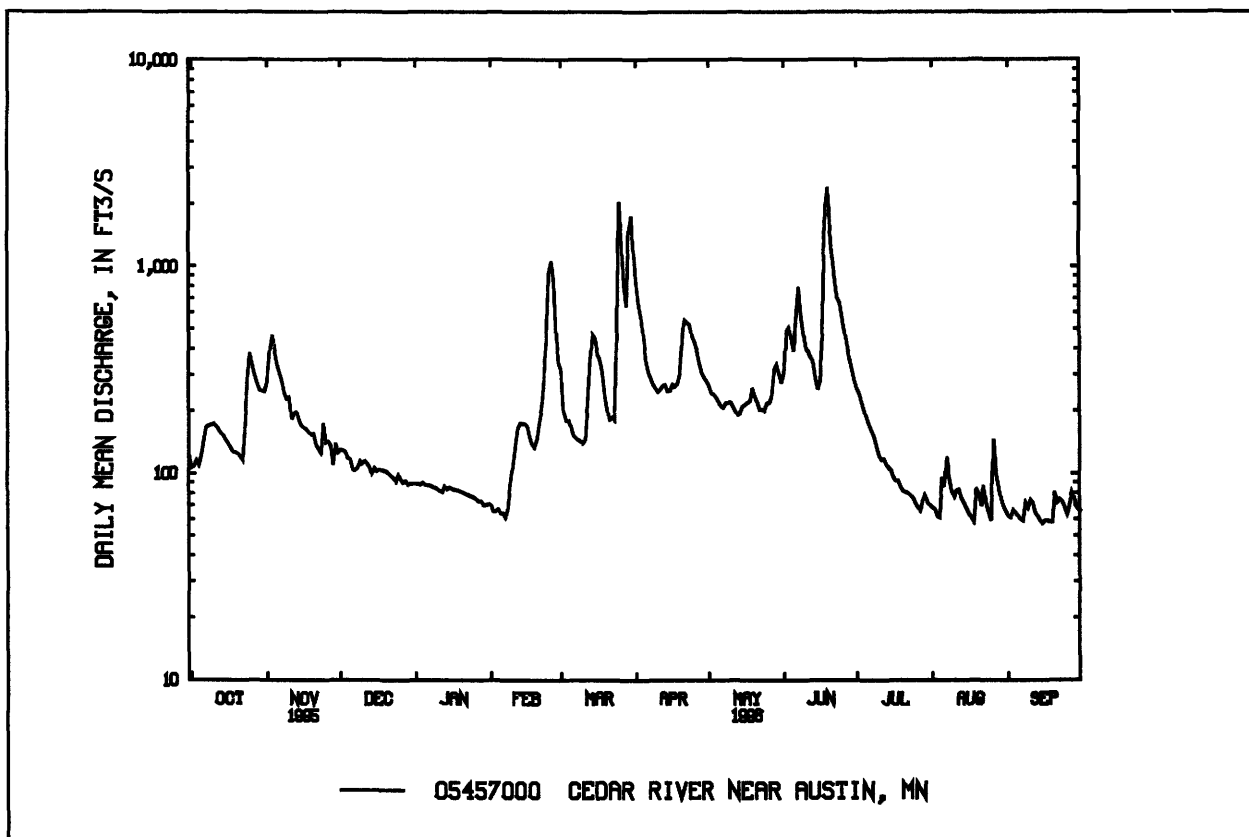
SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1909 - 1996
ANNUAL TOTAL	102626	84908	
ANNUAL MEAN	281	232	230 ^a
HIGHEST ANNUAL MEAN			824
LOWEST ANNUAL MEAN			58.1
HIGHEST DAILY MEAN	1730	Apr 22	2400
LOWEST DAILY MEAN	66	Feb 15	57
ANNUAL SEVEN-DAY MINIMUM	71	Feb 12	59
INSTANTANEOUS PEAK FLOW		2640	Jun 19
INSTANTANEOUS PEAK STAGE		8.30	Jun 19
INSTANTANEOUS LOW FLOW		56 ^d	Aug 18
ANNUAL RUNOFF (AC-FT)	203600	168400	166600
ANNUAL RUNOFF (CFSM)	.66	.55	.54
ANNUAL RUNOFF (INCHES)	8.98	7.43	7.35
10 PERCENT EXCEEDS	626	464	477
50 PERCENT EXCEEDS	163	145	92
90 PERCENT EXCEEDS	88	68	44

a Median of annual mean discharges is 217 ft³/s.

b Occurred on several days in 1911, result of regulation.

c From floodmark in well.

d Occurred several days, August and September.



DES MOINES RIVER BASIN

05476000 DES MOINES RIVER AT JACKSON, MN

LOCATION.--Lat 43°37'10", long 94°59'10", in SE¼SW¼ sec.24, T.102 N., R.35 W., Jackson County, Hydrologic Unit 07100001, on right bank in storage room of city powerplant in Jackson.

DRAINAGE AREA.--1,220 mi², approximately.

PERIOD OF RECORD.--May 1909 to December 1913, August 1930 to current year (winter record incomplete prior to 1936). Published as Des Moines River near Jackson, 1930-35, as West Fork Des Moines River near Jackson, 1936-44, and as West Fork Des Moines River at Jackson, 1945-69.

REVISED RECORDS.--WSP 1115: 1942. WSP 1175: Drainage area. WSP 1238: 1950. WSP 1308: 1938(M).

GAGE.--Water-stage recorder. Datum of gage is 1,287.75 ft above mean sea level. May 31, 1909, to Dec. 20, 1913, nonrecording gage at site 0.6 mi downstream at datum 0.99 ft lower. Aug. 22, 1930, to Sept. 30, 1944, nonrecording gage at site 7 mi upstream at datum 17.10 ft higher. Oct. 1, 1944, to Oct. 26, 1949, nonrecording gage at site 600 ft upstream at datum 10.64 ft higher. Oct. 27, 1949, to Dec. 15, 1965, water-stage recorder 200 ft downstream at present datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Regulation at times from Yankton, Long, Shetek, and Hero Lakes.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 900 ft³/s and maximum (*)

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 07	0600	1110	7.17	Mar. 25	0100	1220	7.29
Nov. 03	0100	1220	7.43	Mar. 31	2100	1880	8.97
Nov. 06	0500	1250	7.50	June 01	1400	1340	7.60
Nov. 14	2100	1090	7.07	June 24	1600	*4070	*13.21

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	463	1070	714	e222	79	e160	1460	450	1330	2450	321	133
2	512	1180	753	e223	54	e165	1470	426	1290	2280	269	90
3	613	1170	744	e221	61	e165	1540	426	1210	2130	243	100
4	813	802	712	e210	102	e170	1500	443	1120	1990	229	392
5	1020	1000	700	e210	e110	e170	1370	453	1090	1870	251	267
6	1090	1160	571	e190	e115	e170	1300	456	1110	1770	245	199
7	1100	1080	e430	e189	e120	e175	1210	458	1120	1670	265	188
8	961	1070	e390	e187	e120	e180	1110	487	1090	1540	253	198
9	929	1030	e330	e183	e125	e190	1050	519	1110	1420	229	196
10	937	1070	e310	e170	e125	e200	997	561	1110	1310	259	179
11	989	892	e290	e165	e125	e220	971	618	1060	1210	338	165
12	945	568	e280	e160	e120	e240	933	681	982	1120	463	156
13	913	930	e280	e155	e120	e260	863	728	908	1030	422	138
14	865	1040	e280	e150	e125	e290	840	792	833	952	402	115
15	801	1010	e280	e148	e125	e310	830	806	776	891	390	99
16	743	980	e280	e151	e120	e320	823	793	766	827	335	86
17	685	890	e280	e168	e120	e320	763	768	1360	774	307	86
18	557	849	e280	e159	e125	e330	749	757	2170	743	272	89
19	535	827	e280	e152	e140	e330	748	798	2480	688	266	89
20	539	814	e275	e150	e155	e340	702	921	2550	627	272	75
21	447	792	e270	e145	e165	e330	672	930	2830	594	267	71
22	412	640	e265	e140	e170	e320	664	912	3240	566	389	76
23	499	621	e260	e135	e180	e300	630	908	3710	531	547	72
24	765	465	e255	e130	e180	e320	615	923	4010	466	497	70
25	1090	522	e255	e125	e175	e350	613	932	4000	422	399	87
26	1150	705	e250	e122	e170	e390	597	962	3750	388	370	103
27	1170	676	e235	e118	e165	403	493	1000	3530	374	308	114
28	1150	495	e230	e117	e160	538	522	1050	3300	468	275	119
29	1110	438	e228	e112	e160	906	504	1150	3020	465	250	105
30	1070	577	e226	e110	---	1490	471	1230	2740	412	222	99
31	1030	---	e222	107	---	1750	---	1310	---	388	209	---
TOTAL	25903	25363	11155	4924	3811	11802	27010	23648	59595	32366	9764	3756
MEAN	836	845	360	159	131	381	900	763	1986	1044	315	132
MAX	1170	1180	753	223	180	1750	1540	1310	4010	2450	547	392
MIN	412	438	222	107	54	160	471	426	766	374	209	70
AC-FT	51380	50310	22130	9770	7560	23410	53570	46910	118200	64200	19370	7750
CFSM	.68	.69	.29	.13	.11	.31	.74	.63	1.63	.86	.26	.11
IN.	.79	.77	.34	.15	.12	.36	.82	.72	1.82	.99	.30	.12

e Estimated.

DES MOINES RIVER BASIN

05476000 DES MOINES RIVER AT JACKSON, MN--Continued

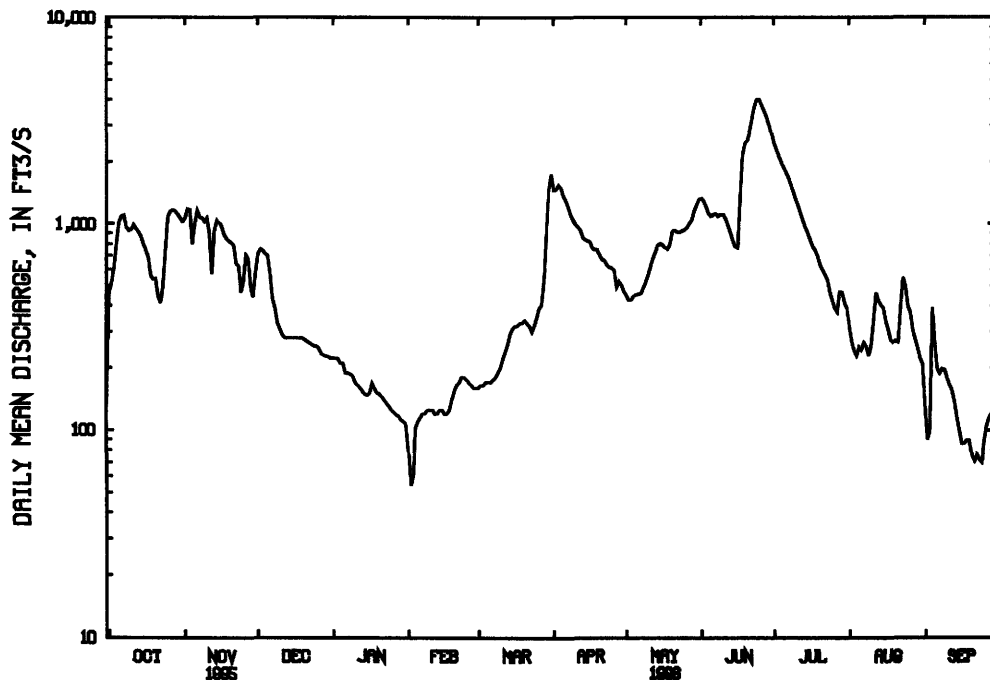
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1996, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	171	175	101	47.7	66.8	456	1030	641	632	535	232	182
MAX	1724	1833	792	298	504	2250	6045	3923	4892	6018	2192	2243
(WY)	1987	1980	1980	1980	1983	1983	1969	1993	1993	1993	1993	1942
MIN	.000	.000	.000	.000	.000	11.8	9.37	2.59	3.76	1.04	.13	.000
(WY)	1956	1956	1956	1956	1936	1959	1959	1934	1931	1931	1955	1931

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR	FOR 1996 WATER YEAR	WATER YEARS 1930 - 1996
ANNUAL TOTAL	339894	239297	
ANNUAL MEAN	931	654	378 ^a
HIGHEST ANNUAL MEAN			2098
LOWEST ANNUAL MEAN			15.1
HIGHEST DAILY MEAN	3500	4010	15500
LOWEST DAILY MEAN	33	54	.00
ANNUAL SEVEN-DAY MINIMUM	35	77	.00
INSTANTANEOUS PEAK FLOW		4070	15700
INSTANTANEOUS PEAK STAGE		13.21	19.45
INSTANTANEOUS LOW FLOW		28 ^b	.00
ANNUAL RUNOFF (AC-FT)	674200	474600	273700
ANNUAL RUNOFF (CFSM)	.76	.54	.31
ANNUAL RUNOFF (INCHES)	10.36	7.30	4.21
10 PERCENT EXCEEDS	2280	1220	1010
50 PERCENT EXCEEDS	741	454	84
90 PERCENT EXCEEDS	77	121	2.9

a Median of annual mean discharges is 153 ft³/s..

b Result of freezeup.



— 05476000 DES MOINES RIVER AT JACKSON, MN

BIG SIOUX RIVER BASIN

06483000 ROCK RIVER AT LUVERNE, MN

LOCATION.--Lat 43°39'15", long 96°12'03", in SW1/4,NE1/4 sec.11, T.102 N., R.45 W., Rock County, Hydrologic Unit 10170204, at bridge on Main Street (County Highway 4) in Luverne.

DRAINAGE AREA.--425 mi².

PERIOD OF RECORD.-- Sept. 1911 to Sept. 1914, non-recording gage at same site, monthly discharges only for same period published in WSP 1309. October 1972 to September 1995, annual maximums only. Daily-mean discharges, October 1995 to current.

GAGE.--Water-stage recorder. Datum of gage is 1,426.26 ft above mean sea level. Staff gage from 1911-14, crest-stage gage from 1975 to 1995.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e100	e600	e160	e52	e22	e33	e280	106	337	218	49	38
2	e500	e540	e160	e50	e22	e32	e300	108	352	221	47	40
3	e1500	e450	e150	e48	e23	e32	e270	120	320	207	46	55
4	e1300	e400	e140	e46	e24	e31	e240	142	279	197	71	521
5	e800	e330	e130	e43	e25	e30	e220	162	252	190	86	366
6	e600	e280	e120	e41	e27	e29	e190	167	241	168	89	270
7	e450	e250	e100	e39	e28	e29	e170	169	252	153	119	225
8	e340	e250	e90	e37	e29	e31	e160	175	245	164	183	196
9	e274	e220	e80	e38	e31	e37	e145	202	223	127	123	213
10	e270	e200	e70	e39	e33	e43	129	253	198	115	91	183
11	e280	e180	e58	e40	e35	e48	137	308	181	105	96	138
12	e300	e170	e52	e41	e37	e56	151	269	163	108	242	110
13	e280	e150	e50	e41	e38	e66	153	234	149	103	179	91
14	e260	e140	e52	e39	e40	e78	136	220	134	97	132	79
15	e240	e130	e54	e37	e41	e90	124	227	126	90	108	75
16	e220	e140	e56	e35	e41	e105	119	234	265	88	92	67
17	e210	e170	e58	e34	e41	e115	117	225	1390	90	77	61
18	e190	e190	e60	e33	e42	e125	117	213	1540	88	64	57
19	e180	e210	e56	e31	e41	e135	125	306	1110	81	68	59
20	e170	e190	e54	e30	e39	e140	130	394	1110	75	136	74
21	e165	e170	e54	e29	e36	e139	132	325	975	75	127	97
22	e160	e160	e54	e29	e34	e130	134	266	862	71	96	99
23	e160	e150	e56	e29	e35	e125	140	274	687	66	73	88
24	e250	e140	e56	e29	e35	e120	135	360	611	61	64	81
25	e350	e140	e56	e29	e36	e115	129	355	494	56	57	79
26	e500	e150	e56	e29	e36	e110	130	324	403	53	55	96
27	e650	e160	e54	e28	e35	e120	125	345	345	51	55	155
28	e900	e155	e56	e26	e34	e160	121	526	303	48	49	161
29	e800	e150	e56	e25	e34	e180	113	538	269	53	44	150
30	e700	e148	e56	e24	---	e200	110	413	237	50	41	129
31	e660	---	e54	e23	---	e240	---	344	---	50	40	---
TOTAL	13759	6713	2358	1094	974	2924	4682	8304	14053	3319	2799	4053
MEAN	444	224	76.1	35.3	33.6	94.3	156	268	468	107	90.3	135
MAX	1500	600	160	52	42	240	300	538	1540	221	242	521
MIN	100	130	50	23	22	29	110	106	126	48	40	38
AC-FT	27290	13320	4680	2170	1930	5800	9290	16470	27870	6580	5550	8040
CFSM	1.04	.53	.18	.08	.08	.22	.37	.63	1.10	.25	.21	.32
IN.	1.20	.59	.21	.10	.09	.26	.41	.73	1.23	.29	.24	.35

e Estimated.

BIG SIOUX RIVER BASIN

06483000 ROCK RIVER AT LUVERNE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1996, BY WATER YEAR (WY)

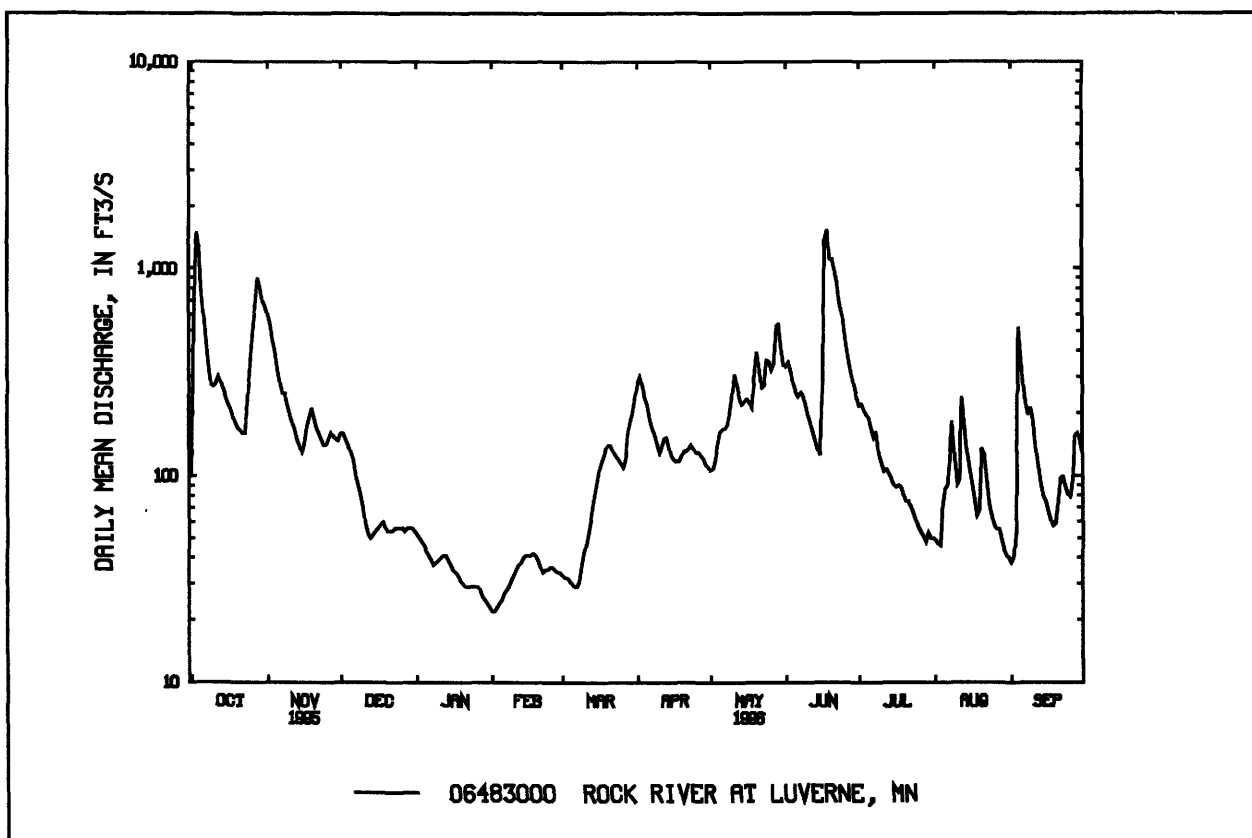
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	207	75.6	29.2	35.3	62.6	89.2	103	159	624	62.8	52.5	74.0
MAX	444	224	76.1	35.3	91.7	94.3	156	268	1951	108	90.3	135
(WY)	1996	1996	1996	1996	1912	1996	1996	1996	1914	1914	1996	1996
MIN	12.9	10.5	7.74	35.3	33.6	84.0	29.2	82.8	21.6	10.9	19.2	14.2
(WY)	1913	1913	1913	1996	1996	1912	1914	1912	1912	1912	1912	1912

SUMMARY STATISTICS

FOR 1996 WATER YEAR

WATER YEARS 1911 - 1996

ANNUAL TOTAL	65032			
ANNUAL MEAN	178	178		
HIGHEST ANNUAL MEAN		178		1906
LOWEST ANNUAL MEAN		178		1906
HIGHEST DAILY MEAN	1540	Jun 18	11200	Jun 13 1914
LOWEST DAILY MEAN	22 ^a	Feb 1	6.0 ^a	Feb 1 1912
ANNUAL SEVEN-DAY MINIMUM	23	Jan 29	6.0	Feb 1 1912
INSTANTANEOUS PEAK FLOW	1690	Jun 18	35400	May 8 1993
INSTANTANEOUS PEAK STAGE	6.54	Jun 18	14.23	May 8 1993
ANNUAL RUNOFF (AC-FT)	129000		128700	
ANNUAL RUNOFF (CFSM)	.42		.42	
ANNUAL RUNOFF (INCHES)	5.69		5.68	
10 PERCENT EXCEEDS	346		267	
50 PERCENT EXCEEDS	124		40	
90 PERCENT EXCEEDS	35		10	

^a Backwater from ice.

BIG SIOUX RIVER BASIN
06483000 ROCK RIVER AT LUVERNE, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.-- Water years 1957, 1960-61, 1967--68, 1972, 1989-90, 1994 to current year.

REMARKS.-- Letter K indicates non-ideal colony count, letter E indicates estimated value.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE WATER (DEG C) (00010)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	
NOV 28...	1700	--	E155	843	--	7.7	--	0.0	--	13.0	
APR 09...	1400	--	145	675	669	8.2	8.1	7.0	--	11.3	
MAY 10...	0830	250	--	728	--	8.2	--	7.5	--	10.5	
21...	1540	304	--	779	--	8.2	--	19.0	724	8.6	
AUG 14...	1340	135	--	745	--	8.1	--	24.5	--	8.5	
DATE		COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML) (31673)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	MAGNE-SIUM, DIS-SOLVED (MG/L AS CA) (00915)	
NOV 28...	K34	93	344	7	405	--	0.020	7.50	--	--	
APR 09...	6	93	267	0	326	0.140	0.030	4.20	84	30	
MAY 10...	--	--	--	--	--	<0.015	0.030	3.30	--	--	
21...	K390	110	--	--	--	0.050	0.040	4.90	--	--	
AUG 14...	K470	200	--	--	--	0.030	0.040	4.60	--	--	
DATE		SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)
NOV 28...	--	--	--	18	84	--	--	--	--	<0.050	<0.050
APR 09...	8.7	4.2	15	67	16	30	5.0	32	<0.050	<0.050	
MAY 10...	--	--	--	18	78	--	--	--	--	<0.050	<0.050
21...	--	--	--	17	76	--	--	--	--	<0.050	<0.050
AUG 14...	--	--	--	16	86	--	--	--	--	<0.050	<0.050

**High-Flow Partial-Record Stations
and
Miscellaneous and
Low-Flow Sites**

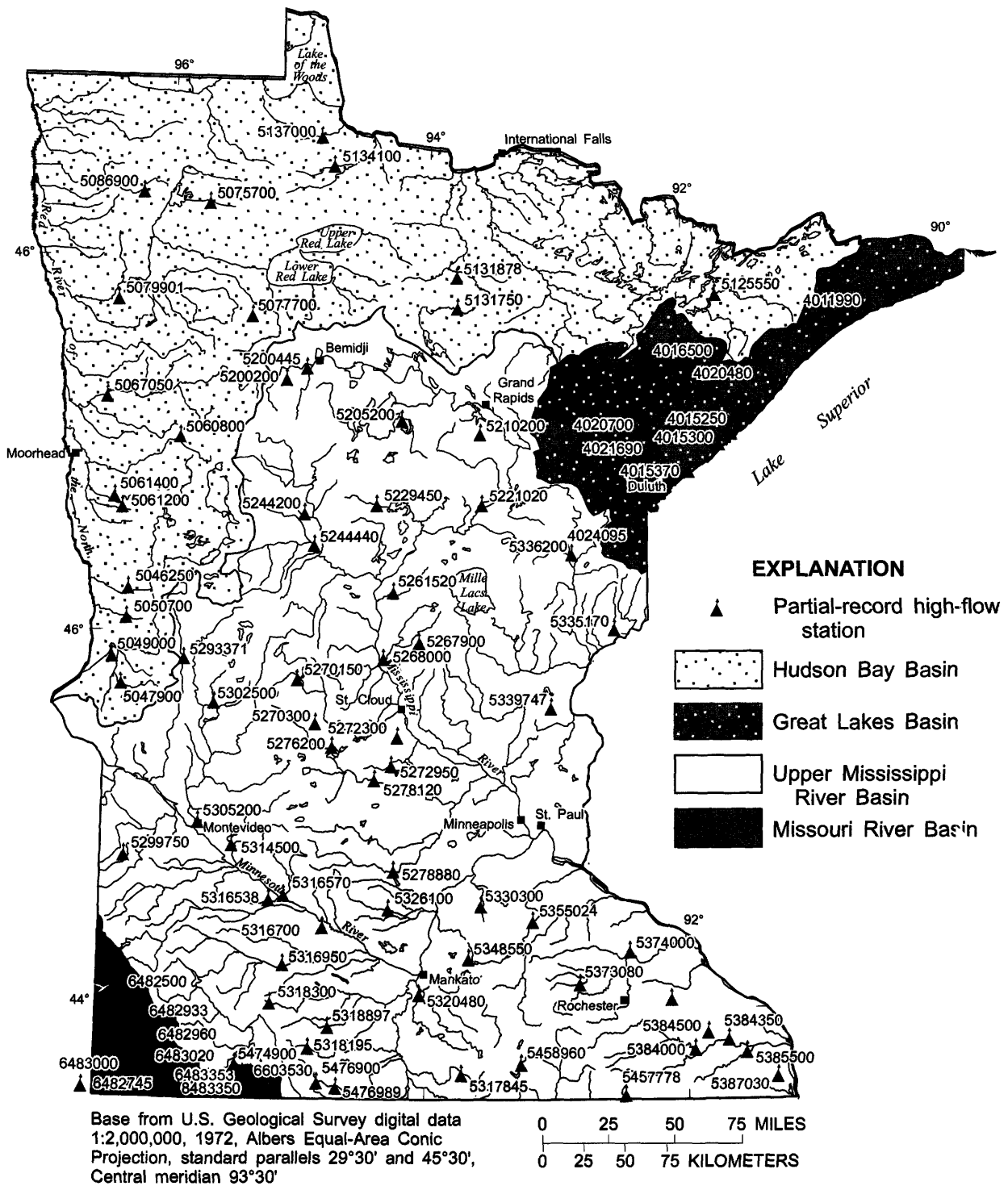


Figure 9.--Location of high-flow partial-record stations.

DISCHARGE AT HIGH-FLOW PARTIAL-RECORD AND MISCELLANEOUS STATIONS

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at high-flow partial-record stations are presented in a table of annual maximum stage and discharge. Discharge measurements made at miscellaneous sites for both low flows and high flows are given in a second table.

HIGH-FLOW PARTIAL-RECORD STATIONS

The following table contains annual maximum discharges for high-flow (crest-stage) partial-record stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at high-flow sites during water year 1996

Station No.	Station Name	Location	Drainage area (mi ²)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft ³ /s)
04011990	Cascade River near Grand Marais, MN	Lat 47°47'24", long 90°31'35", in SE ¹ / ₄ sec. 1, T. 61 N., R. 2 W., Cook County, Hydrologic Unit 04010101, at bridge on Forest Road 45, 6.6 miles upstream from mouth, 9.5 miles west of Grand Marais.	--	1985-current year	5-19-96	a12.95	1350
04015250	Silver Creek tributary near Two Harbors, MN	Lat 47°04'40", long 91°36'49", in SW ¹ / ₄ NE ¹ / ₄ sec. 16, T. 53 N., R. 10 W., Lake County, Hydrologic Unit 04010102, at culvert on County Highway 3, 1.0 mile upstream from mouth, 4.5 miles northeast of Two Harbors.	3.72	1965-current year	4-19-96	b4.68	142
04015300	Little Stewart River near Two Harbors, MN	Lat 47°03'52", long 91°40'03", in SE ¹ / ₄ NE ¹ / ₄ sec. 24, T. 53 N., R. 11 W., Lake County, Hydrologic Unit 04010102, at culvert on County Highway 2, 2.0 miles upstream from mouth, 2.7 miles north of Two Harbors.	5.54	1960-current year	4-19-96	b11.92	263
04015370	Talmadge River at Duluth, MN	Lat 46°53'20", long 91°55'21", in SE ¹ / ₄ NE ¹ / ₄ sec. 24, T. 51 N., R. 13 W., St. Louis County, Hydrologic Unit 04010102, at culvert on U.S. Highway 61, 0.6 mile upstream from mouth, 0.5 mile northeast of Duluth city limits.	5.79	1964-current year	7-11-96	17.79	645
04016500	St Louis River near Aurora, MN	Lat 47°29'30", long 92°14'20", in NW ¹ / ₄ SW ¹ / ₄ sec. 22, T. 58 N., R. 15 W., St. Louis County, Hydrologic Unit 04010201, at bridge on County Highway 100, 0.8 mile downstream from Partridge River and 1.5 mile south of Aurora.	290	1942-87#, 1988-current year	4-23-96	4.70	1780

Annual maximum discharge at high-flow sites during water year 1996

Station No.	Station Name	Location	Drainage area (mi ²)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft ³ /s)
04020480	North Branch Whiteface River near Fairbanks, MN	Lat 47°22'20", long 91°56'28", in NW ¹ / ₄ NW ¹ / ₄ sec. 1, T. 56 N., R. 13 W., St. Louis County, Hydrologic Unit 04010201, at culvert on County Highway 16, 2 miles upstream from the mouth of Jenkins Creek, 0.7 mile west of Fairbanks.	17.1	1979-current year	4-21-96	b12.61	210
04020700	Bug Creek at Shaw, MN	Lat 47°06'40", long 92°21'03", in SW ¹ / ₄ SE ¹ / ₄ sec. 34, T. 54 N., R. 16 W., St. Louis County, Hydrologic Unit 04010201, at culverts on County Road 15 at Shaw, 7.5 miles upstream from mouth.	24.0	1979-current year	4-20-96	b14.34	325
04021690	Cloquet River near Toimi, MN	Lat 47°21'00", long 91°39'30", in NE ¹ / ₄ SW ¹ / ₄ sec. 7, T. 56 N., R. 10 W., Lake County, Hydrologic Unit 04010202, at bridge on County Highway 2, 5.8 miles southeast of Toimi, 23 miles north of Two Harbors.	--	1986-current year	5-19-96	7.07	650
04024095	Nemadji River near Holyoke, MN	Lat 46°31'04", long 92°23'22", in NE ¹ / ₄ NE ¹ / ₄ sec. 32, T. 47 N., R. 16 W., Carlton County, Hydrologic Unit 04010301, at bridge on State Highway 23, 3.5 miles north of Holyoke, 7 miles south of Wrenshall.	118	1972-current year	4-19-96	a12.05	1870
05046250	Ottertail River near Foxhome, MN	Lat 46°12'48", long 96°18'24", in SW ¹ / ₄ SW ¹ / ₄ sec. 26, T. 132 N., R. 45 W., Wilkin County, Hydrologic Unit 09020103, at bridge on County Road 19, 4 miles south of Foxhome, 10.8 miles below Orwell Dam.	--	1990-current year	5-30-96	cd16.1	1370
05049000	Mustinka River above Wheaton, MN	Lat 45°49'15", long 96°29'25", in SW ¹ / ₄ sec. 8, T. 127 N., R. 46 W., Traverse County, Hydrologic Unit 09020102, at bridge on U.S. Highway 75, 1 mile upstream from Chicago, Milwaukee and St. Paul railroad bridge, 0.5 mile north of Wheaton, about 8 miles above Lake Traverse.	834	1915-24#, 1930-58#, 1985-current year	4-9-96	b15.19	2100
05049200	Eighteenmile Creek near Wheaton, MN	Lat 45°47'18", long 96°31'52", in NW ¹ / ₄ NW ¹ / ₄ sec. 25, T. 127 N., R. 47 W., Traverse County, Hydrologic Unit 09020102, at culvert on County Highway 7, 1.4 miles upstream from mouth, 2.0 miles southwest of Wheaton.	68.5	1965-current year	5-18-96	8.05	400
05050700	Rabbit River near Nashua, MN	Lat 46°04'30", long 96°18'24", in SE ¹ / ₄ NE ¹ / ₄ sec. 15, T. 130 N., R. 45 W., Wilkin County, Hydrologic Unit 09020101, at bridge on County Road 19, 2.6 miles north of Nashua, 4.8 miles upstream from mouth of South Fork Rabbit River.	56.1	1979-current year	4-11-96	bc14.01	560

Annual maximum discharge at high-flow sites during water year 1996

Station No.	Station Name	Location	Drainage area (mi ²)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft ³ /s)
05060800	Buffalo River near Callaway, MN	Lat 47°01'17", long 95°54'43", in SW ¹ / ₄ SW ¹ / ₄ sec. 17, T. 141 N., R. 41 W., Becker County, Hydrologic Unit 09020106, at culvert on U.S. Highway 59, 2.7 miles north of Callaway.	94.5	1960-current year	5-18-96	16.61	577
05061200	Whiskey Creek at Barnesville, MN	Lat 46°39'35", long 96°25'54", in SE ¹ / ₄ SW ¹ / ₄ sec. 20, T. 137 N., R. 45 W., Clay County, Hydrologic Unit 09020106, at culvert on State Highway 34, 0.7 mile upstream from Blue Eagle Lake, 1.0 mile northeast of Barnesville.	25.3	1961-64, 1965-66#, 1967-current year	5-18-96	c5.55	245
05061400	Spring Creek above Downer, MN	Lat 46°44'37", long 96°25'12", in NW ¹ / ₄ NW ¹ / ₄ sec. 30, T. 138 N., R. 45 W., Clay County, Hydrologic Unit 09020106, at culvert on county road, 3.1 miles east of Downer.	5.81	1961-current year	5-18-96	10.71	225
05067050	Marsh River Ditch near Ada, MN	Lat 47°17'46", long 96°26'09", in NE ¹ / ₄ NE ¹ / ₄ sec. 13, T. 144 N., R. 46 W., Norman County, Hydrologic Unit 09020108, at bridge on County Highway 24, 3.5 miles southeast of Ada.	--	1985-current year	4-14-96	b17.39	950
05075700	Mud River near Grygla, MN	Lat 48°19'31", long 95°44'35", in NE ¹ / ₄ NE ¹ / ₄ sec. 23, T. 156 N., R. 40 W., Hydrologic Unit 09020304, Marshall County, at bridge on State Highway 89, 6 miles west of Grygla.	170	1979-current year	4-19-96	a18.57	1950
05077700	Ruffy Brook near Gonvick, MN	Lat 47°44'50", long 95°24'45", in SE ¹ / ₄ SE ¹ / ₄ sec. 5, T. 149 N., R. 37 W., Clearwater County, Hydrologic Unit 09020305, at culvert on County Highway 67, 4.0 miles upstream from mouth, 4.8 miles east of Gonvick.	45.2	1960-78#, 1979-85, 1986#, 1987-current year	4-19-96	a5.78	455
05079901	Burnham Creek near Crookston, MN	Lat 47°43'59", long 96°39'52", in SE ¹ / ₄ SW ¹ / ₄ sec. 10, T. 149 N., R. 47 W., Polk County, Hydrologic Unit 09020303, at triple box culvert on U.S. Highway 75, 0.75 mile northeast of Girard, 3 miles southwest of Crookston, 7 miles above mouth.	d111	1986-current year	4-15-96	ac18.94	1950
05086900	Middle River near Newfolden, MN	Lat 48°22'04", long 96°16'47", in NE ¹ / ₄ NE ¹ / ₄ sec. 3, T. 156 N., R. 44 W., Marshall County, Hydrologic Unit 09020309, at bridge on township road, 2.0 miles northeast of Newfolden.	91.1	1979-current year	5-18-96	18.31	2300
05125550	Stony River near Babbitt, MN	Lat 47°41'36", long 91°45'38", in SW ¹ / ₄ SW ¹ / ₄ sec. 8, T. 60 N., R. 11 W., Lake County, Hydrologic Unit 09030001, in Superior National Forest, at bridge on Forest Road 424, 4.7 miles upstream from mouth, 8.5 miles southeast of Babbitt.	219	1975-80#, 1986-current year	5-2-96	6.85	1200

Annual maximum discharge at high-flow sites during water year 1996

Station No.	Station Name	Location	Drainage area (mi ²)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft ³ /s)
05131750	Big Fork River near Bigfork, MN	Lat 47°44'56", long 93°46'31", in SW ¹ / ₄ NE ¹ / ₄ sec.27, T.61 N., R.27 W., Itasca County, Hydrologic Unit 09030006, at bridge on State Highway 6, 5.5 miles west of Bigfork.	602	1973-current year	4-26-96	c13.23	1750
05131878	Bowerman Brook near Craigville, MN	Lat 47°55'29", long 93°45'34", in NE ¹ / ₄ NW ¹ / ₄ sec.26, T. 63 N., R.27 W., Koochiching County, Hydrologic Unit 09030006, at culvert on State Highway 6, 2.4 miles upstream from mouth, 7.0 miles west of Craigville.	25.0	1979-current year	4-19-96	b14.98	290
05134100	North Branch Rapid River near Baudette, MN	Lat 48°31'56", long 94°38'50", in NW ¹ / ₄ SW ¹ / ₄ sec.4, T.158 N., R.31 W., Lake of the Woods County, Hydrologic Unit 09030007, at bridge on County Highway 1, 12.7 miles southwest of Baudette.	d180	1986-current year	n.a.	n.a.	n.a.
05137000	Winter Road River near Baudette, MN	Lat 48°42'39", long 94°41'52", in NW ¹ / ₄ NE ¹ / ₄ sec.1, T.160 N., R.32 W., Lake of the Woods County, Hydrologic Unit 09030008, at bridge on State Highway 11, 4.5 miles west of Baudette, 1.8 miles east of Pitt, 5 miles upstream of mouth.	d145	1986-current year	3-31-86 5-18-96	14.30 15.35	e18 ⁷ / ₉ 24 ⁷ / ₉
05200200	Hennepin Creek near Becida, MN	Lat 47°23'52", long 95°05'12", in NW ¹ / ₄ NE ¹ / ₄ sec. 11, T.145 N., R.35 W., Hubbard County, Hydrologic Unit 07010101, at culvert on Stumphges Rapids Trail approximately 0.5 mile west of Hubbard County Road 3, 3 miles north of Becida, 1.5 miles upstream from mouth.	41.4	1979-current year	4-19-96	a13.45	140
05200445	Mississippi River at Bemidji, MN	Lat 46°27'04", long 94°54'23", in NW ¹ / ₄ NW ¹ / ₄ sec.20, T.146 N., R.33 W., Beltrami County, Hydrologic Unit 07010101, at bridge on County Highway 11, 1.4 miles southwest of intersection of State Highway 197 and County Highway 7 in Bemidji.	400	1973-87, 1988-89#, 1990-current year	4-25-96	a12.64	11 ⁶ / ₀
05205200	Boy River near Remer, MN	Lat 47°04'51", long 94°05'54", in SE ¹ / ₄ SE ¹ / ₄ sec. 28 T.142 N., R.27 W., Cass County, Hydrologic Unit 07010102, at bridge on County Highway 53, 1.9 miles upstream from Boy Lake and 9 miles northwest of Remer.	310	1986-current year	4-10-96	b11.59	c60
05210200	Smith Creek near Hill City, MN	Lat 47°04'58", long 93°34'59", in SE ¹ / ₄ NW ¹ / ₄ sec.13, T.53 N., R.26 W., Itasca County, Hydrologic Unit 07010101, at culvert on U.S. Highway 169, 6.2 miles north of Hill City.	8.00	1961-current year	4-26-96	5.43	82

Annual maximum discharge at high-flow sites during water year 1996

Station No.	Station Name	Location	Drainage area (mi ²)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft ³ /s)
05221020	Willow River below Palisade, MN	Lat 46°42'36", long 93°33'21", in NW¼NE¼ sec.30, T.49 N., R.25 W., Aitkin County, Hydrologic Unit 07010103, at bridge on County Highway 3, 3.2 miles west of Palisade.	44	1972-current year	4-26-96	15.89	2920
05229450	Pine River near Pine River, MN	Lat 48°41'39", long 94°22'11", in NE¼SE¼ sec.8, T.137 N., R.29 W., Cass County, Hydrologic Unit 07010105, at bridge 2.3 miles southeast of Pine River, on U.S. Highway 371, 4.9 miles upstream of upper Whitefish Lake.	277	1986-current year	4-19-96	4.15	800
05244200	Cat River near Nimrod, MN	Lat 46°37'49", long 94°55'51", in SW¼SW¼ sec.36, T.137 N., R.34 W., Wadena County, Hydrologic Unit 07010106, at bridge on State Highway 227, 2.5 miles west of Nimrod, 3.0 miles upstream from mouth.	49.2	1961-current year	4-19-96	a7.15	250
05244440	Leaf River near Aldrich, MN	Lat 46°27'25", long 94°50'29", in SW¼SW¼ sec.34, T.135 N., R.33 W., Wadena County, Hydrologic Unit 07010107, at bridge on County Highway 29, 3.3 miles upstream from mouth, 7.0 miles northeast of Aldrich.	860	1972-current year	4-16-96	a14.88	2970
05261520	Nokasippi River near Fort Ripley, MN	Lat 46°12'02", long 94°19'03", in NE¼NE¼ sec. 24, T.43 N., R.32 W., Crow Wing County, Hydrologic Unit 07010104, at bridge on County Highway 2, 3 miles northeast of Fort Ripley.	178	1967-70+, 74+, 1976+, 1986-current year	4-19-96	a12.47	530
05267900	Hillman Creek near Pierz, MN	Lat 45°58'27", long 94°04'21", in NE¼SE¼ sec. 9, T.40 N., R.30 W., Morrison County, Hydrologic Unit 07010201, at bridge on county highway, 1.1 miles upstream from mouth, 1.5 miles east of Pierz.	46.7	1964-current year	4-11-96	13.79	550
05268000	Platte River at Royalton, MN	Lat 45°50'43", long 94°17'40", in SE¼NW¼ sec.26, T.39 N., R.32 W., Morrison County, Hydrologic Unit 07010201, at bridge on County Highway 27, 0.6 mile north of Royalton, 6.6 miles upstream from mouth.	335	1929-36, 1972-current year	4-15-96	a11.82	1620
05270150	Ashley Creek near Sauk Centre, MN	Lat 45°46'46", long 94°58'52", in NW¼SE¼ sec.29, T.127 N., R.34 W., Todd County, Hydrologic Unit 07010202, at bridge on County Highway 11, 3 miles north of Sauk Centre.	113	1963-70+, 74+, 1976+, 1986-88, 1989#, 1990-current year	10-1-95	a16.35	500

Annual maximum discharge at high-flow sites during water year 1996

Station No.	Station Name	Location	Drainage area (mi ²)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft ³ /s)
05270300	Sauk River tributary at Spring Hill, MN	Lat 45°31'22", long 94°48'31", in SW ¹ / ₄ NE ¹ / ₄ sec.27, T.124 N., R.33 W., Stearns County, Hydrologic Unit 07010202, at culvert on State Highway 4, 1.0 mile east of Spring Hill, 2.7 miles upstream from mouth.	7.06	1960-current year	4-12-96	10.67	153
05272300	Johnson Creek near St. Augusta, MN	Lat 45°27'49", long 94°09'19", in NW ¹ / ₄ SW ¹ / ₄ sec.13, T.123 N., R.28 W., Stearns County, Hydrologic Unit 07010203, at bridge on County Highway 7, 1.0 mile south of St. Augusta, 3.3 miles upstream from mouth.	46.7	1964-current year	5-19-96	12.36	180
05272950	Clearwater River near South Haven, MN	Lat 45°16'45", long 94°15'04", in NE ¹ / ₄ NW ¹ / ₄ sec.19, T.121 N., R.28 W., Wright County, Hydrologic Unit 07010203, at culvert 3.4 miles southeast of Kimball, 0.25 mile downstream of Scott Lake Outlet, 2.0 miles southeast of South Haven.	--	1985-current year	5-20-96	15.42	375
05276200	North Fork Crow River at Paynesville, MN	Lat 45°23'09", long 94°42'41", in SW ¹ / ₄ SE ¹ / ₄ sec.9, T. 122 N., R.32 W., Stearns County, Hydrologic Unit 07010204, at bridge on county road at northeast edge of Paynesville city limits.	236	1973-current year	4-13-96	a4.64	860
05278120	North Fork Crow River near Kingston, MN	Lat 45°12'13", long 94°23'16", in SW ¹ / ₄ SE ¹ / ₄ sec.13, T. 120 N., R. 30 W., Meeker County, Hydrologic Unit 07010204, at bridge on State Highway 24, 3.7 miles west of Kingston, 3.9 miles east of Forest City.	--	1986-current year	4-7-96	15.53	2600
05278880	Buffalo Creek near New Auburn, MN	Lat 44°43'02", long 94°11'34", in NW ¹ / ₄ NW ¹ / ₄ sec. 14, T. 114 N., R. 28 W., Sibley County, Hydrologic Unit 07010205, at bridge on Ideal Ave., 3.3 miles southwest of Glencoe and 3.0 miles northeast of New Auburn.	--	1996	3-21-96	b21.04	g690
05293371	Pomme de Terre River near Elbow Lake, MN	Lat 45°57'47", long 95°53'07", in SE ¹ / ₄ SW ¹ / ₄ sec. 19, T. 129 N., R. 41 W., Grant County, Hydrologic Unit 07020002, at bridge on County Road 47, 4 miles southeast of Elbow Lake, 2.5 miles south of the outlet of Pomme de Terre Lake.	340	1986-current year	3-30-96	a5.64	288
05299750	Florida Creek near Burr, MN	Lat 44°49'00", long 96°25'10", in SE ¹ / ₄ SE ¹ / ₄ sec. 29, T. 115 N., R.46 W., Yellow Medicine County, Hydrologic Unit 07020003, at culvert on County Road 15, 3.0 miles west of Burr, 7.6 miles northwest of Canby.	77.3	1982, 1983-84#, 1991-current year	3-15-96	16.15	230
05302500	Little Chippewa River near Starbuck, MN	Lat 45°36'52", long 95°37'12", in NW ¹ / ₄ NE ¹ / ₄ sec.30, T. 125 N., R.39 W., Pope County, Hydrologic Unit 07020005, at culvert on State Highway 28, 4.4 miles west of Starbuck.	69.6	1979-current year	3-15-96	b13.85	255

Annual maximum discharge at high-flow sites during water year 1996

Station No.	Station Name	Location	Drainage area (mi ²)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft ³ /s)
05305200	Spring Creek near Montevideo, MN	Lat 44°58'41", long 95°42'57", in NW ¹ / ₄ NW ¹ / ₄ sec. 5, T. 117 N., R. 40 W., Chippewa County, Hydrologic Unit 07020005, at culvert on State Highway 29, 1.2 miles upstream from mouth, 2.0 miles north of Montevideo.	15.8	1959-current year	5-22-96	c13.50	54
05314500	Hawk Creek near Maynard, MN	Lat 44°52'10", long 95°28'58", in SW ¹ / ₄ NW ¹ / ₄ sec. 7, T. 116 N., R. 38 W., at Renville and Chippewa County line, Hydrologic Unit 07020004, at bridge on State Highway 23, 3.0 miles southwest of Maynard.	474	1949-54#, 1981-current year	5-18-96	ac15.20	1570
05316538	Ramsey Creek near Redwood Falls, MN	Lat 44°33'08", long 95°10'38", in SE ¹ / ₄ NE ¹ / ₄ sec. 33, T. 113 N., R. 36 W., Redwood County, Hydrologic Unit 07020006 at bridge on township road 2.3 miles northeast of KLGR radio towers, on west side of Redwood Falls.	--	1991-93, 1995-current year	6-17-96	20.91	305
05316570	Beaver Creek at Beaver Falls, MN	Lat 44°35'03", long 95°02'49", in NE ¹ / ₄ NW ¹ / ₄ sec. 22, T. 113 N., R. 35 W., Renville County, Hydrologic Unit 07020004, at bridge on County Highway 2 in Beaver Falls, 2.2 miles upstream from mouth, 3.8 miles northwest of Morton.	194	1972-current year	6-17-96	ac9.65	590
05316700	Spring Creek near Sleepy Eye, MN	Lat 44°24'12", long 94°44'41", in NE ¹ / ₄ SE ¹ / ₄ sec. 24, T. 111 N., R. 33 W., Brown County, Hydrologic Unit 07020007, at culvert on county highway, 4.3 miles upstream from mouth, 7.5 miles north of Sleepy Eye.	31.3	1959-current year	6-17-96	a13.31	405
05316950	Cottonwood River near Springfield, MN	Lat 44°12'12", long 95°02'53", on line between secs. 33 and 34, T. 109 N., R. 35 W., Brown County, Hydrologic Unit 07020008, at bridge on County Highway 2, 1.3 miles downstream from Mound Creek, 1.0 mile upstream from Coal Mine Creek, 3.5 miles southwest of Springfield.	773	1973-current year	6-18-96	a25.77	4600
05317845	East Branch Blue Earth River near Walters, MN	Lat 43°37'58", long 93°42'28", in SE ¹ / ₄ SE ¹ / ₄ sec. 16, T. 102 N., R. 24 W., Faribault County, Hydrologic Unit 07020009, at culvert on State Highway 22, 2.5 miles northwest of Walters.	30.2	1979-current year	3-25-96	b16.27	145
05318195	Elm Creek near Trimont, MN	Lat 43°45'27", long 94°50'30", in NW ¹ / ₄ NW ¹ / ₄ sec. 5, T. 103 N., R. 33 W., Martin County, Hydrologic Unit 07020009, at bridge on County Road 103, 12.5 miles northeast of Jackson, 5 miles west of Trimont.	--	1991-current year	6-17-96	21.70	940

Annual maximum discharge at high-flow sites during water year 1996

Station No.	Station Name	Location	Drainage area (mi ²)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft ³ /s)
05318300	Watonwan River near Delft, MN	Lat 43°59'55", long 95°07'11", in NE ¹ / ₄ SE ¹ / ₄ sec. 11, T. 106 N. R.36 W., Cottonwood County, Hydrologic Unit 07020010, at culvert on U.S. Highway 71, 1.7 miles northwest of Delft.	13.5	1960-current year	6-16-96	ac15.81	320
05318897	South Fork Watonwan River near Ormsby, MN	Lat 43°53'08", long 94°41'27", in SE ¹ / ₄ NW ¹ / ₄ sec.21, T. 105 N., R.32 W., Watonwan County, Hydrologic Unit 07020010, at bridge on township road, 2.6 miles north of Ormsby, 5.0 miles upstream from Willow Creek.	107	1979-current year	6-19-96	15.94	1130
05320480	Maple River near Rapidan, MN	Lat 44°03'54", long 94°01'32", in SW ¹ / ₄ SW ¹ / ₄ sec.13, T. 107 N., R.27 W., Blue Earth County, Hydrologic Unit 07020011, at bridge on County Highway 35, 3.0 miles southeast of Rapidan, 3.3 miles upstream from mouth.	338	1972-current year	6-17-96	10.77	2350
05326100	Middle Branch Rush River near Gaylord, MN	Lat 44°30'27", long 94°15'00", in SW ¹ / ₄ NW ¹ / ₄ sec. 18, T. 112 N., R. 28 W., Sibley County, Hydrologic Unit 07020012, at bridge on township road, 3.0 miles southwest of Gaylord, 10.5 miles upstream from the main branch of Rush River.	68.5	1979-current year	3-25-96	bc18.01	€30
05330300	Sand Creek near New Prague, MN	Lat 44°32'37", long 93°32'16", in NE ¹ / ₄ NW ¹ / ₄ sec.1, T.112 N., R.23 W., Le Sueur County, Hydrologic Unit 07020012, at culvert on State Highway 13 and 19, 1.9 miles east of New Prague.	62.4	1960-current year	3-13-96	10.51	243
05335170	Crooked Creek near Hinckley, MN	Lat 46°00'42", long 92°31'45", in NE ¹ / ₄ NE ¹ / ₄ sec.30, T.41 N., R. 17 W., Pine County, Hydrologic Unit 07030001, at culvert on State Highway 48, 2.7 miles upstream from mouth, 8 miles south of Duxbury, 19 miles east of Hinckley.	93	1966-70+, 74+, 76+, 79-80+, 1986-current year	4-19-96	14.60	1270
05336200	Glaisby Brook near Kettle River, MN	Lat 46°27'19", long 92°51'34", in SE ¹ / ₄ NW ¹ / ₄ sec.22, T.46 N., R.20 W., Carlton County, Hydrologic Unit 07030003, at bridge on State Highways 27 and 73, 1.0 mile upstream from mouth, 2.4 miles south of Kettle River.	27.5	1960-70#, 1971-current year	4-18-96	6.68	580
05339747	Goose Creek at Harris, MN	Lat 45°35'11", long 92°58'39", in SW ¹ / ₄ SW ¹ / ₄ sec.21, T.36 N., R.21 W., Chisago County, Hydrologic Unit 07030005, at culverts on County Highway 9, 0.15 mile west of County Highway 30 in Harris, 8 miles above mouth.	d60	1986-current year	4-19-96	7.50	295

Annual maximum discharge at high-flow sites during water year 1996

Station No.	Station Name	Location	Drainage area (mi ²)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft ³ /s)
05348550	Cannon River below Sabre Lake near Kilkenny, MN	Lat 44°17'50", long 93°37'44", in NE ¹ / ₄ NE ¹ / ₄ sec.31, T. 110 N., R.23 W., LeSueur County, Hydrologic Unit 07040002, at bridge on township road, 0.25 mile downstream of Sabre Lake, 3 miles southeast of Kilkenny.	--	1985-current year	3-25-96	c12.38	236
05355024	Cannon River at Northfield, MN	Lat 44°27'19", long 93°09'46", in NE ¹ / ₄ NE ¹ / ₄ sec.1, T.111 N., R.20 W., Rice County, Hydrologic Unit 07040002, at Fifth Street bridge in Northfield.	934	1980-current year	3-30-96	a903.48	4220
05373080	Milliken Creek near Concord, MN	Lat 44°07'13", long 92°49'08", in NW ¹ / ₄ NW ¹ / ₄ sec.36, T. 108 N., R.17 W., Dodge County, Hydrologic Unit 07040004, at bridge on County Road 9, 8.0 miles upstream from mouth, 2.1 miles southeast of Concord.	22.2	1979-current year	6-17-96	13.78	480
05374000	Zumbro River at Zumbro Falls, MN	Lat 44°17'12", long 92°25'56", in sec.36, T.110 N., R.14 W., Wabasha County, Hydrologic Unit 07040004, in Zumbro Falls, 1,000 ft downstream from Cold Creek, 0.7 mi upstream from bridge on U.S. Highway 63, and 6.3 mi downstream from North Fork.	d1,130	1909-17#, 1929-80#, 1990-current year	3-25-96	14.02	6770
05376110	Middle Fork White-water River near State Park Group Camp near St. Charles, MN	Lat 44°03'21", long 92°03'13", in SW ¹ / ₄ sec.20, T.107 N., R.10 W., Winona County, Hydrologic Unit 07040003, at wooden bridge near Group Camp in Whitewater State Park.	--	1986-current year (no data obtained in 1987)	9-21-86 4-27-88 3-24-89 4-24-90 7-22-91 5-16-92 6-17-93 3-6-94 3-12-95 3-25-96	g69.18 2.88 e66.78 67.39 65.50 63.76 66.90 64.86 66.02 68.02	e3850 e130 e1750 e2220 e990 e312 e1830 e695 e1260 2740
05384000	Root River near Lanesboro, MN	Lat 43°44'58", long 91°58'43", in sec. 1, T.103 N., R.10 W., Fillmore County, Hydrologic Unit 07040008, 0.5 mi upstream from highway bridge, 1.2 mi upstream from South Branch, and 2.5 mi northeast of Lanesboro.	615	1910-17# 1940-85# 1986, 87-90# 1991-current year	3-25-96	a5.53	2900
05384350	Root River at Rushford, MN	Lat 43°48'11", long 91°45'10", in NE ¹ / ₄ NE ¹ / ₄ sec.23, T.104 N., R.8 W., Fillmore County, Hydrologic Unit 07040008, at U.S. Highway 16 bridge on south side of Rushford.	--	1985-current year	3-25-96	23.96	10,600
05384500	Rush Creek near Rushford, MN	Lat 43°50'00", long 91°46'40", in SW ¹ / ₄ SW ¹ / ₄ sec. 3, T.104 N., R.8 W., Fillmore County, Hydrologic Unit 07040008, at bridge, 1.5 miles northwest of Rushford, 3.0 miles upstream from mouth.	129	1942-79# 1980-current year	3-25-96	6.93	2550

Annual maximum discharge at high-flow sites during water year 1996

Station No.	Station Name	Location	Drainage area (mi ²)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft ³ /s)
05385500	South Fork Root River near Houston, MN	Lat 43°44'19", long 91°33'50", in NE ¹ / ₄ SW ¹ / ₄ sec.9, T.103 N., R.6 W., Houston County, Hydrologic Unit 07040008, at bridge on State Highway 76, 0.5 mile upstream from Badger Creek, 1.5 mile south of Houston.	275	1953-83#, 1985-current year	3-25-96	10.06	2700
05387030	Crooked Creek at Freeburg, MN	Lat 43°36'37", long 91°21'39", in SW ¹ / ₄ NE ¹ / ₄ sec.30, T.102 N., R.4 W., Houston County, Hydrologic Unit 07060001, at bridge on State Highway 249 at Freeburg 6.5 miles upstream from mouth.	44.2	1979-current year	3-25-96	9.27	185
05457778	Little Cedar River near Johnsbury, MN	Lat 43°30'52", long 92°45'19", in NW ¹ / ₄ NE ¹ / ₄ sec.33, T.101 N., R.16 W., Mower County, Hydrologic Unit 07080201, at bridge on County Road 6, 1 mile northeast of Johnsbury, 1 mile north of Minnesota-Iowa border.	46	1986-current year	3-29-96	11.31	645
05458960	Bancroft Creek at Bancroft, MN	Lat 43°42'09", long 93°21'23", in SW ¹ / ₄ SE ¹ / ₄ sec.21, T.103 N., R.21 W., Freeborn County, Hydrologic Unit 07080202, at bridge on County Road 14, 1.6 miles northeast of Fountain Lake, 1 mile north of Interstate 90.	29.1	1985+, 1986-current year	6-18-96	3.21	100
05474900	Elk Creek near Brewster, MN	Lat 43°40'43", long 95°27'10", in NE ¹ / ₄ SE ¹ / ₄ sec.36, T.102 N., R.39 W., Nobles County, Hydrologic Unit 07100001, on County Highway 1 bridge 0.7 miles south of Brewster.	--	1996	6-17-96	24.37	1380
05476900	Fourmile Creek near Dunnell, MN	Lat 43°34'57", long 94°46'26", in SW ¹ / ₄ NW ¹ / ₄ sec.2, T.101 N., R.33 W., Martin County, Hydrologic Unit 07100003, at bridge on State Highway 4, 0.6 mile upstream from mouth, 1.6 miles north of Dunnell.	14.0	1960-current year	6-17-96	c10.44	48
05476989	East Fork Des Moines River near Ceylon, MN	Lat 43°33'53", long 94°39'15", in NW ¹ / ₄ SW ¹ / ₄ sec.11, T.101 N., R.32 W., Martin County, Hydrologic Unit 07010003, at bridge on County Road 23, 2.4 miles northwest of Ceylon.	154	1986-current year	6-18-96	c17.34	500
06482500	Pipestone Creek near Pipestone, MN	Lat 44°04'54", long 96°18'27", in SE ¹ / ₄ SE ¹ / ₄ sec.12, T.107 N., R.46 W., Pipestone County, Hydrologic Unit 10170203, at bridge on U.S. Highway 75, 5.5 miles north of Pipestone.	--	1991-current year	6-16-96	c16.22	105

Annual maximum discharge at high-flow sites during water year 1996

Station No.	Station Name	Location	Drainage area (mi ²)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft ³ /s)
06482745	Beaver Creek at Valley Springs, S.D.	Lat 43°35'10", long 96°28'20", in NW¼NW¼ sec.3, T.101 N., R.47 W., Minnehaha County, South Dakota, Hydrologic Unit 10170203, at bridge on County Road 103 (Valley Drive), 1 mile west of South Dakota-Minnesota border, 2.5 miles south of Interstate 90.	104	1986-current year	6-16-96	c16.13	260
06482933	Chanarambi Creek near Edgerton, MN	Lat 43°53'59", long 96°03'39", in NW¼SW¼ sec.18, T.105 N., R.43 W., Murray County, Hydrologic Unit 10170204, at bridge on township road, 3.8 miles northeast of Edgerton, 7.4 miles upstream from mouth.	56.1	1979-current year	6-17-96	14.45	457
06482960	Champepadan Creek near Leota, MN	Lat 43°47'24", long 96°00'40", in NE¼NE¼ sec.28, T.104 N., R. 43 W., Nobles County, Hydrologic Unit 10170204, at bridge on Nobles County Road 18 near junction with County Road 19, 3 miles south of Leota.	--	1996	6-18-96	16.46	†
06483020	Elk Creek near Lismore, MN	Lat 43°41'38", long 96°00'46", in NE¼SE¼ sec. 29, T.103 N., R. 43 W., Nobles County, Hydrologic Unit 10170204, at bridge on Nobles County Road 19, 4.6 miles southwest of Lismore.	--	1996	6-23-96	15.09	†
06483350	Little Rock River near Rushmore, MN	Lat 43°32'36", long 95°48'58", in NE¼NE¼ sec. 24, T. 101 N., R.42 W., Nobles County, Hydrologic Unit 10170204, at bridge #4967, on County Road 6, 1.5 miles west of Ransom, 5.1 miles south of Rushmore.	--	1991-current year	5-28-96	c23.91	295
06488353	Little Rock Creek near Rushmore, MN	Lat 43°32'37", long 95°50'50", in NE¼NW¼ sec.23, T. 101 N., R. 42 W., Nobles County, Hydrologic Unit 10170204, at bridge on County Road 6, 5.5 miles southeast of Rushmore.	--	1996	6-22-96	25.94	†
06603530	Little Sioux River near Spafford, MN	Lat 43°36'08", long 95°15'27", in NE¼NE¼ sec. 34, T. 102 N., R. 37 W., Jackson County, Hydrologic Unit 10230003, at bridge on county highway, 1.6 miles downstream from Jackson County ditch No. 11, 5.8 miles east of Spafford.	41.1	1962-current year	6-19-96	ac7.00	48

+ Operated as low flow site.

