Water Resources Data Minnesota Water Year 1981

Volume 2. Upper Mississippi and Missouri River Basins

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT MN-81-2
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 1981

1980

OCTOBER

S	M	T	W	T	F	S
			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	29	30	31	

NOVEMBER

S	M	T	W	T	F	S
						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	29
30						

DECEMBER

S	M	T	W	T	F	S
	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	29	30	31			

1981

JANUARY

S	M	T	W	T	F	S
				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	29	30	31

FEBRUARY

S	M	T	W	T	F	S
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

MARCH

S	M	T	W	T	F	S
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
29	30	31				

APRIL

S	M	T	W	T	F	S
			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	29	30		

MAY

S	M	T	W	T	F	S
					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	29	30
31						

JUNE

S	M	T	W	T	F	S
	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	29	30				

JULY

S	M	T	W	T	F	S
			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	29	30	31	

AUGUST

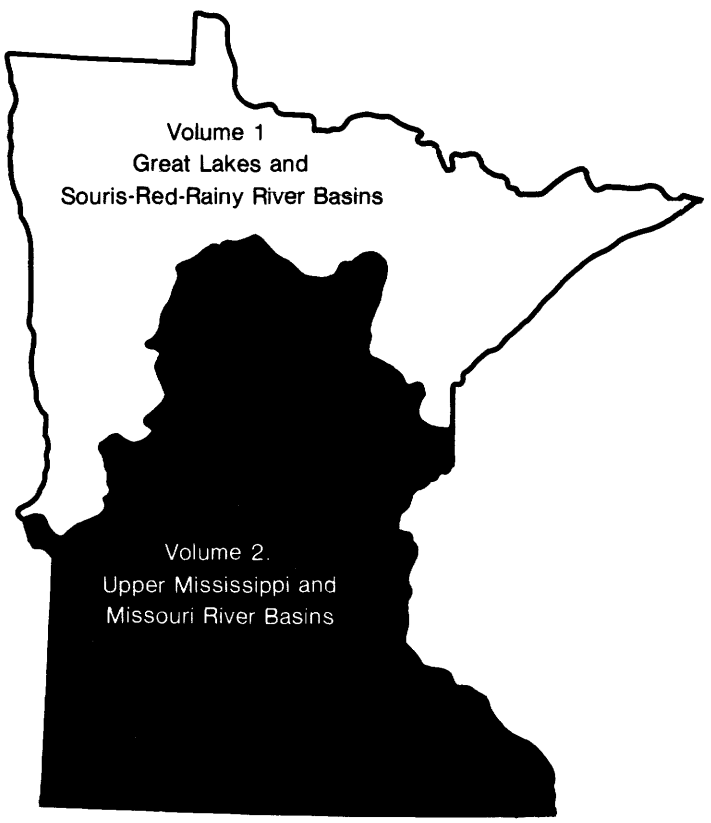
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

SEPTEMBER

S	M	T	W	T	F	S
		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	29	30			

Water Resources Data Minnesota Water Year 1981

Volume 2. Upper Mississippi and Missouri River Basins



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT MN-81-2
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

JAMES G. WATT, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

For additional information write to
District Chief, Water Resources Division
U.S. Geological Survey
702 Post Office Building
St. Paul, Minnesota 55101

1982

PREFACE

This report was prepared by personnel of the Minnesota district of the Water Resources Division of the U.S. Geological Survey under the supervision of D. R. Albin, District Chief, and F. T. Schaefer, Acting Regional Hydrologist, Northeastern Region. It was done in cooperation with the State of Minnesota and with other agencies.

This report is one of a series issued by state. General direction for the series is by Philip Cohen, Chief Hydrologist, U.S. Geological Survey, and James E. Biesecker, Assistant Chief Hydrologist for Scientific Publications and Data Management.

Data for Minnesota are in two volumes as follows:

Volume 1. Great Lakes and Souris-Red-Rainy River Basins

Volume 2. Upper Mississippi and Missouri River Basins

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. USGS/WRD/HD-82/057	2.	3. Recipient's Accession No.

4. Title and Subtitle
Water Resources for Minnesota, Water year 1981
Volume 2, Upper Mississippi and Missouri River Basins

5. Report Date
July 1982

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Organization Name and Address
U.S. Geological Survey, Water Resources Division
702 Post Office Building
St. Paul, Minnesota 55101

10. Project/Task/Work Unit No.
USGS-WRD-MN-81-2

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
U.S. Geological Survey, Water Resources Division
702 Post Office Building
St. Paul, Minnesota 55101

13. Type of Report & Period Covered
Annual Oct. 1, 1980 to Sept. 30, 1981

14.

15. Supplementary Notes
Prepared in cooperation with the State of Minnesota and with other agencies.

16. Abstract (Limit: 200 words)

Water-resources data for the 1981 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 in wells and springs. This volume contains discharge records for 70 gaging stations; stage and contents for 8 lakes and reservoirs; water quality for 41 stream stations, 3 partial-record stream stations, 4 partial-record lake stations, and 98 wells; and water levels for 287 observation wells. Also included are 109 high-flow partial-record stations and 27 low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements. These data, together with the data in Volume 1, represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State and Federal agencies in Minnesota.

17. Document Anelysis a. Descriptors
*Minnesota, *Hydrologic data, *Surface water, *Ground water, *Water quality, Flow rate, Gaging stations, Lakes, Reservoirs, Chemical analyses, Sediments, Water temperatures, Sampling sites, Water levels, Water analyses, Data collection

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
No restriction on distribution This report may be purchased from National Technical Information Service Springfield, VA 22161	UNCLASSIFIED	498
	20. Security Class (This Page) UNCLASSIFIED	22. Price

(See ANSI-Z39.18) See Instructions on Reverse OPTIONAL FORM 272 (4-77) (Formerly NTIS-35) Department of Commerce

CONTENTS

	Page
Preface	III
List of gaging stations, in downstream order, for which records are published	VI
List of ground-water wells, by county, for which records are published	VII
Introduction	1
Cooperation	1
Acknowledgments	2
Hydrologic conditions	2
Definition of terms	3
Downstream order and station number	16
Numbering system for wells and miscellaneous sites	16
Special networks and programs	16
Explanation of stage and water-discharge records	17
Collection and computation of data	17
Accuracy of field data and computed results	19
Other data available	19
Records of discharge collected by agencies other than the Geological Survey	19
Explanation of water-quality records	19
Collection and examination of data	19
Water analysis	20
Water temperature	20
Sediment	20
Explanation of ground-water level records	20
Collection of the data	20
Publications on techniques of water-resources investigations	26
Discontinued gaging stations	27
Gaging-station records	30
Discharge at partial-record stations and miscellaneous sites	316
Low-flow partial-record stations	316
High-flow partial-record stations	322
Miscellaneous sites	333
Low-flow investigations in the Chippewa-Pomme de Terre watersheds	336
Analyses of samples collected at water-quality miscellaneous sites	340
Miscellaneous analyses of streams	351
Ground-water records	361
Ground-water level records	364
Quality of ground-water records	472
Index	483

ILLUSTRATIONS

Figure 1.	Graph showing comparison of discharge at four long-term representative gaging stations for the current year with median discharge for water years 1951-80	4
2.	Graph showing comparison of dissolved-solids concentrations for the current year with mean monthly values for the period of record	6
3.	Graph showing comparison of suspended-sediment loads for the current year with mean monthly values for the periods of record	7
4.	Map showing relationship of seasonal water-table levels to long-term mean levels	8
5.	Map showing relationship of seasonal confined levels to long term mean levels	9
6	Diagram showing system for numbering wells and miscellaneous sites	16
7.	Map showing location of water-discharge stations	22
8.	Map showing location of water-quality stations	24
9.	Map showing location of high-flow partial-record stations	320
10.	Map showing location of ground-water wells	362

TABLE

Table 1.	Peaks of record occurring during water year 1981 at high-flow partial-record sites	3

Letter 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)

		Page
UPPER MISSISSIPPI RIVER BASIN		
Mississippi River:		
Winnibigoshish Lake near Deer River	(- e - - -)...	30
Mississippi River at Winnibigoshish Dam, near Deer River	(d - - - -)...	31
LEECH LAKE RIVER BASIN		
Williams Lake near Akeley	(- - c b p)...	32
Leech Lake at Federal Dam	(- e - - -)...	47
Leech Lake River at Federal Dam	(d - - - -)...	48
Pokegama Lake near Grand Rapids	(- e - - -)...	49
Mississippi River at Grand Rapids	(d - - - p)...	50,351
PRAIRIE RIVER BASIN		
Prairie River near Taconite	(d - - - p)...	51,351
SWAN RIVER BASIN		
Swan River near Calumet	(d - - - p)...	52,351
SANDY RIVER BASIN		
Sandy Lake at Libby	(- e - - -)...	53
Sandy River at Sandy Lake Dam, at Libby	(d - - - -)...	54
Mississippi River below Sandy River, near Libby	(d - - - p)...	55,351
Mississippi River at Aitkin	(d - - - p)...	56,351
PINE RIVER BASIN		
Pine River Reservoir at Cross Lake	(- e - - -)...	57
Pine River at Cross Lake Dam, at Cross Lake	(d - - - -)...	58
CROW WING RIVER BASIN		
Crow Wing River at Nimrod	(d - - - p)...	59,351
Long Prairie River at Long Prairie	(d - - - p)...	60,352
Gull River:		
Gull Lake near Brainerd	(- e - - -)...	61
Gull River at Gull Lake Dam, near Brainerd	(d - - - -)...	62
Crow Wing River near Pillager	(d - - - p)...	63,352
Mississippi River near Royalton	(d - c b p)...	64,352
SAUK RIVER BASIN		
Sauk River near St. Cloud	(d - - - p)...	76,352
ELK RIVER BASIN		
St. Francis River at Santiago	(d - c b p)...	77
St. Francis River above Zimmerman	(d - c b p)...	81
Elk River near Big Lake	(d - - - p)...	84,352
CROW RIVER BASIN		
North Fork Crow River:		
Middle Fork Crow River near Spicer	(d - - - p)...	87,352
Crow River at Rockford	(d - - - p)...	88,353
Mississippi River at Anoka	(- - c - p)...	91
RUM RIVER BASIN		
Mille Lacs Lake (head of Rum River) at Garrison	(- e - - -)...	93
Rum River near St. Francis	(d - - - p)...	94,353
Elm Creek near Champlin	(d - - - p)...	95,353
Mississippi River near Anoka	(d - c - p)...	96,353
Mississippi River at Fridley	(- - c - p)...	99
Bassett Creek in Golden Valley	(d - - - -)...	106
Mississippi River at Ford Dam, St. Paul	(- - c - p)...	107
MINNESOTA RIVER BASIN		
Little Minnesota River (head of Minnesota River) near Peever, SD	(d - - - p)...	114,353
Whetstone River near Big Stone City, SD	(d - - - p)...	115,353
Big Stone Lake at Ortonville	(- e - - -)...	118
Minnesota River at Ortonville	(d - - - p)...	119,354
Yellow Bank River near Odessa	(d - - - p)...	120,354
Pomme de Terre River at Appleton	(d - - - p)...	121,354
Lac qui Parle River:		
Lazarus Creek (head of Lac qui Parle Creek):		
Canby Creek near Canby	(- - - - p)...	122
Lac qui Parle River near Lac qui Parle	(d - - - p)...	124,354
Minnesota River near Lac qui Parle	(d - - - p)...	125,354
Chippewa River near Milan	(d - - - p)...	126,354
Minnesota River at Montevideo	(d - - - p)...	129,355
Yellow Medicine River:		
South Branch Yellow Medicine River at Minneota	(d - - - p)...	130,355
Yellow Medicine River near Granite Falls	(d - - - p)...	131,355
Redwood River near Marshall	(d - - - p)...	134,355
Redwood River near Redwood Falls	(d - - - p)...	135,355
Cottonwood River near New Ulm	(d - - - p)...	136,356
Little Cottonwood River near Courtland	(d - - - p)...	137,356
Blue Earth River:		
Watonwan River near Garden City	(d - - - p)...	138,356
Blue Earth River near Rapidan	(d - - - p)...	140,356
Le Sueur River near Rapidan	(d - - - p)...	141,356

Page

UPPER MISSISSIPPI RIVER BASIN--Continued
MINNESOTA RIVER BASIN--Continued
Minnesota River at Mankato..... (d - - - p)... 142,356
High Island Creek near Henderson..... (d - - - p)... 146,356
Minnesota River near Jordan..... (d - c b p)... 147,357
Purgatory Creek at Eden Prairie..... (d - - - p)... 357
Minnesota River at Burnsville..... (- - c - p)... 158
Minnesota River at Fort Snelling State Park, at St. Paul..... (d - c - p)... 165
Mississippi River at St. Paul..... (d - c - p)... 173,357
Mississippi River at Industrial Molasses at St. Paul..... (- - c - p)... 177
Mississippi River at 494 Bridge at Newport..... (d - c - p)... 184
Mississippi River at Fifth Street at Newport..... (- - c - p)... 187
Mississippi River at Grey Cloud Island near Cottage Grove..... (d - c - p)... 194
Mississippi River at Ninninger..... (d - c b p)... 202
Mississippi River at lock and dam 2, at Hastings..... (d - c - p)... 207
ST. CROIX RIVER BASIN
St. Croix River:
Kettle River:
Kettle River below Sandstone..... (d - - - p)... 215,357
Kettle River near Cloverdale..... (d - c b p)... 216
Snake River:
Knife River near Mora..... (d - - - p)... 217,357
Snake River near Pine City..... (d - c b p)... 218,357
Sunrise River near Lindstrom..... (d - - - p)... 220,357
St. Croix River at St. Croix Falls, WI..... (d - c b p)... 221
St. Croix River at Stillwater..... (d - c - p)... 229
St. Croix River at Afton..... (- - c - p)... 230
St. Croix River at Prescott, WI..... (d - c - p)... 237
Mississippi River at Prescott, WI..... (d - - - p)... 238,357
Mississippi River at lock and dam 3, near Red Wing..... (d - c - p)... 239
VERMILLION RIVER BASIN
Vermillion River near Empire..... (d - c - p)... 247,358
CANNON RIVER BASIN
Cannon River:
Straight River near Faribault..... (d - - - p)... 255,358
ZUMBRO RIVER BASIN
South Fork Zumbro River on Belt Line at Rochester..... (d - - - p)... 256
Bear Creek at Rochester..... (d - - - p)... 262
Silver Creek at Rochester..... (d - - - p)... 268
Cascade Creek at Rochester..... (d - - - p) 274
South Fork Zumbro River at Rochester..... (d - - - p)... 279,358
South Fork Zumbro River near Rochester..... (d - - - -)... 283
Zumbro River at Kellogg..... (d - - - p)... 284,358
WHITEWATER RIVER BASIN
North Fork Whitewater River near Elba..... (d - c b p)... 288,358
Whitewater River near Beaver..... (d - - - p)... 292,358
GARVIN BROOK BASIN
Garvin Brook:
Rollingstone Creek:
Straight Valley Creek near Rollingstone..... (d - - - p)... 295,359
Mississippi River at Winona..... (d - c b p)... 296,359
ROOT RIVER BASIN
Root River near Lanesboro..... (d - - - p)... 303,359
Root River near Houston..... (d - - - p)... 304,359
South Fork Root River near Houston..... (d - - - p)... 307,359
IOWA RIVER BASIN
Iowa River:
Cedar River near Austin..... (d - - - p)... 310,359
DES MOINES RIVER BASIN
Des Moines River at Jackson..... (d - - - p)... 313,359

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

AITKIN
Well 045N23W05ADD01..... 364
Well 045N23W05ADD02..... 364
Well 045N23W05ADD03..... 364
Well 047N27W26BBC01..... 365
ANOKA
Well 031N22W18AAA01..... 365
Well 031N22W18AAA02..... 366
Well 031N22W18AAA05..... 366
Well 031N22W23CBC01..... 367
Well 031N22W23CBC02..... 367
Well 031N22W23CBC03..... 367
Well 031N24W01CBB01..... 368

Page

ANOKA--Continued
Well 032N23W04AAD02 368
Well 033N23W05BAB01 368
Well 033N24W30ABB01 369
Well 034N24W25DAC01 369
BECKER
Well 140N36W26AAD01 369
BELTRAMI
Well 147N34W35ADC01 370
BENTON
Well 036N29W30BCC02 370
Well 037N31W09AAA02 370
Well 038N31W18DCA01 371
Well 038N31W18DCD02 371
Well 038N31W23AAB02 371
BIG STONE
Well 121N44W27CCC01 372
Well 124N48W17AAA01 372
Well 124N48W23AAA04 373
Well 124N48W31BBB01 373
Well 124N49W02DDD01 373
BLUE EARTH
Well 105N26W04BDC01 374
Well 106N28W03DBA01 374
Well 108N25W04BBC01 375
BROWN
Well 108N30W09ADD01 375
Well 110N32W30DDB01 375
CARLTON
Well 046N19W21CBB01 377
Well 048N18W21ACD01 377
Well 048N18W21CDC01 377
CARVER
Well 116N23W12CDB01 378
CHIPPEWA
Well 119N41W07BBB01 378
Well 119N41W29DDD01 378
Well 119N42W17DDD01 379
CHISAGO
Well 033N21W20BBC02 379
Well 035N19W17BAB02 379
Well 035N19W17BDB01 380
Well 035N21W26BCC01 380
COTTONWOOD
Well 105N36W08ACA01 381
Well 105N37W29AAA01 381
Well 105N38W20BAA01 381
CROW WING
Well 135N28W16CCD01 382
DAKOTA
Well 027N23W09ABD01 382
Well 027N24W34BDC01 383
Well 028N22W19DCC01 383
Well 028N22W19DCC02 383
Well 112N18W03CDC01 384
Well 112N18W08ABA01 384
Well 112N18W08BBC01 385
Well 112N19W11BBD01 385
Well 112N19W30DBD01 385
Well 113N17W01BBA01 386
Well 113N17W20BCA01 386
Well 113N18W07BAC01 386
Well 114N17W10AAA01 387
Well 114N17W15ADA01 387
Well 114N17W16CBB01 387
Well 114N17W18ABB01 388
Well 114N17W26CCB01 388
Well 114N17W31CCC01 388
Well 114N17W33BBC01 389
Well 114N18W01ADB01 389
Well 114N18W11DDD01 389
Well 114N18W17AAB01 390
Well 114N18W29AAB01 390
Well 114N18W35CCB01 390
Well 114N19W04DAC01 391
Well 114N19W22DDD01 391
Well 114N19W32BAD01 392
Well 114N20W33ABC01 392

Page

DAKOTA--Continued
Well 115N18W18BCB01 392
Well 115N19W26DCD01 393
Well 115N20W08CDC01 393
DODGE
Well 105N18W13DDD01 394
Well 107N17W13BBA01 394
DOUGLAS
Well 127N40W27CBB01 395
FARIBAULT
Well 103N28W24BDC01 395
Well 104N26W36CAC01 396
FREEBORN
Well 101N23W02DAC01 396
Well 103N20W36CCB01 396
GOODHUE
Well 110N15W31BBD01 397
Well 111N15W21CDA01 397
Well 112N18W29DBA01 397
Well 113N15W27BAB01 398
GRANT
Well 127N41W06CAC01 398
Well 127N41W32BBA01 398
Well 129N41W18ACB01 399
Well 129N41W30BCA01 399
Well 129N41W31ACA01 399
Well 130N42W23DBD01 400
Well 130N42W26DAA01 400
Well 130N42W36CCC01 400
Well 130N42W36CCC02 401
HENNEPIN
Well 027N24W30AAA01 401
Well 027N24W30BDA01 401
Well 028N24W23ADD01 402
Well 029N24W06CCC01 402
Well 029N24W23CCB02 403
Well 029N24W26BAB01 403
Well 029N24W27ABD01 404
Well 116N21W07DAD01 404
Well 117N21W16CCA01 405
Well 117N21W16CDB01 405
Well 117N21W32DAD01 405
Well 117N22W03ADC01 406
Well 117N23W11BBD01 406
Well 118N21W07DCB01 406
Well 118N21W32CBB01 407
Well 118N21W32CBD01 407
Well 119N21W04BBA01 407
Well 119N21W19DDD01 408
Well 119N22W28ACC01 408
HUBBARD
Well 139N32W16AAA01 408
ISANTI
Well 035N24W14BCD01 409
Well 035N24W14CDC01 410
Well 036N23W32ACB01 410
ITASCA
Well 055N25W17ACD01 410
JACKSON
Well 104N37W19DBD01 411
KANABEC
Well 038N23W07DBB01 411
Well 038N25W12BCB01 411
Well 038N25W25AAD02 412
Well 039N23W05DAC01 412
Well 039N24W04ADA01 412
Well 039N24W11DDC01 413
Well 040N24W12BCC01 413
KANDIYOHI
Well 119N35W14ABB01 413
Well 122N33W04BCD01 414
Well 122N34W06CBC01 414
LE SUEUR
Well 111N26W14ADA01 415
Well 112N23W02BAB01 415
Well 112N23W06DDD01 415
LINCOLN
Well 110N44W33DCD01 416

Page

MARTIN
Well 103N32W08CCD01 416
MC LEOD
Well 115N27W14ABA01 416
Well 115N28W05ACC01 417
Well 115N28W11ADD01 417
Well 116N29W35DDC01 417
Well 117N27W10DAA01 418
MEEKER
Well 119N30W19AAB01 418
Well 121N31W26BDC01 418
MILLE LACS
Well 038N27W35ABC01 419
MORRISON
Well 039N31W23DAA01 419
Well 130N29W08DCC01 419
MOWER
Well 103N17W09DAA01 420
MURRAY
Well 105N43W18BCC01 420
Well 106N39W21DCD01 421
Well 106N40W12ABB01 421
Well 107N40W21AAB01 421
Well 108N41W36BBC01 422
OLMSTED
Well 106N14W14ADB01 422
PINE
Well 039N20W18DDD01 423
Well 041N18W33AAD01 423
Well 041N19W33CCC01 423
Well 041N20W32BBB01 424
Well 044N19W10BAB01 424
Well 045N20W26DBB01 424
PIPESTONE
Well 106N44W33CCD01 425
Well 107N47W12CDC01 425
POPE
Well 123N40W04BDA01 426
Well 123N40W17AAC01 426
Well 123N40W30DAD01 426
Well 124N36W20DDD01 427
Well 124N40W05BCC01 427
Well 124N40W05CCA01 427
Well 124N40W18DAD01 428
Well 124N40W30BCC01 428
Well 125N36W04ADA01 428
Well 125N36W16BBB01 429
Well 125N37W14DBB01 429
Well 126N36W20BCC01 430
RAMSEY
Well 028N22W06ABD02 430
Well 028N23W03ADD01 431
Well 029N22W14CAB01 431
Well 029N22W14CAB02 431
Well 029N22W14CAB03 432
Well 029N22W16ADD01 432
Well 029N22W24ADA01 432
Well 029N22W31DDD01 433
Well 029N23W03CBA01 433
Well 029N23W11CCC01 433
Well 029N23W25CCD01 434
Well 029N23W35BAD01 434
Well 030N22W23CBB01 434
Well 030N23W01BAB01 435
Well 030N23W35BDC01 435
REDWOOD
Well 109N36W21DCC01 435
Well 109N37W09CCC01 436
Well 109N38W30BBD01 436
Well 110N38W20CCD01 437
Well 110N39W17AAA01 437
Well 112N36W14AAA01 437
Well 112N36W24DDC01 438
Well 112N37W21CCC01 438
Well 112N38W21BBC01 439
Well 112N39W22BBB01 439
RENVILLE
Well 115N32W29AAC01 439

Page

RICE
Well 110N20W19BDC01 440
Well 111N20W11CDC01 440
Well 112N21W31CBB01 440
ROCK
Well 102N45W35DDC01 441
Well 102N46W14AAA01 441
Well 104N44W21CDC01 441
SCOTT
Well 113N21W28CAC01 442
Well 113N24W06BCB01 442
Well 113N24W28DAA01 442
Well 113N24W28DAA02 443
Well 113N25W02CAC01 443
Well 114N21W20BAA01 443
Well 114N22W35DCC01 444
Well 115N21W09CCC01 444
Well 115N22W12ABA01 445
Well 115N23W28AAC01 445
SHERBURNE
Well 033N27W21CCA01 445
Well 033N27W21CCA02 446
Well 033N27W21CCC01 446
Well 033N27W29CDC01 447
Well 033N28W16DDD02 447
Well 034N27W10DDD02 447
Well 034N27W18AAB01 448
Well 034N28W04ADA02 448
Well 034N28W31BDD02 448
Well 034N28W36CCC02 449
Well 034N29W21ABB02 449
Well 034N29W21ABB03 449
Well 034N30W11ACD02 450
Well 035N26W15DBB01 450
Well 035N26W15DBB02 450
Well 035N27W07CCA02 451
Well 035N27W14DCD01 451
Well 035N27W29DBB02 451
Well 035N29W12AAD02 452
Well 035N29W28ABC01 452
Well 035N30W10CCB01 452
STEARNS
Well 122N28W07ABA02 453
Well 122N28W30BCC02 453
Well 122N29W23CAA02 453
Well 123N28W12BAB02 454
Well 123N28W30ABA02 454
Well 123N29W07DBC02 454
Well 123N29W27CCC02 455
Well 123N30W18BCC02 455
Well 123N32W33AAD02 455
Well 124N28W03CDB02 456
Well 124N28W06CDD01 456
Well 124N28W21CDA01 456
Well 125N30W22CDD01 457
Well 125N33W03CDA02 457
Well 126N28W17CAA01 458
Well 126N30W17ABC02 458
Well 126N34W23CDA01 458
SWIFT
Well 120N42W28DDD01 459
Well 120N43W02DDD01 459
Well 121N39W06BDB01 459
Well 121N39W07AAC01 460
Well 122N42W21BBB01 460
TODD
Well 133N35W02CAC01 460
Well 133N35W07CCC01 461
WABASHA
Well 111N12W04BBD01 461
WADENA
Well 134N34W19ADD01 462
WASHINGTON
Well 027N20W02BCC01 462
Well 027N20W02BCC02 463
Well 027N20W02BCC03 463
Well 027N21W28BCC01 463
Well 028N20W11CAA01 464

Page

WASHINGTON--Continued
Well 028N20W34ADA01 464
Well 029N21W06CAD01 464
Well 029N21W10CCC01 465
Well 029N21W13CAB01 465
Well 030N21W15CBB01 465
Well 031N21W28ABD01 466
Well 032N20W30BCD01 466
WATONWAN
Well 106N32W01DDB01 466
WINONA
Well 106N10W19DDA01 467
WRIGHT
Well 118N27W03CAC01 467
Well 118N27W03CAC03 468
Well 118N27W15CDC01 468
Well 119N26W24BAB02 468
Well 119N26W35DDA01 469
Well 121N23W22ACC01 469
Well 121N25W15BBA02 469
Well 122N27W11AAC02 470
YELLOW MEDICINE
Well 114N40W16BAC01 470
Well 114N45W04DCD01 470

WATER RESOURCES DATA FOR MINNESOTA, 1981

INTRODUCTION

Water resources data for the 1981 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 70 gaging stations; stage and contents for 8 lakes and reservoirs; water quality for 41 stream stations, 3 partial-record stream stations, 4 partial-record lake stations, 1 precipitation station, and 98 wells; and water levels for 287 observation wells. Also included are 109 high-flow partial-record stations and 27 low-flow partial-record stations. Additional water data were collected at various sites, not involved in the systematic data collection program, and are published as miscellaneous measurements. These data, together with the data in Volume 1, represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Minnesota.

Records of discharge or stage of streams, and contents or stage of lakes and reservoirs were first published in a series of U.S. Geological Survey water-supply papers titled "Surface Water Supply of the United States." Through September 30, 1960, these water-supply papers were in an annual series and then in a 5-year series for 1961-65 and 1966-70. Records of chemical quality, water temperatures, and suspended sediment were published from 1941 to 1970 in an annual series of water supply papers titled "Quality of Surface Waters of the United States." Records of ground-water levels were published from 1935 to 1974 in a series of water-supply papers titled "Ground-Water Levels in the United States." Water-supply papers may be consulted in the libraries of the principal cities in the United States or may be purchased from Branch of Distribution, U.S. Geological Survey, 1200 South Eads Street, Arlington, VA 22202.

For water years 1961 through 1974, streamflow data were released by the Geological Survey in annual reports on a State-boundary basis. Water-quality records for water years 1964 through 1974 were similarly released either in separate reports or in conjunction with streamflow records.

Beginning with the 1975 water year, water data for streamflow, water quality, and ground water are published as an official Survey report on a State-boundary basis. These official Survey reports carry an identification number consisting of the two letter State abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report MN-81-2." Water-Data reports are for sale 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) 725-7841.

COOPERATION

The U.S. Geological Survey and organizations 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, Division of Waters, Larry Seymour, director.

Minnesota Department of Transportation, Richard P. Braun, commissioner.

Minnesota Department of Health, George R. Pettersen, commissioner.

Minnesota Pollution Control Agency, Louis J. Breimhurst, executive director.

Metropolitan Waste Control Commission of the Twin Cities Area, B. L. Lukermann, chairwoman.

Metropolitan Council of the Twin Cities Area, Charles R. Weaver, chairman.

Elm Creek Conservation Commission, Gerald E. Butcher, chairman.

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army, in collecting records for 45 gaging stations and 11 water-quality stations published in this report.

Twelve gaging stations in the Hudson Bay and St. Lawrence River basins were maintained by funds appropriated to the United States Department of State. Nine of these, on waters adjacent to the international boundary, are maintained by the United States (or Canada) under agreement with Canada (or the United States), and the records are obtained and compiled in a manner equally acceptable in both countries. These stations are designated herein as "International gaging stations."

Some records for the Red River of the North, which borders the State on the west, were obtained at the request of other Federal agencies as a part of the program of the U.S. Department of the Interior for development of the Missouri River basin.

ACKNOWLEDGMENT

Minnesota district personnel who contributed significantly to the collection and preparation of water-resources data for publication in this report were:

St. Paul District Office

Kurt T. Gunard, Chief, Hydrologic Records Section

St. Paul Field Headquarters

Joseph H. Hess,
Hydrologist-in-Charge

Jerry K. Hicks
David J. Bauer
Ruth E. Bergstrom
William D. Bemis
Paul E. Felsheim
David L. Lorenz

Duane A. Wicklund
Gregory B. Mitton
Luanne Nelson
Leo G. Schaffer
Charles J. Smith
Gregory W. Stratton

Ground-Water Section

Henry W. Anderson, Chief
Alex Brietkrietz

Montevideo Field Headquarters

Charles E. Cornelius,
Technician-in-Charge

Patrick J. Finnegan
Marlys Fluto
Roderick L. Johnson
Richard L. Kittelson

Grand Rapids Subdistrict Office

Donald W. Ericson,
Hydrologist-in-Charge

James L. Zirbel
Howard D. Braden
William A. Gothard
Wallace W. Larson
Gregory R. Melhus
Tilie L. Yocus

Water-Quality Section

Mark R. Have, Chief
Jeffrey L. Henry
Lan H. Tornes

Scientific Publications Unit

Ronald J. Wolf, Chief
John L. Callahan
Margaret M. Diedrich
Jo Anne A. Jannis

Computer Applications Unit

James E. Jacques, Chief
Linda M. Christenson

HYDROLOGIC CONDITIONS

PRECIPITATION AND STREAMFLOW

Normal annual precipitation in Minnesota ranges from 19 inches in the northwest to 32 inches in the southeast. The average annual runoff ranges from less than 2 inches in the west to more than 16 inches in the northeast. During the 1981 water year, rainfall was deficient throughout the State from October through May. Above normal rainfall during June, July, and August in most of the State reduced the rainfall deficit in some areas and resulted in a surplus in other areas. Total precipitation for the 1981 water year was above normal in the northwest, north-central, south-central, and southeast areas and below normal in all remaining areas. The southwest was the most deficient in precipitation, almost 5 inches below normal. Annual runoff in 1981 ranged from less than 0.2 inch in parts of the west to almost 17 inches in the northeast.

Records from stations in central and southern Minnesota indicate a considerable variation in annual runoff from much below to much above average. Crow River at Rockford in east-central Minnesota and Chippewa River near Milan in west-central Minnesota had near average runoff for the year with 2.34 and 1.58 inches, respectively. Root River near Houston in southeast Minnesota had excessive annual runoff with 9.16 inches, whereas Des Moines River at Jackson in southwest Minnesota was much below average with 0.3 inch. Annual and monthly mean discharges for these stations are compared to median discharges for a 30-year base period in figure 1.

Annual mean streamflow was considerably below average at many gaging stations in west-central and southwest Minnesota. Chippewa River near Milan, with average runoff, was an exception to this trend (fig. 1). Runoff at many stations in central, east-central, and south-central Minnesota varied from average to somewhat below average. Southeast Minnesota had much above average runoff.

Peaks of record did not occur at any continuous-record gaging stations during 1981. However, peaks of record did occur at four high-flow partial-record sites in south-central Minnesota, as shown in table 1.

The combined storage in the six Mississippi River Headwater Reservoirs (Winnibigoshish, Leech, Pokegama, Pine, Sandy, and Gull) was 1,448,321 acre-feet at the end of the water year, an increase of 156,870 acre-feet from the corresponding date a year ago.

WATER QUALITY

Dissolved-solids data from selected NASQAN stations and suspended-sediment-load data from selected daily sediment stations were used to indicate how overall water quality varied for the Upper Mississippi River basin. There are no water-quality stations located in Minnesota that monitor water quality in the Missouri River basin.

Table 1.--Peaks of record occurring during water year 1981 at high-flow partial-record sites

Station number	Station name	Drainage area (mi^2)	Period of record	Previous maximum		Maximum, 1981		Recurrence interval (years)
				Year	Discharge (ft^3/s)	Date	Discharge (ft^3/s)	
05317850	Foster Creek near Alden	2.26	1959-81	1965	185	July 15	223	10-25
05318200	East Branch Blue Earth River tributary near Blue Earth	9.20	1960-81	1968	468	June 23	610	~100
05320200	Le Sueur River tributary near Mankato	0.073	1959-81	1978	83	June 23	320	>100
05320400	Maple River tributary near Mapleton	6.22	1959-81	1960	548	July 22	2000	>100

> Greater than.
~ Approximately.

Dissolved-solids concentrations in water from the upper part of the Upper Mississippi River basin were higher than normal during the fall and winter, but quickly dropped to near normal during March and remained near normal for the rest of the water year. This change in dissolved-solids concentration is represented by the graph shown in figure 2 for the Mississippi River near Royalton in central Minnesota. Dissolved-solids concentrations in the Minnesota River near Jordan, at the lower end of the Minnesota River basin, were near normal throughout the year, and concentrations in the Mississippi River at Winona in southeast Minnesota were below normal throughout most of the water year (fig. 2).

Suspended-sediment loads were generally lower than normal throughout the Upper Mississippi River basin as represented by data collected at four gaging stations; Yellow Bank River near Odessa in western Minnesota, Mississippi River near Anoka in east-central Minnesota, Minnesota River at Mankato in south-central Minnesota, and Root River near Houston in southeast Minnesota (fig. 3).

Constituent concentrations in all samples of ground water analyzed and published in this volume were below maximum limits for drinking water prescribed by the U.S. Environmental Protection Agency with two exceptions. A shallow well in Grant County in western Minnesota was sampled twice during the water year, once on November 13, 1980, and again on April 23, 1981; the samples contained 12 and 14 mg/L of nitrite plus nitrate as nitrogen, respectively. The maximum prescribed concentration for nitrate as nitrogen in Class A water used for domestic consumption is 10 mg/L. A Galena Formation well in Faribault County, in south-central Minnesota, was found to contain 120 ug/L of total chromium on July 8, 1981. The maximum concentration of total chromium in Class A water used for domestic consumption is 50 ug/L.

GROUND-WATER LEVELS

The water table was at or below normal level in most of the State during the 1981 water year. The seasonal position of the water table (fig. 4) reflects a shortage of recharge during fall, winter, and early spring. The recovery to near-normal levels in summer reflects the influence of precipitation on recharge to the aquifer. Figure 4 shows how the water table relates seasonally to normal levels based on water-level fluctuations in 17 key wells. The 1980-81 levels are compared to the long-term means for each month and grouped by seasons. During fall and winter, the water table was at or below normal except in northwest, northeast, and southeast Minnesota. During spring, continuing deficiencies in precipitation resulted in a below-normal water table in most of the State except the northeast and the Twin Cities area. During summer, the water table recovered to near normal in response to late spring and early summer rain.

Water levels in confined aquifers, both buried drift and bedrock, were at or below normal levels in most of the State during all the 1981 water year. The seasonal position of these confined levels (fig. 5) reflects a shortage of natural recharge related to deficient precipitation similar to the water-table response, but slightly subdued and delayed in time. Figure 5 shows how the confined levels relate seasonally to normal levels based on water-level fluctuations in 17 key wells. During fall and winter, water levels were at or below normal except in northeast Minnesota and two small areas in central Minnesota including the western part of the Twin Cities basin. During spring, the area of below normal levels increased to include more than half the State. During summer water levels in much of the State were back to near normal.

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 the back cover.

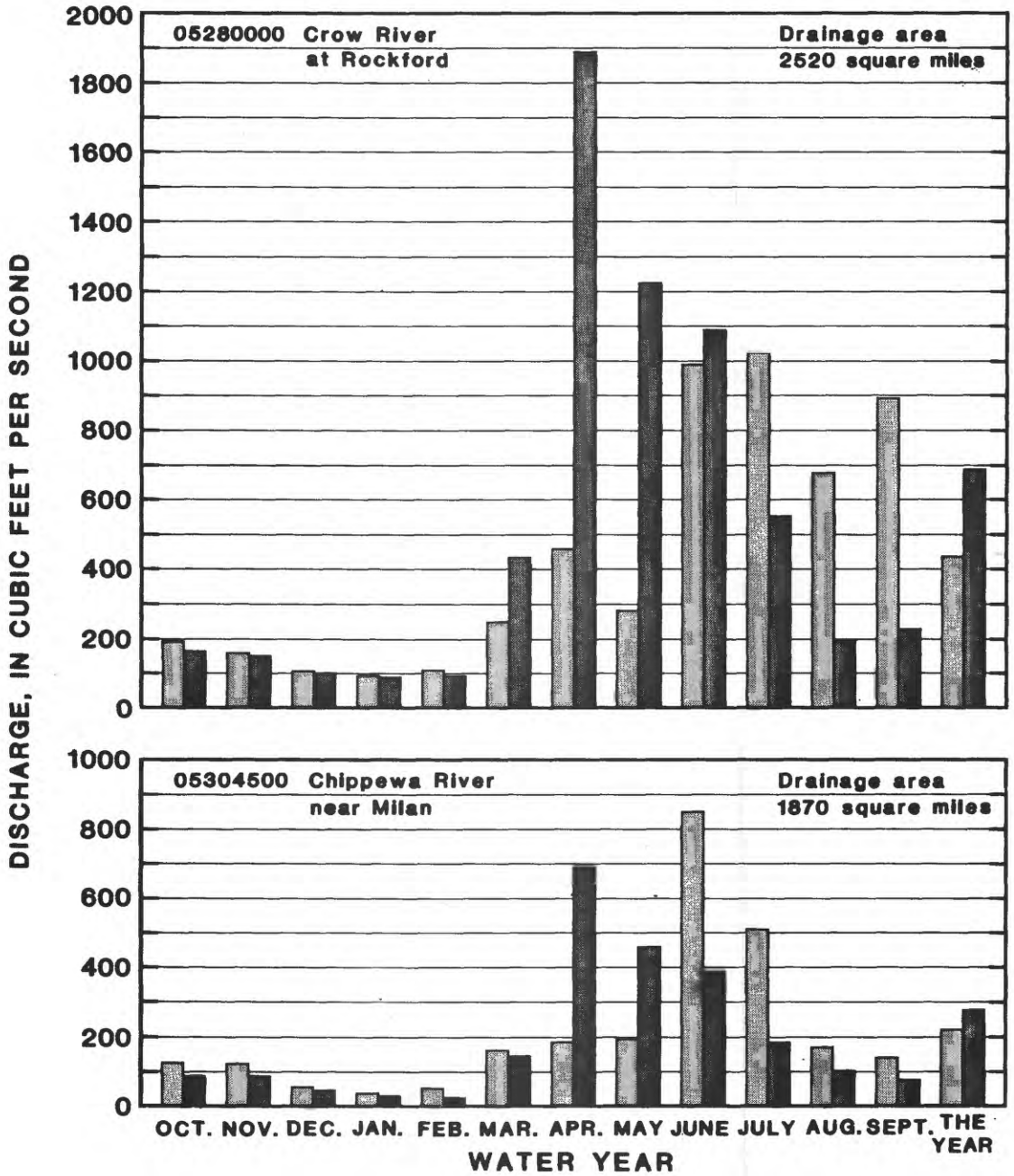
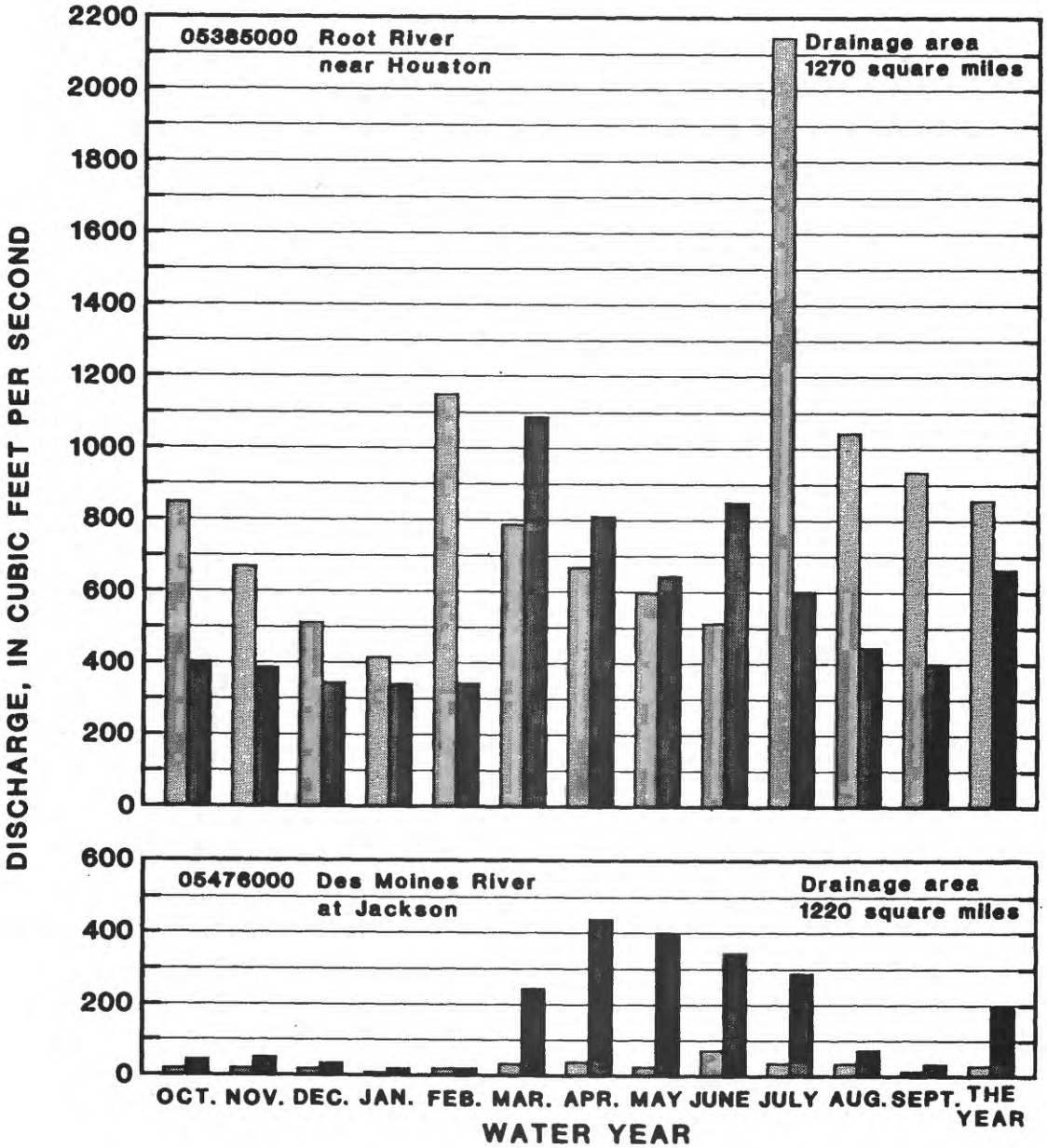


Figure 1.--Comparison of discharges at four long-term representative 30-year base period



EXPLANATION

- Monthly and yearly mean discharges during 1981 water year
- Median of monthly and yearly mean discharges for water years 1951–80

gaging stations for the current year with median discharges for a

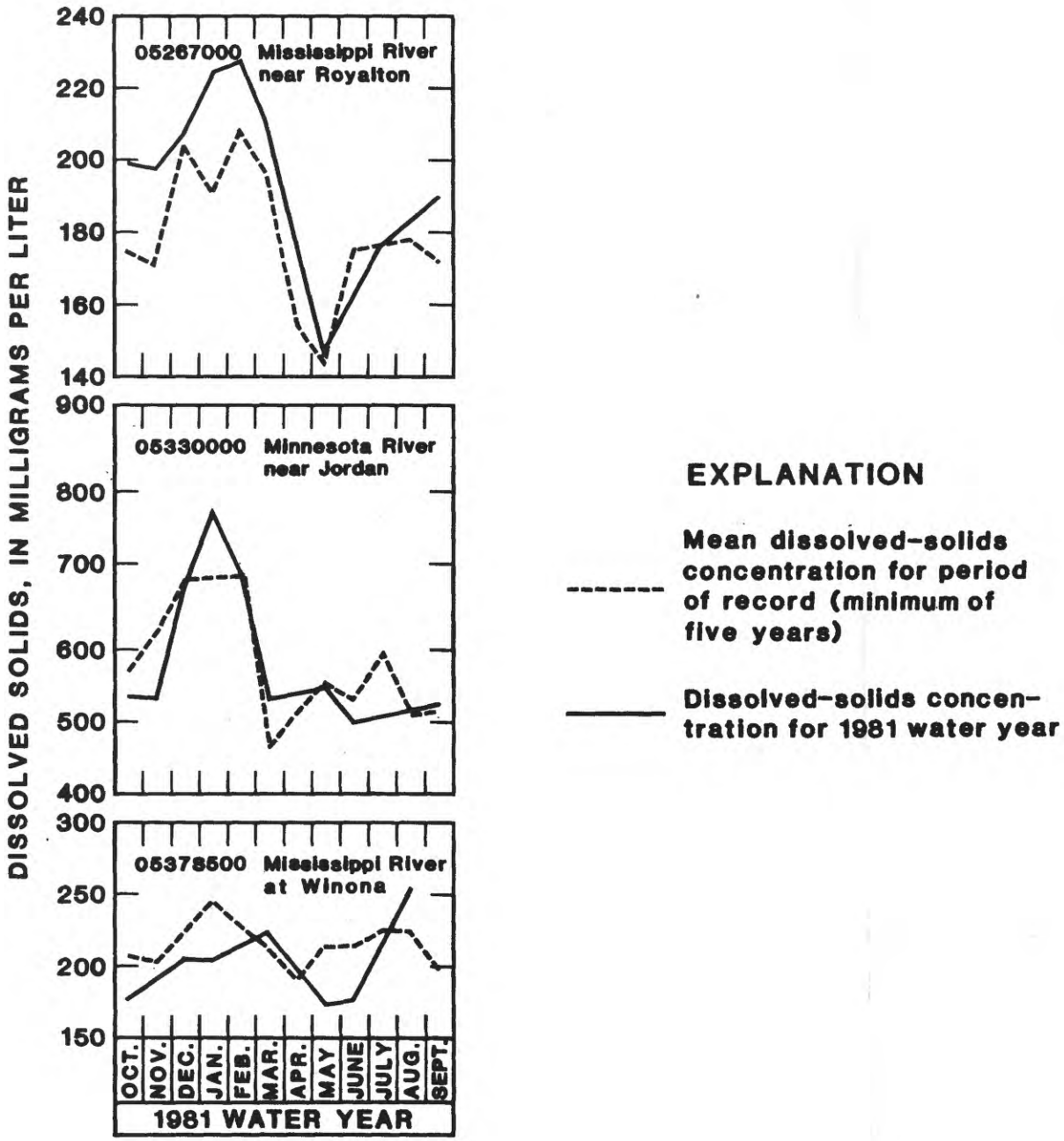


Figure 2.--Comparison of dissolved-solids concentrations for the current year with mean monthly values for the periods of record

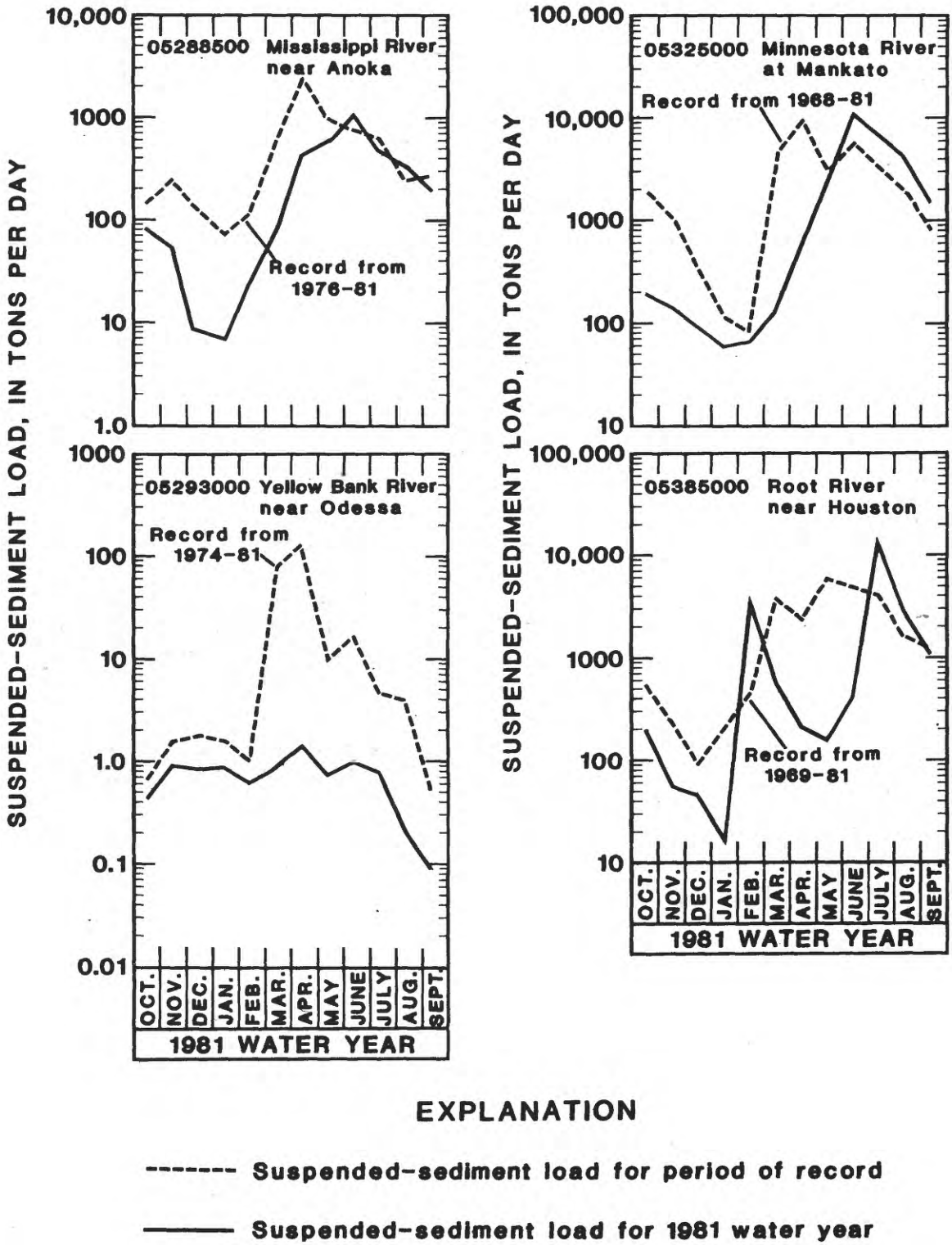
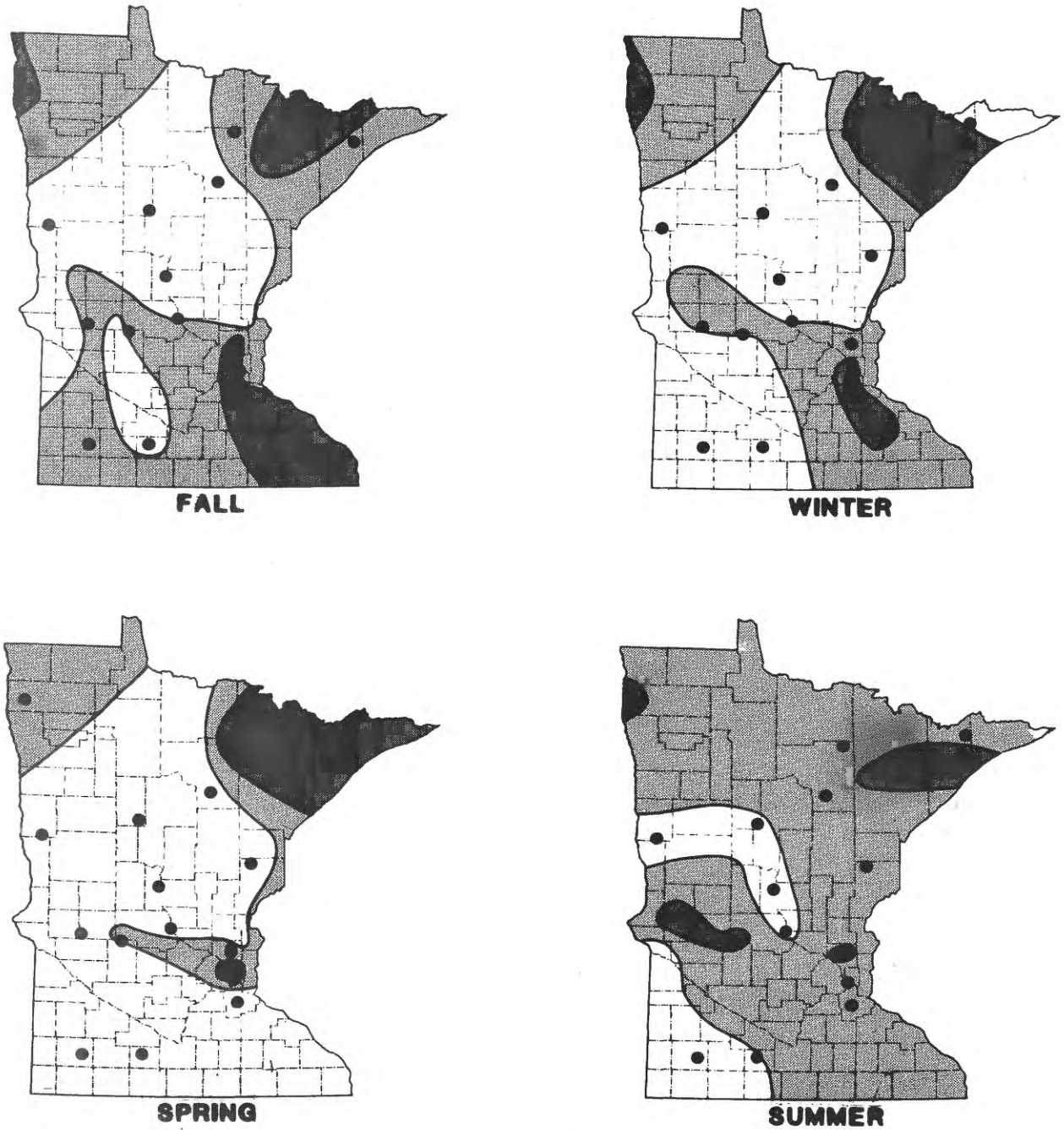


Figure 3.--Comparison of suspended-sediment loads for the current year with mean monthly values for the periods of record



EXPLANATION

WATER-TABLE LEVELS

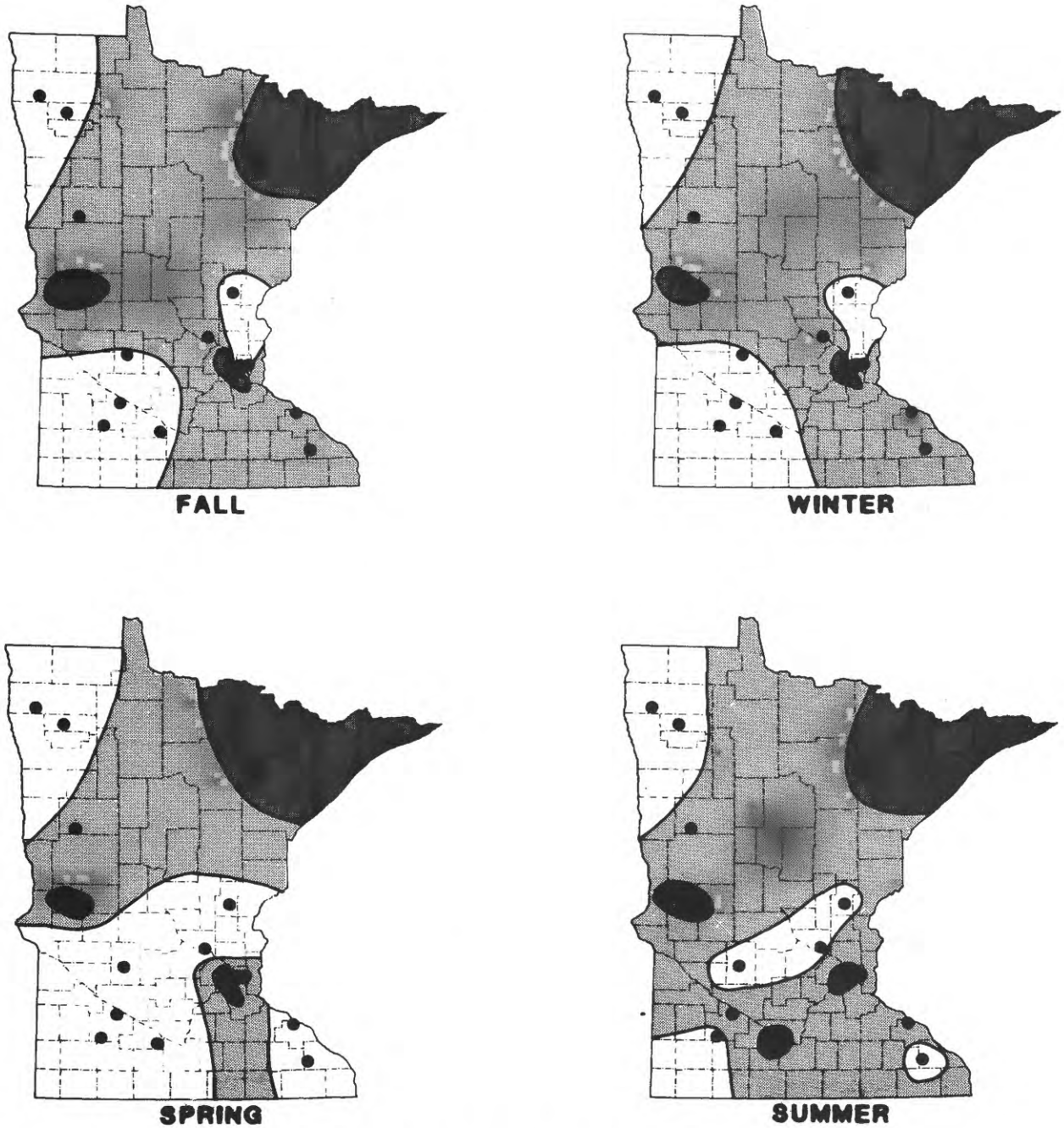
Above normal--water levels are more than one-half standard deviation above the long-term mean

Normal--water levels are within one-half standard deviation of the long-term mean

Below normal--water levels are more than one-half standard deviation below the long-term mean

● **Observation well**

Figure 4.--Relationship of seasonal water-table levels to long-term mean levels



EXPLANATION

CONFINED-AQUIFER WATER LEVELS

- **Above normal**--water levels are more than one-half standard deviation above the long-term mean
- **Normal**--water levels are within one-half standard deviation of the long-term mean
- **Below normal**--water levels are more than one-half standard deviation below the long-term mean
- **Observation well**

Figure 5.--Relationship of seasonal water levels in confined aquifers to long-term mean levels

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 sheet within 24 hours when incubated at 35°C ± 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 whien incubated at 44.5°C ± 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 found also 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 ± 1.0°C on M-FC 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 quantitiy 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.

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 memmbrane filter, and thus may include some very small (colloidal) suspended particles. Analyses are performed on filtered samples.

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 ($CaCO_3$).

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) 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 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.

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 (m^2), 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 milliters (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 organochlorine 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 [mg $C/(m^2 \cdot time)$ for periphyton and macrophytes and mg $C/(m^3 \cdot time)$ 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 [mg $O_2/(m^2 \cdot time)$ for periphyton and macrophytes and mg $O_2/(m^3 \cdot time)$ 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.

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.

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.

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 quantity and intensity of precipitation.

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).

Suspended-sediment discharge (tons/day) is the rate at which dry weight of sediment passes a section of a stream or is the quantity of 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.

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

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 appoximating 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 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 emersed 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 miltiplate 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 planimetered. All areas shown are those for the stage when the planimetered 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 um membrane 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 um 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 and naming of organisms. 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.....Ephermeridae
Genus.....Hexageria
Species Hexagenia limbata

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. This 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 method 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 percent 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.

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 discharge. 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.

DOWNSTREAM ORDER AND STATION NUMBER

Since October 1, 1950, the order of listing hydrologic-station records in Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a main-stream station are listed before that station. A station on a tributary that enters between two main-stream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other 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 indention in a list of stations in the front of the report. Each indention 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 used 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 8-digit number for each station such as 05041000, which appears just to the left of the station name, includes the 2-digit part number "05" plus the 6-digit downstream order number "041000".

NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES

The 8-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 6 digits denote the degrees, minutes, and seconds of latitude, the next 7 digits denote degrees, minutes, and seconds of longitude, and the last 2 digits (assigned sequentially) identify the wells or other sites within a 1-second grid. See figure 6 below. 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.

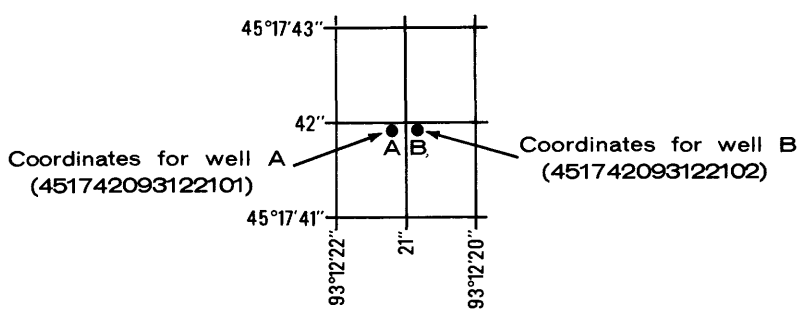


Figure 6.--Example of system for numbering wells and miscellaneous sites

SPECIAL NETWORKS AND PROGRAMS

Hydrologic bench-mark station is one that provides hydrologic data for a basin in which the hydrologic regimen will likely be governed solely by natural conditions. Data collected at a bench-mark station may be used to separate effects of natural from manmade changes in other basins which have been developed and in which the physiography, climate, and geology are similar to those in the undeveloped bench-mark basin.

National stream-quality accounting network (NASQAN) is a data collection network designed by the U.S. Geological Survey to meet many of the information demands of agencies or groups involved in national or regional water-quality planning and management. Both accounting and broad-scale monitoring objectives have been incorporated into the network design. Areal configuration of the network is based on river-basin accounting units (identified by 8-digit hydrologic-unit numbers) designated by the Office of Water Data Coordination in consultation with the Water Resources Council. Primary objectives of the network are (1) to depict areal variability of streamflow and water-quality conditions nationwide on a year-by-year basis and (2) to detect and assess long-term changes in streamflow and stream quality.

Pesticide program is a network of regularly sampled water-quality stations where samples are collected to determine the concentration and distribution of pesticides in streams where potential contamination could result from the application of the commonly used insecticides and herbicides. Operation of the network is a Federal interagency activity.

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radiosotopes. 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 base line 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 STAGE AND WATER-DISCHARGE RECORDS

COLLECTION AND COMPUTATION OF DATA

The base data collected at gaging stations consist of records of stage and measurements of discharge of streams or canals, and stage, surface area, and contents of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records, and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from either direct readings on a nonrecording gage or from a water-stage recorder that gives either a continuous graph of the fluctuations or a tape punched at selected time intervals. Measurements of discharge are made with a current meter, using the general methods adopted by the Geological Survey. These methods are described in standard text-books, in Water-Supply Paper 888, and in U.S. Geological Survey Techniques of Water-Resources Investigations, book 3, chapter A6.

For stream-gaging stations, rating tables giving the discharge for any stage are prepared from stage-discharge relation curves. If extensions to the rating curves are necessary to express discharge greater than measured, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, computation of flow over dams or weirs), step-backwater techniques, velocity-area studies, and logarithmic plotting. The daily mean discharge is computed from gage heights and rating tables, then the monthly and yearly mean discharges are computed from the daily figures. 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 computed by the shifting-control method, in which correction factors based on individual discharge measurements and notes by hydrologists and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is basically the shifting-control method.

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.

At some northern stream-gaging stations the stage-discharge relation is affected by ice in the winter, and it becomes impossible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed on the basis of gage-height record and occasional winter discharge measurements. Consideration is given to the available information on temperature and precipitation, notes by gage observers and hydrologists, and comparable records of discharge for other stations in the same or nearby basins.

For a lake or reservoir station, capacity tables giving the contents for any stage are prepared from stage-area relation curves defined by surveys. The application of the stage to the capacity table gives the contents, from which the daily, monthly, or yearly change in contents is computed.

If the stage-capacity curve is subject to changes because of deposition of sediment in the reservoir, periodic resurveys of the reservoir are necessary to define new stage-capacity curves. During the period between reservoir surveys the computed contents may be increasingly in error due to the gradual accumulation of sediment.

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. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the

float is frozen in the well, or for various other reasons. For such periods the daily discharges are estimated on the basis of recorded range-in-stage, prior and subsequent records, discharge measurements, weather records, and comparison with records for other stations in the same or nearby basins. Likewise daily contents may be estimated on the basis of operator's log, prior and subsequent records, inflow-outflow studies, and other information.

The data in this report generally comprise a description of the station and tabulations of daily and monthly figures. For gaging stations on streams or canals a table showing the daily discharge and monthly and yearly discharge is given. For gaging stations on lakes and reservoirs a monthly summary table of stage and contents or a table showing the daily contents is given. Tables of daily mean gage heights are included for some streamflow stations and for some reservoir stations. Records are published for the water year, which begins on October 1 and ends on September 30.

The description of the gaging station gives the location, drainage area, period of record, notations of revisions of previously published records, type and history of gages, general remarks, average discharge, and extremes of discharge or contents. The location of the gaging station and the drainage area are obtained from most accurate maps available. River mileage, given under "LOCATION" for some stations, is that determined and used by the Corps of Engineers or other agencies. Periods for which there are published records for the present station or for stations generally equivalent to the present one are given under "PERIOD OF RECORD."

Previously published streamflow records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published along with the current records in one of the annual or compilation reports. In order to make it easier to find such revised records, a paragraph headed "REVISED RECORDS" has been added to the description of all stations for which revised records have been published. Listed herein are all the reports in which revisions have been published, each followed by the water years for which figures are revised in that report. In listing the water years only one number is given; for instance, 1965 stands for the water year October 1, 1964, to September 30, 1965. If no daily, monthly, or annual figures of discharge are affected by the revision, the fact is brought out by notations after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the revised figure was first published is given. It should be noted that for all stations for which cubic feet per second per square mile and runoff in inches are published, a revision of the drainage area necessitates corresponding revision of all figures based on the drainage area. Revised figures of cubic feet per second per square mile and runoff in inches resulting from a revision of the drainage area only are usually not published in the annual series of reports.

The type of gage currently in use; the datum of the present gage referred to National Geodetic Vertical Datum; and a condensed history of the types, locations, and datums of previous gages used during the period of record are given under "GAGE." National Geodetic Vertical Datum is explained in "DEFINITION OF TERMS."

Information pertaining to the accuracy of the discharge records and to conditions which affect the natural flow of the gaging station is given under "REMARKS." For reservoir stations, information on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir is given under "REMARKS."

The average discharge for the number of years indicated is given under "AVERAGE DISCHARGE"; it is not given for stations having fewer than 5 complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. In addition, the median of yearly mean discharges is given for stream-gaging stations having 10 or more complete years of record if the median differs from the average by more than 10 percent. Under "EXTREMES" are given first, the extremes for the period of record, second, information available outside the period of record, and last, those for the current year. Unless otherwise qualified, the maximum discharge (or contents) is the instantaneous maximum corresponding to the crest stage obtained by use of a water-stage recorder (graphic or digital), a crest-stage gage, or a nonrecording gage read at the time of crest. If the maximum gage height did not occur on the same day as the maximum discharge (or contents), it is given separately. Similarly, the minimum is the instantaneous minimum unless otherwise qualified. For some stations, peak discharges are listed with "EXTREMES FOR CURRENT YEAR". If they are, all independent peaks above the selected base are published in tabular format with the time of occurrence and corresponding gage heights, including the maximum for the year. The base discharge, which is given in the table heading, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for any canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time; for example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimums for these stations are published in a separate paragraph following the table of peaks.