Operated as a continuous-record gaging station.

† Discharge not determined.

a Affected by shifting control.

f Discharge estimated

n.a. Not available at time of printing

b Backwater from ice.

c Not annual maximum gage height.

d Approximate.

e Revised.

g Not previously published.

Miscellaneous Sites

Discharge measurements made at miscellaneous sites during the 1996 water year are listed in the following table. Those measurements of base flow are designated by an asterisk (*) and measurements from earlier water years but not previously published by an (a). Stations previously published as High-Flow Partial-Record are designated by an (#).

Stream Name and (Station No.)	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements	
					Date	Dis- charge (ft ³ /s)
<u>Red River of the North Basin</u>						
Otter Tail River (05030150)	Red River of the North	Lat 46°38'34", long 95°36'15", in NW¼NW¼ sec. 34, T. 137 N., R. 39 W., Otter Tail County, Hydrologic Unit 09020103, at bridge on township road, 2.5 mile southeast of Luce.	--	1994-96	10-3-94	a106
					10-7-94	a134
					10-20-94	a136
					11-7-94	a147
					12-19-94	a148
					2-7-95	a124
					4-26-95	a249
					6-26-95	a110
					8-2-95	*a67
					10-4-95	160
					10-31-95	173
					11-22-95	189
					1-11-96	133
					2-7-96	123
					3-13-96	132
4-16-96	330					
5-1-96	338					
6-27-96	180					
7-30-96	90					
9-4-96	*54					
10-15-96	*57					
Little Pine Lake Outlet (05030181)	Otter Tail River	Lat 46°37'36", long 95°32'23", in NW¼NE¼ sec. 1, T. 136 N., R. 39 W., Otter Tail County, Hydrologic Unit 09020103, at bridge on State Highway 8, at outlet to Little Pine Lake, 3 miles northeast of Perham, MN.	--	1933, 1964,66, 1970, 1973-74, 1976-77, 1995-96	11-1-95	190
					5-22-96	367
					6-28-96	214
Toad River below State Hwy. 87 (05030230)	Big Pine Lake	Lat 46°45'11", long 95°31'33", in SW¼NE¼ sec. 19, T.138 N., R. W., Becker County, Hydrologic Unit 09020103, at bridge on township road, 0.1 mile below Colette Creek.	--	1996	7-23-96	*12
					8-7-96	22
					8-21-96	*7
					9-4-96	*10
		9-12-96	*10			
Toad River at Dead Lake Outlet (05030245)	Big Pine Lake	Lat 46°42'32", long 95°33'11", in SE¼NW¼ sec. 1, T.137 N., R.39 W., Otter tail County, Hydrologic Unit 09020103, at bridge on township road, at Dead Lake Outlet, 7 miles north of Perham.	--	1996	5-23-96	104
					6-27-96	55
					7-5-96	22
					7-18-96	21
					7-23-96	*15
					8-7-96	17
					8-21-96	*6.6
					9-4-96	*12
		9-12-96	*11			
Toad River at County Road 60 (05030255)	Big Pine Lake	Lat 46°39'55", long 95°31'27", in NE¼SE¼ sec. 19, T.137 N., R.38 W., Otter Tail County, Hydrologic Unit 09020103, at bridge on County Road 60, 4 miles north of Perham.	--	1996	5-29-96	77
					6-27-96	51

Stream Name and (Station No.)	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measure nents	
					Date	Dis- charge (ft ³ /s)
<u>Red River of the North Basin</u> ---continued						
Toad River at State Highway 8 (05030270)	Big Pine Lake	Lat 46°28'39", long 95°30'37", in SE ¹ / ₄ SW ¹ / ₄ sec. 29, T. 137 N., R. 38 W., Otter Tail County, Hydrologic Unit 09020103, at culvert on State Highway 8 at northwest end of Big Pine Lake, 4.0 miles northeast of Perham, MN.	--	1995-96	10-4-95	63
					10-18-95	89
					11-1-95	76
					11-21-95	46
					1-11-96	24
					2-6-96	20
					3-12-96	25
					4-16-96	317
					4-22-96	380
					5-1-96	230
					5-10-96	122
					5-29-96	82
Big Pine Lake Outlet (05030290)	Otter Tail River	Lat 46°35'31", long 95°30'12", in NE ¹ / ₄ SW ¹ / ₄ sec. 17, T.136 N., R. 38 W., Otter Tail County, Hydrologic Unit 09020103, at Dam at outlet to Big Pine Lake, 3 miles east of Perham, MN.	--	1995-96	4-30-96	704
					5-10-96	588
					5-22-96	552
					5-29-96	505
					6-28-96	330
Wild Rice River at County Road 24	Red River of the North	Lat 47°17'29", long 96°26'09", in SE ¹ / ₄ NE ¹ / ₄ sec. 13, T.144 N., R.46 W., Norman County, Hydrologic Unit 09020108, at bridge on County Highway 24, 3.5 miles southeast of Ada.	--	1996	4-14-96	3810
Red Lake River	Red River of the North	Lat 48°06'29", long 96°08'11" in SE ¹ / ₄ SE ¹ / ₄ sec. 35, T.154 N., R.43 W., Pennington County, Hydrologic Unit 09020303, 2 miles above Thief River in Thief River Falls.	--	1996	9-11-96	930
Thief River (05076000)	Red Lake River	Lat 48°11'08", long 96°10'11", in NW ¹ / ₄ SW ¹ / ₄ sec. 3, T.154 N., R.43 W., Marshall County, Hydrologic Unit 09020304, 0.2 mile upstream from high- way bridge, 5 mile north of Thief River Falls, 7 miles upstream from mouth.	959	1959-17#, 1920-21#, 1922-24#, 1928-81#, 1982-1996#	9-10-96	*23
Red Lake River below dam	Red River Of the North	Lat 48°06'45", long 96°10'54" in NW ¹ / ₄ NE ¹ / ₄ sec. 33, T.154 N., R.43 W., Pennington County, Hydrologic Unit 09020303, 0.25 mile below dam in Thief River Falls.	--	1996	9-11-96	874
<u>Lake of the Woods Basin</u>						
Lost River (05131435)	Net Lake	Lat 48°08'57", long 92°58'36", in SW ¹ / ₄ NE ¹ / ₄ sec. 1, T.65 N., R.21 W., St.Louis County, Hydrologic Unit 09030005, at trail road ford, 4.6 miles above mouth at Nett Lake, 5.8 miles north- east of town of Nett Lake.	--	1996	2-12-96	6.9
					3-13-96	7.0
					6-19-96	*2.6
					7-30-96	*2.1
					8-27-96	10

Stream Name and (Station No.)	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements	
					Date	Dis- charge (ft ³ /s)
<u>Mississippi River Basin</u>						
Mississippi River at Franklin Ave. (05288920)		Lat 44°58'46", long 93°14'50", in SE ¹ / ₄ SE ¹ / ₄ sec. 23, T. 29 N., R. 24 W., Hennepin County, Hydrologic Unit 09010206, at lower St. Anthony Falls lock and dam in Minneapolis at River mile 853.3 upstream from Ohio River. Dis- charge measurements made at Hennepin and Franklin Ave. bridges are included.	19,700	1912, 1938-39, 1941,43, 1953-54,57, 1963-85, 1990-96	5-7-96	28,000
					6-13-96	12,500
Shingle Creek at Zane Ave. (05288695)	Mississippi River	Lat 45°05'31", long 93°21'23", in NW ¹ / ₄ NW ¹ / ₄ sec. 28, T. 119 N., R. 21 W., Hennepin County, Hydrologic Unit 07010206, at bridge on Zane Ave. over Shingle Creek, , in Brooklyn Park, MN.	--	1996	9-27-96	*1.5
<u>Minnesota River Basin</u>						
Blue Earth River at County Rd 6 (05317832)	Minnesota River	Lat 43°37'47", long 94°06'14", in NW ¹ / ₄ NW ¹ / ₄ sec. 20, T. 102 N., R. 27W., Faribault County, Hydrologic Unit 07020009, at bridge on County Road 6, at southwest side of Blue Earth.	155	1996	4-11-96	139
					5-28-96	800
					6-19-96	929
					6-21-96	628
					7-29-96	*34
East Branch Blue Earth River at County Rd 16 (05318119)	Minnesota River	Lat 43°38'16", long 94°05'01", in NW ¹ / ₄ SW ¹ / ₄ sec. 16 T.102 N., R.27 W., Faribault County, Hydrologic Unit 07020009, at bridge on County Road 16, at east side of Blue Earth.	--	1996	4-11-96	239
					5-28-96	345
					6-19-96	578
					6-21-96	511
					7-29-96	*21

Measurements of streamflow in the area covered by this report made at low-flow partial record stations are given in the following table. These measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with simultaneous discharge of a nearby stream (when continuous records are available), will give a picture of the low-flow potentiality of a stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Stream	Tributary to	Location	Drainage area (mi ²)	Period of record	Measurement ^a	
					Date	Discharge (ft ³ /s)
<u>Bassett Creek Basin</u>						
Bassett Creek at Fruen Mill (05288900)	Mississippi River	Lat 44°58'45", long 93°18'48", in SW ¹ / ₄ SE ¹ / ₄ sec. 20, T.29 N., R.24 W., Hennepin County, Hydrologic Unit 07010206, at Fruen Mill, 700 feet downstream from Glenwood Ave. in Minneapolis, 2.66 miles above mouth.	41.6	1952-56, 1963-81, 1996	7-24-96	6.2
<u>Minnesota River Basin</u>						
Ridgely Creek at Ft. Ridgely State Park near St. George (05316680)	Minnesota River	Lat 44°26'49", long 94°43'22", in NW ¹ / ₄ SW ¹ / ₄ sec. 5, T.111 N., R.32 W., Nicollet County, Hydrologic Unit 07020007, at culvert on County Highway 29, in Fort Ridgely State Park.	69.0	1969-70, 1974-76, 78, 1985, 1996	9-12-96	2.7
Little Rock Creek near Fairfax (05316740)	Minnesota River	Lat 44°23'41", long 94°37'15", in NW ¹ / ₄ NW ¹ / ₄ sec. 30, T.111 N., R.31 W., Nicollet County, Hydrologic Unit 07020007, at bridge on County Highway 21, 10 miles southeast of Fairfax.	83.6	1965-70, 1974, 1996	9-12-96	0.0
Cottonwood River near Tracy (05316840)	Minnesota River	Lat 44°20'41", long 95°36'50", in SE ¹ / ₄ SE ¹ / ₄ sec. 11, T.110 N., R.40 W., Lyon County, Hydrologic Unit 07020008, at bridge on County Road 11, 7.25 miles north of Tracy.	77.6	1968-69, 1973-76, 1980-81, 83, 1996	9-13-96	4.6
Dry Creek at Sanborn (05316910)	Cottonwood River	Lat 44°11'43", long 95°08'15", in SE ¹ / ₄ SW ¹ / ₄ sec. 35, T.109 N., R.36 W., Redwood County, Hydrologic Unit 07020008, at bridge on County Highway 41, 1.5 miles upstream from mouth, at southwest limits of Sanborn.	40.4	1969, 1973-76, 79, 1983, 85, 1996	9-13-96	3.0
Mound Creek near Springfield (05316940)	Cottonwood River	Lat 44°11'40", long 95°03'34", in NW ¹ / ₄ NW ¹ / ₄ sec. 4, T.108 N., R.35 W., Brown County, Hydrologic Unit 07020008, at County Highway 2, 0.9 mile upstream from mouth, 5 miles southwest of Springfield.	52.8	1968-69, 1973, 74, 1976, 78, 1980-81, 1996	9-13-96	7.5
Coal Mine Creek near Springfield (05316960)	Cottonwood River	Lat 44°13'28", long 95°01'55", in SW ¹ / ₄ SE ¹ / ₄ sec. 22, T.109 N., R.35 W., Brown County, Hydrologic Unit 07020008, at double barrel culvert on township road, 1 mile upstream from mouth, 3 miles southwest of Springfield.	46.2	1968-69, 1973-74, 1996	9-13-96	2.4
Cottonwood River at Leavenworth (05316970)	Minnesota River	Lat 44°13'39", long 94°48'22", in SW ¹ / ₄ SW ¹ / ₄ sec. 22, T.109 N., R.33 W., Brown County, Hydrologic Unit 07020008, at bridge on County Highway 8, 0.25 mile north of Leavenworth.	87.6	1965-70, 1973-75, 1996	9-12-96	62

Stream	Tributary to	Location	Drainage area (mi ²)	Period of record	Measurements	
					Date	Discharge (ft ³ /s)
Minnesota River Basin --continued						
Sleepy Eye Creek near Cobden (05316990)	Cottonwood River	Lat 44°15'41", long 94°49'35", in SE ¹ / ₄ NE ¹ / ₄ sec. 8, T.109 N., R.33 W., Brown County, Hydrologic Unit 07020008, at bridge on township road, 1.75 miles southeast of Cobden.	268	1965-70, 1973-74, 76, 1996	9-12-96	14
Morgan Creek at Cambria (05317300)	Minnesota River	Lat 44°14'32", long 94°19'36", in SW ¹ / ₄ SW ¹ / ₄ sec. 16, T.109 N., R.29 W., Blue Earth County, Hydrologic Unit 07020007, at culvert on State Highway 68, 0.5 mile upstream from mouth, 0.6 mile northwest of Cambria.	59.1	1969-70, 73, 1980, 85, 1987-88, 1996	9-11-96	4.6
Swan Lake Outlet near Nicollet (05317400)	Minnesota River	Lat 44°12'45", long 94°11'25", in SE ¹ / ₄ SE ¹ / ₄ sec. 28, T.109 N., R.28 W., Nicollet County, Hydrologic Unit 07020007, at culvert on County Highway 62, 4.5 miles south of Nicollet.	79.2	1965-70, 1976, 1996	9-11-96	1.5
Lily Creek near Fairmont (05318160)	Center Creek	Lat 43°40'40", long 94°29'32", in NE ¹ / ₄ SE ¹ / ₄ sec. 36, T.103 N., R.31 W., Martin County, Hydrologic Unit 07020009, at bridge on County Highway 39, 1 mile upstream from mouth, and 2.3 miles northwest of Fairmont.	39.9	1969-71, 1975, 76, 1980, 85, 87, 1996	7-26-96	2.0
Center Creek on Co. Rd 143 at Fairmont (05318170)	Blue Earth River	Lat 43°40'22", long 94°27'44", in NE ¹ / ₄ NW ¹ / ₄ sec. 5, T.102 N., R.30 W., Martin County, Hydrologic Unit 07020009, at bridge on County Road 143, in Fairmont, downstream of Lake George outlet, 800 ft above sewage treatment plant outfall.	--	1969, 1971, 1995-96	9-14-95 7-26-96	1.5 5.8
Elm Creek near Trimont (05318200)	Blue Earth River	Lat 43°45'15", long 94°39'10", in SW ¹ / ₄ NW ¹ / ₄ sec. 2, T.103 N., R.32 W., Martin County, Hydrologic Unit 07020009, at bridge on township road, 1.0 mile east of County Highway 38, 3 miles east of Trimont.	132	1969-71, 1975-76, 1996	7-26-96	7.6
Watonwan River near Darfur (05318400)	Blue Earth River	Lat 44°01'37", long 94°47'56", in NE ¹ / ₄ SE ¹ / ₄ sec. 33, T.107 N., R.33 W., Watonwan County, Hydrologic Unit 07020010, at bridge on County Highway 5, 2 miles southeast of Darfur.	85.2	1969, 1987, 1996	7-25-96	11
North Fork Watonwan River near Darfur (05318550)	Watonwan River	Lat 44°04'46", long 94°50'21", in SE ¹ / ₄ SE ¹ / ₄ sec. 7, T.107 N., R.33 W., Watonwan County, Hydrologic Unit 07020010, at bridge on County Road 4, 1.9 miles north of Darfur.	--	1969, 1987, 1996	7-25-96	6.0
Watonwan River at La Salle (05318700)	Blue Earth River	Lat 44°03'53", long 94°35'22", in NE ¹ / ₄ NE ¹ / ₄ sec. 19, T.107 N., R.31 W., Watonwan County, Hydrologic Unit 07020010, at bridge on County Highway 27, 1 mile southeast of La Salle.	206	1968-70, 1974-76, 1996	7-25-96	30

LOW-FLOW SITES--Continued

Stream	Tributary to	Location	Drain- age area (mi ²)	Period of record	Measurements	
					Date	Dis- charge (ft ³ /s)
Minnesota River Basin --continued						
St. James Creek at County Road 27	Watonwan River	Lat 44°00'20", long 94°35'21", in NE ¹ / ₄ NE ¹ / ₄ sec. 7, T.106 N., R.31 W., Watonwan County, Hydrologic Unit 07020010, at bridge on County Road 27, 2.7 miles northeast of St. James.	47.2	1969, 1996	7-25-96	1.9
Butterfield Creek near La Salle (05318750)	St. James Creek	Lat 44°03'03", long 94°33'28", in NE ¹ / ₄ NW ¹ / ₄ sec. 28, T.107 N., R.31 W., Watonwan County, Hydrologic Unit 07020010, at culvert on farm road, 0.2 mile from mouth, adjacent to County Road 3.	58.4	1969, 1987, 1996	7-25-96	8.0
St. James Creek near La Salle (05318800)	Watonwan River	Lat 44°03'04", long 94°33'26", in SW ¹ / ₄ SE ¹ / ₄ sec. 21, T.107 N., R.31 W., Watonwan County, Hydrologic Unit 07020010, at bridge on County road, 100 feet downstream from Butterfield Creek, 1.4 miles southeast of La. Salle.	121	1968-70, 1974-76, 1996	7-25-96	14
Watonwan River at County Road 9	Blue Earth River	Lat 44°02'21", long 94°25'10", in SE ¹ / ₄ SW ¹ / ₄ sec. 27, T.107 N., R.30 W., Watonwan County, Hydrologic Unit 07020010, at bridge on County Road 9, on south side of Madelia, near Watona Park.	--	1996	7-25-96	87
South Fork Watonwan River near Madelia (05319100)	Watonwan River	Lat 44°02'33", long 94°27'42", in NE ¹ / ₄ SW ¹ / ₄ sec. 29, T.107 N., R.30 W., Watonwan County, Hydrologic Unit 07020010, at bridge Highway 116, 0.4 mile upstream from mouth, 1.6 miles west of Madelia.	185	1968-70, 1974-76, 1996	7-25-96	22
Spring Branch Creek near Lewisville (05319220)	Perch Creek	Lat 43°58'28", long 94°25'45", in SE ¹ / ₄ NE ¹ / ₄ sec. 21, T.106 N., R.30 W., on State High- way 15 and 30, 3.5 miles north of Lewis- ville.	23.2	1969, 1987, 1996	7-25-96	0.71
Le Sueur River near New Richland (05320020)	Blue Earth River	Lat 45°56'43", long 93°27'21", in SW ¹ / ₄ NE ¹ / ₄ sec. 34, T.106 N., R.22 W., Waseca County, Hydrologic Unit 07020011, at bridge on County Highway 56, 3.75 miles northeast of New Richland.	75.9	1969, 1971, 1976, 1980, 1987-89, 1996	7-24-96	3.8
Boot Creek near New Richland (05320040)	Le Sueur River	Lat 43°56'07", long 93°30'52", in NW ¹ / ₄ NE ¹ / ₄ sec. 6, T.105 N., R.22 W., Waseca County, Hydrologic Unit 07020011, at bridge on County Road 4, 0.5 mile upstream from mouth, 2 miles north- west of New Richland.	49.3	1969, 1971, 1976, 1980, 1987-89, 1996	7-24-96	2.4
Little Le Sueur R. near Wilton (05320060)	Le Sueur River	Lat 44°00'06", long 93°30'32", in SE ¹ / ₄ NE ¹ / ₄ sec. 7, T.106 N., R.22 W., Waseca County, Hydrologic Unit 07020011, at bridge on County Highway 51, 0.25 miles upstream from mouth, 1.5 miles southeast of Wilton.	24.2	1969, 1971, 1976, 1980, 1987-89, 1996	7-24-96	2.2
Le Sueur River at Wilton (05320070)	Blue Earth River	Lat 44°00'52", long 93°31'38", in NE ¹ / ₄ SE ¹ / ₄ sec. 1, T.106 N., R.23 W., Waseca County, Hydrologic Unit 07020011, at bridge on County Highway 4, 0.2 mile east of Wilton.	177	1968-69, 1976, 1980, 1995-96	7-24-96	10

Stream	Tributary to	Location	Drain- age area (mi ²)	Period of record	Measurements	
					Date	In- crease (ft ³ /s)
<u>Vermillion River Basin</u>						
South Branch Vermillion River at Empire (05345100)	Vermillion River	Lat 44°39'33", long 93°00'27", in NE ¹ / ₄ NW ¹ / ₄ sec. 29, T.114 N., R.18 W., Dakota County, Hydrologic Unit 07040001, at bridge on County Road 66, 0.1 mile above mouth, 3.5 miles southwest of Vermillion, 3.5 miles southwest of Ver- million, 0.1 mile east of Empire.	--	1990-91, 1995	a9-14-95	9.8
<u>Cannon River Basin</u>						
Cannon River at Faribault (05352010)	Mississippi River	Lat 44°18'28", long 93°16'22", in SW ¹ / ₄ NE ¹ / ₄ sec. 30, T.110 N., R.20 W., Rice County, Hydrologic Unit 07040002, at mill dam near bridge over 2nd Ave North- west, in Faribault, above mouth of Straight River.	341	1965-73, 1995	a9-14-95	53
<u>Mississippi River Basin</u>						
Miller Creek near Lake City (05355360)	Mississippi River	Lat 44°25'51", long 92°16'35", in NW ¹ / ₄ SE ¹ / ₄ sec. 8, T.111 N., R.12 W., Wabasha County, Hydrologic Unit 07040001, at bridge on County highway 9, 1.3 miles south of Lake City.	14.6	1969-71, 1974-75, 1977, 1980, 1984-85, 1988, 1996	7-25-96	5.6
Kings Creek at Maple Springs	Mississippi	Lat 44°24'38", long 92°09'46", in SE ¹ / ₄ SW ¹ / ₄ sec. 17, T.111 N., R.11 W., Wabasha County, Hydrologic Unit 07040001, 0.2 mile 1 upstream of bridge on U.S. Trunk Highway 61, at Maple Springs.	-	1985, 1988, 1996	7-25-96	1.1
<u>Zumbro River Basin</u>						
Milliken Creek at Co 22 near Concord (05373100)	Middle Fork Zumbro River	Lat 44°08'04", long 92°46'07", in SW ¹ / ₄ NE ¹ / ₄ sec. 29, T.108 N., R.16 W., Dodge County, Hydrologic Unit 07040004, at bridge on County Highway 22, 3.5 miles southeast of Concord.	28.6	1970-71, 1974, 76-77, 1979-80, 1988, 1996	7-26-96	1.6
Dodge Center Creek near Dodge Center (05373200)	South Branch Middle Fork Zumbro River	Lat 44°01'48", long 92°53'14", in SW ¹ / ₄ NE ¹ / ₄ sec. 32, T.107 N., R.17 W., Dodge County, Hydrologic Unit 07040004, at bridge on County Road H, 1.5 miles west of Dodge Center.	77.5	1970-71, 1974, 76-77, 1979-80, 1988, 1996	7-26-96	5.2
South Branch of Middle Fork Zumbro River at Man- torville	Middle Fork Zumbro River	Lat 44°03'51", long 92°45'17", in NW ¹ / ₄ NW ¹ / ₄ sec. 21, T.107 N., R.16 W., Dodge County, Hydrologic Unit 07040004, at old mill dam at County Highway 15 in Mantorville.	-	1995	a9-15-95	9.7

LOW-FLOW SITES--Continued

Stream	Tributary to	Location	Drain- age area (mi ²)	Period of record	Measurements	
					Date	Dis- charge (ft ³ /s)
North Fork of Zumbro River at Mazeppa (05373850)	Zumbro River	Lat 44°16'00", long 92°32'58", in NW ¹ / ₄ NW ¹ / ₄ sec. 7, T.109 N., R.14 W., Wabasha County, Hydrologic Unit 07040004, at bridge on County Highway 1, at southwest edge of Mazeppa.	174	1969-71, 1974, 76 - 77, 1980, 84, 88, 1996	7-26-96	51
<u>Zumbro River Basin ---continued</u>						
Trout Brook near Mazeppa (05373950)	North Fork Zumbro River	Lat 44°16'34", long 92°31'16", in SW ¹ / ₄ NE ¹ / ₄ sec. 5, T.109 N., R.14 W., Wabasha County, Hydrologic Unit 07040004, at bridge on State Highway 60, 1.3 miles east of Mazeppa.	53.8	1969-71, 1974, 77, 1980, 84-85, 1988, 1996	7-26-96	18
Cold Spring Creek at Zumbro Falls (05373995)	Zumbro River	Lat 44°17'18", long 92°26'02", in SE ¹ / ₄ NE ¹ / ₄ sec. 36, T.109 N., R.14 W., Wabasha County, Hydrologic Unit 07040004, at tri- ple box culvert on State Highway 60, 0.2 mile upstream from mouth, 0.6 mile north- west of Zumbro Falls.	45.9	1916, 1969- 71, 1974, 77, 1979-80, 84, 1996	7-26-96	17
Long Creek near Millville (05374420)	Zumbro River	Lat 44°15'50", long 92°14'27", in NE ¹ / ₄ NW ¹ / ₄ sec. 10 T.109 N., R.12 W., Wabasha County, Hydrologic Unit 07040004, at bridge on road along right bank of Zumbro River, 3.2 miles northeast of Millville.	33	1970-71, 1974, 77, 1979-80, 88, 1996	7-26-96	9.9
Middle Creek near Theilman (05374450)	Zumbro River	Lat 44°15'58", long 92°13'39", in NW ¹ / ₄ NW ¹ / ₄ sec. 11, T.109 N., R.12 W., Wabasha County, Hydrologic Unit 07040004, at bridge on County Road, 2.5 miles southwest of Theilman, 0.55 mile upstream from mouth, 3.7 miles northeast of Millville.	17.2	1970-71, 1974, 77, 79, 1988, 1996	7-26-96	6.9
West Albany Creek near West Albany	Zumbro River	Lat 44°16'10", long 92°18'22" in NE ¹ / ₄ NE ¹ / ₄ sec. 29, T.110 N., R. 13 W. Wabasha County, Hydrologic Unit 07040004, at State Highway 60, 1 mile east of West Albany.	--	1988, 1996	7-25-96	9.8
Spring Creek near West Albany (05374480)	Zumbro River	Lat 44°18'06", long 92°14'36", in NE ¹ / ₄ SW ¹ / ₄ sec. 27, T.110 N., R.12 W., Wabasha County, Hydrologic Unit 07040004, at bridge on County Highway 11, 0.8 mile upstream from mouth, 2.2 miles east of West Albany.	63.6	1969-71, 1974, 77, 1980, 88, 1996	7-25-96	21
Trout Brook at Dumfries (05374600)	Zumbro River	Lat 44°20'49", long 92°06'53", in SW ¹ / ₄ NE ¹ / ₄ sec. 10, T.110 N., R.11 W., Wabasha County, Hydrologic Unit 07040004, at bridge on State Highway 60, 0.3 mile east of County Highway 30, in Dumfries.	21.6	1969-70, 1974, 77, 1985, 88, 1996	7-25-96	0.93

Upper Iowa River Basin

Stream	Tributary to	Location	Drain- age area (mi ²)	Period of record	Measurement	
					Date	D's- charge (ft ³ /s)
Upper Iowa River near Leroy (05387240)	Mississippi River	Lat 43°31'38", long 92°32'12", in NW ¹ / ₄ NE ¹ / ₄ sec. 29, T.101 N., R.14 W., Mower County, Hydrologic Unit 070060002, at bridge on county road, 2 miles northwest of Le Roy.	36.1	1971, 74, 76, 1985, 1996	7-25-96	3.4
<u>Iowa River Basin</u>						
Cedar River above Treatment Plant at Austin (05455975)	Iowa River	Lat 43°39'37", long 92°58'29", in SW ¹ / ₄ SE ¹ / ₄ sec. 3, T.102 N., R.18 W., Mower County, Hydrologic Unit 07080201, downstream of Main street bridge, above Sewage Treatment plant out- fall, in Lafayette Park, in Austin.	--	1995, 96	a9-15-95 7-25-96	41 48
Turtle Creek near Austin (05456500)	Cedar River	Lat 43°41'05", long 93°02'15", in NE ¹ / ₄ NW ¹ / ₄ sec. 31, T.103 N., R.18 W., Mower County, Hydrologic Unit 07080201, at bridge on County Road, 3 miles west of Austin.	144	1947-51b, 1969, 1971, 1984, 87-88, 1996	7-26-96	1 ^c
Rose Creek near Austin (05457160)	Cedar River	Lat 43°36'48", long 92°58'10", in NW ¹ / ₄ NW ¹ / ₄ sec. 26, T.102 N., R.18 W., Mower County, Hydrologic Unit 07080201, at bridge on County Highway 29, 0.3 mile upstream from mouth, 3.8 miles south of Austin.	65.8	1969, 1971, 1974, 76, 1980, 84-85, 1987, 89, 1996	7-25-96	9.5
Woodbury Creek near Lyle (05457220)	Cedar River	Lat 43°30'37", long 93°00'34", in SE ¹ / ₄ NE ¹ / ₄ sec. 32, T.101 N., R.18 W., Mower County, Hydrologic Unit 07080201, at bridge on State Highway 105, 0.2 mile above mouth, 3.3 miles west of Lyle.	40.4	1971, 74, 76, 1984-85, 87, 1989, 1996	7-25-96	6.4
Otter Creek at Lyle (05457280)	Cedar River	Lat 43°30'00", long 92°55'52", in SE ¹ / ₄ SE ¹ / ₄ sec. 36, T.101 N., R.18 W., Mower County, Hydrologic Unit 07080201, at bridge on county road on Minn.-Iowa border.	38.3	1971, 1974, 1984-85, 87, 1989, 1996	7-25-96	7.1
Little Cedar River below Johnsburg (05457780)	Cedar River	Lat 43°30'00", long 92°44'57", in SE ¹ / ₄ SE ¹ / ₄ sec. 33, T.101 N., R.16 W., Mower County, Hydrologic Unit 07080201, at bridge on township road on Minn.-Iowa border, 1.1 miles southeast of Johnsburg.	48	1971, 74, 76, 1984-85, 1996	7-25-96	4.3
Shell Rock River at Albert Lea Lake outlet nr Glenville (05458966)	Cedar River	Lat 43°36'44", long 93°17'32", in NE ¹ / ₄ NE ¹ / ₄ sec. 25, T.102 N., R.21 W., at Albert Lea Lake Outlet, Freeborn County, Hydrologic Unit 07080202, at County Highway 19, 2.8 miles north of Glenville.	--	1946, 1995	9-15-95	6.1
<u>Big Sioux River Basin</u>						
Rock River near Hardwick (06482945)	Big Sioux River	Lat 43°43'04", long 96°09'51", in SE ¹ / ₄ SW ¹ / ₄ sec. 18, T.103 N., R.44 W., Rock County, Hydrologic Unit 10170204, at bridge on County Highway 8, 4.3 miles southeast of Hardwick.	312	1969-70, 1973-76, 1988, 1996	1-24-96 7-29-96	25 33

LOW-FLOW SITES--Continued

Stream	Tributary to	Location	Drain- age area (mi ²)	Period of record	Measurements	
					Date	Dis- charge (ft ³ /s)
Mound Creek near Luverne (06482965)	Rock River	Lat 43°42'51", long 96°10'21", in NE ¹ / ₄ NE ¹ / ₄ sec. 24, T.103 N., R.45 W., Rock County, Hydrologic Unit 10170204, at county road below lower dam in Blue Mounds State Park, 4.5 miles north of Luv- erne.	--	1959, 1985, 1996	1-24-96 7-29-96	1.5 1.8
<u>Big Sioux River Basin--continued</u>						
Champepadan Creek near Hardwick (06482980)	Rock River	Lat 43°42'31", long 96°07'59", in NE ¹ / ₄ SE ¹ / ₄ sec. 20, T.103 N., R.44 W., Rock County, Hydrologic Unit 10170204, at bridge on County Highway 9, 1.2 miles upstream from mouth, and 5.8 miles southeast of Hardwick.	75.5	1969-70, 1973-74, 1983, 85, 88, 1996	1-24-96 7-30-96	2.4 9.7
Rock River north- east of Luverne	Big Sioux River	Lat 43°40'24", long 96°10'22", in NE ¹ / ₄ NE ¹ / ₄ sec. 1, T.102 N., R.45 W., Rock County, Hydrologic Unit 10170204, near township road, 1.5 miles northeast of Luv- erne.	--	1996	1-23-96 7-30-96	28 49
Rock River near Luverne	Big Sioux River	Lat 43°39'35", long 96°11'00" in SE ¹ / ₄ SW ¹ / ₄ sec. 11, T.102 N., R.45 W., Rock County, Hydrologic Unit 10170204, on section line, 1 mile east of Luverne.	--	1996	1-23-96 7-30-96	35 51
Rock River tributary at Luverne	Rock River	Lat 43°39'20", long 96°11'55", in SW ¹ / ₄ NE ¹ / ₄ sec. 11, T. 102 N., R.45 W., Rock County, Hydrologic Unit 10170204, 0.15 mile north east of bridge over Rock River, on old U.S. 16 in Luverne.	--	1996	7-30-96	0.20
Rock River tributary #2 at Luverne	Rock River	Lat 43°38'56", long 96°12'46", in SW ¹ / ₄ SW ¹ / ₄ sec. 11, T.102 N., R.45 W., culvert on U.S Trunk Highway 75, in Luv- erne, 0.6 mile north of Interstate 90.	-	1996	7-31-96	0.05
Rock River south- east of Luverne	Big Sioux River	Lat 43°38'17", long 96°11'54", in SE ¹ / ₄ NE ¹ / ₄ sec. 14, T.102 N., R.45 W., at bridge on Interstate 90, 1 mile southeast of Luverne.	--	1996	1-23-96 7-31-96	31 56
Rock River tributary near Luverne	Rock River	Lat 43°38'11", long 96°12'46", in NW ¹ / ₄ SW ¹ / ₄ sec. 14, T.102 N., R.45 W., Rock County, Hydrologic Unit 10170204, at culvert under U.S. Trunk Highway 75, 0.5 mile south of Interstate 90, south of Luverne.	--	1996	7-31-96	0.21
Rock River at County Road 16 near Luverne	Big Sioux River	Lat 43°36'58", long 96°11'51", in SW ¹ / ₄ SE ¹ / ₄ sec. 23, T.102 N., R.45 W., Rock County, Hydrologic Unit 10170204, at bridge on County Road 16, 1.5 miles south of Interstate 90, south of Luverne.	--	1996	1-22-96 7-31-96	36 53
Elk River near Luverne (06483030)	Rock River	Lat 43°36'02", long 96°10'58", in NW ¹ / ₄ NE ¹ / ₄ sec. 36, T.102 N., R.45 W., Rock County, Hydrologic Unit 10170204 at bridge on township road, 3 miles south- east of Interstate 90, south of Luverne.	--	1969-70, 1973-74, 1983, 85, 88, 1996	1-22-96 7-31-96	2.2 7.6

Stream	Tributary to	Location	Drainage area (mi ²)	Period of record	Measurements	
					Date	Discharge ^a (ft ³ /s)
<u>Big Sioux River Basin--continued</u>						
Rock River at County Road 15 near Luverne	Big Sioux River	Lat 43°35'14", long 96°11'55", in SW ¹ / ₄ SE ¹ / ₄ sec. 35, T.102 N., R.45 W., Rock County, Hydrologic Unit 10170204, at bridge on County Road 15, 3.5 mile south of Interstate 90 interchange south of Luverne.	--	1996	1-25-96 7-31-96	32 59
Rock River 4.8 mi southeast of Interstate 90 near Luverne	Big Sioux River	Lat 43°34'18", long 96°11'13", in NE ¹ / ₄ NW ¹ / ₄ sec. 12, T.101 N., R.45 W., Rock County, Hydrologic Unit 10170204, close to section line, 1 mile south of County Road 15, 4.8 miles southeast of Interstate 90 intersection, south of Luverne.	--	1996	1-25-96 8-1-96	37 62
Rock River 5.5 mi southeast of Interstate 90 near Luverne	Big Sioux River	Lat 43°33'54", long 96°11'04", in NE ¹ / ₄ SW ¹ / ₄ sec. 12, T.101 N., R.45 W., Rock County, Hydrologic Unit 10170204, at center of section 12, 1.5 miles south of County Road 15, 5.5 miles southeast of Interstate 90, south of Luverne.	--	1996	12-1-95	148
Rock River 6 mi southeast of Interstate 90 near Luverne	Big Sioux River	Lat 43°33'19", long 96°10'53", in NW ¹ / ₄ NE ¹ / ₄ sec. 13, T.101 N., R.45 W., Rock County, Hydrologic Unit 10170204, 2.2 miles south of County Road 15,, 6 miles southeast of Interstate 90 intersection, south of Luverne.	--	1996	1-25-96 8-1-96	33 61
Rock River at County Road 1 near Luverne	Big Sioux River	Lat 43°32'38", long 96°10'41", in SW ¹ / ₄ SE ¹ / ₄ sec. 13, T.101 N., R.45 W., Rock County, Hydrologic Unit 10170204, at bridge on County Road 1, 6.5 miles southeast of Interstate 90 intersection, south of Luverne.	--	1996	1-25-96 8-1-96	32 65
Ash Creek at Ash Creek (06483070)	Rock River	Lat 43°32'57", long 96°11'46", in NE ¹ / ₄ SE ¹ / ₄ sec. 14, T.101 N., R.45 W., Rock County, Hydrologic Unit 10170204, at bridge on township road, 0.7 mile north of Ash Creek.	13.4	1969-70, 1973-74, 1988, 1996	7-31-96	1.6
Rock River near Steen	Big Sioux River	Lat 43°30'00", long 96°11'04", in SE ¹ / ₄ SW ¹ / ₄ sec. 36, T.101 N., R.45 W., Rock County, Hydrologic Unit 10170204, at bridge on County Road 58, on Minnesota/Iowa border, 4 miles southeast of Steen.	--	1996	1-24-96 8-1-96	39 68

a not previously published

b previously operated as a continuous record gaging station

c previously published as a high-flow partial-record station

**Water Quality
of
Partial-Record Stations**

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

Water-quality partial-record stations are particular sites where chemical quality, biological and (or) sediment data are collected systematically over a period of years for use in hydrologic analyses. Letter E indicates estimated value. Letter K indicates non-ideal colony count.

475725089381301 - WAUSWAUGONING BAY (SITE 1) NEAR GRAND PORTAGE, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	STREPTOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML) (31673)
JUN							
25...	1030	90	7.7	5.5	12.1	<1	<1
25...	1031	89	7.7	4.5	12.3	--	--
25...	1032	89	7.6	4.0	12.6	--	--
25...	1033	89	7.5	3.5	12.7	--	--
25...	1034	89	7.5	3.5	12.8	--	--
25...	1035	89	7.5	3.5	12.8	--	--
25...	1036	89	7.5	3.5	12.9	--	--
25...	1037	89	7.5	3.5	13.0	--	--
25...	1038	89	7.5	3.5	13.1	--	--
25...	1039	89	7.5	3.5	13.2	--	--

475745089391501 - GRAND PORTAGE BAY (SITE 4) NEAR GRAND PORTAGE, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	STREPTOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML) (31673)
JUN							
25...	1130	90	7.6	5.5	12.4	<1	<1

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

475730089400001 - GRAND PORTAGE BAY (SITE 3) NEAR GRAND PORTAGE, MN M

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	PH SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
JUN					
25...	1115	90	7.6	5.5	12.4
25...	1116	90	7.6	5.5	12.5
25...	1117	90	7.6	5.0	12.6
25...	1118	89	7.6	5.0	12.7

475757089394001 - GRAND PORTAGE BAY (SITE 5) NEAR GRAND PORTAGE, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
JUN							
25...	1145	90	7.6	5.5	12.4	<1	<1

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)
JUN						
25...	<0.010	0.320	<0.015	<0.20	<0.010	<0.010

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

475740089410001 - GRAND PORTAGE BAY (SITE 6) NEAR GRAND PORTAGE, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
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JUN 25...	1200	90	7.6	5.5	12.4	<1	<1
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DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHOPHOS- PHATE DIS- SOLVED (MG/L AS P) (00671)
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JUN 25...	<0.010	0.320	<0.015	<0.20	<0.010	0.010
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475710089412001 - GRAND PORTAGE BAY (SITE 7) NEAR GRAND PORTAGE, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
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JUN 25...	90	7.6	5.5	12.4	<1	K1
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ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

05030245- TOAD RIVER AT DEAD LAKE OUTLET NEAR PERHAM MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	RESIDUE VOLA- TILE, SUS- PENDED (MG/L) (00535)
MAY							
23...	0930	104	415	7.9	17.0	5	11
JUN							
05...	1000	59	435	8.4	15.0	--	--
19...	1310	82	453	7.9	22.0	--	--
JUL							
03...	0925	49	429	8.5	21.0	--	--
18...	1030	21	571	8.2	22.0	--	--
23...	1505	12	405	8.6	24.0	--	--
AUG							
07...	1015	17	358	8.4	23.0	--	--
21...	1015	6.6	310	8.4	22.0	--	--
SEP							
04...	1320	12	276	8.7	25.0	--	--
12...	0930	11	357	8.7	16.0	--	--

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	SEDI- MENT, SUS- PENDED (MG/L) (80154)
MAY						
23...	<0.010	<0.050	0.030	0.068	<0.010	11
JUN						
05...	<0.010	0.100	0.050	0.051	0.020	23
19...	<0.010	<0.050	0.050	0.047	0.010	3
JUL						
03...	<0.010	<0.050	0.030	0.047	<0.010	9
18...	<0.010	0.080	0.060	0.043	0.010	17
23...	0.010	0.070	0.050	0.039	0.010	8
AUG						
07...	<0.010	0.070	0.030	0.047	0.020	28
21...	<0.010	<0.050	<0.015	0.045	<0.010	--
SEP						
04...	<0.010	0.090	0.110	0.041	0.050	--
12...	<0.010	0.060	<0.015	0.077	<0.010	--

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

05030255- TOAD RIVER NEAR PERHAM, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	SEDI- MENT, SUS- PENDED (MG/L) (80154)
MAY											
29...	1005	77	453	7.7	15.0	<0.010	<0.050	0.030	0.068	0.010	13
JUN											
12...	0950	--	500	7.9	--	<0.010	0.060	0.040	0.066	0.020	19
26...	1325	45	453	8.6	20.0	<0.010	0.170	0.120	0.083	0.030	12
JUL											
10...	0915	36	453	7.9	20.0	0.010	0.100	0.090	0.044	0.020	18

05320300- COBB RIVER TRIBUTARY NEAR MAPLETON, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	COLI- FORM, FECAL, 0.7 UM-MF (COLS/ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
MAR									
21...	1500	2.3	746	8.1	1.5	745	13.4	320	K6400
28...	1115	5.7	627	6.9	0.5	742	17.6	170	5300
APR									
03...	0930	10	528	8.1	2.5	730	14.0	110	2000
10...	1240	4.1	981	7.8	8.0	735	11.4	K18	2000
18...	1430	6.6	772	7.7	8.0	737	12.9	38	320
23...	1215	5.7	798	8.2	6.0	743	14.2	K21	180
29...	1300	3.3	885	7.9	6.5	740	15.1	K9	130
MAY									
07...	1110	6.6	822	7.8	7.0	728	14.4	K22	420
15...	0945	7.4	730	7.2	7.0	733	15.2	180	K3000
23...	0900	6.3	789	8.3	9.0	736	13.5	110	560
JUN									
01...	0900	5.3	695	8.0	10.5	737	11.3	200	84
06...	0930	12	743	8.0	10.5	740	12.0	700	7100
11...	1410	5.0	730	8.3	17.0	742	14.1	70	77
17...	1105	302	223	7.8	18.5	733	11.2	--	--
17...	1210	276	211	7.7	18.0	733	11.3	--	--
17...	1650	214	262	7.4	18.5	732	10.8	--	--
18...	0830	132	317	7.7	16.0	734	8.3	--	--
19...	0820	83	351	7.8	15.5	728	9.5	--	--
25...	1145	20	612	7.8	18.5	745	10.0	190	3000
JUL									
02...	0940	4.6	751	7.1	15.0	738	11.0	800	5900
09...	1245	3.2	887	8.1	19.0	742	10.8	430	980
16...	1045	1.5	729	8.1	18.5	741	13.2	22000	3400
23...	1100	1.4	930	7.9	19.0	739	12.3	1100	1600
31...	1120	1.3	701	8.0	18.5	742	12.9	860	1500
AUG									
05...	1330	1.6	613	8.1	24.0	736	9.6	5300	K12000
AUG									
10-11	0900	--	364	7.6	--	--	--	--	--
13...	1330	2.2	844	7.9	22.0	747	8.4	K1300	1800
AUG									
19-20	1200	--	427	7.0	--	--	--	--	--
20...	1150	3.6	692	7.6	19.0	746	8.3	K46000	K33000
AUG									
21-22	2200	--	730	8.4	--	--	--	--	--

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

05320300- COBB RIVER TRIBUTARY NEAR MAPLETON, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDEDE (MG/L) (00530)	RESIDUE VOLA- TILE, SUS- PENDEDE (MG/L) (00535)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	SEDI- MENT, SUS- PENDEDE (MG/L) (80154)
MAR								
21...	4	1	0.150	5.50	3.00	0.490	0.450	15
28...	38	9	0.120	5.90	1.20	0.320	0.250	78
APR								
03...	60	6	0.030	5.80	0.250	0.250	0.180	72
10...	32	12	0.020	5.80	0.220	0.160	0.090	116
18...	17	<1	0.020	8.80	0.090	0.080	0.040	95
23...	--	--	0.020	9.10	0.110	0.150	0.030	124
29...	19	13	0.030	9.10	0.060	0.040	0.020	56
MAY								
07...	7	8	0.020	9.90	0.070	0.050	0.030	--
15...	7	10	0.040	9.60	0.040	0.090	0.030	16
23...	<1	<1	0.050	9.90	0.040	0.040	0.030	68
JUN								
01...	--	--	0.060	10.0	0.020	0.040	0.020	17
06...	20	8	0.070	13.0	0.070	0.070	0.040	136
11...	26	18	0.070	12.0	0.070	0.170	0.020	173
17...	320	10	0.050	9.20	0.150	0.460	0.310	495
17...	250	50	0.050	9.70	0.150	0.430	0.320	445
17...	260	50	0.070	13.0	0.190	0.450	0.330	444
18...	250	40	0.090	14.0	0.210	0.370	0.320	404
19...	176	56	0.100	2.50	0.270	0.470	0.340	305
25...	--	--	--	--	--	--	--	--
JUL								
02...	18	6	--	--	--	--	--	114
09...	15	8	0.070	12.0	0.100	0.120	0.090	153
16...	10	8	0.130	11.0	0.080	0.060	0.070	78
23...	21	4	0.170	10.0	0.130	0.090	0.080	159
31...	36	20	--	--	--	--	--	105
AUG								
05...	46	4	0.170	5.80	0.170	0.170	0.130	--
AUG								
10-11	704	100	0.080	4.50	0.100	0.400	0.280	--
13...	28	10	0.100	8.60	0.090	0.150	0.150	148
AUG								
19-20	276	72	0.080	4.50	0.070	0.610	0.370	--
20...	60	12	0.070	7.50	0.120	0.340	0.320	73
AUG								
21-22	31	8	0.130	6.50	0.140	0.220	0.200	--

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

05320300- COBB RIVER TRIBUTARY NEAR MAPLETON, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
		(US/CM) (00095)	(00400)	(00010)	(00025)	(00300)	(31625)	(31673)
AUG 26-26	0100	246	8.2	--	--	--	K18000	--
AUG 26-26	1145	338	8.1	--	--	--	--	--
26-26 27...	1635	601	7.3	18.5	745	7.4	4100	K12000
DATE	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	RESIDUE VOLA- TILE, SUS- PENDED (MG/L) (00535)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	
	AUG 26-26	1020	124	0.040	2.10	0.100	0.790	0.430
AUG 26-26	144	40	0.030	5.60	0.040	0.460	0.350	
27...	72	26	0.030	8.30	0.100	0.290	0.240	

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

05322000- BLUE EARTH RIVER AT MOUTH AT MANKATO, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	RESIDUE VOLA- TILE, SUS- PENDED (MG/L) (00535)
MAR								
21...	1610	506	8.3	1.0	745	15.1	119	108
APR								
03...	1145	420	8.5	3.0	734	14.2	490	36
18...	1620	645	8.2	8.0	736	13.0	76	3
MAY								
03...	1100	674	8.6	10.0	746	11.6	44	21
22...	1000	665	8.3	18.0	742	11.0	82	7
JUL								
17...	1430	675	8.4	25.5	736	11.0	50	11
NITRO- GEN, NITRITE DIS- SOLVED DATE AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS PHOS- PHORUS TOTAL (MG/L AS P) (00665)	CHLOR-A PHYTO- ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CHLOR-B PHYTO- SEDI- MENT, SUS- (MG/L (MG/L) (80154)	PLANK- TON CHROMO PENDE (UG/L) (70953)	PLANK- TON CHROMO FLUOROM (UG/L) (70954)	FLUOROM
MAR								
21...	0.030	2.50	0.220	0.180	0.090	143	--	--
APR								
03...	0.090	6.60	0.290	0.280	0.180	802	5.90	0.300
18...	0.020	5.20	0.020	0.200	0.040	267	32.0	1.60
MAY								
03...	0.020	5.90	0.020	0.240	<0.010	134	26.0	<0.100
22...	0.030	6.00	0.030	0.140	<0.010	231	--	--
JUL								
17...	0.020	5.20	0.040	0.100	0.020	163	9.80	0.500

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

05288695- SHINGLE CREEK AT ZANE AVE. AT BROOKLYN PARK, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
SEP 19...	1000	--	--	--	--	--	--	--	--	--
27...	1020	1.5	643	7.1	12.0	731	5.4	160	0	195

05288710- SHINGLE CREEK AT 46TH ST. IN MINNEAPOLIS, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)
MAY 17...	1040	0.020	0.010	0.50	0.80	0.170	0.110	0.050	<0.010

05288920- MISSISSIPPI RIVER AT MINNEAPOLIS, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
SEP 27...	1200	366	8.2	14.5	8.1	154	0	188

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

05330902- NINE MILE CREEK NR JAMES CIRCLE AT BLOOMINGTON,
(National Water-Quality Assessment Station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	ALKA- LITY WAT DIS TOT IT FIELD (MG/L AS CACO3) (39086)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CAR- BONATE WATER DIS IT FIELD (MG/L AS CO3) (00452)
MAR												
11...	1015	6.2	1600	1570	7.8	7.9	2.5	745	15.2	242	261	0
APR												
15...	1050	19	749	745	8.3	7.9	5.0	741	13.7	144	150	0
MAY												
14...	1130	18	592	763	7.8	7.9	12.0	742	9.7	173	176	0
JUN												
21...	1010	72	435	448	7.6	7.2	19.5	739	7.8	106	116	0
JUL												
12...	1020	7.1	647	637	8.0	7.9	18.5	742	8.7	164	173	0
AUG												
05...	1240	6.6	382	384	7.9	7.8	22.0	740	8.6	99	106	--
SEP												
04...	1100	1.7	748	741	8.0	8.0	19.0	745	9.4	216	236	0

DATE	BICAR- BONATE DIS IT FIELD MG/L AS HCO3 (00453)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS- (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHOSOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C) (00689)	SOLIDS AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
MAR												
11...	295	0.530	<0.010	1.0	1.2	0.700	0.070	0.040	0.030	5.9	0.20	848
APR												
15...	176	0.020	<0.010	0.40	0.70	0.150	0.080	0.020	<0.010	5.6	0.70	396
MAY												
14...	211	0.020	0.010	0.50	1.0	0.100	0.110	0.020	<0.010	6.8	2.9	421
JUN												
21...	129	0.140	0.020	0.70	0.90	0.210	0.130	0.090	0.070	7.6	2.6	248
JUL												
12...	200	0.030	0.010	0.50	0.60	0.330	0.060	0.040	0.050	6.9	0.40	392
AUG												
05...	121	<0.015	0.030	0.50	0.40	0.430	0.030	0.030	0.060	5.6	0.60	217
SEP												
04...	264	0.020	0.010	0.30	0.30	0.420	0.020	0.020	0.020	3.6	0.40	431

DATE	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SED. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAR												
11...	82	28	180	6.5	330	23	0.30	15	110	300	45	28
APR												
15...	45	15	76	3.3	140	15	0.20	4.8	140	88	18	79
MAY												
14...	56	20	66	3.4	130	17	0.20	2.5	88	81	24	93
JUN												
21...	32	11	36	2.7	62	7.8	0.20	6.3	220	59	24	86
JUL												
12...	48	19	47	2.7	91	12	0.20	7.4	150	58	4	95
AUG												
05...	31	11	25	2.4	47	9.5	0.10	7.1	75	42	9	86
SEP												
04...	70	25	44	3.4	90	21	0.20	17	17	110	54	84