The daily table for stream-gaging stations gives the mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also may be 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 are omitted if there is extensive regulation or diversion, if the drainage area includes large noncontributing areas, or if the average annual rainfall over the drainage basin is usually less than 20 inches. In the yearly summary below the monthly summary, the figures shown are the appropriate daily discharges for the calendar and water years.

Footnotes to the table of daily discharge are introduced by the word "NOTE". Footnotes are used to indicate periods for which the discharge is computed or estimated by special methods because of no gage-height record, backwater from various sources, or other unusual conditions. Periods of no gage-height record are indicated if the period is continuous for a month or more or includes the maximum discharge for the year. Periods of backwater from an unusual source, of indefinte stage-discharge relation, or of any other unusual condition at the gage site are indicated only if they are a month or more in length and the accuracy of the records is affected. Days on which the stage-discharge relation is affected by ice are not indicated. The methods used in computing discharge for various unusual conditions have been explained in preceding paragraphs.

For most gaging stations on lakes and reservoirs the data presented comprise a description of the station and a monthly summary table of stage and contents. For some reservoirs a table showing daily contents or stage is given.

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. Occasionally, a series of discharge measurements are made within a short time period to investigate the seepage gains or losses along a reach of a stream or to determine the low-flow characteristics of an area. Such measurements are also given in special tables following the tables of partial-record stations.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of streamflow data 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 observations of stage, measurements of discharge, and interpretations of records.

The station description under "REMARKS" states the degree of accuracy of the records. "Excellent" means that about 95 percent of the daily discharges are within 5 percent; "good," within 10 percent; and "fair," within 15 percent. "Poor" means that daily discharges have less than "fair" accuracy.

Figures of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 ft^3/s; to tenths between 1.0 and 10 ft^3/s; to whole numbers between 10 and 1,000 ft^3/s; and to 3 significant figures above 1,000 ft^3/s. The number of significant figures used is based solely on the magnitude of the figure. The same rounding rules apply to discharge figures listed for partial-record stations.

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 DATA 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 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.

RECORDS OF DISCHARGE COLLECTED BY AGENCIES OTHER THAN THE GEOLOGICAL SURVEY

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. Information on records available at specific sites can be obtained upon request.

EXPLANATION OF WATER-QUALITY RECORDS

COLLECTION AND EXAMINATION OF DATA

Surface-water samples for analyses usually are collected at or near gaging stations. The quality-of-water records are given immediately following the discharge records at these stations.

The descriptive heading for water-quality records gives the period of record for all water-quality data; the period of daily record for parameters that are measured on a daily basis (specific conductance, pH, dissolved oxygen, water temperature, sediment discharge, etc.), extremes for the period of daily record; extremes for the current year; and general remarks.

For ground-water records, no descriptive statements are given; however, the well number, depth of well, date of sampling and (or) other pertinent data are given in the table containing the chemical analyses of the ground water.

WATER ANALYSIS

Most methods for collecting and analyzing water samples are described in the U.S. Geological Survey Techniques of Water-Resources Investigations listed on a following page.

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.

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 district office.

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 daily 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.

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 concentraiton, 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 in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of the quantities of suspended sediment, records of the periodic measurements of the particle-size distribution of the suspended sediment and bed material are included.

EXPLANATION OF GROUND-WATER LEVEL RECORDS

COLLECTION OF THE DATA

Only ground-water level data from a basic network of observation wells are published herein. This basic network contains observation wells so located that the most significant data are obtained from the fewest wells in the most important aquifers.

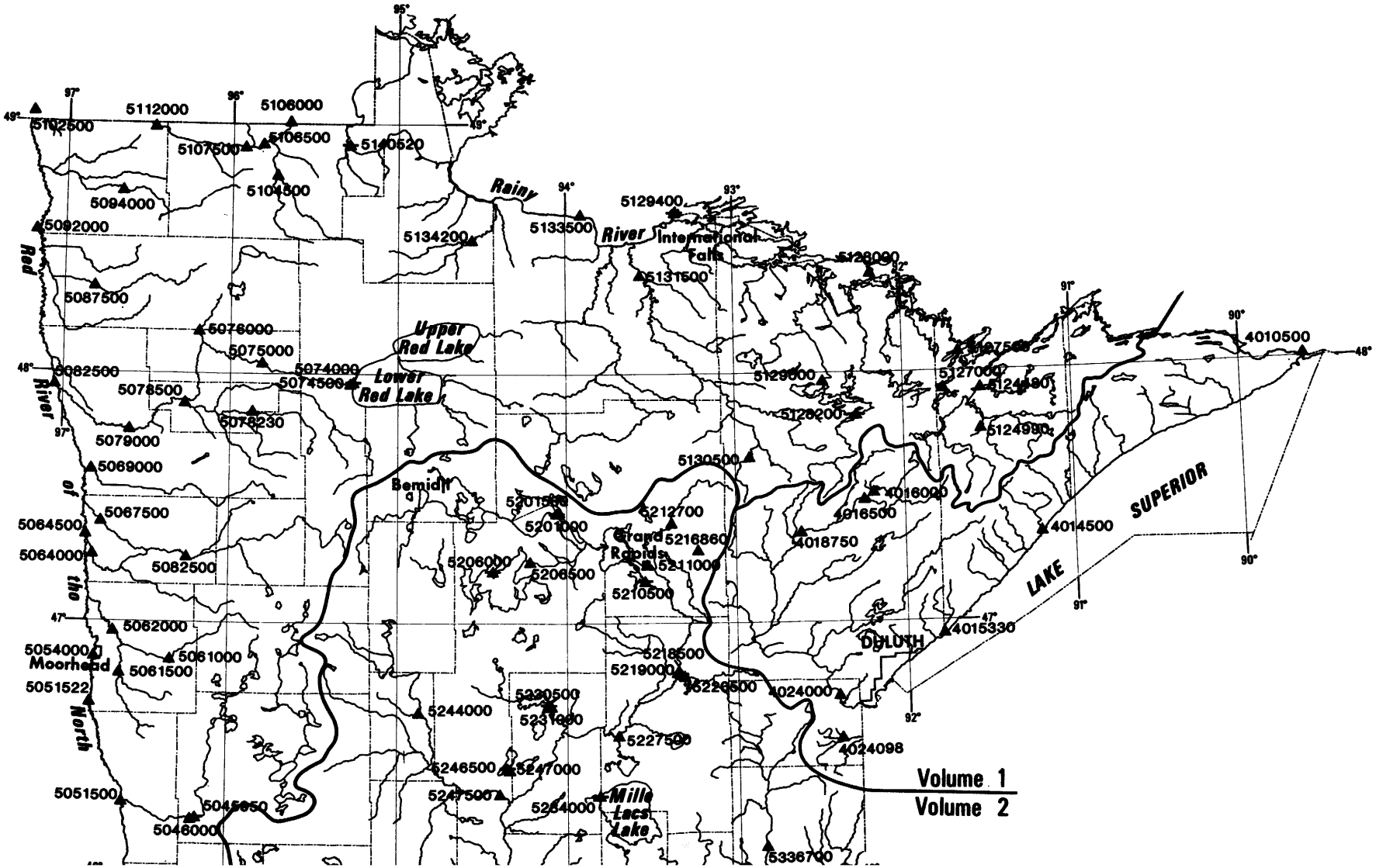
Each well is identified by means of (1) a 15-digit number that is based on latitude and longitude and (2) a local number that is provided for local needs. See figure 3.

Measurements are made in many types of wells, under varying conditions of access and at different temperatures, hence, neither the method of measurement nor the equipment can be standardized. At each observation well, however, the equipment and techniques used are those that will ensure that measurements at each well are consistent.

Water-level measurements in this report are given in feet with reference to either NGVD of 1929 or land-surface datum (lsd). NGVD of 1929 is the datum plane on which the national network of precise levels is based; land-surface datum is a datum plane that is approximately at land surface at each well. If known, the altitude of the land-surface datum in NGVD of 1929 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).

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth to water of several hundred feet, the error in determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water the accuracy is greater. Accordingly, most measurements are reported to a hundredth of a foot, but some are given only to a tenth of a foot or a larger unit.

Hydrographs showing water-level fluctuations are included for 32 representative wells; 13 bedrock, 14 surficial sand, and 5 buried sand wells.



Volume 1
Volume 2

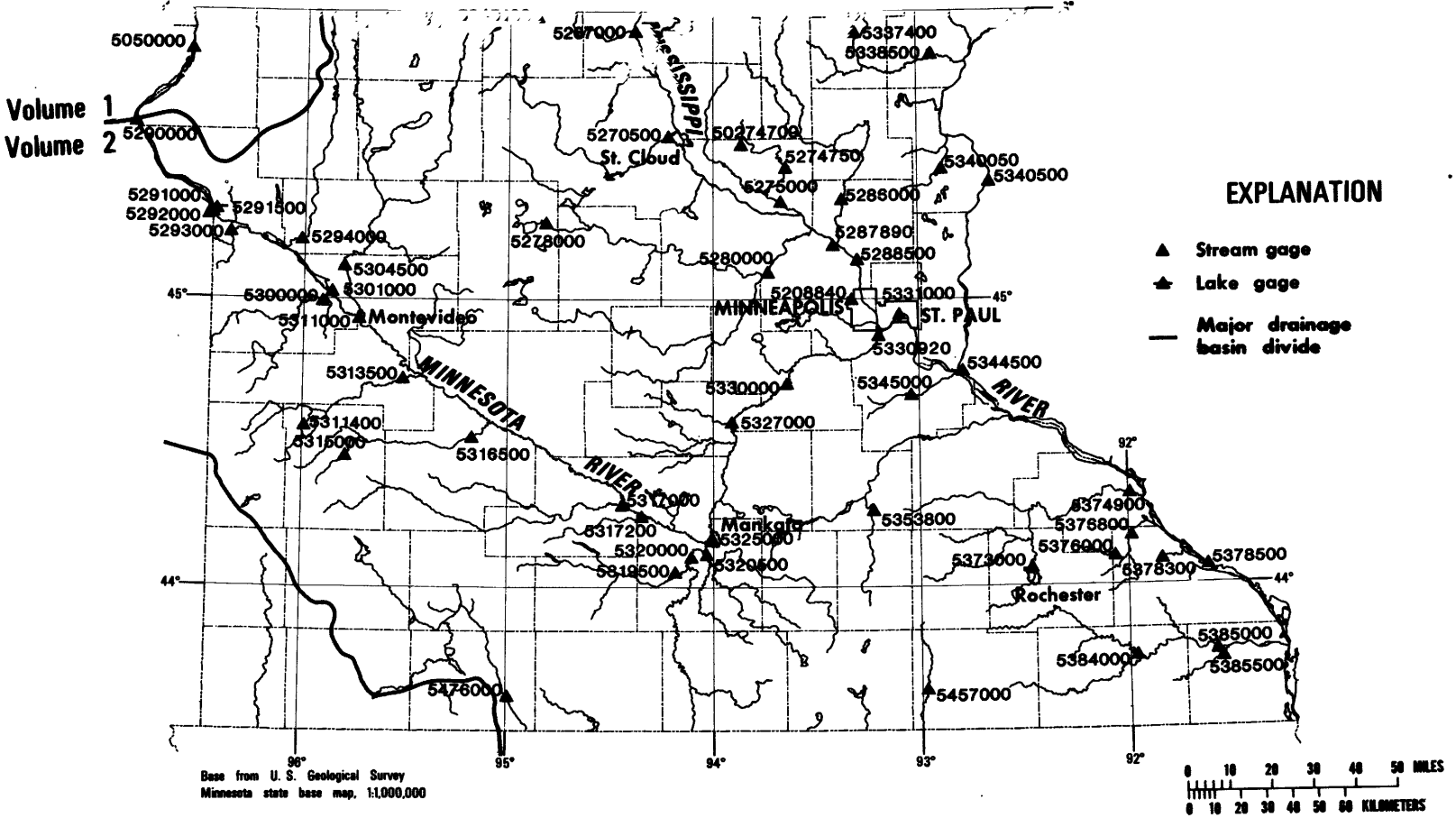
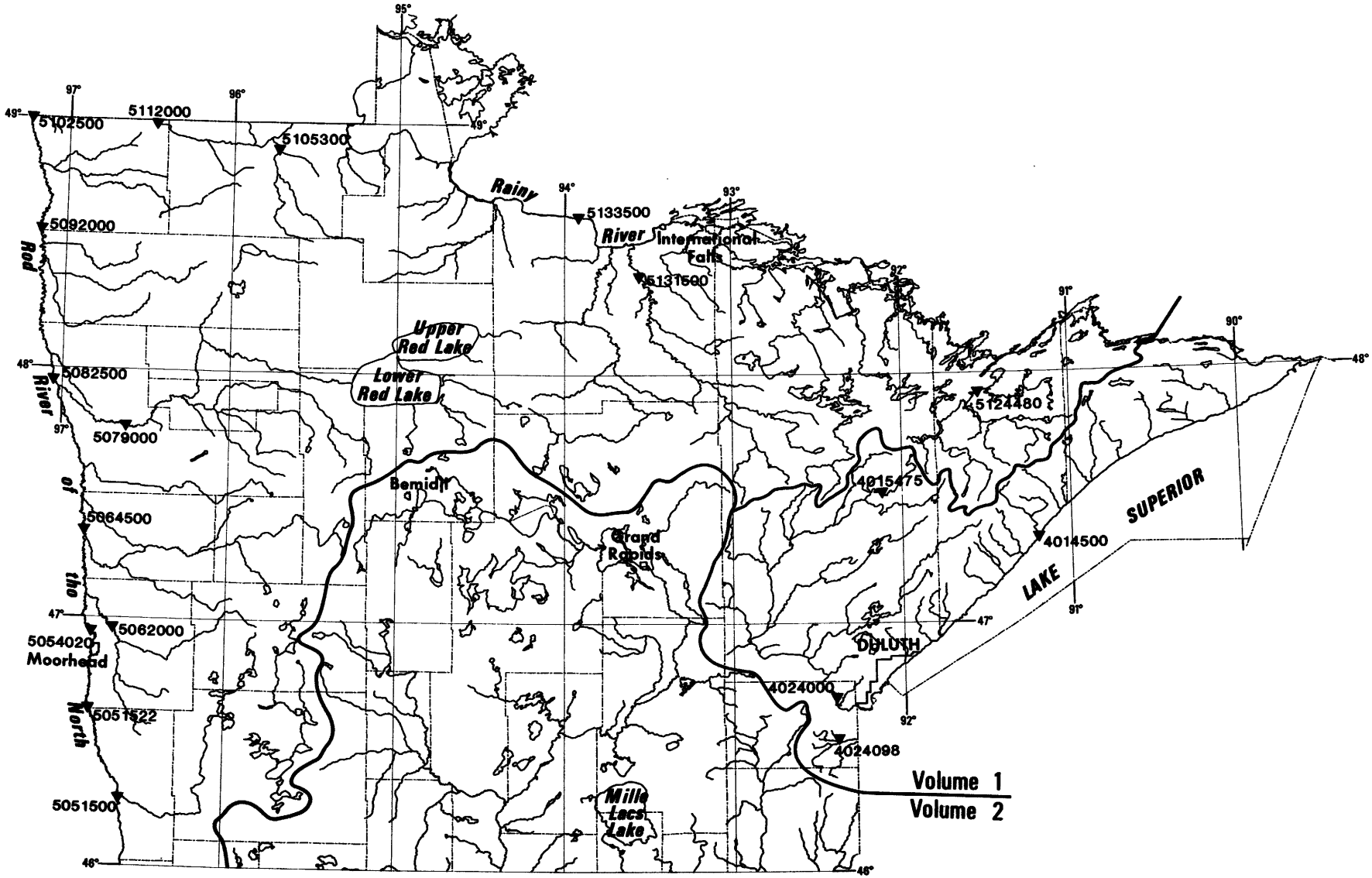


Figure 7.--Location of water-discharge stations



Rainy
River
International Falls
Upper Red Lake
Lower Red Lake
Bemidji
Grand Rapids
Mille Lacs Lake
DULUTH
LAKE SUPERIOR
Rod River of the North
Moorhead
5102500
5112000
5105300
5133500
5131500
5092000
5082500
5079000
5064500
5062000
5054020
5051522
5051500
5124480
4015475
4014500
4024000
4024098
Volume 1
Volume 2

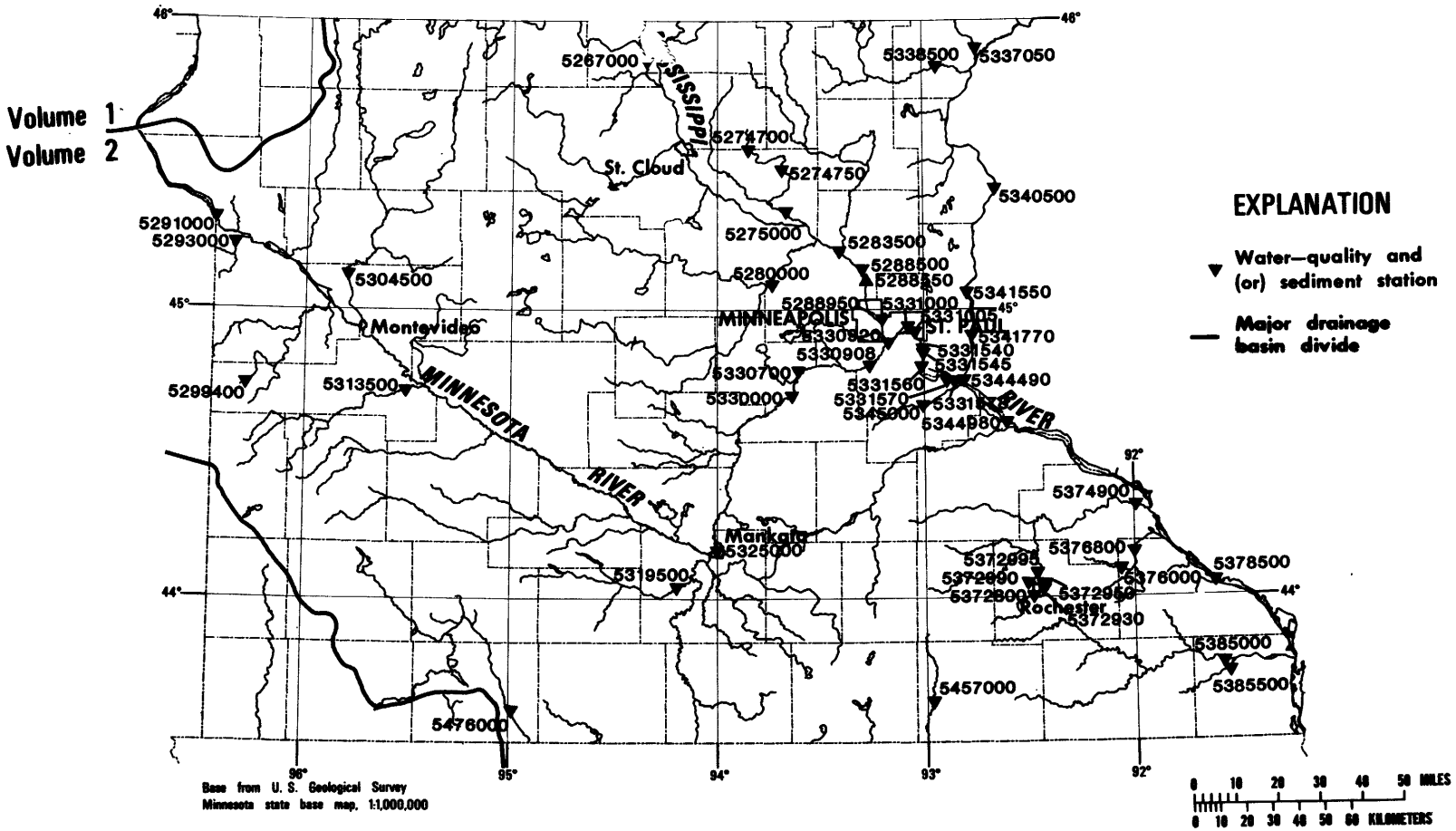


Figure 8.--Location of water-quality stations

Thirty-four manuals by the U.S. Geological Survey have been published to date in the series on techniques describing procedures for planning and executing 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) is on 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 Distribution, 1200 South Eads Street, Arlington, VA 22202 (authorized agent of the Superintendent of Documents, Government Printing Office).

NOTE: When ordering 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-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.
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. 1968. 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 measurements at gaging stations,* by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.
3-A8. *Discharge measurements at gaging stations,* by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.
3-A11. *Measurement of discharge by moving-boat method,* by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.
3-B1. *Aquifer-test design, observation, and data analysis,* by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.
3-B2. *Introduction to ground-water hydraulics, a programed text for self-instruction,* by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.
3-C1. *Fluvial sediment concepts,* by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.
3-C2. *Field methods for measurement of fluvial sediment,* by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.
3-C3. *Computation of fluvial-sediment discharge,* by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.
4-A1. *Some statistical tools in hydrology,* by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.
4-A2. *Frequency curves,* by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.
4-B1. *Low-flow investigations,* by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.
4-B2. *Storage analyses for water supply,* by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.
4-B3. *Regional analyses of streamflow characteristics,* by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.
4-D1. *Computation of rate and volume of stream depletion by wells,* by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages.
5-A1. *Methods for determination of inorganic substances in water and fluvial sediments,* by M. W. Skougstad and others, editors: USGS--TWRI Book 5, Chapter A1. 1979. 626 pages.
5-A2. *Determination of minor elements in water by emission spectroscopy,* by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.
5-A3. *Methods for analysis of organic substances in water,* by D. F. Goerlitz and Eugene Brown: USGS--TWRI Book 5, Chapter A3. 1972. 40 pages.
5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples,* edited by P. E. Greeson, T. A. Ehlke, G. A. Irwin, B. W. Lium, and K. V. Slack: USGS--TWRI Book 5, Chapter A4. 1977. 332 pages.
5-A5. *Methods for determination of radioactive substances in water and fluvial sediments,* by L. L. Thatcher, V. J. Janzer, and K. W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages.
5-C1. *Laboratory theory and methods for sediment analysis,* by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.
7-C1. *Finite difference model for aquifer simulation in two dimensions with results of numerical experiments,* by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.
7-C2. *Computer model of two-dimensional solute transport and dispersion in ground water,* by L. F. Konikow and J. D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.
8-A1. *Methods of measuring water levels in deep wells,* by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.
8-B2. *Calibration and maintenance of vertical-axis type current meters,* by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages.

DISCONTINUED GAGING STATIONS

The following continuous-record streamflow or stage stations in Minnesota have been discontinued or converted to partial-record stations. Daily streamflow or stage records were collected and published for the period of record shown for each station

Station number	Station name	Drainage area (mi^2)	Period of record
	Upper Mississippi River basin		
05210000	Mississippi River near Deer River, MN	a3,190	1945-50
*05213000	Prairie River near Grand Rapids, MN	485	1909†, 1925-49
05216800	O'Brien Creek near Pengilly, MN	-	1963-68
05217000	Swan River near Warba, MN	254	1954-69
05217500	Swan River near Swan River, MN	a290	1929
05218000	Mississippi River above Sandy River near Libby (above Sandy River), MN	4,560	1895-1915, 1925-29
05221000	Willow River near Palisade, MN	442	1929
05226200	Ripple (Mud) River near Wealthwood, MN	-	1937-39
05232000	Pelican Brook (Long Lake) near Pequot Lakes, MN	-	1938-42, 1943-47
05241500	Rabbit River near Crosby, MN	8.38	1945-63
05242700	Little Sand Lake outlet (Sand Lake outlet) near Dorset, MN	a74	1930-41
05244500	Crow Wing River at Motley, MN	a2,140	1909†, 1913-17, 1930-31
05244980	Diversion from Long Prairie River near Osakis, MN	-	1939-47
05245000	Long Prairie River near Osakis, MN	-	1949-54
05245500	Long Prairie River near Motley, MN	973	1909-17, 1930-31
05246000	Crow Wing River at Pillager	a3,230	1903†, 1909-13, 1925-50
*05261000	Mississippi River near Fort Ripley, MN	a11,010	1906, 1909-10, 1929
05261500	Nokasippi River near Fort Ripley, MN	210	1929
*05268000	Platte (Platt) River at Royalton, MN	338	1929-36
05269000	Mississippi River near Sauk Rapids, MN	a12,400	1903-06
05270000	Mississippi River at Sartell, MN	a12,450	1929, 1943-47†
05273500	Clearwater River at Clearwater, MN	-	1937, 1940-42
05274500	Elk River above St. Francis River near Big Lake, MN	384	1929
05274700	St. Francis River at Santiago, MN	-	1965-70
05274900	St. Francis River near Big Lake, MN	-	1965-70
05275500	Mississippi River at Elk River, MN	a14,500	1915-56
05276000	North Fork Crow River near Regal, MN	215	1943-54
05277000	Middle Fork Crow River at New London, MN	-	1939-42, 1943-47
05277500	Middle Fork Crow River (Calhoun Lake Diversion) near Spicer, MN	-	1939, 1940-46
05278400	North Fork Crow River near Rockford, MN	-	1909-10
05278500	South Fork Crow River at Cosmos, MN	221	1945-64
05278930	Buffalo River near Glencoe, MN	374	1972-80
*05279000	South Fork Crow River near Mayer, MN	a1,170	1934-79
05279500	South Fork Crow River near Rockford, MN	a1,250	1909-12

"See footnotes at end of table."

Station number	Station name	Drainage area (mi^2)	Period of record
	Upper Mississippi River basin--Continued		
05283500	Mississippi River at Anoka, MN	a17,100	1897, 1905-13
05284500	Rum River at Onamia, MN	414	1910-12
05284750	Rum River at Spencer Brook, MN	-	1960-64
05285000	Rum River at Cambridge, MN	a1,160	1909-14
05285500	Rum River at St. Francis, MN	-	1903
05286500	Rum River near Anoka, MN	1,430	1905-06, 1909
05289000	Minnetonka Lake (head of Minnehaha Creek) near Wayzata (at Excelsior), MN	-	1938-64
05289500	Minnehaha Creek at Minnetonka Mills, MN	130	1953-64
	Minnesota River basin		
05292500	Minnesota River near Odessa, MN	a1,340	1909-12, 1944-63
05293500	Pomme de Terre River near Morris, MN	-	1937-39, 1940-47
05299500	Canby Creek at Canby, MN	-	1938-39, 1940-46
05300500	Ten Mile Creek near Boyd, MN	82.8	1949-51
05302000	Little Chippewa River near Lowry, MN	a54	1941
*05302500	Little Chippewa River near Starbuck, MN	111	1938-39
05303000	Chippewa River at diversion dam near Hancock, MN	-	1930-39, 1940-46
05303500	Chippewa River at Benson, MN	a1,270	1949-51
05304000	Shakopee Creek near Benson, MN	352	1949-54
05305000	Chippewa River near Watson, MN	a2,050	1910-17, 1931-36
05311500	Yellow Medicine River near Cottonwood, MN	465	1945-46
05312000	Spring Creek near Clarkfield, MN	a89	1945-46
05312500	Spring Creek near Hazel Run, MN	101	1945-48
05313000	Yellow Medicine River near Hanley Falls, MN	606	1945-47
05313521	Hawk Creek at outlet of Eagle Lake near Willmar, MN	-	1972-73
05313560	Eagle Lake tributary No. 7 near Willmar, MN	-	1972-73
05313570	Eagle Lake tibutary No. 8 near Willmar, MN	-	1972-73
05314000	Chetomba Creek near Maynard, MN	a200	1949-51
*05314500	Hawk Creek near Maynard, MN	474	1949-54
*05315200	Prairie Ravine near Marshall, MN	5.63	1959-64
05315500	Redwood River near Green Valley, MN	436	1945-57
05316000	Redwood River near Seaforth, MN	573	1945-46
05316770	Minnesota River at New Ulm, MN	9,536	1968-76
05317500	Minnesota River at Judson, MN	a11,200	1938-50
*05318000	East Branch (East Fork) Blue Earth River near Bricelyn, MN	132	1951-70
05319000	South Fork Watonwan River at diversion dam near St. James, MN	-	1939, 1940-46
05319500	Watonwan River near Garden City, MN	812	1940-45
05321000	Blue Earth River at Mankato, MN	a3,550	1938-39, 1940-42
05330400	Sand Creek at diversion dam near Jordan, MN	-	1938-39, 1940-46

"See footnotes at end of table."

Station number	Station name	Drainage area (mi^2)	Period of record
	Minnesota River basin--Continued		
05330800	Purgatory Creek at Eden Prairie, MN	-	1975-80
05330900	Nine Mile Creek at Bloomington, MN	-	1963-73
	St. Croix River basin		
*05336200	Glaisby Brook near Kettle River, MN	24.2	1959-70
05336500	Kettle River near Sandstone, MN	825	1908-16
05337000	Grindstone River at Hickley, MN	-	1940-47
05337500	Snake River at Mora, MN	422	1909-13
05338000	Snake River at Sanatorium Bridge near Pine City, MN	-	1937-38
05339500	St. Croix River near Rush City, MN	a5,120	1923-61
05340000	Sunrise River near Stacy, MN	167	1949-65
	Lower Mississippi River basin		
05345500	Vermillion River at Empire (Empire City), MN	124	1942-44
05346000	Vermillion River at Hastings, MN	195	1942-47
*05355200	Cannon River at Welch, MN	a1,320	1909-14, 1930-71
05371500	Mississippi River at Wabasha, MN	a56,600	1934
05373500	Zumbro River (South Branch) near Zumbro Falls, MN	821	1911-17
05374000	Zumbro River at Zumbro Falls, MN	-	1909-17, 1929-80
05374500	Zumbro River at Theilman, MN	a1,320	1938-56
*05376500	South Fork Whitewater River near Altura, MN	76.8	1939-71
05377000	Beaver Creek at Beaver, MN	15.4	1939-40
05377500	Whitewater River at Beaver, MN	288	1936-38†, 1939-56
05379000	Gilmore Creek at Winona, MN	8.95	1939-63
05380500	Mississippi River at Lamoile, MN	a60,000	1930-31
05383500	Mississippi River at LaCrosse, WI	-	1929-55
05383600	North Branch Root River tributary near Stewartville, MN	0.73	1959-64
*05384500	Rush Creek near Rushford, MN	129	1942-79
05386000	Root River below South Fork near Houston, MN	a1,560	1938-61
05456500	Turtle Creek near Austin, MN	144	1947-51
05475000	Heron Lake outlet near Heron Lake, MN	-	1930-43
	Big Sioux River basin		
*06483000	Rock River at Luverne, MN	440	1911-14
06603000	Little Sioux River near Lakefield, MN	17.1	1948-63
06603500	Jackson County ditch No. 11 near Lakefield, MN	7.69	1948-61

* Presently operated as a high-flow partial-record station.
† Stage records only.
a Approximately.

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 (1.6 km) northwest of Little Winnibigoshish Lake, 14 mi (23 km) northwest of town of Deer River, and at mile 1,248 (2,008 km) upstream from Ohio River.

DRAINAGE AREA.--1,442 mi^2 (3,735 km^2).

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 National Geodetic Vertical Datum of 1929 (levels by 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 (392.869 m) National Geodetic Vertical Datum of 1929.

REMARKS (Revised).--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 (394.700 m) and 1,303.14 ft (397.200 m) (maximum allowable range) is 668,737 acre-ft (825 hm^3) of which 439,636 acre-ft (542 hm^3) is controlled storage between elevations 1,294.94 ft (394.700 m) and 1,300.94 ft (396.530 m) (normal operating range). Contents shown herein are contents above elevation 1,286.00 ft (391.973 m). Prior to September 1978, published contents as contents above elevation 1,288.94 ft (392.869 m). Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 996,500 acre-ft (1,230 hm^3) capacity table then in use, July 30, 1905, elevation, 1,303.39 ft (397.273 m); minimum observed, 33,680 acre-ft (41.5 hm^3) below zero of capacity table then in use, Oct. 20, 1931, elevation, 1,288.25 ft (392.659 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 693,200 acre-ft (855 hm^3) July 17, elevation, 1,298.85 ft (395.889 m); minimum, 587,700 acre-ft (725 hm^3) Jan. 12, elevation, 1,297.26 ft (395.405 m).

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1297.51	603800	
Oct. 31	1297.53	605100	+1290
Nov. 30	1297.39	596000	-9010
Dec. 31	1297.30	590300	-5760
CAL YR 1980			-15410
Jan. 31	1297.27	590900	+638
Feb. 28	1297.41	597300	+1920
Mar. 31	1297.54	605700	+8370
Apr. 30	1297.80	622600	+16910
May 31	1298.04	638400	+15810
June 30	1298.64	678800	+40380
July 31	1298.48	667900	-10890
Aug. 31	1298.16	646400	-21520
Sept. 30	1298.24	651800	+5350
WTR YR 1981			+43510

05201500 MISSISSIPPI RIVER AT WINNIBIGOSHISH DAM NEAR DEER RIVER, MN

LOCATION.--Lat 47°25'42", long 94°03'00", in SW¼ sec.25, T.146 N., R.27 W., Itasca County, Hydrologic Unit 07010101, on Leech Lake Indian Reservation, at dam 1 mi (1.6 km) northwest of Little Winnibigoshish Lake, 14 mi (23 km) northwest of town of Deer River, and at mile 1,248 (2,008 km) upstream from Ohio River.

DRAINAGE AREA.--1,442 mi^2 (3,735 km^2).

PERIOD OF RECORD.--May 1884 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder on headwater and nonrecording gage on tailwater. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to June 30, 1973, gages at same sites with datum at 1,289.47 ft (393.030 m) adjustment of 1912. Prior to July 8, 1949, nonrecording headwater gage at same site and datum in use.

REMARKS.--Daily discharge is computed on the basis of modified weir formula and corrected to conform with discharge measurements, the head being determined from readings of headwater and tailwater gages. Flow completely regulated by Winnibigoshish Lake (station 05201000).

COOPERATION.--Daily discharge computed by Corps of Engineers.

AVERAGE DISCHARGE (unadjusted).--97 years, 513 ft^3/s (14.53 m^3/s), 4.83 in/yr (123 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 4,370 ft^3/s (124 m^3/s) Aug. 6, 1905; no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1,340 ft^3/s (37.9 m^3/s) July 22-23; minimum daily, 100 ft^3/s (2.83 m^3/s) Feb. 1 to Mar. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	101	305	356	356	100	100	101	101	101	356	1150	449
2	101	302	356	356	100	100	101	101	101	405	1150	449
3	101	305	356	356	100	100	106	101	101	405	1150	450
4	101	305	356	355	100	100	101	101	101	405	1150	450
5	101	299	356	355	100	100	101	101	101	405	1150	450
6	101	360	356	355	100	100	101	101	101	405	1150	450
7	101	360	356	355	100	100	101	101	101	455	1150	452
8	101	360	356	355	100	100	101	101	101	505	1150	452
9	151	368	356	239	100	100	101	101	101	554	1150	452
10	151	360	356	120	100	100	101	101	101	603	1150	452
11	200	360	356	120	100	100	101	101	101	650	1150	452
12	200	360	356	120	100	100	101	101	101	697	1150	452
13	200	360	356	120	100	100	101	101	101	696	1150	449
14	200	360	356	120	100	100	101	101	101	743	1150	449
15	250	360	356	120	100	100	101	101	102	790	1100	453
16	250	360	356	120	100	100	101	101	102	885	1060	454
17	250	360	356	120	100	100	101	101	102	994	1010	452
18	293	360	356	120	100	100	101	101	102	1070	963	452
19	293	360	356	120	100	100	101	101	102	1160	917	453
20	293	360	356	120	100	100	101	101	102	1250	821	453
21	293	360	356	120	100	100	101	101	102	1300	726	453
22	293	360	356	120	100	100	101	101	102	1340	634	452
23	293	360	356	120	100	100	101	101	102	1340	588	452
24	293	352	356	120	100	100	101	101	102	1330	538	452
25	294	360	355	120	100	100	101	101	102	1330	541	452
26	294	352	355	120	100	100	101	101	102	1330	542	452
27	293	360	355	120	100	100	101	101	153	1330	543	454
28	293	360	355	120	100	100	101	101	203	1280	543	454
29	293	360	355	120	---	100	101	101	250	1240	496	453
30	292	360	356	120	---	101	101	101	304	1190	496	454
31	293	---	356	120	---	101	---	101	---	1150	496	---
TOTAL	6763	10508	11031	5722	2800	3102	3035	3131	3548	27593	28114	13553
MEAN	218	350	356	185	100	100	101	101	118	890	907	452
MAX	294	368	356	356	100	101	106	101	304	1340	1150	454
MIN	101	299	355	120	100	100	101	101	101	356	496	449
CFSM	.15	.24	.25	.13	.07	.07	.07	.07	.08	.62	.63	.31
IN.	.17	.27	.28	.15	.07	.08	.08	.08	.09	.71	.73	.35

CAL YR 1980 TOTAL 110195 MEAN 301 MAX 923 MIN 100 CFSM .21 IN 2.84
WTR YR 1981 TOTAL 118900 MEAN 326 MAX 1340 MIN 100 CFSM .23 IN 3.07

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN

LOCATION.--Lat 46°57'24", long 94°40'26", in SE¼NW¼ sec.12, T.140 N., R.32 W., Hubbard County, Hydrologic Unit 07010102. Samples are collected near center of lake at the deepest point.

DRAINAGE AREA.--0.875 mi^2 (21.27 km^2).

PERIOD OF RECORD.--Water years 1977 to current year.

REMARKS.--There are various meteorologic instruments at the station, and data from these instruments are available in the District office. Letter E indicates estimated value.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	SAMPLING DEPTH (FT) (00003)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	SPECIFIC CONDUCTANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	TRANSPARENCY (SECCHI DISK) (M) (00078)	OXYGEN, DISSOLVED (MG/L) (00300)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARBONATE (MG/L AS CACO3) (95902)
OCT										
07...	1115	.00	158	--	7.7	13.2	--	9.5	--	--
07...	1120	3.30	158	170	7.8	13.1	--	9.4	83	.00
07...	1127	6.60	158	--	7.8	13.1	--	9.5	--	--
07...	1132	13.2	158	--	7.8	12.8	--	9.1	--	--
07...	1138	19.8	157	--	7.7	12.6	--	9.0	--	--
07...	1144	26.4	157	165	7.7	12.5	--	8.7	83	.00
07...	1310	--	--	--	--	--	6.3	--	--	--
20...	1206	.00	157	--	7.6	8.9	--	10.5	--	--
20...	1214	6.60	157	--	7.7	8.8	--	10.4	--	--
20...	1225	13.2	157	--	7.8	8.7	--	10.2	--	--
20...	1232	19.8	156	--	7.8	8.7	--	10.2	--	--
20...	1237	26.4	156	160	7.8	8.7	--	10.2	79	.00
20...	1345	3.30	157	161	7.7	8.8	--	10.5	82	.00
20...	1350	--	--	--	--	--	5.9	--	--	--
JAN										
13...	1626	3.30	190	191	7.4	3.7	--	9.4	96	3.0
13...	1632	6.60	190	--	7.4	3.8	--	9.3	--	--
13...	1639	13.2	190	--	7.4	4.0	--	8.8	--	--
13...	1648	19.8	192	--	7.2	4.1	--	8.6	--	--
13...	1657	23.6	191	193	7.1	4.2	--	7.6	91	.00
13...	1702	26.4	191	--	7.1	4.3	--	7.0	--	--
13...	1835	--	--	--	--	--	5.5	--	--	--
FEB										
14...	1310	--	--	--	--	--	7.2	--	--	--
18...	1115	.00	199	--	7.2	1.0	--	9.8	--	--
18...	1130	3.30	199	197	7.2	1.0	--	9.8	87	.00
18...	1140	13.2	202	--	7.1	4.1	--	7.8	--	--
18...	1150	19.8	205	--	7.0	4.5	--	6.0	--	--
18...	1155	26.4	208	--	6.9	4.5	--	5.2	--	--
18...	1200	27.1	209	203	6.9	4.5	--	4.9	90	.00
18...	1300	--	--	--	--	--	7.2	--	--	--
MAR										
17...	1125	.00	191	--	7.0	--	--	8.8	--	--
17...	1135	3.30	190	198	7.0	--	--	8.9	88	.00
17...	1140	6.60	190	--	7.0	--	--	8.8	--	--
17...	1150	13.2	190	--	7.0	--	--	8.7	--	--
17...	1200	19.8	191	--	6.9	--	--	7.5	--	--
17...	1205	26.4	195	--	6.6	--	--	4.6	--	--
17...	1210	27.1	195	182	6.6	--	--	4.6	90	--
17...	1230	--	--	--	--	--	6.5	--	--	--

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
OCT									
07...	--	--	--	--	--	--	--	--	--
07...	21	7.5	1.2	1.1	83	1.1	.6	.9	101
07...	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--
07...	21	7.5	1.2	1.1	83	.2	.5	.9	100
07...	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--
20...	20	7.1	1.1	1.1	81	.3	.6	.4	100
20...	21	7.1	1.1	1.1	82	.1	.7	.4	102
20...	--	--	--	--	--	--	--	--	--
JAN									
13...	25	8.2	1.4	1.1	93	1.0	.7	.1	106
13...	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--
13...	24	7.6	1.5	1.1	94	1.3	.8	.3	102
13...	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--
FEB									
14...	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--
18...	22	7.9	1.5	1.2	98	.1	.7	.6	120
18...	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--
18...	23	7.9	1.4	1.2	100	.0	.7	1.1	120
18...	--	--	--	--	--	--	--	--	--
MAR									
17...	--	--	--	--	--	--	--	--	--
17...	24	6.7	1.3	1.1	91	.4	.7	.6	101
17...	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--
17...	23	7.8	1.4	1.1	100	.4	.9	.8	118
17...	--	--	--	--	--	--	--	--	--

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)
OCT									
07...	--	--	--	--	.019	--	--	--	--
07...	83	--	--	--	--	10	5	--	--
07...	--	--	--	--	.018	--	--	--	--
07...	--	--	--	--	.021	--	--	--	--
07...	--	--	--	--	.021	--	--	--	--
07...	82	--	--	--	.019	0	6	--	--
07...	--	.05	.57	.62	.017	--	--	5.68	.000
20...	--	--	--	--	.017	--	--	--	--
20...	--	--	--	--	.023	--	--	--	--
20...	--	--	--	--	.023	--	--	--	--
20...	--	--	--	--	.020	--	--	--	--
20...	79	--	--	--	.018	20	7	--	--
20...	81	--	--	--	--	20	7	--	--
20...	--	.01	.56	.57	.022	--	--	7.21	.000
JAN									
13...	93	--	--	--	.019	20	1	--	--
13...	--	--	--	--	.014	--	--	--	--
13...	--	--	--	--	.012	--	--	--	--
13...	--	--	--	--	.013	--	--	--	--
13...	93	--	--	--	--	30	6	--	--
13...	--	--	--	--	.018	--	--	--	--
13...	--	.03	.73	.76	.019	--	--	1.47	.000
FEB									
14...	--	--	--	--	.018	--	--	--	--
18...	--	--	--	--	.014	--	--	--	--
18...	93	--	--	--	.020	<10	1	--	--
18...	--	--	--	--	.015	--	--	--	--
18...	--	--	--	--	.019	--	--	--	--
18...	--	--	--	--	.020	--	--	--	--
18...	95	--	--	--	--	<10	20	--	--
18...	--	.05	.64	.69	.020	--	--	1.69	.000
MAR									
17...	--	--	--	--	.007	--	--	--	--
17...	90	--	--	--	--	<10	<1	--	--
17...	--	--	--	--	.013	--	--	--	--
17...	--	--	--	--	.009	--	--	--	--
17...	--	--	--	--	.011	--	--	--	--
17...	--	--	--	--	.018	--	--	--	--
17...	96	--	--	--	--	<10	<1	--	--
17...	--	.05	.46	.51	.010	--	--	3.43	.000

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	SAMP-LING DEPTH (FT) (00003)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TRANS-PAR-ENCY (SECCHI DISK) (M) (00078)	OXYGEN, DIS-SOLVED (MG/L) (00300)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
APR										
14...	1315	.00	177	--	7.6	7.0	--	11.2	--	--
14...	1326	6.60	177	--	7.6	7.0	--	11.3	--	--
14...	1344	19.8	175	--	7.7	6.9	--	11.2	--	--
14...	1350	26.4	175	--	7.7	6.8	--	11.3	--	--
14...	1400	--	--	--	--	--	5.0	--	--	--
27...	1005	.00	179	--	7.8	10.0	--	10.8	--	--
27...	1010	3.30	179	179	7.8	9.7	--	10.8	90	.00
27...	1017	6.60	178	--	7.9	8.8	--	11.0	--	--
27...	1022	13.2	178	--	7.9	8.4	--	11.1	--	--
27...	1028	19.8	177	--	7.9	8.1	--	10.9	--	--
27...	1039	26.4	177	178	7.9	8.0	--	10.8	90	.00
27...	1050	--	--	--	--	--	4.6	--	--	--
MAY										
12...	1203	.00	182	--	7.5	13.1	--	8.3	--	--
12...	1211	3.30	179	184	8.1	13.0	--	8.3	91	.00
12...	1215	6.60	179	--	8.1	12.9	--	8.3	--	--
12...	1221	13.2	179	--	8.0	12.8	--	8.2	--	--
12...	1229	19.8	179	--	7.9	11.5	--	8.5	--	--
12...	1237	26.4	179	173	7.4	9.8	--	7.8	91	3.0
12...	1300	--	--	--	--	--	6.0	--	--	--
26...	1528	.00	180	--	7.7	17.6	--	--	--	--
26...	1530	3.30	180	185	7.6	17.5	--	--	85	.00
26...	1532	6.60	180	--	7.6	17.4	--	--	--	--
26...	1533	13.2	180	--	8.0	--	--	--	--	--
26...	1534	17.8	180	--	8.0	--	--	--	--	--
26...	1535	26.4	186	--	7.0	11.0	--	--	--	--
26...	1537	27.4	186	177	7.0	11.0	--	--	79	.00
26	1545	--	--	--	--	--	6.3	--	--	--
JUN										
08...	1029	3.30	174	172	8.2	19.8	--	8.7	87	.00
08...	1032	6.60	174	--	8.2	19.8	--	8.6	--	--
08...	1034	13.2	176	--	8.1	19.0	--	9.6	--	--
08...	1036	19.8	183	--	7.0	14.2	--	10.1	--	--
08...	1037	23.1	184	184	7.0	12.6	--	8.6	93	3.0
08...	1038	26.4	186	--	6.8	12.1	--	6.8	--	--
08...	1040	--	--	--	--	--	--	--	--	--
11...	1007	.00	--	--	--	--	--	--	--	--
22...	1000	3.30	--	164	--	--	--	--	87	.00
22...	1009	6.60	--	--	--	--	--	--	--	--
22...	1011	13.2	--	--	--	--	--	--	--	--
22...	1013	19.8	--	--	--	--	--	--	--	--

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
APR									
14...	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--
27...	24	7.3	1.2	1.8	94	1.1	.5	<.1	98
27...	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--
27...	24	7.4	1.3	1.7	92	1.8	.5	<.1	100
27...	--	--	--	--	--	--	--	--	--
MAY									
12...	--	--	--	--	--	--	--	--	--
12...	24	7.5	1.4	1.1	93	.5	.4	<.1	94
12...	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--
12...	24	7.5	1.5	1.1	88	.7	.5	<.1	97
12...	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--
26...	23	6.8	1.4	1.2	97	.0	.6	<.1	107
26...	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--
26...	21	6.4	1.6	1.1	88	.1	.7	.1	115
26...	--	--	--	--	--	--	--	--	--
JUN									
08...	23	7.2	1.2	1.1	88	.4	.5	.4	100
08...	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--
08...	25	7.5	1.3	1.1	90	.0	.6	.4	108
08...	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--
22...	23	7.1	1.1	1.0	92	.1	1.5	.5	84
22...	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)
APR									
14...	--	--	--	--	.014	--	--	--	--
14...	--	--	--	--	.015	--	--	--	--
14...	--	--	--	--	.015	--	--	--	--
14...	--	--	--	--	.016	--	--	--	--
14...	--	.03	.28	.31	.012	--	--	8.53	.000
27...	--	--	--	--	.019	--	--	--	--
27...	--	--	--	--	--	<10	1	--	--
27...	--	--	--	--	.029	--	--	--	--
27...	--	--	--	--	.017	--	--	--	--
27...	--	--	--	--	.020	--	--	--	--
27...	--	--	--	--	.020	<10	<1	--	--
27...	--	<.01	1.00	--	.019	--	--	6.51	.000
MAY									
12...	--	--	--	--	.006	--	--	--	--
12...	--	--	--	--	--	<10	2	--	--
12...	--	--	--	--	.007	--	--	--	--
12...	--	--	--	--	.013	--	--	--	--
12...	--	--	--	--	.008	--	--	--	--
12...	--	--	--	--	.029	<10	3	--	--
12...	--	<.01	.66	--	.019	--	--	3.39	.000
26...	--	--	--	--	.016	--	--	--	--
26...	--	--	--	--	.004	30	10	--	--
26...	--	--	--	--	.006	--	--	--	--
26...	--	--	--	--	.011	--	--	--	--
26...	--	--	--	--	.019	--	--	--	--
26...	--	--	--	--	.010	--	--	--	--
26...	84	--	--	--	--	30	10	--	--
26...	--	1.1	.36	1.5	--	--	--	2.70	.000
JUN									
08...	87	--	--	--	--	40	10	--	--
08...	--	--	--	--	.006	--	--	--	--
08...	--	--	--	--	.006	--	--	--	--
08...	--	--	--	--	.006	--	--	--	--
08...	90	--	--	--	.008	50	20	--	--
08...	--	--	--	--	.004	--	--	--	--
08...	--	<.01	.53	--	.007	--	--	4.31	.000
11...	--	--	--	--	.009	--	--	--	--
22...	90	--	--	--	--	40	10	--	--
22...	--	--	--	--	.011	--	--	--	--
22...	--	--	--	--	.014	--	--	--	--
22...	--	--	--	--	.008	--	--	--	--

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	SAMPLING DEPTH (FT) (00003)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	SPECIFIC CONDUCTANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARBONATE (MG/L AS CACO3) (95902)
JUN--Continued									
22...	1015	26.4	--	184	--	--	--	90	.00
22...	1020	--	--	--	--	--	--	--	--
JUL									
08...	1100	.00	--	--	--	--	--	--	--
08...	1103	3.30	176	154	8.0	27.0	--	83	1.0
08...	1105	6.60	180	--	7.9	--	--	--	--
08...	1110	13.2	176	--	7.8	--	--	--	--
08...	1115	19.8	173	--	7.7	--	--	--	--
08...	1120	26.4	170	180	7.6	--	--	90	.00
08...	1130	--	--	--	--	--	--	--	--
11...	1100	--	--	--	--	--	--	--	--
20...	0850	.00	--	--	--	--	--	--	--
20...	0855	3.30	--	156	--	--	--	79	.00
20...	0905	6.60	--	--	--	--	--	--	--
20...	0910	13.1	--	--	--	--	--	--	--
20...	0915	19.7	--	--	--	--	--	--	--
20...	0920	26.0	--	184	--	--	--	96	.00
20...	0930	--	--	--	--	--	--	--	--
AUG									
04...	1120	.00	160	--	8.5	--	--	--	--
04...	1125	6.60	--	--	--	--	--	--	--
04...	1130	13.1	165	--	8.5	--	--	--	--
04...	1135	19.7	165	--	8.4	--	--	--	--
04...	1140	26.2	190	--	7.2	--	--	--	--
04...	1200	3.30	--	150	--	--	--	73	.00
04...	1210	26.0	--	180	--	--	--	90	.00
04...	1220	--	--	--	--	--	--	--	--
13...	0920	.00	145	--	7.4	23.1	--	--	--
13...	0921	3.00	--	146	--	23.0	--	77	1.0
13...	0922	6.00	145	--	7.8	23.0	--	--	--
13...	0924	12.0	145	--	7.6	22.5	--	--	--
13...	0926	18.0	145	--	7.8	21.5	--	--	--
13...	0928	26.0	175	176	7.5	14.2	--	94	3.0
13...	0930	--	--	--	--	--	--	--	--
SEP									
01...	1050	.00	163	--	7.3	20.7	7.6	--	--
01...	1100	12.2	164	--	7.6	20.8	6.9	--	--
01...	1105	18.3	164	--	7.6	20.7	6.9	--	--
01...	1110	24.4	193	--	6.8	18.5	1.6	--	--
01...	1200	--	--	--	--	--	--	--	--

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
JUN--Continued									
22...	24	7.2	1.1	1.1	95	.0	.7	.5	115
22...	--	--	--	--	--	--	--	--	--
JUL									
08...	--	--	--	--	--	--	--	--	--
08...	21	7.3	1.2	1.0	82	.2	.5	.6	89
08...	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--
08...	24	7.3	1.4	1.0	90	.5	.8	.6	104
08...	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--
20...	20	7.1	1.3	1.0	83	.5	.5	.9	92
20...	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--
20...	26	7.5	1.3	1.1	98	.9	.5	1.1	105
20...	--	--	--	--	--	--	--	--	--
AUG									
04...	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--
04...	18	6.7	1.4	1.0	77	.2	.5	1.0	89
04...	24	7.3	1.2	1.1	96	.9	.9	1.3	114
04...	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--
13...	19	7.1	1.3	1.0	76	2.2	1.3	1.1	101
13...	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--
13...	25	7.6	1.4	1.2	91	.3	1.5	1.5	115
13...	--	--	--	--	--	--	--	--	--
SEP									
01...	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)
JUN Continued									
22...	92	--	--	--	.031	70	20	--	--
22...	--	.11	.78	.89	.012	--	--	7.82	.000
JUL									
08...	--	--	--	--	.008	--	--	--	--
08...	81	--	--	--	--	40	10	--	--
08...	--	--	--	--	.020	--	--	--	--
08...	--	--	--	--	<.001	--	--	--	--
08...	--	--	--	--	.016	--	--	--	--
08...	90	--	--	--	.008	130	40	--	--
08...	--	.02	.72	.74	<.001	--	--	4.62	.000
11...	--	--	--	--	.003	--	--	--	--
20...	--	--	--	--	.006	--	--	--	--
20...	81	--	--	--	--	40	9	--	--
20...	--	--	--	--	.006	--	--	--	--
20...	--	--	--	--	.005	--	--	--	--
20...	--	--	--	--	.007	--	--	--	--
20...	97	--	--	--	.009	100	70	--	--
20...	--	.01	.32	.33	.011	--	--	5.74	.000
AUG									
04...	--	--	--	--	.010	--	--	--	--
04...	--	--	--	--	.094	--	--	--	--
04...	--	--	--	--	.016	--	--	--	--
04...	--	--	--	--	.014	--	--	--	--
04...	--	--	--	--	.022	--	--	--	--
04...	75	--	--	--	--	20	1	--	--
04...	94	--	--	--	--	10	5	--	--
04...	--	.01	.73	.74	.013	--	--	5.56	.000
13...	--	--	--	--	.016	--	--	--	--
13...	79	--	--	--	--	20	4	--	--
13...	--	--	--	--	.014	--	--	--	--
13...	--	--	--	--	.023	--	--	--	--
13...	--	--	--	--	.015	--	--	--	--
13...	93	--	--	--	.023	10	40	--	--
13...	--	<.01	.47	--	.017	--	--	3.32	<.010
SEP									
01...	--	--	--	--	.010	--	--	--	--
01...	--	--	--	--	.009	--	--	--	--
01...	--	--	--	--	.007	--	--	--	--
01...	--	--	--	--	.010	--	--	--	--
01...	--	--	--	--	.054	--	--	--	--

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	SAMPLING DEPTH (FT) (00003)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	SPECIFIC CONDUCTANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	TRANSPARENCY (SECCHI DISK) (M) (00078)	OXYGEN, DISSOLVED (MG/L) (00300)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARBONATE (MG/L AS CACO3) (95902)
SEP--Continued										
01...	1240	--	--	--	--	--	3.5	--	--	--
15...	1045	.00	166	--	7.8	19.7	--	7.5	--	--
15...	1050	3.10	166	152	7.8	19.8	--	7.4	67	.00
15...	1110	13.0	165	--	7.8	19.8	--	7.4	--	--
15...	1120	19.5	165	--	7.8	19.8	--	7.5	--	--
15...	1130	26.6	190	156	6.8	17.6	--	1.7	73	.00
15...	1145	--	--	--	--	--	--	--	--	--
15...	1530	--	--	--	--	--	--	--	--	--
29...	1100	.00	172	--	6.7	14.0	--	8.2	--	--
29...	1105	3.30	172	160	7.0	14.0	--	8.0	78	.00
29...	1110	6.60	172	--	7.0	14.0	--	7.9	--	--
29...	1115	13.1	171	--	7.2	14.0	--	7.5	--	--
29...	1125	26.5	171	164	7.2	14.0	--	7.9	73	.00
29...	1400	--	--	--	--	--	2.80	--	--	--
29...	1510	--	--	--	--	--	--	--	--	--

DATE	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)
SEP--Continued									
01...	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--
15...	18	5.4	1.2	.8	80	.1	.3	1.7	100
15...	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--
15...	19	6.1	1.3	.9	82	1.6	.4	2.0	94
15...	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--
29...	21	6.2	1.3	1.0	83	1.0	.5	2.0	90
29...	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--
29...	20	5.6	4.7	1.0	84	.7	.9	1.7	93
29...	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, TOTAL (MG/L AS N) (00600)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70954)
SEP--Continued									
01...	--	<.01	.67	--	.009	--	--	5.61	.260
15...	--	--	--	--	.013	--	--	--	--
15...	76	--	--	--	.017	10	10	--	--
15...	--	--	--	--	.016	--	--	--	--
15...	--	--	--	--	.016	--	--	--	--
15...	81	--	--	--	.032	40	<10	--	--
15...	--	.04	.70	.74	.020	--	--	4.09	.490
15...	--	--	--	--	.005	--	--	--	--
29...	--	--	--	--	.014	--	--	--	--
29...	83	--	--	--	--	10	40	--	--
29...	--	--	--	--	.014	--	--	--	--
29...	--	--	--	--	.016	--	--	--	--
29...	85	--	--	--	.015	<10	<10	--	--
29...	--	.05	.79	.84	.015	--	--	8.36	<.010
29...	--	--	--	--	.014	--	--	--	--

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	OCT 7,80		OCT 20,80		JAN 13,81		FEB 18,81		MAR 17,81		APR 14,81	
TIME	1310		1350		1835		1300		1230		1400	
TOTAL CELLS/ML	2900		2200		820		910		1100		5400	
DIVERSITY: DIVISION	0.9		1.5		0.1		1.3		0.8		1.4	
.CLASS	0.9		1.5		0.1		1.3		0.8		1.4	
..ORDER	1.7		2.7		0.1		1.4		1.7		2.5	
...FAMILY	1.8		2.9		0.1		1.4		1.8		2.5	
....GENUS	2.0		2.9		0.1		1.4		1.8		2.9	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)												
.BACILLARIOPHYCEAE												
..BACILLARIALES												
...NITZSCHIACEAE												
....NITZSCHIA	--	-	14	1	--	-	--	-	--	-	98	2
..EUPODISCALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	--	-	--	-	--	-	--	-	140	3
....MELOSIRA	--	-	330	15	--	-	--	-	--	-	28	1
....STEPHANODISCUS	--	-	--	-	--	-	--	-	--	-	56	1
..FRAGILARIALES												
...FRAGILARIACEAE												
....ASTERIONELLA	550#	19	140	6	--	-	--	-	--	-	110	2
....SYNEDRA	--	-	--	-	--	-	--	-	--	-	98	2
....TABELLARIA	--	-	--	-	--	-	--	-	--	-	110	2
..NAVICULALES												
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	--	-	--	-	--	-	--	-
...NAVICULACEAE												
....NAVICULA	--	-	--	-	--	-	--	-	--	-	*	0
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...CHLOROCOCCACEAE												
....SCHROEDERIA	72	2	150	7	13	2	110	12	100	9	--	-
....TETRAEDRON	--	-	--	-	--	-	--	-	--	-	*	0
...COCCOMYXACEAE												
....ELAKATOTHRIX	--	-	--	-	--	-	--	-	--	-	--	-
...DICTYOSPHAERIACEAE												
....DICTYOSPHAERIUM	--	-	--	-	--	-	--	-	--	-	--	-
...MICRACTINIACEAE												
....MICRACTINIUM	--	-	--	-	--	-	--	-	--	-	--	-
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	--	-	--	-	--	-	42	1
....OOCYSTIS	--	-	--	-	--	-	--	-	--	-	--	-
....SELENASTRUM	--	-	--	-	--	-	--	-	13	1	--	-
...PALMELLACEAE												
....SPHAEROCYSTIS	--	-	110	5	--	-	--	-	--	-	--	-
...RADIOCOCCACEAE												
....RADIOCOCCUS	--	-	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE												
....COELASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
....SCENEDESMUS	57	2	27	1	--	-	--	-	--	-	--	-
....TETRASTRUM	--	-	--	-	--	-	--	-	--	-	56	1
..TETRASPORALES												
...GLOEOCYSTACEAE												
....GLOEOCYSTIS	--	-	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	27	1	--	-	14	2	64	6	84	2
..ZYGNEMATALES												
...DESMIDIACEAE												
....COSMARIUM	--	-	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.CHRYSOPHYCEAE												
..OCHROMONADALES												
...DINOBRYACEAE												
....DINOBRYON	--	-	110	5	--	-	--	-	--	-	56	1
...OCHROMONADACEAE												
....OCHROMONAS	--	-	--	-	--	-	--	-	--	-	--	-
....UROGLENOPSIS	--	-	--	-	--	-	--	-	--	-	--	-
...SYNURACEAE												
....MALLOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
.XANTHOPHYCEAE												
..MISCHOCOCCALES												
...SCIADACEAE												
....CENTRITRACTUS	--	-	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981--Continued

DATE	OCT 7,80		OCT 20,80		JAN 13,81		FEB 18,81		MAR 17,81		APR 14,81	
TIME	1310		1350		1835		1300		1230		1400	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CRYPTOPHYTA (CRYPTOMONADS)												
.CRYPTOPHYCEAE												
..CRYPTOMONADALES												
...CRYPTOCHRYSIDACEAE												
....CHROOMONAS	--	-	--	-	--	-	84	9	--	-	510	9
...CRYPTOMONADACEAE												
....CRYPTOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	27	1	--	-	--	-	620#	55	690	13
....COCCOCHLORIS	--	-	--	-	--	-	--	-	--	-	56	1
....EUCAPSIS	--	-	--	-	--	-	--	-	--	-	--	-
....GOMPHOSPHAERIA	--	-	690#	31	--	-	--	-	--	-	490	9
..NOSTOCALES												
...NOSTOCACEAE												
....ANABAENA	220	7	--	-	--	-	--	-	--	-	--	-
....APHANIZOMENON	860#	30	340#	15	800#	98	640#	71	280#	25	2400#	45
....CYLINDROSPERMUM	--	-	--	-	--	-	--	-	--	-	--	-
..OSCILLATORIALES												
...OSCILLATORIACEAE												
....LYNGBYA	1100#	40	270	12	--	-	--	-	--	-	--	-
....OSCILLATORIA	--	-	--	-	--	-	--	-	--	-	250	5
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....TRACHELOMONAS	--	-	--	-	--	-	56	6	--	-	42	1
PYRRHOPHYTA (FIRE ALGAE)												
.DINOPHYCEAE												
..DINOKONTAE												
...GLENODINIACEAE												
....GLENODINIUM	--	-	--	-	--	-	--	-	39	3	--	-
...GYMNODINIACEAE												
....GYMNODINIUM	--	-	--	-	--	-	--	-	--	-	28	1
...PERIDINIACEAE												
....PERIDINIUM	--	-	--	-	--	-	--	-	--	-	--	-

DATE	APR 27,81	MAY 12,81	MAY 26,81	JUN 8,81	JUN 22,81	JUL 8,81
TIME	1050	1300	1545	1040	1020	1130
TOTAL CELLS/ML	4600	850	11000	27000	14000	57000
DIVERSITY: DIVISION	1.2	0.9	1.0	1.0	1.5	0.3
.CLASS	1.2	0.9	1.0	1.0	1.5	0.3
..ORDER	2.1	2.0	1.7	1.0	1.7	0.3
...FAMILY	2.1	2.0	2.0	1.2	1.8	0.4
....GENUS	2.3	2.0	2.0	1.2	1.9	1.1

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)												
.BACILLARIOPHYCEAE												
..BACILLARIALES												
...NITZSCHIACEAE												
....NITZSCHIA	*	0	--	-	--	-	--	-	--	-	*	0
..EUPODISCALES												
...COSCINODISCACEAE												
....CYCLOTELLA	42	1	26	3	--	-	--	-	--	-	*	0
....MELOSIRA	--	-	--	-	--	-	--	-	--	-	--	-
....STEPHANODISCUS	--	-	--	-	--	-	--	-	--	-	--	-
..FRAGILARIALES												
...FRAGILARIACEAE												
....ASTERIONELLA	630	14	--	-	--	-	--	-	--	-	--	-
....SYNEDRA	250	5	13	2	--	-	--	-	--	-	--	-
....TABELLARIA	--	-	--	-	--	-	--	-	--	-	--	-
..NAVICULALES												
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	--	-	--	-	--	-	--	-
...NAVICULACEAE												
....NAVICULA	--	-	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981--Continued

DATE	APR 27,81		MAY 12,81		MAY 26,81		JUN 8,81		JUN 22,81		JUL 8,81	
TIME	1050		1300		1545		1040		1020		1130	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...CHLOROCOCCACEAE												
....SCHROEDERIA	--	-	--	-	140	1	--	-	70	1	*	0
....TETRAEDRON	--	-	--	-	--	-	--	-	--	-	--	-
...COCCOMYXACEAE												
....ELAKATOTHRIX	--	-	--	-	--	-	--	-	--	-	*	0
...DICTYOSPHAERIACEAE												
....DICTYOSPHAERIUM	--	-	--	-	--	-	--	-	4600#	34	530	1
...MICRACTINIACEAE												
....MICRACTINIUM	--	-	100	12	--	-	--	-	--	-	--	-
...OOCYSTACEAE												
....ANKISTRODESMUS	56	1	--	-	280	3	310	1	--	-	--	-
....OOCYSTIS	--	-	--	-	--	-	1300	5	--	-	--	-
....SELENASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
...PALMELLACEAE												
....SPHAEROCYSTIS	140	3	--	-	980	9	--	-	--	-	510	1
...RADIOCOCCACEAE												
....RADIOCOCCUS	--	-	--	-	--	-	4200#	15	--	-	920	2
...SCENEDESMACEAE												
....COELASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-	--	-
....TETRASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
..TETRASPORALES												
...GLOEOCYSTACEAE												
....GLOEOCYSTIS	--	-	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	56	1	--	-	--	-	--	-	--	-	*	0
..ZYGNEMATALES												
...DESMIDIACEAE												
....COSMARIUM	--	-	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.CHRYSOPHYCEAE												
..OCHROMONADALES												
...DINOBRYACEAE												
....DINOBRYON	28	1	--	-	700	6	--	-	--	-	*	0
...OCHROMONADACEAE												
....OCHROMONAS	--	-	--	-	420	4	--	-	3000#	22	--	-
....UROGLENOPSIS	--	-	--	-	--	-	21000#	75	--	-	--	-
...SYNURACEAE												
....MALLOMONAS	130	3	--	-	--	-	--	-	--	-	--	-
.XANTHOPHYCEAE												
..MISCHOCOCCALES												
...SCIADACEAE												
....CENTRITRACTUS	*	0	--	-	--	-	--	-	--	-	--	-
CRYPTOPHYTA (CRYPTOMONADS)												
.CRYPTOPHYCEAE												
..CRYPTOMONADALES												
...CRYPTOCHRYSIDACEAE												
....CHROOMONAS	--	-	13	2	--	-	--	-	--	-	--	-
...CRYPTOMONADACEAE												
....CRYPTOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	240	5	52	6	2800#	26	210	1	520	4	42000#	73
....COCCOCHLORIS	--	-	--	-	--	-	--	-	--	-	--	-
....EUCAPSIS	--	-	--	-	--	-	--	-	--	-	--	-
....GOMPHOSPHAERIA	--	-	--	-	--	-	--	-	--	-	12000#	22
..NOSTOCALES												
...NOSTOCACEAE												
....ANABAENA	--	-	--	-	--	-	--	-	350	3	--	-
....APHANIZOMENON	2500#	54	270#	32	5600#	51	720	3	5000#	37	--	-
....CYLINDROSPERMUM	--	-	--	-	--	-	--	-	--	-	310	1
..OSCILLATORIALES												
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	--	-	--	-	--	-	--	-
....OSCILLATORIA	510	11	370#	44	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....TRACHELOMONAS	--	-	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981--Continued

DATE	APR 27,81		MAY 12,81		MAY 26,81		JUN 8,81		JUN 22,81		JUL 8,81	
TIME	1050		1300		1545		1040		1020		1130	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
PYRRHOPHYTA (FIRE ALGAE)												
.DINOPHYCEAE												
..DINOKONTAE												
...GLENODINIACEAE												
....GLENODINIUM	--	-	--	-	--	-	--	-	--	-	--	-
...GYMNODINIACEAE												
....GYMNODINIUM	--	-	--	-	--	-	--	-	--	-	--	-
...PERIDINIACEAE												
....PERIDINIUM	--	-	--	-	--	-	--	-	--	-	--	-

DATE	JUL 20,81		AUG 4,81		AUG 13,81		SEP 1,81		SEP 15,81		SEP 29,81	
TIME	0930		1220		0930		1240		1108		1400	
TOTAL CELLS/ML	100000		42000		75000		79000		17000		160000	
DIVERSITY: DIVISION	0.2		0.2		0.1		0.1		0.0		0.0	
.CLASS	0.2		0.2		0.1		0.1		0.0		0.0	
..ORDER	0.3		0.2		0.2		0.2		0.0		0.1	
...FAMILY	0.3		0.2		0.2		0.2		0.0		0.1	
....GENUS	0.9		1.2		1.1		1.2		0.9		0.6	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)												
.BACILLARIOPHYCEAE												
..BACILLARIALES												
...NITZSCHIACEAE												
....NITZSCHIA	--	-	--	-	--	-	*	0	--	-	--	-
..EUPODISCALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	--	-	--	-	--	-	--	-	--	-
....MELOSIRA	--	-	--	-	--	-	--	-	--	-	*	0
....STEPHANODISCUS	--	-	--	-	--	-	--	-	--	-	--	-
..FRAGILARIALES												
...FRAGILARIACEAE												
....ASTERIONELLA	--	-	--	-	--	-	--	-	--	-	--	-
....SYNEDRA	--	-	--	-	--	-	--	-	--	-	--	-
....TABELLARIA	--	-	--	-	--	-	--	-	--	-	--	-
..NAVICULALES												
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	--	-	*	0	--	-	--	-
...NAVICULACEAE												
....NAVICULA	--	-	--	-	--	-	--	-	--	-	--	-
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...CHLOROCOCCACEAE												
....SCHROEDERIA	*	0	*	0	*	0	--	-	--	-	--	-
....TETRAEDRON	--	-	--	-	--	-	--	-	--	-	--	-
...COCCOMYXACEAE												
....ELAKATOTHRIX	--	-	--	-	--	-	--	-	*	0	--	-
...DICTYOSPHAERIACEAE												
....DICTYOSPHAERIUM	--	-	220	1	--	-	--	-	--	-	--	-
...MICRACTINIACEAE												
....MICRACTINIUM	--	-	--	-	--	-	--	-	--	-	--	-
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	--	-	--	-	--	-	--	-
....OOCYSTIS	780	1	*	0	*	0	*	0	--	-	--	-
....SELENASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
...PALMELLACEAE												
....SPHAEROCYSTIS	*	0	--	-	490	1	--	-	--	-	--	-
...RADIOCOCCACEAE												
....RADIOCOCCUS	--	-	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE												
....COELASTRUM	--	-	--	-	--	-	*	0	--	-	--	-
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-	*	0
....TETRASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
..TETRASPORALES												
...GLOEOCYSTACEAE												
....GLOEOCYSTIS	1300	1	--	-	--	-	*	0	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
..ZYGNEMATALES												
...DESMIDIACEAE												
....COSMARIUM	--	-	--	-	*	0	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981--Continued

DATE	JUL 20,81		AUG 4,81		AUG 13,81		SEP 1,81		SEP 15,81		SEP 29,81	
TIME	0930		1220		0930		1240		1108		1400	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHRYSOPHYTA												
.CHRYSOPHYCEAE												
..OCHROMONADALES												
...DINOBRYACEAE												
....DINOBRYON	--	-	--	-	--	-	--	-	--	-	--	-
...OCHROMONADACEAE												
....OCHROMONAS	*	0	--	-	--	-	*	0	--	-	*	0
....UROGLENOPSIS	--	-	--	-	--	-	--	-	--	-	--	-
...SYNURACEAE												
....MALLOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
.XANTHOPHYCEAE												
..MISCHOCOCCALES												
...SCIADACEAE												
....CENTRITRACTUS	--	-	--	-	--	-	--	-	--	-	--	-
CRYPTOPHYTA (CRYPTOMONADS)												
.CRYPTOPHYCEAE												
..CRYPTOMONADALES												
...CRYPTOCHRYSIDACEAE												
....CHROOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
...CRYPTOMONADACEAE												
....CRYPTOMONAS	*	0	490	1	*	0	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	85000#	84	27000#	65	50000#	67	38000#	48	12000#	70	140000#	88
....COCCOCHLORIS	--	-	*	0	--	-	--	-	--	-	--	-
....EUCAPSIS	*	0	--	-	--	-	--	-	--	-	--	-
....GOMPHOSPHAERIA	13000	12	13000#	32	23000#	31	39000#	50	5100#	29	17000	11
..NOSTOCALES												
...NOSTOCACEAE												
....ANABAENA	--	-	--	-	420	1	*	0	--	-	1300	1
....APHANIZOMENON	1100	1	380	1	*	0	--	-	*	0	1200	1
....CYLINDROSPERMUM	--	-	--	-	--	-	--	-	--	-	--	-
..OSCILLATORIALES												
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	--	-	--	-	--	-	--	-
....OSCILLATORIA	--	-	--	-	620	1	840	1	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....TRACHELOMONAS	--	-	--	-	--	-	--	-	--	-	*	0
PYRRHOPHYTA (FIRE ALGAE)												
.DINOPHYCEAE												
..DINOKONTAE												
...GLENODINIACEAE												
....GLENODINIUM	--	-	--	-	--	-	--	-	--	-	--	-
...GYMNODINIACEAE												
....GYMNODINIUM	--	-	--	-	--	-	--	-	--	-	--	-
...PERIDINIACEAE												
....PERIDINIUM	--	-	*	0	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05206000 LEECH LAKE AT FEDERAL DAM, MN

LOCATION.--Lat 47°12'23", long 94°18'31", in lot 2, sec.14, T.143 N., R.29 W., Cass County, Hydrologic Unit 07010102, on Leech Lake Indian Reservation, at head of Leech Lake River on Waboose Bay, 5 mi (8 km) southwest of town of Federal Dam.