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

05355300 MISSISSIPPI RIVER AT RED WING, MN--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	17.0	17.0	17.0	26.0	25.0	25.5	24.5	23.5	24.0	26.0	25.5	25.5
2	18.0	17.0	17.5	26.0	25.0	25.5	25.0	24.5	24.5	25.5	25.0	25.5
3	17.5	16.5	17.0	26.5	25.5	26.0	25.5	24.5	25.0	26.0	25.0	25.5
4	17.0	16.5	16.5	27.0	25.5	26.0	25.0	24.0	24.5	26.0	25.5	25.5
5	17.0	16.5	17.0	27.0	25.5	26.0	24.5	24.0	24.5	26.5	26.0	26.0
6	17.5	16.5	17.0	26.5	25.5	26.0	26.0	24.5	25.0	26.0	26.0	26.0
7	17.5	17.0	17.5	26.5	25.0	25.5	26.5	26.0	26.0	26.0	25.5	25.5
8	19.0	17.0	18.0	26.0	24.5	25.0	26.5	26.0	26.0	26.0	24.5	25.5
9	20.0	18.5	19.0	25.0	24.0	24.5	26.0	25.5	26.0	24.5	24.0	24.5
10	21.0	19.5	20.0	25.0	23.5	24.5	26.0	25.0	25.5	24.5	24.5	24.5
11	22.0	20.0	21.0	25.0	24.0	24.0	25.5	25.0	25.5	---	---	---
12	23.5	21.0	22.0	24.0	23.5	23.5	26.0	25.5	25.5	23.5	22.5	22.5
13	24.0	22.5	23.5	24.5	23.5	24.0	26.0	26.0	26.0	22.5	21.0	21.5
14	25.0	23.0	24.0	24.5	23.5	24.0	26.5	25.5	26.0	22.0	20.0	21.0
15	25.0	24.0	24.5	25.0	24.0	24.5	25.5	24.5	25.0	21.0	20.0	20.5
16	24.5	24.0	24.0	25.5	24.0	25.0	25.5	24.5	25.0	21.5	20.5	21.0
17	24.0	23.0	23.0	25.5	24.5	25.0	25.5	25.0	25.5	21.5	21.0	21.0
18	23.0	22.0	22.5	26.5	25.0	25.5	26.0	25.5	25.5	21.5	20.0	20.5
19	22.0	21.5	22.0	26.5	25.5	26.0	25.5	25.0	25.5	21.0	20.0	20.5
20	23.0	22.0	22.5	26.0	24.5	25.0	25.5	24.5	25.0	21.0	19.5	20.5
21	22.5	21.5	22.0	25.5	24.5	25.0	26.0	25.0	25.5	21.0	20.0	20.5
22	21.5	20.5	21.0	25.5	25.0	25.5	26.5	25.5	26.0	20.5	20.0	20.0
23	21.5	21.0	21.0	25.5	24.5	25.0	26.0	25.0	25.5	20.0	19.0	19.5
24	21.5	20.5	21.0	25.5	24.5	25.0	26.0	25.5	26.0	19.5	18.5	19.0
25	23.5	21.0	22.0	24.5	24.0	24.5	26.5	25.5	26.0	20.0	18.5	19.0
26	23.0	22.0	22.5	25.0	24.0	24.5	26.0	25.5	26.0	20.0	19.0	19.5
27	24.5	23.0	23.5	25.0	24.5	25.0	25.5	24.5	25.0	20.0	19.0	19.5
28	25.5	24.0	25.0	25.0	24.5	25.0	25.0	24.5	24.5	20.0	19.0	19.0
29	26.0	25.0	25.5	25.0	24.0	24.5	25.0	24.5	25.0	19.5	18.5	19.0
30	26.0	25.5	25.5	24.0	23.5	23.5	25.5	25.0	25.0	19.0	18.5	18.5
31	---	---	---	24.0	23.0	23.5	26.0	25.5	25.5	---	---	---
MONTH	26.0	16.5	21.0	27.0	23.0	25.0	26.5	23.5	25.5	---	---	---

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

05355300 MISSISSIPPI RIVER AT RED WING, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE	SPE-CIFIC CON-DUCT-ANCE LAB	PH WATER WHOLE FIELD (STAND-ARD UNITS)	PH WATER WHOLE LAB (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3)	ALKA-LINITY LAB (MG/L AS CACO3)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3)	
		(00061)	(00095)	(90095)	(00400)	(00403)	(00010)	(00025)	(00300)	(39086)	(90410)	(00452)	
MAR 18...	1200	--	490	511	7.5	7.6	2.5	--	--	171	179	0	
APR 17...	1135	--	375	372	8.0	7.9	5.0	--	12.0	138	141	0	
MAY 29...	1145	47700	467	462	8.2	8.0	16.0	751	9.2	155	161	0	
JUN 18...	1130	--	653	648	7.9	8.0	22.0	741	6.5	191	207	0	
JUL 18...	1055	--	446	438	8.0	7.7	25.0	740	6.8	150	159	0	
AUG 09...	1230	--	276	393	8.0	7.9	26.0	--	8.0	126	139	0	
SEP 11...	1205	--	466	474	8.1	8.0	24.0	749	6.6	157	168	0	
DATE		BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN,AM-MONIA + DIS-ORGANIC (MG/L AS N)	NITRO-GEN,AM-MONIA + DIS-ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, DIS-SOLVED (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	SOLIDS, SUS-PENDED AT 180 DEG. C DIS-SOLVED (MG/L)	
		(00453)	(00608)	(00613)	(00623)	(00625)	(00631)	(00665)	(00666)	(00671)	(00681)	(00689)	(70300)
MAR 18...	209	--	--	--	--	--	--	--	--	--	7.0	1.1	309
APR 17...	168	0.060	0.020	0.60	0.80	0.880	0.130	0.050	0.050	7.4	1.3	224	
MAY 29...	189	0.020	0.020	0.60	0.90	1.30	0.120	0.040	0.030	--	--	295	
JUN 18...	233	0.160	0.040	0.80	1.2	2.20	0.210	0.100	0.080	7.1	--	392	
JUL 18...	183	0.060	0.030	0.40	0.90	1.40	0.150	0.070	0.090	8.1	1.6	277	
AUG 09...	154	0.030	0.030	0.50	0.90	0.730	0.120	0.060	0.060	8.8	1.2	232	
SEP 11...	192	0.100	0.080	0.60	0.80	1.80	0.170	0.080	0.110	7.0	1.7	294	
DATE		CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SULFATE DIS-SOLVED (MG/L AS SO4)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	SEDI-MENT, SUS-PENDED (MG/L)	SED. SIEVE DIAM. % FINER THAN .062 MM
		(00915)	(00925)	(00930)	(00935)	(00940)	(00945)	(00950)	(00955)	(01046)	(01056)	(80154)	(70331)
MAR 18...	55	21	16	4.3	22	47	0.20	14	62	63	--	--	--
APR 17...	44	16	8.2	3.8	12	32	0.10	13	150	23	1830	2	2
MAY 29...	53	21	10	3.0	14	58	0.30	7.6	58	12	93	98	98
JUN 18...	69	30	15	3.6	18	100	0.30	10	12	7	57	99	99
JUL 18...	48	19	12	2.3	15	43	0.20	13	65	2	46	97	97
AUG 09...	39	17	12	2.4	16	34	0.20	11	49	2	38	95	95
SEP 11...	48	20	15	2.5	20	43	0.30	14	3	3	52	95	95

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

443620092370601 - PICKEREL SLOUGH, W.CORNER (SW8) AT PRAIRIE ISL.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE	SPE- CIFIC CON- DUCT- ANCE	PH WATER WHOLE FIELD	PH WATER WHOLE LAB	TEMPER- ATURE WATER	OXYGEN, DIS- SOLVED	CALCIUM DIS- SOLVED	MAGNE- SIUM, DIS- SOLVED	SODIUM, DIS- SOLVED	POTAS- SIUM, DIS- SOLVED
		(US/CM) (00095)	(US/CM) (90095)	(STAND- ARD UNITS) (00400)	(STAND- ARD UNITS) (00403)						
MAY 01...	1130	437	430	8.3	8.6	10.5	9.8	50	19	9.9	3.4
DATE	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NC3 DIS- SOLVED (MG/L AS N) (00631)
MAY 01...	157	161	7	177	49	13	0.20	6.2	282	0.010	0.541
DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS- (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	
MAY 01...	0.030	0.50	1.1	0.110	<0.010	0.010	9.1	2.8	81	51	

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

443717092401901 - VERMILLION RIVER (SW6) AT PRAIRIE ISLAND, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE	SPE- CIFIC CON- DUCT- ANCE	PH WATER WHOLE FIELD	PH WATER WHOLE LAB	TEMPER- ATURE WATER	BARO- METRIC PRES- SURE	OXYGEN, DIS- SOLVED	CALCIUM DIS- SOLVED	MAGNE- SIUM, DIS- SOLVED	SODIUM, DIS- SOLVED	
		(US/CM) (00095)	(US/CM) (90095)	(STAND- ARD UNITS) (00400)	(STAND- ARD UNITS) (00403)		(MM OF HG) (00025)					(MG/L) (00300)
APR 30...	1140	432	416	8.3	8.4	9.5	739	10	49	19	10	
DATE		POTAS- SIUM, DIS- SOLVED	ALKA- LITY WAT DIS TOT IT FIELD	ALKA- LITY LAB	BICAR- BONATE WATER DIS IT FIELD	SULFATE DIS- SOLVED	CHLO- RIDE, DIS- SOLVED	FLUO- RIDE, DIS- SOLVED	SILICA, DIS- SOLVED	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED	NITRO- GEN, NITRITE DIS- SOLVED	NITRO- GEN, NO2+NO3 DIS- SOLVED
		(MG/L AS K) (00935)	(MG/L AS CACO3 (39086)	(MG/L AS CACO3) (90410)	(MG/L AS HCO3 (00453)	(MG/L AS SO4) (00945)	(MG/L AS CL) (00940)	(MG/L AS F) (00950)	(MG/L AS SIO2) (00955)	(MG/L (70300)	(MG/L AS N) (00613)	(MG/L AS N) (00631)
APR 30...	3.5	154	153	188	52	13	0.20	6.4	273	0.010	0.820	
DATE		NITRO- GEN, AMMONIA DIS- SOLVED	NITRO- GEN,AM- MONIA + ORGANIC DIS.	NITRO- GEN,AM- MONIA + ORGANIC TOTAL	PHOS- PHORUS TOTAL	PHOS- PHORUS DIS- SOLVED	PHOS- PHORUS ORTHO, DIS- SOLVED	CARBON, ORGANIC DIS- SOLVED	CARBON, ORGANIC SUS- PENDE TOTAL	IRON, DIS- SOLVED	MANGA- NESE, DIS- SOLVED	
		(MG/L AS N) (00608)	(MG/L AS N) (00623)	(MG/L AS N) (00625)	(MG/L AS P) (00665)	(MG/L AS P) (00666)	(MG/L AS P) (00671)	(MG/L AS C) (00681)	(MG/L AS C) (00689)	(UG/L AS FE) (01046)	(UG/L AS MN) (01056)	
APR 30...	0.020	0.50	1.0	0.110	0.020	0.030	9.1	3.0	85	15		

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

443747092380401 - STURGEON LAKE, S.E. SIDE (SW7) AT PRAIRIE ISL.,

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE	SPE- CIFIC CON- DUCT- ANCE	PH WATER WHOLE FIELD	PH WATER WHOLE LAB	TEMPER- ATURE WATER	BARO- METRIC PRES- SURE	OXYGEN, DIS- SOLVED	CALCIUM DIS- SOLVED	MAGNE- SIUM, DIS- SOLVED	SODIUM, DIS- SOLVED
		(US/CM) (00095)	(US/CM) (90095)	(STAND- ARD UNITS) (00400)	(STAND- ARD UNITS) (00403)		(MM OF HG) (00025)				
APR 30...	1240	412	423	8.4	8.0	10.5	738	12.5	49	19	9.8
DATE	POTAS- SIUM, DIS- SOLVED	ALKA- LITY WAT DIS	ALKA- LITY LAB	BICAR- BONATE WATER	SULFATE DIS- SOLVED	CHLO- RIDE, DIS- SOLVED	FLUO- RIDE, DIS- SOLVED	SILICA, DIS- SOLVED	SOLIDS, RESIDUE	NITRO- GEN, NITRITE	NITRO- GEN, NO2+NO3
		TOT IT FIELD	(MG/L AS CACO3)	(MG/L AS HCO3	(MG/L AS SO4)	(MG/L AS CL)	(MG/L AS F)	(MG/L AS SIO2)	AT 180 DEG. C DIS- SOLVED	DIS- SOLVED	DIS- SOLVED
APR 30...	AS K) (00935)	MG/L AS CACO3 (39086)	AS CACO3) (90410)	MG/L AS HCO3 (00453)	AS SO4) (00945)	AS CL) (00940)	AS F) (00950)	AS (00955)	(MG/L) (70300)	(MG/L AS N) (00613)	(MG/L AS N) (00631)
	3.7	158	150	193	51	12	0.20	7.1	267	0.010	0.510
DATE	NITRO- GEN, AMMONIA	NITRO- GEN,AM- MONIA +	NITRO- GEN,AM- MONIA +	PHOS- PHORUS TOTAL	PHOS- PHORUS DIS- SOLVED	PHOS- PHORUS ORTHO, DIS- SOLVED	CARBON, ORGANIC DIS- SOLVED	CARBON, ORGANIC SUS- PENDE TOTAL	IRON, DIS- SOLVED	MANGA- NESE, DIS- SOLVED	
	DIS- SOLVED	ORGANIC DIS.	ORGANIC TOTAL								(MG/L AS N)
APR 30...	(00608)	(00623)	(00625)	(00665)	(00666)	(00671)	(00681)	(00689)	(01046)	26	

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

443753092400401 - NELSON LAKE, SO. END, (SW5) AT PRAIRIE ISLAND,

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE	SPE- CIFIC CON- DUCT- ANCE	PH WATER WHOLE FIELD	PH WATER WHOLE LAB	TEMPER- ATURE WATER	BARO- METRIC PRES- SURE	OXYGEN, DIS- SOLVED	CALCIUM DIS- SOLVED	MAGNE- SIUM, DIS- SOLVED	SODIUM, DIS- SOLVED	
		(US/CM) (00095)	(US/CM) (90095)	(STAND- ARD UNITS) (00400)	(STAND- ARD UNITS) (00403)		(MM OF HG) (00025)					
APR 30...	1040	358	389	8.7	7.3	11.0	739	10.9	35	18	10	
DATE		POTAS- SIUM, DIS- SOLVED	ALKA- LINITY WAT DIS TOT IT FIELD	ALKA- LINITY LAB	BICAR- BONATE WATER DIS IT FIELD	SULFATE DIS- SOLVED	CHLO- RIDE, DIS- SOLVED	FLUO- RIDE, DIS- SOLVED	SILICA, DIS- SOLVED	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED	NITRO- GEN, NITRITE DIS- SOLVED	NITRO- GEN, NO2+NO3 DIS- SOLVED
		(MG/L AS K) (00935)	(MG/L AS CACO3) (39086)	(MG/L AS CACO3) (90410)	(MG/L AS HCO3 (00453)	(MG/L AS SO4) (00945)	(MG/L AS CL) (00940)	(MG/L AS F) (00950)	(MG/L AS SIO2) (00955)	(MG/L) (70300)	(MG/L AS N) (00613)	(MG/L AS N) (00631)
APR 30...	4.4	127	127	155	41	15	0.20	1.2	212	<0.010	<0.050	
DATE		NITRO- GEN, AMMONIA DIS- SOLVED	NITRO- GEN,AM- MONIA + ORGANIC DIS.	NITRO- GEN,AM- MONIA + ORGANIC TOTAL	PHOS- PHORUS TOTAL	PHOS- PHORUS DIS- SOLVED	PHOS- PHORUS ORTHO, DIS- SOLVED	CARBON, ORGANIC DIS- SOLVED	CARBON, ORGANIC SUS- PENDE TOTAL	IRON, DIS- SOLVED	MANGA- NESE, DIS- SOLVED	
		(MG/L AS N) (00608)	(MG/L AS N) (00623)	(MG/L AS N) (00625)	(MG/L AS P) (00665)	(MG/L AS P) (00666)	(MG/L AS P) (00671)	(MG/L AS C) (00681)	(MG/L AS C) (00689)	(UG/L AS FE) (01046)	(UG/L AS MN) (01056)	
APR 30...	0.020	0.60	1.9	0.170	<0.010	0.010	9.6	>5.0	64	150		

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

443818092383801 - STURGEON LAKE, WEST SIDE, (SW2) AT PRAIRIE ISL,

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	CALCIUM, DIS- SOLVED (MG/L) AS CA (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L) AS MG (00925)	SODIUM, DIS- SOLVED (MG/L) AS NA (00930)	POTAS- SIUM, DIS- SOLVED (MG/L) AS F (00935)
MAY 01...	1300	414	376	8.6	7.8	12.0	12.5	46	18	9.7	3.4
DATE	TIME	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LINITY LAB (MG/L) AS CACO3 (90410)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	SULFATE DIS- SOLVED (MG/L) AS SO4 (00945)	CHLO- RIDE, DIS- SOLVED (MG/L) AS CL (00940)	FLUO- RIDE, DIS- SOLVED (MG/L) AS F (00950)	SILICA, DIS- SOLVED (MG/L) AS SIO2 (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L) AS N (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L) AS N (00631)
MAY 01...	163	130	199	40	15	0.20	5.9	223	0.010	0.580	
DATE	TIME	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L) AS N (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L) AS N (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L) AS N (00625)	PHOS- PHORUS TOTAL (MG/L) AS P (00665)	PHOS- PHORUS DIS- SOLVED (MG/L) AS P (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L) AS P (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L) AS C (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L) AS C (00689)	IRON, DIS- SOLVED (UG/L) AS FE (01046)	MANGA- NESE, DIS- SOLVED (UG/L) AS MN (01056)
MAY 01...		0.020	0.50	1.0	0.090	<0.010	0.010	9.0	2.6	81	15

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

443832092394301 - NORTH LAKE, S.E. ARM OF, (SW3) AT PRAIRIE ISL,

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)
MAY 02...	1000	392	393	9.0	8.7	10.5	744	12.4	47	18	9.3
DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3) (39086)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CAR- BONATE WATER DIS IT FIELD (MG/L AS CO3) (00452)	BICAR- BONATE WATER DIS IT FIELD (MG/L AS HCO3) (00453)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)
MAY 02...	3.9	154	149	29	129	46	12	0.20	1.7	242	<0.010
DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, SUS- PENDE TOTAL (MG/L AS C) (00689)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)
MAY 02...	<0.050	0.020	0.60	1.3	0.090	<0.010	<0.010	9.9	>5.0	75	9.0

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

443836092390001 - BUFFALO SLOUGH, S.E. (SW1) AT PRAIRIE ISLAND, M

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)
APR 30...	1330	475	464	8.0	8.1	15.0	9.9	54	21	10	2.6
DATE		ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)
APR 30...		184	189	224	44	11	0.20	8.8	288	0.010	0.200
DATE		NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDEED TOTAL (MG/L AS C) (00689)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)
APR 30...		0.020	0.40	0.80	0.090	0.030	0.020	8.2	2.1	47	90

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

443840092400301 - NORTH LAKE, SOUTH BAY OF, (SW4) AT PRAIRIE ISL,

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE	SPE- CIFIC CON- DUCT- ANCE	PH WATER WHOLE FIELD	PH WATER WHOLE LAB	TEMPER- ATURE WATER	OXYGEN, DIS- SOLVED	CALCIUM DIS- SOLVED	MAGNE- SIUM, DIS- SOLVED	SODIUM, DIS- SOLVED	POTAS- SIUM, DIS- SOLVED
		(US/CM) (00095)	(US/CM) (90095)	(STAND- ARD UNITS) (00400)	(STAND- ARD UNITS) (00403)						
MAY 02...	1130	391	394	9.1	8.9	12.0	300	48	18	9.7	3.6
DATE	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)
MAY 02...	156	144	30	129	49	12	0.20	3.0	249	0.010	0.070
DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDEED TOTAL (MG/L AS C) (00689)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	
MAY 02...	0.020	0.50	1.2	0.080	<0.010	0.010	9.4	5.2	70	5.0	

[illegible]

**Water Quality of
Miscellaneous Sites**

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

Samples are collected at sites other than gaging stations and partial-record stations to give better areal coverage. Such stations are referred to as miscellaneous stations. Letter E indicates estimated value. Letter K indicates non-ideal colony count.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

05030230- TOAD RIVER BELOW COLLETT CK NEAR FRAZEE, MN

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)	NITROGEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	SEDIMENT, SUSPENDED (MG/L) (80154)
JUL 23...	1440	12	500	8.1	20.0	0.030	0.150	0.110	0.072	0.040	14
AUG 07...	0945	22	419	7.9	19.0	0.040	0.190	0.130	0.076	0.040	47
21...	0930	7.0	429	7.9	19.0	0.040	0.170	0.090	0.120	0.030	--
SEP 04...	1250	10	429	7.9	20.0	0.020	0.120	0.060	0.120	0.040	--
12...	0910	11	476	8.4	14.0	0.020	0.150	0.100	0.110	0.030	--

443145094592101 - COLUMBUS WETLAND NR REDWOOD FALLS, MN.

DATE	TIME	SPECIFIC CONDUCTANCE	SPECIFIC CONDUCTANCE	PH WATER WHOLE FIELD	PH WATER WHOLE LAB	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE	OXYGEN, DIS-SOLVED (MG/L)	CALCIUM, DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTASSIUM, DIS-SOLVED	
		(US/CM) (00095)	(US/CM) (90095)	(STANDARD UNITS) (00400)	(STANDARD UNITS) (00403)		(MM OF HG) (00025)					(MG/L AS K) (00955)	
AUG 23...	1130	536	281	6.6	6.9	19.0	747	0.7	31	8.7	3.5	10	
DATE	TIME	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	NITROGEN, NITRITE DIS-SOLVED (MG/L AS N)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N)	PHOSPHORUS ORTHO, DIS-SOLVED (MG/L AS P)	ARSENIC DIS-SOLVED (UG/L AS AS)	BORON, DIS-SOLVED (UG/L AS B)
		(90410)	(00945)	(00940)	(00950)	(00955)	(70300)	(00613)	(00631)	(00608)	(00671)	(01000)	(01020)
AUG 23...	147		<0.10	2.5	<0.10	0.20	194	<0.010	<0.050	0.510	0.090	<1	18
DATE	TIME	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGANESE, DIS-SOLVED (UG/L AS MN)	MOLYBDENUM, DIS-SOLVED (UG/L AS MO)	SELENIUM, DIS-SOLVED (UG/L AS SE)	STRONTIUM, DIS-SOLVED (UG/L AS SR)	PROPYLCHLOR, WATER, DISS. REC (UG/L)	BUTYLATE, WATER, DISS. REC (UG/L)	SILMAZINE, WATER, DISS. REC (UG/L)	PROMETON, WATER, DISS. REC (UG/L)	DEETHYL ATRAZINE, WATER, DISS. REC (UG/L)
		(01046)	(01049)	(01130)	(01056)	(01060)	(01145)	(01080)	(04024)	(04028)	(04035)	(04037)	(04040)
AUG 23...	760		<1.0	5	1900	<1.0	<1	77	<0.007	<0.002	<0.005	<0.018	E0.005

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

443145094592101 - COLUMBUS WETLAND NR REDWOOD FALLS, MN.--Continued

DATE	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER DISS (UG/L) (04095)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	
AUG 23...		0.013	<0.003	<0.002	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	0.020
DATE	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ACETO- CHLOR, WATER FLTRD REC (UG/L) (49260)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82661)	ETHAL- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82663)	PHORATE WATER FLTRD GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)		
AUG 23...	<0.002	<0.002	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002		
DATE	PEB- ULATE WATER FLTRD 0.7 U GF, REC (UG/L) (82669)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)		
AUG 23...	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004		
DATE	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC (91063)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC (91065)		
AUG 23...	<0.003	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	96.6	108	75.2		

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES
WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

444541095305301 - HAZEL CREEK NR GRANITE FALLS, MN.

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD (00400)	PH WATER WHOLE LAB (STAND- ARD (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)
AUG 21...	1630	1180	1150	8.2	7.9	25.0	738	8.5	120	70	24
DATE		POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)
AUG 21...		5.6	276	340	21	0.40	24	856	0.020	4.10	<0.015
DATE		PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
AUG 21...		0.050	3	110	<3.0	<1.0	68	20	4.2	5	510

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES
WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

05311150 - MINNESOTA RIVER AT HWY 212 IN GRANITE FALLS, MN.

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	CALCIUM, DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)
AUG 21...	1130	889	883	8.2	8.0	23.0	738	7.0	85	53	22	6.1

DATE	ALKA- LITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)
AUG 21...	264	210	15	0.30	22	606	0.010	0.660	0.020	0.090	4	105

DATE	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)
AUG 21...	<3.0	<1.0	45	18	3.0	2	370	<0.007	<0.002	<0.005	E0.013	E0.017

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

05311150 - MINNESOTA RIVER AT HWY 212 IN GRANITE FALLS, MN.--Continued

DATE	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER DISS (UG/L) (04095)	ALPHA BHC DIS- (UG/L) (34253)	P,P' DDE (UG/L) (34653)	CHLOR- PYRIFOS DIS- (UG/L) (38933)	LINDANE DIS- (UG/L) (39341)	DI- ELDRIN DIS- (UG/L) (39381)	METO- LACHLOR WATER (UG/L) (39415)	MALA- THON, DIS- (UG/L) (39532)	PARA- THON, DIS- (UG/L) (39542)	DI- AZINON, DIS- (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)
AUG 21...		0.047	<0.003	<0.002	<0.006	<0.004	<0.001	0.051	<0.005	<0.004	<0.002	0.074
DATE	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ACETO- CHLOR, WATER FLTRD REC (UG/L) (49260)	METRI- BUZIN WATER FLTRD DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82661)	ETHAL- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U (UG/L) (82666)	METHYL PARA- THON WAT FLT 0.7 U (UG/L) (82667)	EPTC WATER FLTRD 0.7 U (UG/L) (82668)	
AUG 21...	0.010	<0.002	<0.004	<0.003	0.006	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	
DATE	PEB- ULATE WATER FLTRD 0.7 U GF, REC (UG/L) (82669)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	
AUG 21...	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	
DATE	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC (91063)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC (91065)	
AUG 21...	<0.003	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	99.4	115	88.3	

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES
WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

444356093275200 - UNAMED TRIB (SITE 6) NR MYSTIC LK AT PRIOR LAKE MN

DATE	TIME	SPECIFIC CONDUCTANCE	SPECIFIC CONDUCTANCE	PH WATER WHOLE FIELD	PH WATER WHOLE LAB	TEMPERATURE WATER	BAROMETRIC PRESSURE	OXYGEN, DIS-SOLVED	ALKALINITY LAB	11TRO-GEN, AMMONIA DIS-SOLVED
		(US/CM) (00095)	(US/CM) (90095)	(STANDARD UNITS) (00400)	(STANDARD UNITS) (00403)		(DEG C) (00010)		(MM OF HG) (00025)	(MG/L AS CaCO3) (90410)
JUN 28...	1230	744	737	8.2	7.9	24.0	742	7.1	277	0.200
DATE		NITROGEN, NITRITE DIS-SOLVED	NITROGEN,AMMONIA + ORGANIC DIS.	NITROGEN,AMMONIA + ORGANIC TOTAL	NITROGEN, NO2+NO3 DIS-SOLVED	PHOSPHORUS TOTAL	PHOSPHORUS DIS-SOLVED	PHOSPHORUS ORTHO, DIS-SOLVED	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED	CALCIUM DIS-SOLVED
		(MG/L AS N) (00613)	(MG/L AS N) (00623)	(MG/L AS N) (00625)	(MG/L AS N) (00631)	(MG/L AS P) (00665)	(MG/L AS P) (00666)	(MG/L AS P) (00671)	(MG/L AS P) (70300)	(MG/L AS Ca) (00915)
JUN 28...	0.160	1.2	1.1	0.310	0.110	0.100	0.080	459	82	
DATE		MAGNESIUM, DIS-SOLVED	SODIUM, DIS-SOLVED	POTASSIUM, DIS-SOLVED	CHLORIDE, DIS-SOLVED	SULFATE DIS-SOLVED	FLUORIDE, DIS-SOLVED	SILICA, DIS-SOLVED	IRON, DIS-SOLVED	MANGANESE, DIS-SOLVED
		(MG/L AS MG) (00925)	(MG/L AS NA) (00930)	(MG/L AS K) (00935)	(MG/L AS CL) (00940)	(MG/L AS SO4) (00945)	(MG/L AS F) (00950)	(MG/L AS SiO2) (00955)	(UG/L AS FE) (01046)	(UG/L AS MN) (01056)
JUN 28...	27	38	2.6	74	0.40	0.20	21	46	3100	

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES
WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

444412093281600 - UNAMED TRIB (SITE 1) NR MYSTIC LK AT PRIOR LAKE, MN

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD ARD (STAND- UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)
JUN 28...	0845	336	346	8.8	7.6	25.0	740	6.6	97	0.090
DATE		NITRO- GEN, NITRITE SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS- (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
JUN 28...		0.010	0.90	1.1	0.060	0.040	<0.010	0.020	188	22
DATE		MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)
JUN 28...		16	18	4.2	44	1.7	0.20	1.0	160	83

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

444414093293400 - UNAMED TRIB (SITE 5) NR MYSTIC LK AT PRIOR LAKE, MN

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 10^4 ML) (31673)
		ALKA- LINITY LAB (MG/L AS CACO3) (90410)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + DIS- ORGANIC (MG/L AS N) (00623)		NITRO- GEN,AM- MONIA + ORGANIC (MG/L AS N) (00625)		NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
JUN 28...	1145	792	781	7.5	7.3	24.5	742	5.4	K210	3900
DATE										
JUN 28...	216	0.150	0.010	1.2	1.5	0.060	0.650	0.080	0.070	541
DATE										
JUN 28...	73	20	62	1.6	120	0.50	0.20	21	940	1200

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

444458093282000 - UNAMED TRIB (SITE 4) NR MYSTIC LK AT PRIOR LAKE, MN

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
JUN 28...	1120	1110	1090	7.4	7.3	23.0	742	3.8	5600	K640
DATE	ALKA- LITY LAB (MG/L AS CACO3) (90410)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + DIS- ORGANIC (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
JUN 28...	356	1.90	0.340	3.0	3.2	18.0	0.910	0.800	0.790	722
DATE	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)
JUN 28...	150	47	18	9.6	71	41	0.20	29	16	270

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES
WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

444459093273000 - UNAMED TRIB (SITE 2) NR MYSTIC LK AT PRIOR LAKE, MN

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	NITRO- GEN, AMONIA DIS- SOLVED (MG/L AS N) (00408)
JUN 28...	0950	516	512	7.6	7.4	18.0	741	7.2	216	0.050
DATE		NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
JUN 28...		0.020	0.40	0.50	5.10	0.070	0.090	0.090	310	72
DATE		MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)
JUN 28...		22	4.9	2.3	14	6.1	0.20	19	5.0	11

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES
WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

444504093272900 - UNAMED TRIB (SITE 3) NR MYSTIC LK AT PRIOR LAKE, MN

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
		ALKA- LINITY LAB (MG/L AS CACO3) (90410)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)		NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)		NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
JUN 28...	1030	509	520	7.9	6.9	19.0	742	7.8	340	750
DATE										
JUN 28...	216		0.030	0.030	0.40	0.40	7.10	0.080	0.080	0.090 302
DATE										
JUN 28...	72	22	4.8	2.3	14	6.1	0.20	19	5.0	3.0

Ground-Water Stations

Ground-Water Levels

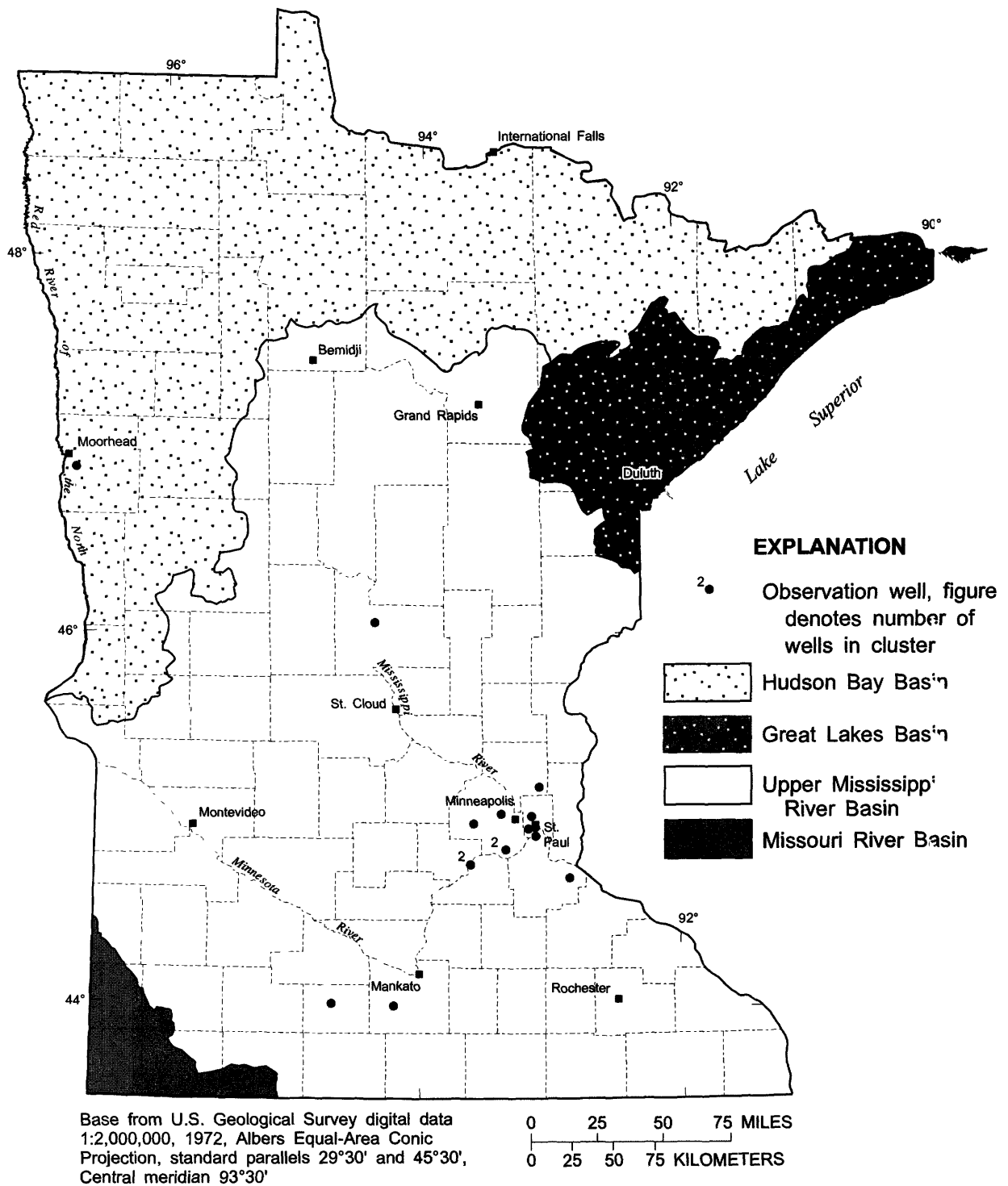


Figure 10.--Location of ground-water wells.

ANOKA COUNTY

450927093033802. Local number, 031N22W23CBC02.

LOCATION.-- Lat 45°09'27", long 93°03'38", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.23, T.31 N., R.22 W., Hydrologic Unit 07010206, at the city of Centerville.
Owner: U. S. Geological Survey.

AQUIFER.-- Jordan Sandstone of Late Cambrian Age.

WELL CHARACTERISTICS.-- Drilled artesian observation well, diameter 6 in. to 95 ft, 2.5 in. to 267 ft, total depth 277 ft, screened 267 to 277 ft, screen diameter 2.4 in.

INSTRUMENTATION.-- Digital recorder with one-hour punch cycle.

DATUM.-- Land-surface datum is 901.6 ft above mean sea level. Measuring point: Top of recorder platform, 2.20 ft above land-surface datum.

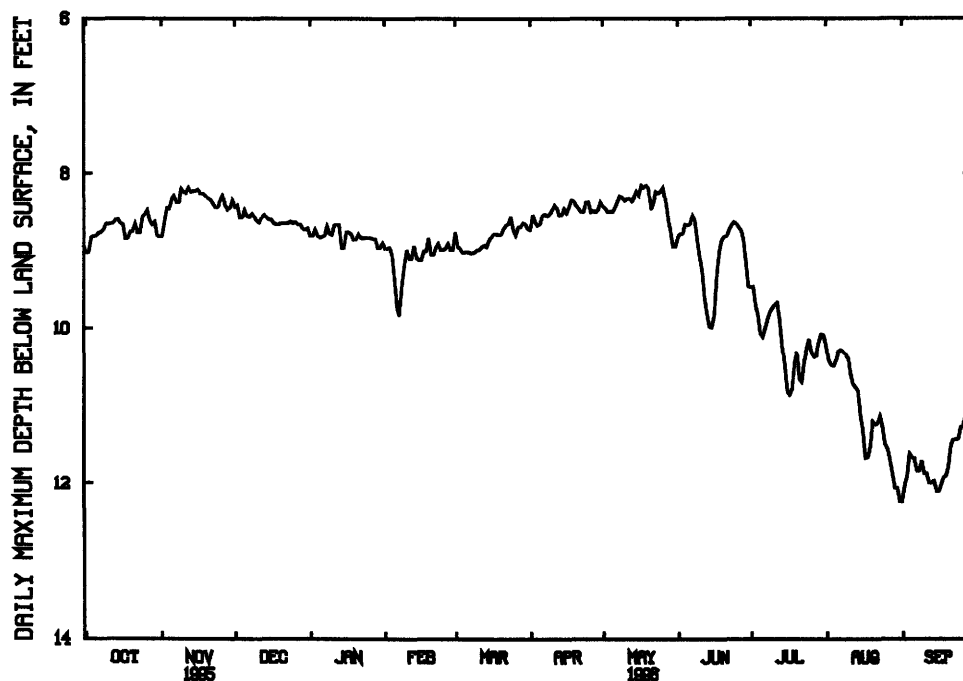
REMARKS.-- Water level affected by nearby flowing wells.

PERIOD OF RECORD.-- February 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.-- Highest water level, 7.50 ft below land-surface datum, July 8, 1993; lowest, 18.57 ft below land-surface datum, Oct. 2, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	8.81	8.34	8.48	8.83	9.39	9.02	8.65	8.50	8.67	10.08	10.42	11.68
10	8.66	8.24	8.61	8.79	8.99	8.99	8.48	8.35	9.08	9.74	10.40	11.88
15	8.64	8.23	8.60	8.96	9.12	8.86	8.46	8.24	9.99	10.51	11.14	12.11
20	8.75	8.32	8.64	8.86	9.05	8.79	8.42	8.19	8.82	10.32	11.22	11.78
25	8.53	8.35	8.64	8.83	8.99	8.73	8.37	8.24	8.65	10.15	11.51	11.29
EOM	8.82	8.35	8.71	8.90	8.99	8.72	8.38	8.95	9.46	10.10	12.24	11.21



450927093033802 31N22W23CBC02

BLUE EARTH COUNTY

440050094102801. Local number, 106N28W03DBA01.

LOCATION.-- Lat 44°00'50", long 94°10'28", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.3, T.106 N., R. 28 W., Hydrologic Unit 07020010, at Farmland Industries Ammonia Plant, 3.2 mi north of Vernon Center.

Owner: Farmland Industries.

AQUIFER.-- Ironton-Galesville Sandstones of Late Cambrian Age.

WELL CHARACTERISTICS.-- Drilled, unused artesian well, diameter 16 in., depth 390 ft, cased to 150 ft.

INSTRUMENTATION.-- Digital recorder with one-hour punch cycle.

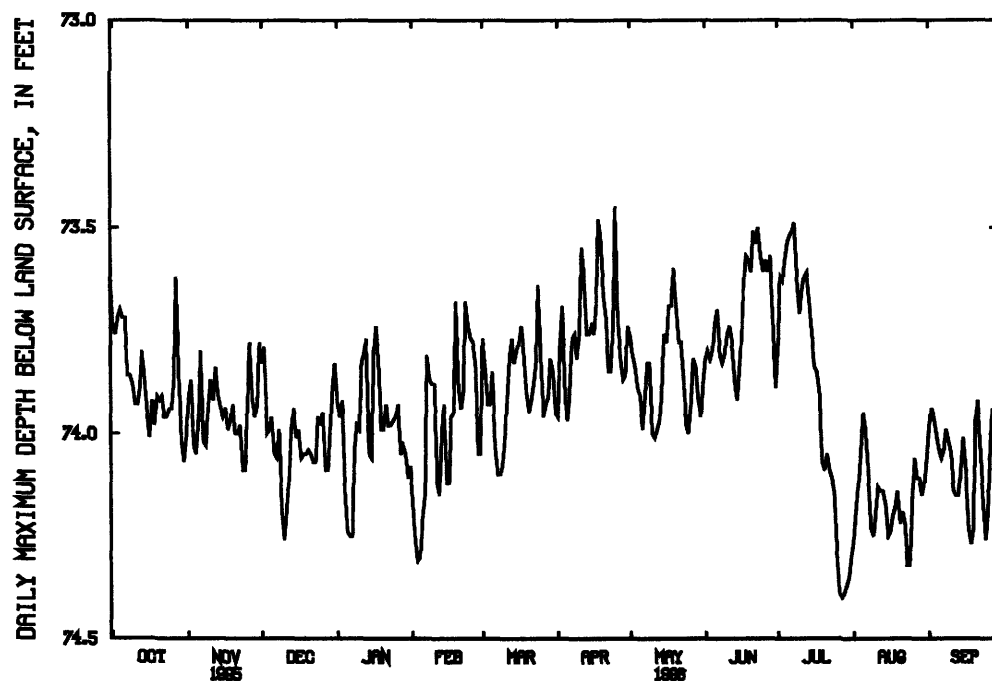
DATUM.-- Land-surface datum is 1,005 ft above mean seal level. Measuring point: Top of recorder platform, 2.00 ft above land-surface datum.

PERIOD OF RECORD.-- October 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.-- Highest water level, 71.25 ft below land-surface datum, July 4, 1993; lowest, 76.73 ft below land-surface datum, Oct. 18, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	73.72	73.97	73.96	74.24	74.20	73.85	73.97	73.91	73.73	73.54	73.95	74.04
10	73.93	73.87	74.26	73.99	73.88	74.02	73.75	74.00	73.76	73.71	74.19	74.05
15	73.95	73.96	74.01	74.06	74.12	73.80	73.74	73.76	73.85	73.76	74.25	74.01
20	73.92	74.00	74.04	73.99	73.89	73.95	73.66	73.69	73.61	74.09	74.22	73.97
25	73.94	73.94	73.98	73.96	73.77	73.81	73.45	74.00	73.61	74.29	74.17	74.19
EOM	74.01	73.78	73.83	74.08	74.05	73.95	73.74	73.88	73.89	74.30	74.06	74.21



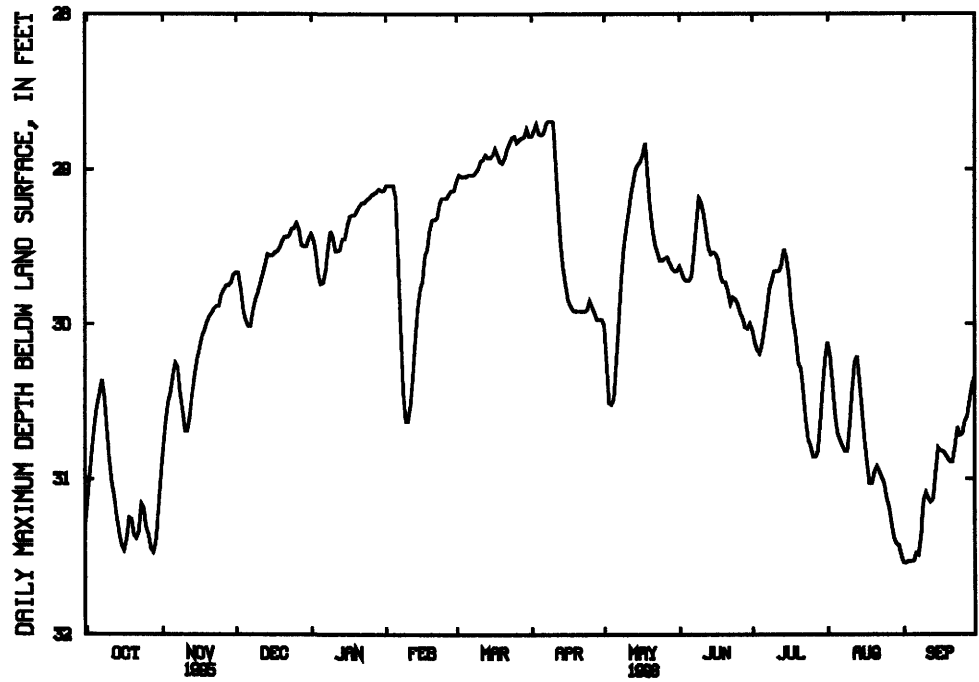
440050094102801 106N28W03DBA01

CLAY COUNTY

465237096383901. Local number, 139N47W05CDC01.
LOCATION.-- Lat 46°52'37", long 96°38'39", in SW¼SE¼SW¼, sec.5, T.139 N., R.47 W., Hydrologic Unit 09020104, 2.4 mi east of Dilworth.
Owner: Steven Schroeder.
AQUIFER.-- Surficial sand and gravel of Pleistocene Age (Buffalo Aquifer).
WELL CHARACTERISTICS.-- Drilled water-table observation well, diameter 8 in., depth 131.3 ft, slotted 91 to 107 ft.
INSTRUMENTATION.-- Digital recorder with 30-minute punch cycle, Apr. 6 - Sept. 30.
DATUM.-- Land-surface datum is 916.7 ft above mean sea level. Measuring point: Top of recorder platform, 3.60 ft above land-surface datum.
REMARKS.-- Water level affected by pumping from nearby wells.
PERIOD OF RECORD.-- January 1947 to current year.
EXTREMES FOR PERIOD OF RECORD.-- Highest water level, 12.19 ft below land-surface datum, July 15, 1947; lowest, 32.94 ft below land-surface datum, Aug. 24, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	30.53	30.34	29.97	29.74	29.19	29.05	28.78	30.48	29.72	30.13	30.71	31.53
10	30.87	30.69	29.80	29.44	30.63	29.00	28.70	29.40	29.22	29.66	30.65	31.09
15	31.43	30.23	29.56	29.45	29.78	28.93	29.74	28.97	29.54	29.57	30.56	30.80
20	31.36	29.95	29.47	29.27	29.33	28.96	29.92	29.25	29.73	30.26	30.96	30.89
25	31.31	29.81	29.38	29.19	29.19	28.79	29.85	29.59	29.87	30.79	31.13	30.71
EOY	31.00	29.68	29.45	29.14	29.14	28.79	29.97	29.66	30.00	30.21	31.50	30.34



465237096383901 139N47W05CDC01

DAKOTA COUNTY

445330093054301. Local number, 028N22W19DCC02.

LOCATION.-- Lat 44°53'30", long 93°05'43", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.19, T.28 N., R. 22 W., Hydrologic Unit 07010206, in West St. Paul.

Owner: U.S. Geological Survey.

AQUIFER.--Prairie du Chien Group of Early Ordovician Age.

WELL CHARACTERISTICS.-- Drilled artesian observation well, diameter 6 in., depth 539 ft, cased to 409 ft.

INSTRUMENTATION.--Digital recorder with 30-minute punch cycle.

DATUM.--Land-surface datum is 1,036.9 ft above mean sea level. Measuring point: Top of recorder platform, 2.60 ft above land-surface datum.

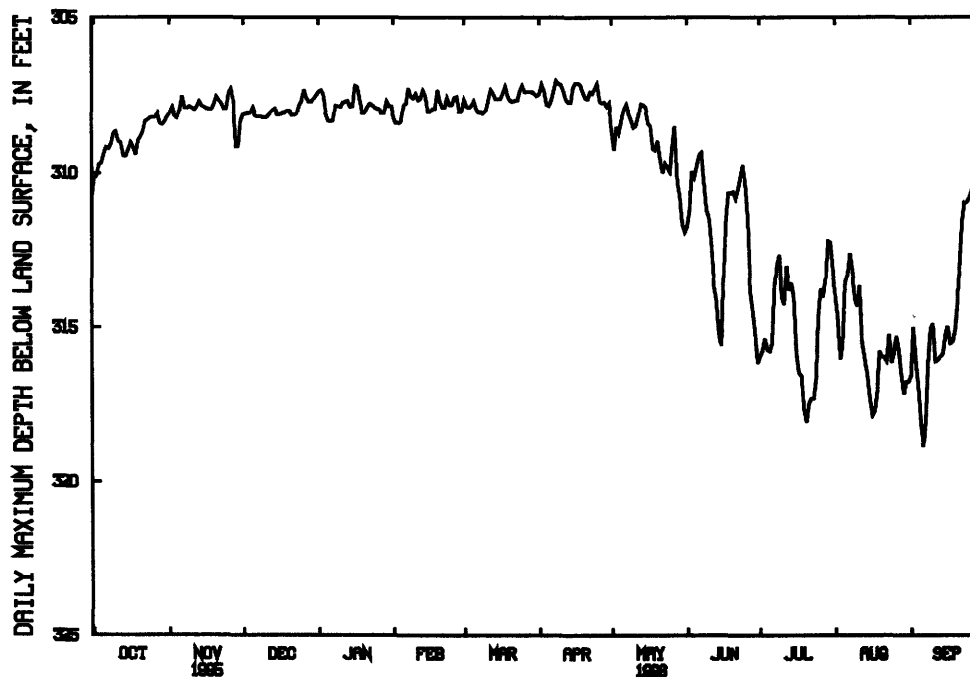
REMARKS.--Water-level affected by regional pumping.

PERIOD OF RECORD.--January 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 306.74 ft below land-surface datum, Apr. 25, 1996; lowest, 328.0 ft below land-surface datum, July 31, 1975.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	309.41	307.99	307.90	308.31	307.83	307.71	307.85	308.34	309.80	315.78	313.56	318.21
10	308.67	307.92	308.22	307.88	307.47	308.00	307.17	308.53	311.45	314.02	314.33	314.89
15	309.26	307.89	308.10	307.86	308.03	307.63	307.26	307.89	315.59	314.05	317.31	315.29
20	308.84	307.56	308.01	308.08	307.73	307.69	307.61	308.97	310.61	318.09	315.96	314.36
25	308.22	307.47	307.71	307.94	307.82	307.21	307.15	309.97	310.32	314.68	315.82	310.82
EOM	308.19	308.32	307.52	307.86	308.03	307.54	307.76	311.91	316.17	313.24	316.77	309.59



445330093054301 028N22W19DCC02

DAKOTA COUNTY -- Continued

444205092500001. Local number, 114N17W10AAA01.

LOCATION.-- Lat 44°42'05", long 92°50'00", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.10, T.114 N., R.17 W., Hydrologic Unit 07040001, southeast of Hastings.

Owner: John Conzemius.

AQUIFER.-- Prairie du Chien Group of Early Ordovician Age.

WELL CHARACTERISTICS.-- Drilled, unused artesian well, diameter 4 in., depth 151 ft, depth of casing unknown.

INSTRUMENTATION.-- Digital recorder with one-hour punch cycle.

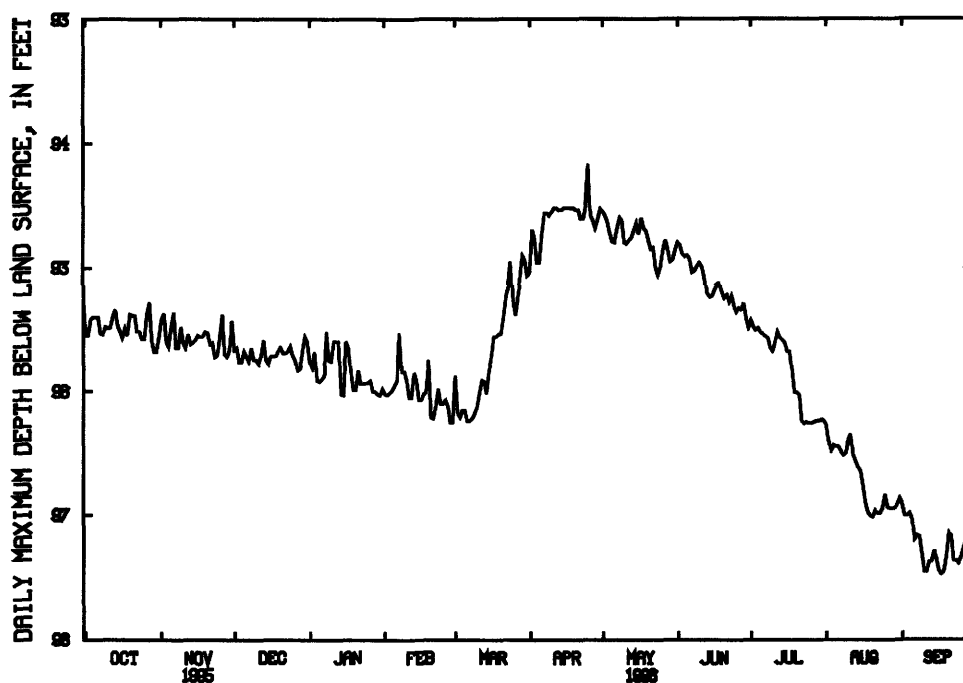
DATUM.-- Land-surface datum is 827 ft above mean sea level. Measuring point: Top of platform, 2.50 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.-- Highest water level, 93.47 ft below land-surface datum, Sept. 30, 1993; lowest, 107.4 ft below land-surface datum, Mar. 12, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	95.40	95.48	95.68	95.92	95.95	96.15	94.96	94.79	94.90	95.53	96.45	97.03
10	95.49	95.61	95.75	95.76	95.91	96.13	94.55	94.80	94.96	95.68	96.40	97.46
15	95.51	95.59	95.78	96.03	96.07	95.83	94.52	94.64	95.23	95.61	96.65	97.36
20	95.39	95.53	95.65	95.99	96.21	95.54	94.54	94.78	95.25	96.01	97.02	97.15
25	95.58	95.57	95.71	95.93	96.10	95.28	94.17	95.00	95.36	96.26	96.84	97.34
EOM	95.56	95.43	95.60	95.98	96.25	95.07	94.53	94.86	95.49	96.24	96.87	97.45



444205092500001 114N17W10AAA01

HENNEPIN COUNTY

444801093202801. Local number, 027N24W30BDA01.

LOCATION.-- Lat 44°48'01", long 93°20'28", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.30, T.27 N., R.24 W., Hydrologic Unit 07020012, by Southwood School in Bloomington. Owner: City of Bloomington.

AQUIFER.-- Jordan Sandstone of Late Cambrian Age.

WELL CHARACTERISTICS.--Drilled, unused artesian well, diameter 12 in. to 137 ft, 8 in. to 269 ft, total depth 330 ft, cased to 269 ft.

INSTRUMENTATION.-- Digital recorder with 30-minute punch cycle.

DATUM.-- Land-surface datum is 815 ft above mean sea level. Measuring point: Top of recorder platform, 2.20 ft above land-surface datum.

REMARKS.-- Water level affected by pumping.

PERIOD OF RECORD.-- March 1969 to current year.

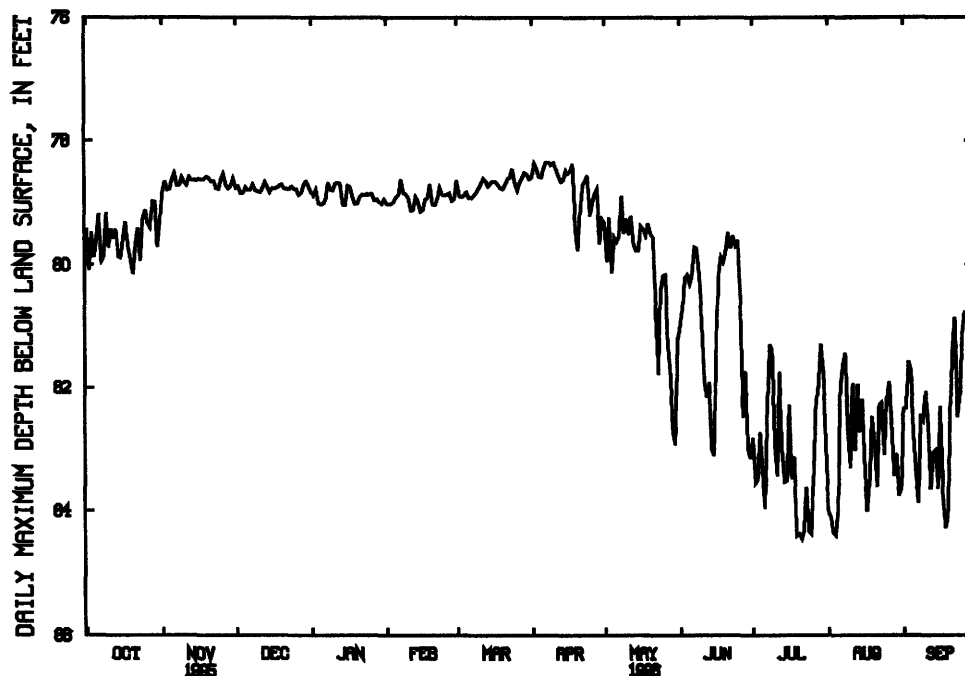
EXTREMES FOR PERIOD OF RECORD.-- Highest water level, 63.05 ft below land-surface datum, Apr. 15, 1969; lowest, 84.86 ft below land-surface datum, July 1, 1988.