DRAINAGE AREA.--1,163 mi^2 (3,012 km^2).

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 National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to Dec. 31, 1884, nonrecording gage 0.5 mi (0.8 km) north of outlet to Leech Lake River at datum 98.47 ft (30.014 m) higher. Dec. 31, 1884, to May 24, 1931, nonrecording gage 0.5 mi (0.8 m) 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 (28.255 m) higher.

REMARKS (Revised).--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 (394.015 m) and 1,297.94 ft (395.612 m) (maximum allowable range) is 688,985 acre-ft (850 hm^3) of which 352,637 acre-ft (435 hm^3) is controlled storage between elevations 1,292.70 ft (394.015 m) and 1,295.70 ft (394.929 m) (normal operating range). Contents shown herein are contents above elevation 1,290.00 ft (393.192 m). Prior to September 1978, published contents as contents above elevation 1,292.20 ft (393.863 m). Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 734,300 acre-ft (905 hm 3) capacity table then in use, June 30, 1916, elevation, 1,297.88 ft (395.594 m); minimum, 51,380 acre-ft (63.4 hm^3) capacity table then in use, Dec. 8, 24, 1976, elevation, 1,292.69 ft (394.012 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 542,300 acre-ft (669 hm^3) Aug. 6, elevation, 1,294.95 ft (394.701 m); minimum, 372,600 acre-ft (459 hm^3) Nov. 26-30, elevation, 1,293.48 ft (394.253 m).

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1980 to SEPTEMBER 1981

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1293.67	393300	
Oct. 31	1293.64	388900	-4370
Nov. 30	1293.48	372600	-16300
Dec. 31	1293.42	366100	-6500
CAL YR 1980			-88400
Jan. 31	1293.40	365000	-1080
Feb. 28	1293.49	373700	+2170
Mar. 31	1293.75	402000	+28400
Apr. 30	1294.01	430700	+28700
May 31	1294.05	435200	+4480
June 30	1294.61	500400	+65200
July 31	1294.61	501600	+1210
Aug. 31	1294.70	511300	+9720
Sept. 30	1294.59	498000	-13300
WTR YR 1981			+98200

05206500 LEECH LAKE RIVER AT FEDERAL DAM, MN

LOCATION.--Lat 47°14'45", long 94°13'12", in sec.29, T.144 N., R.28 W., Cass County, Hydrologic Unit 07010102, on Leech Lake Indian Reservation, on right bank at dam on Leech Lake River at town of Federal Dam, 2 mi (3 km) downstream from natural outlet of Leech Lake.

DRAINAGE AREA.--1,163 mi^2 (3,012 km^2).

PERIOD OF RECORD.--May 1884 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder, headwater gage, and nonrecording tailwater gage. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to June 30, 1973, gages (nonrecording headwater gage prior to July 3, 1948) at same sites with datum at 1,293.23 ft (394.176 m) adjustment of 1912. May 27 to Nov. 30, 1929, nonrecording gage at site 600 ft (183 m) downstream at different datum.

REMARKS.--Discharge computed on basis of modified weir formula, the head being obtained from readings on tailwater gage and mean gage height from recording headwater gage. Flow completely regulated by Leech Lake (station 05206000).

COOPERATION.--Computations of daily discharge furnished by Corps of Engineers.

AVERAGE DISCHARGE (unadjusted).--97 years, 359 ft^3/s (10.17 m^3/s), 4.19 in/yr (106 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 2,520 ft^3/s (71.4 m^3/s) June 7, 1957 (result of dam failure); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 683 ft^3/s (19.3 m^3/s) Aug. 10; minimum daily, 99 ft^3/s (2.80 m^3/s) June 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	104	305	368	352	100	102	110	110	99	112	110	115
2	100	302	352	344	100	102	107	112	101	112	110	115
3	102	305	352	352	100	102	107	110	101	112	110	115
4	102	305	352	344	100	102	107	110	101	124	115	108
5	102	299	352	344	100	102	107	110	106	117	115	100
6	102	360	360	352	100	102	107	110	106	117	216	100
7	102	360	360	352	100	102	107	110	105	117	389	115
8	102	360	352	344	100	102	107	110	105	117	484	116
9	240	368	352	230	100	102	107	110	101	117	588	110
10	245	360	352	230	100	102	107	110	106	112	683	110
11	305	360	352	230	100	102	107	111	106	112	608	252
12	305	360	352	123	100	103	107	111	106	112	564	330
13	299	360	352	100	100	103	107	111	106	112	500	320
14	299	360	352	100	100	103	109	111	106	117	510	320
15	305	360	352	100	100	103	109	111	115	117	500	420
16	305	360	352	100	100	103	107	111	110	122	500	413
17	306	360	352	100	100	103	110	111	110	122	510	413
18	312	360	350	100	100	103	107	111	124	215	510	420
19	305	360	344	100	100	103	105	111	106	215	510	575
20	305	360	344	100	100	103	107	111	110	215	510	564
21	305	360	344	100	100	103	109	109	106	208	500	564
22	294	360	344	100	100	103	109	109	110	208	510	405
23	299	360	352	100	102	103	111	109	110	208	510	413
24	305	352	344	100	100	103	109	111	115	214	510	405
25	305	360	344	100	100	103	109	113	115	208	510	405
26	305	352	344	100	100	103	109	111	115	208	510	357
27	305	360	344	100	100	103	109	113	109	208	424	429
28	305	360	344	100	102	103	109	115	109	208	358	364
29	305	360	352	100	---	103	109	106	117	110	330	367
30	305	360	352	100	---	105	110	101	112	110	256	351
31	305	---	352	100	---	105	---	101	---	110	165	---
TOTAL	7685	10508	10870	5497	2804	3186	3241	3410	3248	4616	12725	9191
MEAN	248	350	351	177	100	103	108	110	108	149	410	306
MAX	312	368	368	352	102	105	111	115	124	215	683	575
MIN	100	299	344	100	100	102	105	101	99	110	110	100
CFSM	.21	.30	.30	.15	.09	.09	.09	.10	.09	.13	.35	.26
IN.	.25	.34	.35	.18	.09	.10	.10	.11	.10	.15	.41	.29

CAL YR 1980 TOTAL 122298 MEAN 334 MAX 1050 MIN 98 CFSM .29 IN 3.91
WTR YR 1981 TOTAL 76981 MEAN 211 MAX 683 MIN 99 CFSM .18 IN 2.46

05210500 POKEGAMA LAKE NEAR GRAND RAPIDS, MN

LOCATION.--Lat 47°10'00", long 93°33'20", in NW¼ sec.17, T.54 N., R.25 W., Itasca County, Hydrologic Unit 07010101, at narrows on U.S. Highway 169, 4 mi (6 km) south of Grand Rapids and at mile 1,184 (1,905 km) upstream from Ohio River.

DRAINAGE AREA.--3,265 mi^2 (8,456 km^2).

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 National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to May 30, 1949, nonrecording gage at Pooles Arm of Pokegama Lake 5 mi (8 km) northwest and May 31, 1949, to July 12, 1973, water-stage recorder at same site and at datum 64.42 ft (19.635 m) higher.

REMARKS (Revised).--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 (387.224 m) and 1,276.42 ft (389.053 m) (maximum allowable range) is 80,126 acre-ft (98.8 hm^3) of which 52,483 acre-ft (64.7 hm^3) is controlled storage between elevations 1,270.42 ft (387.224 m) and 1,274.42 ft (388.443 m) (normal operating range). Contents shown herein are contents above elevation 1,267.00 ft (386.182 m). Prior to September 1978, published contents as contents above elevation 1,268.92 ft (386.767 m). Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 124,100 acre-ft (153 hm^3) Apr. 30, 1979, elevation, 1,276.85 ft (389.184 m); maximum elevation, 1,277.92 ft (389.510 m) May 8, 1897; minimum contents observed, 4,520 acre -ft (5.57 hm^3) below zero of capacity table then in use, Sept. 30, 1934, elevation, 1,268.54 ft (386.651 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 85,540 acre-ft (105 hm^3) Aug. 7, elevation, 1,274.06 ft (388.333 m); minimum, 58,650 acre-ft (72.3 hm^3) Jan. 14, elevation, 1,272.06 ft (387.724 m).

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1273.22	74090	
Oct. 31	1272.95	70440	-3650
Nov. 30	1272.38	62840	-7600
Dec. 31	1272.11	59300	-3540
CAL YR 1980			+2340
Jan. 31	1272.30	65760	+6460
Feb. 28	1272.87	68700	+2010
Mar. 31	1272.94	70310	+1610
Apr. 30	1273.39	76400	+6090
May 31	1273.31	75310	-1090
June 30	1273.60	79260	+3940
July 31	1273.65	79940	+681
Aug. 31	1273.40	76540	-3400
Sept. 30	1273.50	77890	+1360
WTR YR 1981			+2870

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 (122 m) downstream from Blandin Dam, 400 ft (122 m) upstream from bridge on U.S. Highway 169, 2.5 mi (4.0 km) upstream from Prairie River, and at mile 1,182 (1,902 km) upstream from Ohio River.

DRAINAGE AREA.--3,370 mi^2 (8,730 km^2), 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 (378.571 m) National Geodetic Vertical Datum of 1929. 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.

AVERAGE DISCHARGE.--98 years, 1,165 ft^3/s (32.99 m^3/s); median of yearly mean discharges, 1,030 ft^3/s (29.2 m^3/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,500 ft^3/s (354 m^3/s) Sept. 3, 1948, gage height, 15.2 ft (4.633 m), from floodmark, caused by dam failure at gage, from rating curve extended above 4,500 ft^3/s (127 m^3/s); maximum daily, 5,250 ft^3/s (149 m^3/s) Sept. 5, 8, 1905; no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,760 ft^3/s (78.2 m^3/s) Aug. 8, gage height, 8.74 ft (2.664 m); minimum daily, 144 ft^3/s (4.08 m^3/s) Jan. 17; minimum gage height, 2.28 ft (0.695 m) Apr. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	403	880	855	740	315	360	478	760	341	1450	1490	1490
2	405	870	860	750	281	371	532	885	331	1050	1490	1460
3	383	870	911	775	298	420	505	835	352	675	1640	1480
4	387	860	850	750	287	395	529	870	312	675	1750	1540
5	398	906	770	775	312	411	499	820	364	695	1870	1610
6	425	928	785	749	294	387	555	900	319	710	2320	1520
7	380	938	745	750	287	395	605	855	354	855	2500	1570
8	397	933	770	735	305	399	572	730	361	825	2360	1600
9	411	944	770	755	301	407	583	715	327	775	2160	1650
10	406	910	780	755	294	391	576	755	373	775	2160	1650
11	422	928	818	733	296	395	565	565	367	830	2140	1670
12	400	944	770	536	303	415	550	415	358	795	2070	1550
13	417	906	815	541	296	399	575	391	400	800	2070	1640
14	431	938	780	424	292	391	546	395	375	1000	1940	1290
15	420	890	765	383	311	407	536	424	424	1370	1770	875
16	415	933	770	308	296	411	546	403	487	1650	1760	785
17	478	890	770	144	286	399	460	400	510	1350	1800	840
18	555	916	645	205	312	411	341	371	496	960	1730	735
19	510	895	765	220	291	407	387	348	514	944	1760	765
20	650	911	850	217	277	399	291	333	500	1020	1600	760
21	725	870	825	185	264	407	167	348	528	982	1750	745
22	770	910	810	172	254	407	186	337	690	1010	1810	820
23	870	875	800	190	264	395	251	352	725	1030	2080	988
24	850	875	770	225	326	433	514	348	700	1140	2050	1040
25	895	880	850	203	298	399	790	341	700	1250	2080	1280
26	890	860	765	202	312	407	928	352	690	1230	2090	1200
27	885	855	775	202	315	420	830	359	700	1310	2010	1150
28	881	850	765	233	337	418	570	348	938	1440	2040	1190
29	898	845	800	308	---	440	710	333	1260	1440	1910	1180
30	855	855	745	297	---	428	645	340	1420	1410	1910	1200
31	911	---	750	286	---	420	---	293	---	1460	1740	---
TOTAL	18123	26865	24499	13748	8304	12544	15822	15921	16216	32906	59850	37273
MEAN	585	896	790	443	297	405	527	514	541	1061	1931	1242
MAX	911	944	911	775	337	440	928	900	1420	1650	2500	1670
MIN	380	845	645	144	254	360	167	293	312	675	1490	735

CAL YR 1980 TOTAL 291357 MEAN 796 MAX 1750 MIN 154
WTR YR 1981 TOTAL 282071 MEAN 773 MAX 2500 MIN 144

05212700 PRAIRIE RIVER NEAR TACONITE, MN

LOCATION.--Lat 47°23'20", long 93°22'50", in NW¼SW¼ sec.27, T.57 N., R.24 W., Itasca County, Hydrologic Unit 07010103, on left bank 125 ft (38 m) upstream from bridge on County Highway 7, 1.5 mi (2.4 km) downstream from outlet of Lawrence Lake and 5 mi (8 km) north of Taconite.

DRAINAGE AREA.--360 mi^2 (932 km^2), approximately.

PERIOD OF RECORD.--April 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,294.81 ft (394.658 m) National Geodetic Vertical Datum of 1929. Prior to Aug. 31, 1967, nonrecording gage at site 125 ft (38 m) downstream at same datum.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--14 years, 224 ft^3/s (6.344 m^3/s), 8.45 in/yr (215 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,250 ft^3/s (92.0 m^3/s) Apr. 17, 1969, gage height, 11.81 ft (3.600 m); minimum, 7.0 ft^3/s (0.20 m^3/s) Oct. 5, 1970; minimum gage height, 1.34 ft (0.408 m) Nov. 7, 1976, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 989 ft^3/s (28.0 m^3/s) May 1, gage height, 7.85 ft (2.393 m); minimum daily, 47 ft^3/s (1.33 m^3/s) Feb. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	238	155	122	54	48	66	216	986	213	336	79	151
2	232	151	120	53	48	65	242	978	217	334	77	141
3	219	149	116	52	48	64	270	968	241	346	89	130
4	208	147	112	52	48	63	292	945	247	354	125	122
5	200	142	110	51	48	62	300	910	262	349	123	113
6	199	140	105	50	48	62	297	868	273	332	233	107
7	193	140	102	50	48	62	303	815	279	310	272	131
8	184	140	99	49	48	62	307	758	281	282	271	126
9	167	150	96	49	48	64	300	711	273	253	258	119
10	160	153	93	49	48	65	316	655	266	223	233	120
11	153	153	90	49	47	65	313	603	255	207	213	118
12	141	157	87	48	48	66	300	563	237	188	197	113
13	131	164	84	48	54	67	328	524	225	171	181	112
14	125	163	82	48	59	65	370	489	224	166	168	107
15	120	158	80	48	65	69	372	463	216	166	155	103
16	113	157	78	48	71	68	374	424	204	155	142	100
17	112	153	76	48	78	71	400	384	190	145	130	95
18	114	146	74	48	83	70	411	344	187	134	121	93
19	111	140	72	48	88	70	418	310	179	125	114	91
20	110	140	70	48	86	70	414	280	178	118	107	88
21	110	140	68	48	85	71	405	253	175	112	117	84
22	111	139	66	48	83	70	416	230	180	104	141	81
23	115	141	65	48	81	71	518	214	180	98	140	77
24	130	135	64	48	78	72	631	201	186	97	134	75
25	137	130	62	48	75	78	683	194	182	93	145	75
26	137	125	61	48	72	94	723	193	187	90	144	76
27	141	124	60	48	69	94	790	197	185	86	137	80
28	145	122	58	48	67	105	870	201	242	82	131	75
29	148	122	57	48	---	137	922	210	343	77	124	74
30	151	120	56	48	---	167	955	216	346	74	118	75
31	155	---	55	48	---	187	---	213	---	78	119	---
TOTAL	4710	4296	2540	1518	1769	2462	13456	15300	6853	5685	4738	3052
MEAN	152	143	81.9	49.0	63.2	79.4	449	494	228	183	153	102
MAX	238	164	122	54	88	187	955	986	346	354	272	151
MIN	110	120	55	48	47	62	216	193	175	74	77	74
CFSM	.42	.40	.23	.14	.18	.22	1.25	1.37	.63	.51	.43	.28
IN.	.49	.44	.26	.16	.18	.25	1.39	1.58	.71	.59	.49	.32

CAL YR 1980 TOTAL 47887 MEAN 131 MAX 548 MIN 28 CFSM .36 IN 4.95
WTR YR 1981 TOTAL 66379 MEAN 182 MAX 986 MIN 47 CFSM .51 IN 6.86

05216860 SWAN RIVER NEAR CALUMET, MN

LOCATION.--Lat 47°17'20", long 93°13'54", in NW¼SW¼ sec.35, T.56 N., R.23 W., Itasca County, Hydrologic Unit 07010103, on left bank 1.0 mi (1.6 km) downstream from Snowball Creek, 2.1 mi (3.4 km) downstream from bridge on U.S. Highway 65 at outlet of Swan Lake and 3.1 mi (5.0 km) southeast of Calumet.

DRAINAGE AREA.--114 mi^2 (295 km^2).

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,331.19 ft (405.747 m) National Geodetic Vertical Datum of 1929. Prior to June 5, 1964, reference point at present site and datum.

REMARKS.--Records fair. Natural flow of stream affected by continually changing iron-mining activities that include diversions for iron-ore processing, storage in tailing ponds and Swan Lake, and mine pit dewatering.

AVERAGE DISCHARGE.--17 years, 64.8 ft^3/s (1.835 m^3/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 773 ft^3/s (21.9 m^3/s) Apr. 15, 1969, gage height, 5.83 ft (1.777 m); maximum gage height, 5.96 ft (1.817 m) Apr. 23, 1979; minimum discharge, 0.38 ft^3/s (0.011 m^3/s) Oct. 14, 1976, gage height, 4.16 ft (1.268 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 174 ft^3/s (4.93 m^3/s) Apr. 30, gage height, 5.17 ft (1.576 m); minimum discharge, 15 ft^3/s (0.42 m^3/s) Mar. 18; minimum gage height, 4.53 ft (1.381 m) Jan. 20-22, Mar. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65	65	42	23	23	28	38	166	60	115	33	46
2	68	65	40	23	23	27	42	166	60	109	31	44
3	68	60	40	22	22	27	48	162	62	106	31	42
4	68	56	40	22	22	27	52	162	62	103	33	40
5	65	56	40	20	22	26	52	158	62	97	34	40
6	65	58	38	20	22	24	50	154	62	91	37	38
7	65	60	38	19	23	23	50	150	65	85	42	42
8	68	62	37	20	23	23	52	140	60	80	44	44
9	70	67	37	19	23	22	50	140	60	78	50	44
10	65	70	36	19	24	22	52	132	58	72	50	44
11	68	70	34	19	24	22	52	126	60	72	50	42
12	70	70	33	18	24	22	54	118	60	68	50	42
13	70	68	31	18	24	20	60	112	65	60	50	42
14	70	68	30	19	24	20	62	106	68	70	46	38
15	68	65	31	19	24	20	65	103	62	70	46	38
16	70	60	30	19	24	18	75	100	60	65	44	37
17	68	60	30	19	24	18	78	91	58	58	40	37
18	70	56	30	18	26	18	82	82	54	56	38	34
19	68	54	28	18	27	18	85	80	56	52	37	33
20	68	54	28	18	27	18	85	70	60	50	36	33
21	65	56	27	19	28	18	85	68	60	50	40	31
22	68	54	27	20	31	18	88	68	62	48	46	30
23	72	52	27	20	30	18	115	68	65	44	44	28
24	72	50	27	20	28	18	140	68	65	42	44	27
25	70	48	27	20	28	20	150	65	68	42	46	31
26	72	48	26	22	27	20	150	68	70	38	46	34
27	72	46	27	20	28	22	166	65	70	37	46	33
28	70	46	26	20	28	23	162	65	88	34	44	38
29	70	44	26	20	---	30	162	60	106	33	42	40
30	65	44	24	20	---	34	162	60	115	33	40	42
31	65	---	24	20	---	37	---	58	---	33	42	---
TOTAL	2118	1732	981	613	703	701	2564	3231	1983	1991	1302	1134
MEAN	68.3	57.7	31.6	19.8	25.1	22.6	85.5	104	66.1	64.2	42.0	37.8
MAX	72	70	42	23	31	37	166	166	115	115	50	46
MIN	65	44	24	18	22	18	38	58	54	33	31	27

CAL YR 1980 TOTAL 14145.5 MEAN 38.6 MAX 113 MIN 6.4
WTR YR 1981 TOTAL 19053.0 MEAN 52.2 MAX 166 MIN 18

05218500 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 (1.9 km) upstream from mouth, and 14 mi (23 m) north of McGregor.

DRAINAGE AREA.--421 mi^2 (1,090 km^2).

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.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by 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 (1.6 km) upstream at datum 1,207.71 ft (368.110 m) adjustment of 1912. Nov. 29, 1962, to June 30, 1973, water-stage recorder at present site at datum 1,207.71 ft (368.110 m) adjustment of 1912.

REMARKS (Revised).--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 (370.122 m) and 1,221.31 ft (372.255 m) (top of structure) is 73,037 acre-ft (90.0 hm^3), of which 37,539 acre-ft (46.3 hm^3) is controlled storage between elevations 1,214.31 ft (370.122 m) and 1,218.31 ft (371.341 m) (normal operating range). Contents shown herein are contents above elevation 1,207.00 ft (367.894 m). Prior to September 1978, published contents as contents above elevation 1,209.03 ft (368.512 m). Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 167,200 acre-ft (206 hm^3) capacity table then in use, May 19, 1950, elevation, 1,224.82 ft (373.325 m); minimum observed, 5,950 acre-ft (7.34 hm^3) below zero of capacity table then in use, Jan. 20, 1921, elevation, 1,207.96 ft (368.186 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 66,030 acre-ft (81.4 hm^3) Apr. 24, elevation, 1,216.59 ft (370.817 m); minimum, 51,790 acre-ft (63.9 hm^3) Feb. 16-18, elevation, 1,215.02 ft (370.338 m).

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1216.17	62070	
Oct. 31	1216.92	59770	-2300
Nov. 30	1215.57	56610	-3160
Dec. 31	1215.38	54920	-1680
CAL YR 1980			+2440
Jan. 31	1215.14	52310	-2620
Feb. 28	1215.17	53080	+1210
Mar. 31	1215.50	55980	+2900
Apr. 30	1216.43	64510	+8530
May 31	1216.28	63100	-1410
June 30	1216.28	63100	0
July 31	1216.30	63290	+187
Aug. 31	1216.33	63570	+282
Sept. 30	1216.21	62450	-1120
WTR YR 1981			+803

05219000 SANDY RIVER AT SANDY LAKE DAM, 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, at dam at outlet of Sandy Lake, at Libby, 1.2 mi (1.9 km) above mouth, and 14 mi (23 km) north of McGregor.

DRAINAGE AREA.--421 mi^2 (1,090 km^2).

PERIOD OF RECORD.--July 1893 to March 1894, July 1894, November 1894 to March 1895, August 1895 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as "below Sandy Lake Reservoir" 1893-1916.

GAGE.--Water-stage recorders on headwater and tailwater. Datum of gages is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to June 30, 1973, gages (nonrecording gages prior to June 20, 1949) at same site with datum at 1,207.71 ft (368.110 m) adjustment of 1912.

REMARKS.--Discharge computed on basis of head over dam, using modified weir formula, head being obtained from headwater and tailwater recorder records. Flow completely regulated by Sandy Lake (station 05218500).

COOPERATION.--Computations of daily discharge furnished by Corps of Engineers; discharge measurement made and records reviewed by Geological Survey.

AVERAGE DISCHARGE (unadjusted).--86 years (water years 1896-1981), 215 ft^3/s (6.089 m^3/s), 6.94 in/yr (176 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 3,740 ft^3/s (106 m^3/s) July 12, 1897; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1,390 ft^3/s (39.4 m^3/s) Apr. 28; minimum daily, 16 ft^3/s (0.45 m^3/s) Aug. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	378	116	137	109	41	21	22	1270	155	936	196	129
2	162	116	139	109	42	21	21	1250	79	632	196	130
3	164	116	141	109	42	21	21	1250	80	576	194	63
4	164	116	146	109	42	21	21	896	436	302	194	19
5	165	117	137	109	42	21	21	944	808	328	186	19
6	167	117	109	109	42	21	21	960	784	338	186	19
7	167	117	109	108	42	21	21	882	693	342	178	19
8	165	116	109	108	42	21	21	910	693	346	67	19
9	164	116	110	108	42	21	21	804	312	196	62	19
10	165	115	110	108	42	21	21	585	321	198	37	19
11	164	115	112	108	42	21	21	632	364	152	36	19
12	164	115	112	108	42	21	21	640	366	153	36	19
13	164	115	112	66	42	21	21	336	424	52	37	19
14	164	115	110	67	42	21	21	364	618	21	38	19
15	165	115	110	30	41	22	21	380	864	21	38	19
16	165	115	110	40	41	22	158	392	837	21	16	19
17	165	115	110	40	41	22	252	392	837	20	17	20
18	165	115	110	40	41	22	306	392	768	144	17	21
19	165	115	110	40	41	22	309	297	495	143	18	21
20	165	140	112	40	41	22	312	303	510	196	18	22
21	162	140	114	40	21	22	315	309	510	196	18	22
22	124	140	113	40	21	22	315	315	515	351	18	22
23	123	140	112	40	21	22	606	214	1130	354	18	22
24	121	140	110	40	21	22	1060	216	828	350	18	22
25	120	140	110	40	21	22	1330	218	1070	350	18	22
26	117	140	110	40	21	22	1220	216	1030	343	85	21
27	116	141	109	40	21	22	1160	216	1020	340	126	21
28	116	140	109	40	21	22	1390	216	1020	265	126	20
29	116	139	110	40	---	22	1300	202	1010	265	126	20
30	116	139	100	40	---	22	1270	154	984	196	126	20
31	116	---	109	40	---	22	---	155	---	196	128	---
TOTAL	4854	3736	3561	2105	1001	668	11619	16310	19561	8323	2574	865
MEAN	157	125	115	67.9	35.8	21.5	387	526	652	268	83.0	28.8
MAX	378	141	146	109	42	22	1390	1270	1130	936	196	130
MIN	116	115	100	30	21	21	21	154	79	20	16	19
CFSM	.37	.30	.27	.16	.09	.05	.92	1.25	1.55	.64	.20	.07
IN.	.43	.33	.31	.19	.09	.06	1.03	1.44	1.73	.74	.23	.08

CAL YR 1980 TOTAL 36001 MEAN 98.4 MAX 1180 MIN 17 CFSM .23 IN 3.18
WTR YR 1981 TOTAL 75177 MEAN 206 MAX 1390 MIN 16 CFSM .49 IN 6.64

05220500 MISSISSIPPI RIVER BELOW SANDY RIVER, NEAR LIBBY, MN

LOCATION.--Lat 46°47'23", long 93°19'43", in SE¼NE¼ sec.25, T.50 N., R.24 W., Aitkin County, Hydrologic Unit 07010103, on right bank 600 ft (183 m) downstream from Sandy River, 0.8 mi (1.3 km) northwest of Libby and at mile 1,106 (1,780 km) upstream from Ohio River.

DRAINAGE AREA.--5,060 mi^2 (13,110 km^2), approximately.

PERIOD OF RECORD.--April 1930 to current year.

REVISED RECORDS.--WSP 1914: 1958.

GAGE.--Water-stage recorder. Datum of gage is 1,204.06 ft (366.997 m) National Geodetic Vertical Datum of 1929. Prior to July 28, 1931, nonrecording gage at site 600 ft (183 m) upstream at datum 3.16 ft (0.96 m) higher.

REMARKS.--Records good except those for winter period, which are fair. Flow regulated by Winnibigoshish Lake (station 05201000), Leech Lake (station 05206000), Pokegama Lake (station 05210500), and Sandy Lake (station 05218500).