REVISIONS.-- Water levels for water year 1995 for the period, Aug. 7 to Sep. 30, have been revised as follows:

DAY	AUG	SEP
5	--	82.98
10	80.16	82.41
15	79.84	81.76
20	80.38	80.01
25	81.01	79.94
EOM	79.76	79.83

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	79.60	78.63	78.76	79.03	78.90	78.83	78.59	79.56	80.31	83.41	83.97	82.77
10	79.73	78.67	78.82	78.80	78.92	78.77	78.35	79.26	80.94	82.92	83.30	82.06
15	79.89	78.65	78.83	79.04	79.14	78.68	78.48	79.78	83.10	83.50	82.19	83.63
20	80.15	78.60	78.71	79.02	79.03	78.78	79.78	79.50	79.79	84.37	82.91	82.39
25	79.12	78.63	78.78	78.87	78.88	78.68	79.21	80.19	79.61	84.37	82.20	81.11
EOM	79.31	78.61	78.74	78.95	78.95	78.62	79.27	81.23	83.15	82.94	83.62	80.95



444801093202801 27N24W30BDA01

HENNEPIN COUNTY -- Continued

450116093205301. Local number, 029N24W06CCC01.

LOCATION.-- Lat 45°01'16", long 93°20'53", in SW¹/₄SW¹/₄SW¹/₄ sec.6, T.29 N., R.24 W., Hydrologic Unit 07010206, at the corner of 36th Avenue and Unity Avenue North, Robbinsdale.

Owner: Minnesota Department of Transportation.

AQUIFER.-- St. Peter Sandstone of Middle Ordovician Age.

WELL CHARACTERISTICS.-- Drilled, unused artesian well, diameter 5 in., depth 200 ft, cased to 152 ft.

INSTRUMENTATION.-- Digital recorder with 30-minute punch cycle.

DATUM.-- Land-surface datum is 870 ft above mean sea level. Measuring point: Top of casing, 3.50 ft above land-surface datum.

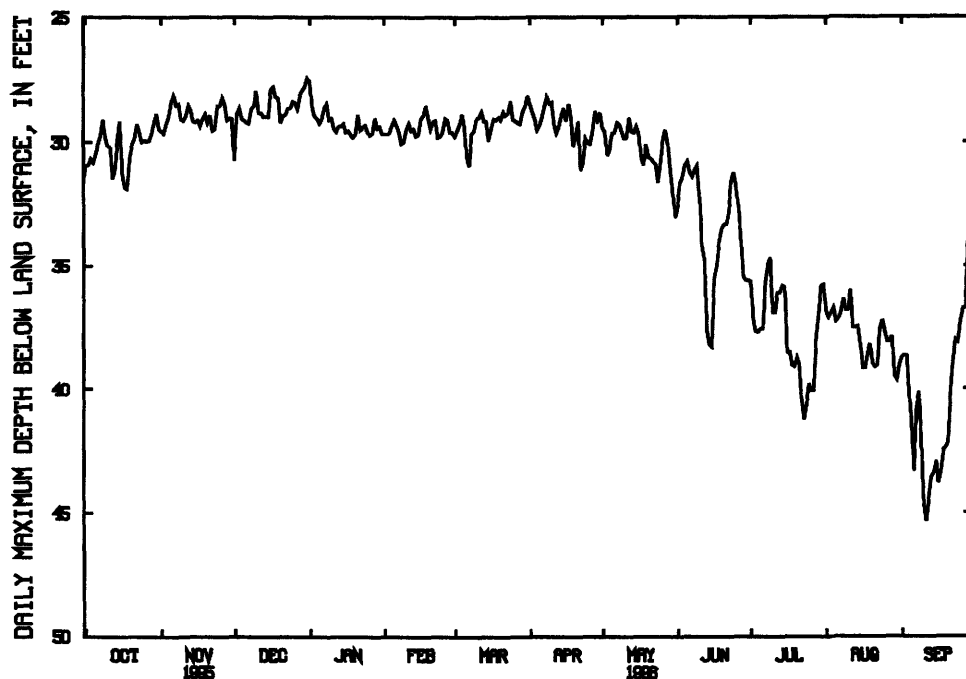
REMARKS.-- Water level affected by pumping.

PERIOD OF RECORD.-- March 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.-- Highest water level, 24.54 ft below land-surface datum, Dec. 28, 29, 1975; lowest, 53.03 ft below land-surface datum, June 15, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	30.50	28.38	29.12	29.23	29.11	29.37	29.34	29.65	30.78	37.56	37.27	41.45
10	30.13	29.13	27.94	29.05	29.49	29.05	28.40	29.84	32.13	36.89	36.80	44.77
15	29.14	29.20	28.98	29.24	29.70	29.95	28.64	29.38	38.28	35.90	38.12	42.92
20	30.11	29.21	29.22	29.68	29.47	29.09	29.79	30.62	33.33	38.72	38.97	42.17
25	29.92	28.54	28.38	29.57	29.58	29.08	30.04	30.84	31.69	39.79	37.65	37.20
EOM	29.46	29.08	27.44	29.66	29.59	28.15	28.83	33.06	35.60	35.76	39.00	34.57



450116093205301 29N24W06CCC01

HENNEPIN COUNTY -- Continued

445740093333001. Local number, 117N23W11BBD01.

LOCATION.-- Lat 44°57'40", long 93°33'30", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.11, T.117 N., R.23 W., Hydrologic Unit 07010206, 2 mi southwest of Wayzata, at Lake Minnetonka.

Owner: Minnetonka Boat Works, Inc., Orono.

AQUIFER.-- Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.

WELL CHARACTERISTICS.-- Drilled artesian observation well, diameter 6 in., depth 437 ft, cased to 270 ft.

INSTRUMENTATION.-- Graphic recorder with a one-inch = 5 days pen trace until May 9. Electronic data logger with 15-minute scan interval.

DATUM.-- Land-surface datum is 930.8 ft above mean sea level. Measuring point: Floor of recorder platform, 3.30 ft above land-surface datum.

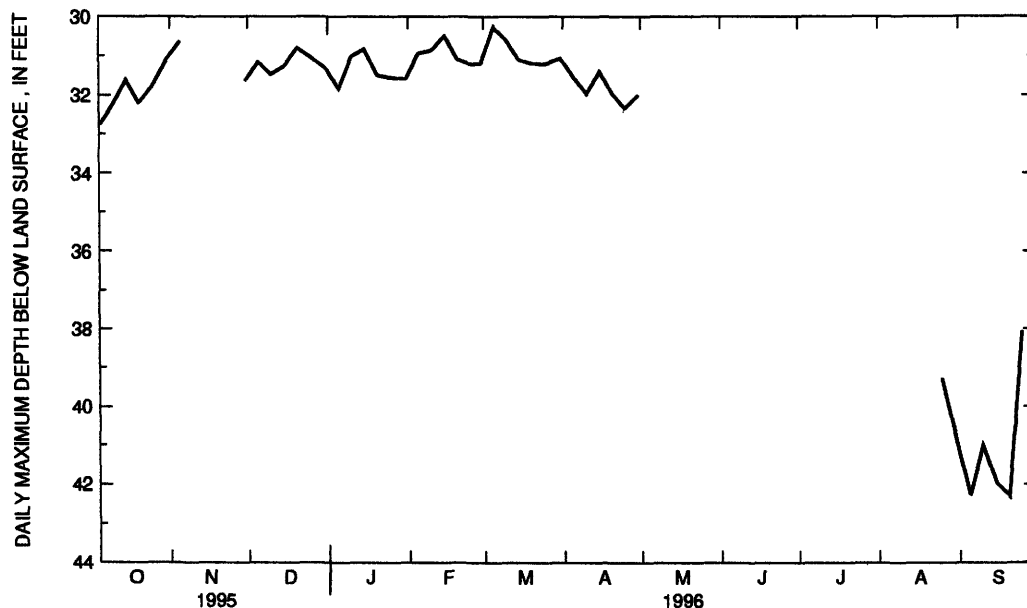
REMARKS.-- Water level affected by pumping.

PERIOD OF RECORD.-- August 1942 to current year.

EXTREMES FOR PERIOD OF RECORD.-- Highest water level, 14.05 ft below land-surface datum, Apr. 30, 1954; lowest, 44.77 ft below land-surface datum, June 28, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	32.76	30.62	31.16	31.83	30.94	30.26	31.53	--	--	--	--	42.29
10	32.27	--	31.47	31.01	30.85	30.59	31.95	--	--	--	--	41.02
15	31.62	--	31.26	30.82	30.47	31.09	31.40	--	--	--	--	41.97
20	32.19	--	30.79	31.49	31.07	31.20	31.95	--	--	--	--	42.31
25	31.79	--	31.02	31.55	31.21	30.21	32.33	--	--	--	39.28	38.06
EOM	31.08	30.63	31.32	31.58	31.20	31.06	31.98	--	--	--	40.95	--



HENNEPIN COUNTY -- Continued

450223093231801. Local number, 118N21W07DCB01.

LOCATION.-- Lat 45°02'23", long 93°23'18", in NW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.7, T.118 N., R.21 W., Hydrologic Unit 07010206, by water tower at 47th Avenue North and Aquila Avenue.

Owner: City of New Hope.

AQUIFER.-- Jordan Sandstone of Late Cambrian Age.

WELL CHARACTERISTICS.-- Drilled, unused artesian well, diameter 16 in., depth 422 ft, cased to 339 ft.

INSTRUMENTATION.-- Digital recorder with a 30-minute punch cycle.

DATUM.-- Land-surface datum is 933 ft above mean sea level. Measuring point: Top of recorder platform, 3.00 ft above land-surface datum.

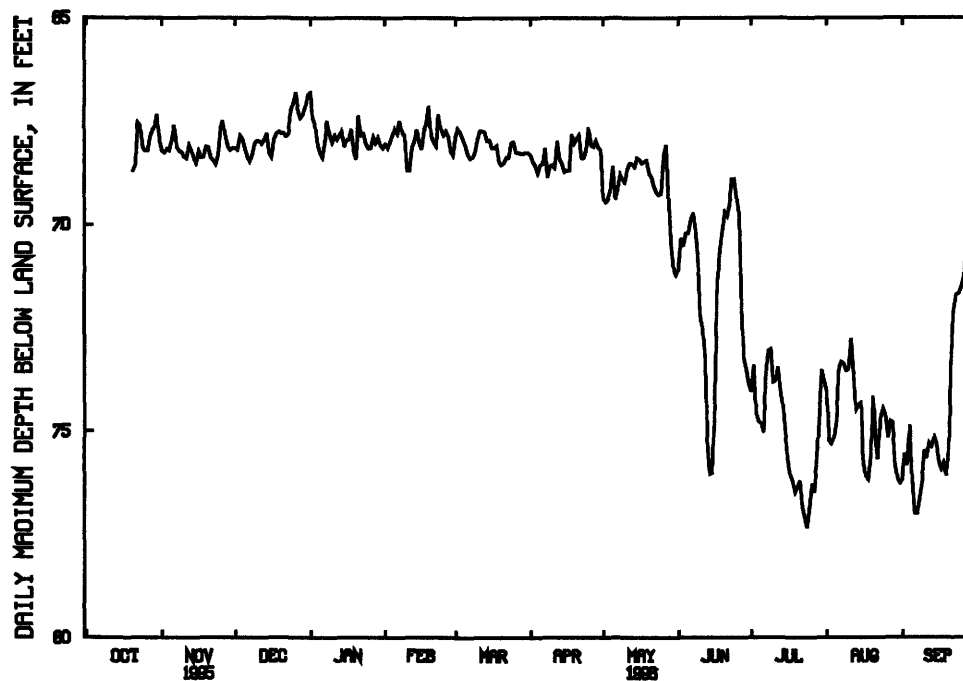
REMARKS.-- Water level affected by pumping.

PERIOD OF RECORD.-- October 1965 to current year.

EXTREMES FOR PERIOD OF RECORD.-- Highest water level, 60.46 ft below land-surface datum, Dec. 17, 1967; lowest, 77.56 ft below land-surface datum, July 11, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	--	67.91	68.14	68.25	67.68	68.05	68.55	68.58	70.22	74.82	74.77	76.23
10	--	68.35	67.96	67.99	68.69	67.94	68.54	68.96	72.19	73.82	73.51	75.48
15	--	68.50	68.25	68.10	68.02	67.94	68.71	68.38	76.02	75.08	74.32	75.30
20	68.69	68.12	67.78	68.40	67.84	68.54	67.91	68.75	69.70	76.36	74.16	75.49
25	68.20	67.71	67.05	68.15	67.82	67.99	67.64	69.25	69.38	76.86	74.64	71.53
EOM	68.00	68.14	66.85	68.13	68.32	68.25	68.18	71.21	73.88	73.80	76.27	70.73



450223093231801 118N21W07DCB01

MORRISON COUNTY

460444094212501. Local number, 130N29W08DCC01.

LOCATION.-- Lat 46°04'44", long 94°21'25", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.8, T.130 N., R.29 W., Hydrologic Unit 07010104, at Camp Ripley.

Owner: Minnesota Army National Guard, Camp Ripley.

AQUIFER.-- Surficial outwash sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.-- Drilled water-table observation well, diameter 2 in., depth 59 ft, screened 56 to 59 ft.

INSTRUMENTATION.-- Monthly measurements by observer.

DATUM.-- Land-surface datum is 1,149.0 ft above mean sea level. Measuring point: Top of casing, 2.10 ft above land-surface datum.

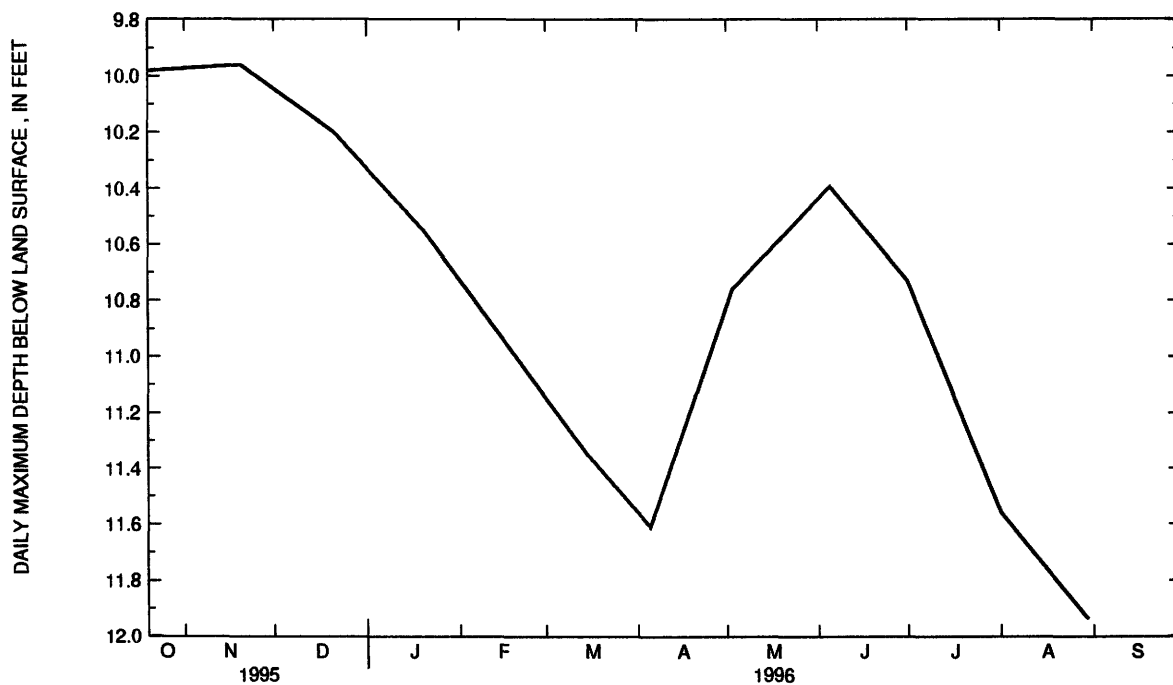
REMARKS.-- Water levels used in monthly National Water Conditions Report.

PERIOD OF RECORD.-- April 1949 to current year.

EXTREMES FOR PERIOD OF RECORD.-- Highest water level, 7.35 ft below land-surface datum, July 28, 1972; lowest, 19.75 ft below land-surface datum, Aug. 4, 1961.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	9.98	JAN 20	10.55	MAY 3	10.76	AUG 1	11.56
NOV 20	9.96	MAR 15	11.35	JUN 5	10.39	AUG 30	11.94
DEC 21	10.20	APR 5	11.61	JUL 1	10.73		



RAMSEY COUNTY

445700093051001. Local number, 029N22W31DDD01.

LOCATION.-- Lat 44°57'00", long 93°05'10", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.31, T.29 N., R.22 W., Hydrologic Unit 07010206, at 261 E. 5th Street, St. Paul.

Owner: Control Data Corporation.

AQUIFER.-- Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.

WELL CHARACTERISTICS.-- Drilled, unused artesian well, diameter 16 in. to 131 ft, 12 in. to 151 ft, depth 313 ft, cased to 151 ft.

INSTRUMENTATION.-- Digital recorder with 15-minute punch cycle.

DATUM.-- Land-surface datum is 750 ft above mean sea level. Measuring point: Top of recorder platform, 9.00 ft below land-surface datum.

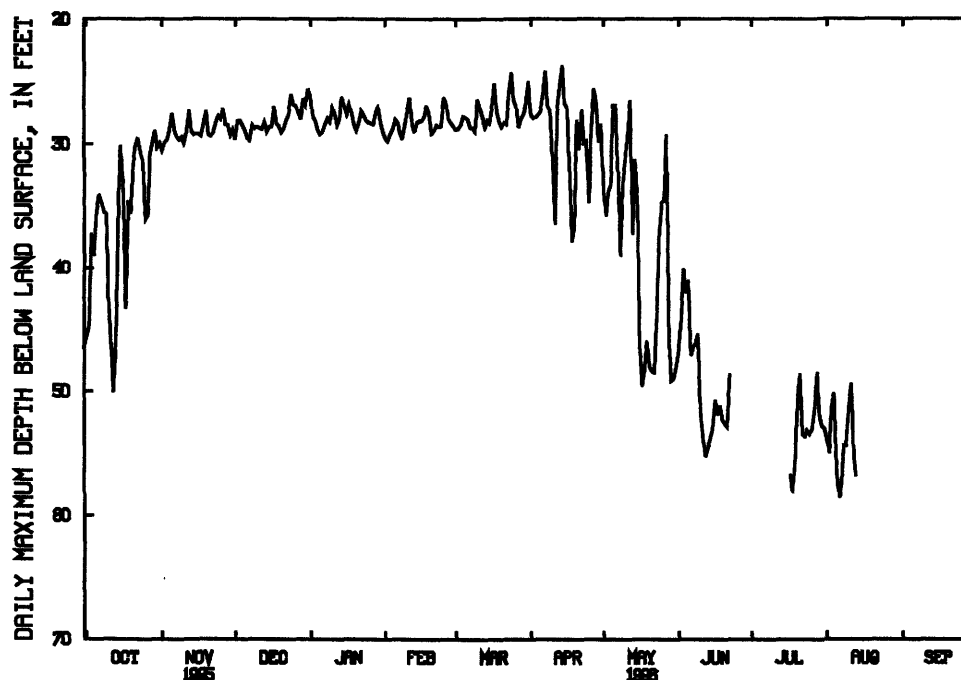
REMARKS.-- Water level affected by pumping of nearby wells (during summer months).

PERIOD OF RECORD.-- December 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.-- Highest water level, 22.80 ft below land-surface datum, Apr. 15, 1996; lowest, 83.28 ft below land-surface datum, Aug. 4, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	35.51	27.49	28.88	29.26	28.01	27.87	27.38	26.87	41.01	--	56.33	--
10	42.82	29.95	28.61	27.08	27.32	26.42	31.04	31.15	51.71	--	51.31	--
15	30.08	29.20	28.62	26.92	28.13	28.29	26.73	34.84	53.08	--	--	--
20	31.99	29.24	29.06	28.90	29.16	28.61	28.04	47.99	52.63	50.95	--	--
25	36.11	27.96	26.84	28.25	26.27	26.49	34.78	34.72	--	53.49	--	--
EOM	29.93	28.82	25.63	29.04	28.56	25.00	28.37	48.05	--	53.00	--	--



445700093051001 29N22W31DDD01

RAMSEY COUNTY -- Continued

450238093082501. Local number, 030N23W35BDC01.

LOCATION.-- Lat 45°02'38", long 93°08'25", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.35, T.30 N., R.23 W., Hydrologic Unit 07010206, southeast corner of Arbogast Street and Richmond Avenue.

Owner: City of Shoreview.

AQUIFER.-- Jordan Sandstone of Late Cambrian Age.

WELL CHARACTERISTICS.-- Drilled unused artesian well, diameter 20 in. to 129 ft, 12 in to 465 ft, total depth 510 ft, cased to 465 ft.

INSTRUMENTATION.-- Digital recorder with 30-minute punch cycle.

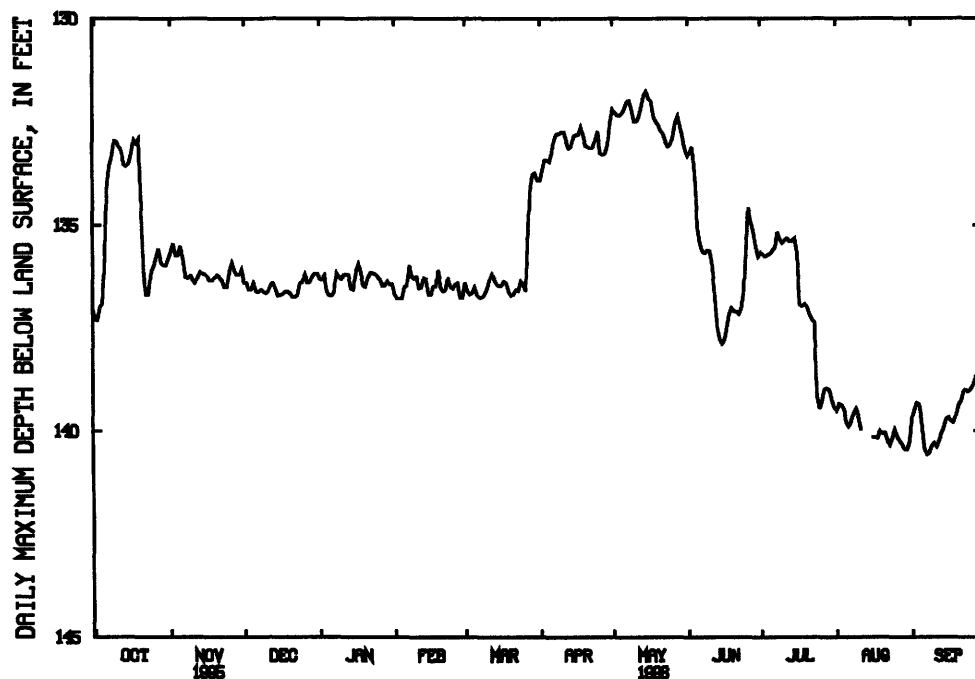
DATUM.-- Land-surface datum is 960 ft above mean sea level. Measuring point: Top of recorder platform, 1.50 ft above land-surface datum.

PERIOD OF RECORD.-- April 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.-- Highest water level, 129.26 ft below land-surface datum, Mar. 1, 1987; lowest, 146.01 ft below land-surface datum, July 28, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	135.82	135.50	136.41	136.70	136.50	136.51	133.46	132.30	135.05	135.69	139.79	139.80
10	132.98	136.32	136.65	136.30	136.24	136.57	132.74	132.48	135.63	135.43	139.66	140.29
15	133.51	136.19	136.71	136.56	136.68	136.47	132.84	131.77	137.87	135.31	--	139.71
20	134.48	136.20	136.65	136.49	136.52	136.70	133.07	132.58	137.09	136.97	140.06	139.37
25	136.00	136.10	136.39	136.26	136.53	136.43	132.73	133.05	135.64	139.46	139.96	138.99
EOM	135.82	136.07	136.17	136.43	136.76	133.91	132.53	133.15	135.76	139.43	140.26	138.62



450238093082501 30N23W35BDC01

SCOTT COUNTY

444427093353902. Local number, 115N23W28BDD02.

LOCATION.-- Lat 44°44'27", long 93°35'39", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.28, T.115 N., R.23 W., Hydrologic Unit 07020012, Merriam J-ction.

Owner: Chicago and Northwestern Transportation Company.

AQUIFER.-- Ironton-Galesville Sandstone of Late Cambrian Age.

WELL CHARACTERISTICS.-- Drilled artesian observation well, diameter 4 in., depth 355 ft, screened 350 to 355 ft.

INSTRUMENTATION.-- Digital recorder with one-hour punch cycle.

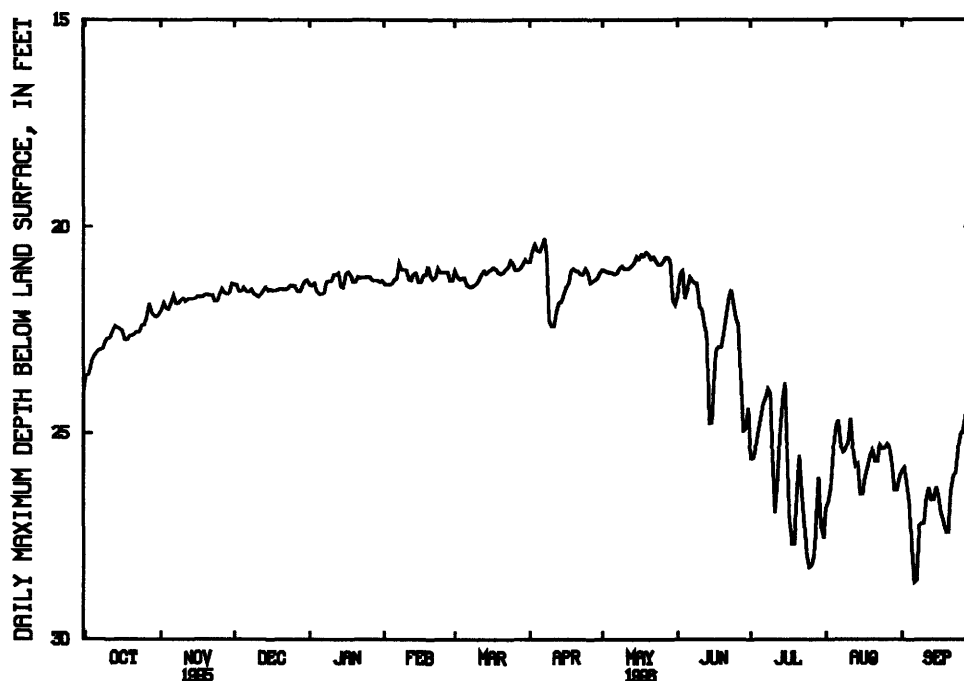
DATUM.-- Land-surface datum is 758 ft above mean sea level. Measuring point: Top of casing, 1.00 ft above land-surface datum.

PERIOD OF RECORD.-- November 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.-- Highest water level, 19.59 ft below land-surface datum, Apr. 8, 1993; lowest, 45.28 ft below land-surface datum, July 29, 1991.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	23.10	21.85	21.47	21.63	21.28	21.24	20.60	21.12	21.53	24.66	24.84	27.85
10	22.71	21.73	21.66	21.32	21.05	21.38	22.42	21.03	21.95	25.61	25.25	27.20
15	22.48	21.74	21.53	21.46	21.34	21.08	21.64	20.73	24.77	23.78	26.50	26.33
20	22.65	21.64	21.49	21.34	21.21	21.14	21.07	20.68	22.58	26.53	25.43	27.43
25	22.38	21.64	21.43	21.23	21.10	20.89	21.13	20.92	22.24	28.28	25.38	25.03
EOM	22.12	21.38	21.29	21.30	21.30	20.86	21.10	21.90	24.39	27.57	26.08	25.07



444427093353902 115N23W28BDD02

SCOTT COUNTY -- Continued

444427093353903. Local number, 115N23W28BDD03.

LOCATION.-- Lat 44°44'27", long 93°35'39", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.28, T.115 N., R.23 W., Hydrologic Unit 07020012, at Merriam Junction

Owner: Chicago and Northwestern Transportation Company.

AQUIFER.-- Mount Simon Sandstone of Late Cambrian Age.

WELL CHARACTERISTICS.-- Drilled artesian observation well, diameter 4 in., depth 525 ft, screened 520 to 525 ft.

INSTRUMENTATION.-- Digital recorder with one-hour punch cycle.

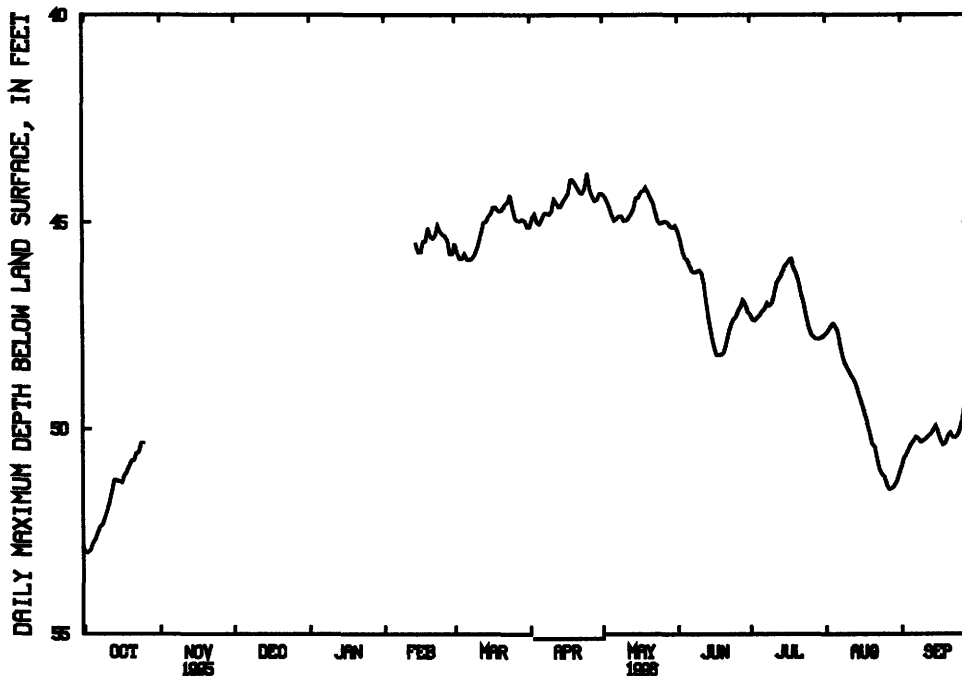
DATUM.-- Land-surface datum is 758 ft above mean sea level. Measuring point: Top of casing, 1.00 ft above land-surface datum.

PERIOD OF RECORD.-- November 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.-- Highest water level, 33.85 ft below land-surface datum, Mar. 8, 1985; lowest, 55.12 ft below land-surface datum, Aug. 1, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	52.68	--	--	--	--	45.78	45.04	44.83	45.91	47.25	47.54	50.38
10	51.98	--	--	--	--	45.69	44.75	44.96	46.17	46.97	48.56	50.29
15	51.28	--	--	--	45.73	44.87	44.49	44.42	47.73	46.11	49.29	49.94
20	50.78	--	--	--	45.35	44.74	44.08	44.27	48.16	46.24	50.38	50.18
25	50.34	--	--	--	45.30	44.65	43.80	45.03	47.31	47.54	51.19	50.00
EOM	--	--	--	--	45.78	45.11	44.31	45.09	47.18	47.76	51.11	49.04



444427093353903 115N23W28BDD03

WATONWAN COUNTY

440037094372601. Local number, 106N32W01DDB01.

LOCATION.-- Lat 44°00'37", long 94°37'26", in NW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.1, T.106 N., R.32 W., Hydrologic Unit 07020010, north of St James.

Owner: U.S. Geological Survey.

AQUIFER.-- Surficial outwash sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.-- Drilled water-table observation well, diameter 2 in., depth 22 ft, screened 19 to 22 ft.

INSTRUMENTATION.-- Monthly measurements by observer.

DATUM.-- Land-surface datum is 1,056.2 ft above mean sea level. Measuring point: Top of casing, 4.80 ft above land-surface datum.

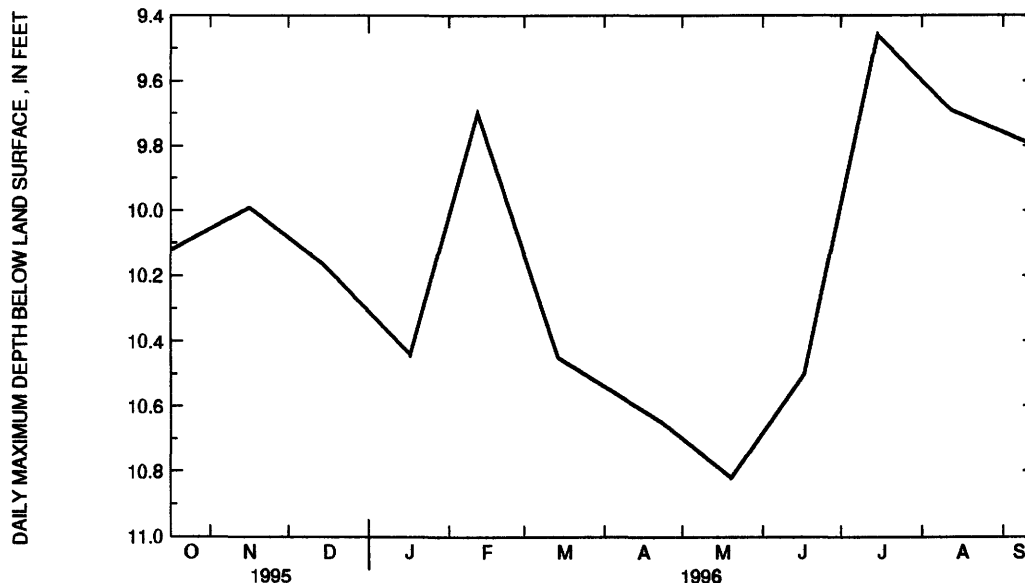
REMARKS.-- Water levels used in monthly National Water Conditions Report.

PERIOD OF RECORD.-- November 1965 to current year.

EXTREMES FOR PERIOD OF RECORD.-- Highest water level, 4.11 ft below land-surface datum, Apr. 27, 1969; lowest, 16.22 ft below land-surface datum, Mar. 7, 1990.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	10.12	JAN 17	10.44	APR 23	10.65	JUL 15	9.46
NOV 16	9.99	FEB 12	9.70	MAY 20	10.82	AUG 12	9.69
DEC 15	10.17	MAR 14	10.45	JUN 17	10.50	SEP 13	9.80



Quality Of Ground Water

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)
ANOKA COUNTY										
450758093061501	08-26-96	0900	484	484	7.6	7.3	10.5	1.7	22.0	740
450835093094301	07-03-96	1100	405	--	7.7	--	11.5	--	--	--
451009093181700	05-16-96	1300	--	--	--	--	--	--	--	--
451009093181701	05-16-96	1400	--	--	--	--	--	--	--	--
451009093181701	06-20-96	1300	597	582	7.5	7.3	9.0	62	26.0	743
451013093185100	05-14-96	1400	--	--	--	--	--	--	--	--
451013093185101	05-14-96	1500	--	--	--	--	--	--	--	--
451013093185101	06-18-96	1500	991	970	7.0	7.0	10.5	15	--	737
451100093181400	05-15-96	1300	--	--	--	--	--	--	--	--
451100093181401	05-15-96	1400	--	--	--	--	--	--	--	--
451100093181401	06-18-96	1100	914	828	6.8	6.6	11.0	44	18.0	737
451100093181401	06-19-96	1100	914	--	6.8	--	9.0	56	23.0	741
451104093212801	05-17-96	1500	--	--	--	--	--	--	--	--
451104093212801	06-19-96	1100	914	588	6.8	6.9	9.0	56	23.0	741
451104093212802	05-17-96	1300	--	--	--	--	--	--	--	--
451104093212803	05-17-96	1400	--	--	--	--	--	--	--	--
451116093183100	05-16-96	0900	--	--	--	--	--	--	--	--
451116093183101	05-16-96	1000	--	--	--	--	--	--	--	--
451116093183101	06-24-96	1000	857	836	6.9	7.0	10.0	60	15.5	743
451150093162601	06-10-96	1300	--	--	--	--	--	--	--	--
451150093162601	06-17-96	1500	150	130	6.6	6.5	10.5	23	--	--
451222093185000	05-20-96	1400	--	--	--	--	--	--	--	--
451222093185001	05-20-96	1500	--	--	--	--	--	--	--	--
451222093185001	06-17-96	1500	150	130	6.6	6.5	--	--	--	--
451222093185001	06-20-96	1000	744	729	7.3	7.2	10.5	240	27.0	742
451236093202000	05-17-96	0900	--	--	--	--	--	--	--	--
451236093202001	05-17-96	1000	--	--	--	--	--	--	--	--
451236093202001	06-19-96	1400	554	549	7.4	7.2	9.5	12	27.0	739
451315093202500	06-10-96	1100	--	--	--	--	--	--	--	--
451315093202501	06-10-96	1200	--	--	--	--	--	--	--	--
451315093202501	06-17-96	1200	487	482	7.3	7.3	14.0	24	19.0	737
451441093271702	03-15-96	1240	384	--	7.5	--	8.5	--	--	--
451651093035001	03-15-96	1620	594	--	7.6	--	5.0	--	--	--
452132093045301	11-08-95	1150	--	--	--	--	--	--	--	--
452132093045302	11-08-95	1100	--	--	--	--	--	--	--	--
452132093045302	11-08-95	1150	--	--	--	--	--	--	--	--
452153093050201	11-08-95	1300	--	--	--	--	--	--	--	--
452155093050503	11-13-95	1030	--	--	--	--	--	--	--	--
452155093050504	11-08-95	1400	--	--	--	--	--	--	--	--
452156093050405	11-13-95	1200	--	--	--	--	--	--	--	--
452156093050406	11-13-95	1100	--	--	--	--	--	--	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	FLOW RATE, INSTAN- TANEOUS (G/M) (00059)	OXYGEN, DIS- SOLVED (MG/L) (00300)	CALCIUM DIS- SOLVED (MG/L) AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L) AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L) AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L) AS K) (00935)	ALKA- LINITY WAT WH TOT IT FIELD MG/L AS CACO3 (00419)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	ALKA- LINITY WAT D'S TOT IT FIELD MG/L AS CACO3 (39086)
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ANOKA COUNTY

450758093061501	08-26-96	0.7	0	55	25	5.7	2.6	--	257	250
450835093094301	07-03-96	--	0.1	--	--	--	--	--	--	--
451009093181701	06-20-96	0.8	2.6	86	16	8.6	1.8	203	209	206
451013093185101	06-18-96	1.2	0.2	130	31	34	2.7	364	388	366
451100093181401	06-18-96	--	4.1	110	27	25	2.7	297	255	300
451100093181401	06-19-96	1.2	1.8	--	--	--	--	--	--	222
451104093212801	06-19-96	1.2	1.8	68	24	7.2	1.7	229	233	222
451116093183101	06-24-96	0.8	0.7	140	17	9.7	1.7	232	227	233
451150093162601	06-17-96	1.0	3.8	15	3.6	3.8	0.40	18	20	18
451222093185001	06-17-96	--	--	15	3.6	3.8	0.40	--	20	18
451222093185001	06-20-96	0.5	6.1	110	23	8.9	1.3	267	265	256
451236093202001	06-19-96	1.4	6.8	81	20	4.4	0.70	255	262	256
451315093202501	06-17-96	1.0	7.5	65	15	3.6	1.3	192	199	196
451441093271702	03-15-96	--	2.2	--	--	--	--	--	--	--
451651093035001	03-15-96	--	1.3	--	--	--	--	--	--	--

STATION NUMBER	DATE	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	BROMIDE DIS- SOLVED (MG/L AS BR) (71870)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (0063C)
450758093061501	08-26-96	7.5	1.4	0.20	0.030	19	260	--	--	--
450835093094301	07-03-96	33	11	0.12	0.023	--	--	0.024	0.041	--
451009093181701	06-20-96	80	10	0.10	0.010	24	356	0.050	1.55	1.60
451013093185101	06-18-96	90	46	<0.10	0.010	18	598	<0.010	--	--
451100093181401	06-18-96	75	69	0.40	0.15	33	572	<0.010	--	--
451104093212801	06-19-96	29	21	0.10	0.020	22	342	<0.010	--	4.60
451116093183101	06-24-96	170	27	<0.10	0.020	28	574	<0.010	--	0.740
451150093162601	06-17-96	10	5.1	0.20	<0.010	21	116	<0.010	--	5.30
451222093185001	06-17-96	10	5.1	0.20	<0.010	21	116	--	--	--
451222093185001	06-20-96	61	8.5	<0.10	0.030	26	456	<0.010	--	16.0
451236093202001	06-19-96	23	4.3	<0.10	0.030	24	324	<0.010	--	2.70
451315093202501	06-17-96	8.6	17	<0.10	0.030	22	288	<0.010	--	4.80
451441093271702	03-15-96	--	2.8	--	--	--	--	<0.010	--	0.540
451651093035001	03-15-96	--	8.2	--	--	--	--	0.030	12.0	12.0
452132093045301	11-08-95	--	3.2	--	--	--	--	0.030	0.030	0.060
452132093045302	11-08-95	--	4.9	--	--	--	--	0.960	8.34	9.30
452153093050201	11-08-95	--	190	--	--	--	--	0.020	0.540	0.560
452155093050503	11-13-95	--	5.8	--	--	--	--	<0.010	--	0.080
452155093050504	11-08-95	--	45	--	--	--	--	<0.010	--	--
452156093050405	11-13-95	--	27	--	--	--	--	2.70	0.300	3.00
452156093050406	11-13-95	--	53	--	--	--	--	0.020	--	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	NITRO- GEN, NO ₂ +NO ₃ DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)
ANOKA COUNTY									
450758093061501	08-26-96	--	--	--	--	--	4.0	<1	81
450835093094301	07-03-96	--	--	--	--	0.170	--	--	--
451009093181701	06-20-96	1.60	0.020	0.40	0.050	0.030	5.0	1	87
451013093185101	06-18-96	<0.050	0.080	0.50	0.040	0.010	4.0	<1	72
451100093181401	06-18-96	<0.050	0.690	1.2	1.50	0.010	7.0	340	68
451104093212801	06-19-96	4.60	0.020	<0.20	<0.010	0.020	4.0	<1	61
451116093183101	06-24-96	0.740	1.60	1.9	<0.010	0.020	6.0	2	235
451150093162601	06-17-96	5.30	0.030	0.40	<0.010	<0.010	91	<1	53
451222093185001	06-17-96	--	--	--	--	--	91	<1	53
451222093185001	06-20-96	16.0	0.030	<0.20	0.020	0.020	6.0	<1	67
451236093202001	06-19-96	2.70	0.020	<0.20	<0.010	0.020	4.0	<1	54
451315093202501	06-17-96	4.80	0.030	<0.20	0.020	0.020	6.0	<1	38
451441093271702	03-15-96	0.540	<0.015	<0.20	0.030	0.010	--	--	--
451651093035001	03-15-96	12.0	0.020	0.30	0.050	0.030	--	--	--
452132093045301	11-08-95	0.060	<0.015	0.30	<0.010	<0.010	--	--	--
452132093045302	11-08-95	9.30	<0.015	<0.20	<0.010	0.010	--	--	--
452153093050201	11-08-95	0.560	0.040	<0.20	0.020	0.040	--	--	--
452155093050503	11-13-95	0.080	1.80	2.1	<0.010	<0.010	--	--	--
452155093050504	11-08-95	<0.050	0.050	0.30	<0.010	<0.010	--	--	--
452156093050405	11-13-95	3.00	14.0	21	<0.010	<0.010	--	--	--
452156093050406	11-13-95	<0.050	0.900	2.1	<0.010	<0.010	--	--	--
STATION NUMBER	DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)
450758093061501	08-26-96	<1.0	--	<1.0	3.0	<1.0	<1.0	190	<1.0
451009093181701	06-20-96	<1.0	--	<1.0	4.0	1.0	<1.0	40	<1.0
451013093185101	06-18-96	<1.0	--	<1.0	12	4.0	7.0	51	<1.0
451100093181401	06-18-96	<1.0	--	<1.0	7.0	<1.0	1.0	26000	<1.0
451104093212801	06-19-96	<1.0	--	<1.0	9.0	2.0	4.0	9.0	<1.0
451116093183101	06-24-96	<1.0	--	<1.0	7.0	3.0	2.0	1800	<1.0
451150093162601	06-17-96	<1.0	--	<1.0	3.0	1.0	6.0	39	<1.0
451222093185001	06-17-96	<1.0	--	<1.0	3.0	1.0	6.0	39	<1.0
451222093185001	06-20-96	<1.0	--	<1.0	9.0	<1.0	<1.0	24	<1.0
451236093202001	06-19-96	<1.0	--	<1.0	7.0	<1.0	<1.0	26	<1.0
451315093202501	06-17-96	<1.0	--	<1.0	9.0	<1.0	1.0	3.0	<1.0
451441093271702	03-15-96	--	30	--	--	--	--	--	--
451651093035001	03-15-96	--	40	--	--	--	--	--	--
452132093045301	11-08-95	--	20	--	--	--	--	--	--
452132093045302	11-08-95	--	<10	--	--	--	--	--	--
452132093045302	11-08-95	--	--	--	--	--	--	--	--
452153093050201	11-08-95	--	10	--	--	--	--	--	--
452155093050503	11-13-95	--	50	--	--	--	--	--	--
452155093050504	11-08-95	--	<10	--	--	--	--	--	--
452156093050405	11-13-95	--	220	--	--	--	--	--	--
452156093050406	11-13-95	--	20	--	--	--	--	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	ANTI- MONY, DIS- SOLVED (UG/L AS SB) (01095)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)
ANOKA COUNTY									
450758093061501	08-26-96	201	1.0	2.0	<1.0	6.0	<1.0	<1	0.60
451009093181701	06-20-96	397	2.0	12	<1.0	2.0	<1.0	2	1.1
451013093185101	06-18-96	2400	1.0	21	<1.0	10	1.0	<1	7.6
451100093181401	06-18-96	1470	6.0	6.0	<1.0	5.0	<1.0	<1	11
451104093212801	06-19-96	4.0	<1.0	8.0	<1.0	2.0	<1.0	<1	3.0
451116093183101	06-24-96	422	<1.0	12	<1.0	4.0	<1.0	<1	5.1
451150093162601	06-17-96	41	<1.0	8.0	<1.0	52	<1.0	2	7.0
451222093185001	06-17-96	41	<1.0	8.0	<1.0	52	<1.0	2	--
451222093185001	06-20-96	109	<1.0	8.0	<1.0	1.0	<1.0	<1	1.2
451236093202001	06-19-96	22	1.0	4.0	<1.0	2.0	<1.0	<1	1.0
451315093202501	06-17-96	<1.0	<1.0	2.0	<1.0	7.0	<1.0	<1	1.1
451441093271702	03-15-96	--	--	--	--	--	--	--	0.70
451651093035001	03-15-96	--	--	--	--	--	--	--	3.4
452132093045301	11-08-95	--	--	--	--	--	--	--	2.8
452132093045302	11-08-95	--	--	--	--	--	--	--	E0.80
452153093050201	11-08-95	--	--	--	--	--	--	--	1.2
452155093050503	11-13-95	--	--	--	--	--	--	--	E4.2
452155093050504	11-08-95	--	--	--	--	--	--	--	E7.8
452156093050405	11-13-95	--	--	--	--	--	--	--	E3.6
452156093050406	11-13-95	--	--	--	--	--	--	--	E19

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN DIS- SOLVED (MG/L) (00300)
BELTRAMI COUNTY										
473021094551201	07-30-96	1400	397	--	7.2	--	9.5	--	--	1.1
BENTON COUNTY										
453551094104701	07-18-96	1100	569	--	7.2	--	10.5	--	--	3.0
BLUE EARTH COUNTY										
434657093372301	11-21-95	1300	445	--	7.6	--	0.5	4.0	738	13.6
434657093372301	04-23-96	1130	--	--	--	--	--	--	--	--
434657093372301	06-07-96	0820	--	582	--	7.7	--	--	--	--
434704093325301	11-21-95	1200	710	--	7.6	--	1.5	8.0	737	14.5
434704093325301	04-23-96	1050	--	--	--	--	--	--	--	--
434704093325301	06-07-96	0730	--	712	--	7.7	--	--	--	--
435144093381501	11-21-95	1430	764	--	7.8	--	2.5	--	--	14.4
435144093381501	04-23-96	1240	--	--	--	--	--	--	--	--
435144093381501	06-07-96	0915	--	--	--	--	--	--	--	--
435211093492901	11-21-95	1530	700	--	7.8	--	0.5	--	--	13.4
435211093492901	02-13-96	1630	--	--	--	--	--	--	--	--
435211093492901	04-23-96	1330	--	--	--	--	--	--	--	--
435211093492901	06-07-96	1010	--	668	--	7.9	--	--	--	--
435659093494101	11-21-95	1630	851	--	7.6	--	0.0	--	--	14.5
435659093494101	04-23-96	1400	--	--	--	--	--	--	--	--
435659093494101	06-07-96	1045	--	768	--	7.7	--	--	--	--
435749093554801	11-21-95	1730	884	--	8.7	--	1.0	--	--	--
435749093554801	04-23-96	1500	--	--	--	--	--	--	--	--
435749093554801	06-07-96	1130	--	837	--	7.7	--	--	--	--
440052093580501	04-26-96	1615	1070	--	7.0	--	7.0	--	--	1.8
440053093580501	04-26-96	1630	924	--	7.0	--	7.0	--	--	0.9
440054093580501	04-26-96	1700	864	--	6.9	--	6.5	--	--	3.5
440055093580501	04-26-96	1715	859	--	6.9	--	7.0	--	--	2.8
440057093575601	04-26-96	1530	1520	--	6.8	--	4.0	--	--	0.1
440058093575701	04-26-96	1500	1490	--	6.8	--	7.0	--	--	0.8

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	SULFATE	CHLO-	FLUO-	BROMIDE	NITRO-	NITRO-	NITRO-	NITRO-
		DIS-	RIDE,	RIDE,	DIS-	GEN,	GEN,	GEN,	GEN,
		(MG/L	DIS-	DIS-	(MG/L	NITRITE	NITRATE	NO2+NO3	NO2+NO3
		AS SO4)	AS CL)	AS F)	AS BR)	DIS-	DIS-	NO2+NO3	DIS-
		(00945)	(00940)	(00950)	(71870)	(MG/L	(MG/L	(MG/L	(MG/L
		AS N)	AS N)	AS N)	AS N)	AS N)	AS N)	AS N)	AS N)
		(00613)	(00618)	(00630)	(00631)				
BELTRAMI COUNTY									
473021094551201	07-30-96	9.8	2.1	0.15	<0.015	<0.005	0.576	--	--
BENTON COUNTY									
453551094104701	07-18-96	24	35	<0.27	0.036	<0.005	1.83	--	--
BLUE EARTH COUNTY									
435211093492901	02-13-96	--	1.5	--	--	0.010	0.610	0.620	0.620
440052093580501	04-26-96	--	11	--	--	<0.010	--	0.160	0.160
440053093580501	04-26-96	--	4.0	--	--	0.040	3.36	3.40	3.40
440054093580501	04-26-96	--	2.5	--	--	<0.010	--	8.50	8.50
440055093580501	04-26-96	--	2.5	--	--	<0.010	--	7.70	7.70
440057093575601	04-26-96	--	3.5	--	--	<0.010	--	0.190	0.190
440058093575701	04-26-96	--	3.0	--	--	<0.010	--	1.20	1.20
STATION NUMBER	DATE	NITRO-	NITRO-	NITRO-	PHOS-	PHOS-	PHOS-	BORON,	CARBON,
		GEN,	GEN,AM-	GEN,AM-	PHOS-	PHORUS	PHORUS	DIS-	ORGANIC
		AMMONIA	DIS-	DIS-	PHOS-	DIS-	DIS-	SOLVED	TOTAL
		SOLVED	ORGANIC	ORGANIC	TOTAL	TOTAL	TOTAL	SOLVED	AS C)
		(MG/L	(MG/L	(MG/L	(MG/L	(MG/L	(MG/L	(UG/L	(MG/L
		AS N)	AS N)	AS N)	AS P)	AS P)	AS P)	AS B)	AS C)
		(00608)	(00625)	(00623)	(00665)	(00666)	(00671)	(01020)	(00680)
BELTRAMI COUNTY									
473021094551201	07-30-96	--	--	--	--	--	<0.020	--	--
BENTON COUNTY									
453551094104701	07-18-96	--	--	--	--	--	<0.020	--	--
BLUE EARTH COUNTY									
434657093372301	04-23-96	--	--	--	--	--	--	20	--
434657093372301	06-07-96	--	--	--	--	--	--	32	23
434704093325301	04-23-96	--	--	--	--	--	--	30	12
434704093325301	06-07-96	--	--	--	--	--	--	32	5.8
435144093381501	04-23-96	--	--	--	--	--	--	40	18
435211093492901	02-13-96	0.740	0.80	0.80	0.030	<0.010	0.030	<10	--
435211093492901	04-23-96	--	--	--	--	--	--	40	12
435211093492901	06-07-96	--	--	--	--	--	--	47	18
435659093494101	04-23-96	--	--	--	--	--	--	60	20
435659093494101	06-07-96	--	--	--	--	--	--	65	14
435749093554801	04-23-96	--	--	--	--	--	--	70	53
435749093554801	06-07-96	--	--	--	--	--	--	71	4.3
440052093580501	04-26-96	0.040	--	0.30	--	<0.010	<0.010	100	2.5
440053093580501	04-26-96	<0.015	--	<0.20	--	<0.010	0.010	80	3.0
440054093580501	04-26-96	<0.015	--	0.20	--	0.020	0.020	70	2.3
440055093580501	04-26-96	<0.015	--	0.20	--	0.030	0.040	70	8.4
440057093575601	04-26-96	0.170	--	0.20	--	<0.010	<0.010	100	1.9
440058093575701	04-26-96	0.120	--	0.20	--	<0.010	<0.010	70	2.2

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	FARO- METRIC PRES- SURE (MM OF HG) (00025)
BLUE EARTH COUNTY									
440059093575801	04-26-96	1430	1080	--	6.8	--	7.0	--	--
440100093575901	04-26-96	1400	912	--	6.9	--	6.5	--	--
440106093564901	09-06-96	0955	589	--	6.8	--	16.5	--	--
440106093564902	09-06-96	0950	1200	--	6.5	--	15.5	--	--
440106093564903	09-06-96	1000	1010	--	6.7	--	11.5	--	--
440106093565001	09-06-96	0910	566	--	6.8	--	15.5	--	--
440106093565003	09-06-96	0915	1060	--	6.5	--	14.5	--	--
440106093565004	09-06-96	0905	1320	--	6.6	--	17.0	--	--
440106093565101	09-06-96	0835	768	--	6.6	--	15.5	--	--
440106093565102	09-06-96	0828	1020	--	6.5	--	14.5	--	--
440106093565103	09-06-96	0845	1610	--	6.4	--	14.0	--	--
440106093565203	09-06-96	0755	1210	--	6.4	--	14.5	--	--
440108093574901	11-22-95	0950	775	--	7.5	--	2.5	4.0	734
440108093574901	02-13-96	1800	--	--	--	--	--	--	--
440108093574901	04-23-96	1550	--	--	--	--	--	--	--
440108093574901	06-07-96	1200	--	761	--	7.8	--	--	--
440109093550201	11-22-95	1410	704	--	8.1	--	8.0	7.0	733
440109093550201	04-24-96	1000	--	--	--	--	--	--	--
440109093550201	06-07-96	1515	--	870	--	7.4	--	--	--
440110093550201	11-22-95	1430	865	--	7.3	--	8.5	6.0	734
440110093550201	04-24-96	1020	--	--	--	--	--	--	--
440110093550201	06-07-96	1530	--	1120	--	7.4	--	--	--
440110093564901	09-06-96	1035	500	--	6.8	--	17.5	--	--
440110093564902	09-06-96	1030	608	--	6.8	--	16.0	--	--
440110093564903	09-06-96	1040	1150	--	6.6	--	16.5	--	--
440110093565001	09-06-96	1110	587	--	6.8	--	18.0	--	--
440110093565002	09-06-96	1105	--	--	--	--	--	--	--
440110093565003	09-06-96	1115	--	--	1	--	15.5	6.5	--
440110093565101	09-06-96	1145	680	--	6.7	--	16.0	--	--
440110093565102	09-06-96	1140	--	--	1.3	--	15.5	6.5	--
440110093565103	09-06-96	1150	1180	--	6.6	--	18.0	--	--
440110093565202	09-06-96	1210	--	--	--	--	--	--	--
440110093565203	09-06-96	1220	--	--	--	--	17.0	6.5	--
440118093561001	11-22-95	1020	736	--	7.7	--	8.0	4.0	734
440118093561001	04-23-96	1630	--	--	--	--	--	--	--
440118093561001	06-07-96	1645	--	743	--	7.5	--	--	--
440121093561601	11-22-95	1220	713	--	7.9	--	7.5	--	--
440121093561601	04-24-96	0830	--	--	--	--	--	--	--
440121093561601	06-07-96	1330	--	738	--	7.6	--	--	--
440122093561101	11-22-95	1310	704	--	8.1	--	8.0	7.0	733
440122093561101	04-24-96	0920	--	--	--	--	--	--	--
440122093561101	06-07-96	1445	--	719	--	7.9	--	--	--
440131093562801	11-22-95	1150	672	--	8.1	--	8.0	--	--
440131093562801	04-24-96	0850	--	--	--	--	--	--	--
440131093562801	06-07-96	1245	--	757	--	7.3	--	--	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	OXYGEN, DIS- SOLVED (MG/L) (00300)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)
BLUE EARTH COUNTY								
440059093575801	04-26-96	0.3	3.8	<0.010	--	1.30	1.30	0.030
440100093575901	04-26-96	0.1	2.7	<0.010	--	0.060	0.060	0.340
440106093564901	09-06-96	0.9	--	<0.010	--	0.360	0.360	0.160
440106093564902	09-06-96	1.0	--	<0.010	--	0.060	0.060	0.360
440106093564903	09-06-96	1.2	--	<0.010	--	0.110	0.110	1.10
440106093565001	09-06-96	--	--	0.050	0.530	0.580	0.580	0.240
440106093565003	09-06-96	0.6	--	<0.010	--	0.050	0.050	0.250
440106093565004	09-06-96	--	--	<0.010	--	0.090	0.090	0.270
440106093565101	09-06-96	--	--	<0.010	--	0.150	0.150	0.030
440106093565102	09-06-96	1.6	--	<0.010	--	0.070	0.070	0.030
440106093565103	09-06-96	1.7	--	<0.010	--	0.060	0.060	0.200
440106093565203	09-06-96	1.9	--	<0.010	--	0.120	0.120	0.030
440108093574901	11-22-95	13.4	--	--	--	--	--	--
440108093574901	02-13-96	--	0.40	0.010	0.630	0.640	0.640	0.380
440109093550201	11-22-95	13.9	--	--	--	--	--	--
440110093550201	11-22-95	10.0	--	--	--	--	--	--
440110093564901	09-06-96	108	--	<0.010	--	0.160	0.160	0.130
440110093564902	09-06-96	1.3	--	<0.010	--	0.080	0.080	0.150
440110093564903	09-06-96	2.2	--	<0.010	--	0.090	0.090	0.580
440110093565001	09-06-96	2.1	--	<0.010	--	0.060	0.060	0.160
440110093565002	09-06-96	--	--	0.010	0.100	0.110	0.110	0.070
440110093565003	09-06-96	--	--	<0.010	--	0.070	0.070	0.310
440110093565101	09-06-96	0.9	--	<0.010	--	0.050	0.050	1.10
440110093565102	09-06-96	--	--	<0.010	--	0.060	0.060	0.060
440110093565103	09-06-96	--	--	<0.010	--	0.080	0.080	0.510
440110093565202	09-06-96	--	--	<0.010	--	14.0	14.0	0.020
440110093565203	09-06-96	--	--	0.420	2.08	2.50	2.50	0.020
440118093561001	11-22-95	7.2	--	--	--	--	--	--
440121093561601	11-22-95	10.7	--	--	--	--	--	--
440122093561101	11-22-95	13.9	--	--	--	--	--	--
440131093562801	11-22-95	10.6	--	--	--	--	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
		BLUE EARTH COUNTY						
440059093575801	04-26-96	--	<0.20	--	<0.010	<0.010	80	2.3
440100093575901	04-26-96	--	0.40	--	<0.010	<0.010	150	1.3
440106093564901	09-06-96	--	0.50	--	0.120	0.160	--	--
440106093564902	09-06-96	--	0.80	--	0.050	0.050	--	--
440106093564903	09-06-96	--	1.3	--	0.040	0.060	--	--
440106093565001	09-06-96	--	1.0	--	0.300	0.340	--	--
440106093565003	09-06-96	--	0.60	--	0.040	0.060	--	--
440106093565004	09-06-96	--	0.60	--	<0.010	0.020	--	--
440106093565101	09-06-96	--	0.70	--	0.320	0.350	--	--
440106093565102	09-06-96	--	0.50	--	0.070	0.080	--	--
440106093565103	09-06-96	--	0.50	--	0.070	0.070	--	--
440106093565203	09-06-96	--	0.50	--	0.070	0.080	--	--
440108093574901	02-13-96	0.70	0.50	0.030	0.080	0.030	<10	--
440108093574901	04-23-96	--	--	--	--	--	50	9.8
440108093574901	06-07-96	--	--	--	--	--	45	6.8
440109093550201	04-24-96	--	--	--	--	--	50	13
440109093550201	06-07-96	--	--	--	--	--	67	11
440110093550201	04-24-96	--	--	--	--	--	80	8.7
440110093550201	06-07-96	--	--	--	--	--	117	13
440110093564901	09-06-96	--	0.70	--	0.270	0.320	--	--
440110093564902	09-06-96	--	0.70	--	0.060	0.100	--	--
440110093564903	09-06-96	--	1.0	--	0.050	0.040	--	--
440110093565001	09-06-96	--	0.70	--	0.030	0.040	--	--
440110093565002	09-06-96	--	0.60	--	0.100	0.110	--	--
440110093565003	09-06-96	--	1.0	--	<0.010	0.020	--	--
440110093565101	09-06-96	--	1.6	--	0.350	0.320	--	--
440110093565102	09-06-96	--	0.50	--	0.080	0.090	--	--
440110093565103	09-06-96	--	0.90	--	0.040	0.050	--	--
440110093565202	09-06-96	--	0.40	--	0.120	0.160	--	--
440110093565203	09-06-96	--	0.40	--	0.090	0.110	--	--
440118093561001	04-23-96	--	--	--	--	--	30	2.7
440118093561001	06-07-96	--	--	--	--	--	39	5.5
440121093561601	11-22-95	--	--	--	--	--	--	--
440121093561601	04-24-96	--	--	--	--	--	60	2.2
440121093561601	06-07-96	--	--	--	--	--	64	5.4
440122093561101	11-22-95	--	--	--	--	--	--	--
440122093561101	04-24-96	--	--	--	--	--	30	5.8
440122093561101	06-07-96	--	--	--	--	--	38	8.6
440131093562801	11-22-95	--	--	--	--	--	--	--
440131093562801	04-24-96	--	--	--	--	--	30	6.3
440131093562801	06-07-96	--	--	--	--	--	44	8.9

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)
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BLUE EARTH COUNTY

440133093562701	11-22-95	1120	713	--	7.8	--	7.5	--	5.0	733
440133093562701	04-24-96	0900	--	--	--	--	--	--	--	--
440133093562701	06-07-96	1345	--	746	--	7.4	--	--	--	--
440252094000101	11-22-95	0830	733	--	7.7	--	0.0	--	4.0	736
440252094000101	04-23-96	1710	--	--	--	--	--	--	--	--
440252094000101	06-07-96	1745	--	661	--	8.2	--	--	--	--

DAKOTA COUNTY

443042092570401	08-15-96	1100	570	569	7.4	7.3	12.5	5.4	22.0	746
443119093050101	08-08-96	1000	566	560	7.4	7.3	14.0	1.5	24.0	747
443641093110701	09-04-96	1000	527	524	7.4	7.3	12.5	1.9	26.0	739
443645092525501	08-12-96	1300	519	513	7.4	7.4	17.0	3.5	30.0	740
443645092525501	08-20-96	1100	519	--	7.4	--	13.0	2.8	25.0	744
443808093012801	09-03-96	1300	459	456	7.6	7.5	13.5	1.6	32.0	740
443934092565601	08-12-96	1000	459	458	7.7	7.4	15.5	1.1	25.0	743
443934092565601	08-20-96	1000	461	--	7.7	--	12.0	3.0	24.0	748
444211092544601	08-14-96	1200	442	441	7.5	7.4	12.5	3.0	26.0	743
444214092490401	08-26-96	1200	349	346	7.9	7.5	13.0	1.5	25.0	743
444331093080801	08-19-96	1400	522	520	7.5	7.4	12.0	1.0	26.0	740
445108093054801	08-06-96	1000	555	554	7.7	7.6	16.0	5.1	30.0	740
445117093042701	08-13-96	1200	556	556	7.5	7.5	15.0	2.0	29.0	738

DOUGLAS COUNTY

455349095220501	08-27-96	1000	868	--	7.0	--	11.0	--	--	--
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GOODHUE COUNTY

442140092521101	08-27-96	1000	548	539	7.3	7.2	15.5	1.1	25.0	736
442733092532401	08-22-96	1100	632	631	7.6	7.3	13.0	1.3	22.0	737
443112092513901	08-29-96	1000	571	562	7.5	7.3	13.0	1.8	23.0	746
443650092375601	08-15-96	1200	575	574	7.6	7.5	18.0	--	25.5	749
443656092373901	08-15-96	1430	548	547	7.2	7.3	26.0	--	25.0	750
443658092381201	08-15-96	1600	816	815	6.8	6.9	15.5	--	26.5	749
443722092390201	08-14-96	1700	384	388	8.0	7.8	13.0	--	25.0	746
443744092384401	08-15-96	1800	230	242	8.0	7.6	13.0	--	31.0	750
443744092391701	08-14-96	1130	540	540	7.7	7.5	14.5	--	20.0	746
443745092381301	08-15-96	0930	322	338	7.8	7.7	12.0	--	20.0	748

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	FLOW RATE, INSTAN- TANEOUS (G/M) (00059)	OXYGEN, DIS- SOLVED (MG/L) (00300)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	ALKA- LITY LAB (MG/L AS CACO3) (90410)
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BLUE EARTH COUNTY

440133093562701	11-22-95	--	11.2	--	--	--	--	--	--	--
440252094000101	11-22-95	--	14.3	--	--	--	--	--	--	--

DAKOTA COUNTY

443042092570401	08-15-96	1.3	0	72	26	3.7	1.2	--	--	239
443119093050101	08-08-96	0.3	0	76	26	4.1	1.4	--	--	280
443641093110701	09-04-96	0.6	2.2	71	25	4.2	1.3	--	--	268
443645092525501	08-12-96	0.4	0.2	61	29	2.9	0.80	--	--	265
443645092525501	08-20-96	0.5	0	--	--	--	--	--	--	--
443808093012801	09-03-96	0.6	0.1	55	24	2.7	1.1	--	--	233
443934092565601	08-12-96	0.3	4.0	53	22	3.2	0.80	--	--	179
443934092565601	08-20-96	1.0	4.5	--	--	--	--	--	--	--
444211092544601	08-14-96	0.5	0	55	21	3.7	2.2	--	--	220
444214092490401	08-26-96	0.5	7.1	43	16	1.9	0.90	--	--	148
444331093080801	08-19-96	1.0	0	69	24	3.1	2.0	--	--	255
445108093054801	08-06-96	0.3	0	62	32	6.0	1.9	--	--	295
445117093042701	08-13-96	0.3	0	65	29	4.9	1.7	--	--	287

DOUGLAS COUNTY

455349095220501	08-27-96	--	0.7	--	--	--	--	--	--	--
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GOODHUE COUNTY

442140092521101	08-27-96	0.6	0	76	22	3.2	1.5	--	--	277
442733092532401	08-22-96	0.3	1.2	79	33	2.2	1.1	--	--	312
443112092513901	08-29-96	0.5	0	77	28	2.1	1.3	--	--	272
443650092375601	08-15-96	0.5	<0.1	67	21	19	3.1	268	0	232
443656092373901	08-15-96	0.4	0.2	64	24	13	3.5	246	0	213
443658092381201	08-15-96	0.3	3.9	130	24	3.8	1.0	498	0	434
443722092390201	08-14-96	0.6	8.7	48	16	3.5	0.60	181	0	158
443744092384401	08-15-96	0.4	11.6	28	7.9	7.4	0.50	133	0	116
443744092391701	08-14-96	0.4	9.5	63	22	8.9	1.0	201	0	183
443745092381301	08-15-96	0.5	<0.1	39	11	10	2.5	173	0	144

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	BROMIDE DIS- SOLVED (MG/L AS BR) (71870)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)
DAKOTA COUNTY										
443042092570401	08-15-96	234	56	8.2	0.10	0.040	11	340	0.010	0.470
443119093050101	08-08-96	270	28	2.6	0.10	0.040	14	321	<0.010	--
443641093110701	09-04-96	278	8.7	0.40	0.20	0.050	16	289	<0.010	--
443645092525501	08-12-96	256	21	1.5	0.20	0.030	12	289	<0.010	--
443808093012801	09-03-96	232	18	0.20	0.20	0.060	12	388	<0.010	--
443934092565601	08-12-96	173	17	11	0.10	0.060	14	257	0.010	7.80
444211092544601	08-14-96	216	19	0.70	0.20	0.070	13	211	0.010	--
444214092490401	08-26-96	142	13	3.2	<0.10	0.040	15	190	<0.010	--
444331093080801	08-19-96	246	28	2.3	0.10	0.060	19	260	0.010	17.0
445108093054801	08-06-96	293	7.2	1.8	0.30	0.050	15	292	<0.010	--
445117093042701	08-13-96	247	17	3.3	0.20	0.050	18	308	0.010	--
DOUGLAS COUNTY										
455349095220501	08-27-96	--	9.1	92	0.09	0.096	--	--	<0.005	<0.005
GOODHUE COUNTY										
442140092521101	08-27-96	267	22	0.20	0.20	0.040	9.5	230	<0.010	--
442733092532401	08-22-96	269	41	3.4	0.20	0.070	13	374	<0.010	--
443112092513901	08-29-96	278	27	0.50	0.20	0.090	13	318	<0.010	--
443650092375601	08-15-96	220	47	23	0.20	0.030	20	349	0.010	0.000
443656092373901	08-15-96	202	57	16	0.20	<0.010	28	255	0.010	0.270
443658092381201	08-15-96	408	23	5.8	0.10	0.050	25	444	0.020	2.18
443722092390201	08-14-96	148	21	6.6	<0.10	0.030	20	234	0.010	4.90
443744092384401	08-15-96	109	5.4	3.3	<0.10	0.010	16	142	0.010	0.800
443744092391701	08-14-96	165	14	51	<0.10	0.060	18	313	0.010	2.40
443745092381301	08-15-96	142	23	5.6	0.30	<0.010	12	197	0.010	0.870

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMM. DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)
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DAKOTA COUNTY

443042092570401	08-15-96	0.480	0.480	0.030	<0.20	<0.010	0.010	4.0	<1	21
443119093050101	08-08-96	0.070	0.070	0.090	<0.20	<0.010	0.010	3.0	<1	61
443641093110701	09-04-96	0.080	0.080	0.040	<0.20	0.010	<0.010	3.0	<1	161
443645092525501	08-12-96	0.060	0.060	0.020	<0.20	<0.010	0.010	3.0	<1	10
443808093012801	09-03-96	0.070	0.070	0.020	<0.20	<0.010	<0.010	3.0	<1	21
443934092565601	08-12-96	7.90	7.90	0.020	<0.20	0.020	0.030	3.0	<1	24
444211092544601	08-14-96	--	<0.050	0.110	<0.20	<0.010	0.010	3.0	<1	62
444214092490401	08-26-96	4.70	4.70	<0.015	<0.20	0.050	0.050	5.0	<1	20
444331093080801	08-19-96	17.0	17.0	0.030	<0.20	0.030	0.060	4.0	<1	217
445108093054801	08-06-96	0.050	0.050	0.710	0.80	<0.010	0.020	3.0	2	139
445117093042701	08-13-96	--	<0.050	0.190	0.20	0.020	0.020	4.0	<1	110

DOUGLAS COUNTY

455349095220501	08-27-96	--	--	--	--	--	<0.020	--	--	--
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GOODHUE COUNTY

442140092521101	08-27-96	--	<0.050	0.120	<0.20	0.020	<0.010	3.0	<1	63
442733092532401	08-22-96	--	<0.050	0.030	<0.20	<0.010	<0.010	3.0	<1	19
443112092513901	08-29-96	--	<0.050	0.020	<0.20	<0.010	<0.010	5.0	<1	32
443650092375601	08-15-96	0.070	0.070	0.030	<0.20	0.030	0.030	--	--	--
443656092373901	08-15-96	0.280	0.280	0.160	0.30	0.250	0.270	--	--	--
443658092381201	08-15-96	2.20	2.20	0.030	<0.20	0.020	0.040	--	--	--
443722092390201	08-14-96	5.00	5.00	0.020	<0.20	0.020	0.030	--	--	--
443744092384401	08-15-96	0.870	0.870	0.020	<0.20	0.030	0.040	--	--	--
443744092391701	08-14-96	2.50	2.50	0.030	<0.20	0.020	0.030	--	--	--
443745092381301	08-15-96	0.880	0.880	0.020	<0.20	0.020	0.030	--	--	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)
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BLUE EARTH COUNTY

440133093562701	04-24-96	--	40	--	--	--	--	--	--	--
440133093562701	06-07-96	--	55	--	--	--	--	--	--	--
440252094000101	04-23-96	--	40	--	--	--	--	--	--	--
440252094000101	06-07-96	--	56	--	--	--	--	--	--	--

DAKOTA COUNTY

443042092570401	08-15-96	<1.0	--	<1.0	4.0	4.0	2.0	41	<1.0	13
443119093050101	08-08-96	<1.0	--	<1.0	4.0	<1.0	<1.0	1100	<1.0	86
443641093110701	09-04-96	<1.0	--	<1.0	2.0	<1.0	<1.0	440	<1.0	256
443645092525501	08-12-96	<1.0	--	<1.0	5.0	<1.0	<1.0	170	<1.0	10
443808093012801	09-03-96	<1.0	--	<1.0	2.0	<1.0	<1.0	920	<1.0	34
443934092565601	08-12-96	<1.0	--	<1.0	3.0	<1.0	10	<3.0	<1.0	1.0
444211092544601	08-14-96	<1.0	--	<1.0	4.0	<1.0	<1.0	830	<1.0	62
444214092490401	08-26-96	<1.0	--	<1.0	4.0	<1.0	3.0	<3.0	<1.0	<1.0
444331093080801	08-19-96	<1.0	--	<1.0	5.0	<1.0	<1.0	280	<1.0	331
445108093054801	08-06-96	<1.0	--	<1.0	5.0	<1.0	<1.0	1500	<1.0	191
445117093042701	08-13-96	<1.0	--	<1.0	3.0	<1.0	<1.0	260	<1.0	200

GOODHUE COUNTY

442140092521101	08-27-96	<1.0	--	<1.0	3.0	<1.0	<1.0	940	<1.0	30
442733092532401	08-22-96	<1.0	--	<1.0	7.0	<1.0	<1.0	3800	<1.0	61
443112092513901	08-29-96	<1.0	--	<1.0	3.0	<1.0	<1.0	3500	<1.0	56
443650092375601	08-15-96	--	--	--	--	--	--	3.0	--	160
443656092373901	08-15-96	--	--	--	--	--	--	<3.0	--	2000
443658092381201	08-15-96	--	--	--	--	--	--	14	--	70
443722092390201	08-14-96	--	--	--	--	--	--	5.0	--	<1.0
443744092384401	08-15-96	--	--	--	--	--	--	<3.0	--	<1.0
443744092391701	08-14-96	--	--	--	--	--	--	5.0	--	<1.0
443745092381301	08-15-96	--	--	--	--	--	--	<3.0	--	49

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	ANTI- MONY, DIS- SOLVED (UG/L AS SB) (01095)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)
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BLUE EARTH COUNTY

440133093562701	04-24-96	--	--	--	--	--	--	6.7	--
440133093562701	06-07-96	--	--	--	--	--	--	2.6	--
440252094000101	04-23-96	--	--	--	--	--	--	12	--
440252094000101	06-07-96	--	--	--	--	--	--	12	--

DAKOTA COUNTY

443042092570401	08-15-96	8.0	22	<1.0	290	<1.0	<1	--	0.60
443119093050101	08-08-96	<1.0	3.0	<1.0	147	<1.0	<1	--	0.60
443641093110701	09-04-96	1.0	3.0	<1.0	13	<1.0	<1	--	0.40
443645092525501	08-12-96	3.0	3.0	<1.0	75	<1.0	<1	--	0.40
443808093012801	09-03-96	1.0	3.0	<1.0	93	<1.0	<1	--	0.20
443934092565601	08-12-96	1.0	2.0	<1.0	210	<1.0	<1	--	0.40
444211092544601	08-14-96	2.0	2.0	<1.0	113	<1.0	<1	--	0.20
444214092490401	08-26-96	<1.0	2.0	<1.0	61	<1.0	<1	--	0.20
444331093080801	08-19-96	1.0	3.0	<1.0	12	<1.0	<1	--	0.70
445108093054801	08-06-96	4.0	2.0	<1.0	108	<1.0	<1	--	1.2
445117093042701	08-13-96	2.0	3.0	<1.0	85	<1.0	<1	--	0.40

GOODHUE COUNTY

442140092521101	08-27-96	<1.0	3.0	<1.0	7.0	<1.0	<1	--	0.60
442733092532401	08-22-96	1.0	3.0	<1.0	8.0	<1.0	<1	--	0.40
443112092513901	08-29-96	1.0	2.0	<1.0	40	<1.0	<1	--	0.40

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)
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GOODHUE COUNTY

443745092390201	08-15-96	1720	676	689	7.5	7.5	15.0	--	29.5	748
443746092383001	08-14-96	1320	297	303	8.0	7.7	15.0	--	24.5	747
443756092390901	08-13-96	1800	460	459	7.0	7.5	17.0	--	30.0	745
443808092384401	08-13-96	1700	522	520	5.9	6.3	15.5	--	31.0	745
443814092393901	08-14-96	0850	343	346	7.0	7.0	17.0	--	18.0	746
443814092395301	08-14-96	1030	567	564	7.0	6.9	15.5	--	29.5	745
443814092395302	08-14-96	1530	462	464	7.8	7.6	13.0	--	23.0	746
443830092390701	08-13-96	1400	374	377	7.2	7.5	17.0	--	34.0	748
443834092390301	08-13-96	1530	555	559	6.9	7.3	16.0	--	30.0	745
443839092394901	08-13-96	1100	439	440	7.1	7.4	15.0	--	29.0	756

HENNEPIN COUNTY

444854093242501	09-03-96	1000	592	586	7.7	7.6	15.5	1.8	25.0	740
445018093290901	08-01-96	1400	634	626	7.4	7.4	15.0	12	29.0	741
445625093223603	04-22-96	1100	852	812	7.3	7.2	11.5	--	7.0	740
450104093294601	09-12-96	1000	703	688	7.4	7.2	10.5	0.75	18.0	743
450122093193801	07-09-96	1100	2450	2100	6.8	6.8	14.5	88	23.0	745
450126093180901	07-09-96	0900	1230	1200	7.0	6.9	10.5	25	22.0	744
450226093203901	07-08-96	1400	878	866	7.2	7.3	17.5	38	25.0	739
450236093175801	07-08-96	0900	1250	1210	7.5	7.5	9.5	30	23.0	436
450305093172501	07-09-96	1400	959	950	7.6	7.6	16.0	730	24.0	745
450305093172501	07-25-96	1100	986	--	7.7	--	19.5	580	23.0	744
450326093175201	07-03-96	0900	1160	1150	7.3	7.4	11.5	4.7	24.0	744
450327093193501	07-08-96	1100	563	502	6.7	6.4	11.5	22	21.0	736
450328093232001	07-03-96	1200	558	543	7.5	7.6	13.0	15	29.0	744
450333093201701	07-02-96	1300	514	514	7.3	7.6	14.0	14	26.0	743

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	FLOW RATE, INSTAN- TANEOUS (G/M) (00059)	OXYGEN, DIS- SOLVED (MG/L) (00300)	CALCIUM DIS- SOLVED (MG/L) AS CA (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L) AS MG (00925)	SODIUM, DIS- SOLVED (MG/L) AS NA (00930)	POTAS- SIUM, DIS- SOLVED (MG/L) AS K (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	ALKA- LITY WAT WH TOT IT FIELD MG/L AS CACO3 (00419)
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GOODHUE COUNTY

443745092390201	08-15-96	0.3	<0.1	42	18	69	3.9	223	0	--
443746092383001	08-14-96	0.4	10.4	38	11	2.2	0.50	117	0	--
443756092390901	08-13-96	0.3	6.1	59	20	4.5	0.40	201	0	--
443808092384401	08-13-96	0.5	1.8	58	22	5.2	2.1	127	0	--
443814092393901	08-14-96	0.3	6.5	42	15	3.1	0.80	149	0	--
443814092395301	08-14-96	0.4	7.4	41	13	42	8.7	90	0	--
443814092395302	08-14-96	0.6	1.2	60	21	3.5	1.1	228	0	--
443830092390701	08-13-96	0.2	6.1	47	18	4.0	0.50	185	0	--
443834092390301	08-13-96	0.4	<0.1	65	25	12	2.4	272	0	--
443839092394901	08-13-96	0.4	4.0	55	20	5.4	0.80	224	0	--

HENNEPIN COUNTY

444854093242501	09-03-96	0.5	0.2	--	--	--	--	--	--	--
445018093290901	08-01-96	0.4	5.4	86	29	2.3	2.0	--	--	--
445625093223603	04-22-96	--	0.4	80	30	45	4.0	376	0	--
450104093294601	09-12-96	1.0	0.3	90	33	11	2.2	--	--	--
450122093193801	07-09-96	0.2	0.5	200	16	230	4.9	--	--	459
450126093180901	07-09-96	0.8	1.9	170	61	12	1.7	--	--	539
450226093203901	07-08-96	0.2	5.4	91	29	46	2.7	--	--	271
450236093175801	07-08-96	0.5	0.2	70	21	140	3.1	--	--	238
450305093172501	07-09-96	0.2	1.5	120	38	27	5.7	--	--	--
450305093172501	07-25-96	--	3.9	--	--	--	--	--	--	228
450326093175201	07-03-96	0.5	0.4	110	28	85	4.4	--	--	292
450327093193501	07-08-96	0.8	0.1	43	7.7	32	5.1	--	--	94
450328093232001	07-03-96	0.5	2.0	66	15	23	1.7	--	--	168
450333093201701	07-02-96	0.7	0.7	61	16	18	2.6	--	--	171

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	BROMIDE DIS- SOLVED (MG/L AS BR) (71870)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRITE ³ DIS- SOLVED (MG/L AS N) (00613)
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GOODHUE COUNTY

443745092390201	08-15-96	193	183	23	88	0.30	0.38	9.7	368	0.010
443746092383001	08-14-96	103	96	8.4	8.1	<0.10	<0.010	19	197	0.010
443756092390901	08-13-96	200	165	15	5.8	<0.10	0.040	18	273	0.010
443808092384401	08-13-96	117	104	41	53	<0.10	0.75	14	346	0.010
443814092393901	08-14-96	130	122	33	11	<0.10	0.020	10	203	0.010
443814092395301	08-14-96	78	74	42	32	<0.10	0.050	19	373	0.010
443814092395302	08-14-96	203	187	32	9.0	<0.10	0.050	21	279	0.010
443830092390701	08-13-96	174	152	25	2.8	<0.10	0.020	11	214	0.010
443834092390301	08-13-96	252	223	34	12	0.20	0.010	16	329	0.010
443839092394901	08-13-96	208	184	17	5.0	0.10	0.020	14	252	0.010

HENNEPIN COUNTY

444854093242501	09-03-96	--	319	--	--	--	--	--	--	<0.010
445018093290901	08-01-96	267	240	30	9.8	0.20	0.070	26	367	<0.010
445625093223603	04-22-96	319	308	9.6	76	0.20	0.050	15	448	0.010
450104093294601	09-12-96	390	342	<0.10	0.50	0.20	0.050	24	391	<0.010
450122093193801	07-09-96	450	463	72	370	0.20	0.11	38	1250	<0.010
450126093180901	07-09-96	417	539	98	29	0.20	0.14	35	778	0.010
450226093203901	07-08-96	277	266	27	91	0.20	0.070	26	484	<0.010
450236093175801	07-08-96	241	242	69	190	0.20	0.040	14	682	<0.010
450305093172501	07-09-96	215	226	170	69	0.20	0.090	29	628	<0.010
450305093172501	07-25-96	--	216	--	--	--	--	--	--	--
450326093175201	07-03-96	292	292	90	130	0.10	0.060	20	670	0.020
450327093193501	07-08-96	70	90	9.5	110	<0.10	0.18	17	352	0.010
450328093232001	07-03-96	173	167	17	50	0.20	0.040	21	317	<0.010
450333093201701	07-02-96	177	166	17	29	0.40	<0.010	23	312	0.030

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMM. DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)
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GOODHUE COUNTY

443745092390201	08-15-96	0.060	0.070	0.070	0.200	<0.20	<0.010	0.020	--	--
443746092383001	08-14-96	8.09	8.10	8.10	0.020	<0.20	0.040	0.080	--	--
443756092390901	08-13-96	6.89	6.90	6.90	0.020	<0.20	<0.010	0.020	--	--
443808092384401	08-13-96	5.89	5.90	5.90	0.020	<0.20	0.020	0.030	--	--
443814092393901	08-14-96	0.150	0.160	0.160	0.020	<0.20	0.030	0.030	--	--
443814092395301	08-14-96	30.0	30.0	30.0	0.020	<0.20	0.040	0.040	--	--
443814092395302	08-14-96	1.69	1.70	1.70	0.020	<0.20	0.040	0.030	--	--
443830092390701	08-13-96	0.340	0.350	0.350	0.020	<0.20	<0.010	0.010	--	--
443834092390301	08-13-96	0.040	0.050	0.050	0.220	0.30	<0.010	0.020	--	--
443839092394901	08-13-96	2.29	2.30	2.30	0.020	<0.20	<0.010	0.010	--	--

HENNEPIN COUNTY

444854093242501	09-03-96	--	0.080	0.080	0.360	0.40	0.070	0.020	3.0	7
445018093290901	08-01-96	--	6.70	6.70	0.050	<0.20	<0.010	0.020	3.0	<1
445625093223603	04-22-96	0.250	0.260	0.260	0.110	0.30	<0.010	<0.010	4.0	<1
450104093294601	09-12-96	--	0.060	0.060	0.970	0.90	0.100	0.040	3.0	8
450122093193801	07-09-96	--	--	<0.050	1.60	2.0	0.080	0.040	5.0	<1
450126093180901	07-09-96	1.39	1.40	1.40	0.030	<0.20	<0.010	0.030	4.0	<1
450226093203901	07-08-96	--	4.80	4.80	0.040	<0.20	0.050	0.050	4.0	<1
450236093175801	07-08-96	--	0.060	0.060	0.270	0.40	0.020	0.030	6.0	1
450305093172501	07-09-96	--	--	<0.050	0.770	1.2	<0.010	0.030	6.0	8
450326093175201	07-03-96	1.48	1.50	1.50	0.080	<0.20	<0.010	<0.010	4.0	1
450327093193501	07-08-96	--	--	<0.050	0.950	1.3	0.470	0.500	44	3
450328093232001	07-03-96	--	3.60	3.60	0.020	<0.20	0.050	0.060	6.0	<1
450333093201701	07-02-96	5.37	5.40	5.40	0.030	0.40	0.070	0.090	5.0	6

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)
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GOODHUE COUNTY

443745092390201	08-15-96	--	--	--	--	--	--	370	--
443746092383001	08-14-96	--	--	--	--	--	--	<3.0	--
443756092390901	08-13-96	--	--	--	--	--	--	6.0	--
443808092384401	08-13-96	--	--	--	--	--	--	8.0	--
443814092393901	08-14-96	--	--	--	--	--	--	5.0	--
443814092395301	08-14-96	--	--	--	--	--	--	15	--
443814092395302	08-14-96	--	--	--	--	--	--	4.0	--
443830092390701	08-13-96	--	--	--	--	--	--	4.0	--
443834092390301	08-13-96	--	--	--	--	--	--	51	--
443839092394901	08-13-96	--	--	--	--	--	--	3.0	--

HENNEPIN COUNTY

444854093242501	09-03-96	237	<1.0	<1.0	2.0	<1.0	<1.0	--	<1.0
445018093290901	08-01-96	128	<1.0	<1.0	3.0	<1.0	5.0	5.0	<1.0
445625093223603	04-22-96	106	<1.0	<1.0	5.0	<1.0	<1.0	1100	<1.0
450104093294601	09-12-96	151	<1.0	<1.0	3.0	<1.0	2.0	3400	<1.0
450122093193801	07-09-96	194	<1.0	<1.0	17	<1.0	<1.0	2600	<1.0
450126093180901	07-09-96	96	<1.0	<1.0	4.0	<1.0	2.0	5.0	<1.0
450226093203901	07-08-96	61	<1.0	<1.0	6.0	<1.0	<1.0	36	<1.0
450236093175801	07-08-96	139	<1.0	<1.0	9.0	<1.0	<1.0	1100	<1.0
450305093172501	07-09-96	95	<1.0	<1.0	<1.0	<1.0	1.0	310	<1.0
450326093175201	07-03-96	90	<1.0	<1.0	4.0	1.0	2.0	660	<1.0
450327093193501	07-08-96	104	<1.0	<1.0	5.0	2.0	1.0	15000	<1.0
450328093232001	07-03-96	44	<1.0	<1.0	9.0	<1.0	<1.0	60	<1.0
450333093201701	07-02-96	118	<1.0	<1.0	3.0	2.0	7.0	22	<1.0

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	ANTI- MONY, DIS- SOLVED (UG/L AS SB) (01095)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)
GOODHUE COUNTY									
443745092390201	08-15-96	57	--	--	--	--	--	--	--
443746092383001	08-14-96	<1.0	--	--	--	--	--	--	--
443756092390901	08-13-96	1.0	--	--	--	--	--	--	--
443808092384401	08-13-96	5.0	--	--	--	--	--	--	--
443814092393901	08-14-96	<1.0	--	--	--	--	--	--	--
443814092395301	08-14-96	1.0	--	--	--	--	--	--	--
443814092395302	08-14-96	1.0	--	--	--	--	--	--	--
443830092390701	08-13-96	<1.0	--	--	--	--	--	--	--
443834092390301	08-13-96	1600	--	--	--	--	--	--	--
443839092394901	08-13-96	<1.0	--	--	--	--	--	--	--
HENNEPIN COUNTY									
444854093242501	09-03-96	179	4.0	3.0	<1.0	6.0	<1.0	<1	0.90
445018093290901	08-01-96	<1.0	2.0	2.0	<1.0	11	<1.0	2	0.70
445625093223603	04-22-96	817	1.0	3.0	<1.0	1.0	<1.0	<1	3.4
450104093294601	09-12-96	108	<1.0	2.0	<1.0	139	<1.0	<1	1.4
450122093193801	07-09-96	711	2.0	5.0	--	5.0	<1.0	<1	8.6
450126093180901	07-09-96	63	<1.0	6.0	<1.0	7.0	<1.0	1	4.0
450226093203901	07-08-96	8.0	2.0	10	<1.0	6.0	<1.0	1	1.1
450236093175801	07-08-96	412	2.0	3.0	<1.0	4.0	<1.0	<1	3.9
450305093172501	07-09-96	405	5.0	5.0	<1.0	13	<1.0	<1	2.2
450326093175201	07-03-96	1050	2.0	7.0	<1.0	3.0	<1.0	<1	2.2
450327093193501	07-08-96	778	1.0	3.0	--	6.0	<1.0	<1	7.6
450328093232001	07-03-96	5.0	2.0	9.0	<1.0	8.0	<1.0	<1	1.2
450333093201701	07-02-96	723	2.0	11	<1.0	6.0	<1.0	<1	5.2

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	FLOW RATE, INSTAN- TANEOUS (G/M) (00059)
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HENNEPIN COUNTY

450430093220801	06-03-96	1000	--	--	--	--	--	--	--	--	--
450430093220801	07-02-96	1000	779	776	7.1	7.4	13.5	--	22.0	743	0.3
450448093205300	05-24-96	0900	--	--	--	--	--	--	--	--	--
450448093205301	05-24-96	1000	--	--	--	--	--	--	--	--	--
450448093205301	06-27-96	0900	1250	1210	7.1	7.1	12.5	27	28.0	746	0.3
450456093193201	06-06-96	1000	--	--	--	--	--	--	--	--	--
450456093193201	07-02-96	1500	533	544	7.5	7.7	13.5	28	26.0	743	0.7
450516093195900	06-03-96	1400	--	--	--	--	--	--	--	--	--
450516093195901	06-03-96	1500	--	--	--	--	--	--	--	--	--
450516093195901	06-26-96	0900	1060	1050	7.3	7.3	11.5	13	26.0	744	0.5
450516093281001	08-27-96	1300	754	768	7.9	7.3	11.0	0.30	22.0	744	1.5
450518093172500	05-22-96	1400	--	--	--	--	--	--	--	--	--
450518093172501	05-22-96	1500	--	--	--	--	--	--	--	--	--
450518093172501	06-26-96	1400	1030	1090	7.5	7.5	16.0	630	--	--	--
450524093223200	05-23-96	1000	--	--	--	--	--	--	--	--	--
450524093223201	05-23-96	1100	--	--	--	--	--	--	--	--	--
450524093223201	07-10-96	0900	943	918	7.0	7.1	11.5	--	23.0	747	0.3
450542093182300	06-04-96	1000	--	--	--	--	--	--	--	--	--
450542093182301	06-04-96	1100	--	--	--	--	--	--	--	--	--
450542093182301	06-27-96	1200	789	766	6.9	6.9	14.0	--	31.0	746	0.5
450557093201800	06-07-96	0900	--	--	--	--	--	--	--	--	--
450557093201801	06-07-96	1000	--	--	--	--	--	--	--	--	--
450557093201801	06-25-96	1000	1090	1070	7.1	7.2	13.5	18	24.0	745	0.8
450611093183100	05-23-96	1400	--	--	--	--	--	--	--	--	--
450611093183101	05-23-96	1500	--	--	--	--	--	--	--	--	--
450611093183101	06-26-96	1200	1450	1420	7.1	7.1	9.5	79	28.0	746	0.8
450624093220500	05-21-96	0800	--	--	--	--	--	--	--	--	--
450624093220501	05-21-96	0900	--	--	--	--	--	--	--	--	--
450624093220501	06-25-96	1200	1440	1410	7.4	7.4	14.0	20	27.0	745	0.5
450702093185100	05-21-96	1200	--	--	--	--	--	--	--	--	--
450702093185101	05-21-96	1300	--	--	--	--	--	--	--	--	--
450702093185101	06-24-96	1300	856	881	7.9	7.8	18.5	42	21.0	742	--
450704093210400	05-21-96	1500	--	--	--	--	--	--	--	--	--
450704093210401	05-21-96	1600	--	--	--	--	--	--	--	--	--
450704093210401	06-25-96	1500	1200	1170	7.2	7.4	13.0	46	30.0	746	0.5

HUBBARD COUNTY

46552709503550107-31-961000	383	--	7.6	--	9.0	--	--	--	--	--	--
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QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	BROMIDE DIS- SOLVED (MG/L AS BR) (71870)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMM. DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA+ ORGANIC DIS. (MG/L AS N) (00623)
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HENNEPIN COUNTY

450430093220801	07-02-96	<0.10	0.050	29	456	<0.010	--	1.80	1.80	0.020	0.40
450448093205301	06-27-96	0.20	0.050	21	728	0.040	4.86	4.90	4.90	0.040	0.30
450456093193201	07-02-96	0.20	<0.010	15	321	0.070	0.640	0.710	0.710	0.050	0.50
450516093195901	06-26-96	<0.10	0.070	24	612	0.020	1.68	1.70	1.70	0.020	<0.20
450516093281001	08-27-96	0.20	0.10	24	192	<0.010	--	--	<0.050	0.550	0.60
450518093172501	06-26-96	0.10	0.10	26	744	<0.010	--	--	<0.050	0.120	0.20
450524093223201	07-10-96	0.20	0.090	28	570	0.010	9.39	9.40	9.40	1.40	1.8
450542093182301	06-27-96	0.40	0.010	19	440	0.010	1.09	1.10	1.10	0.520	0.70
450557093201801	06-25-96	0.10	0.040	23	632	0.020	1.98	2.00	2.00	0.040	<0.20
450611093183101	06-26-96	0.20	0.010	25	1130	0.010	--	--	<0.050	0.310	<0.20
450624093220501	06-25-96	<0.10	0.050	38	1070	<0.010	--	--	<0.050	0.210	<0.20
450702093185101	06-24-96	0.20	0.13	17	600	<0.010	--	--	<0.050	0.160	0.20
450704093210401	06-25-96	<0.10	0.030	14	852	0.020	0.450	0.470	0.470	0.070	<0.20

HUBBARD COUNTY

465527095035501	07-31-96	0.11	<0.015	--	--	<0.005	4.23	--	--	--	--
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QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	IRON, DIS- SOLVED	LEAD, DIS- SOLVED	MANGA- NESE, DIS- SOLVED	MOLYB- DENUM, DIS- SOLVED	NICKEL, DIS- SOLVED	SILVER, DIS- SOLVED	ZINC, DIS- SOLVED	ANTI- MONY, DIS- SOLVED	SELE- NIUM DIS- SOLVED	CARBON, ORG. DIS- SOLVED
		(UG/L AS FE) (01046)	(UG/L AS PB) (01049)	(UG/L AS MN) (01056)	(UG/L AS MO) (01060)	(UG/L AS NI) (01065)	(UG/L AS AG) (01075)	(UG/L AS ZN) (01090)	(UG/L AS SB) (01095)	(UG/L AS SE) (01145)	(MG/L AS C) (00621)
HENNEPIN COUNTY											
450430093220801	07-02-96	47	<1.0	8.0	3.0	17	<1.0	4.0	<1.0	<1	1.9
450448093205301	06-27-96	54	<1.0	1240	2.0	19	<1.0	6.0	2.0	<1	5.2
450456093193201	07-02-96	66	<1.0	525	2.0	12	<1.0	29	<1.0	<1	9.0
450516093195901	06-26-96	87	<1.0	298	2.0	9.0	<1.0	2.0	<1.0	1	1.7
450516093281001	08-27-96	530	<1.0	1040	4.0	4.0	<1.0	13	<1.0	<1	1.2
450518093172501	06-26-96	1700	<1.0	468	2.0	7.0	<1.0	10	<1.0	<1	9.6
450524093223201	07-10-96	38	<1.0	165	1.0	13	<1.0	2.0	<1.0	2	4.2
450542093182301	06-27-96	2300	<1.0	877	6.0	14	<1.0	4.0	<1.0	<1	4.1
450557093201801	06-25-96	73	<1.0	814	2.0	9.0	<1.0	2.0	<1.0	<1	1.7
450611093183101	06-26-96	5700	<1.0	2660	3.0	8.0	<1.0	5.0	<1.0	<1	5.5
450624093220501	06-25-96	3400	<1.0	1230	3.0	9.0	<1.0	44	<1.0	<1	2.0
450702093185101	06-24-96	230	<1.0	587	18	14	<1.0	13	<1.0	<1	2.8
450704093210401	06-25-96	42	<1.0	2520	3.0	13	<1.0	7.0	<1.0	<1	1.8

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN DIS- SOLVED (MG/L) (00300)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
MORRISON COUNTY										
454943094173201	08-26-96	1500	431	--	7.7	--	11.0	--	0.7	--
NICOLLET COUNTY										
442034093572201	07-15-96	1400	661	--	7.1	--	13.0	--	8.9	--
442524094325201	05-14-96	1530	1890	1820	6.6	7.0	--	--	--	--
442524094325201	06-04-96	1100	1900	1860	6.8	6.8	--	--	--	--
442524094325201	07-31-96	1200	--	2120	--	6.9	--	--	--	--
NOBLES COUNTY										
434422095364201	08-29-96	1300	648	--	7.5	--	9.5	--	0.5	--
POPE COUNTY										
453726095314801	08-27-96	1430	743	--	7.1	--	11.0	--	0.5	--
453916095222601	08-27-96	1200	771	--	7.1	--	10.0	--	6.0	--
RAMSEY COUNTY										
450129093002401	08-01-96	1130	388	--	7.3	--	10.5	--	0.1	--
REDWOOD COUNTY										
441428095073601	11-08-95	1134	2340	--	6.9	--	10.0	--	2.1	9
441428095073601	04-17-96	1040	--	--	--	--	--	--	--	--
441428095073601	05-15-96	1200	2430	--	7.3	--	5.0	--	1.6	--
441428095073601	07-24-96	0800	2140	--	6.7	--	11.0	735	2.3	--
441428095073701	07-24-96	1025	1500	--	7.6	--	14.5	735	1.8	--
441430095073705	11-08-95	0835	--	--	--	--	--	--	--	--
441430095073705	04-17-96	1200	--	--	--	--	--	--	--	--
441430095073705	05-15-96	1010	2530	--	7.4	--	7.5	--	0.4	--
441430095073705	07-24-96	1000	2620	--	6.6	--	12.0	735	0.5	--
441431095073705	11-08-95	1017	2810	--	6.7	--	9.5	--	0.9	9
441431095073705	04-17-96	1130	--	--	--	--	--	--	--	--
441431095073705	05-15-96	1100	2880	--	7.2	--	12.5	--	1.5	--
441431095073705	07-24-96	0940	2790	--	6.5	--	9.5	735	0.3	--
441432095073601	11-08-95	1206	1640	--	7.2	--	10.5	--	2.1	K8
441432095073601	04-17-96	1230	--	--	--	--	--	--	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	CALCIUM	MAGNE-	SODIUM,	POTAS-	BICAR-	CAR-	ALKA-	ALKA-	SULFATE
		DIS- SOLVED (MG/L AS CA) (00915)	SOLIUM, DIS- SOLVED (MG/L AS MG) (00925)	DIS- SOLVED (MG/L AS NA) (00930)	SIUM, DIS- SOLVED (MG/L AS K) (00935)	BONATE WATER DIS IT FIELD MG/L AS HCO ₃ (00453)	BONATE WATER DIS IT FIELD MG/L AS CO ₃ (00452)	LINITY LAB (MG/L AS CACO ₃) (90410)	LINITY WAT DIS TOT IT FIELD MG/L AS CACO ₃ (39086)	DIS- SOLVED (MG/L AS SO ₄) (00945)

MORRISON COUNTY

[illegible]

NICOLLET COUNTY

442034093572201	07-15-96	--	--	--	--	--	--	--	37
442524094325201	05-14-96	180	75	71	48	--	--	698	160
442524094325201	06-04-96	190	80	79	49	--	--	667	170
442524094325201	07-31-96	220	92	90	59	--	--	736	240

NOBLES COUNTY

434422095364201	08-29-96	--	--	--	--	--	--	--	78
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POPE COUNTY

453726095314801	08-27-96	--	--	--	--	--	--	--	85
453916095222601	08-27-96	--	--	--	--	--	--	--	55

RAMSEY COUNTY

450129093002401	08-01-96	53	20	3.5	1.6	216	0	--	177	8.7
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REDWOOD COUNTY

441428095073601	11-08-95	--	--	--	--	--	--	430
441428095073601	04-17-96	--	--	--	--	--	--	220
441428095073601	05-15-96	--	--	--	--	--	--	430
441428095073601	07-24-96	--	--	--	--	--	--	370
441428095073701	07-24-96	--	--	--	--	--	--	170
441430095073705	11-08-95	--	--	--	--	--	--	450
441430095073705	04-17-96	--	--	--	--	--	--	190
441430095073705	05-15-96	--	--	--	--	--	--	470
441430095073705	07-24-96	--	--	--	--	--	--	490
441431095073705	11-08-95	--	--	--	--	--	--	600
441431095073705	04-17-96	--	--	--	--	--	--	330
441431095073705	05-15-96	--	--	--	--	--	--	590
441431095073705	07-24-96	--	--	--	--	--	--	500
441432095073601	11-08-95	--	--	--	--	--	--	390
441432095073601	04-17-96	--	--	--	--	--	--	400

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	NITRO- CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	NITRO- FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	NITRO- SILICA, BROMIDE DIS- SOLVED (MG/L AS BR) (71870)	GEN, DIS- SOLVED (MG/L AS SIO2) (00955)	GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- NITRATE DIS- SOLVED (MG/L AS N) (00618)	GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)
MORRISON COUNTY									
454943094173201	08-26-96	11	0.38	0.012	--	<0.005	0.760	--	--
NICOLLET COUNTY									
442034093572201	07-15-96	22	0.15	0.062	--	<0.005	9.70	--	--
442524094325201	05-14-96	130	0.40	--	--	3.70	8.30	12.0	12.0
442524094325201	06-04-96	120	0.40	--	--	0.020	9.98	10.0	10.0
442524094325201	07-31-96	140	0.50	--	--	--	--	--	--
NOBLES COUNTY									
434422095364201	08-29-96	21	0.49	0.038	--	<0.005	0.950	--	--
POPE COUNTY									
453726095314801	08-27-96	19	0.14	0.031	--	<0.005	<0.005	--	--
453916095222601	08-27-96	44	0.51	0.047	--	<0.005	4.36	--	--
RAMSEY COUNTY									
450129093002401	08-01-96	1.8	0.20	<0.015	17	<0.005	<0.005	--	--
REDWOOD COUNTY									
441428095073601	11-08-95	300	--	--	--	<0.010	--	--	<0.050
441428095073601	04-17-96	170	--	--	--	<0.010	--	0.140	0.140
441428095073601	05-15-96	300	--	--	--	<0.010	--	0.110	0.110
441428095073601	07-24-96	240	--	--	--	0.010	0.050	0.060	0.060
441428095073701	07-24-96	200	--	--	--	0.010	0.070	0.080	0.080
441430095073705	11-08-95	300	--	--	--	0.020	--	--	<0.050
441430095073705	04-17-96	130	--	--	--	0.020	0.110	0.130	0.130
441430095073705	05-15-96	290	--	--	--	<0.010	--	0.100	0.100
441430095073705	07-24-96	300	--	--	--	0.010	0.050	0.060	0.060
441431095073705	11-08-95	330	--	--	--	<0.010	--	--	<0.050
441431095073705	04-17-96	190	--	--	--	<0.010	--	0.130	0.130
441431095073705	05-15-96	350	--	--	--	<0.010	--	0.100	0.100
441431095073705	07-24-96	330	--	--	--	0.010	0.050	0.060	0.060
441432095073601	11-08-95	180	--	--	--	<0.010	--	0.060	0.060
441432095073601	04-17-96	190	--	--	--	<0.010	--	0.170	0.170

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
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MORRISON COUNTY

454943094173201	08-26-96	--	--	--	0.210	--	--	--	--
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NICOLLET COUNTY

442034093572201	07-15-96	--	--	--	<0.020	--	--	--	--
442524094325201	05-14-96	6.80	12	2.20	1.60	--	--	--	--
442524094325201	06-04-96	5.60	7.8	1.10	1.10	--	--	--	--
442524094325201	07-31-96	--	--	--	--	--	--	--	--

NOBLES COUNTY

434422095364201	08-29-96	--	--	--	<0.020	--	--	--	--
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POPE COUNTY

453726095314801	08-27-96	--	--	--	<0.020	--	--	--	--
453916095222601	08-27-96	--	--	--	0.032	--	--	--	--

RAMSEY COUNTY

450129093002401	08-01-96	--	--	--	<0.020	10	0.9	65	66
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REDWOOD COUNTY

441428095073601	11-08-95	0.070	0.70	<0.010	<0.010	--	--	--	--
441428095073601	04-17-96	0.050	0.60	<0.010	<0.010	--	--	--	--
441428095073601	05-15-96	<0.015	0.60	0.020	<0.010	--	<0.015	--	--
441428095073601	07-24-96	0.270	0.80	<0.010	0.030	--	--	--	--
441428095073701	07-24-96	0.150	1.0	<0.010	<0.010	--	--	--	--
441430095073705	11-08-95	0.560	1.1	<0.010	<0.010	--	--	--	--
441430095073705	04-17-96	0.470	0.90	0.020	0.020	--	--	--	--
441430095073705	05-15-96	0.570	1.2	0.040	<0.010	--	--	--	--
441430095073705	07-24-96	0.660	1.3	0.010	0.020	--	--	--	--
441431095073705	11-08-95	0.470	1.4	<0.010	<0.010	--	--	--	--
441431095073705	04-17-96	0.420	1.1	<0.010	0.010	--	--	--	--
441431095073705	05-15-96	0.340	1.0	0.060	<0.010	--	--	--	--
441431095073705	07-24-96	0.410	0.70	<0.010	0.020	--	--	--	--
441432095073601	11-08-95	0.570	0.90	0.050	0.030	--	--	--	--
441432095073601	04-17-96	0.070	0.40	0.040	0.030	--	--	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	FLOW RATE, INSTAN- TANEOUS (G/M) (00059)

REDWOOD COUNTY

441432095073601	05-15-96	0900	2240	--	7.7	--	5.5	--	--	--	--
441432095073601	07-24-96	0840	2500	--	6.7	--	11.5	--	--	735	--
441433095073701	11-08-95	1237	555	--	7.4	--	10.0	--	--	--	--
441433095073701	04-17-96	0950	--	--	--	--	--	--	--	--	--
441433095073701	05-15-96	1130	2310	--	7.8	--	5.5	--	--	--	--
441433095073701	07-24-96	1050	2230	--	6.9	--	11.5	--	--	735	--
443055094591101	08-23-96	0830	686	707	7.1	7.4	10.0	--	--	742	--
443055094591101	09-25-96	1130	707	--	6.9	--	11.0	--	--	--	--
443129094590901	08-23-96	1200	649	653	7.3	7.6	10.0	--	--	--	--
443140094580001	08-30-96	1120	707	724	6.9	7.3	12.0	--	--	--	--
443144094583401	08-30-96	1010	666	672	7.0	7.3	14.0	--	--	--	--
443146095000101	08-29-96	1750	8420	8900	6.4	6.9	16.0	--	--	--	--
443146095002001	08-29-96	1620	687	698	6.8	7.2	15.0	--	--	--	--
443147094590901	08-23-96	1430	757	770	6.6	7.0	13.5	--	--	--	--
443147094590901	08-30-96	0912	751	--	7.7	--	14.0	--	--	745	--

RICE COUNTY

441450093265701	07-30-96	1100	749	735	7.4	7.2	10.0	4.4	25.0	740	1.5
441944093194601	08-21-96	1100	647	646	7.4	7.3	15.0	2.2	27.0	741	0.4
442612093110201	08-13-96	1000	742	739	7.3	7.3	14.5	0.70	24.0	740	0.4
442816093125901	08-27-96	1300	697	676	7.3	7.2	12.5	1.6	26.0	741	0.3
443232093230901	07-31-96	1300	856	839	7.2	7.3	11.5	2.1	26.0	737	0.3

ROCK COUNTY

433345096110001	08-30-96	1030	739	--	7.2	--	12.5	--	--	--	--
433345096110002	11-29-95	1200	742	--	7.2	--	11.5	--	--	--	--
433345096110002	04-10-96	1330	802	760	7.2	7.4	9.0	--	--	720	--
433345096110002	05-22-96	0838	624	--	7.0	--	8.0	--	--	--	--
433345096110002	08-13-96	1130	740	--	6.9	--	11.0	--	--	--	--
433347096113501	11-29-95	1445	889	--	7.2	--	11.0	--	--	--	--
433347096113501	04-10-96	1600	877	863	7.2	7.4	10.5	--	--	720	--
433347096113501	05-22-96	1220	862	--	7.0	--	7.5	--	--	--	--
433347096113501	08-13-96	0945	867	--	6.8	--	11.5	--	--	--	--
433352096110501	11-29-95	1030	721	--	7.4	--	9.5	--	--	--	--
433352096110501	04-10-96	0830	592	588	7.6	7.8	4.0	--	--	724	--
433352096110501	05-22-96	0945	678	--	7.3	--	7.0	--	--	723	--
433352096110501	08-13-96	1255	723	--	7.2	--	19.5	--	--	--	--
433555096255601	10-31-95	1100	722	748	7.2	7.4	--	--	--	--	--
433645096214401	11-01-95	1230	713	745	7.4	7.4	--	--	--	--	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	OXYGEN, DIS- SOLVED (MG/L) (00300)	COLI- FORM, FECAL, UM-MF (COLS/ 100 ML) (31625)	STREP- TOCOCCI KF AGAR (COLS. PER (31673)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD CO3 (00452)	ALKA- LITY LAB (MG/L AS CACO3) (90410)
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REDWOOD COUNTY

441432095073601	05-15-96	0.4	--	--	--	--	--	--	--	--	--
441432095073601	07-24-96	2.4	--	--	--	--	--	--	--	--	--
441433095073701	11-08-95	7.2	--	--	--	--	--	--	--	--	--
441433095073701	05-15-96	1.7	--	--	--	--	--	--	--	--	--
441433095073701	07-24-96	1.1	--	--	--	--	--	--	--	--	--
443055094591101	08-23-96	4.3	<1	K8	79	35	7.9	2.9	--	--	345
443055094591101	09-25-96	0.2	--	--	--	--	--	--	--	--	--
443129094590901	08-23-96	6.1	--	--	83	24	5.2	2.5	--	--	268
443140094580001	08-30-96	1	<1	<1	94	33	3.9	3.0	--	--	317
443144094583401	08-30-96	2.5	<1	<1	85	23	16	1.7	--	--	300
443146095000101	08-29-96	0.1	K3	K3	660	150	880	18	--	--	224
443146095002001	08-29-96	0.1	<1	K2	85	28	11	4.0	--	--	312
443147094590901	08-23-96	1.9	--	--	100	34	3.9	2.2	--	--	404
443147094590901	08-30-96	0.5	<1	K10	--	--	--	--	--	--	--

RICE COUNTY

441450093265701	07-30-96	0.1	--	--	97	32	20	2.2	--	--	379
441944093194601	08-21-96	0	--	--	85	27	9.7	3.6	--	--	354
442612093110201	08-13-96	4.9	--	--	93	35	6.2	1.1	--	--	317
442816093125901	08-27-96	0.5	--	--	92	31	6.4	2.9	--	--	376
443232093230901	07-31-96	0.1	--	--	98	47	24	3.3	--	--	458

ROCK COUNTY

433345096110001	08-30-96	0.6	--	--	--	--	--	--	--	--	--
433345096110002	11-29-95	--	0	0	--	--	--	--	371	0	--
433345096110002	04-10-96	8.4	<1	<1	94	34	13	3.1	368	0	--
433345096110002	05-22-96	12.0	1	1	--	--	--	--	--	--	--
433345096110002	08-13-96	0.2	0	0	--	--	--	--	--	--	--
433347096113501	11-29-95	5.7	0	0	--	--	--	--	354	0	--
433347096113501	04-10-96	5.5	<1	<1	110	37	12	1.5	337	0	--
433347096113501	05-22-96	5.9	<1	<1	--	--	--	--	--	--	--
433347096113501	08-13-96	5.0	0	0	--	--	--	--	--	--	--
433352096110501	11-29-95	0.2	0	0	--	--	--	--	354	0	--
433352096110501	04-10-96	0.2	<1	K27	69	28	12	2.5	272	0	--
433352096110501	05-22-96	0.1	<1	<880	--	--	--	--	--	--	--
433352096110501	08-13-96	0.1	0	0	--	--	--	--	--	--	--
433555096255601	10-31-95	--	--	--	86	23	27	10	--	--	316
433645096214401	11-01-95	--	--	--	89	25	21	7.6	--	--	310