AVERAGE DISCHARGE.--51 years, 2,018 ft^3/s (57.15 m^3/s), 5.42 in/yr (138 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,000 ft^3/s (453 m^3/s) May 17, 1950, gage height, 20.02 ft (6.102 m); minimum, 83 ft^3/s (2.35 m^3/s) Nov. 16, 1936, gage height, 1.44 ft (0.439 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,220 ft^3/s (120 m^3/s) May 1, gage height, 9.47 ft (2.886 m); mimimum daily discharge, 420 ft^3/s (11.9 m^3/s) Jan. 24; minimum gage height, 2.82 ft (0.860 m) Jan. 24, 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1130	1480	1090	1020	500	630	1000	4200	1060	2870	1860	2550
2	1100	1490	1090	1020	500	640	1070	4210	1020	2810	1890	2400
3	1150	1470	1090	1020	500	650	1170	4120	1180	2670	1910	2220
4	1090	1440	1080	1020	500	660	1260	3950	1460	2350	2010	2120
5	1000	1440	1080	1020	500	670	1270	3920	1580	2110	2130	2130
6	974	1430	1080	1020	500	680	1320	3790	1520	1980	2260	2150
7	1010	1490	1070	1020	500	690	1330	3660	1490	1890	2640	2180
8	1060	1500	1070	1020	500	700	1340	3550	1400	1820	3000	2140
9	1030	1530	1070	1020	500	710	1340	3330	1250	1770	3270	2120
10	1030	1570	1060	1020	500	720	1350	2980	1270	1710	3410	2130
11	1010	1560	1060	1020	500	730	1360	2870	1260	1660	3400	2140
12	989	1540	1060	1020	500	730	1350	2720	1260	1600	3310	2120
13	1000	1500	1060	994	500	720	1340	2380	1340	1530	3170	2100
14	969	1460	1050	850	520	720	1380	2090	1580	1500	3030	2040
15	938	1430	1050	750	520	710	1490	1920	1770	1530	2910	1990
16	933	1400	1050	700	530	700	1600	1870	1730	1680	2760	1750
17	928	1370	1050	650	535	700	1660	1860	1650	1960	2610	1440
18	918	1340	1040	600	540	690	1670	1820	1550	2140	2510	1300
19	933	1310	1040	500	540	690	1600	1740	1440	2000	2450	1240
20	1000	1290	1040	450	550	690	1540	1620	1430	1820	2390	1190
21	1020	1260	1040	440	560	680	1540	1490	1430	1760	2370	1180
22	1130	1230	1040	440	560	680	1620	1350	1620	1770	2380	1170
23	1230	1200	1040	440	570	680	2090	1270	1870	1740	2430	1160
24	1310	1170	1030	420	580	680	2920	1250	2080	1710	2470	1220
25	1410	1150	1030	430	590	680	3340	1260	2310	1800	2590	1360
26	1460	1120	1030	450	600	680	3600	1270	2330	1910	2690	1490
27	1520	1100	1030	450	610	680	3870	1250	2310	1890	2720	1640
28	1530	1100	1030	450	620	680	4140	1230	2270	1820	2720	1660
29	1510	1100	1030	450	---	730	4160	1200	2510	1830	2700	1660
30	1500	1100	1030	460	---	800	4130	1150	2790	1840	2660	1680
31	1490	---	1030	490	---	900	---	1100	---	1840	2590	---
TOTAL	35302	40570	32640	22654	14925	21700	58850	72420	49760	59310	81240	53670
MEAN	1139	1352	1053	731	533	700	1962	2336	1659	1913	2621	1789
MAX	1530	1570	1090	1020	620	900	4160	4210	2790	2870	3410	2550
MIN	918	1100	1030	420	500	630	1000	1100	1020	1500	1860	1160
CFSM	.23	.27	.21	.14	.11	.14	.39	.46	.33	.38	.52	.35
IN.	.26	.30	.24	.17	.11	.16	.43	.53	.37	.44	.60	.39

CAL YR 1980 TOTAL 476578 MEAN 1302 MAX 2620 MIN 367 CFSM .26 IN 3.50
WTR YR 1981 TOTAL 543041 MEAN 1488 MAX 4210 MIN 420 CFSM .29 IN 3.99

05227500 MISSISSIPPI RIVER AT AITKIN, MN

LOCATION.--Lat 46°32'26", long 93°42'26", in SW¼NW¼ 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 (1.6 km) downstream from Ripple River and at mile 1,055.9 (1,698.9 km) upstream from Ohio River.

DRAINAGE AREA.--6,140 mi^2 (15,900 km^2), approximately.

PERIOD OF RECORD.--March 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,182.41 ft (360.40 m) National Geodetic Vertical Datum of 1929 (levels by 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 (0.9 m) higher. Diversion channel: Non-recording gage. Datum of gage is 1,182.02 ft (360.28 m) National Geodetic Vertical Datum of 1929. Apr. 9, 1955, to Apr. 10, 1956, nonrecording gage at site 4 mi (6 km) downstream at different datum. Apr. 11, 1956, to Sept. 30, 1967, nonrecording gage at same site at datum 3.0 ft (0.9 m) higher.

REMARKS.--Records good except those for winter period, which are fair. Flow regulated by Winnibigoshish Lake (see sta 05201000), Leech Lake (see sta 05206000), Pokegama Lake (see sta 05210500), and Sandy Lake (see sta 05218500). Water diverted at medium and high stages into Aitkin diversion channel 6.5 mi (10.5 km) above station, bypasses station and returns to river 15.5 mi (24.9 km) below station. Diversion began Apr. 2, 1955. These records include flow in diversion channel.

AVERAGE DISCHARGE.--36 years, 2,878 ft^3/s (81.50 m^3/s), 6.37 in/yr (162 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft^3/s (566 m^3/s) May 20, 1950, gage height, 22.49 ft (6.855 m), present datum; minimum, 151 ft^3/s (4.28 m^3/s) Sept. 1, 1961, gage height, 0.60 ft (0.183 m).

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 6,100 ft^3/s (173 m^3/s) May 2, 3; minimum daily, 540 ft^3/s (15.3 m^3/s) Jan. 26-30. River gage: Maximum discharge, 4,280 ft^3/s (121 m^3/s) May 3, gage height, 10.60 ft (3.231 m); minimum daily, 540 ft^3/s (15.3 m^3/s) Jan. 26-30; minimum gage height, 2.91 ft (0.887 m) Jan. 26, 27. Diversion gage: Maximum discharge, 1,850 ft^3/s (52.4 m^3/s) May 3, gage height, 9.37 ft (2.856 m), from graph based on gage readings; no flow on many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1430	1600	1130	1110	570	720	1180	6030	1400	4080	2020	2830
2	1350	1560	1130	1110	570	740	1300	6100	1370	4170	2040	2730
3	1280	1580	1130	1110	580	750	1430	6100	1670	4070	2060	2620
4	1290	1580	1130	1110	580	760	1570	5990	2100	3890	2100	2390
5	1270	1540	1130	1110	580	780	1680	5880	2380	3520	2190	2250
6	1200	1530	1130	1110	580	800	1730	5680	2530	3340	2320	2210
7	1150	1530	1120	1110	580	820	1780	5510	2480	3150	2460	2250
8	1150	1560	1120	1100	580	840	1760	5320	2420	2660	2720	2240
9	1170	1610	1120	1110	580	860	1740	5070	2340	2500	3130	2220
10	1180	1630	1120	1110	580	880	1750	4700	2180	2380	3440	2200
11	1160	1650	1120	1110	580	880	1750	4330	2100	2300	3580	2200
12	1140	1660	1120	1110	580	880	1760	3980	2080	2210	3640	2180
13	1110	1590	1120	1110	590	880	1770	3720	2140	2130	3570	2170
14	1110	1540	1110	1090	590	890	1790	3370	2520	2060	3440	2140
15	1100	1500	1110	1020	600	890	1790	3020	3020	2020	3280	2090
16	1070	1440	1110	920	600	890	1880	2880	3180	2010	3130	2030
17	1060	1390	1110	860	610	890	1970	2500	3150	2120	2940	1860
18	1060	1360	1110	800	620	880	1990	2470	3090	2290	2760	1620
19	1040	1320	1110	740	620	880	2020	2430	2870	2450	2610	1430
20	1040	1290	1110	690	620	870	1980	2320	2630	2390	2510	1340
21	1080	1260	1110	620	630	870	1910	2160	2590	2240	2430	1290
22	1120	1220	1110	580	640	870	1950	2010	2780	2140	2410	1240
23	1170	1200	1110	560	640	870	2270	1860	3040	2120	2400	1220
24	1290	1170	1110	550	660	870	2910	1760	3550	2100	2440	1200
25	1410	1150	1100	550	670	870	3710	1650	3860	2070	2520	1240
26	1500	1140	1100	540	680	870	4490	1630	3960	2060	2710	1340
27	1530	1140	1100	540	690	870	4870	1630	3980	2120	2890	1460
28	1630	1140	1100	540	710	860	5220	1640	3960	2130	2930	1580
29	1650	1140	1100	540	---	900	5640	1650	3870	2070	2970	1680
30	1640	1130	1100	540	---	980	5980	1540	3870	2040	2950	1760
31	1620	---	1100	560	---	1070	---	1460	---	2020	2910	---
TOTAL	39000	42150	34530	26660	17110	26680	73570	106390	83110	78850	85500	57010
MEAN	1258	1405	1114	860	611	861	2452	3432	2770	2544	2758	1900
MAX	1650	1660	1130	1110	710	1070	5980	6100	3980	4170	3640	2830
MIN	1040	1130	1100	540	570	720	1180	1460	1370	2010	2020	1200
CFSM	.21	.23	.18	.14	.10	.14	.40	.56	.45	.41	.45	.31
IN.	.24	.26	.21	.16	.10	.16	.45	.64	.50	.48	.52	.35

CAL YR 1980 TOTAL 547928 MEAN 1497 MAX 4290 MIN 404 CFSM .24 IN 3.32
WTR YR 1981 TOTAL 670560 MEAN 1837 MAX 6100 MIN 540 CFSM .30 IN 4.06

05230500 PINE RIVER RESERVOIR AT CROSS LAKE, MN

LOCATION.--Lat 46°40'09", long 94°06'44", in SW¼NW¼ 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 village of Cross Lake.

DRAINAGE AREA.--562 mi^2 (1,456 km^2).

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 National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to May 3, 1949, nonrecording gage at same site and datum.

REMARKS (Revised).--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 (373.782 m) and 1,234.82 ft (376.373 m) (maximum allowable range) is 118,703 acre-ft (146 hm^3) of which 53,272 acre-ft (65.7 hm^3) is controlled storage between elevations 1,226.32 ft (373.782 m) and 1,230.32 ft (375.002 m) (normal operating range). Contents shown herein are contents above an elevation 1,216.00 ft (340.157 m). Prior to September 1978, published contents as contents above elevation 1,218.67 ft (371.451 m). Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 173,600 acre-ft (214 hm^3) capacity table then in use, July 10, 1916, elevation, 1,234.56 ft (376.294 m); minimum observed, 1,310 acre-ft (1.62 hm^3) below zero of capacity table then in use, Aug. 20, 1918, elevation, 1,217.67 ft (371.146 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 102,930 acre-ft (127 hm^3) Aug. 4, elevation, 1,229.52 ft (374.758 m); minimum, 90,080 acre-ft (111 hm^3) Dec. 3, elevation, 1,228.57 ft (374.468 m).

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1229.20	98570	
Oct. 31	1228.99	95730	-2840
Nov. 30	1228.65	91150	-4580
Dec. 31	1228.65	91150	0
CAL YR 1980			+10510
Jan. 31	1228.71	92360	+1210
Feb. 28	1228.97	95460	+1750
Mar. 31	1229.30	99930	+4470
Apr. 30	1229.46	102100	+2180
May 31	1229.38	101000	-1090
June 30	1229.40	101300	+273
July 31	1229.42	101600	+272
Aug. 31	1229.47	102200	+682
Sept. 30	1229.19	98440	-3810
WTR YR 1981			-1480

05231000 PINE RIVER AT CROSS LAKE DAM, AT CROSS LAKE, MN

LOCATION.--Lat 46°40'09", long 94°06'44", in SW¼NW¼ sec.21, T.137 N., R.27 W., Crow Wing County, Hydrologic Unit 07010105, at dam at outlet of Cross Lake at Village of Cross Lake.

DRAINAGE AREA.--562 mi^2 (1,456 km^2).

PERIOD OF RECORD.--April 1886 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as "below Pine River Reservoir" 1895-1916, 1929, and as "at Pine River Dam, at Cross Lake" 1941-56.

GAGE.--Water-stage recorder, headwater gage, and nonrecording tailwater gage. Datum of gages is 1,216.32 ft (370.734 m) National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Mar. 26, 1886, to May 31, 1929, nonrecording gages on headwater and tail water at same sites and datum. June 1 to Nov. 30, 1929, nonrecording gage in tailwater at datum 1.60 ft (0.49 m) lower. Dec. 1, 1929, to May 2, 1949, nonrecording gage on headwater and Dec. 1, 1929, to August 1949, nonrecording gage on tailwater at present sites and datum.

REMARKS.--Discharge computed principally on basis of modified weir formula, the head being obtained from twice-daily readings on tailwater gage and from headwater recorder. Flow completely regulated by Pine River Reservoir (station 05230500).

COOPERATION.--Computations of daily discharge furnished by Corps of Engineers.

AVERAGE DISCHARGE (unadjusted).--95 years, 216 ft^3/s (6.117 m^3/s), 5.22 in/yr (133 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 2,250 ft^3/s (63.7 m^3/s) in June 1896 (does not include flow bypassing dam through crevasse); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 550 ft^3/s (15.6 m^3/s) July 4-6; minimum daily, 40 ft^3/s (1.13 m^3/s) July 11-13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	100	150	160	100	100	50	100	275	300	315	140	325
2	100	150	160	100	100	50	100	275	300	345	140	325
3	100	150	160	100	100	50	100	275	300	400	140	325
4	100	150	110	100	100	50	146	275	492	550	190	325
5	100	150	100	100	100	50	150	275	300	550	200	325
6	100	188	100	100	100	50	150	275	300	550	200	325
7	100	200	100	100	100	50	150	275	300	300	301	325
8	133	200	100	100	100	50	150	275	300	300	420	325
9	150	200	100	100	100	50	150	275	208	125	420	325
10	150	200	100	100	100	50	150	275	200	100	420	325
11	150	200	100	100	100	50	196	275	200	40	376	325
12	150	200	100	100	100	50	200	188	200	40	250	201
13	150	200	100	100	100	50	200	175	200	40	320	190
14	150	200	100	100	100	50	200	175	276	100	340	190
15	150	200	100	100	100	50	200	175	340	180	230	130
16	150	200	100	100	100	50	200	175	473	180	200	130
17	150	200	100	100	100	50	200	175	500	180	200	75
18	150	200	100	100	100	50	200	175	317	180	113	75
19	150	200	100	100	100	50	200	100	300	180	100	75
20	150	200	100	100	100	50	200	100	204	244	100	75
21	150	200	100	100	52	50	90	100	200	250	100	75
22	150	200	100	100	50	50	80	100	200	158	63	75
23	150	200	100	100	50	50	170	100	450	140	50	75
24	150	200	100	100	50	50	490	100	500	140	50	75
25	150	200	100	100	50	50	200	172	500	140	96	75
26	150	200	100	100	50	50	200	175	500	140	175	75
27	150	165	100	100	50	50	200	175	500	140	175	75
28	150	160	100	100	50	50	263	216	500	140	225	75
29	150	160	100	100	---	50	275	225	500	140	225	75
30	150	160	100	100	---	50	275	298	315	140	225	75
31	150	---	100	100	---	96	---	300	---	140	225	---
TOTAL	4283	5583	3290	3100	2402	1596	5585	6424	10175	6567	6409	5466
MEAN	138	186	106	100	85.8	51.5	186	207	339	212	207	182
MAX	150	200	160	100	100	96	490	300	500	550	420	325
MIN	100	150	100	100	50	50	80	100	200	40	50	75
CFSM	.25	.33	.19	.18	.15	.09	.33	.37	.60	.38	.37	.32
IN.	.28	.37	.22	.21	.16	.11	.37	.43	.67	.43	.42	.36

CAL YR 1980 TOTAL 44239 MEAN 121 MAX 340 MIN 30 CFSM .22 IN 2.93
WTR YR 1981 TOTAL 60880 MEAN 167 MAX 550 MIN 40 CFSM .30 IN 4.03

05244000 CROW WING RIVER AT NIMROD, MN

LOCATION.--Lat 46°38'25", long 94°52'44", in SE¼NW¼ sec.32, T.137 N., R.33 W., Wadena County, Hydrologic Unit 07010106, on right bank 200 ft (61 m) upstream from highway bridge, 0.2 mi (0.3 km) north of Nimrod, and 0.7 mi (1.1 km) upstream from Cat River.

DRAINAGE AREA.--1,010 mi^2 (2,620 km^2), approximately.

PERIOD OF RECORD.--April 1910 to September 1914, July 1930 to September 1981 (discontinued as a continuous-record station; converted to a crest-stage partial-record station). Winter records incomplete prior to 1940.

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 (400.285 m) National Geodetic Vertical datum of 1929 (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 (0.671 m) lower. July 28, 1930, to Nov. 4, 1949, nonrecording gages at same site and datum.

REMARKS.--Records good except those for winter period, which are fair. Flow affected by natural storage in many lakes.

AVERAGE DISCHARGE.--42 years (water years 1940-81), 471 ft^3/s (13.34 m^3/s), 6.33 in/yr (161 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,700 ft^3/s (105 m^3/s) Oct. 10, 1973, gage height, 7.35 ft (2.240 m); maximum gage height, 7.64 ft (2.329 m) Apr. 20, 1950 (backwater from ice); minimum discharge observed, 45 ft^3/s (1.27 m^3/s) Aug. 7, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 675 ft^3/s (19.1 m^3/s) Sept. 7, gage height, 3.76 ft (1.146 m); maximum recorded gage height, 3.97 ft (1.210 m) Jan. 17, Feb. 10, 11 (backwater from ice); minimum discharge, 162 ft^3/s (4.59 m^3/s) Nov. 25, gage height, 2.39 ft (0.728 m), result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	259	342	300	230	205	250	358	342	309	441	546	594
2	257	339	290	230	205	240	358	340	309	392	558	577
3	267	336	280	230	205	240	370	336	341	376	536	554
4	273	336	275	230	205	230	370	340	328	359	590	533
5	275	328	270	230	205	230	358	336	323	334	599	517
6	275	328	270	225	205	230	353	328	323	309	581	524
7	273	331	270	225	205	230	342	322	312	293	601	659
8	273	339	265	225	205	230	336	317	306	279	582	666
9	268	343	265	225	205	230	326	323	294	270	557	594
10	264	339	260	225	205	230	326	316	288	255	545	541
11	267	333	260	220	200	235	320	305	269	324	533	508
12	265	333	255	220	200	235	315	295	265	323	520	489
13	262	336	255	220	200	240	326	290	314	313	503	473
14	271	336	250	220	200	255	336	285	519	372	492	463
15	270	338	250	220	200	270	320	275	594	433	486	446
16	275	338	245	220	200	280	315	270	535	422	468	436
17	295	325	245	215	200	290	315	261	473	407	454	424
18	301	318	245	215	200	290	305	256	405	385	441	416
19	310	358	240	215	200	290	300	240	375	380	417	406
20	315	317	240	215	210	280	295	238	363	392	396	395
21	315	328	240	215	220	260	290	231	358	399	376	394
22	317	315	240	210	230	266	310	227	445	386	374	383
23	334	300	240	210	240	261	320	238	485	389	376	384
24	349	275	240	210	250	261	310	303	539	406	405	376
25	355	243	240	210	260	266	300	337	512	424	537	374
26	356	280	235	210	260	275	305	365	440	402	645	377
27	355	320	235	210	260	275	310	359	386	386	656	375
28	351	340	235	210	260	280	326	346	488	382	636	380
29	346	330	235	210	---	320	331	331	603	368	624	382
30	346	310	235	210	---	348	336	315	525	386	607	379
31	346	---	230	210	---	348	---	299	---	496	588	---
TOTAL	9285	9734	7835	6770	6040	8165	9782	9366	12026	11483	16229	14019
MEAN	300	324	253	218	216	263	326	302	401	370	524	467
MAX	356	358	300	230	260	348	370	365	603	496	656	666
MIN	257	243	230	210	200	230	290	227	265	255	374	374
CFSM	.30	.32	.25	.22	.21	.26	.32	.30	.40	.37	.52	.46
IN.	.34	.36	.29	.25	.22	.30	.36	.34	.44	.42	.60	.52

CAL YR 1980 TOTAL 124652 MEAN 341 MAX 1040 MIN 180 CFSM .34 IN 4.59
WTR YR 1981 TOTAL 120734 MEAN 331 MAX 666 MIN 200 CFSM .33 IN 4.45

NOTE.--No gage-height record Feb. 12 to Mar. 18.

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 bank 90 ft (27 m) upstream from bridge on First Avenue at Long Prairie and 400 ft (122 m) downstream from Venewitz Creek.

DRAINAGE AREA.--432 mi^2 (1,119 km^2).

PERIOD OF RECORD.--October 1971 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,281.74 ft (390.674 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--10 years, 144 ft^3/s (4.078 m^3/s), 4.53 in/yr (115 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,270 ft^3/s (92.6 m^3/s) July 22, 1972, gage height, 9.37 ft (2.856 m); minimum daily, 0.84 ft^3/s (0.02 m^3/s) Jan. 12-18, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 258 ft^3/s (7.31 m^3/s) Apr. 30, gage height, 3.06 ft (0.933 m); maximum gage height, 4.42 ft (1.347 m) Mar. 19 (backwater from ice); minimum daily, 43 ft^3/s (1.22 m^3/s) Jan. 13 to Feb. 14; minimum gage height, 1.42 ft (0.433 m) Dec. 2 (backwater from ice).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	179	119	46	44	43	76	112	230	147	170	106	92
2	171	117	45	44	43	74	109	199	151	155	104	92
3	165	116	45	44	43	74	116	188	166	145	100	91
4	164	111	44	44	43	75	133	182	161	136	96	86
5	160	106	44	44	43	73	138	179	152	127	105	85
6	156	107	44	44	43	72	128	179	140	122	153	85
7	149	106	44	44	43	75	119	159	133	114	129	97
8	142	105	44	44	43	76	114	145	126	111	113	91
9	136	104	44	44	43	75	110	145	125	108	108	89
10	135	100	44	44	43	73	107	140	120	106	105	90
11	132	98	44	44	43	74	106	130	114	107	104	90
12	128	97	44	44	43	101	103	125	112	110	103	87
13	128	98	44	43	43	122	104	118	139	106	100	85
14	129	95	44	43	43	101	110	113	191	110	100	82
15	122	89	44	43	44	103	118	108	210	116	98	81
16	122	88	44	43	49	99	124	107	224	111	95	84
17	133	89	44	43	50	93	116	105	231	110	92	80
18	138	79	44	43	62	80	111	103	233	110	90	77
19	135	70	44	43	74	70	118	103	219	110	88	75
20	138	78	44	43	79	73	122	99	215	109	84	73
21	140	73	44	43	85	69	128	95	200	104	82	72
22	141	73	44	43	92	71	136	96	204	110	80	71
23	151	74	44	43	93	76	158	105	206	108	79	71
24	155	67	44	43	95	79	167	158	230	114	91	70
25	150	51	44	43	99	83	161	188	219	116	98	69
26	149	50	44	43	92	88	150	210	209	104	101	70
27	145	49	44	43	84	87	150	192	204	99	97	70
28	140	51	44	43	80	88	164	181	210	97	90	69
29	134	49	44	43	---	100	199	183	208	96	89	69
30	132	47	44	43	---	111	251	175	191	96	91	69
31	125	---	44	43	---	116	---	152	---	98	91	---
TOTAL	4424	2556	1368	1345	1680	2627	3982	4592	5390	3535	3062	2412
MEAN	143	85.2	44.1	43.4	60.0	84.7	133	148	180	114	98.8	80.4
MAX	179	119	46	44	99	122	251	230	233	170	153	97
MIN	122	47	44	43	43	69	103	95	112	96	79	69
CFSM	.33	.20	.10	.10	.14	.20	.31	.34	.42	.26	.23	.19
IN.	.38	.22	.12	.12	.14	.23	.34	.40	.46	.30	.26	.21

CAL YR 1980 TOTAL 54417 MEAN 149 MAX 811 MIN 44 CFSM .35 IN 4.69
WTR YR 1981 TOTAL 36973 MEAN 101 MAX 251 MIN 43 CFSM .23 IN 3.18

05246500 GULL LAKE NEAR BRAINERD, MN

LOCATION.--Lat 46°24'40", long 94°21'26", in N½ sec.20, T.134 N., R.29 W., Cass County, Hydrologic Unit 07010106, in pool of dam on Gull River, 800 ft (244 m) south of outlet of Gull Lake, 0.2 mi (0.3 km) upstream from Gull Lake Dam, and 8 mi (13 km) northwest of Brainerd.

DRAINAGE AREA.--287 mi^2 (743 km^2).

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 National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to Aug. 10, 1949, nonrecording gage 800 ft (244 m) 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 (362.145 m) adjustment of 1912.

REMARKS (Revised).--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 (363.550 m) and 1,194.75 ft (364.160 m) (maximum allowable range and normal operating range) is 26,008 acre-ft (32.1 hm^3). Contents shown herein are contents above elevation 1,188.00 ft (362.102 m). Prior to September 1978, published contents as contents above elevation 1,188.75 ft (362.331 m). Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 74,800 acre-ft (92.2 hm^3) capacity table then in use, June 30, 1914, elevation, 1,195.05 ft (364.251 m); minimum observed, 22,250 acre-ft (27.4 hm^3) capacity table then in use, Mar. 20, 1924, elevation, 1,190.75 ft (362.941 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 64,370 acre-ft (79.4 hm^3) June 14, elevation, 1,194.20 ft (363.992 m); minimum, 53,310 acre-ft (65.7 hm^3) Jan. 12, elevation, 1,193.34 ft (363.730 m).

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1193.84	59680	
Oct. 31	1193.71	57980	-1690
Nov. 30	1193.55	55910	-2080
Dec. 31	1193.41	54090	-1820
CAL YR 1980			-1690
Jan. 31	1193.34	53310	-777
Feb. 28	1193.48	55000	+1300
Mar. 31	1193.77	58760	+3770
Apr. 30	1194.00	61760	+3000
May 31	1194.00	61760	0
June 30	1194.05	62410	+652
July 31	1193.96	61240	-1170
Aug. 31	1194.02	62020	+783
Sept. 30	1193.85	59800	-2220
WTR YR 1981			-258

05247000 GULL RIVER AT GULL LAKE DAM, NEAR BRAINERD, MN

LOCATION.--Lat 46°24'40", long 94°21'12", in sec.20, T.134 N., R.29 W., Cass County, Hydrologic Unit 07010106, in headwater and tailwater of dam at outlet of Gull Lake, 8 mi (13 km) northwest of Brainerd.

DRAINAGE AREA.--287 mi^2 (743 km^2).

PERIOD OF RECORD.--August 1911 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as "Gull Lake Reservoir" 1929.

GAGE.--Water-stage recorder on headwater and nonrecording gage on tailwater. Datum of gages is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). August 1911 to May 23, 1929, and Dec. 1, 1929, to Aug. 1, 1949, both gages were nonrecording gages at same site and datum in use. May 24 to Nov. 30, 1929, nonrecording gage 500 ft (152 m) downstream at different datum. Aug. 2, 1949, to June 30, 1973, at present sites with datum of gage at 1,188.14 ft (362.145 m) adjustment of 1912.

REMARKS.--Discharge computed at dam on basis of modified weir formulas, the head being obtained from twice-daily readings on tailwater gage and from headwater recorder. Flow completely regulated by Gull Lake (station 05246500).

COOPERATION.--Computations of daily discharge furnished by Corps of Engineers.

AVERAGE DISCHARGE (unadjusted).--70 years, 107 ft^3/s (3.030 m^3/s), 5.06 in/yr (129 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 1,120 ft^3/s (31.7 m^3/s) May 15, 1938; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 410 ft^3/s (11.6 m^3/s) June 4; minimum daily, 14 ft^3/s (0.40 m^3/s) Sept. 5-8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	91	90	90	56	20	20	185	224	250	20	124
2	24	91	75	85	56	20	20	185	224	93	20	126
3	23	91	88	87	56	20	20	185	224	92	20	61
4	23	91	89	85	56	20	20	185	410	93	100	61
5	23	91	90	89	56	20	20	185	216	92	100	14
6	23	91	90	90	56	20	20	185	150	92	100	14
7	23	91	90	87	56	20	20	77	148	90	100	14
8	23	91	90	89	56	20	20	77	148	90	100	14
9	93	91	90	89	56	20	20	77	65	20	100	20
10	90	90	90	89	56	20	20	77	65	20	100	20
11	90	90	90	89	56	20	20	77	65	20	100	20
12	90	90	90	89	56	20	20	32	65	20	100	60
13	90	90	90	56	56	20	20	32	65	20	64	60
14	90	90	90	56	56	20	84	32	66	20	64	60
15	90	90	90	56	56	20	84	32	345	20	64	38
16	90	90	90	56	56	20	84	32	345	90	64	38
17	90	90	90	56	56	20	84	32	345	90	64	20
18	90	90	86	56	56	20	84	32	345	90	20	20
19	90	90	86	56	56	20	84	32	338	90	20	20
20	90	90	89	56	56	20	84	32	118	90	20	20
21	90	90	89	56	20	20	84	21	118	56	20	20
22	90	90	90	56	20	20	84	21	118	56	20	20
23	91	90	90	56	20	20	84	21	182	20	20	20
24	91	90	87	56	20	20	185	21	182	20	20	20
25	91	90	90	56	20	20	185	21	182	20	20	20
26	91	90	90	56	20	20	185	96	182	20	137	20
27	91	90	90	56	20	20	185	150	250	20	187	20
28	91	90	90	56	20	20	185	224	250	20	187	20
29	91	90	90	56	---	20	185	224	250	20	187	20
30	91	90	90	56	---	20	185	224	250	20	187	20
31	91	---	90	56	---	20	---	224	---	20	187	---
TOTAL	2268	2709	2759	2122	1280	620	2395	3030	5935	1774	2512	1024
MEAN	73.2	90.3	89.0	68.5	45.7	20.0	79.8	97.7	198	57.2	81.0	34.1
MAX	93	91	90	90	56	20	185	224	410	250	187	126
MIN	23	90	75	56	20	20	20	21	65	20	20	14
CFSM	.26	.32	.31	.24	.16	.07	.28	.34	.69	.20	.28	.12
IN.	.29	.35	.36	.28	.17	.08	.31	.39	.77	.23	.33	.13

CAL YR 1980 TOTAL 28506 MEAN 77.9 MAX 180 MIN 17 CFSM .27 IN 3.69
WTR YR 1981 TOTAL 28428 MEAN 77.9 MAX 410 MIN 14 CFSM .27 IN 3.68

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 & Light Co., 3.6 mi (5.8 km) above mouth and 4.9 mi (7.9 km) southeast of Pillager.

Drainage Area.--3300 mi²

PERIOD OF RECORD.--October 1968 to current year. Records for August 1924 to September 1968 available in files of the Minnesota district office.

REMARKS.--Records poor. Discharge computed on basis of powerplant records. 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 & Light Co. under general supervision of Geological Survey, in connection with a Federal Power Commission project.

AVERAGE DISCHARGE.--13 years, 1,243 ft^3/s (35.20 m^3/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 16,600 ft^3/s (470 m^3/s) Apr. 12, 13, 1969; minimum daily, 60 ft^3/s (1.70 m^3/s) Aug. 10, 11, 13, 14, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum daily discharge since 1924, 18,300 ft^3/s (518 m^3/s) Apr. 14, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1,420 ft^3/s (40.2 m^3/s) Jun. 19, 20, 21, 24; minimum daily, 283 ft^3/s (8.01 m^3/s) Jan. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	790	634	571	464	349	417	851	1390	1140	1380	1040	1050
2	709	684	338	343	349	390	926	1200	974	1380	1400	846
3	533	875	325	374	349	410	989	1390	1350	1260	1380	865
4	621	791	470	344	349	376	926	1390	1240	839	1250	784
5	760	540	457	387	349	389	959	1140	1390	875	866	705
6	608	506	464	343	349	402	855	1120	1340	840	1290	740
7	740	634	489	344	349	350	787	1020	1030	861	1380	751
8	680	575	486	356	348	429	730	804	786	633	1370	820
9	481	675	423	344	330	395	741	752	763	628	1240	1220
10	650	702	417	343	340	389	716	753	896	655	1060	730
11	644	770	380	343	349	408	685	734	780	649	1270	721
12	433	886	393	336	349	381	685	719	680	437	1000	750
13	434	791	395	343	349	469	865	719	777	419	870	725
14	594	627	363	343	348	434	811	661	1300	575	843	683
15	704	686	379	325	348	425	844	487	1400	684	841	703
16	633	681	387	283	349	425	938	415	1350	648	818	684
17	810	565	483	335	349	755	781	417	1390	770	836	646
18	562	552	373	344	349	946	938	549	1370	939	808	682
19	541	476	387	343	349	945	937	615	1420	658	808	662
20	649	550	381	343	453	700	666	560	1420	528	808	671
21	684	580	343	343	368	621	827	415	1420	695	606	685
22	683	609	343	348	389	621	940	415	1410	862	625	792
23	702	692	343	349	534	649	906	459	1410	1030	650	740
24	740	436	375	349	396	685	883	899	1420	861	743	687
25	684	343	343	349	566	881	939	1010	1390	842	845	641
26	842	412	343	349	431	591	1110	1050	1380	808	1130	686
27	935	410	343	349	517	421	1160	1390	1380	808	1030	565
28	726	560	362	349	386	466	1110	1390	1380	811	954	444
29	828	598	380	349	---	589	1080	1320	1380	811	1070	385
30	670	546	372	349	---	808	886	1390	1380	810	1070	598
31	614	---	350	349	---	818	---	1390	---	818	1140	---
TOTAL	20684	18386	12258	10812	10640	16985	26471	27963	36746	24814	31041	21661
MEAN	667	613	395	349	380	548	882	902	1225	800	1001	722
MAX	935	886	571	464	566	946	1160	1390	1420	1380	1400	1220
MIN	433	343	325	283	330	350	666	415	680	419	606	385

CAL YR 1980 TOTAL 272922 MEAN 746 MAX 2390 MIN 260
WTR YR 1981 TOTAL 258461 MEAN 708 MAX 1420 MIN 283

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN

LOCATION.--Lat 45°51'40", long 94°21'30", in lot 2, sec.20, T.39 N., R.32 W., Morrison County, Hydrologic Unit 07010104, at plant of Minnesota Power & Light Co., 4 mi (6.4 km) northwest of Royalton, 4.5 mi (7.2 km) downstream from Swan River, and at mile 956 (1,538 km) upstream from Ohio River.

DRAINAGE AREA.--11,600 mi^2 (30,000 km^2), approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1924 to current year.

REMARKS.--Records fair. Discharge computed on basis of powerplant records. 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).

COOPERATION.--Records collected by Minnesota Power & Light Co. under general supervision of Geological Survey, in connection with a Federal Power Commission project.

AVERAGE DISCHARGE.--57 years, 4,425 ft^3/s (125.3 m^3/s), 5.18 in/yr (132 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 37,700 ft^3/s (1,070 m^3/s) Apr. 16, 1965; minimum daily, 254 ft^3/s (7.19 m^3/s) Nov. 25, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 10,400 ft^3/s (295 m^3/s) May 2; minimum daily, 1,060 ft^3/s (30.0 m^3/s) Feb. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2570	2940	2420	1870	1200	2020	2820	9980	3960	7950	3920	5210
2	2770	2850	1490	2020	1200	1790	2880	10400	3720	7950	4030	5090
3	2370	3000	1280	1850	1070	1600	3260	10300	3720	7640	4630	4710
4	2430	3170	1500	1890	1200	1840	3350	10300	4230	7230	4710	4550
5	2210	2900	2610	1800	1200	1840	3100	10300	4950	6660	4100	4190
6	2270	2820	2310	2020	1270	1860	3570	10100	5210	6360	4570	3730
7	2340	2900	2180	1720	1300	1770	3350	9640	5270	5700	5470	4310
8	2460	2940	1970	1740	1200	1640	3540	9080	4780	5690	5440	3950
9	2220	2980	2120	1840	1270	1960	3300	8520	4470	4030	5680	3930
10	2100	3020	2150	1740	1270	1790	3450	8520	4450	3810	5680	4200
11	2100	2820	2300	1770	1060	1730	3350	7440	4320	3930	6080	3920
12	2900	3000	2120	1620	1270	1920	3180	7230	3670	4030	6440	3780
13	2650	3020	2160	1720	1300	1750	3370	6660	4250	3290	6330	3460
14	2310	3020	2350	1720	1160	1970	3470	5700	4820	3680	6150	3820
15	2490	3020	2160	1720	1270	1970	3340	5850	6410	3350	5800	3100
16	2400	3020	2140	1650	1200	2120	3530	4180	7320	3480	5330	3520
17	2570	2990	2320	1370	1200	2120	3820	4230	7660	3450	5160	3110
18	2450	2820	2070	1650	1270	2120	3360	4050	7980	3700	4920	3000
19	2270	2820	2040	1500	1390	2120	3870	3770	6870	3740	4270	2930
20	2450	2820	2010	1360	1530	2270	3820	3680	7020	3960	3980	2190
21	2330	2820	2040	1420	1820	2180	3420	3620	6660	3660	3660	2510
22	2440	3000	1700	1330	1690	2070	3840	3340	7060	3700	3430	2320
23	2710	3050	1910	1200	1790	2020	4220	3430	6540	3460	3430	2220
24	2920	2900	1740	1200	1900	2020	4220	3300	7220	4310	3890	2130
25	2610	2310	1850	1200	1900	2270	5500	3830	7740	3980	4000	2080
26	2730	2320	1820	1200	1920	2270	6410	3510	8830	3900	4220	2260
27	3110	2280	1820	1200	2120	2120	7660	3900	8770	3480	5090	2200
28	3330	2470	1920	1200	1940	2120	8430	3910	8540	3630	4710	2130
29	3100	2530	2020	1200	---	2120	8430	3960	8110	3430	5250	2560
30	3250	2500	2060	1200	---	2410	10200	3700	7870	3250	5210	2440
31	3180	---	2020	1130	---	2900	---	4000	---	3520	5210	---
TOTAL	80040	85050	62600	48050	39910	62700	130060	190430	182420	139950	150790	99550
MEAN	2582	2835	2019	1550	1425	2023	4335	6143	6081	4515	4864	3318
MAX	3330	3170	2610	2020	2120	2900	10200	10400	8830	7950	6440	5210
MIN	2100	2280	1280	1130	1060	1600	2820	3300	3670	3250	3430	2080
CFSM	.22	.24	.17	.13	.12	.17	.37	.53	.52	.39	.42	.29
IN.	.26	.27	.20	.15	.13	.20	.42	.61	.59	.45	.48	.32

CAL YR 1980 TOTAL 1150100 MEAN 3142 MAX 14500 MIN 1020 CFSM .27 IN 3.69
WTR YR 1981 TOTAL 1271550 MEAN 3484 MAX 10400 MIN 1060 CFSM .30 IN 4.08

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1963-66, 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: November 1980 to September 1981.
WATER TEMPERATURES: November 1980 to September 1981.

INSTRUMENTATION.--Water-quality minimonitor since November 1980.

REMARKS.--Letter K indicates non-ideal colony count. Letters ND indicate none detected. Phytoplankton data are for both 1980 and 1981 water years.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 819 micromhos July 26, 1981; minimum, 208 micromhos May 13, 1981.
WATER TEMPERATURES: Maximum, 31.0°C July 18, 1981; minimum, 0.0°C several days during winter period.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 819 micromhos July 26; minimum, 208 micromhos May 13.
WATER TEMPERATURES: Maximum, 31.0°C July 18; minimum, 0.0°C several days during winter period.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE, AIR (DEG C) (00020)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)
OCT										
29...	1130	3100	308	302	8.4	4.0	5.0	.50	14.0	113
NOV										
24...	1230	3010	320	306	8.4	-1.0	1.0	.50	14.4	104
DEC										
22...	1200	1720	370	407	7.9	-6.0	.0	.70	11.5	81
JAN										
19...	1500	1610	370	368	7.8	5.5	.5	.90	8.4	61
FEB										
18...	1300	1300	420	391	6.8	12.0	.5	.80	6.4	46
MAR										
18...	1130	2270	310	330	7.9	-1.0	2.0	.80	11.3	85
MAY										
06...	1300	8600	207	216	8.2	17.0	15.0	.80	8.8	90
JUL										
17...	1300	3440	260	254	7.4	29.0	23.0	3.4	4.6	55
SEP										
01...	1800	4950	300	276	7.4	24.0	21.5	3.8	8.0	92

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	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)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
OCT										
29...	27	K7	150	1.0	39	13	5.7	.2	1.7	150
NOV										
24...	K5	K7	140	.00	36	13	6.3	.2	1.6	150
DEC										
22...	K18	K3	170	2.0	44	15	6.8	.2	1.9	170
JAN										
19...	K16	K3	170	.00	43	15	6.7	.2	2.0	180
FEB										
18...	82	K12	180	.00	49	14	7.4	.2	2.2	180
MAR										
18...	K960	32	160	6.0	41	13	6.3	.2	2.5	150
MAY										
06...	28	17	110	11	28	8.5	4.5	.2	1.8	94
JUL										
17...	K13	240	130	10	34	11	5.2	.2	1.2	120
SEP										
01...	50	53	140	4.0	38	12	4.8	.2	1.4	140

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)
OCT										
29...	8.4	4.9	.1	7.8	199	171	1670	.08	.08	.030
NOV										
24...	8.1	4.0	.1	5.2	198	165	1610	.18	.16	.040
DEC										
22...	11	5.1	.1	8.5	208	196	966	.30	.28	.070
JAN										
19...	9.4	4.8	.2	10	225	201	978	.30	.30	.120
FEB										
18...	11	5.5	.1	13	228	213	800	.42	.42	.170
MAR										
18...	9.7	6.5	.1	12	208	183	1280	.37	.37	.050
MAY										
06...	7.5	3.4	.1	5.0	146	116	3390	.10	.10	.040
JUL										
17...	7.2	20	.1	11	177	163	1640	.15	.15	.080
SEP										
01...	2.5	3.5	.1	10	190	157	2540	.17	.17	.030

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	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)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT									
29...	.030	.66	.37	.030	.020	--	3	25	82
NOV									
24...	.040	.40	.40	.020	.010	9.7	4	33	88
DEC									
22...	.070	.53	.53	.020	.010	9.1	1	4.6	100
JAN									
19...	.120	.48	.48	.030	.010	7.1	1	4.3	100
FEB									
18...	.150	.52	.50	.020	.020	--	3	11	69
MAR									
18...	.050	.50	.42	.030	.020	8.1	2	12	100
MAY									
06...	.040	.91	.70	.050	.010	--	8	186	93
JUL									
17...	.070	.77	.66	.070	.040	16	12	111	90
SEP									
01...	.030	.82	.63	.060	.040	--	8	107	90

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA) (01007)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO) (01037)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)
OCT											
29...	1130	1	1	200	50	0	0	30	<10	0	0
FEB											
18...	1300	0	0	100	100	0	0	10	<10	0	0
MAY											
06...	1300	0	0	100	50	--	<1	10	<10	--	1
SEP											
01...	1800	2	2	100	<50	<1	<1	10	10	<1	<1

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
OCT										
29...	6	4	300	40	4	0	50	20	<.1	<.1
FEB										
18...	3	3	310	310	5	0	150	150	.2	.2
MAY										
06...	4	3	540	150	1	0	130	40	<.1	<.1
SEP										
01...	10	9	490	110	6	2	90	10	.5	.5

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)
OCT										
29...	4	0	0	0	0	0	10	0	--	.5
FEB										
18...	9	5	0	0	--	--	50	20	7.5	--
MAY										
06...	5	2	0	0	0	0	40	20	14	.9
SEP										
01...	40	5	<1	<1	<1	<1	20	10	12	.5

DATE	TIME	ALDRIN, TOTAL (UG/L) (39330)	CHLOR-DANE, TOTAL (UG/L) (39350)	DDD, TOTAL (UG/L) (39360)	DDE, TOTAL (UG/L) (39365)	DDT, TOTAL (UG/L) (39370)	DI-AZINON, TOTAL (UG/L) (39570)	DI-ELDRIN TOTAL (UG/L) (39380)	ENDRIN, TOTAL (UG/L) (39390)	ETHION, TOTAL (UG/L) (39398)
OCT										
29...	1130	ND	ND	ND	ND	ND	ND	ND	ND	ND

DATE	HEPTA-CHLOR, TOTAL (UG/L) (39410)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L) (39420)	LINDANE TOTAL (UG/L) (39340)	MALA-THION, TOTAL (UG/L) (39530)	METH-OXY-CHLOR, TOTAL (UG/L) (39480)	METHYL PARA-THION, TOTAL (UG/L) (39600)	METHYL TRI-THION, TOTAL (UG/L) (39790)	PARA-THION, TOTAL (UG/L) (39540)	TOX-APHENE, TOTAL (UG/L) (39400)	TOTAL TRI-THION (UG/L) (39786)
OCT										
29...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

05267000 MISSISSIPPI RIVER NEAR ROYALTON--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1981

DATE	NOV 20,79		DEC 19,79		MAR 18,80		APR 30,80		JUN 24,80	
TIME	1030		1200		1345		1445		1000	
TOTAL CELLS/ML	1400		2100		280		15000		4000	
DIVERSITY: DIVISION	1.3		1.2		0.6		0.8		1.6	
.CLASS	1.4		1.5		0.6		0.8		1.6	
..ORDER	1.9		1.7		1.5		1.4		2.0	
...FAMILY	2.3		2.3		2.3		1.5		2.2	
....GENUS	2.5		2.9		2.9		1.6		2.8	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)										
.CHLOROPHYCEAE										
..CHLOROCOCCALES										
...CHARACIACEAE										
....SCHROEDERIA	--	-	--	-	--	-	--	-	--	-
...COELASTRACEAE										
....COELASTRUM	--	-	240	11	--	-	--	-	--	-
...MICRACTINIACEAE										
....MICRACTINIUM	--	-	--	-	--	-	510	3	--	-
...OOCYSTACEAE										
....ANKISTRODESMUS	26	2	200	9	10	4	310	2	26	1
....CHLORELLA	--	-	--	-	15	5	--	-	--	-
....CHODATELLA	39	3	30	1	--	-	--	-	--	-
....DICTYOSPHAERIUM	--	-	110	5	--	-	--	-	--	-
....GLOEOACTINIUM	--	-	--	-	--	-	--	-	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	210	1	--	-
....OOCYSTIS	52	4	--	-	--	-	--	-	26	1
....SELENASTRUM	--	-	--	-	--	-	--	-	39	1
....TETRAEDRON	--	-	15	1	--	-	--	-	*	0
....TREUBARIA	--	-	--	-	--	-	--	-	--	-
....WESTELLA	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE										
....ACTINASTRUM	--	-	--	-	--	-	--	-	--	-
....CRUCIGENIA	--	-	61	3	--	-	--	-	310	8
....SCENEDESMUS	52	4	30	1	20	7	410	3	280	7
....TETRASTRUM	--	-	61	3	--	-	--	-	52	1
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	13	1	--	-	--	-	310	2	120	3
CHRYSOPHYTA										
.BACILLARIOPHYCEAE										
..CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	52	4	970#	45	91#	33	11000#	71	410	10
....MELOSIRA	13	1	120	6	--	-	--	-	1500#	38
....STEPHANODISCUS	--	-	--	-	--	-	--	-	--	-
..PENNALES										
...DIATOMACEAE										
....DIATOMA	120	8	--	-	--	-	--	-	--	-
...FRAGILARIACEAE										
....ASTERIONELLA	--	-	30	1	15	5	--	-	--	-
....FRAGILARIA	26	2	--	-	45#	16	--	-	--	-
....SYNEDRA	--	-	45	2	40	15	--	-	*	0
...GOMPHONEMATACEAE										
....GOMPHONEMA	--	-	--	-	15	5	--	-	--	-
...NAVICULACEAE										
....NAVICULA	39	3	15	1	20	7	--	-	26	1
...NITZSCHIACEAE										
....NITZSCHIA	78	6	15	1	5	2	1800	12	--	-
.CHRYSOPHYCEAE										
..CHRYSOMONADALES										
...MALLOMONADACEAE										
....MALLOMONAS	--	-	--	-	--	-	--	-	--	-
...OCHROMONADACEAE										
....DINOBRYON	--	-	91	4	--	-	--	-	--	-
....OCHROMONAS	13	1	--	-	--	-	--	-	--	-
CRYPTOPHYTA (CRYPTOMONADS)										
.CRYPTOPHYCEAE										
..CRYPTOMONADALES										
...CRYPTOCHRYSIDACEAE										
....CHROOMONAS	--	-	--	-	--	-	--	-	*	0
...CRYPTOMONADACEAE										
....CRYPTOMONAS	--	-	--	-	--	-	--	-	39	1

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05267000 MISSISSIPPI RIVER NEAR ROYALTON--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1981--Continued

DATE	NOV 20,79		DEC 19,79		MAR 18,80		APR 30,80		JUN 24,80	
TIME	1030		1200		1345		1445		1000	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CYANOPHYTA (BLUE-GREEN ALGAE)										
.CYANOPHYCEAE										
..CHROOCOCCALES										
...CHROOCOCCACEAE										
....AGMENELLUM	--	-	--	-	--	-	--	-	--	-
....ANACYSTIS	90	7	--	-	--	-	820	5	830#	21
....COCCOCHLORIS	--	-	--	-	--	-	--	-	--	-
....GOMPHOSPHAERIA	--	-	--	-	--	-	--	-	--	-
..HORMOGONALES										
...NOSTOCACEAE										
....ANABAENA	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE										
....OSCILLATORIA	780#	56	61	3	--	-	--	-	250	6
....PHORMIDIUM	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
.EUGLENOPHYCEAE										
..EUGLENALES										
...EUGLENACEAE										
....EUGLENA	--	-	--	-	--	-	--	-	*	0
....TRACHELOMONAS	--	-	--	-	--	-	--	-	26	1
PYRRHOPHYTA (FIRE ALGAE)										
.DINOPHYCEAE										
..PERIDINIALES										
...GLENODINIACEAE										
....GLENODINIUM	--	-	45	2	--	-	--	-	--	-

DATE	JUL 30,80		AUG 26,80		SEP 16,80		NOV 24,80	
TIME	1315		1130		1230		1230	
TOTAL CELLS/ML	12000		21000		11000		3100	
DIVERSITY: DIVISION	1.6		1.0		1.2		1.2	
.CLASS	1.6		1.0		1.2		1.2	
..ORDER	2.0		1.1		1.5		2.2	
...FAMILY	2.4		1.2		1.7		2.2	
....GENUS	3.4		2.1		2.2		2.6	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)								
.CHLOROPHYCEAE								
..CHLOROCOCCALES								
...CHARACIACEAE								
....SCHROEDERIA	--	-	--	-	--	-	--	-
...COELASTRACEAE								
....COELASTRUM	--	-	--	-	--	-	--	-
...MICRACTINIACEAE								
....MICRACTINIUM	540	5	400	2	--	-	--	-
...OOCYSTACEAE								
....ANKISTRODESMUS	67	1	230	1	*	0	*	0
....CHLORELLA	--	-	--	-	--	-	--	-
....CHODATELLA	67	1	*	0	*	0	--	-
....DICTYOSPHAERIUM	230	2	--	-	*	0	--	-
....GLOEOACTINIUM	--	-	--	-	--	-	--	-
....KIRCHNERIELLA	--	-	--	-	67	1	--	-
....OOCYSTIS	67	1	*	0	--	-	--	-
....SELENASTRUM	470	4	--	-	84	1	--	-
....TETRAEDRON	--	-	*	0	*	0	--	-
....TREUBARIA	67	1	--	-	--	-	--	-
....WESTELLA	--	-	--	-	--	-	--	-
...SCENEDESMACEAE								
....ACTINASTRUM	--	-	--	-	--	-	--	-
....CRUCIGENIA	400	3	--	-	--	-	--	-
....SCENEDESMUS	1100	9	940	5	540	5	77	2
....TETRASTRUM	--	-	130	1	200	2	51	2
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CHLAMYDOMONAS	230	2	170	1	*	0	26	1

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05267000 MISSISSIPPI RIVER NEAR ROYALTON--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1981--Continued

DATE	JUL 30,80		AUG 26,80		SEP 16,80		NOV 24,80	
TIME	1315		1130		1230		1230	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHRYSOPHYTA								
.BACILLARIOPHYCEAE								
..CENTRALES								
...COSCINODISCACEAE								
....CYCLOTELLA	300	3	440	2	130	1	610#	19
....MELOSIRA	1500	13	1300	6	2100#	19	--	-
....STEPHANODISCUS	--	-	--	-	--	-	120	4
..PENNALES								
...DIATOMACEAE								
....DIATOMA	--	-	--	-	--	-	--	-
...FRAGILARIACEAE								
....ASTERIONELLA	--	-	--	-	67	1	880#	28
....FRAGILARIA	--	-	--	-	--	-	--	-
....SYNEDRA	--	-	--	-	--	-	39	1
...GOMPHONEMATACEAE								
....GOMPHONEMA	--	-	--	-	--	-	--	-
...NAVICULACEAE								
....NAVICULA	--	-	--	-	--	-	--	-
...NITZSCHIACEAE								
....NITZSCHIA	67	1	*	0	*	0	--	-
.CHRYSOPHYCEAE								
..CHRYSOMONADALES								
...MALLOMONADACEAE								
....MALLOMONAS	--	-	--	-	--	-	--	-
...OCHROMONADACEAE								
....DINOBRYON	--	-	--	-	--	-	--	-
....OCHROMONAS	--	-	--	-	--	-	--	-
CRYPTOPHYTA (CRYPTOMONADS)								
.CRYPTOPHYCEAE								
..CRYPTOMONADALES								
...CRYPTOCHRYSIDACEAE								
....CHROOMONAS	170	1	*	0	--	-	--	-
...CRYPTOMONADACEAE								
....CRYPTOMONAS	67	1	270	1	*	0	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)								
.CYANOPHYCEAE								
..CHROOCOCCALES								
...CHROOCOCCACEAE								
....AGMENELLUM	--	-	600	3	270	2	--	-
....ANACYSTIS	3200#	27	12000#	57	6600#	59	310	10
....COCCOCHLORIS	1000	9	4000#	19	250	2	--	-
....GOMPHOSPHAERIA	1400	12	--	-	--	-	150	5
..HORMOGONALES								
...NOSTOCACEAE								
....ANABAENA	740	6	--	-	220	2	--	-
...OSCILLATORIACEAE								
....OSCILLATORIA	--	-	--	-	270	2	850#	27
....PHORMIDIUM	--	-	--	-	130	1	--	-
EUGLENOPHYTA (EUGLENOIDS)								
.EUGLENOPHYCEAE								
..EUGLENALES								
...EUGLENACEAE								
....EUGLENA	--	-	--	-	--	-	--	-
....TRACHELOMONAS	--	-	*	0	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)								
.DINOPHYCEAE								
..PERIDINIALES								
...GLENODINIACEAE								
....GLENODINIUM	100	1	*	0	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05267000 MISSISSIPPI RIVER NEAR ROYALTON--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1981--Continued

DATE	MAR 18,81		MAY 6,81		JUL 17,81		SEP 1,81	
TIME	1130		1300		1300		1800	
TOTAL CELLS/ML	1200		7700		6200		1600	
DIVERSITY: DIVISION	0.8		1.5		1.2		1.0	
.CLASS	0.8		1.5		1.2		1.0	
..ORDER	1.2		2.1		1.6		1.9	
...FAMILY	1.4		2.5		2.3		2.5	
....GENUS	1.4		3.0		2.7		3.1	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)								
.CHLOROPHYCEAE								
..CHLOROCOCCALES								
...CHARACIACEAE								
....SCHROEDERIA	90	7	--	-	--	-	--	-
...COELASTRACEAE								
....COELASTRUM	--	-	--	-	340	5	--	-
...MICRACTINIACEAE								
....MICRACTINIUM	--	-	210	3	320	5	--	-
...OOCYSTACEAE								
....ANKISTRODESMUS	120	10	88	1	--	-	82	5
....CHLORELLA	--	-	--	-	--	-	--	-
....CHODATELLA	--	-	--	-	*	0	--	-
....DICTYOSPHAERIUM	--	-	--	-	120	2	--	-
....GLOEOACTINIUM	--	-	--	-	280	5	140	9
....KIRCHNERIELLA	--	-	--	-	--	-	27	2
....OOCYSTIS	--	-	--	-	52	1	--	-
....SELENASTRUM	--	-	--	-	*	0	--	-
....TETRAEDRON	--	-	--	-	*	0	55	4
....TREUBARIA	--	-	--	-	--	-	--	-
....WESTELLA	--	-	--	-	260	4	--	-
...SCENEDESMACEAE								
....ACTINASTRUM	--	-	470	6	--	-	--	-
....CRUCIGENIA	--	-	--	-	210	3	--	-
....SCENEDESMUS	--	-	180	2	410	7	270#	18
....TETRASTRUM	--	-	--	-	52	1	--	-
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CHLAMYDOMONAS	120	10	*	0	--	-	230	15
CHRYSOPHYTA								
.BACILLARIOPHYCEAE								
..CENTRALES								
...COSCINODISCACEAE								
....CYCLOTELLA	--	-	410	5	150	2	330#	21
....MELOSIRA	--	-	--	-	180	3	180	11
....STEPHANODISCUS	870#	71	1700#	22	--	-	--	-
..PENNALES								
...DIATOMACEAE								
....DIATOMA	--	-	--	-	--	-	27	2
...FRAGILARIACEAE								
....ASTERIONELLA	--	-	1400#	19	--	-	--	-
....FRAGILARIA	--	-	380	5	--	-	27	2
....SYNEDRA	13	1	*	0	--	-	--	-
...GOMPHONEMATACEAE								
....GOMPHONEMA	--	-	--	-	--	-	--	-
...NAVICULACEAE								
....NAVICULA	13	1	59	1	*	0	27	2
...NITZSCHIACEAE								
....NITZSCHIA	--	-	440	6	*	0	160	11
.CHRYSOPHYCEAE								
..CHRYSOMONADALES								
...MALLOMONADACEAE								
....MALLOMONAS	--	-	*	0	--	-	--	-
...OCHROMONADACEAE								
....DINOBRYON	--	-	--	-	--	-	--	-
....OCHROMONAS	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05267000 MISSISSIPPI RIVER NEAR ROYALTON--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1981--Continued

DATE	MAR 18,81		MAY 6,81		JUL 17,81		SEP 1,81	
TIME	1130		1300		1300		1800	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CRYPTOPHYTA (CRYPTOMONADS)								
.CRYPTOPHYCEAE								
..CRYPTOMONADALES								
...CRYPTOCHRYSIDACEAE								
....CHROOMONAS	--	-	59	1	*	0	--	-
...CRYPTOMONADACEAE								
....CRYPTOMONAS	--	-	59	1	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)								
.CYANOPHYCEAE								
..CHROOCOCCALES								
...CHROOCOCCACEAE								
....AGMENELLUM	--	-	--	-	--	-	--	-
....ANACYSTIS	--	-	2100#	27	3200#	51	--	-
....COCCOCHLORIS	--	-	--	-	--	-	--	-
....GOMPHOSPHAERIA	--	-	--	-	--	-	--	-
..HORMOGONALES								
...NOSTOCACEAE								
....ANABAENA	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE								
....OSCILLATORIA	--	-	--	-	570	9	--	-
....PHORMIDIUM	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)								
.EUGLENOPHYCEAE								
..EUGLENALES								
...EUGLENACEAE								
....EUGLENA	--	-	--	-	--	-	--	-
....TRACHELOMONAS	--	-	59	1	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)								
.DINOPHYCEAE								
..PERIDINIALES								
...GLENODINIACEAE								
....GLENODINIUM	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1				---	---	---	---	---	---	344	343	344
2				---	---	---	---	---	---	349	344	347
3				---	---	---	---	---	---	353	349	351
4				301	299	300	---	---	---	354	349	351
5				304	300	302	---	---	---	354	351	352
6				305	302	304	---	---	---	362	353	357
7				304	301	302	---	---	---	362	360	361
8				303	299	301	---	---	---	364	360	362
9				300	298	299	---	---	---	364	358	361
10				300	298	299	---	---	---	360	357	358
11				301	298	300	---	---	---	360	354	357
12				299	297	297	---	---	---	355	354	354
13				297	295	296	---	---	---	357	355	356
14				296	294	295	---	---	---	356	355	355
15				296	294	295	---	---	---	356	354	355
16				297	294	296	---	---	---	355	353	354
17				293	290	292	---	---	---	353	351	352
18				294	290	291	---	---	---	352	350	351
19				296	293	294	---	---	---	352	351	352
20				300	297	299	---	---	---	366	351	357
21				304	302	303	---	---	---	367	364	366
22				311	309	310	343	340	341	365	363	364
23				315	314	314	347	341	345	366	364	365
24				319	318	319	352	347	349	369	365	367
25				---	---	---	352	348	350	371	369	370
26				---	---	---	351	346	348	374	370	372
27				---	---	---	345	342	344	374	373	373
28				---	---	---	348	343	345	375	373	374
29				---	---	---	353	347	350	376	375	375
30				---	---	---	352	346	350	378	376	377
31				---	---	---	346	343	344	380	377	379
MONTH										380	343	360

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	383	380	382	394	385	389	---	---	---	246	223	240
2	386	383	384	390	386	388	---	---	---	239	218	233
3	389	385	386	385	382	383	---	---	---	234	231	233
4	391	388	390	385	384	384	---	---	---	229	226	227
5	394	391	392	385	376	381	---	---	---	224	220	222
6	394	393	394	378	376	377	---	---	---	217	214	216
7	394	390	392	380	377	379	---	---	---	216	214	215
8	390	389	389	379	376	377	---	---	---	216	215	215
9	390	389	390	376	372	374	---	---	---	218	215	217
10	391	389	390	377	373	376	---	---	---	218	216	217
11	394	390	392	379	375	377	---	---	---	221	209	218
12	396	391	393	380	375	378	---	---	---	228	209	221
13	396	395	395	379	377	378	---	---	---	229	208	227
14	401	400	400	382	373	379	334	332	333	232	228	230
15	406	404	405	374	369	372	334	331	332	235	231	233
16	409	408	409	370	363	366	332	331	332	236	231	234
17	417	413	415	365	360	362	335	330	333	236	233	235
18	422	418	420	366	364	365	332	330	331	239	234	237
19	421	419	421	---	---	---	332	328	331	242	238	239
20	421	417	419	---	---	---	329	326	328	244	241	242
21	416	400	410	---	---	---	330	327	328	250	243	246
22	405	400	402	---	---	---	328	326	327	251	249	251
23	402	398	399	---	---	---	327	324	325	253	251	252
24	399	397	398	---	---	---	331	324	328	253	252	252
25	398	396	398	---	---	---	331	328	330	256	252	254
26	396	392	393	---	---	---	333	322	329	257	254	255
27	394	388	391	---	---	---	317	307	313	278	258	264
28	395	390	393	---	---	---	302	294	299	283	277	280
29	---	---	---	---	---	---	289	275	284	287	285	286
30	---	---	---	---	---	---	271	252	262	288	281	286
31	---	---	---	---	---	---	---	---	---	284	282	283
MONTH	422	380	398							288	208	241

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	284	282	283	248	246	247	661	613	637	289	284	287
2	284	280	282	253	246	250	611	557	584	286	283	285
3	286	282	284	253	244	250	549	448	502	285	280	283
4	286	282	284	250	245	247	450	301	350	283	277	280
5	286	279	282	249	235	244	420	350	384	279	276	278
6	289	283	287	236	233	235	426	367	401	280	275	278
7	285	279	281	242	235	238	361	308	324	280	276	278
8	279	277	278	249	242	246	312	292	302	281	276	279
9	281	277	279	251	247	248	350	304	325	280	277	278
10	280	275	277	256	245	251	323	292	310	282	278	280
11	275	264	269	254	250	251	297	285	291	287	278	283
12	268	264	266	252	250	251	293	284	287	291	281	289
13	268	263	265	256	250	253	297	283	289	291	286	289
14	265	260	262	260	254	256	294	282	289	287	285	286
15	259	254	256	262	258	260	290	280	284	286	284	285
16	260	256	258	260	256	258	285	277	281	290	283	285
17	268	258	263	263	257	259	283	269	275	286	282	284
18	269	262	265	270	262	265	269	262	265	285	282	283
19	266	260	264	272	267	269	267	260	263	286	283	284
20	260	252	257	287	271	276	269	263	266	288	286	287
21	253	244	249	288	277	280	269	258	265	290	288	289
22	249	245	247	652	287	447	269	257	262	293	289	291
23	251	246	248	768	667	732	274	246	267	297	293	295
24	253	247	250	771	746	762	277	272	275	299	295	297
25	255	246	251	802	753	775	279	264	275	300	297	298
26	257	250	253	819	803	813	277	263	271	300	298	299
27	259	255	257	815	798	807	282	275	277	303	299	300
28	257	253	255	796	770	784	288	209	282	304	302	303
29	254	249	252	769	741	756	289	286	288	305	304	304
30	250	247	249	739	706	722	292	289	290	305	303	304
31	---	---	---	705	663	684	293	283	289	---	---	---
MONTH	289	244	265	819	233	407	661	209	321	305	275	288

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1				---	---	---	---	---	---	.0	.0	.0
2				---	---	---	---	---	---	.0	.0	.0
3				---	---	---	---	---	---	.0	.0	.0
4				3.5	3.5	3.5	---	---	---	.0	.0	.0
5				4.0	3.5	4.0	---	---	---	.0	.0	.0
6				5.0	4.0	4.5	---	---	---	.0	.0	.0
7				4.5	4.0	4.5	---	---	---	.0	.0	.0
8				4.5	4.0	4.0	---	---	---	.0	.0	.0
9				4.5	4.5	4.5	---	---	---	.0	.0	.0
10				4.5	4.0	4.0	---	---	---	.0	.0	.0
11				4.0	3.5	4.0	---	---	---	.0	.0	.0
12				3.5	3.0	3.0	---	---	---	.0	.0	.0
13				3.0	2.5	2.5	---	---	---	.0	.0	.0
14				2.5	2.0	2.0	---	---	---	.0	.0	.0
15				2.5	1.5	2.0	---	---	---	.0	.0	.0
16				2.5	1.5	2.0	---	---	---	.0	.0	.0
17				2.0	1.0	1.5	---	---	---	.0	.0	.0
18				1.5	1.0	1.5	---	---	---	.0	.0	.0
19				1.5	1.0	1.5	---	---	---	.0	.0	.0
20				1.0	.5	1.0	---	---	---	.0	.0	.0
21				.5	.0	.5	---	---	---	.0	.0	.0
22				1.0	.5	.5	.0	.0	.0	.0	.0	.0
23				1.0	.5	.5	.0	.0	.0	.0	.0	.0
24				.5	.0	.5	.0	.0	.0	.0	.0	.0
25				---	---	---	.0	.0	.0	.0	.0	.0
26				---	---	---	.0	.0	.0	.0	.0	.0
27				---	---	---	.0	.0	.0	.0	.0	.0
28				---	---	---	.0	.0	.0	.0	.0	.0
29				---	---	---	.0	.0	.0	.0	.0	.0
30				---	---	---	.0	.0	.0	.0	.0	.0
31				---	---	---	.0	.0	.0	.0	.0	.0
MONTH										.0	.0	.0

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	.0	.0	.0	.0	.0	.0	---	---	---	13.5	10.5	11.5
2	.0	.0	.0	.0	.0	.0	---	---	---	12.5	11.0	11.5
3	.0	.0	.0	.0	.0	.0	---	---	---	13.5	12.0	13.0
4	.0	.0	.0	.0	.0	.0	---	---	---	13.5	13.0	13.0
5	.0	.0	.0	.0	.0	.0	---	---	---	14.0	12.5	13.0
6	.0	.0	.0	.0	.0	.0	---	---	---	16.0	13.0	14.0
7	.0	.0	.0	.0	.0	.0	---	---	---	15.0	14.0	14.5
8	.0	.0	.0	.0	.0	.0	---	---	---	14.5	14.0	14.5
9	.0	.0	.0	.0	.0	.0	---	---	---	14.5	14.0	14.5
10	.0	.0	.0	.0	.0	.0	---	---	---	14.5	13.5	14.0
11	.0	.0	.0	.0	.0	.0	---	---	---	15.0	13.0	14.0
12	.0	.0	.0	.0	.0	.0	---	---	---	14.5	13.5	14.0
13	.0	.0	.0	.0	.0	.0	9.5	9.0	9.5	17.0	14.5	15.5
14	.0	.0	.0	.5	.0	.0	10.0	8.5	9.0	18.0	15.0	16.0
15	.0	.0	.0	.5	.0	.5	9.0	9.0	9.0	19.0	16.0	17.0
16	.0	.0	.0	.5	.5	.5	9.0	8.5	8.5	18.0	17.0	17.5
17	.0	.0	.0	.5	.5	.5	10.0	9.0	9.5	17.0	16.5	16.5
18	.0	.0	.0	.5	.5	.5	11.0	9.5	10.0	18.0	16.0	17.0
19	.0	.0	.0	---	---	---	11.5	10.5	11.0	21.0	16.5	18.0
20	.0	.0	.0	---	---	---	11.5	10.5	11.0	19.5	17.0	18.0
21	.0	.0	.0	---	---	---	11.0	10.5	10.5	18.5	17.5	18.0
22	.5	.0	.0	---	---	---	10.5	10.0	10.5	19.0	18.5	18.5
23	.0	.0	.0	---	---	---	10.0	8.5	9.0	19.5	19.0	19.0
24	.0	.0	.0	---	---	---	10.5	8.0	9.0	19.5	19.0	19.0
25	.5	.0	.0	---	---	---	9.0	8.5	8.5	19.0	19.0	19.0
26	.5	.0	.0	---	---	---	15.0	9.0	11.5	19.0	18.0	18.5
27	.0	.0	.0	---	---	---	13.5	10.5	11.5	20.0	17.5	18.5
28	.0	.0	.0	---	---	---	12.0	11.0	11.5	19.0	18.5	18.5
29	---	---	---	---	---	---	11.5	10.5	11.0	19.5	18.0	18.5
30	---	---	---	---	---	---	11.5	10.5	11.0	20.0	18.5	19.0
31	---	---	---	---	---	---	---	---	---	19.5	18.5	19.0
MONTH	.5	.0	.0							21.0	10.5	16.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	19.5	19.0	19.0	24.5	23.0	23.5	24.0	22.5	23.0	22.0	21.0	21.0
2	19.5	19.0	19.0	24.5	23.0	23.5	24.5	23.0	23.5	21.0	20.5	20.5
3	20.0	18.5	19.0	27.5	24.0	25.0	26.0	23.5	24.5	21.0	20.0	20.5
4	19.5	19.0	19.0	27.5	24.5	26.0	26.0	24.5	25.5	21.0	20.0	20.5
5	21.5	19.5	20.5	29.5	25.0	27.0	25.5	25.0	25.5	20.5	20.0	20.0
6	22.5	21.0	21.5	28.0	26.5	27.0	25.5	25.0	25.5	20.5	20.0	20.0
7	22.5	21.5	22.0	27.5	26.5	27.0	25.0	24.5	24.5	21.0	20.0	20.5
8	22.5	21.5	22.0	27.5	27.0	27.0	25.5	23.5	24.5	21.5	20.0	21.0
9	22.0	21.5	22.0	29.5	26.5	27.0	24.0	23.5	23.5	21.5	20.5	21.0
10	21.5	20.5	21.0	28.5	26.0	27.0	25.0	23.5	24.0	22.5	21.0	22.0
11	21.5	20.5	21.0	27.5	26.0	26.5	25.5	23.0	24.0	23.5	22.0	23.0
12	22.5	20.5	21.5	29.0	26.5	27.5	26.5	23.5	25.0	22.0	21.5	22.0
13	21.5	21.0	21.5	28.5	27.0	27.5	26.0	24.0	24.5	23.5	22.0	22.5
14	23.0	21.5	22.0	27.5	26.5	26.5	26.5	25.0	25.5	22.0	21.0	21.5
15	23.0	21.0	21.5	26.0	25.5	26.0	26.0	25.0	25.5	21.0	20.0	20.5
16	22.5	21.5	22.0	25.5	24.0	25.0	25.5	24.5	25.0	20.0	19.0	19.5
17	21.5	21.0	21.0	28.5	24.0	26.0	24.5	23.5	24.0	19.5	18.0	18.5
18	21.0	20.5	21.0	31.0	25.5	27.5	24.0	23.0	23.5	18.5	17.0	17.5
19	20.5	19.5	20.0	29.0	26.5	27.5	23.5	23.0	23.5	18.5	17.0	17.5
20	21.0	19.5	20.0	28.0	26.5	27.0	23.5	23.0	23.5	18.0	17.0	17.5
21	20.0	19.0	19.0	26.5	25.0	25.5	23.5	23.0	23.0	17.5	16.5	17.0
22	20.0	19.0	19.5	25.0	24.5	25.0	23.0	22.5	23.0	17.5	17.0	17.0
23	19.0	18.0	18.5	24.5	23.5	24.0	22.5	22.0	22.5	17.0	16.5	16.5
24	19.5	17.5	18.5	24.5	23.0	23.5	22.5	22.0	22.5	16.5	16.0	16.5
25	20.5	17.5	19.5	24.5	23.5	24.0	22.5	22.0	22.5	16.5	15.0	16.0
26	25.0	20.0	22.0	24.5	23.5	23.5	22.0	21.5	22.0	15.5	15.0	15.5
27	23.0	21.0	21.5	23.5	23.0	23.0	22.0	21.0	21.5	15.5	14.0	14.5
28	21.5	21.0	21.0	23.5	22.5	23.0	21.5	20.5	21.0	14.0	13.5	14.0
29	23.0	21.0	22.0	23.0	22.5	22.5	21.0	20.0	20.5	14.0	13.5	13.5
30	24.0	21.5	23.0	23.0	22.5	22.5	22.5	21.0	21.0	13.5	12.0	13.0
31	---	---	---	23.0	22.5	22.5	21.5	21.0	21.5	---	---	---
MONTH	25.0	17.5	20.5	31.0	22.5	25.5	26.5	20.0	23.5	23.5	12.0	18.5

05270500 SAUK RIVER NEAR ST. CLOUD, MN

LOCATION.--Lat 45°33'35", long 94°14'00", in SE¼SW¼ sec.8, T.124 N., R.28 W., Stearns County, Hydrologic Unit 07010203, on right bank 0.5 mi (0.8 km) northwest of Waite Park, 3 mi (4.8 km) west of St. Cloud, and 5 mi (8.0 km) upstream from mouth.