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO ₃ (39086)	SULFATE DIS- SOLVED (MG/L AS SO ₄) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	BROMIDE DIS- SOLVED (MG/L AS BR) (71870)	SILICA, DIS- SOLVED (MG/L AS SiO ₂) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)
REDWOOD COUNTY										
441432095073601	05-15-96	--	360	240	--	--	--	--	<0.010	--
441432095073601	07-24-96	--	440	320	--	--	--	--	<0.010	--
441433095073701	11-08-95	--	530	210	--	--	--	--	<0.010	--
441433095073701	04-17-96	--	320	120	--	--	--	--	<0.010	--
441433095073701	05-15-96	--	630	220	--	--	--	--	<0.010	--
441433095073701	07-24-96	--	--	--	--	--	--	--	0.010	0.060
443055094591101	08-23-96	--	19	11	0.50	--	26	394	<0.010	--
443055094591101	09-25-96	--	--	--	--	--	--	--	--	--
443129094590901	08-23-96	--	23	18	0.20	--	26	366	0.010	7.49
443140094580001	08-30-96	--	20	12	0.20	--	29	334	0.010	3.69
443144094583401	08-30-96	--	26	21	0.20	--	32	408	<0.010	--
443146095000101	08-29-96	--	160	2800	<0.10	--	24	5160	<0.010	--
443146095002001	08-29-96	--	2.9	30	0.10	--	32	404	<0.010	--
443147094590901	08-23-96	--	21	6.0	<0.10	--	33	450	<0.010	--
443147094590901	08-30-96	--	--	--	--	--	--	--	--	--
RICE COUNTY										
441450093265701	07-30-96	373	40	0.80	0.20	0.030	17	431	<0.010	--
441944093194601	08-21-96	348	4.3	0.60	0.20	0.050	21	372	<0.010	--
442612093110201	08-13-96	297	46	13	0.10	0.070	20	434	0.010	7.59
442816093125901	08-27-96	377	6.5	0.60	0.20	0.11	17	218	<0.010	--
443232093230901	07-31-96	438	34	0.60	0.30	0.040	24	468	<0.010	--
ROCK COUNTY										
433345096110001	08-30-96	--	90	18	0.28	0.046	--	--	<0.010	0.195
433345096110002	11-29-95	304	84	19	--	--	--	--	<0.010	--
433345096110002	04-10-96	302	86	21	--	--	16	--	<0.010	--
433345096110002	05-22-96	--	77	19	--	--	--	--	<0.010	--
433345096110002	08-13-96	--	83	19	--	--	--	--	0.010	0.500
433347096113501	11-29-95	290	95	30	--	--	--	--	<0.010	--
433347096113501	04-10-96	276	93	28	--	--	20	--	<0.010	--
433347096113501	05-22-96	--	90	27	--	--	--	--	<0.010	--
433347096113501	08-13-96	--	93	27	--	--	--	--	0.010	17.0
433352096110501	11-29-95	290	84	22	--	--	--	--	0.010	0.070
433352096110501	04-10-96	223	63	19	--	--	8.3	--	<0.010	--
433352096110501	05-22-96	--	79	22	--	--	--	--	0.010	0.100
433352096110501	08-13-96	--	92	23	--	--	--	--	0.020	0.060
433555096255601	10-31-95	320	82	2.2	0.30	--	27	460	--	--
433645096214401	11-01-95	327	85	2.5	0.30	--	23	456	--	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMM. DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N) (00623)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)
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REDWOOD COUNTY

441432095073601	05-15-96	0.120	0.120	0.170	1.0	0.040	0.040	--	--	--
441432095073601	07-24-96	0.060	0.060	0.090	0.50	<0.010	<0.010	--	--	--
441433095073701	11-08-95	--	<0.050	1.40	1.9	0.050	0.040	--	--	--
441433095073701	04-17-96	0.200	0.200	0.050	0.40	0.030	0.020	--	--	--
441433095073701	05-15-96	0.180	0.180	<0.015	0.40	0.020	0.010	--	--	--
441433095073701	07-24-96	0.070	0.070	0.320	0.80	0.010	0.020	--	--	--
443055094591101	08-23-96	0.120	0.120	0.130	--	--	0.030	--	2	--
443129094590901	08-23-96	7.50	7.50	0.040	--	--	0.020	--	2	--
443140094580001	08-30-96	3.70	3.70	0.020	--	--	0.020	--	<1	--
443144094583401	08-30-96	2.40	2.40	<0.015	--	--	0.020	--	<1	--
443146095000101	08-29-96	0.050	0.050	1.80	--	--	<0.010	--	<1	--
443146095002001	08-29-96	0.080	0.080	<0.015	--	--	<0.010	--	<1	--
443147094590901	08-23-96	1.10	1.10	0.020	--	--	0.020	--	1	--

RICE COUNTY

441450093265701	07-30-96	0.090	0.090	0.530	0.60	0.070	0.030	3.0	<1	183
441944093194601	08-21-96	--	<0.050	0.770	0.80	0.030	0.020	3.0	<1	155
442612093110201	08-13-96	7.60	7.60	0.020	<0.20	0.020	0.010	3.0	<1	56
442816093125901	08-27-96	--	<0.050	0.350	0.40	0.010	<0.010	3.0	<1	157
443232093230901	07-31-96	0.090	0.090	0.680	0.60	<0.010	<0.010	3.0	<1	77

ROCK COUNTY

433345096110001	08-30-96	--	--	--	--	--	<0.020	--	--	--
433345096110002	11-29-95	0.150	0.150	--	--	--	--	--	--	--
433345096110002	04-10-96	0.220	0.220	0.250	--	--	--	--	--	--
433345096110002	05-22-96	0.150	0.150	0.240	--	--	--	--	--	--
433345096110002	08-13-96	0.510	0.510	0.210	--	--	--	--	--	--
433347096113501	11-29-95	17.0	17.0	--	--	--	--	--	--	--
433347096113501	04-10-96	15.0	15.0	<0.015	--	--	--	--	--	--
433347096113501	05-22-96	16.0	16.0	0.040	--	--	--	--	--	--
433347096113501	08-13-96	17.0	17.0	0.020	--	--	--	--	--	--
433352096110501	11-29-95	0.080	0.080	--	--	--	--	--	--	--
433352096110501	04-10-96	0.150	0.150	0.030	--	--	--	--	--	--
433352096110501	05-22-96	0.110	0.110	0.060	--	--	--	--	--	--
433352096110501	08-13-96	0.080	0.080	0.070	--	--	--	--	--	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CHRO- BORON, CADMIUM DIS- SOLVED (UG/L AS B) AS CD) (01020)	MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	
REDWOOD COUNTY										
443055094591101	08-23-96	--	33	--	--	--	85	<1.0	22	
443129094590901	08-23-96	--	31	--	--	--	<3.0	<1.0	11	
443140094580001	08-30-96	--	30	--	--	--	<3.0	<1.0	16	
443144094583401	08-30-96	--	77	--	--	--	<3.0	<1.0	7	
443146095000101	08-29-96	--	118	--	--	--	<15	<1.0	38	
443146095002001	08-29-96	--	20	--	--	--	<3.0	<1.0	7	
443147094590901	08-23-96	--	31	--	--	--	<3.0	<1.0	7	
RICE COUNTY										
441450093265701	07-30-96	<1.0	--	<1.0	4.0	<1.0	<1.0	2700	<1.0	--
441944093194601	08-21-96	<1.0	--	<1.0	6.0	<1.0	<1.0	1400	<1.0	--
442612093110201	08-13-96	<1.0	--	<1.0	7.0	<1.0	6.0	<3.0	<1.0	--
442816093125901	08-27-96	<1.0	--	<1.0	4.0	<1.0	<1.0	4300	<1.0	--
443232093230901	07-31-96	<1.0	--	<1.0	6.0	<1.0	1.0	110	<1.0	--
ROCK COUNTY										
433345096110002	04-10-96	--	40	--	--	--	1400	--	--	
433347096113501	04-10-96	--	50	--	--	--	<3.0	--	--	
433352096110501	04-10-96	--	40	--	--	--	650	--	--	
433555096255601	10-31-95	--	180	--	--	--	220	--	--	
433645096214401	11-01-95	--	170	--	--	--	1000	--	--	

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	ANTI- MONY, DIS- SOLVED (UG/L AS SB) (01095)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	CARBON, ORG. DIS- SOLVED (MG/L AS C) (00681)
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REDWOOD COUNTY

443055094591101	08-23-96	160	4.2	--	--	170	--	--	<1	--
443129094590901	08-23-96	17	2.3	--	--	130	--	--	1	--
443140094580001	08-30-96	8.0	1.8	--	--	130	--	--	1	--
443144094583401	08-30-96	<1.0	<1.0	--	--	110	--	--	<1	--
443146095000101	08-29-96	6500	<1.0	--	--	1800	--	--	<1	--
443146095002001	08-29-96	21	<1.0	--	--	130	--	--	<1	--
443147094590901	08-23-96	60	1.2	--	--	140	--	--	<1	--

RICE COUNTY

441450093265701	07-30-96	68	1.0	2.0	<1.0	--	7.0	<1.0	<1	1.8
441944093194601	08-21-96	117	1.0	3.0	<1.0	--	6.0	<1.0	<1	1.4
442612093110201	08-13-96	2.0	1.0	4.0	<1.0	--	127	<1.0	1	1.1
442816093125901	08-27-96	118	1.0	4.0	<1.0	--	45	<1.0	<1	1.0
443232093230901	07-31-96	259	<1.0	3.0	<1.0	--	187	<1.0	<1	1.2

ROCK COUNTY

433345096110002	04-10-96	560	--	--	--	--	--	--	--	--
433347096113501	04-10-96	<1.0	--	--	--	--	--	--	--	--
433352096110501	04-10-96	290	--	--	--	--	--	--	--	--
433555096255601	10-31-95	910	--	--	--	--	2.4	--	--	--
433645096214401	11-01-95	160	--	--	--	--	540	--	--	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)
ROCK COUNTY										
433649096214901	11-01-95	1550	671	713	7.3	7.4	--	--	--	--
433725096125001	08-14-96	0905	1050	--	6.8	--	10.5	--	--	--
433750096123201	08-30-96	0900	947	--	7.1	--	10.5	--	--	--
433910096115902	11-28-95	1120	729	--	7.4	--	15.0	--	--	--
433910096115902	04-09-96	1145	727	717	7.5	7.6	7.0	--	--	--
433910096115902	05-20-96	1245	704	--	7.3	--	8.0	--	--	--
433910096115902	08-14-96	1635	740	--	7.1	--	11.0	--	--	--
433911096120101	11-28-95	0830	736	--	7.3	--	12.5	--	--	--
433911096120101	04-09-96	0830	608	614	7.7	7.8	3.0	--	--	729
433911096120101	05-20-96	1105	638	--	7.3	--	5.5	--	--	721
433911096120101	08-14-96	1525	713	--	7.0	--	15.0	--	--	--
433919096115401	11-28-95	1430	731	--	7.3	--	11.5	--	--	--
433919096115401	04-11-96	0830	596	599	7.3	7.6	5.0	--	--	--
433919096115401	05-21-96	0925	592	--	7.4	--	6.0	--	--	724
433919096115401	08-15-96	1145	680	--	7.2	--	10.5	--	--	--
433920096114901	11-28-95	1400	813	--	7.2	--	12.0	--	--	--
433920096114901	04-09-96	1600	781	779	7.3	7.4	8.0	--	--	--
433920096114901	05-20-96	1430	786	--	7.1	--	9.5	--	--	721
433920096114901	08-15-96	0940	785	--	6.9	--	12.5	--	--	--
433929096114701	11-30-95	0845	975	--	6.9	--	10.5	--	--	--
433929096114701	04-11-96	1030	916	885	7.0	7.2	7.0	--	--	--
433929096114701	05-21-96	1215	933	--	6.9	--	6.5	--	--	724
433929096114701	08-15-96	1455	1010	--	6.8	--	10.0	--	--	--
433932096113701	04-11-96	0930	750	745	7.1	7.4	10.5	--	--	--
433932096113701	05-21-96	1045	759	--	7.1	--	11.5	--	--	724
433932096113701	08-29-96	1600	758	--	7.4	--	12.5	--	--	--
433940096131801	11-01-95	0950	852	897	8.6	8.3	--	--	--	--
433952096113101	11-30-95	1015	747	--	7.2	--	11.0	--	--	--
433952096113101	08-15-96	1330	703	--	7.0	--	12.5	--	--	--
434025096124501	08-14-96	1135	2590	--	6.5	--	15.5	--	--	727

SCOTT COUNTY

443328093184701	07-30-96	1400	695	680	7.4	7.2	12.0	7.2	26.0	735
443505093255201	07-31-96	1000	840	827	7.3	7.3	12.5	2.0	23.0	741
444059093260901	08-01-96	1000	691	680	7.4	7.3	13.5	1.1	26.0	739
444059093260901	08-20-96	1300	687	--	7.3	--	13.5	2.1	28.5	745
444202093225901	08-05-96	1200	710	702	7.2	7.2	16.0	2.3	27.0	735

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	FLOW RATE, INSTAN- TANEOUS (G/M) (00059)	OXYGEN, DIS- SOLVED (MG/L) (00300)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCHI FECAL, CALCIUM KF AGAR DIS- (COLS. SOLVED PER (MG/L 100 ML) AS CA) (31673) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	
ROCK COUNTY										
433649096214901	11-01-95	--	--	--	--	83	24	24	7.9	--
433725096125001	08-14-96	--	0.1	--	--	--	--	--	--	--
433750096123201	08-30-96	--	1.9	--	--	--	--	--	--	--
433910096115902	11-28-95	--	0.8	0	0	--	--	--	--	364
433910096115902	04-09-96	--	0.2	<1	<1	83	35	13	2.6	328
433910096115902	05-20-96	--	0.2	<1	<1	--	--	--	--	--
433910096115902	08-14-96	--	0.1	0	0	--	--	--	--	--
433911096120101	11-28-95	--	0.2	0	K2	--	--	--	--	346
433911096120101	04-09-96	--	0.3	<1	K1	72	31	7.5	1.9	398
433911096120101	05-20-96	--	0.2	<1	<1	--	--	--	--	--
433911096120101	08-14-96	--	0.1	0	0	--	--	--	--	--
433919096115401	11-28-95	--	0.2	0	0	--	--	--	--	356
433919096115401	04-11-96	--	0.3	<1	<1	70	29	8.5	1.6	285
433919096115401	05-21-96	--	0.2	<1	<1	--	--	--	--	--
433919096115401	08-15-96	--	0.1	0	0	--	--	--	--	--
433920096114901	11-28-95	--	0.5	0	0	--	--	--	--	381
433920096114901	04-09-96	--	0.2	<1	K2	92	34	19	1.6	346
433920096114901	05-20-96	--	0.5	<1	<1	--	--	--	--	--
433920096114901	08-15-96	--	0.1	0	0	--	--	--	--	--
433929096114701	11-30-95	--	0.3	0	6	--	--	--	--	444
433929096114701	04-11-96	--	0.4	<1	<1	100	35	27	1.0	--
433929096114701	05-21-96	--	0.1	<1	<1	--	--	--	--	--
433929096114701	08-15-96	--	0.1	0	0	--	--	--	--	--
433932096113701	04-11-96	--	0.3	<1	<1	100	31	11	1.7	379
433932096113701	05-21-96	--	0.2	<1	<1	--	--	--	--	--
433932096113701	08-29-96	--	0.5	--	--	--	--	--	--	--
433940096131801	11-01-95	--	--	--	--	68	26	67	11	--
433952096113101	11-30-95	--	0.1	0	0	--	--	--	--	366
433952096113101	08-15-96	--	0.1	0	0	--	--	--	--	--
434025096124501	08-14-96	--	0.7	--	--	--	--	--	--	--

SCOTT COUNTY

443328093184701	07-30-96	0.8	0.3	--	--	93	31	11	3.0	--
443505093255201	07-31-96	0.5	0	--	--	84	47	30	3.1	--
444059093260901	08-01-96	0.3	0	--	--	89	37	5.1	2.9	--
444059093260901	08-20-96	0.3	0.1	--	--	--	--	--	--	--
444202093225901	08-05-96	0.4	0.6	--	--	90	39	5.0	3.0	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	BROMIDE DIS- SOLVED (MG/L AS BR) (71870)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
ROCK COUNTY										
433649096214901	11-01-95	--	324	329	57	2.3	0.40	--	57	455
433725096125001	08-14-96	--	--	--	100	100	--	--	--	--
433910096115902	11-28-95	0	--	298	81	18	--	--	--	--
433910096115902	04-09-96	0	--	269	83	29	--	--	16	--
433910096115902	05-20-96	--	--	--	80	25	--	--	--	--
433910096115902	08-14-96	--	--	--	76	17	--	--	--	--
433911096120101	11-28-95	0	--	284	95	18	--	--	--	--
433911096120101	04-09-96	0	--	236	70	13	--	--	11	--
433911096120101	05-20-96	--	--	--	70	15	--	--	--	--
433911096120101	08-14-96	--	--	--	84	16	--	--	--	--
433919096115401	11-28-95	0	--	292	81	19	--	--	--	--
433919096115401	04-11-96	0	--	234	64	14	--	--	12	--
433919096115401	05-21-96	--	--	--	63	13	--	--	--	--
433919096115401	08-15-96	--	--	--	69	16	--	--	--	--
433920096114901	11-28-95	0	--	312	82	36	--	--	--	--
433920096114901	04-09-96	0	--	284	75	38	--	--	17	--
433920096114901	05-20-96	--	--	--	74	37	--	--	--	--
433920096114901	08-15-96	--	--	--	78	35	--	--	--	--
433929096114701	11-30-95	0	--	364	70	56	--	--	--	--
433929096114701	04-11-96	--	--	--	71	53	--	--	21	--
433929096114701	05-21-96	--	--	--	74	55	--	--	--	--
433929096114701	08-15-96	--	--	--	70	66	--	--	--	--
433932096113701	04-11-96	0	--	311	78	19	--	--	18	--
433932096113701	05-21-96	--	--	--	77	18	--	--	--	--
433940096131801	11-01-95	--	163	154	190	69	0.70	--	4.1	551
433952096113101	11-30-95	0	--	300	73	21	--	--	--	--
433952096113101	08-15-96	--	--	--	63	21	--	--	--	--
434025096124501	08-14-96	--	--	--	1300	1.4	--	--	--	--
SCOTT COUNTY										
443328093184701	07-30-96	--	381	373	6.0	0.40	0.40	0.020	20	381
443505093255201	07-31-96	--	429	416	53	1.1	0.30	0.050	20	456
444059093260901	08-01-96	--	358	323	29	1.3	0.30	0.050	23	392
444202093225901	08-05-96	--	363	347	31	5.4	0.30	0.060	24	397

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMM. DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N) (00623)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)
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ROCK COUNTY

433725096125001	08-14-96	0.010	0.260	0.270	0.270	0.350	--	--	--	--
433750096123201	08-30-96	<0.005	4.95	--	--	--	--	--	<0.020	--
433910096115902	11-28-95	<0.010	--	--	<0.050	--	--	--	--	--
433910096115902	04-09-96	<0.010	--	0.070	0.070	0.440	--	--	--	--
433910096115902	05-20-96	<0.010	--	0.060	0.060	0.400	--	--	--	--
433910096115902	08-14-96	0.010	0.060	0.070	0.070	0.430	--	--	--	--
433911096120101	11-28-95	<0.010	--	--	<0.050	--	--	--	--	--
433911096120101	04-09-96	<0.010	--	0.060	0.060	0.280	--	--	--	--
433911096120101	05-20-96	<0.010	--	--	<0.050	0.280	--	--	--	--
433911096120101	08-14-96	0.010	0.060	0.070	0.070	0.350	--	--	--	--
433919096115401	11-28-95	0.130	3.27	3.40	3.40	--	--	--	--	--
433919096115401	04-11-96	0.040	0.720	0.760	0.760	<0.015	--	--	--	--
433919096115401	05-21-96	0.050	0.640	0.690	0.690	0.050	--	--	--	--
433919096115401	08-15-96	0.040	0.410	0.450	0.450	0.020	--	--	--	--
433920096114901	11-28-95	0.010	1.49	1.50	1.50	--	--	--	--	--
433920096114901	04-09-96	<0.010	--	0.790	0.790	0.090	--	--	--	--
433920096114901	05-20-96	0.010	0.470	0.480	0.480	0.100	--	--	--	--
433920096114901	08-15-96	0.030	0.330	0.360	0.360	0.090	--	--	--	--
433929096114701	11-30-95	0.030	0.320	0.350	0.350	--	--	--	--	--
433929096114701	04-11-96	0.130	2.87	3.00	3.00	0.020	--	--	--	--
433929096114701	05-21-96	0.120	1.18	1.30	1.30	0.040	--	--	--	--
433929096114701	08-15-96	0.020	0.090	0.110	0.110	0.030	--	--	--	--
433932096113701	04-11-96	<0.010	--	0.720	0.720	0.030	--	--	--	--
433932096113701	05-21-96	0.010	0.820	0.830	0.830	0.050	--	--	--	--
433932096113701	08-29-96	<0.005	1.01	--	--	--	--	--	--	--
433952096113101	11-30-95	0.010	2.09	2.10	2.10	--	--	--	--	--
433952096113101	08-15-96	0.010	3.59	3.60	3.60	0.020	--	--	--	--
434025096124501	08-14-96	0.010	0.060	0.070	0.070	1.30	--	--	--	--

SCOTT COUNTY

443328093184701	07-30-96	<0.010	--	0.090	0.090	0.940	1.0	0.010	0.010	3.0
443505093255201	07-31-96	<0.010	--	0.090	0.090	0.570	0.60	<0.010	<0.010	3.0
444059093260901	08-01-96	<0.010	--	0.120	0.120	0.110	<0.20	<0.010	0.010	3.0
444202093225901	08-05-96	<0.010	--	--	<0.050	0.150	0.30	<0.010	0.020	4.0

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	ARSENIC	BARIUM,	BERYL-	BORON,	CADMIUM	CHRO-	COBALT,	COPPER,	IRON,
		DIS- SOLVED (UG/L AS AS) (01000)	DIS- SOLVED (UG/L AS BA) (01005)	DIS- SOLVED (UG/L AS BE) (01010)	DIS- SOLVED (UG/L AS B) (01020)	DIS- SOLVED (UG/L AS CD) (01025)	DIS- SOLVED (UG/L AS CR) (01030)	DIS- SOLVED (UG/L AS CO) (01035)	DIS- SOLVED (UG/L AS CU) (01040)	DIS- SOLVED (UG/L AS FE) (01046)

ROCK COUNTY

433649096214901	11-01-95	--	--	--	140	--	--	--	--	81
433910096115902	04-09-96	--	--	--	40	--	--	--	--	1800
433911096120101	04-09-96	--	--	--	40	--	--	--	--	330
433919096115401	04-11-96	--	--	--	20	--	--	--	--	<3.0
433920096114901	04-09-96	--	--	--	40	--	--	--	--	770
433929096114701	04-11-96	--	--	--	100	--	--	--	--	6.0
433932096113701	04-11-96	--	--	--	40	--	--	--	--	310
433940096131801	11-01-95	--	--	--	210	--	--	--	--	11

SCOTT COUNTY

443328093184701	07-30-96	1	329	<1.0	--	<1.0	6.0	<1.0	<1.0	1500
443505093255201	07-31-96	<1	7.0	<1.0	--	<1.0	7.0	<1.0	<1.0	1200
444059093260901	08-01-96	<1	12	<1.0	--	<1.0	5.0	<1.0	<1.0	1200
444202093225901	08-05-96	<1	86	<1.0	--	<1.0	6.0	<1.0	1.0	520

STATION NUMBER	DATE	LEAD,	MANGA-	MOLYB-	NICKEL,	SILVER,	ZINC,	ANTI-	SELE-	CARBON,
		DIS- SOLVED (UG/L AS PB) (01049)	NESE, DIS- SOLVED (UG/L AS MN) (01056)	DENUM, DIS- SOLVED (UG/L AS MO) (01060)	DIS- SOLVED (UG/L AS NI) (01065)	DIS- SOLVED (UG/L AS AG) (01075)	DIS- SOLVED (UG/L AS ZN) (01090)	DIS- SOLVED (UG/L AS SB) (01095)	NIUM, DIS- SOLVED (UG/L AS SE) (01145)	ORG. DIS- SOLVED (MG/L AS C) (00681)

ROCK COUNTY

433649096214901	11-01-95	--	500	--	--	--	15	--	--	--
433910096115902	04-09-96	--	1300	--	--	--	--	--	--	--
433911096120101	04-09-96	--	710	--	--	--	--	--	--	--
433919096115401	04-11-96	--	260	--	--	--	--	--	--	--
433920096114901	04-09-96	--	320	--	--	--	--	--	--	--
433929096114701	04-11-96	--	260	--	--	--	--	--	--	--
433932096113701	04-11-96	--	510	--	--	--	--	--	--	--
433940096131801	11-01-95	--	19	--	--	--	410	--	--	--

SCOTT COUNTY

443328093184701	07-30-96	<1.0	35	3.0	3.0	<1.0	57	<1.0	<1	1.5
443505093255201	07-31-96	<1.0	377	<1.0	3.0	<1.0	9.0	<1.0	<1	0.70
444059093260901	08-01-96	<1.0	143	1.0	3.0	<1.0	62	<1.0	<1	0.60
444202093225901	08-05-96	<1.0	269	1.0	3.0	<1.0	66	<1.0	<1	0.80

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)
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SHERBURNE COUNTY

452640094001101	07-16-96	1100	663	--	7.3	--	12.0	--	--	--
453204093364601	11-08-95	1620	--	--	--	--	--	--	--	--
453217093364701	11-09-95	1400	--	--	--	--	--	--	--	--
453414093344101	08-28-96	1400	394	--	7.9	--	10.5	--	--	--

STEARNS COUNTY

452244094420601	07-31-96	1400	650	--	7.2	--	18.0	--	--	--
452244094421401	08-28-96	1000	639	--	7.3	--	15.0	--	--	--
452256094423301	03-13-96	1650	648	--	7.2	--	1.5	--	--	--
452751094300104	03-13-96	1720	835	--	7.2	--	4.5	--	--	--
452751094301804	03-14-96	1050	703	--	6.9	--	8.0	--	--	--
452752094300402	03-13-96	1530	--	--	--	--	--	--	--	--
452755094254501	07-16-96	1400	709	--	7.0	--	11.0	--	--	--
453708094121801	07-18-96	1300	565	--	7.2	--	11.5	--	--	--
454434094570102	07-17-96	1500	690	--	7.3	--	12.0	--	--	--

WASHINGTON COUNTY

445245092545501	08-14-96	0900	613	614	7.5	7.3	12.0	1.6	24.0	738
445321092590101	08-07-96	1000	503	500	7.5	7.5	17.0	0.80	25.0	739
445508092551501	08-02-96	1100	339	--	7.0	--	10.5	--	--	--
445821092575101	09-05-96	1100	488	--	7.7	--	11.0	--	--	--
445919092500101	08-08-96	1400	482	484	7.6	7.5	16.5	1.0	28.0	748
450016092575701	07-02-96	1345	394	--	7.5	--	16.5	--	--	--
450520092543401	08-06-96	1300	389	390	7.8	7.7	19.0	2.5	34.0	737
450603092500201	08-15-96	1400	341	339	7.7	7.5	13.0	2.5	31.0	745
450810092583501	08-27-96	0900	447	457	8.0	7.6	12.0	0.15	17.0	744
450825092524801	08-21-96	1400	287	288	7.8	7.6	17.0	1.7	32.0	741
451602092515601	08-07-96	1400	606	604	7.3	7.3	16.5	3.6	27.0	741

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	FLOW RATE, INSTAN- TANEOUS (G/M) (00059)	OXYGEN, DIS- SOLVED (MG/L) (00300)	CALCIUM DIS- SOLVED (MG/L) AS CA (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L) AS MG (00925)	SODIUM, DIS- SOLVED (MG/L) AS NA (00930)	POTAS- SIUM, DIS- SOLVED (MG/L) AS K (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	ALKA- LITY LAB (MG/L AS CACO3) (90410)
SHERBURNE COUNTY										
452640094001101	07-16-96	--	3.6	--	--	--	--	--	--	--
453414093344101	08-28-96	--	0.6	--	--	--	--	--	--	--
STEARNS COUNTY										
452244094420601	07-31-96	--	7.3	87	29	8.1	1.9	328	0	--
452244094421401	08-28-96	--	2.7	89	28	6.5	2.2	320	0	--
452256094423301	07-17-96	--	0.1	100	35	42	4.6	381	0	--
452751094300103	03-13-96	--	0.3	--	--	--	--	--	--	--
452751094300104	03-13-96	--	0.2	--	--	--	--	--	--	--
452751094301804	03-14-96	--	0.2	--	--	--	--	--	--	--
452755094254501	07-16-96	0.5	6.0	--	--	--	--	--	--	--
453708094121801	07-18-96	--	0.2	--	--	--	--	--	--	--
454434094570102	07-17-96	--	0.1	86	34	15	2.8	387	0	--
WASHINGTON COUNTY										
445245092545501	08-14-96	0.8	2.0	84	26	4.4	1.4	--	--	278
445321092590101	08-07-96	0.3	2.1	64	25	3.1	1.3	--	--	236
445508092551501	08-02-96	--	0.4	--	--	--	--	--	--	--
445821092575101	09-05-96	--	5.7	59	22	8.5	1.1	237	0	--
445919092500101	08-08-96	0.5	3.0	60	24	3.2	1.2	--	--	214
450016092575701	07-02-96	--	0.1	--	--	--	--	--	--	--
450520092543401	08-06-96	0.3	5.1	43	19	3.4	0.80	--	--	127
450603092500201	08-15-96	0.3	0	41	15	3.6	0.90	--	--	176
450810092583501	08-27-96	0.5	4.8	58	21	4.1	0.90	--	--	198
450825092524801	08-21-96	0.5	0	32	14	4.4	1.1	--	--	153
451602092515601	08-07-96	0.5	0.6	80	27	5.0	1.2	--	--	283

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	BROMIDE DIS- SOLVED (MG/L AS BR) (71870)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)
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SHERBURNE COUNTY

452640094001101	07-16-96	--	55	34	0.08	0.068	--	--	0.029	15.8
453204093364601	11-08-95	--	--	5.8	--	--	--	--	0.020	0.470
453217093364701	11-09-95	--	--	5.8	--	--	--	--	0.020	2.18
453414093344101	08-28-96	--	8.6	16	0.14	0.026	--	--	<0.005	0.130

STEARNS COUNTY

452244094420601	07-31-96	269	32	20	0.13	0.033	24	--	<0.005	3.45
452244094421401	08-28-96	--	49	18	0.10	--	19	--	<0.005	1.29
452256094423301	07-17-96	312	52	87	0.12	0.058	23	--	<0.005	0.065
452751094300103	03-13-96	--	--	11	--	--	--	--	0.010	2.59
452751094300104	03-13-96	--	--	20	--	--	--	--	0.400	17.6
452751094301804	03-14-96	--	--	5.4	--	--	--	--	0.060	4.44
452752094300402	03-13-96	--	--	29	--	--	--	--	0.080	21.9
452755094254501	07-16-96	--	36	29	0.12	0.026	--	--	<0.005	12.1
453708094121801	07-18-96	--	28	20	0.14	0.034	--	--	<0.005	<0.005
454434094570102	07-17-96	317	26	18	0.26	0.057	25	--	<0.005	<0.005

WASHINGTON COUNTY

445245092545501	08-14-96	261	20	16	0.10	0.050	18	346	0.010	2.89
445321092590101	08-07-96	228	22	4.3	0.20	0.030	19	289	<0.010	--
445508092551501	08-02-96	--	9.6	5.1	0.11	0.017	--	--	<0.005	0.426
445821092575101	09-05-96	194	17	24	0.14	0.025	20	--	<0.005	1.95
445919092500101	08-08-96	192	16	10	0.20	0.030	22	280	<0.010	--
450016092575701	07-02-96	--	7.1	9.9	0.15	0.019	--	--	<0.005	0.108
450520092543401	08-06-96	113	21	12	0.20	0.030	24	231	<0.010	--
450603092500201	08-15-96	173	5.4	1.5	0.20	0.040	17	186	0.010	0.140
450810092583501	08-27-96	160	22	8.0	0.10	0.030	26	445	<0.010	--
450825092524801	08-21-96	130	0.80	0.80	0.30	0.030	15	153	<0.010	--
451602092515601	08-07-96	276	14	17	0.10	0.040	25	344	<0.010	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	NITRO- GEN, NO ₂ +NO ₃ TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO ₂ +NO ₃ DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMM. DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N) (00623)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)
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SHERBURNE COUNTY

452640094001101	07-16-96	--	--	--	--	--	<0.020	--	--	--
453204093364601	11-08-95	0.490	0.490	0.050	<0.20	<0.010	<0.010	--	--	--
453217093364701	11-09-95	2.20	2.20	0.020	<0.20	<0.010	<0.010	--	--	--
453414093344101	08-28-96	--	--	--	--	--	0.110	--	--	--

STEARNS COUNTY

452244094420601	07-31-96	--	--	--	--	--	<0.020	--	--	73
452244094421401	08-28-96	--	--	--	--	--	<0.020	--	--	92
452256094423301	07-17-96	--	--	--	--	--	<0.020	--	--	186
452751094300103	03-13-96	2.60	2.60	0.030	0.50	<0.010	0.020	--	--	--
452751094300104	03-13-96	18.0	18.0	0.030	<0.20	0.030	0.020	--	--	--
452751094301804	03-14-96	4.50	4.50	0.030	<0.20	0.010	0.020	--	--	--
452752094300402	03-13-96	22.0	22.0	0.090	0.20	0.030	0.040	--	--	--
452755094254501	07-16-96	--	--	--	--	--	<0.020	--	--	--
453708094121801	07-18-96	--	--	--	--	--	<0.020	--	--	--
454434094570102	07-17-96	--	--	--	--	--	<0.020	--	--	175

WASHINGTON COUNTY

445245092545501	08-14-96	2.90	2.90	0.030	<0.20	0.020	0.040	3.0	<1	28
445321092590101	08-07-96	1.90	1.90	0.020	<0.20	<0.010	0.020	3.0	<1	6.0
445508092551501	08-02-96	--	--	--	--	--	<0.020	--	--	--
445821092575101	09-05-96	--	--	--	--	--	<0.020	--	--	12
445919092500101	08-08-96	4.20	4.20	0.020	<0.20	<0.010	0.030	3.0	<1	18
450016092575701	07-02-96	--	--	--	--	--	<0.020	--	--	--
450520092543401	08-06-96	8.40	8.40	<0.015	<0.20	<0.010	0.030	3.0	<1	10
450603092500201	08-15-96	0.150	0.150	0.040	<0.20	0.030	0.050	4.0	<1	18
450810092583501	08-27-96	3.90	3.90	<0.015	<0.20	0.070	0.050	3.0	<1	36
450825092524801	08-21-96	--	<0.050	0.080	<0.20	<0.010	<0.010	3.0	<1	1.0
451602092515601	08-07-96	0.640	0.640	0.020	<0.20	<0.010	0.020	3.0	<1	46

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)
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SHERBURNE COUNTY

453204093364601	11-08-95	--	<10	--	--	--	--	--	--	--
453217093364701	11-09-95	--	<10	--	--	--	--	--	--	--

STEARNS COUNTY

452244094420601	07-31-96	--	--	--	--	--	--	<10	--	36
452244094421401	08-28-96	--	--	--	--	--	--	60	--	96
452256094423301	07-17-96	--	--	--	--	--	--	1100	--	222
452751094300103	03-13-96	--	30	--	--	--	--	--	--	--
452751094300104	03-13-96	--	70	--	--	--	--	--	--	--
452751094301804	03-14-96	--	80	--	--	--	--	--	--	--
452752094300402	03-13-96	--	80	--	--	--	--	--	--	--
454434094570102	07-17-96	--	--	--	--	--	--	1700	--	247

WASHINGTON COUNTY

445245092545501	08-14-96	<1.0	--	<1.0	6.0	<1.0	10	<3.0	<1.0	1.0
445321092590101	08-07-96	<1.0	--	<1.0	4.0	<1.0	13	<3.0	2.0	<1.0
445821092575101	09-05-96	--	--	--	--	--	--	<10	--	<1.0
445919092500101	08-08-96	<1.0	--	<1.0	4.0	<1.0	34	<3.0	<1.0	<1.0
450520092543401	08-06-96	<1.0	--	<1.0	7.0	<1.0	19	<3.0	<1.0	1.0
450603092500201	08-15-96	<1.0	--	<1.0	3.0	<1.0	<1.0	140	<1.0	170
450810092583501	08-27-96	<1.0	--	<1.0	5.0	<1.0	14	<3.0	<1.0	<1.0
450825092524801	08-21-96	<1.0	--	<1.0	3.0	<1.0	<1.0	83	<1.0	30
451602092515601	08-07-96	<1.0	--	<1.0	6.0	<1.0	15	8.0	<1.0	1.0

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	ANTI- MONY, DIS- SOLVED (UG/L AS SB) (01095)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	CARBON, ORGANIC C'S- SOLVED (MG/L AS C) (00681)
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SHERBURNE COUNTY

453204093364601	11-08-95	--	--	--	--	--	--	--	E1.2
453217093364701	11-09-95	--	--	--	--	--	--	--	E1.8

STEARNS COUNTY

452244094420601	07-31-96	--	--	--	94	--	--	--	--
452244094421401	08-28-96	--	--	--	95	--	--	--	--
452256094423301	07-17-96	--	--	--	201	--	--	--	--
452751094300103	03-13-96	--	--	--	--	--	--	--	5.3
452751094300104	03-13-96	--	--	--	--	--	--	--	1.7
452751094301804	03-14-96	--	--	--	--	--	--	--	1.4
452752094300402	03-13-96	--	--	--	--	--	--	--	1.8
454434094570102	07-17-96	--	--	--	294	--	--	--	--

WASHINGTON COUNTY

445245092545501	08-14-96	<1.0	3.0	<1.0	--	79	<1.0	<1	0.60
445321092590101	08-07-96	1.0	2.0	<1.0	--	186	<1.0	2	0.30
445821092575101	09-05-96	--	--	--	64	--	--	--	--
445919092500101	08-08-96	<1.0	2.0	<1.0	--	74	<1.0	<1	0.40
450520092543401	08-06-96	<1.0	1.0	<1.0	--	3.0	<1.0	<1	0.40
450603092500201	08-15-96	<1.0	2.0	<1.0	--	74	<1.0	<1	0.40
450810092583501	08-27-96	<1.0	3.0	<1.0	--	39	<1.0	1	0.70
450825092524801	08-21-96	2.0	2.0	<1.0	--	9.0	<1.0	<1	0.50
451602092515601	08-07-96	<1.0	2.0	<1.0	--	14	<1.0	<1	0.90

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALA-CHLOR, (ESA) WAT FLT GF 0.7U REC (UG/L) (50009)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT (91065)	AMETRYN WATER, DISS, REC, (UG/L) (38401)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)
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ANOKA COUNTY

450758093061501	08-26-96	0900	<0.003	<0.002	<0.002	--	<0.002	117	--	<0.001
450835093094301	07-03-96	1100	--	--	--	--	--	--	--	--

BENTON COUNTY

453551094104701	07-18-96	1100	--	<0.050	<0.050	<0.100	--	--	<0.050	<0.050
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STATION NUMBER	DATE	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BENZENE 14BRFL- SURROG VOC UNFLTRD REC PERCENT (99834)	BUTYL-ATE, WATER, DISS, REC (UG/L) (04028)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR-PYRIFOS DIS- SOLVED (UG/L) (38933)	CYAN-AZINE AMIDE WAT FLT 0.7U REC (UG/L) (50010)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)
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ANOKA COUNTY

450758093061501	08-26-96	<0.002	118	<0.002	<0.003	<0.003	<0.004	--	<0.004	<0.002
450835093094301	07-03-96	--	--	--	--	--	--	--	--	--

BENTON COUNTY

453551094104701	07-18-96	--	--	--	--	--	--	<0.050	<0.050	--
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STATION NUMBER	DATE	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DEISO-PROPYL ATRAZIN WATER, DISS, REC (UG/L) (04038)	DI-AZINON, DIS- SOLVED (UG/L) (39572)	DIAZ-INON D10 SRG WAT FLT 0.7 U GF, REC PERCENT (91063)	DI-ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	ETHANE 12DICL SURROG VOC UNFLTRD REC PERCENT (99832)
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ANOKA COUNTY

450758093061501	08-26-96	<0.002	--	<0.002	98.2	<0.001	<0.017	<0.002	<0.004	107
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BENTON COUNTY

453551094104701	07-18-96	<0.050	<0.050	--	--	--	--	--	--	--
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QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	ETHO- PROP	FONOFOS		LIN- URON	METHYL		METHYL	METO-		METRI-
		WATER	WATER	LINDANE	WATER	MALA-	AZIN-	PARA-	THION	WAT FLTLACHLOR	BUZIN
		FLTRD	FLTRD	DIS-	FLTRD	THION,	PHOS	THION	WAT FLTLACHLOR	WATER	SENCOR
		0.7 U GF, REC (UG/L) (82672)	DISS REC (UG/L) (04095)	SOLVED (UG/L) (39341)	0.7 U GF, REC (UG/L) (82666)	DIS- SOLVED (UG/L) (39532)	0.7 U GF, REC (UG/L) (82686)	0.7 U GF, REC (UG/L) (82667)	0.7 U DISSOLV (UG/L) (39415)	WATER (UG/L) (82630)	WATER (UG/L) (82630)

ANOKA COUNTY

450758093061501	08-26-96	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002	<0.004
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BENTON COUNTY

453551094104701	07-18-96	--	--	--	--	--	--	--	<0.050	<0.050
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STATION NUMBER	DATE	MOL- INATE	NAPROP- AMIDE	P.P'		PARA- THION,	PEB- ULATE	PENDI- METH-	PER- METHRIN	PHORATE	PRO- METON,
		WATER	WATER	FLTRD	DDE	DIS-	WATER	ALIN	CIS	WATER	WATER,
		FLTRD	FLTRD	FLTRD	FLTRD	FLTRD	FILTRD	WAT FLT	WAT FLT	FLTRD	FLTRD
		0.7 U GF, REC (UG/L) (82671)	0.7 U GF, REC (UG/L) (82684)	0.7 U DISSOLV (UG/L) (34653)	0.7 U DISSOLV (UG/L) (39542)	0.7 U DISSOLV (UG/L) (39542)	0.7 U GF, REC (UG/L) (82669)	0.7 U GF, REC (UG/L) (82683)	0.7 U GF, REC (UG/L) (82687)	0.7 U GF, REC (UG/L) (82664)	0.7 U DISS, REC (UG/L) (04037)

ANOKA COUNTY

450758093061501	08-26-96	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002	<0.018
450835093094301	07-03-96	--	--	--	--	--	--	--	--	--

BENTON COUNTY

453551094104701	07-18-96	--	--	--	--	--	--	--	--	<0.050
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STATION NUMBER	DATE	PRO- METRYN,	PRON- AMIDE	PROP- CHLOR,	PRO- PANIL	PRO- PARGITE	PROP- AZINE	SI- MAZINE,	TEBU- THURON
		WATER,	WATER	WATER,	WATER	WATER	WATER	WATER,	WATER
		DISS,	FLTRD	DISS,	FLTRD	FLTRD	DISS	DISS,	FLTRD
		REC (UG/L) (04036)	0.7 U GF, REC (UG/L) (82676)	DISS, REC (UG/L) (04024)	0.7 U GF, REC (UG/L) (82679)	0.7 U GF, REC (UG/L) (82685)	DISS REC (UG/L) (38535)	DISS, REC (UG/L) (04035)	0.7 U GF, REC (UG/L) (82670)

ANOKA COUNTY

450758093061501	08-26-96	--	<0.003	<0.007	<0.004	<0.013	--	<0.005	<0.010
450835093094301	07-03-96	--	--	--	--	--	--	--	--

BENTON COUNTY

453551094104701	07-18-96	<0.050	--	<0.050	--	--	<0.050	<0.050	--
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QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT (91064)	TER- BUTRYN WATER, FLTRD DISS, REC (UG/L) (38888)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TOLUENE D8 SURROG VOC UNFLTRD REC PERCENT (99833)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)

ANOKA COUNTY

450758093061501	08-26-96	<0.007	<0.013	118	--	<0.002	114	<0.001	<0.002
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BENTON COUNTY

453551094104701	07-18-96	--	--	--	<0.05	--	--	--	--
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STATION NUMBER	DATE	TIME	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ACETO- CHLOR, WATER FLTRD REC (UG/L) (49260)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT (91065)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- BENZENE FLUR- 14B~FL- ALIN SURROG WAT FLD VOC 0.7 U UNFLTRD GF, REC REC (UG/L) PERCENT (82673) (99834)

DAKOTA COUNTY

443042092570401	08-15-96	1100	<0.003	<0.002	<0.002	<0.002	123	0.005	<0.002	100
443119093050101	08-08-96	1000	<0.003	<0.002	<0.002	<0.002	99.4	<0.001	<0.002	98.0
443641093110701	09-04-96	1000	<0.003	<0.002	<0.002	<0.002	94.5	<0.001	<0.002	103
443645092525501	08-12-96	1300	<0.003	<0.002	<0.002	<0.002	95.5	<0.001	<0.002	120
443645092525501	08-20-96	1100	--	--	--	--	--	--	--	--
443808093012801	09-03-96	1300	<0.003	<0.002	<0.002	<0.002	89.2	<0.001	<0.002	103
443934092565601	08-12-96	1000	<0.003	<0.002	<0.002	<0.002	99.7	0.690	<0.002	128
443934092565601	08-20-96	1000	--	--	--	--	--	--	--	--
444211092544601	08-14-96	1200	<0.003	<0.002	<0.002	<0.002	102	<0.001	<0.002	74.0
444214092490401	08-26-96	1200	<0.003	<0.002	<0.002	<0.002	120	E0.003	<0.002	122
444331093080801	08-19-96	1400	<0.003	<0.002	<0.002	<0.002	122	<0.001	<0.002	99.0
445108093054801	08-06-96	1000	<0.003	<0.002	<0.002	<0.002	102	<0.001	<0.002	78.0
445117093042701	08-13-96	1200	<0.003	<0.002	<0.002	<0.002	104	E0.002	<0.002	117

STATION NUMBER	DATE	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC PERCENT (91063)

DAKOTA COUNTY

443042092570401	08-15-96	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	E0.006	0.019	109
443119093050101	08-08-96	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	<0.002	<0.002	112
443641093110701	09-04-96	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	<0.002	<0.002	102
443645092525501	08-12-96	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	<0.002	<0.002	108
443808093012801	09-03-96	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	<0.002	<0.002	99.3
443934092565601	08-12-96	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	E0.190	<0.002	109
444211092544601	08-14-96	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	<0.002	<0.002	112
444214092490401	08-26-96	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	E0.003	<0.002	101
444331093080801	08-19-96	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	<0.002	<0.002	107
445108093054801	08-06-96	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	<0.002	<0.002	112
445117093042701	08-13-96	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	E0.002	<0.002	119

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	DISUL-	EPTC	ETHAL-	ETHANE	ETHO-	FONOFOS		LIN-
		FOTON	WATER	FLUR-	12DICL	PROP			URON
		WATER	WATER	ALIN	SURROG	WATER	WATER	LINDANE	WATER
		FLTRD	FLTRD	WAT FLT	VOC	FLTRD	WATER		FLTRD
		0.7 U	0.7 U	0.7 U	UNFLTRD	0.7 U	DISS	DIS-	0.7 U
GF, REC	GF, REC	GF, REC	REC	GF, REC	REC	REC	SOLVED	GF, REC	
(UG/L)	(UG/L)	(UG/L)	(UG/L)	PERCENT	(UG/L)	(UG/L)	(UG/L)	(UG/L)	
(39381)	(82677)	(82668)	(82663)	(99832)	(82672)	(04095)	(39341)	(82666)	

DAKOTA COUNTY

443042092570401	08-15-96	<0.001	<0.017	<0.002	<0.004	111	<0.003	<0.003	<0.004	<0.002
443119093050101	08-08-96	<0.001	<0.017	<0.002	<0.004	108	<0.003	<0.003	<0.004	<0.002
443641093110701	09-04-96	<0.001	<0.017	<0.002	<0.004	106	<0.003	<0.003	<0.004	<0.002
443645092525501	08-12-96	<0.001	<0.017	<0.002	<0.004	103	<0.003	<0.003	<0.004	<0.002
443645092525501	08-20-96	--	--	--	--	--	--	--	--	--
443808093012801	09-03-96	<0.001	<0.017	<0.002	<0.004	106	<0.003	<0.003	<0.004	<0.002
443934092565601	08-12-96	<0.001	<0.017	<0.002	<0.004	107	<0.003	<0.003	<0.004	<0.002
443934092565601	08-20-96	--	--	--	--	--	--	--	--	--
444211092544601	08-14-96	<0.001	<0.017	<0.002	<0.004	96.0	<0.003	<0.003	<0.004	<0.002
444214092490401	08-26-96	<0.001	<0.017	<0.002	<0.004	104	<0.003	<0.003	<0.004	<0.002
444331093080801	08-19-96	<0.001	<0.017	<0.002	<0.004	111	<0.003	<0.003	<0.004	<0.002
445108093054801	08-06-96	<0.001	<0.017	<0.002	<0.004	105	<0.003	<0.003	<0.004	<0.002
445117093042701	08-13-96	<0.001	<0.017	<0.002	<0.004	111	<0.003	<0.003	<0.004	<0.002

STATION NUMBER	DATE	MALA- THION, DIS- SOLVED (UG/L) (39532)	METHYL METHYL		METO- LACHLOR WATER (UG/L) (39415)	METRI- BUZIN WATER (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	P,P' DDE DISSOLV (UG/L) (34653)	PARA- THION, DIS- SOLVED (UG/L) (39542)
			AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)						

DAKOTA COUNTY

443042092570401	08-15-96	<0.005	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003	<0.006	<0.004
443119093050101	08-08-96	<0.005	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003	<0.006	<0.004
443641093110701	09-04-96	<0.005	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003	<0.006	<0.004
443645092525501	08-12-96	<0.005	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003	<0.006	<0.004
443645092525501	08-20-96	--	--	--	--	--	--	--	--	--
443808093012801	09-03-96	<0.005	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003	<0.006	<0.004
443934092565601	08-12-96	<0.005	<0.001	<0.006	0.004	<0.004	<0.004	<0.003	<0.006	<0.004
443934092565601	08-20-96	--	--	--	--	--	--	--	--	--
444211092544601	08-14-96	<0.005	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003	<0.006	<0.004
444214092490401	08-26-96	<0.005	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003	<0.006	<0.004
444331093080801	08-19-96	<0.005	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003	<0.006	<0.004
445108093054801	08-06-96	<0.005	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003	<0.006	<0.004
445117093042701	08-13-96	<0.005	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003	<0.006	<0.004

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF ORGANIC CHEMICALS

DAKOTA COUNTY

STATION NUMBER	DATE	PEB- ULATE WATER FLTRD 0.7 U GF, REC (UG/L) (82669)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	PF- PARITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)
443042092570401	08-15-96	<0.004	<0.004	<0.005	<0.002	<0.018	<0.003	<0.007	<0.004	<0.013
443119093050101	08-08-96	<0.004	<0.004	<0.005	<0.002	<0.018	<0.003	<0.007	<0.004	<0.013
443641093110701	09-04-96	<0.004	<0.004	<0.005	<0.002	<0.018	<0.003	<0.007	<0.004	<0.013
443645092525501	08-12-96	<0.004	<0.004	<0.005	<0.002	<0.018	<0.003	<0.007	<0.004	<0.013
443645092525501	08-20-96	--	--	--	--	--	--	--	--	--
443808093012801	09-03-96	<0.004	<0.004	<0.005	<0.002	<0.018	<0.003	<0.007	<0.004	<0.013
443934092565601	08-12-96	<0.004	<0.004	<0.005	<0.002	<0.018	<0.003	<0.007	<0.004	<0.013
443934092565601	08-20-96	--	--	--	--	--	--	--	--	--
444211092544601	08-14-96	<0.004	<0.004	<0.005	<0.002	<0.018	<0.003	<0.007	<0.004	<0.013
444214092490401	08-26-96	<0.004	<0.004	<0.005	<0.002	<0.018	<0.003	<0.007	<0.004	<0.013
444331093080801	08-19-96	<0.004	<0.004	<0.005	<0.002	<0.018	<0.003	<0.007	<0.004	<0.013
445108093054801	08-06-96	<0.004	<0.004	<0.005	<0.002	<0.018	<0.003	<0.007	<0.004	<0.013
445117093042701	08-13-96	<0.004	<0.004	<0.005	<0.002	<0.018	<0.003	<0.007	<0.004	<0.013

STATION NUMBER	DATE	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC (PERCENT) (91064)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TOLUENE D8 SURROG VOC REC (PERCENT) (99833)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)

DAKOTA COUNTY

443042092570401	08-15-96	<0.005	<0.010	<0.007	<0.013	127	<0.002	93.0	<0.001	<0.002
443119093050101	08-08-96	<0.005	<0.010	<0.007	<0.013	116	<0.002	89.0	<0.001	<0.002
443641093110701	09-04-96	<0.005	<0.010	<0.007	<0.013	110	<0.002	93.0	<0.001	<0.002
443645092525501	08-12-96	<0.005	<0.010	<0.007	<0.013	114	<0.002	112	<0.001	<0.002
443645092525501	08-20-96	--	--	--	--	--	--	--	--	--
443808093012801	09-03-96	<0.005	<0.010	<0.007	<0.013	107	<0.002	84.0	<0.001	<0.002
443934092565601	08-12-96	<0.005	<0.010	<0.007	<0.013	119	<0.002	123	<0.001	<0.002
443934092565601	08-20-96	--	--	--	--	--	--	--	--	--
444211092544601	08-14-96	<0.005	<0.010	<0.007	<0.013	115	<0.002	113	<0.001	<0.002
444214092490401	08-26-96	0.010	<0.010	<0.007	<0.013	128	<0.002	112	<0.001	<0.002
444331093080801	08-19-96	<0.005	<0.010	<0.007	<0.013	130	<0.002	94.0	<0.001	<0.002
445108093054801	08-06-96	<0.005	<0.010	<0.007	<0.013	121	<0.002	90.0	<0.001	<0.002
445117093042701	08-13-96	<0.005	<0.010	<0.007	<0.013	118	<0.002	113	<0.001	<0.002

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF ORGANIC CHEMICALS

DAKOTA COUNTY

STATION NUMBER	DATE	TIME	2,6-DI- ETHYL ANILINE	ACETO- CHLOR, WATER	ALA- CHLOR, WATER,	ALA- CHLOR, (ESA) WAT FLT	ALPHA BHC DIS- SOLVED	HCH ALPHA D6 SRG WAT FLT	AMETRYL WATER,	ATRA- ZINE, WATER,
			0.7 U GF, REC (UG/L) (82660)	FLTRD REC (UG/L) (49260)	DISS, REC, (UG/L) (46342)	GF 0.7U REC (UG/L) (50009)	(UG/L) (34253)	0.7 U GF, REC (UG/L) (91065)	DISS, REC, (UG/L) (38401)	DISS, REC (UG/L) (39632)

GOODHUE COUNTY

442140092521101	08-27-96	1000	<0.003	<0.002	<0.002	--	<0.002	114	--	<0.001
442733092532401	08-22-96	1100	<0.003	<0.002	<0.002	--	<0.002	112	--	E0.003
443112092513901	08-29-96	1000	<0.003	<0.002	<0.002	--	<0.002	109	--	<0.001

HENNEPIN COUNTY

444854093242501	09-03-96	1000	<0.003	<0.002	<0.002	--	<0.002	93.5	--	<0.001
445018093290901	08-01-96	1400	<0.003	<0.002	<0.002	--	<0.002	99.8	--	0.008
450104093294601	09-12-96	1000	<0.003	<0.002	<0.002	--	<0.002	96.8	--	<0.001
450516093281001	08-27-96	1300	<0.003	<0.002	<0.002	--	<0.002	125	--	<0.001

HUBBARD COUNTY

465527095035501	07-31-96	1000	--	<0.050	<0.050	<0.100	--	--	<0.050	0.100
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MORRISON COUNTY

454943094173201	08-26-96	1500	--	<0.050	<0.050	<0.100	--	--	<0.050	<0.050
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REDWOOD COUNTY

441428095073601	11-08-95	1134	--	--	--	--	--	--	--	--
441428095073601	04-17-96	1040	--	--	--	--	--	--	--	--
441428095073601	05-15-96	1200	--	--	--	--	--	--	--	--
441428095073601	07-24-96	0800	--	--	--	--	--	--	--	--
441428095073701	07-24-96	1025	--	--	--	--	--	--	--	--
441430095073705	11-08-95	0835	--	--	--	--	--	--	--	--
441430095073705	04-17-96	1200	--	--	--	--	--	--	--	--
441430095073705	05-15-96	1010	--	--	--	--	--	--	--	--
441430095073705	07-24-96	1000	--	--	--	--	--	--	--	--
441431095073705	11-08-95	1017	--	--	--	--	--	--	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BENZENE 14BRFL- SURROG VOC UNFLTRD REC PERCENT (99834)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	CYAN- AZINE AMIDE WAT FLT GF 0.7U REC (UG/L) (50010)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (72682)

GOODHUE COUNTY

442140092521101	08-27-96	<0.002	123	<0.002	<0.003	<0.003	<0.004	--	<0.004	<0.002
442733092532401	08-22-96	<0.002	99.0	<0.002	<0.003	<0.003	<0.004	--	<0.004	<0.002
443112092513901	08-29-96	<0.002	102	<0.002	<0.003	<0.003	<0.004	--	<0.004	<0.002

HENNEPIN COUNTY

444854093242501	09-03-96	<0.002	104	<0.002	<0.003	<0.003	<0.004	--	<0.004	<0.002
445018093290901	08-01-96	<0.002	79.0	<0.002	<0.003	<0.003	<0.004	--	<0.004	<0.002
450104093294601	09-12-96	<0.002	99.0	<0.002	<0.003	<0.003	<0.004	--	<0.004	<0.002
450516093281001	08-27-96	<0.002	126	<0.002	<0.003	<0.003	<0.004	--	<0.004	<0.002

HUBBARD COUNTY

465527095035501	07-31-96	--	--	--	--	--	--	<0.050	<0.050	--
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MORRISON COUNTY

454943094173201	08-26-96	--	--	--	--	--	--	<0.050	<0.050	--
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STATION NUMBER	DATE	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DEISO- PROPYL ATRAZIN WATER, DISS, REC (UG/L) (04038)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC PERCENT (91063)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	ETHANE 12DICI SURROG VOC UNFLTRD REC PERCENT (99832)

GOODHUE COUNTY

442140092521101	08-27-96	<0.002	--	<0.002	96.2	<0.001	<0.017	<0.002	<0.004	117
442733092532401	08-22-96	<0.002	--	<0.002	109	<0.001	<0.017	<0.002	<0.004	106
443112092513901	08-29-96	<0.002	--	<0.002	91.7	<0.001	<0.017	<0.002	<0.004	105

HENNEPIN COUNTY

444854093242501	09-03-96	<0.002	--	<0.002	99.3	<0.001	<0.017	<0.002	<0.004	106
445018093290901	08-01-96	<0.004	--	0.381	116	<0.001	<0.017	<0.002	<0.004	100
450104093294601	09-12-96	<0.002	--	<0.002	106	<0.001	<0.017	<0.002	<0.004	107
450516093281001	08-27-96	<0.002	--	<0.002	103	<0.001	<0.017	<0.002	<0.004	111

HUBBARD COUNTY

465527095035501	07-31-96	0.090	<0.050	--	--	--	--	--	--	--
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MORRISON COUNTY

454943094173201	08-26-96	<0.050	<0.050	--	--	--	--	--	--	--
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QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	ETHO- PROP WATER FLTRD 0.7 U	FONOFOS WATER DISS	LINDANE DIS- SOLVED (UG/L)	LIN- URON WATER FLTRD 0.7 U	MALA- THION, DIS- SOLVED (UG/L)	METHYL AZIN- PHOS WAT FLT 0.7 U	METHYL PARA- THION WAT FLT 0.7 U	METO- LACHLOR WATER (UG/L)	METRI- BUZIN SENCOR WATER (UG/L)
		GF, REC	REC	SOLVED	GF, REC	SOLVED	GF, REC	GF, REC	DISSOLV	DISSOLV
		(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)
		(82672)	(04095)	(39341)	(82666)	(39532)	(82686)	(82667)	(39415)	(82630)
GOODHUE COUNTY										
442140092521101	08-27-96	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002	<0.004
442733092532401	08-22-96	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002	<0.004
443112092513901	08-29-96	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002	<0.004

HENNEPIN COUNTY

444854093242501	09-03-96	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002	<0.004
445018093290901	08-01-96	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002	<0.004
450104093294601	09-12-96	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002	<0.004
450516093281001	08-27-96	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002	<0.004

HUBBARD COUNTY

[illegible]

MORRISON COUNTY

[illegible]

STATION NUMBER	DATE	MOL- INATE	NAPROP- AMIDE			PEB- ULATE	PENDI- METH-	PER- METHRINPHORATE	PRO- METON,
		WATER	WATER			WATER	ALIN	CIS	WATER
		FLTRD	FLTRD	P,P'	PARA- THON,	FILTRD	WAT FLT	WAT FLT	FLTRD
		0.7 U	0.7 U	DDE	DIS-	0.7 U	0.7 U	0.7 U	0.7 U
		GF, REC	GF, REC	DISSOLV	SOLVED	GF, REC	GF, REC	GF, REC	GF, REC
		(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	REC
		(82671)	(82684)	(34653)	(39542)	(82669)	(82683)	(82687)	(82664)
									(04037)

GOODHUE COUNTY

442140092521101	08-27-96	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002	<0.018
442733092532401	08-22-96	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002	<0.018
443112092513901	08-29-96	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002	<0.018

HENNEPIN COUNTY

444854093242501	09-03-96	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002	<0.018
445018093290901	08-01-96	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002	<0.018
450104093294601	09-12-96	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002	<0.018
450516093281001	08-27-96	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002	<0.018

HUBBARD COUNTY

465527095035501	07-31-96	--	--	--	--	--	--	--	0.050
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MORRISON COUNTY

[illegible]

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	PRO-METRYN, WATER, DISS, REC (UG/L) (04036)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PROP-AZINE WATER DISS, REC (UG/L) (38535)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)
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GOODHUE COUNTY

442140092521101	08-27-96	--	<0.003	<0.007	<0.004	<0.013	--	<0.005	<0.010
442733092532401	08-22-96	--	<0.003	<0.007	<0.004	<0.013	--	<0.005	<0.010
443112092513901	08-29-96	--	<0.003	<0.007	<0.004	<0.013	--	<0.005	<0.010

HENNEPIN COUNTY

444854093242501	09-03-96	--	<0.003	<0.007	<0.004	<0.013	--	<0.005	<0.010
445018093290901	08-01-96	--	<0.003	<0.007	<0.004	<0.013	--	<0.005	<0.010
450104093294601	09-12-96	--	<0.003	<0.007	<0.004	<0.013	--	<0.005	<0.010
450516093281001	08-27-96	--	<0.003	<0.007	<0.004	<0.013	--	<0.005	<0.010

HUBBARD COUNTY

465527095035501	07-31-96	<0.050	--	<0.050	--	--	<0.050	<0.050	--
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MORRISON COUNTY

454943094173201	08-26-96	<0.050	--	<0.050	--	--	<0.050	<0.050	--
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STATION NUMBER	DATE	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT (91064)	TER-BUTRYN WATER, DISS, REC (UG/L) (38888)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TOLUENE D8 SURROG VOC UNFLTRD REC PERCENT (99833)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRI-FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)
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GOODHUE COUNTY

442140092521101	08-27-96	<0.007	<0.013	121	--	<0.002	106	<0.001	<0.002
442733092532401	08-22-96	<0.007	<0.013	123	--	<0.002	88.0	<0.001	<0.002
443112092513901	08-29-96	<0.007	<0.013	120	--	<0.002	85.0	<0.001	<0.002

HENNEPIN COUNTY

444854093242501	09-03-96	<0.007	<0.013	115	--	<0.002	92.0	<0.001	<0.002
445018093290901	08-01-96	<0.007	<0.013	125	--	<0.002	95.0	<0.001	<0.002
450104093294601	09-12-96	<0.007	<0.013	120	--	<0.002	92.0	<0.001	<0.002
450516093281001	08-27-96	<0.007	<0.013	128	--	<0.002	109	<0.001	<0.002

HUBBARD COUNTY

465527095035501	07-31-96	--	--	--	<0.05	--	--	--	--
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MORRISON COUNTY

454943094173201	08-26-96	--	--	--	<0.05	--	--	--	--
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QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	1-NAPH THOL, WATER, FLTRD, GF 0.7U REC (UG/L) (49295)	2,4,5-T DIS- SOLVED (UG/L) (39742)	2,4-D, DIS- SOLVED (UG/L) (39732)	2,4-DB WATER, FLTRD, GF 0.7U REC (UG/L) (38746)	2,6-DI- ETHYL ANILINE WAT FLT GF, REC (UG/L) (82660)	3HYDRXY CARBO- FURAN WAT,FLT GF 0.7U REC (UG/L) (49308)	ACETO- CHLOR, WATER FLTRD REC (UG/L) (49260)	ACIFL- UORFEN WATER, FLTRD, GF 0.7U REC (UG/L) (49315)	ALA- CHLOR (ELISA) WAT FLT 0.7 U GF, REC (UG/L) (82695)
REDWOOD COUNTY										
443055094591101	08-23-96	--	--	--	--	<0.003	--	<0.002	--	--
443055094591101	09-25-96	<0.007	<0.035	<0.035	<0.035	--	<0.014	--	<0.035	--
443129094590901	08-23-96	--	--	--	--	--	--	--	--	--
RICE COUNTY										
441450093265701	07-30-96	--	--	--	--	<0.003	--	<0.002	--	--
441944093194601	08-21-96	--	--	--	--	<0.003	--	<0.002	--	--
442612093110201	08-13-96	--	--	--	--	E0.003	--	<0.002	--	--
442816093125901	08-27-96	--	--	--	--	<0.003	--	<0.002	--	--
443232093230901	07-31-96	--	--	--	--	<0.003	--	<0.002	--	--
ROCK COUNTY										
433345096110001	08-30-96	--	--	--	--	--	--	<0.050	--	--
433345096110002	11-29-95	--	--	--	--	--	--	<0.050	--	0.07
433345096110002	04-10-96	--	--	--	--	--	--	<0.050	--	--
433345096110002	05-22-96	--	--	--	--	--	--	<0.050	--	--
433345096110002	08-13-96	--	--	--	--	--	--	<0.050	--	--
433347096113501	11-29-95	--	--	--	--	--	--	<0.050	--	<0.05
433347096113501	04-10-96	--	--	--	--	--	--	<0.050	--	--
433347096113501	05-22-96	--	--	--	--	--	--	<0.050	--	--
433347096113501	08-13-96	--	--	--	--	--	--	<0.050	--	--
433352096110501	11-29-95	--	--	--	--	--	--	<0.050	--	<0.05
433352096110501	04-10-96	--	--	--	--	--	--	<0.050	--	--
433352096110501	05-22-96	--	--	--	--	--	--	<0.050	--	--
433352096110501	08-13-96	--	--	--	--	--	--	<0.050	--	--
433725096125001	08-14-96	--	--	--	--	--	--	<0.050	--	--
433750096123201	08-30-96	--	--	--	--	--	--	<0.050	--	--
433910096115902	11-28-95	--	--	--	--	--	--	<0.050	--	--
433910096115902	04-09-96	--	--	--	--	--	--	<0.050	--	--
433910096115902	05-20-96	--	--	--	--	--	--	<0.050	--	--
433910096115902	08-14-96	--	--	--	--	--	--	<0.050	--	--
433911096120101	11-28-95	--	--	--	--	--	--	<0.050	--	0.06
433911096120101	04-09-96	--	--	--	--	--	--	<0.050	--	--
433911096120101	05-20-96	--	--	--	--	--	--	<0.050	--	--
433911096120101	08-14-96	--	--	--	--	--	--	<0.050	--	--
433919096115401	11-28-95	--	--	--	--	--	--	<0.050	--	0.11
433919096115401	04-11-96	--	--	--	--	--	--	<0.050	--	--
433919096115401	05-21-96	--	--	--	--	--	--	<0.050	--	--
433919096115401	08-15-96	--	--	--	--	--	--	<0.050	--	--
433920096114901	11-28-95	--	--	--	--	--	--	<0.050	--	0.13
433920096114901	04-09-96	--	--	--	--	--	--	<0.050	--	--
433920096114901	05-20-96	--	--	--	--	--	--	<0.050	--	--
433920096114901	08-15-96	--	--	--	--	--	--	<0.050	--	--
433929096114701	11-30-95	--	--	--	--	--	--	<0.050	--	<0.05

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALA-CHLOR, (ESA) WAT FLT GF 0.7U REC (UG/L) (50009)	ALDI-CARB, WATER, FLTRD, GF 0.7U REC (UG/L) (49312)	ALDI-CARB SULFONE WAT,FLT GF 0.7U REC (UG/L) (49313)	ALDICA-RB SUL- FOXIDE, WAT,FLT GF 0.7U REC (UG/L) (49314)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	HCH ALPHA D6 SRG WAT FLT GF, REC PERCENT (91065)	AMETRYN WATER, DISS, REC, (UG/L) (38401)	AROCLR 1016 PCB TOTAL (UG/L) (34671)	AROCLR 1221 PCB TOTAL (UG/L) (39488)
		REDWOOD COUNTY									
443055094591101	08-23-96	<0.002	--	--	--	--	<0.002	76.0	--	--	--
443055094591101	09-25-96	--	--	<0.016	<0.016	<0.021	--	--	--	<0.100	<0.100
443129094590901	08-23-96	--	--	--	--	--	--	--	--	<0.100	<0.100
RICE COUNTY											
441450093265701	07-30-96	<0.002	--	--	--	--	<0.002	96.0	--	--	--
441944093194601	08-21-96	<0.002	--	--	--	--	<0.002	120	--	--	--
442612093110201	08-13-96	1.30	--	--	--	--	<0.002	98.8	--	--	--
442816093125901	08-27-96	<0.002	--	--	--	--	<0.002	121	--	--	--
443232093230901	07-31-96	<0.002	--	--	--	--	<0.002	98.2	--	--	--
ROCK COUNTY											
433345096110001	08-30-96	<0.050	0.630	--	--	--	--	--	<0.050	--	--
433345096110002	11-29-95	<0.050	0.740	--	--	--	--	--	<0.050	--	--
433345096110002	04-10-96	<0.050	0.690	--	--	--	--	--	<0.050	--	--
433345096110002	05-22-96	<0.050	0.490	--	--	--	--	--	<0.050	--	--
433345096110002	08-13-96	<0.050	0.710	--	--	--	--	--	<0.050	--	--
433347096113501	11-29-95	<0.050	<0.100	--	--	--	--	--	<0.050	--	--
433347096113501	04-10-96	<0.050	<0.100	--	--	--	--	--	<0.050	--	--
433347096113501	05-22-96	<0.050	<0.100	--	--	--	--	--	<0.050	--	--
433347096113501	08-13-96	<0.050	<0.100	--	--	--	--	--	<0.050	--	--
433352096110501	11-29-95	<0.050	0.930	--	--	--	--	--	<0.050	--	--
433352096110501	04-10-96	<0.050	0.720	--	--	--	--	--	<0.050	--	--
433352096110501	05-22-96	<0.050	0.660	--	--	--	--	--	<0.050	--	--
433352096110501	08-13-96	<0.050	0.970	--	--	--	--	--	<0.050	--	--
433725096125001	08-14-96	<0.050	0.210	--	--	--	--	--	<0.050	--	--
433750096123201	08-30-96	<0.050	0.130	--	--	--	--	--	<0.050	--	--
433910096115902	11-28-95	<0.050	1.08	--	--	--	--	--	<0.050	--	--
433910096115902	04-09-96	<0.050	0.850	--	--	--	--	--	<0.050	--	--
433910096115902	05-20-96	<0.050	0.970	--	--	--	--	--	<0.050	--	--
433910096115902	08-14-96	<0.050	1.61	--	--	--	--	--	<0.050	--	--
433911096120101	11-28-95	<0.050	0.810	--	--	--	--	--	<0.050	--	--
433911096120101	04-09-96	<0.050	0.700	--	--	--	--	--	<0.050	--	--
433911096120101	05-20-96	<0.050	0.690	--	--	--	--	--	<0.050	--	--
433911096120101	08-14-96	<0.050	0.780	--	--	--	--	--	<0.050	--	--
433919096115401	11-28-95	<0.050	1.02	--	--	--	--	--	<0.050	--	--
433919096115401	04-11-96	<0.050	0.810	--	--	--	--	--	<0.050	--	--
433919096115401	05-21-96	<0.050	0.760	--	--	--	--	--	<0.050	--	--
433919096115401	08-15-96	<0.050	0.780	--	--	--	--	--	<0.050	--	--
433920096114901	11-28-95	<0.050	0.770	--	--	--	--	--	<0.050	--	--
433920096114901	04-09-96	<0.050	0.560	--	--	--	--	--	<0.050	--	--
433920096114901	05-20-96	<0.050	0.610	--	--	--	--	--	<0.050	--	--
433920096114901	08-15-96	<0.050	0.710	--	--	--	--	--	<0.050	--	--
433929096114701	11-30-95	<0.050	<0.100	--	--	--	--	--	<0.050	--	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	AROCLO	AROCLO	ATRA-	BDMC,	BEN-	BENTA-	BENZENE	BRO-	B ² O-
		1232	1242	ZINE,	SURROG,	FLUR-	ZON,	14BRFL-	MACIL,	MO ² YNIL
		PCB	PCB	WATER,	WATER,	ALIN	WATER,	SURROG	WATER,	WATER,
		TOTAL	TOTAL	DISS,	UNFLTRD	0.7 U	GF 0.7U	UNFLTRD	DISS,	GF 0.7U
		(UG/L)	(UG/L)	REC	REC	GF, REC	REC	REC	REC	REC
		(39492)	(39496)	(39632)	PERCENT	(UG/L)	(UG/L)	PERCENT	(UG/L)	(UG/L)
					(99835)	(82673)	(38711)	(99834)	(04029)	(40311) (04028)
REDWOOD COUNTY										
443055094591101	08-23-96	--	--	0.007	--	<0.002	--	--	--	<0.002
443055094591101	09-25-96	<0.100	<0.100	--	98.0	--	<0.014	--	<0.035	<0.035
443129094590901	08-23-96	<0.100	<0.100	--	--	--	--	--	--	--
RICE COUNTY										
441450093265701	07-30-96	--	--	<0.001	--	<0.002	--	85.0	--	<0.002
441944093194601	08-21-96	--	--	<0.001	--	<0.002	--	101	--	<0.002
442612093110201	08-13-96	--	--	0.120	--	<0.002	--	114	--	<0.002
442816093125901	08-27-96	--	--	<0.001	--	<0.002	--	121	--	<0.002
443232093230901	07-31-96	--	--	<0.001	--	<0.002	--	84.0	--	<0.002
ROCK COUNTY										
433345096110001	08-30-96	--	--	0.080	--	--	--	--	--	--
433345096110002	11-29-95	--	--	0.090	--	--	--	--	--	--
433345096110002	04-10-96	--	--	0.050	--	--	--	--	--	--
433345096110002	05-22-96	--	--	<0.050	--	--	--	--	--	--
433345096110002	08-13-96	--	--	0.100	--	--	--	--	--	--
433347096113501	11-29-95	--	--	0.110	--	--	--	--	--	--
433347096113501	04-10-96	--	--	0.090	--	--	--	--	--	--
433347096113501	05-22-96	--	--	0.090	--	--	--	--	--	--
433347096113501	08-13-96	--	--	0.100	--	--	--	--	--	--
433352096110501	11-29-95	--	--	0.120	--	--	--	--	--	--
433352096110501	04-10-96	--	--	0.060	--	--	--	--	--	--
433352096110501	05-22-96	--	--	0.100	--	--	--	--	--	--
433352096110501	08-13-96	--	--	0.620	--	--	--	--	--	--
433725096125001	08-14-96	--	--	<0.050	--	--	--	--	--	--
433750096123201	08-30-96	--	--	0.110	--	--	--	--	--	--
433910096115902	11-28-95	--	--	0.090	--	--	--	--	--	--
433910096115902	04-09-96	--	--	0.060	--	--	--	--	--	--
433910096115902	05-20-96	--	--	0.060	--	--	--	--	--	--
433910096115902	08-14-96	--	--	0.560	--	--	--	--	--	--
433911096120101	11-28-95	--	--	0.070	--	--	--	--	--	--
433911096120101	04-09-96	--	--	0.080	--	--	--	--	--	--
433911096120101	05-20-96	--	--	0.070	--	--	--	--	--	--
433911096120101	08-14-96	--	--	0.600	--	--	--	--	--	--
433919096115401	11-28-95	--	--	0.100	--	--	--	--	--	--
433919096115401	04-11-96	--	--	<0.050	--	--	--	--	--	--
433919096115401	05-21-96	--	--	<0.050	--	--	--	--	--	--
433919096115401	08-15-96	--	--	0.050	--	--	--	--	--	--
433920096114901	11-28-95	--	--	0.070	--	--	--	--	--	--
433920096114901	04-09-96	--	--	<0.050	--	--	--	--	--	--
433920096114901	05-20-96	--	--	0.050	--	--	--	--	--	--
433920096114901	08-15-96	--	--	0.280	--	--	--	--	--	--
433929096114701	11-30-95	--	--	<0.050	--	--	--	--	--	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CAR-BARYL WATER, FLTRD, GF 0.7U REC (UG/L) (49310)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CARBO- FURAN, WATER, FLTRD, GF 0.7U REC (UG/L) (49309)	CHLOR- AMBEN, WATER, FLTRD, GF 0.7U REC (UG/L) (49307)	CHLORO- THALO- NIL, WAT,FLT PYRIFOS DIS- SOLVED (UG/L) (38933)	CLOPYR- ALID, WATER, FLTRD, GF 0.7U REC (UG/L) (49305)	CYAN- AZINE CYANA- AMIDE ZINE, WAT FLT H2O, GF 0.7U DISS, REC REC (UG/L) (UG/L) (50010) (04041)
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REDWOOD COUNTY

443055094591101	08-23-96	<0.003	--	<0.003	--	--	--	<0.004	--	--	E0.004
443055094591101	09-25-96	--	<0.008	--	<0.028	<0.011	<0.035	--	<0.050	--	--

RICE COUNTY

441450093265701	07-30-96	<0.003	--	<0.003	--	--	--	<0.004	--	--	<0.004
441944093194601	08-21-96	<0.003	--	<0.003	--	--	--	<0.004	--	--	<0.004
442612093110201	08-13-96	<0.003	--	<0.003	--	--	--	<0.004	--	--	<0.004
442816093125901	08-27-96	<0.003	--	<0.003	--	--	--	<0.004	--	--	<0.004
443232093230901	07-31-96	<0.003	--	<0.003	--	--	--	<0.004	--	--	<0.004

ROCK COUNTY

433345096110001	08-30-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433345096110002	11-29-95	--	--	--	--	--	--	--	--	<0.050	<0.050
433345096110002	04-10-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433345096110002	05-22-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433345096110002	08-13-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433347096113501	11-29-95	--	--	--	--	--	--	--	--	<0.050	<0.050
433347096113501	04-10-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433347096113501	05-22-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433347096113501	08-13-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433352096110501	11-29-95	--	--	--	--	--	--	--	--	<0.050	<0.050
433352096110501	04-10-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433352096110501	05-22-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433352096110501	08-13-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433725096125001	08-14-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433750096123201	08-30-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433910096115902	11-28-95	--	--	--	--	--	--	--	--	<0.050	<0.050
433910096115902	04-09-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433910096115902	05-20-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433910096115902	08-14-96	--	--	--	--	--	--	--	--	0.050	<0.050
433911096120101	11-28-95	--	--	--	--	--	--	--	--	<0.050	<0.050
433911096120101	04-09-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433911096120101	05-20-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433911096120101	08-14-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433919096115401	11-28-95	--	--	--	--	--	--	--	--	<0.050	<0.050
433919096115401	04-11-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433919096115401	05-21-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433919096115401	08-15-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433920096114901	11-28-95	--	--	--	--	--	--	--	--	<0.050	<0.050
433920096114901	04-09-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433920096114901	05-20-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433920096114901	08-15-96	--	--	--	--	--	--	--	--	<0.050	<0.050
433929096114701	11-30-95	--	--	--	--	--	--	--	--	<0.050	<0.050

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	DACTHAL	DCPA	DEETHYL	DEETHYL	DEISO-		DIAZ-		DICHLO-	DCHL.
		MONO- ACID, WAT,FLT GF 0.7U REC (UG/L) (49304)	WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DEISO- PROPYL ATRAZIN DISS, REC (UG/L) (04039)	PROPYL ATRAZIN DISS, REC (UG/L) (04038)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	INON D10 SRG GF, REC PERCENT (91063)	DICAMBA WATER, FLTRD, GF 0.7U REC (UG/L) (38442)	BIFENIL, PROP, WATER, H2O, FLTRD, FLTRD, GF 0.7U GF 0.7U F °C REC (UG/L) (UG/L) (49303) (49302)	

REDWOOD COUNTY

443055094591101	08-23-96	--	<0.002	E0.002	--	--	<0.002	83.5	--	--	--
443055094591101	09-25-96	<0.017	--	--	--	--	--	--	<0.035	<0.020	<0.032

RICE COUNTY

441450093265701	07-30-96	--	<0.002	<0.002	--	--	<0.002	119	--	--	--
441944093194601	08-21-96	--	<0.002	<0.002	--	--	<0.002	108	--	--	--
442612093110201	08-13-96	--	<0.002	E0.059	--	--	<0.002	107	--	--	--
442816093125901	08-27-96	--	<0.002	<0.002	--	--	<0.002	109	--	--	--
443232093230901	07-31-96	--	<0.002	<0.002	--	--	<0.002	110	--	--	--

ROCK COUNTY

433345096110001	08-30-96	--	--	<0.050	--	<0.050	--	--	--	--	--
433345096110002	11-29-95	--	--	<0.050	--	<0.050	--	--	--	--	--
433345096110002	04-10-96	--	--	<0.050	--	<0.050	--	--	--	--	--
433345096110002	05-22-96	--	--	<0.050	--	<0.050	--	--	--	--	--
433345096110002	08-13-96	--	--	<0.050	--	<0.050	--	--	--	--	--
433347096113501	11-29-95	--	--	0.090	--	0.100	--	--	--	--	--
433347096113501	04-10-96	--	--	0.090	--	0.090	--	--	--	--	--
433347096113501	05-22-96	--	--	0.080	--	0.050	--	--	--	--	--
433347096113501	08-13-96	--	--	0.090	--	0.120	--	--	--	--	--
433352096110501	11-29-95	--	--	<0.050	--	<0.050	--	--	--	--	--
433352096110501	04-10-96	--	--	<0.050	--	<0.050	--	--	--	--	--
433352096110501	05-22-96	--	--	0.050	--	<0.050	--	--	--	--	--
433352096110501	08-13-96	--	--	0.100	--	0.080	--	--	--	--	--
433725096125001	08-14-96	--	--	<0.050	--	<0.050	--	--	--	--	--
433750096123201	08-30-96	--	--	0.100	--	<0.050	--	--	--	--	--
433910096115902	11-28-95	--	--	<0.050	--	<0.050	--	--	--	--	--
433910096115902	04-09-96	--	--	<0.050	--	<0.050	--	--	--	--	--
433910096115902	05-20-96	--	--	<0.050	--	<0.050	--	--	--	--	--
433910096115902	08-14-96	--	--	0.100	--	0.060	--	--	--	--	--
433911096120101	11-28-95	--	--	0.050	--	<0.050	--	--	--	--	--
433911096120101	04-09-96	--	--	0.050	--	<0.050	--	--	--	--	--
433911096120101	05-20-96	--	--	<0.050	--	<0.050	--	--	--	--	--
433911096120101	08-14-96	--	--	0.100	--	0.090	--	--	--	--	--
433919096115401	11-28-95	--	--	0.050	--	0.060	--	--	--	--	--
433919096115401	04-11-96	--	--	<0.050	--	<0.050	--	--	--	--	--
433919096115401	05-21-96	--	--	<0.050	--	<0.050	--	--	--	--	--
433919096115401	08-15-96	--	--	--	<0.05	<0.050	--	--	--	--	--
433920096114901	11-28-95	--	--	<0.050	--	<0.050	--	--	--	--	--
433920096114901	04-09-96	--	--	<0.050	--	<0.050	--	--	--	--	--
433920096114901	05-20-96	--	--	<0.050	--	<0.050	--	--	--	--	--
433920096114901	08-15-96	--	--	0.050	--	0.050	--	--	--	--	--
433929096114701	11-30-95	--	--	<0.050	--	<0.050	--	--	--	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	DI- ELDRIN DIS- SOLVED	DINOSEB WATER, FLTRD, GF 0.7U REC	DISUL- FOTON WATER FLTRD 0.7 U GF, REC	DIURON, WATER, FLTRD, GF 0.7U REC	DNOC WAT,FLT GF 0.7U REC	EPTC WATER FLTRD 0.7 U GF, REC	ESFEN- VAL- ERATE, WAT,FLT GF 0.7U REC	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC	ETHANE 12DICL SIRROG VOC UNFLTD REC
		(UG/L) (39381)	(UG/L) (49301)	(UG/L) (82677)	(UG/L) (49300)	(UG/L) (49299)	(UG/L) (82668)	(UG/L) (49298)	(UG/L) (82663)	PERCENT (99832)

REDWOOD COUNTY

443055094591101	08-23-96	<0.001	--	<0.017	--	--	<0.002	--	<0.004	--
443055094591101	09-25-96	--	<0.035	--	<0.020	<0.035	--	<0.019	--	--
443129094590901	08-23-96	--	--	--	--	--	--	--	--	--

RICE COUNTY

441450093265701	07-30-96	<0.001	--	<0.017	--	--	<0.002	--	<0.004	108
441944093194601	08-21-96	<0.001	--	<0.017	--	--	<0.002	--	<0.004	105
442612093110201	08-13-96	<0.001	--	<0.017	--	--	<0.002	--	<0.004	108
442816093125901	08-27-96	<0.001	--	<0.017	--	--	<0.002	--	<0.004	124
443232093230901	07-31-96	<0.001	--	<0.017	--	--	<0.002	--	<0.004	105

STATION NUMBER	DATE	ETHO- PROP WATER FLTRD 0.7 U GF, REC	FEN- URON, WATER, FLTRD, GF 0.7U REC	FLUO- METURON WATER, FLTRD, GF 0.7U REC	FONOFOS WATER DISS REC	LINDANE DIS- SOLVED (UG/L)	LIN- URON WATER FLTRD 0.7 U GF, REC	LINURON WATER, FLTRD, GF 0.7U REC	MALA- THION, DIS- SOLVED (UG/L)	MCPB, WATER, FLTRD, GF 0.7U REC
		(UG/L) (82672)	(UG/L) (49297)	(UG/L) (38811)	(UG/L) (04095)	(UG/L) (39341)	(UG/L) (82666)	(UG/L) (38478)	(UG/L) (39532)	(UG/L) (38487)

REDWOOD COUNTY

443055094591101	08-23-96	<0.003	--	--	<0.003	<0.004	<0.002	--	<0.005	--
443055094591101	09-25-96	--	<0.013	<0.035	--	--	--	<0.018	--	<0.035

RICE COUNTY

441450093265701	07-30-96	<0.003	--	--	<0.003	<0.004	<0.002	--	<0.005	--
441944093194601	08-21-96	<0.003	--	--	<0.003	<0.004	<0.002	--	<0.005	--
442612093110201	08-13-96	<0.003	--	--	<0.003	<0.004	<0.002	--	<0.005	--
442816093125901	08-27-96	<0.003	--	--	<0.003	<0.004	<0.002	--	<0.005	--
443232093230901	07-31-96	<0.003	--	--	<0.003	<0.004	<0.002	--	<0.005	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	MCPA, WATER, FLTRD, GF 0.7U REC (UG/L) (38482)	METHIO- CARB, WATER, FLTRD, GF 0.7U REC (UG/L) (38501)	METH- OMYL, WATER, FLTRD, GF 0.7U REC (UG/L) (49296)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)
REDWOOD COUNTY										
443055094591101	08-23-96	--	--	--	<0.001	<0.006	E0.003	<0.004	<0.004	<0.003
443055094591101	09-25-96	<0.050	<0.026	<0.017	--	--	--	--	--	--
RICE COUNTY										
441450093265701	07-30-96	--	--	--	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003
441944093194601	08-21-96	--	--	--	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003
442612093110201	08-13-96	--	--	--	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003
442816093125901	08-27-96	--	--	--	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003
443232093230901	07-31-96	--	--	--	<0.001	<0.006	<0.002	<0.004	<0.004	<0.003
ROCK COUNTY										
433345096110001	08-30-96	--	--	--	--	--	<0.050	<0.050	--	--
433345096110002	11-29-95	--	--	--	--	--	0.050	<0.050	--	--
433345096110002	04-10-96	--	--	--	--	--	<0.050	<0.050	--	--
433345096110002	05-22-96	--	--	--	--	--	0.050	<0.050	--	--
433345096110002	08-13-96	--	--	--	--	--	0.070	<0.050	--	--
433347096113501	11-29-95	--	--	--	--	--	<0.050	<0.050	--	--
433347096113501	04-10-96	--	--	--	--	--	<0.050	<0.050	--	--
433347096113501	05-22-96	--	--	--	--	--	<0.050	<0.050	--	--
433347096113501	08-13-96	--	--	--	--	--	<0.050	<0.050	--	--
433352096110501	11-29-95	--	--	--	--	--	0.110	<0.050	--	--
433352096110501	04-10-96	--	--	--	--	--	0.120	<0.050	--	--
433352096110501	05-22-96	--	--	--	--	--	0.290	<0.050	--	--
433352096110501	08-13-96	--	--	--	--	--	0.300	<0.050	--	--
433725096125001	08-14-96	--	--	--	--	--	<0.050	<0.050	--	--
433750096123201	08-30-96	--	--	--	--	--	<0.050	<0.050	--	--
433910096115902	11-28-95	--	--	--	--	--	0.050	<0.050	--	--
433910096115902	04-09-96	--	--	--	--	--	0.050	<0.050	--	--
433910096115902	05-20-96	--	--	--	--	--	0.080	<0.050	--	--
433910096115902	08-14-96	--	--	--	--	--	0.110	<0.050	--	--
433911096120101	11-28-95	--	--	--	--	--	<0.050	<0.050	--	--
433911096120101	04-09-96	--	--	--	--	--	0.180	<0.050	--	--
433911096120101	05-20-96	--	--	--	--	--	0.140	<0.050	--	--
433911096120101	08-14-96	--	--	--	--	--	0.150	<0.050	--	--
433919096115401	11-28-95	--	--	--	--	--	0.060	<0.050	--	--
433919096115401	04-11-96	--	--	--	--	--	<0.050	<0.050	--	--
433919096115401	05-21-96	--	--	--	--	--	<0.050	<0.050	--	--
433919096115401	08-15-96	--	--	--	--	--	0.050	<0.050	--	--
433920096114901	11-28-95	--	--	--	--	--	<0.050	<0.050	--	--
433920096114901	04-09-96	--	--	--	--	--	0.060	<0.050	--	--
433920096114901	05-20-96	--	--	--	--	--	0.060	<0.050	--	--
433920096114901	08-15-96	--	--	--	--	--	0.100	<0.050	--	--
433929096114701	11-30-95	--	--	--	--	--	<0.050	<0.050	--	--

QUALITY OF GROUND WATER
 WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
 ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	NEB- URON, WATER, FLTRD, GF 0.7U REC (UG/L) (49294)	NORFLUR AZON, WATER, FLTRD, GF 0.7U REC (UG/L) (49293)	ORY- ZALIN, WATER, FLTRD, GF 0.7U REC (UG/L) (49292)	OXAMYL, WATER, FLTRD, GF 0.7U REC (UG/L) (38866)	P,P' DDE DISSOLV (UG/L) (34653)	PARA- THION, DIS- SOLVED (UG/L) (39542)	AROCLOR 1248 PCB TOTAL (UG/L) (39500)	AROCLOR 1254 PCB TOTAL (UG/L) (39504)	AROCLOR 1260 PCB TOTAL (UG/L) (39508)

REDWOOD COUNTY

443055094591101	08-23-96	--	--	--	--	<0.006	<0.004	--	--	--
443055094591101	09-25-96	<0.015	<0.024	<0.019	<0.018	--	--	<0.100	<0.100	<0.100
443129094590901	08-23-96	--	--	--	--	--	--	<0.100	<0.100	<0.100

RICE COUNTY

441450093265701	07-30-96	--	--	--	--	<0.006	<0.004	--	--	--
441944093194601	08-21-96	--	--	--	--	<0.006	<0.004	--	--	--
442612093110201	08-13-96	--	--	--	--	<0.006	<0.004	--	--	--
442816093125901	08-27-96	--	--	--	--	<0.006	<0.004	--	--	--
443232093230901	07-31-96	--	--	--	--	<0.006	<0.004	--	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	PIC- LORAM, WATER, FLTRD, GF 0.7U REC (UG/L) (49291)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRO- METRYN, WATER, DISS, REC (UG/L) (04036)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)
REDWOOD COUNTY										
443055094591101	08-23-96	<0.004	<0.004	<0.005	<0.002	--	<0.018	--	<0.003	<0.007
443055094591101	09-25-96	--	--	--	--	<0.050	--	--	--	--
RICE COUNTY										
441450093265701	07-30-96	<0.004	<0.004	<0.005	<0.002	--	<0.018	--	<0.003	<0.007
441944093194601	08-21-96	<0.004	<0.004	<0.005	<0.002	--	<0.018	--	<0.003	<0.007
442612093110201	08-13-96	<0.004	<0.004	<0.005	<0.002	--	<0.018	--	<0.003	<0.007
442816093125901	08-27-96	<0.004	<0.004	<0.005	<0.002	--	<0.018	--	<0.003	<0.007
443232093230901	07-31-96	<0.004	<0.004	<0.005	<0.002	--	<0.018	--	<0.003	<0.007
ROCK COUNTY										
433345096110001	08-30-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433345096110002	11-29-95	--	--	--	--	--	<0.050	<0.050	--	<0.050
433345096110002	04-10-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433345096110002	05-22-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433345096110002	08-13-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433347096113501	11-29-95	--	--	--	--	--	<0.050	<0.050	--	<0.050
433347096113501	04-10-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433347096113501	05-22-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433347096113501	08-13-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433352096110501	11-29-95	--	--	--	--	--	<0.050	<0.050	--	<0.050
433352096110501	04-10-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433352096110501	05-22-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433352096110501	08-13-96	--	--	--	--	--	<0.050	<0.050	--	0.050
433725096125001	08-14-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433750096123201	08-30-96	--	--	--	--	--	0.610	<0.050	--	<0.050
433910096115902	11-28-95	--	--	--	--	--	<0.050	<0.050	--	<0.050
433910096115902	04-09-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433910096115902	05-20-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433910096115902	08-14-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433911096120101	11-28-95	--	--	--	--	--	<0.050	<0.050	--	<0.050
433911096120101	04-09-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433911096120101	05-20-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433911096120101	08-14-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433919096115401	11-28-95	--	--	--	--	--	<0.050	<0.050	--	<0.050
433919096115401	04-11-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433919096115401	05-21-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433919096115401	08-15-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433920096114901	11-28-95	--	--	--	--	--	<0.050	<0.050	--	<0.050
433920096114901	04-09-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433920096114901	05-20-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433920096114901	08-15-96	--	--	--	--	--	<0.050	<0.050	--	<0.050
433929096114701	11-30-95	--	--	--	--	--	<0.050	<0.050	--	<0.050

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PROP-AZINE WATER DISS REC (UG/L) (38535)	PRO-PHAM, WATER, FLTRD, GF 0.7U REC (UG/L) (49236)	PRO-POXUR, WATER, FLTRD, GF 0.7U REC (UG/L) (38538)	SILVEX, DIS- SOLVED (UG/L) (39762)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)
REDWOOD COUNTY										
443055094591101	08-23-96	<0.004	<0.013	--	--	--	--	<0.005	<0.010	<0.017
443055094591101	09-25-96	--	--	--	<0.035	<0.035	<0.021	--	--	--
443129094590901	08-23-96	--	--	--	--	--	--	--	--	--
RICE COUNTY										
441450093265701	07-30-96	<0.004	<0.013	--	--	--	--	<0.005	<0.010	<0.017
441944093194601	08-21-96	<0.004	<0.013	--	--	--	--	<0.005	<0.010	<0.017
442612093110201	08-13-96	<0.004	<0.013	--	--	--	--	0.005	<0.010	<0.017
442816093125901	08-27-96	<0.004	<0.013	--	--	--	--	<0.005	<0.010	<0.017
443232093230901	07-31-96	<0.004	<0.013	--	--	--	--	<0.005	<0.010	<0.017
ROCK COUNTY										
433345096110001	08-30-96	--	--	<0.050	--	--	--	<0.050	--	--
433345096110002	11-29-95	--	--	<0.050	--	--	--	<0.050	--	--
433345096110002	04-10-96	--	--	<0.050	--	--	--	<0.050	--	--
433345096110002	05-22-96	--	--	<0.050	--	--	--	<0.050	--	--
433345096110002	08-13-96	--	--	<0.050	--	--	--	<0.050	--	--
433347096113501	11-29-95	--	--	<0.050	--	--	--	<0.050	--	--
433347096113501	04-10-96	--	--	<0.050	--	--	--	<0.050	--	--
433347096113501	05-22-96	--	--	<0.050	--	--	--	<0.050	--	--
433347096113501	08-13-96	--	--	<0.050	--	--	--	<0.050	--	--
433352096110501	11-29-95	--	--	<0.050	--	--	--	<0.050	--	--
433352096110501	04-10-96	--	--	<0.050	--	--	--	<0.050	--	--
433352096110501	05-22-96	--	--	<0.050	--	--	--	<0.050	--	--
433352096110501	08-13-96	--	--	<0.050	--	--	--	<0.050	--	--
433725096125001	08-14-96	--	--	<0.050	--	--	--	<0.050	--	--
433750096123201	08-30-96	--	--	<0.050	--	--	--	<0.050	--	--
433910096115902	11-28-95	--	--	<0.050	--	--	--	<0.050	--	--
433910096115902	04-09-96	--	--	<0.050	--	--	--	<0.050	--	--
433910096115902	05-20-96	--	--	<0.050	--	--	--	<0.050	--	--
433910096115902	08-14-96	--	--	<0.050	--	--	--	<0.050	--	--
433911096120101	11-28-95	--	--	<0.050	--	--	--	<0.050	--	--
433911096120101	04-09-96	--	--	<0.050	--	--	--	<0.050	--	--
433911096120101	05-20-96	--	--	<0.050	--	--	--	<0.050	--	--
433911096120101	08-14-96	--	--	<0.050	--	--	--	<0.050	--	--
433919096115401	11-28-95	--	--	<0.050	--	--	--	<0.050	--	--
433919096115401	04-11-96	--	--	<0.050	--	--	--	<0.050	--	--
433919096115401	05-21-96	--	--	<0.050	--	--	--	<0.050	--	--
433919096115401	08-15-96	--	--	<0.050	--	--	--	<0.050	--	--
433920096114901	11-28-95	--	--	<0.050	--	--	--	<0.050	--	--
433920096114901	04-09-96	--	--	<0.050	--	--	--	<0.050	--	--
433920096114901	05-20-96	--	--	<0.050	--	--	--	<0.050	--	--
433920096114901	08-15-96	--	--	<0.050	--	--	--	<0.050	--	--
433929096114701	11-30-95	--	--	<0.050	--	--	--	<0.050	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	TERBUTH YLAZINE SURROGTBUTRYN WAT FLT 0.7 U GF, REC PERCENT (91064)	TER- BUTRYN WATER, DISS, REC (UG/L) (38888)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TOLUENE D8 SURROG VOC REC PERCENT (99833)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRIAZIN SCREEN (ELISA) WAT,WH REC,AS (UG/L) (34757)	TRI- CLOPYR, WATER, FLTRD, GF 0.7U REC (UG/L) (49235)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)
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REDWOOD COUNTY

443055094591101	08-23-96	<0.013	110	--	<0.002	--	<0.001	--	--	<0.002
443055094591101	09-25-96	--	--	--	--	--	--	--	<0.050	--

RICE COUNTY

441450093265701	07-30-96	<0.013	125	--	<0.002	98.0	<0.001	--	--	<0.002
441944093194601	08-21-96	<0.013	123	--	<0.002	92.0	<0.001	--	--	<0.002
442612093110201	08-13-96	<0.013	114	--	<0.002	114	<0.001	--	--	<0.002
442816093125901	08-27-96	<0.013	133	--	<0.002	95.0	<0.001	--	--	<0.002
443232093230901	07-31-96	<0.013	118	--	<0.002	100	<0.001	--	--	<0.002

ROCK COUNTY

433345096110001	08-30-96	--	--	<0.05	--	--	--	--	--	--
433345096110002	11-29-95	--	--	<0.05	--	--	--	0.1	--	--
433345096110002	04-10-96	--	--	<0.05	--	--	--	--	--	--
433345096110002	05-22-96	--	--	<0.05	--	--	--	--	--	--
433345096110002	08-13-96	--	--	<0.05	--	--	--	--	--	--
433347096113501	11-29-95	--	--	<0.05	--	--	--	0.1	--	--
433347096113501	04-10-96	--	--	<0.05	--	--	--	--	--	--
433347096113501	05-22-96	--	--	<0.05	--	--	--	--	--	--
433347096113501	08-13-96	--	--	<0.05	--	--	--	--	--	--
433352096110501	11-29-95	--	--	<0.05	--	--	--	0.1	--	--
433352096110501	04-10-96	--	--	<0.05	--	--	--	--	--	--
433352096110501	05-22-96	--	--	<0.05	--	--	--	--	--	--
433352096110501	08-13-96	--	--	<0.05	--	--	--	--	--	--
433725096125001	08-14-96	--	--	<0.05	--	--	--	--	--	--
433750096123201	08-30-96	--	--	<0.05	--	--	--	--	--	--
433910096115902	11-28-95	--	--	<0.05	--	--	--	0.1	--	--
433910096115902	04-09-96	--	--	<0.05	--	--	--	--	--	--
433910096115902	05-20-96	--	--	<0.05	--	--	--	--	--	--
433910096115902	08-14-96	--	--	<0.05	--	--	--	--	--	--
433911096120101	11-28-95	--	--	<0.05	--	--	--	--	--	--
433911096120101	04-09-96	--	--	<0.05	--	--	--	--	--	--
433911096120101	05-20-96	--	--	<0.05	--	--	--	--	--	--
433911096120101	08-14-96	--	--	<0.05	--	--	--	--	--	--
433919096115401	11-28-95	--	--	<0.05	--	--	--	0.1	--	--
433919096115401	04-11-96	--	--	<0.05	--	--	--	--	--	--
433919096115401	05-21-96	--	--	<0.05	--	--	--	--	--	--
433919096115401	08-15-96	--	--	<0.05	--	--	--	--	--	--
433920096114901	11-28-95	--	--	<0.05	--	--	--	0.1	--	--
433920096114901	04-09-96	--	--	<0.05	--	--	--	--	--	--
433920096114901	05-20-96	--	--	<0.05	--	--	--	--	--	--
433920096114901	08-15-96	--	--	<0.05	--	--	--	--	--	--
433929096114701	11-30-95	--	--	<0.05	--	--	--	0.0	--	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	2,6-DI- ETHYL ANILINE WAT FLT. 0.7 U GF, REC (UG/L) (82660)	ACETO- CHLOR, WATER FLTRD REC (UG/L) (49260)	ALA- CHLOR (ELISA) WAT FLT 0.7 U GF, REC (UG/L) (82695)	ALA- CHLOR, (ESA) WAT FLT DISS, REC, (UG/L) (46342)	ALA- CHLOR, (ESA) WAT FLT GF 0.7U REC (UG/L) (50009)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT (91065)	AMETR N WATER, DISS, REC, (UG/L) (38401)
ROCK COUNTY										
433929096114701	04-11-96	1030	--	<0.050	--	<0.050	<0.100	--	--	<0.050
433929096114701	05-21-96	1215	--	<0.050	--	<0.050	<0.100	--	--	<0.050
433929096114701	08-15-96	1455	--	<0.050	--	<0.050	<0.100	--	--	<0.050
433932096113701	04-11-96	0930	--	<0.050	--	<0.050	1.34	--	--	<0.050
433932096113701	05-21-96	1045	--	<0.050	--	<0.050	1.25	--	--	<0.050
433932096113701	08-29-96	1600	--	<0.050	--	<0.050	1.46	--	--	<0.050
433952096113101	11-30-95	1015	--	<0.050	<0.05	<0.050	0.350	--	--	<0.050
433952096113101	08-15-96	1330	--	<0.050	--	<0.050	0.400	--	--	<0.050
SCOTT COUNTY										
443328093184701	07-30-96	1400	<0.003	<0.002	--	<0.002	--	<0.002	100	--
443505093255201	07-31-96	1000	<0.003	<0.002	--	<0.002	--	<0.002	94.3	--
444059093260901	08-01-96	1000	<0.003	<0.002	--	<0.002	--	<0.002	69.0	--
444202093225901	08-05-96	1200	<0.003	<0.002	--	<0.002	--	<0.002	103	--
STEARNS COUNTY										
452256094423301	07-17-96	1100	--	<0.050	--	<0.050	1.97	--	--	<0.050
452755094254501	07-16-96	1400	--	<0.050	--	<0.050	4.27	--	--	<0.050
453708094121801	07-18-96	1300	--	<0.050	--	<0.050	0.570	--	--	<0.050
454434094570102	07-17-96	1500	--	<0.050	--	<0.050	1.59	--	--	<0.050
WASHINGTON COUNTY										
445245092545501	08-14-96	0900	<0.003	<0.002	--	<0.002	--	<0.002	99.8	--
445321092590101	08-07-96	1000	<0.003	<0.002	--	<0.002	--	<0.002	98.8	--
445821092575101	09-05-96	1100	--	--	--	--	--	--	--	--
445919092500101	08-08-96	1400	<0.003	<0.002	--	<0.002	--	<0.002	102	--
450016092575701	07-02-96	1345	--	--	--	--	--	--	--	--
450520092543401	08-06-96	1300	<0.003	<0.002	--	<0.002	--	<0.002	101	--
450603092500201	08-15-96	1400	<0.003	<0.002	--	<0.002	--	<0.002	113	--
450810092583501	08-27-96	0900	<0.003	<0.002	--	<0.002	--	<0.002	123	--
450825092524801	08-21-96	1400	<0.003	<0.002	--	<0.002	--	<0.002	115	--
451602092515601	08-07-96	1400	<0.003	<0.002	--	<0.002	--	<0.002	102	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BENZENE 14BRFL- SURROG VOC UNFLTRD REC PERCENT (99834)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	CYAN- AZINE AMIDE WAT FLT GF 0.7U REC (UG/L) (50010)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)
ROCK COUNTY										
433929096114701	04-11-96	<0.050	--	--	--	--	--	--	<0.050	<0.050
433929096114701	05-21-96	<0.050	--	--	--	--	--	--	<0.050	<0.050
433929096114701	08-15-96	<0.050	--	--	--	--	--	--	<0.050	<0.050
433932096113701	04-11-96	0.060	--	--	--	--	--	--	<0.050	<0.050
433932096113701	05-21-96	<0.050	--	--	--	--	--	--	<0.050	<0.050
433932096113701	08-29-96	<0.050	--	--	--	--	--	--	<0.050	<0.050
433940096131801	11-01-95	--	--	--	--	--	--	--	--	--
433952096113101	11-30-95	0.080	--	--	--	--	--	--	<0.050	<0.050
433952096113101	08-15-96	0.080	--	--	--	--	--	--	<0.050	>0.050
434025096124501	08-14-96	--	--	--	--	--	--	--	--	--
SCOTT COUNTY										
443328093184701	07-30-96	<0.001	<0.002	85.0	<0.002	<0.003	<0.003	<0.004	--	<0.004
443505093255201	07-31-96	<0.001	<0.002	83.0	<0.002	<0.003	<0.003	<0.004	--	<0.004
444059093260901	08-01-96	<0.001	<0.002	80.0	<0.002	<0.003	<0.003	<0.004	--	<0.004
444059093260901	08-20-96	--	--	--	--	--	--	--	--	--
444202093225901	08-05-96	<0.001	<0.002	88.0	<0.002	<0.003	<0.003	<0.004	--	<0.004
STEARNS COUNTY										
452256094423301	07-17-96	<0.050	--	--	--	--	--	--	<0.050	<0.050
452755094254501	07-16-96	0.090	--	--	--	--	--	--	<0.050	<0.050
453708094121801	07-18-96	<0.050	--	--	--	--	--	--	<0.050	<0.050
454434094570102	07-17-96	<0.050	--	--	--	--	--	--	0.060	<0.050
WASHINGTON COUNTY										
445245092545501	08-14-96	0.041	<0.002	80.0	<0.002	<0.003	<0.003	<0.004	--	<0.004
445321092590101	08-07-96	0.011	<0.002	73.0	<0.002	<0.003	<0.003	<0.004	--	<0.004
445821092575101	09-05-96	--	--	--	--	--	--	--	--	--
445919092500101	08-08-96	0.007	<0.002	97.0	<0.002	<0.003	<0.003	<0.004	--	<0.004
450016092575701	07-02-96	--	--	--	--	--	--	--	--	--
450520092543401	08-06-96	0.006	<0.002	78.0	<0.002	<0.003	<0.003	<0.004	--	<0.004
450603092500201	08-15-96	<0.001	<0.002	100	<0.002	<0.003	<0.003	<0.004	--	<0.004
450810092583501	08-27-96	0.057	<0.002	117	<0.002	<0.003	<0.003	<0.004	--	<0.004
450825092524801	08-21-96	<0.001	<0.002	101	<0.002	<0.003	<0.003	<0.004	--	<0.004
451602092515601	08-07-96	<0.001	<0.002	79.0	<0.002	<0.003	<0.003	<0.004	--	<0.004

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	DCPA	DEETHYL	DEISO-	DI-	DIAZ-	DI-	DISUL-	EPTC	ETHAL-
		WATER	ATRA-	PROPYL		INON		FOTON		FLUR-
		FLTRD	ZINE,	WATER,	AZINON,	D10 SRG	ELDRIN	WATER	WATER	ALIN
		0.7 U	DISS,	WATER,	DIS-	0.7 U	DIS-	0.7 U	0.7 U	0.7 U
		GF, REC	REC	REC	SOLVED	GF, REC	SOLVED	GF, REC	GF, REC	GF, REC
		(UG/L)	(UG/L)	(UG/L)	(UG/L)	PERCENT	(UG/L)	(UG/L)	(UG/L)	(UG/L)
		(82682)	(04040)	(04038)	(39572)	(91063)	(39381)	(82677)	(82668)	(82663)
ROCK COUNTY										
433929096114701	04-11-96	--	<0.050	<0.050	--	--	--	--	--	--
433929096114701	05-21-96	--	<0.050	<0.050	--	--	--	--	--	--
433929096114701	08-15-96	--	<0.050	<0.050	--	--	--	--	--	--
433932096113701	04-11-96	--	<0.050	<0.050	--	--	--	--	--	--
433932096113701	05-21-96	--	<0.050	<0.050	--	--	--	--	--	--
433932096113701	08-29-96	--	<0.050	<0.050	--	--	--	--	--	--
433940096131801	11-01-95	--	--	--	--	--	--	--	--	--
433952096113101	11-30-95	--	0.060	<0.050	--	--	--	--	--	--
433952096113101	08-15-96	--	0.050	0.050	--	--	--	--	--	--
434025096124501	08-14-96	--	--	--	--	--	--	--	--	--
SCOTT COUNTY										
443328093184701	07-30-96	<0.002	<0.002	--	<0.002	126	<0.001	<0.017	<0.002	<0.004
443505093255201	07-31-96	<0.002	<0.002	--	<0.002	139	<0.001	<0.017	<0.002	<0.004
444059093260901	08-01-96	<0.002	<0.002	--	<0.002	74.4	<0.001	<0.017	<0.002	<0.004
444059093260901	08-20-96	--	--	--	--	--	--	--	--	--
444202093225901	08-05-96	<0.002	<0.002	--	<0.002	116	<0.001	<0.017	<0.002	<0.004
STEARNS COUNTY										
452256094423301	07-17-96	--	<0.050	<0.050	--	--	--	--	--	--
452755094254501	07-16-96	--	0.300	<0.050	--	--	--	--	--	--
453708094121801	07-18-96	--	<0.050	<0.050	--	--	--	--	--	--
454434094570102	07-17-96	--	<0.050	<0.050	--	--	--	--	--	--
WASHINGTON COUNTY										
445245092545501	08-14-96	<0.002	E0.037	--	<0.002	112	<0.001	<0.017	<0.002	<0.004
445321092590101	08-07-96	<0.002	E0.008	--	19.0	113	<0.001	<0.017	<0.002	<0.004
445821092575101	09-05-96	--	--	--	--	--	--	--	--	--
445919092500101	08-08-96	<0.002	E0.016	--	<0.002	116	<0.001	<0.017	<0.002	<0.004
450016092575701	07-02-96	--	--	--	--	--	--	--	--	--
450520092543401	08-06-96	<0.002	E0.053	--	<0.002	110	<0.001	<0.017	<0.002	<0.004
450603092500201	08-15-96	<0.002	<0.002	--	<0.002	100	<0.001	<0.017	<0.002	<0.004
450810092583501	08-27-96	<0.002	E0.104	--	<0.002	98.9	<0.001	<0.017	<0.002	<0.004
450825092524801	08-21-96	<0.002	<0.002	--	<0.002	103	<0.001	<0.017	<0.002	<0.004
451602092515601	08-07-96	<0.002	<0.002	--	0.026	118	<0.001	<0.017	<0.002	<0.004

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	ETHANE	ETHO-			LIN-		METHYL	METHYL	
		12DICL	PROP			URON		AZIN-	PARA-	
		SURROG	WATER	FONOFOS		WATER	MALA-	PHOS	THION	METO-
		VOC	FLTRD	WATER	LINDANE	FLTRD	THION,	WAT FLT	WAT FLT	LACHLOR
		UNFLTRD	0.7 U	DISS	DIS-	0.7 U	DIS-	0.7 U	0.7 U	WATER
		REC	GF, REC	REC	SOLVED	GF, REC	SOLVED	GF, REC	GF, REC	DISSOLV
		PERCENT	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)
		(99832)	(82672)	(04095)	(39341)	(82666)	(39532)	(82686)	(82667)	(39415)
ROCK COUNTY										
433929096114701	04-11-96	--	--	--	--	--	--	--	--	<0.050
433929096114701	05-21-96	--	--	--	--	--	--	--	--	<0.050
433929096114701	08-15-96	--	--	--	--	--	--	--	--	<0.050
433932096113701	04-11-96	--	--	--	--	--	--	--	--	<0.050
433932096113701	05-21-96	--	--	--	--	--	--	--	--	<0.050
433932096113701	08-29-96	--	--	--	--	--	--	--	--	<0.050
433940096131801	11-01-95	--	--	--	--	--	--	--	--	--
433952096113101	11-30-95	--	--	--	--	--	--	--	--	<0.050
433952096113101	08-15-96	--	--	--	--	--	--	--	--	<0.050
434025096124501	08-14-96	--	--	--	--	--	--	--	--	--
SCOTT COUNTY										
443328093184701	07-30-96	108	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002
443505093255201	07-31-96	108	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002
444059093260901	08-01-96	103	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002
444059093260901	08-20-96	--	--	--	--	--	--	--	--	--
444202093225901	08-05-96	106	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002
STEARNS COUNTY										
452256094423301	07-17-96	--	--	--	--	--	--	--	--	0.220
452755094254501	07-16-96	--	--	--	--	--	--	--	--	<0.050
453708094121801	07-18-96	--	--	--	--	--	--	--	--	<0.050
454434094570102	07-17-96	--	--	--	--	--	--	--	--	<0.050
WASHINGTON COUNTY										
445245092545501	08-14-96	114	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002
445321092590101	08-07-96	103	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002
445821092575101	09-05-96	--	--	--	--	--	--	--	--	--
445919092500101	08-08-96	106	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002
450016092575701	07-02-96	--	--	--	--	--	--	--	--	--
450520092543401	08-06-96	105	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002
450603092500201	08-15-96	111	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002
450810092583501	08-27-96	108	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002
450825092524801	08-21-96	105	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002
451602092515601	08-07-96	115	<0.003	<0.003	<0.004	<0.002	<0.005	<0.001	<0.006	<0.002

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	METRI- BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	P,P' DDE DISSOLV (UG/L) (34653)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PENDI- METH- ALIN WAT FLT (UG/L) (82683)	PER- METHRIN CIS WAT FLT (UG/L) (82687)	PHORAT. WATER FLTRD 0.7 U GF, REC (UG/L) (82664)

ROCK COUNTY

433929096114701	04-11-96	<0.050	--	--	--	--	--	--	--	--
433929096114701	05-21-96	<0.050	--	--	--	--	--	--	--	--
433929096114701	08-15-96	<0.050	--	--	--	--	--	--	--	--
433932096113701	04-11-96	<0.050	--	--	--	--	--	--	--	--
433932096113701	05-21-96	<0.050	--	--	--	--	--	--	--	--
433932096113701	08-29-96	<0.050	--	--	--	--	--	--	--	--
433940096131801	11-01-95	--	--	--	--	--	--	--	--	--
433952096113101	11-30-95	<0.050	--	--	--	--	--	--	--	--
433952096113101	08-15-96	<0.050	--	--	--	--	--	--	--	--
434025096124501	08-14-96	--	--	--	--	--	--	--	--	--

SCOTT COUNTY

443328093184701	07-30-96	<0.004	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002
443505093255201	07-31-96	<0.004	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002
444059093260901	08-01-96	<0.004	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002
444059093260901	08-20-96	--	--	--	--	--	--	--	--	--
444202093225901	08-05-96	<0.004	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002

STEARNS COUNTY

452256094423301	07-17-96	<0.050	--	--	--	--	--	--	--	--
452755094254501	07-16-96	<0.050	--	--	--	--	--	--	--	--
453708094121801	07-18-96	<0.050	--	--	--	--	--	--	--	--
454434094570102	07-17-96	<0.050	--	--	--	--	--	--	--	--

WASHINGTON COUNTY

445245092545501	08-14-96	<0.004	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002
445321092590101	08-07-96	<0.004	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002
445821092575101	09-05-96	--	--	--	--	--	--	--	--	--
445919092500101	08-08-96	<0.004	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002
450016092575701	07-02-96	--	--	--	--	--	--	--	--	--
450520092543401	08-06-96	<0.004	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002
450603092500201	08-15-96	<0.004	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002
450810092583501	08-27-96	<0.004	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002
450825092524801	08-21-96	<0.004	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002
451602092515601	08-07-96	<0.004	<0.004	<0.003	<0.006	<0.004	<0.004	<0.004	<0.005	<0.002

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRO- METRYN, WATER, DISS, REC (UG/L) (04036)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PROP- AZINE WATER DISS REC (UG/L) (38535)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)
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ROCK COUNTY

433929096114701	04-11-96	<0.050	<0.050	--	<0.050	--	--	<0.050	<0.0 ⁵⁰	--
433929096114701	05-21-96	<0.050	<0.050	--	<0.050	--	--	<0.050	<0.0 ⁵⁰	--
433929096114701	08-15-96	<0.050	<0.050	--	<0.050	--	--	<0.050	<0.0 ⁵⁰	--
433932096113701	04-11-96	<0.050	<0.050	--	<0.050	--	--	<0.050	<0.0 ⁵⁰	--
433932096113701	05-21-96	<0.050	<0.050	--	<0.050	--	--	<0.050	<0.0 ⁵⁰	--
433932096113701	08-29-96	<0.050	<0.050	--	<0.050	--	--	<0.050	<0.0 ⁵⁰	--
433940096131801	11-01-95	--	--	--	--	--	--	--	--	--
433952096113101	11-30-95	<0.050	<0.050	--	<0.050	--	--	<0.050	<0.0 ⁵⁰	--
433952096113101	08-15-96	<0.050	<0.050	--	<0.050	--	--	1.36	<0.0 ⁵⁰	--
434025096124501	08-14-96	--	--	--	--	--	--	--	--	--

SCOTT COUNTY

443328093184701	07-30-96	<0.018	--	<0.003	<0.007	<0.004	<0.013	--	<0.0 ⁵⁰	<0.010
443505093255201	07-31-96	<0.018	--	<0.003	<0.007	<0.004	<0.013	--	<0.0 ⁵⁰	<0.010
444059093260901	08-01-96	<0.018	--	<0.003	<0.007	<0.004	<0.013	--	<0.0 ⁵⁰	<0.010
444059093260901	08-20-96	--	--	--	--	--	--	--	--	--
44402093225901	08-05-96	<0.018	--	<0.003	<0.007	<0.004	<0.013	--	<0.0 ⁵⁰	<0.010

STEARNS COUNTY

452256094423301	07-17-96	0.140	<0.050	--	<0.050	--	--	<0.050	<0.050	--
452755094254501	07-16-96	<0.050	<0.050	--	<0.050	--	--	<0.050	<0.050	--
453708094121801	07-18-96	<0.050	<0.050	--	<0.050	--	--	<0.050	<0.050	--
454434094570102	07-17-96	<0.050	<0.050	--	<0.050	--	--	<0.050	<0.050	--

WASHINGTON COUNTY

445245092545501	08-14-96	<0.018	--	<0.003	<0.007	<0.004	<0.013	--	<0.0 ⁵⁰	<0.010
445321092590101	08-07-96	<0.018	--	<0.003	<0.007	<0.004	<0.013	--	<0.0 ⁵⁰	<0.010
445821092575101	09-05-96	--	--	--	--	--	--	--	--	--
445919092500101	08-08-96	<0.018	--	<0.003	<0.007	<0.004	<0.013	--	<0.0 ⁵⁰	<0.010
450016092575701	07-02-96	--	--	--	--	--	--	--	--	--
450520092543401	08-06-96	<0.018	--	<0.003	<0.007	<0.004	<0.013	--	<0.0 ⁵⁰	<0.010
450603092500201	08-15-96	<0.018	--	<0.003	<0.007	<0.004	<0.013	--	<0.0 ⁵⁰	<0.010
450810092583501	08-27-96	<0.018	--	<0.003	<0.007	<0.004	<0.013	--	<0.0 ⁵⁰	<0.010
450825092524801	08-21-96	<0.018	--	<0.003	<0.007	<0.004	<0.013	--	<0.0 ⁵⁰	<0.010
451602092515601	08-07-96	<0.018	--	<0.003	<0.007	<0.004	<0.013	--	<0.0 ⁵⁰	<0.010

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC (91064)	TER- BUTRYN WATER, FLTRD DISS, REC (UG/L) (38888)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TOLUENE D8 SURROG VOC UNFLTRD REC (99833)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRIAZIN SCREEN (ELISA) WAT,WH REC,AS ATRAZIN (UG/L) (34757)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)

ROCK COUNTY

433929096114701	04-11-96	--	--	--	<0.05	--	--	--	--	--
433929096114701	05-21-96	--	--	--	<0.05	--	--	--	--	--
433929096114701	08-15-96	--	--	--	<0.05	--	--	--	--	--
433932096113701	04-11-96	--	--	--	<0.05	--	--	--	--	--
433932096113701	05-21-96	--	--	--	<0.05	--	--	--	--	--
433932096113701	08-29-96	--	--	--	<0.05	--	--	--	--	--
433940096131801	11-01-95	--	--	--	--	--	--	--	--	--
433952096113101	11-30-95	--	--	--	<0.05	--	--	--	0.1	--
433952096113101	08-15-96	--	--	--	<0.05	--	--	--	--	--
434025096124501	08-14-96	--	--	--	--	--	--	--	--	--

SCOTT COUNTY

443328093184701	07-30-96	<0.007	<0.013	135	--	<0.002	96.0	<0.001	--	<0.002
443505093255201	07-31-96	<0.007	<0.013	148	--	<0.002	95.0	<0.001	--	<0.002
444059093260901	08-01-96	<0.007	<0.013	82.3	--	<0.002	94.0	<0.001	--	<0.002
444059093260901	08-20-96	--	--	--	--	--	--	--	--	--
444202093225901	08-05-96	<0.007	<0.013	125	--	<0.002	96.0	<0.001	--	<0.002

STEARNS COUNTY

452256094423301	07-17-96	--	--	--	<0.05	--	--	--	--	--
452755094254501	07-16-96	--	--	--	<0.05	--	--	--	--	--
453708094121801	07-18-96	--	--	--	<0.05	--	--	--	--	--
454434094570102	07-17-96	--	--	--	<0.05	--	--	--	--	--

WASHINGTON COUNTY

445245092545501	08-14-96	<0.007	<0.013	120	--	<0.002	100	<0.001	--	<0.002
445321092590101	08-07-96	<0.007	<0.013	117	--	<0.002	91.0	<0.001	--	<0.002
445821092575101	09-05-96	--	--	--	--	--	--	--	--	--
445919092500101	08-08-96	<0.007	<0.013	121	--	<0.002	96.0	<0.001	--	<0.002
450016092575701	07-02-96	--	--	--	--	--	--	--	--	--
450520092543401	08-06-96	<0.007	<0.013	118	--	<0.002	97.0	<0.001	--	<0.002
450603092500201	08-15-96	<0.007	<0.013	114	--	<0.002	94.0	<0.001	--	<0.002
450810092583501	08-27-96	<0.007	<0.013	130	--	<0.002	108	<0.001	--	<0.002
450825092524801	08-21-96	<0.007	<0.013	120	--	<0.002	96.0	<0.001	--	<0.002
451602092515601	08-07-96	<0.007	<0.013	121	--	<0.002	94.0	<0.001	--	<0.002

QUALITY OF GROUND WATER
 WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
 ANALYSES OF RADIOCHEMICALS

STATION NUMBER	DATE	TIME	TRITIUM TOTAL (PCI/L) (07000)	TRITIUM TOTAL (TU) (07017)	TRITIUM TOTAL COUNT ERROR (TU) (07019)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	TRITIUM 2 SIGMA WATER, WHOLE, TOTAL (PCI/L) (75985)	RM-222 2 SIGMA WATER, WHOLE, TOTAL, (PCI/L) (75902)
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ANOKA COUNTY

450758093061501	08-26-96	0900	6.0	--	--	2.0	1.0	2.1
450835093094301	07-03-96	1100	--	18	1.3	--	--	--
451009093181701	06-20-96	1300	--	--	--	1.0	--	--
451013093185101	06-18-96	1500	--	--	--	6.0	--	--
451100093181401	06-18-96	1100	34	--	--	<1.0	3.0	--
451100093181401	06-19-96	1100	--	--	--	--	--	--
451104093212801	06-19-96	1100	--	--	--	<1.0	--	--
451116093183101	06-24-96	1000	--	--	--	1.0	--	--
451150093162601	06-17-96	1500	--	--	--	<1.0	--	--
451222093185001	06-17-96	1500	--	--	--	<1.0	--	--
451222093185001	06-20-96	1000	--	--	--	<1.0	--	--
451236093202001	06-19-96	1400	39	--	--	<1.0	3.0	--
451315093202501	06-17-96	1200	--	--	--	<1.0	--	--

BELTRAMI COUNTY

473021094551201	07-30-96	1400	--	28	1.9	--	--	--
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BENTON COUNTY

453551094104701	07-18-96	1100	--	16	1.2	--	--	--
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QUALITY OF GROUND WATER
 WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
 ANALYSES OF RADIOCHEMICALS

STATION	NUMBER	DATE	TIME	N15/N14 NO3 FRAC WATER FLTRD 0.45 U PER MIL (82690)	N15/N14 NH4 FRAC WATER FLTRD 0.45 U PER MIL (82691)
BLUE EARTH COUNTY					
	434657093372301	04-23-96	1130	8.5	--
	434657093372301	06-07-96	0820	7.6	--
	434704093325301	04-23-96	1050	13.1	--
	434704093325301	06-07-96	0730	7.2	--
	435144093381501	04-23-96	1240	8.9	--
	435144093381501	06-07-96	0915	8.4	--
	435659093494101	04-23-96	1400	15.4	--
	435659093494101	06-07-96	1045	11.0	--
	435749093554801	04-23-96	1500	9.2	--
	435749093554801	06-07-96	1130	8.3	--
	440052093580501	04-26-96	1615	--	--
	440053093580501	04-26-96	1630	14.5	--
	440054093580501	04-26-96	1700	13.2	--
	440055093580501	04-26-96	1715	12.1	--
	440057093575601	04-26-96	1530	--	--
	440058093575701	04-26-96	1500	21.2	--
	440059093575801	04-26-96	1430	20.6	--
	440100093575901	04-26-96	1400	--	11.3
	440108093574901	04-23-96	1550	12.8	--
	440108093574901	06-07-96	1200	9.0	--
	440109093550201	04-24-96	1000	15.5	--
	440109093550201	06-07-96	1515	11.0	--
	440110093550201	04-24-96	1020	13.2	--
	440110093550201	06-07-96	1530	15.6	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF RADIOCHEMICALS

STATION NUMBER	DATE	TIME	TRITIUM TOTAL (PCI/L) (07000)	TRITIUM TOTAL (TU) (07017)	TRITIUM TOTAL COUNT ERROR (TU) (07019)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	TRITIUM 2 SIGMA WATER, WHOLE, TOTAL (PCI/L) (75985)	RN-222 2 SIGMA WATER, WHOLE, TOTAL, (PCI/L) (76002)	N15/N14 NO3 FF AC WATER FLTRD 0.45 U PEF MIL (82 °90)
BLUE EARTH COUNTY									
440118093561001	04-23-96	1630	--	--	--	--	--	--	12.4
440118093561001	06-07-96	1645	--	--	--	--	--	--	8.5
440121093561601	04-24-96	0830	--	--	--	--	--	--	6.4
440121093561601	06-07-96	1330	--	--	--	--	--	--	5.4
440122093561101	04-24-96	0920	--	--	--	--	--	--	8.6
440122093561101	06-07-96	1445	--	--	--	--	--	--	6.8
440131093562801	04-24-96	0850	--	--	--	--	--	--	9.8
440131093562801	06-07-96	1245	--	--	--	--	--	--	8.9
440133093562701	04-24-96	0900	--	--	--	--	--	--	15.9
440133093562701	06-07-96	1345	--	--	--	--	--	--	10.4
DAKOTA COUNTY									
443042092570401	08-15-96	1100	--	--	--	3.0	--	19	--
443119093050101	08-08-96	1000	20	--	--	1.0	2.0	22	--
443641093110701	09-04-96	1000	1.0	--	--	1.0	1.0	19	--
443645092525501	08-12-96	1300	6.0	--	--	2.0	1.0	--	--
443645092525501	08-20-96	1100	--	--	--	--	--	24	--
443808093012801	09-03-96	1300	--	--	--	<1.0	--	15	--
443934092565601	08-12-96	1000	--	--	--	<1.0	--	--	--
443934092565601	08-20-96	1000	--	--	--	--	--	17	--
444211092544601	08-14-96	1200	2.0	--	--	<1.0	1.0	27	--
444214092490401	08-26-96	1200	--	--	--	<1.0	--	18	--
444331093080801	08-19-96	1400	24	--	--	1.0	2.0	27	--
445108093054801	08-06-96	1000	--	--	--	<1.0	--	26	--
445117093042701	08-13-96	1200	18	--	--	1.0	2.0	19	--
DOUGLAS COUNTY									
455349095220501	08-27-96	1000	--	30	2.1	--	--	--	--
GOODHUE COUNTY									
442140092521101	08-27-96	1000	<1.0	--	--	<1.0	1.0	21	--
442733092532401	08-22-96	1100	--	--	--	<1.0	--	16	--
443112092513901	08-29-96	1000	<1.0	--	--	<1.0	1.0	29	--

QUALITY OF GROUND WATER
 WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
 ANALYSES OF RADIOCHEMICALS

STATION NUMBER	DATE	TIME	URANIUM NATURAL DIS- TRITIUM SOLVED		TRITIUM	RN-222
			TOTAL	(UG/L	2 SIGMA	2 SIGMA
			(PCI/L) (07000)	AS U) (22703)	WATER, WHOLE, TOTAL (PCI/L) (75985)	WATER, WHOLE, TOTAL, (PCI/L) (76002)
HENNEPIN COUNTY						
444854093242501	09-03-96	1000	--	<1.0		--20
445018093290901	08-01-96	1400	--	<1.0	--	24
445625093223603	04-22-96	1100	--	<1.0	--	--
450104093294601	09-12-96	1000	--	<1.0	--	--
450122093193801	07-09-96	1100	--	<1.0	--	--
450126093180901	07-09-96	0900	--	2.0	--	--
450226093203901	07-08-96	1400	--	<1.0	--	--
450236093175801	07-08-96	0900	--	1.0	--	--
450305093172501	07-09-96	1400	--	5.0	--	--
450305093172501	07-25-96	1100	--	--	--	--
450326093175201	07-03-96	0900	--	13	--	--
450327093193501	07-08-96	1100	--	<1.0	--	--
450328093232001	07-03-96	1200	--	<1.0	--	--
450333093201701	07-02-96	1300	--	4.0	--	--
450430093220801	07-02-96	1000	45	<1.0	3.0	--
450448093205301	06-27-96	0900	--	4.0	--	--
450456093193201	07-02-96	1500	45	<1.0	3.0	--
450516093195901	06-26-96	0900	--	4.0	--	--
450516093281001	08-27-96	1300	1.0	3.0	1.0	17
450518093172501	06-26-96	1400	85	<1.0	5.0	--
450524093223201	07-10-96	0900	--	2.0	--	--
450542093182301	06-27-96	1200	--	1.0	--	--
450557093201801	06-25-96	1000	--	2.0	--	--
450611093183101	06-26-96	1200	--	<1.0	--	--
450624093220501	06-25-96	1200	42	<1.0	3.0	--
450702093185101	06-24-96	1300	--	<1.0	--	--
450704093210401	06-25-96	1500	42	6.0	3.0	--

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
ANALYSES OF RADIOCHEMICALS

STATION NUMBER	DATE	TIME	TRITIUM TOTAL (TU) (07017)	TRITIUM TOTAL COUNT ERROR (TU) (07019)	H-2 / H-1 STABLE ISOTOPE RATIO PER MIL (82082)	O-18 / O-16 STABLE ISOTOPE RATIO PER MIL (82085)
ROCK COUNTY						
433347096113501	11-29-95	1445	--	--	-64.7	-9.48
433347096113501	04-10-96	1600	--	--	-64.0	-9.56
433347096113501	05-22-96	1220	--	--	-65.8	-9.55
433347096113501	08-13-96	0945	--	--	-65.2	-9.43
433352096110501	11-29-95	1030	--	--	-58.2	-8.66
433352096110501	04-10-96	0830	--	--	-80.9	-11.64
433352096110501	05-22-96	0945	--	--	-67.5	-9.72
433352096110501	08-13-96	1255	--	--	-57.5	-8.14
433555096255601	10-31-95	1100	--	--	--	--
433645096214401	11-01-95	1230	--	--	--	--
433649096214901	11-01-95	1550	--	--	--	--
433725096125001	08-14-96	0905	--	--	-63.5	-8.45
433750096123201	08-30-96	0900	13	1.1	-65.0	-9.28
433910096115902	11-28-95	1120	--	--	-62.4	-8.87
433910096115902	04-09-96	1145	--	--	-77.2	-11.16
433910096115902	05-20-96	1245	--	--	--	--
433910096115902	08-14-96	1635	--	--	-62.3	-9.01
433911096120101	11-28-95	0830	--	--	-62.2	-8.95
433911096120101	04-09-96	0830	--	--	-83.3	-11.81
433911096120101	05-20-96	1105	--	--	-71.2	-10.19
433911096120101	08-14-96	1525	--	--	-59.3	-8.33
433919096115401	11-28-95	1430	--	--	-63.1	-8.94
433919096115401	04-11-96	0830	--	--	-92.8	-13.21
433919096115401	05-21-96	0925	--	--	--	--
433919096115401	08-15-96	1145	--	--	-68.4	-9.85
433920096114901	11-28-95	1400	--	--	-62.9	-9.14
433920096114901	04-09-96	1600	--	--	-71.8	-10.37
433920096114901	05-20-96	1430	--	--	--	--
433920096114901	08-15-96	0940	--	--	-62.6	-8.91
433929096114701	11-30-95	0845	--	--	-62.1	-9.09
433929096114701	04-11-96	1030	--	--	-64.6	-9.62
433929096114701	05-21-96	1215	--	--	-64.9	-9.41
433929096114701	08-15-96	1455	--	--	-62.7	-9.22
433932096113701	04-11-96	0930	--	--	-66.8	-9.99
433932096113701	05-21-96	1045	--	--	--	--
433932096113701	08-29-96	1600	12	1.0	-67.9	-9.80
433940096131801	11-01-95	0950	--	--	--	--
433952096113101	11-30-95	1015	--	--	-68.6	-9.85
433952096113101	08-15-96	1330	--	--	-67.4	-10.10
434025096124501	08-14-96	1135	--	--	-55.7	-8.16

QUALITY OF GROUND WATER
 WATER QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
 ANALYSES OF RADIOCHEMICALS

STATION NUMBER	DATE	TIME	TRITIUM TOTAL (PCI/L) (07000)	TRITIUM TOTAL (TU) (07017)	TRITIUM TOTAL COUNT ERROR (TU) (07019)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	TRITIUM 2 SIGMA WATER, WHOLE, TOTAL (PCI/L) (75985)	RN-222 2 SIGMA WATER, WHOLE, TOTAL, (PCI/L) (76902)
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SCOTT COUNTY

443328093184701	07-30-96	1400	<1.0	--	--	<1.0	1.0	24
443505093255201	07-31-96	1000	--	--	--	4.0	--	28
444059093260901	08-01-96	1000	1.0	--	--	2.0	1.0	--
444059093260901	08-20-96	1300	--	--	--	--	--	23
444202093225901	08-05-96	1200	--	--	--	3.0	--	30

SHERBURNE COUNTY

452640094001101	07-16-96	1100	--	16	1.2	--	--	--
453414093344101	08-28-96	1400	--	14	1.1	--	--	--

STEARNS COUNTY

452244094420601	07-31-96	1400	--	15	1.1	--	--	--
452244094421401	08-28-96	1000	--	17	1.3	--	--	--
452256094423301	07-17-96	1100	--	18	1.4	--	--	--
452755094254501	07-16-96	1400	--	16	1.3	--	--	--
453708094121801	07-18-96	1300	--	23	1.7	--	--	--
454434094570102	07-17-96	1500	--	15	1.2	--	--	--

WASHINGTON COUNTY

445245092545501	08-14-96	0900	--	--	--	1.0	--	20
445321092590101	08-07-96	1000	--	--	--	1.0	--	21
445508092551501	08-02-96	1100	--	12	1.0	--	--	--
445821092575101	09-05-96	1100	--	15	1.2	--	--	--
445919092500101	08-08-96	1400	73	--	--	<1.0	5.0	22
450016092575701	07-02-96	1345	--	15	1.1	--	--	--
450520092543401	08-06-96	1300	86	--	--	<1.0	5.0	28
450603092500201	08-15-96	1400	--	--	--	<1.0	--	20
450810092583501	08-27-96	0900	--	--	--	<1.0	--	38
450825092524801	08-21-96	1400	--	--	--	<1.0	--	23
451602092515601	08-07-96	1400	71	--	--	<1.0	5.0	21

Chemical Quality Of Precipitation

CHEMICAL QUALITY OF PRECIPITATION

461458094295000 PRECIPITATION STATION AT CAMP RIPLEY, MN

WATER-QUALITY RECORDS

LOCATION.-- Lat 46°14'58", long 94°29'50", in NE 1/4 sec.18, T.132 N., R.30 W., Morrison County, Hydrologic Unit 07010104, approximately 500 ft southwest of the abandoned Gilgal Church and approximately 5 miles south of the town of Pillager.

PERIOD OF RECORD.-- October 1983 to current year (weekly composite).

INSTRUMENTATION.--Samples are collected in a polyethylene bucket by an electrically operated wet/dry collector. A recording rain gage and a standard U.S. Weather Service bulk rain gage measure rainfall quantity.

REMARKS.-- An observer collects only the wetfall bucket and services the rain gages weekly. If there is enough wetfall, specific conductance and pH are determined, with the remaining contents sent to the Illinois State Water Survey Laboratory for analysis.

CHEMICAL ANALYSIS, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
WEEKLY COMPOSITE

DATE	TIME	TOTAL PRECIP- ITATION FOR DEFINED PERIOD (IN) (00193)	SPEC. CONDUCT- TANCE CK.SOL. ATM DEP WET TOT (US/CM) (83152)	SPEC. CONDUCT- TANCE FIELD ATM DEP WET TOT (US/CM) (83154)	SPEC. CONDUCT- TANCE LAB ATM DEP WET TOT (US/CM) (83156)	PH CK.SOL. ATM DEP WET T (UNITS) (83105)	PH FIELD ATM DEP WET T (UNITS) (83106)	PH LAB ATM DEP WET T (UNITS) (83107)	CALCIUM ATM DEP WET DIS (MG/L) (82932)
OCT 03-10	1930	0.87	22.4	7.2	7.3	4.30	4.90	5.36	0.190
OCT 10-17	1930	0.02	--	--	20.2	--	--	6.66	1.03
OCT 17-24	1930	0.72	21.5	8.6	7.9	4.30	5.10	6.05	0.800
OCT 24-31	1930	0.44	22.4	10.2	10.2	4.30	4.60	4.82	0.060
OCT 31- NOV 07	2030	0.33	21.5	10.7	10.9	4.30	4.80	4.68	0.030
NOV 07-14	2030	0.18	21.3	9.3	9.9	4.30	4.90	6.25	0.520
NOV 14-21	2030	0.15	20.3	10.1	9.5	4.30	4.80	4.93	0.070
NOV 21-28	1615	0.25	22.0	4.1	3.6	4.30	4.90	5.61	0.060
NOV 28- DEC 05	2030	0.05	21.4	19.8	--	4.30	5.20	--	--
DEC 05-12	2030	0.50	21.4	5.0	5.2	4.30	4.90	5.47	0.250
DEC 12-19	2015	0.47	20.9	12.6	13.5	4.30	4.80	4.60	0.060
DEC 19-26	2030	0.01	--	--	--	--	--	--	--
DEC 26 1995- JAN 02 1996	1600	--	--	--	13.1	--	--	4.59	0.030
JAN 02-09	2030	--	--	--	1.6	--	--	5.84	<0.010
JAN 09-16	2015	--	14.4	5.6	5.7	4.90	5.00	5.07	0.020
JAN 16-23	2030	--	14.1	2.7	3.0	4.90	5.30	5.34	0.090
JAN 23-30	2100	--	14.6	13.9	14.3	4.80	4.70	4.73	0.370
JAN 30- FEB 06	2100	--	--	--	--	--	--	--	--
FEB 06-13	2030	0.12	14.5	6.4	7.0	4.80	5.10	5.16	0.100
FEB 13-20	2030	0.07	14.3	4.3	4.4	4.90	5.40	6.07	0.130
FEB 20-27	2030	0.49	14.3	30.3	26.8	4.90	4.50	4.46	0.460
FEB 27- MAR 05	1530	--	14.7	5.1	4.6	4.90	5.00	5.65	0.170
MAR 05-12	2030	0.0	--	--	2.0	--	--	5.54	0.010
MAR 12-19	1200	0.11	14.3	5.8	5.9	4.80	5.40	6.21	0.300
MAR 19-26	1500	0.55	14.1	10.0	8.7	4.80	6.20	5.08	0.190

CHEMICAL QUALITY OF PRECIPITATION

461458094295000 - PRECIPITATION STATION AT CAMP RIPLEY, MN

CHEMICAL QUALITY OF PRECIPITAT, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

WEEKLY COMPOSITE--Continued

DATE	CHLO- RIDE ATM DEP WET DIS (MG/L) (82944)	MAG- NESIUM ATM DEP WET DIS (MG/L) (83002)	NI- TROGEN AMMON. ATM DEP WET DIS AS NH4 (MG/L) (83047)	NI- TROGEN NITRATE ATM DEP WET DIS AS NO3 (MG/L) (83071)	PHOS- PHORUS ORTHO ATM DEP WET DIS AS PO4 (MG/L) (83111)	POTAS- SIUM ATM DEP WET DIS (MG/L) (83120)	SODIUM ATM DEP WET DIS (MG/L) (83138)	SULFATE ATM DEP WET DIS AS SO4 (MG/L) (83160)	VOLUME ATM DEP WET (L) (83177)
OCT									
03-10	0.06	0.019	0.460	1.28	<0.003	0.022	0.050	0.75	1.528
OCT									
10-17	0.24	0.192	1.35	2.31	<0.011	0.135	0.199	2.21	0.037
OCT									
17-24	0.09	0.067	0.150	1.21	<0.003	0.028	0.064	0.98	1.209
OCT									
24-31	0.04	0.010	0.300	1.22	<0.003	0.015	0.041	0.70	0.001
OCT 31-									
NOV 07	0.05	0.005	0.140	1.12	<0.003	0.006	0.038	0.63	0.277
NOV									
07-14	0.11	0.057	0.570	1.57	<0.003	0.038	0.115	0.83	0.308
NOV									
14-21	0.07	0.012	0.400	1.27	<0.003	0.017	0.023	0.70	0.281
NOV									
21-28	0.05	0.010	0.200	0.49	<0.003	0.005	0.071	0.30	0.442
NOV 28-									
DEC 05	--	--	--	--	--	--	--	--	0.082
DEC									
05-12	0.04	0.031	0.130	1.23	<0.003	0.020	0.022	0.21	0.827
DEC									
12-19	0.05	0.007	0.190	1.69	<0.003	0.011	0.021	0.57	0.862
DEC									
19-26	--	--	--	--	--	--	--	--	0.00
DEC 26 1995-									
JAN 02 1996	0.05	0.023	0.020	1.57	<0.003	0.043	0.065	0.29	--
JAN									
02-09	0.06	<0.003	0.090	0.05	<0.003	0.015	0.039	<0.03	0.00
JAN									
09-16	0.03	0.004	0.190	0.74	<0.003	0.004	0.019	0.29	0.365
JAN									
16-23	0.04	0.009	<0.020	0.35	<0.003	0.016	0.037	0.13	1.344
JAN									
23-30	0.10	0.029	0.080	2.75	<0.003	0.020	0.069	0.25	0.421
JAN 30-									
FEB 06	--	--	--	--	--	--	--	--	0.005
FEB									
06-13	0.06	0.017	0.290	0.69	<0.003	0.017	0.042	0.61	0.204
FEB									
13-20	0.23	0.027	0.450	0.69	<0.003	0.019	0.145	0.22	0.096
FEB									
20-27	0.15	0.053	0.900	3.25	<0.003	0.043	0.122	2.67	0.871
FEB 27-									
MAR 05	0.15	0.016	0.210	0.95	<0.003	0.014	0.099	0.19	0.229
MAR									
05-12	0.04	0.003	0.060	0.07	<0.003	0.016	0.025	<0.03	0.00
MAR									
12-19	0.09	0.029	0.360	0.86	<0.003	0.014	0.094	0.39	0.158
MAR									
19-26	0.10	0.028	0.310	1.37	<0.003	0.018	0.070	0.71	0.931

CHEMICAL QUALITY OF PRECIPITATION

461458094295000 - PRECIPITATION STATION AT CAMP RIPLEY, MN

CHEMICAL QUALITY OF PRECIPITAT, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

WEEKLY COMPOSITE--Continued

DATE	TIME	TOTAL PRECIP- ITATION FOR DEFINED PERIOD (IN) (00193)	SPEC. CONduc- TANCE CK.SOL. ATM DEP WET TOT (US/CM) (83152)	SPEC. CONduc- TANCE FIELD ATM DEP WET TOT (US/CM) (83154)	SPEC. CONduc- TANCE LAB ATM DEP WET TOT (US/CM) (83156)	PH CK.SOL. ATM DEP WET T (UNITS) (83105)	PH FIELD ATM DEP WET T (UNITS) (83106)	PH LAB ATM DEP WET T (UNITS) (83107)	CALCIUM ATM DEP WET DIS (MG/L) (82932)
MAR 26- APR 02	1200	0.02	--	--	74.4	--	--	4.28	0.860
APR 02-09	2030	0.17	14.3	27.6	22.5	4.90	4.60	5.59	0.350
APR 09-16	1930	0.71	14.3	21.3	17.5	4.80	5.20	6.62	0.710
APR 16-23	1930	0.03	--	--	12.6	--	--	6.14	--
APR 23-30	1930	0.25	14.5	14.3	13.2	4.80	5.30	6.82	0.690
APR 30- MAY 07	2000	0.31	14.5	15.9	6.7	4.90	5.10	5.64	0.070
MAY 07-14	1930	1.00	14.5	5.1	4.3	4.90	5.30	5.44	0.050
MAY 14-21	1930	--	14.3	9.8	9.5	4.90	5.10	6.02	0.260
MAY 21-28	2000	--	14.0	9.4	9.8	4.90	5.60	6.30	0.390
MAY 28- JUN 04	1330	0.45	14.5	9.7	9.9	4.90	5.20	5.57	0.300
JUN 04-11	1930	0.70	13.9	9.2	9.1	4.90	5.10	4.99	0.130
JUN 11-18	1930	0.30	13.9	27.4	27.1	4.90	5.30	7.00	1.99
JUN 18-25	1930	0.57	14.3	12.9	12.3	4.90	4.70	4.98	0.170
JUN 25- JUL 02	1930	0.36	--	--	43.0	--	--	4.25	--
JUL 02-09	1915	0.64	14.0	13.3	11.2	4.90	5.00	5.85	0.170
JUL 09-16	1930	1.71	14.0	7.2	6.7	4.90	5.60	6.16	0.210
JUL 16-23	2000	0.46	13.8	5.1	4.9	4.90	5.00	6.01	0.130
JUL 23-30	1600	1.77	13.9	6.6	6.7	4.90	5.20	6.31	0.440
JUL 30- AUG 06	1930	0.31	13.7	10.7	10.2	4.90	5.10	5.01	0.180
AUG 06-13	1930	0.30	14.0	6.3	6.0	4.90	5.30	5.38	0.150
AUG 13-20	1930	0.10	13.9	12.8	9.7	4.90	5.00	5.39	0.100
AUG 20-27	1230	0.06	13.9	15.7	14.1	4.90	5.40	5.92	0.600
AUG 27- SEP 03	1800	0.95	13.9	18.2	15.5	4.90	4.80	4.98	0.130
SEP 03-10	1400	0.06	14.3	13.9	13.6	4.90	5.10	4.77	0.340
SEP 10-17	1930	0.0	--	--	2.3	--	--	5.63	0.020

CHEMICAL QUALITY OF PRECIPITATION

461458094295000 - PRECIPITATION STATION AT CAMP RIPLEY, MN

CHEMICAL QUALITY OF PRECIPITAT, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

WEEKLY COMPOSITE--Continued

DATE	CHLO- RIDE ATM DEP WET DIS (MG/L) (82944)	MAG- NESIUM ATM DEP WET DIS (MG/L) (83002)	NI- TROGEN AMMON. ATM DEP WET DIS AS NH4 (MG/L) (83047)	NI- TROGEN NITRATE ATM DEP WET DIS AS NO3 (MG/L) (83071)	PHOS- PHORUS ORTHO ATM DEP WET DIS AS PO4 (MG/L) (83111)	POTAS- SIUM ATM DEP WET DIS (MG/L) (83120)	SODIUM ATM DEP WET DIS (MG/L) (83138)	SULFATE ATM DEP WET DIS AS SO4 (MG/L) (83160)	VOLUME ATM DEP WET (L) (83177)
MAR 26-									
APR 02	0.54	0.136	4.92	17.2	<0.012	0.050	0.476	6.43	0.030
APR 02-09	0.18	0.046	2.08	4.52	<0.003	0.024	0.118	2.87	0.246
APR 09-16	0.10	0.068	1.47	2.81	<0.003	0.073	0.123	1.81	0.543
APR 16-23	--	--	--	--	--	--	--	--	0.015
APR 23-30	0.11	0.126	1.11	1.46	<0.003	0.029	0.074	0.91	0.425
APR 30-									
MAY 07	0.06	0.011	0.490	0.87	<0.003	0.013	0.044	0.81	0.540
MAY 07-14	0.11	0.010	0.200	0.63	<0.003	0.005	0.091	0.32	1.648
MAY 14-21	0.12	0.042	0.780	1.79	<0.003	0.032	0.125	1.11	2.676
MAY 21-28	0.09	0.102	0.680	1.44	<0.003	0.027	0.066	1.14	0.60
MAY 28-									
JUN 04	0.18	0.072	0.570	1.83	<0.003	0.050	0.116	0.82	0.706
JUN 04-11	0.08	0.024	0.450	0.99	<0.003	0.064	0.057	0.88	1.211
JUN 11-18	0.16	0.277	1.77	4.30	<0.003	0.052	0.097	1.60	0.524
JUN 18-25	0.10	0.023	0.470	1.44	<0.003	0.018	0.060	1.11	0.972
JUN 25-									
JUL 02	--	--	--	--	--	--	--	--	0.009
JUL 02-09	0.15	0.026	1.08	2.16	<0.003	0.036	0.086	1.10	1.107
JUL 09-16	0.05	0.034	0.530	0.99	<0.003	0.016	0.035	0.64	2.918
JUL 16-23	0.05	0.036	0.340	0.52	<0.003	0.012	0.022	0.40	0.769
JUL 23-30	0.05	0.064	0.390	0.85	<0.003	0.009	0.027	0.43	3.135
JUL 30-									
AUG 06	0.13	0.024	0.440	1.61	<0.003	0.025	0.096	0.81	0.528
AUG 06-13	0.12	0.030	0.290	1.11	<0.003	0.020	0.095	0.42	0.536
AUG 13-20	0.08	0.018	0.700	1.68	<0.003	0.038	0.047	0.96	0.00
AUG 20-27	0.18	0.111	0.860	2.77	<0.003	0.078	0.117	1.31	0.00
AUG 27-									
SEP 03	0.08	0.013	1.09	1.03	<0.003	0.028	0.035	2.80	1.658
SEP 03-10	0.13	0.023	0.330	1.13	<0.003	<0.003	0.064	1.67	0.00
SEP 10-17	0.12	0.008	0.090	0.12	<0.003	0.024	0.096	<0.03	0.00

CHEMICAL QUALITY OF PRECIPITATION

461458094295000 - PRECIPITATION STATION AT CAMP RIPLEY, MN

CHEMICAL QUALITY OF PRECIPITAT, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

WEEKLY COMPOSITE--Continued

DATE	TIME	TOTAL PRECIP- ITATION FOR DEFINED PERIOD (IN) (00193)	SPEC. CONDUCTANCE CK.SOL. ATM DEP WET TOT (US/CM) (83152)	SPEC. CONDUCTANCE FIELD ATM DEP WET TOT (US/CM) (83154)	SPEC. CONDUCTANCE LAB ATM DEP WET TOT (US/CM) (83156)	PH CK.SOL. ATM DEP WET T (UNITS) (83105)	PH FIELD ATM DEP WET T (UNITS) (83106)	PH LAB ATM DEP WET T (UNITS) (83107)	CALCIUM ATM DEP WET DIS (MG/L) (82932)
SEP 17-24	1515	1.01	14.1	7.4	7.8	4.90	5.40	5.00	0.030
SEP 24- OCT 01	1500	0.95	14.1	11.0	11.2	4.90	5.30	4.85	0.080
DATE	CHLO- RIDE ATM DEP WET DIS (MG/L) (82944)	MAG- NESIUM ATM DEP WET DIS (MG/L) (83002)	NI- TROGEN AMMON. ATM DEP WET DIS AS NH4 (MG/L) (83047)	NI- TROGEN NITRATE ATM DEP WET DIS AS NO3 (MG/L) (83071)	PHOS- PHORUS ORTHO ATM DEP WET DIS AS PO4 (MG/L) (83111)	POTAS- SIUM ATM DEP WET DIS (MG/L) (83120)	SODIUM ATM DEP WET DIS (MG/L) (83138)	SULFATE ATM DEP WET DIS AS SO4 (MG/L) (83160)	VOLUME ATM DEP WET (L) (83177)
SEP 17-24	0.05	0.006	0.330	0.82	<0.003	0.007	0.026	0.65	1.724
SEP 24- OCT 01	0.06	0.017	0.440	1.16	<0.003	0.008	0.035	1.18	0.001

	Page		Page
A		Chippewa River near Milan	248
Access to WATSTORE data	15	Chisholm, Sturgeon River at	126
Accuracy of the records	12	Classification of records, surface-water quality	12
Ada, Marsh River Ditch near	347	Clearwater River at Plummer	84
Aitkin, Mississippi River at	152	Clearwater River at Red Lake Falls	88
Akeley, Williams Lake near	142	Clearwater River near South Haven	350
Aldrich, Leaf River near	349	Climax, Sand Hill River at	72
Alvarado, Snake River above	94	Cloquet River near Toimi	346
Anoka, Mississippi River near	206	Concord, Milliken Creek near	353
Appleton, Pomme de Terre River at	244	Cooperation	1
Argyle, Middle River at	98	Cottonwood River near New Ulm	258
Arrangement of records, water quality	12	Cottonwood River near Springfield	351
Ashley Creek near Sauk Centre	349	Courtland, Little Cottonwood River near	260
Aurora, St. Louis River near	345	Craigville, Bowerman Brook near	348
Austin, Cedar River near	336	Crane Lake, Vermilion River near	122
B		Crooked Creek at Freeburg	354
Babitt, Stony River near	347	Crooked Creek near Hinckley	352
Bancroft Creek at Bancroft	354	Crookston, Burnham Creek near	347
Bancroft, Bancroft Creek at	354	Crookston, Red Lake River at	90
Barnesville, Whiskey Creek at	347	Crookston, Burnham Creek near	347
Basswood River near Winton	118	Cross Lake, Pine River Reservoir at	154
Baudette, North Branch Rapid River near	348	Crow River at Rockford	190
Baudette, Winter Road River near	348	Crow Wing River at Nimrod	160
Beaver Creek at Beaver Falls	351	Crow Wing River near Pillager	166
Beaver Creek at Valley Springs	355	D	
Beaver Falls, Beaver Creek at	351	Data collection and computation	9
Beaver, Whitewater River near	328	Data collection and computation, ground-water levels	14
Becida, Hennepin Creek near	348	Data table of daily mean values	11
Bemidji, Mississippi River at	348	Deer Creek near Holyoke	34
Bemidji, Mississippi River near	138	Deer River, Winnibigoshish Lake near	140
Big Fork River near Bigfork	348	Delft, Watonwan River near	352
Big Lake, Elk River near	180	Des Moines River at Jackson	338
Big Stone City, SD, Whetstone River near	238	Dilworth, Buffalo River near	60
Bigfork, Big Fork River near	348	Doran, Bois de Sioux River near	44
Blue Earth River near Rapidan	264	Downer, Spring Creek above	347
Bois de Sioux River near Doran	44	Downstream order system and station number	9
Bois de Sioux River near White Rock, SD	42	Drayton, ND, Red River of the North at	100
Bowerman Brook near Craigville	348	Duluth, Talmadge River at	345
Boy River near Remer	348	Dunnell, Fourmile Creek near	354
Brainerd, Gull Lake near	164	E	
Brainerd, Mississippi River at	156	East Branch Blue Earth River near Walters	351
Buffalo Creek near New Auburn	350	East Fork Des Moines River near Ceylon	354
Buffalo River near Callaway	347	Edgerton, Chanarambi Creek near	355
Buffalo River near Dilworth	60	Eighteenmile Creek near Wheaton	346
Buffalo River near Hawley	56	Elbow Lake, Pomme de terre River near	350
Bug Creek at Shaw	346	Elizabeth, Otter Tail River near	36
Burnham Creek near Crookston	347	Elk River near Big Lake	180
Burr, Florida Creek near	350	Elm Creek near Champlin	202
C		Elm Creek near Trimont	351
Callaway, Buffalo River near	347	Ely, Kawishiwi River near	112
Camp Ripley, Precipitation Station at	503	Emerson, Manitoba, Red River of the North at	104
Cannon River at Northfield	353	Empire, Vermillion River near	320
Cannon River at Welch	324	F	
Cannon River below Sabre Lake near Kilkenny	353	Fairbanks, North Branch Whiteface River near	346
Caribou, Roseau River below State Ditch 51, near	110	Faribault, Straight River near	322
Cascade River near Grand Marais	345	Fargo, Red River of the North at	54
Cat River near Nimrod	349	Federal Dam, Leech Lake at	144
Cedar River near Austin	336	Fergus Falls, Orwell Lake near	38
Ceylon, East Fork Des Moines River at	354	Fergus Falls, Otter Tail River below Orwell Dam, near	40
Champlin, Elm Creek near	202	Florida Creek near Burr	350
Chanarambi Creek near Edgerton	355	Fort Frances, Ontario, Rainy Lake near	124
Chemical quality of precipitation	503	Fort Ripley, Nokassippi River	349

	Page		Page
Fourmile Creek near Dunnell	354	Lac qui Parle, Lac qui Parle River near	246
Foxhome, Ottetail River near	346	Lake Bronson, South Branch Two Rivers at	102
Freeburg, Crooked Creek at	354	Lake of the Woods at Springsteel Island near Warroad	136
G		Lanesboro, Root River near	353
Garden City, Watonwan River near	262	Le Sueur River near Rapidan	276
Gaylord, Middle Branch Rush River near	352	Leaf River near Aldrich	349
Glaisby Brook near Kettle River	352	Leech Lake at Federal Dam	144
Gonvick, Ruffy Brook near	347	Libby, Sandy Lake at	150
Goodridge, Red Lake River at High Landing near	80	List of counties for which ground-water water-quality records are published	ix
Goose Creek at Harris	352	List of counties for which ground-water-level records are published ix	
Grand Forks, ND, Red River of the North at	92	List of gaging stations, in downstream order, for which records are published	v
Grand Marais, Cascade River near	345	Little Cedar River near Johnsbury	354
Grand Portage, Pigeon River at Middle Falls, near	28	Little Chippewa River near Starbuck	350
Grand Rapids, Mississippi River at	148	Little Cottonwood River near Courtland	260
Grand Rapids, Pokegama Lake near	146	Little Fork River at Littlefork	132
Granite Falls, Yellow Medicine River near	252	Little Minnesota River near Peever, SD	236
Ground-water level records, by county	405	Little Rock River near Rushmore	355
Ground-water quality data, by county	420	Little Sioux River near Spafford	355
Grygla, Mud River near	347	Little Stewart River near Two Harbors	345
Gull Lake near Brainerd	164	Littlefork, Little Fork River at	132
H		Long Prairie River at Long Prairie	162
Halstad, Red River of the North at	68	Long Prairie, Long Prairie River at	162
Harris, Goose Creek at	352	Lost River at Oklee	86
Hawk Creek near Maynard	351	Lower Red Lake at Battle River mouth near Saum	76
Hawley, Buffalo River near	56	Lower Red Lake near Red Lake	78
Henderson, High Island Creek near	284	M	
Hendrum, Wild Rice River at	66	Malung, Roseau River below South Fork near	106
Hennepin Creek near Becida	348	Manitou Rapids, Rainy River at	134
Hickson, ND, Red River of the North at	50	Mankato, Minnesota River at	278
High Island Creek near Henderson	284	Maple River near Rapidan	352
High-flow partial-record stations	345	Marsh River Ditch near Ada	347
Hill City, Smith Creek near	348	Marsh River near Shelly	70
Hillman Creek near Pierz	349	Marshall, Redwood River near	254
Hinckley, Crooked Creek near	352	Maynard, Hawk Creek near	351
Holyoke, Deer Creek near	34	Middle Branch Rush River near Gaylord	352
Holyoke, Nemadji River near	346	Middle Fork Whitewater River near State Park Group Camp near St. Charles	353
Houston, Root River near	334	Middle River at Argyle	98
Houston, South Fork Root River near	354	Middle River near Newfolden	347
Hydrologic bench-mark network, definition of	8	Milan, Chippewa River near	248
I		Mille Lacs Lake at Cove Bay near Onamia	192
Identifying estimated daily discharge	12	Milliken Creek near Concord	353
Illustrations, in table of contents	v	Minnesota River at Mankato	278
Introduction	1	Minnesota River at Montevideo	250
J		Minnesota River at Ortonville	240
Jackson, Des Moines River at	338	Minnesota River near Jordan	286
Johnsbury, Little Cedar River near	354	Mississippi River at Aitkin	152
Johnson Creek near St. Augusta	350	Mississippi River at Brainerd	156
Jordan, Minnesota River near	286	Mississippi River at Bemidji	348
K		Mississippi River at Grand Rapids	148
Kawishiwi River near Ely	112	Mississippi River at Prescott, WI	318
Kawishiwi River near Winton	116	Mississippi River at St. Cloud	178
Kettle River below Sandstone	310	Mississippi River at St. Paul	298
Kettle River, Glaisby Brook near	352	Mississippi River at Winona	330
Kilkenny, Cannon River below Sabre Lake near	353	Mississippi River near Anoka	206
Kingston, North Fork Crow River near	350	Mississippi River at Brainerd	156
Knife River near Mora	312	Mississippi River near Bemidji	138
Knife River near Two Harbors	30	Mississippi River near Fort Ripley	168
L		Mississippi River near Royalton	170
Laboratory measurements, surface-water quality	13	Montevideo, Minnesota River at	250
Lac la Croix, Ontario, Namakan River at	120	Montevideo, Spring Creek near	351
Lac qui Parle River near Lac qui Parle	246		

	Page		Page
Mora, Knife River near	312	Rainy Lake near Fort Frances, Ontario	124
Mud River near Grygla	347	Rainy River at Manitou Rapids	134
Mustinka River above Wheaton	346	Ramsey Creek near Redwood Falls	351
N		Rapidan, Blue Earth River near	264
Namakan River at outlet of Lac la Croix, Ontario	120	Rapidan, Le Sueur River near	276
Nashua, Rabbit River near	346	Rapidan, Maple River near	352
National stream quality accounting network (NASQAN), definition of	8	Records of ground-water levels	14
National trends network (NTN), definition of	8	Records of stage and water discharge	9
Nemadji River near Holyoke	346	Records of surface-water quality	12
Nett Lake, Nett Lake River near	130	Records of ground-water water quality	15
Nett Lake, Wood Duck River near	128	Red Lake Falls, Clearwater River at	88
Nett Lake River near Nett Lake	130	Red Lake River at Crookston	90
New Prague, Sand Creek near	352	Red Lake River at High Landing, near Goodridge	80
New Ulm, Cottonwood River near	258	Red Lake, Lower Red Lake near	78
Newfolden, Middle River near	347	Red River of the North at Drayton, ND	100
Nimrod, Cat River near	349	Red River of the North at Hickson, ND	50
Nimrod, Crow Wing River at	160	Red River of the North at Emerson, Manitoba	104
Nokasippi River near Fort Ripley	349	Red River of the North at Fargo, ND	54
North Branch Rapid River near Baudette	348	Red River of the North at Grand Forks, ND	92
North Branch Whiteface River near Fairbanks	346	Red River of the North at Halstad	68
North Fork Crow River at Paynesville	350	Red River of the North at Wahpeton, ND	46
North Fork Crow River near Kingston	350	Redwood Falls, Ramsey Creek near	351
Northfield, Cannon River at	353	Redwood Falls, Redwood River near	256
Numbering system for wells and miscellaneous sites	9	Redwood River near Marshall	254
O		Redwood River near Redwood Falls	256
Odessa, Yellow Bank River near	242	Remer, Boy River near	348
Oklee, Lost River at	86	Rochester, South Fork Zumbro River at	326
Onamia, Mille Lacs Lake at Cove Bay near	192	Rockford, Crow River at	190
On-site measurement and sample collection, surface-water quality ..	12	Root River at Rushford	353
Ormsby, South Fork Watonwan River near	352	Root River near Lanesboro	353
Ortonville, Minnesota River at	240	Root River near Houston	334
Orwell Lake near Fergus Falls	38	Roseau River at Ross	108
Other records available	12	Roseau River below South Fork near Malung	106
Otter Tail River below Orwell Dam, near Fergus Falls	40	Roseau River below State Ditch 51, near Caribou	110
Otter Tail River near Elizabeth	36	Ross, Roseau River at	108
Ottertail River near Foxhome	346	Royalton, Mississippi River near	170
P		Royalton, Platte River at	349
Palisade, Willow River below	349	Ruffy Brook near Gonvick	347
Park Rapids, Straight River near	158	Rum River near St. Francis	194
Paynesville, North Fork Crow River at	350	Rush Creek near Rushford	353
Peever, SD, Little Minnesota River near	236	Rushford, Root River at	353
Pierz, Hillman Creek near	349	Rushford, Rush Creek near	353
Pigeon River at Middle Falls, near Grand Portage	28	Rushmore, Little Rock River at	355
Pillager, Crow Wing River near	166	S	
Pine City, Snake River near	314	Sabin, South Branch Buffalo River at	58
Pine River near Pine River	349	Sand Creek near New Prague	352
Pine River Reservoir at Cross Lake	154	Sand Hill River at Climax	72
Pine River, Pine River near	349	Sandstone, Kettle River below	310
Pipestone Creek near Pipestone	354	Sandy Lake at Libby	150
Pipestone, Pipestone Creek near	354	Sauk Centre, Ashley Creek near	349
Platte River at Royalton	349	Sauk River near St. Cloud	176
Plummer, Clearwater River at	84	Sauk River tributary at Spring Hill	350
Pokegama Lake near Grand Rapids	146	Scanlon, St. Louis River at	32
Pomme de Terre River at Appleton	244	Shaw, Bug Creek at	346
Pomme de Terre River near Elbow Lake	350	Shelly, Marsh River near	70
Precipitation Station at Camp Ripley	503	Silver Creek tributary near Two Harbors	345
Prescott, WI, Mississippi River at	318	Sleepy Eye, Spring Creek near	351
Publications on techniques of water-resources investigations	21	Smith Creek near Hill City	348
R		Snake River above Alvarado	94
Rabbit River near Nashua	346	Snake River near Pine City	314
Radiochemical program, definition of	8	South Branch Buffalo River at Sabin	58
		South Branch Two Rivers at Lake Bronson	102
		South Fork Root River near Houston	354

	Page		Page
South Fork Watonwan River near Ormsby	352	Whiskey Creek at Barnesville	347
South Fork Zumbro River at Rochester	326	White Rock, SD, Bois de Sioux River near	42
South Haven, Clearwater River near	350	Whitewater River near Beaver	328
Spafford, Little Sioux River near	355	Wild Rice River at Hendrum	66
Special networks and programs	8	Wild Rice River at Twin Valley	62
Spring Creek above Downer	347	Williams Lake near Akeley	142
Spring Creek near Montevideo	351	Willow River below Palisade	349
Spring Creek near Sleepy Eye	351	Winnibigoshish Lake near Deer River	140
Spring Hill, Sauk River tributary at	350	Winona, Mississippi River at	330
Springfield, Cottonwood River near	351	Winter Road River near Baudette	348
St. Augusta, Johnson Creek near	350	Winton, Basswood River near	118
St. Charles, Middle Fork Whitewater River near State Park Group Camp near	353	Winton, Kawishiwi River near	116
St. Cloud, Mississippi River at	178	Wood Duck Creek near Nett Lake	128
St. Cloud, Sauk River near	176	Y	
St. Croix Falls, St. Croix River at	316	Yellow Bank River near Odessa	242
St. Croix River at St. Croix Falls	316	Yellow Medicine River near Granite Falls	252
St. Francis, Rum River near	194	Z	
St. Louis River at Scanlon	32	Zumbro Falls, Zumbro River at	353
St. Louis River near Aurora	345	Zumbro River at Zumbro Falls	353
St. Paul, Mississippi River at	298		
Starbuck, Little Chippewa River near	350		
Staright River near Park Rapids	158		
Station identification numbers, definition of	9		
Station manuscript	10		
Statistics of monthly mean data	11		
Stony River near Babbitt	347		
Straight River near Faribault	322		
Straight River near Park Rapids	158		
Sturgeon River near Chisholm	126		
Summary of hydrologic conditions	1		
Summary statistics	11		
T			
Table of contents	iv		
Talmadge River at Duluth	345		
Thief River Falls, Thief River near	82		
Thief River near Thief River Falls	82		
Toimi, Cloquet River near	346		
Trimont, Elm Creek near	351		
Tritium network, definition of	8		
Twin Valley, Wild Rice River at	62		
Two Harbors, Knife River near	30		
Two Harbors, Little Stewart River near	345		
Two Harbors, Silver Creek tributary near	345		
U			
Upper Red Lake at Waskish	74		
V			
Valley Springs, Beaver Creek at	355		
Vermilion River near Crane Lake	122		
Vermillion River near Empire	320		
W			
Wahpeton, ND, Red River of the North at	46		
Walters, East Branch Blue Earth River near	351		
Warroad, Lake of the Woods at Lake of the Woods at Springsteel Island near	136		
Water temperature, surface water quality	13		
Watonwan River near Delft	352		
Watonwan River near Garden City	262		
Welch, Cannon River at	324		
Wheaton, Eighteenmile Creek near	346		
Wheaton, Mustinka River above	346		
Whetstone River near Big Stone City, SD	238		

CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
<i>Length</i>		
inch (in.)	2.54×10^1	millimeter
	2.54×10^{-2}	meter
foot (ft)	3.048×10^{-1}	meter
mile (mi)	1.609×10^0	kilometer
<i>Area</i>		
acre	4.047×10^3	square meter
	4.047×10^{-1}	square hectometer
	4.047×10^{-3}	square kilometer
square mile (mi ²)	2.590×10^0	square kilometer
<i>Volume</i>		
gallon (gal)	3.785×10^0	liter
	3.785×10^0	cubic decimeter
	3.785×10^{-3}	cubic meter
million gallons (Mgal)	3.785×10^3	cubic meter
	3.785×10^{-3}	cubic hectometer
cubic foot (ft ³)	2.832×10^1	cubic decimeter
	2.832×10^{-2}	cubic meter
cubic-foot-per-second day [(ft ³ /s) d]	2.447×10^3	cubic meter
	2.447×10^{-3}	cubic hectometer
acre-foot (acre-ft)	1.233×10^3	cubic meter
	1.233×10^{-3}	cubic hectometer
	1.233×10^{-6}	cubic kilometer
<i>Flow</i>		
cubic foot per second (ft ³ /s)	2.832×10^1	liter per second
	2.832×10^1	cubic decimeter per second
	2.832×10^{-2}	cubic meter per second
gallon per minute (gal/min)	6.309×10^{-2}	liter per second
	6.309×10^{-2}	cubic decimeter per second
	6.309×10^{-5}	cubic meter per second
million gallons per day (Mgal/d)	4.381×10^1	cubic decimeter per second
	4.381×10^{-2}	cubic meter per second
<i>Mass</i>		
ton (short)	9.072×10^{-1}	megagram or metric ton

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment for the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

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