DRAINAGE AREA.--925 mi^2 (2,396 km^2).

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 (discontinued). Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--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 (315.355 m) National Geodetic Vertical Datum of 1929. Prior to Nov. 22, 1934, nonrecording gage on highway bridge 1 mi (1.6 km) downstream at datum 6.77 ft (2.06 m) lower.

REMARKS.--Records good except those for winter period, which are fair. Flow regulated by powerplants and reservoirs above station.

AVERAGE DISCHARGE.--51 years (water years 1910-12, 1931, 1935-81), 276 ft^3/s (7.816 m^3/s), 4.05 in/yr (103 mm/yr); median of yearly mean discharges, 237 ft^3/s (6.71 m^3/s), 3.48 in/yr (88 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,100 ft^3/s (258 m^3/s) Apr. 13, 1965, gage height, 10.68 ft (3.255 m); minimum, 0.3 ft^3/s (0.008 m^3/s) Nov. 25, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 750 ft^3/s (21.2 m^3/s) June 16, gage height, 3.27 ft (0.997 m); minimum, 8.7 ft^3/s (0.25 m^3/s) Dec. 1, gage height, 0.49 ft (0.149 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	422	288	28	92	88	128	264	332	231	545	154	255
2	418	286	41	91	88	136	249	329	250	513	154	231
3	337	287	74	89	88	146	245	346	261	483	167	219
4	321	274	77	88	88	158	250	341	241	459	163	203
5	314	223	90	87	89	172	279	344	231	425	153	188
6	314	221	110	86	89	165	281	332	226	391	182	176
7	314	218	140	86	90	168	285	329	205	354	199	199
8	307	224	150	86	90	163	272	322	203	324	196	198
9	309	225	148	86	90	164	266	311	197	289	210	217
10	313	220	146	86	91	164	268	279	201	254	204	225
11	311	213	144	86	92	169	249	261	184	281	200	219
12	304	213	142	86	92	170	232	248	171	350	190	221
13	273	210	140	86	93	170	269	242	418	422	176	225
14	149	210	138	86	94	173	312	235	656	403	161	218
15	136	208	136	86	95	181	316	233	724	386	143	207
16	141	207	133	86	96	186	308	221	742	380	121	189
17	250	197	130	86	97	188	304	200	712	368	109	165
18	291	58	127	86	98	192	288	193	683	341	104	154
19	290	38	122	86	99	193	266	192	620	313	97	150
20	287	86	133	86	100	189	255	187	601	293	88	132
21	299	37	128	86	101	179	273	179	594	269	80	121
22	299	24	122	86	102	172	301	169	617	249	76	117
23	301	22	118	86	104	167	328	156	608	244	76	115
24	302	22	113	86	107	162	309	158	656	237	78	116
25	300	22	109	87	110	161	296	162	671	222	105	117
26	298	23	106	87	113	165	296	168	649	203	130	176
27	294	23	102	87	117	153	295	166	625	190	190	202
28	294	24	100	88	121	155	290	200	624	179	232	154
29	292	25	98	88	---	227	324	222	621	169	260	121
30	293	26	96	88	---	228	339	230	584	158	263	117
31	291	---	94	88	---	221	---	230	---	152	251	---
TOTAL	9064	4354	3535	2694	2722	5365	8509	7517	14006	9846	4912	5347
MEAN	292	145	114	86.9	97.2	173	284	242	467	318	158	178
MAX	422	288	150	92	121	228	339	346	742	545	263	255
MIN	136	22	28	86	88	128	232	156	171	152	76	115
CFSM	.32	.16	.12	.09	.11	.19	.31	.26	.51	.34	.17	.19
IN.	.36	.18	.14	.11	.11	.22	.34	.30	.56	.40	.20	.22

CAL YR 1980 TOTAL 120995 MEAN 331 MAX 926 MIN 22 CFSM .36 IN 4.87
WTR YR 1981 TOTAL 77871 MEAN 213 MAX 742 MIN 22 CFSM .23 IN 3.13

05274700 ST. FRANCIS RIVER AT SANTIAGO, MN

LOCATION.--Lat 45°32'30", long 93°48'50", in NE¼ sec.10, T.35 N., R.28 W., Sherburne County, Hydrologic Unit 07010203, on right bank 0.2 mi (0.3 km) east of Santiago, and 0.4 mi (0.6 km) upstream from bridge on county road.

DRAINAGE AREA.--87.4 mi^2 (226 km^2).

PERIOD OF RECORD.--June 1965 to September 1970, May 1980 to November 1981 (discontinued).

GAGE.--Water-stage recorder.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--6 years (water years 1966-70, 1981), 33.8 ft^3/s (0.957 m^3/s), 5.25 in/yr (133 mm/yr), 24,490 acre-ft/yr (30.2 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,970 ft^3/s (84.1 m^3/s) Apr. 7, 1969, gage height, 11.42 ft (3.481 m); minimum discharge, 0.10 ft^3/s (0.003 m^3/s) July 10, 1966; minimum gage height, 3.11 ft (0.948 m) Nov. 26, 1967.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 14, 1965, reached a stage of 12.17 ft (3.709 m) present datum, from floodmarks, backwater from ice, discharge, 2,940 ft^3/s (83.3 m^3/s).

EXTREMES FOR CURRENT PERIOD.--May to September 1980: Maximum discharge during period, 69 ft^3/s (1.95 m^3/s) June 8, gage height, 5.08 ft (1.548 m); minimum discharge, 1.9 ft^3/s (0.054 m^3/s) Aug. 15, gage height 3.78 ft (1.152 m); minimum gage height 3.25 ft (0.991 m) July 19.

Water year 1981: Maximum discharge, 190 ft^3/s (5.38 m^3/s) June 15, gage height, 7.03 ft (2.143 m); minimum, 0.30 ft^3/s (0.008 m^3/s) Aug. 22, gage height, 3.22 ft (0.981 m).

October to November 1981: Maximum discharge during period, 63 ft^3/s (1.78 m^3/s) Oct. 20, gage height, 5.21 ft (1.588 m); minimum, 2.3 ft^3/s) (0.065 m^3/s) Oct. 2, gage height, 3.51 ft (1.070 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1								---	16	6.5	5.6	5.3
2								---	60	5.7	5.9	4.6
3								---	58	9.3	5.5	6.6
4								---	42	6.0	7.8	8.4
5								---	30	4.3	6.6	5.6
6								---	42	3.5	6.9	5.7
7								---	55	3.9	8.4	7.0
8								---	65	4.0	12	4.9
9								---	50	3.7	8.4	4.4
10								---	36	3.9	5.8	3.9
11								---	25	4.6	4.8	6.3
12								---	21	4.5	3.9	20
13								---	22	4.1	3.7	26
14								---	30	4.0	2.9	21
15								---	30	3.8	2.1	16
16								---	24	3.8	2.6	12
17								---	20	3.4	4.2	7.9
18								---	16	3.3	4.8	6.0
19								---	16	3.1	7.8	5.9
20								---	14	3.1	8.9	6.4
21								---	15	3.3	9.3	5.7
22								---	11	4.4	8.5	5.7
23								---	8.9	3.7	7.6	6.4
24								---	7.9	3.6	6.5	7.3
25								---	7.3	4.4	5.8	7.4
26								---	6.7	4.0	5.2	7.7
27								---	6.7	4.3	4.9	7.8
28								3.4	7.9	5.9	5.4	6.5
29								4.0	7.4	5.6	5.4	8.6
30								4.4	6.8	5.7	5.2	8.5
31								4.6	---	5.8	4.1	---
TOTAL								---	757.6	139.2	186.5	255.5
MEAN								---	25.3	4.49	6.02	8.52
MAX								---	65	9.3	12	26
MIN								---	6.7	3.1	2.1	3.9
CFSM								---	.29	.05	.07	.10
IN.								---	.32	.06	.08	.11
AC-FT								---	1500	276	370	507

05274700 ST. FRANCIS RIVER AT SANTIAGO, MN--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.3	4.4	5.7	2.7	2.0	3.6	21	38	5.7	38	2.4	3.6
2	6.2	4.6	6.0	2.6	2.0	3.5	18	34	5.6	25	2.7	3.3
3	5.4	4.8	6.2	2.6	2.0	3.4	15	28	5.7	18	2.7	2.7
4	5.8	5.0	6.2	2.5	1.9	3.3	15	25	5.1	15	2.3	2.4
5	5.2	5.7	6.2	2.5	1.9	3.2	14	25	5.0	12	1.9	2.3
6	5.1	5.4	6.1	2.4	1.9	3.1	14	28	4.6	9.5	1.7	2.2
7	4.3	5.5	6.2	2.4	1.9	3.1	16	27	4.0	7.9	1.9	2.1
8	4.7	5.9	6.1	2.4	1.9	3.0	14	26	3.7	6.3	1.7	2.1
9	5.6	6.1	5.7	2.3	1.9	3.9	13	21	3.3	5.4	1.5	2.0
10	6.4	5.7	5.4	2.3	1.9	5.4	12	17	8.2	4.6	1.3	1.5
11	6.1	5.7	5.2	2.3	1.9	5.6	11	14	9.0	8.4	1.3	1.7
12	6.1	5.9	5.2	2.2	1.9	6.0	11	12	5.9	11	1.3	1.5
13	6.4	5.8	5.0	2.2	1.9	6.1	11	11	20	15	1.3	1.4
14	6.3	5.4	4.7	2.2	1.9	6.6	17	10	125	14	1.5	1.8
15	5.1	5.0	4.5	2.2	2.8	6.4	21	9.1	183	13	1.2	1.6
16	5.6	5.4	4.2	2.2	4.0	6.5	22	8.2	178	11	.93	1.5
17	5.6	4.6	4.1	2.1	5.6	5.5	19	7.2	143	10	1.0	1.6
18	6.2	4.9	3.9	2.1	8.5	3.7	16	6.8	109	8.6	.80	1.8
19	5.6	5.9	3.8	2.1	7.6	2.9	19	6.5	80	7.3	.70	1.8
20	5.5	6.2	3.6	2.1	7.0	3.0	32	6.1	62	6.3	.49	1.5
21	5.7	7.7	3.5	2.1	6.3	3.2	34	5.3	49	5.4	.42	1.5
22	5.9	6.8	3.4	2.0	5.6	3.1	37	4.7	45	5.0	.57	1.3
23	6.0	8.3	3.3	2.0	5.2	2.9	51	5.0	46	4.6	.77	1.6
24	5.8	7.9	3.2	2.0	4.7	3.0	65	4.8	62	4.3	1.5	2.0
25	5.7	7.6	3.1	2.0	4.4	3.1	67	4.6	93	4.0	2.5	2.1
26	5.6	7.3	3.0	2.0	4.1	3.7	59	4.5	85	3.5	4.2	2.7
27	6.1	6.6	3.0	2.0	3.9	3.8	51	4.6	66	3.2	5.9	2.6
28	6.5	6.4	2.9	2.0	3.8	4.3	42	5.3	52	2.9	6.8	2.5
29	5.5	6.2	2.8	2.0	---	7.6	39	6.6	48	2.6	6.2	2.5
30	5.0	6.9	2.8	2.0	---	11	40	6.6	53	2.1	5.1	2.3
31	4.4	---	2.7	2.0	---	16	---	6.3	---	2.2	3.9	---
TOTAL	176.7	179.6	137.7	68.5	100.4	149.5	816	418.2	1564.8	286.1	68.48	61.5
MEAN	5.70	5.99	4.44	2.21	3.59	4.82	27.2	13.5	52.2	9.23	2.21	2.05
MAX	7.3	8.3	6.2	2.7	8.5	16	67	38	183	38	6.8	3.6
MIN	4.3	4.4	2.7	2.0	1.9	2.9	11	4.5	3.3	2.1	.42	1.3
CFSM	.07	.07	.05	.03	.04	.06	.31	.15	.60	.11	.03	.02
IN.	.08	.08	.06	.03	.04	.06	.35	.18	.67	.12	.03	.03
AC-FT	350	356	273	136	199	297	1620	829	3100	567	136	122

WTR YR 1981 TOTAL 4027.48 MEAN 11.0 MAX 183 MIN .42 CFSM .13 IN 1.71 AC-FT 7990

05274700 ST. FRANCIS RIVER AT SANTIAGO, MN--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	16										
2	2.4	15										
3	2.8	15										
4	4.3	---										
5	4.9	---										
6	4.6	---										
7	4.4	---										
8	5.6	---										
9	5.1	---										
10	5.1	---										
11	4.8	---										
12	4.6	---										
13	4.9	---										
14	16	---										
15	33	---										
16	47	---										
17	54	---										
18	55	---										
19	58	---										
20	62	---										
21	59	---										
22	50	---										
23	41	---										
24	33	---										
25	27	---										
26	23	---										
27	21	---										
28	19	---										
29	18	---										
30	18	---										
31	17	---										
TOTAL	707.1	---										
MEAN	22.8	---										
MAX	62	---										
MIN	2.4	---										
CFSM	.26	---										
IN.	.30	---										
AC-FT	1400	---										

05274700 ST. FRANCIS RIVER AT SANTIAGO, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1980 to June 1981 (discontinued).

REMARKS.--Letter K indicates non-ideal colony count.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT												
02...	1500	6.7	375	--	7.5	12.0	1.0	7.2	69	26	140	110
DEC												
02...	0950	6.2	340	381	8.0	.0	2.1	10.5	76	18	K86	K13
FEB												
04...	1230	1.9	339	345	7.6	.0	1.5	8.0	56	14	K13	20
APR												
08...	1030	15	320	319	7.8	9.5	5.3	10.0	89	51	36	28
MAY												
01...	1044	38	380	--	--	12.5	--	--	--	--	--	--
JUN												
13-24	--	--	--	232	--	--	15	--	--	--	--	--

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	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, DIS-SOLVED (MG/L AS P) (00666)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)
OCT											
02...	--	228	--	--	--	1.3	.010	.070	.050	5	.09
DEC											
02...	--	251	--	--	--	1.2	.030	.050	.020	--	--
FEB											
04...	--	216	--	--	--	1.7	.050	.080	.010	2	.01
APR											
08...	--	218	--	.33	.010	.34	.040	.090	.040	15	.60
MAY											
01...	--	--	--	--	--	--	--	--	--	5	.51
JUN											
13-24	9.8	198	12	--	--	.64	.110	.140	.100	--	--

05274750 ST. FRANCIS RIVER ABOVE ZIMMERMAN, MN

LOCATION.--Lat 45°28'17", long 93°39'50", in NW¼NE¼ sec.2, T.34 N., R.27 W., Sherburne County, Hydrologic Unit 07010203, in Sherburne National Wildlife Refuge, on right bank 9 mi (14.5 km) southwest of Santiago, 3.5 mi (5.6 km) west and 2 mi (3.2 km) north of Zimmerman.

PERIOD OF RECORD.--May 1980 to current year.

GAGE.--Water-stage recorder.

REMARKS.--Records fair.

EXTREMES FOR CURRENT PERIOD.--May to Sept. 1980: Maximum discharge during period, 87 ft^3/s (2.46 m^3/s) June 13, gage height, 4.65 ft (1.417 m); minimum, 4.2 ft^3/s (0.12 m^3/s) July 27, gage height 3.40 ft (1.036 m).

Water year 1981: Maximum discharge, 235 ft^3/s (6.66 m^3/s) June 20, gage height, 6.48 ft (1.975 m); minimum daily, 7.5 ft^3/s (0.21 m^3/s) Jan. 28 to Feb. 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1								---	28	30	4.8	12
2								---	29	27	5.4	12
3								---	32	24	5.2	12
4								---	41	22	4.8	20
5								---	49	21	4.8	23
6								---	64	18	5.0	24
7								---	78	18	6.4	24
8								---	83	17	10	23
9								---	84	16	9.9	23
10								---	83	13	9.9	20
11								---	83	12	10	19
12								---	83	13	9.9	30
13								---	85	11	11	32
14								---	83	10	12	32
15								---	78	11	11	28
16								---	68	10	10	27
17								---	62	9.3	12	23
18								---	58	8.2	11	22
19								---	54	7.6	14	32
20								---	44	7.6	14	43
21								36	44	7.6	16	48
22								31	42	7.0	16	48
23								26	41	6.4	15	45
24								23	40	5.8	16	42
25								21	39	5.8	16	41
26								21	38	4.9	17	38
27								20	36	4.6	15	37
28								20	36	4.8	13	36
29								21	34	4.7	12	37
30								23	30	4.7	12	38
31								26	---	4.8	12	---
TOTAL								---	1649	366.8	341.1	891
MEAN								---	55.0	11.8	11.0	29.7
MAX								---	85	30	17	48
MIN								---	28	4.6	4.8	12
CFSM								---	.87	.19	.17	.47
IN.								---	.97	.22	.20	.52
AC-FT								---	3270	728	677	1770

05274750 ST. FRANCIS RIVER ABOVE ZIMMERMAN, MN--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	25	13	8.8	7.5	16	21	87	20	110	24	21
2	39	24	12	8.8	7.5	16	19	85	22	112	25	21
3	35	25	12	8.7	7.5	15	19	83	24	104	26	21
4	35	25	12	8.6	7.5	15	18	75	21	96	26	21
5	34	23	12	8.6	7.5	14	17	70	21	90	26	20
6	34	22	12	8.5	7.5	14	16	63	20	86	26	20
7	32	23	11	8.4	7.5	13	15	57	19	73	27	20
8	31	22	11	8.4	7.5	13	14	51	19	61	25	20
9	28	21	11	8.3	7.5	12	15	51	18	50	25	21
10	28	21	11	8.2	7.5	12	15	51	19	40	24	20
11	30	21	11	8.1	7.5	12	16	52	19	38	24	20
12	26	21	11	8.1	7.5	14	16	48	19	40	24	19
13	24	21	11	8.0	7.5	16	17	43	36	42	23	19
14	25	21	10	8.0	7.5	17	17	38	67	43	22	18
15	25	21	10	8.0	7.5	18	17	35	120	43	22	19
16	25	21	10	7.9	8.0	18	18	32	167	43	21	18
17	25	21	10	7.9	9.0	17	20	30	186	41	20	15
18	28	20	10	7.8	11	16	19	28	212	39	19	15
19	28	20	10	7.8	16	14	20	26	230	36	18	14
20	27	20	9.8	7.8	28	13	21	23	230	34	16	14
21	27	19	9.7	7.7	26	12	21	20	227	31	15	13
22	25	18	9.6	7.7	25	11	26	18	223	30	14	12
23	25	18	9.6	7.7	23	11	42	20	209	29	15	10
24	28	18	9.5	7.6	22	11	45	20	201	29	16	9.9
25	28	17	9.4	7.6	21	10	44	20	191	29	17	9.9
26	26	16	9.3	7.6	19	15	45	21	175	28	23	11
27	26	15	9.2	7.6	18	13	44	20	148	26	25	17
28	25	15	9.1	7.5	17	16	46	21	130	25	26	20
29	25	14	9.0	7.5	---	23	60	24	117	23	27	19
30	25	13	9.0	7.5	---	23	80	24	107	22	26	17
31	26	---	8.9	7.5	---	21	---	21	---	22	23	---
TOTAL	883	601	322.1	248.2	355.5	461	803	1257	3217	1515	690	514.8
MEAN	28.5	20.0	10.4	8.01	12.7	14.9	26.8	40.5	107	48.9	22.3	17.2
MAX	39	25	13	8.8	28	23	80	87	230	112	27	21
MIN	24	13	8.9	7.5	7.5	10	14	18	18	22	14	9.9
CFSM	.45	.32	.16	.13	.20	.24	.42	.64	1.69	.77	.35	.27
IN.	.52	.35	.19	.15	.21	.27	.47	.74	1.89	.89	.40	.30
AC-FT	1750	1190	639	492	705	914	1590	2490	6380	3010	1370	1020

WTR YR 1981 TOTAL 10867.6 MEAN 29.8 MAX 230 MIN 7.5 CFSM .47 IN 6.38 AC-FT 21560

NOTE.--No gage-height record Dec. 3 to Mar. 25, Sept. 1-8, 10-14, 18-30.

05274750 ST. FRANCIS RIVER ABOVE ZIMMERMAN, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1980 to August 1981 (discontinued).

REMARKS.--Letter K indicates non-ideal colony count.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT												
02...	0930	38	330	--	8.0	11.5	1.2	8.0	74	43	57	40
DEC												
02...	1440	12	466	452	8.0	1.0	1.4	15.4	112	27	K6	K4
FEB												
04...	1733	7.5	419	418	7.4	.0	2.5	2.8	20	22	K3	22
APR												
08...	1445	14	295	300	7.9	15.0	7.5	9.4	95	46	K4	K8
MAY												
01...	1044	89	270	--	--	13.0	--	--	--	--	--	--
JUN												
13-26	--	--	--	236	--	--	6.1	--	--	63	--	--
JUL												
20...	1253	34	310	--	--	29.0	--	--	--	--	--	--
AUG												
27...	1445	26	320	--	--	20.5	--	--	--	--	--	--

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	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, DIS-SOLVED (MG/L AS P) (00666)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)
OCT											
02...	--	208	--	--	--	.00	.130	.060	.020	9	.92
DEC											
02...	--	278	--	--	--	.09	.010	.040	.010	--	--
FEB											
04...	--	260	--	--	--	.20	.210	.040	<.010	--	--
APR											
08...	--	198	--	<.08	<.010	.08	.210	.100	.020	20	.77
MAY											
01...	--	--	--	--	--	--	--	--	--	30	7.2
JUN											
13-26	5.7	183	18	--	--	.05	.060	.090	.050	--	--
JUL											
20...	--	--	--	--	--	--	--	--	--	5	.47
AUG											
27...	--	--	--	--	--	--	--	--	--	3	.24

05275000 ELK RIVER NEAR BIG LAKE, MN

LOCATION.--Lat 45°20'02", long 93°40'00", in NE¼SW¼ sec.23, T.33 N., R.27 W., Sherburne County, Hydrologic Unit 07010203, on right bank at upstream side of highway bridge, 4 mi (6 km) east of Big Lake and 4 mi (6 km) downstream from St. Francis River.

DRAINAGE AREA.--615 mi^2 (1,593 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1911 to September 1917, April to September 1931, April to November 1932, March to November 1933, March 1934 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 (274.198 m) National Geodetic Vertical Datum of 1929. April 1911 to Sept. 30, 1917, Apr. 1, 1931, to July 26, 1934, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter periods, which are fair.

AVERAGE DISCHARGE.--53 years (water years 1912-17, 1935-81), 256 ft^3/s (7.250 m^3/s), 5.65 in/yr (144 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,360 ft^3/s (208 m^3/s) Apr. 16, 1965, gage height, 10.86 ft (3.310 m); minimum, 3.6 ft^3/s (0.102 m^3/s) July 31, 1934.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 686 ft^3/s (19.4 m^3/s) June 20, gage height, 2.60 ft (0.792 m); minimum, 58 ft^3/s (1.64 m^3/s) Nov. 25, gage height, 0.70 ft (0.213 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	216	163	134	80	78	237	199	350	133	429	141	135
2	209	161	134	79	78	228	209	348	131	384	149	132
3	206	161	134	79	77	210	214	344	141	351	145	125
4	203	161	132	78	76	191	226	346	136	332	138	120
5	202	157	128	78	76	186	226	348	126	311	129	116
6	196	156	125	78	76	176	223	331	120	287	125	112
7	190	154	122	78	76	176	231	308	116	262	129	118
8	185	155	120	78	76	179	224	294	110	240	127	119
9	182	153	118	78	76	150	218	284	107	220	126	114
10	177	152	117	77	76	150	214	267	110	195	121	108
11	170	149	116	77	76	132	213	252	110	224	116	105
12	167	147	115	77	76	127	208	245	108	276	111	100
13	163	147	115	77	76	126	209	228	195	299	109	98
14	162	150	116	77	76	122	219	214	413	287	109	94
15	162	150	116	76	76	120	222	201	540	267	108	95
16	168	147	114	76	79	121	215	191	591	256	103	94
17	175	147	112	76	81	120	217	181	601	242	98	93
18	172	148	108	76	98	118	219	172	613	224	93	91
19	175	150	105	76	123	114	220	165	657	210	89	89
20	174	153	101	76	145	110	216	157	682	195	86	89
21	172	145	98	76	158	108	217	149	674	183	86	88
22	170	142	95	76	170	107	232	139	656	175	86	87
23	172	140	92	78	180	106	286	131	637	167	90	85
24	179	134	89	81	190	107	314	127	651	162	97	87
25	179	110	86	84	200	110	309	127	622	159	117	89
26	176	135	84	84	210	110	309	127	592	154	147	100
27	172	165	82	83	220	110	311	126	561	143	159	103
28	167	165	81	81	233	114	299	134	544	135	156	107
29	165	142	81	80	---	155	300	148	520	130	153	111
30	164	144	80	79	---	191	333	144	478	124	150	110
31	163	---	80	78	---	190	---	138	---	122	142	---
TOTAL	5533	4483	3330	2427	3232	4501	7252	6716	11675	7145	3735	3114
MEAN	178	149	107	78.3	115	145	242	217	389	230	120	104
MAX	216	165	134	84	233	237	333	350	682	429	159	135
MIN	162	110	80	76	76	106	199	126	107	122	86	85
CFSM	.29	.24	.17	.13	.19	.24	.39	.35	.63	.37	.20	.17
IN.	.33	.27	.20	.15	.20	.27	.44	.41	.71	.43	.23	.19

CAL YR 1980 TOTAL 80909 MEAN 221 MAX 909 MIN 49 CFSM .36 IN 4.89
WTR YR 1981 TOTAL 63143 MEAN 173 MAX 682 MIN 76 CFSM .28 IN 3.82

05275000 ELK RIVER NEAR BIG LAKE, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-71, 1975 to current year.

REMARKS.--Suspended-sediment sampled collected once daily when stage exceeds 2.0 ft.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---		---	---	---	---	---		---
2	---	---	---	---		---	---	---	---	---		19.5
3	---	---	---	---		---	11.5	---	---	---		---
4	---	---	---	---		---	---	---	---	---		---
5	---	---	---	---		---	---	---	---	---		---
6	---	---	---	---		---	---	---	---	---		---
7	---	---	---	---		---	---	---	---	---		---
8	---	---	---	---		---	---	---	---	26.0		---
9	12.0	---	---	---		---	---	---	---	---		---
10	---	---	---	---		---	---	---	---	---		---
11	---	---	---	---		1.0	---	---	---	---		---
12	---	---	---	---		---	---	14.0	---	---		---
13	---	---	---	---		---	---	---	---	---		---
14	---	2.5	---	---		---	---	---	22.0	---		---
15	---	---	---	---		---	---	---	19.5	---		---
16	---	---	---	---		---	---	---	18.0	---		---
17	---	---	.5	---		---	---	---	22.0	---		---
18	---	---	---	---		---	---	---	20.0	---		---
19	---	---	---	---		---	---	---	17.0	---		---
20	---	---	---	---		---	---	---	17.0	---		---
21	---	---	---	---		---	---	---	17.0	---		---
22	---	---	---	.0		---	---	---	18.0	---		---
23	---	---	---	---		---	---	---	16.0	---		---
24	---	---	---	---		---	---	---	20.0	---		---
25	---	---	---	---		---	---	---	21.0	---		---
26	---	---	---	---		---	---	---	22.0	---		---
27	---	---	---	---		---	---	---	---	---		---
28	---	---	---	---		---	---	---	21.0	---		---
29	---	---	---	---		---	---	---	23.0	---		---
30	---	---	---	---		---	---	---	21.0	---		---
31	---	---	---	---		---	---	---	---	---		---

05275000 ELK RIVER NEAR BIG LAKE, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	---	---	---	---	---	---	---	---			---	---
2	---	---	---	---	---	---	---	---			---	---
3	---	---	---	---	---	---	---	---			---	---
4	---	---	---	---	---	---	---	---			---	---
5	---	---	---	---	---	---	---	---			---	---
6	---	---	---	---	---	---	---	---			---	---
7	---	---	---	---	---	---	---	---			---	---
8	---	---	---	---	---	---	---	---			---	---
9	9	4.5	---	---	---	---	---	---			---	---
10	---	---	---	---	---	---	---	---			---	---
11	---	---	---	---	---	---	---	---			1	.40
12	---	---	---	---	---	---	---	---			---	---
13	---	---	---	---	---	---	---	---			---	---
14	---	---	1	.40	---	---	---	---			---	---
15	---	---	---	---	---	---	---	---			---	---
16	---	---	---	---	---	---	---	---			---	---
17	---	---	---	---	5	1.5	---	---			---	---
18	---	---	---	---	---	---	---	---			---	---
19	---	---	---	---	---	---	---	---			---	---
20	---	---	---	---	---	---	---	---			---	---
21	---	---	---	---	---	---	---	---			---	---
22	---	---	---	---	---	---	11	2.3			---	---
23	---	---	---	---	---	---	---	---			---	---
24	---	---	---	---	---	---	---	---			---	---
25	---	---	---	---	---	---	---	---			---	---
26	---	---	---	---	---	---	---	---			---	---
27	---	---	---	---	---	---	---	---			---	---
28	---	---	---	---	---	---	---	---			---	---
29	---	---	---	---	---	---	---	---			---	---
30	---	---	---	---	---	---	---	---			---	---
31	---	---	---	---	---	---	---	---			---	---

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1			---	---	---	---	---	---			---	---
2			---	---	---	---	---	---			19	6.5
3			---	---	---	---	---	---			---	---
4			---	---	---	---	---	---			---	---
5			---	---	---	---	---	---			---	---
6			---	---	---	---	---	---			---	---
7			---	---	---	---	---	---			---	---
8			---	---	---	---	21	14			---	---
9			---	---	---	---	---	---			---	---
10			---	---	---	---	---	---			---	---
11			---	---	---	---	---	---			---	---
12			17	11	---	---	---	---			---	---
13			---	---	---	---	---	---			---	---
14			---	---	54	60	---	---			---	---
15			---	---	39	57	---	---			---	---
16			---	---	27	43	---	---			---	---
17			---	---	24	39	---	---			---	---
18			---	---	22	36	---	---			---	---
19			---	---	22	39	---	---			---	---
20			---	---	20	37	---	---			---	---
21			---	---	19	35	---	---			---	---
22			---	---	19	34	---	---			---	---
23			---	---	19	33	---	---			---	---
24			---	---	19	33	---	---			---	---
25			---	---	19	32	---	---			---	---
26			---	---	18	29	---	---			---	---
27			---	---	18	27	---	---			---	---
28			---	---	19	28	---	---			---	---
29			---	---	20	28	---	---			---	---
30			---	---	22	28	---	---			---	---
31			---	---	---	---	---	---			---	---

05278000 MIDDLE FORK CROW RIVER NEAR SPICER, MN

LOCATION.--Lat 45°15'45", long 94°48'10", in NE¼ sec.27, T.121 N., R.33 W., Kandiyohi County, Hydrologic Unit 07010204, on right bank 75 ft (23 m) upstream from highway bridge, 1.5 mi (2.4 km) downstream from Lake Calhoun, 3 mi (4.8 km) downstream from Green Lake, and 6.8 mi (10.9 km) northeast of Spicer.

DRAINAGE AREA.--179 mi^2 (464 km^2), approximately.

PERIOD OF RECORD.--March 1949 to current year.

REVISED RECORDS.--WSP 1508: 1949(M), 1950.

GAGE.--Water-stage recorder and concrete and steel sharp-crested V-notch weir. Datum of gage is 1,147.93 ft (349.889 m) National Geodetic Vertical Datum of 1929 (Kandiyohi County Highway Department bench mark). Prior to July 20, 1950, nonrecording gage at bridge 75 ft (23 m) downstream at same datum.

REMARKS.--Records good except those for winter period, which are fair. Flow affected by natural storage and some regulation from lakes above station.

AVERAGE DISCHARGE.--32 years, 51.7 ft^3/s (1.464 m^3/s), 3.92 in/yr (100 mm/yr); median of yearly mean discharges, 39.0 ft^3/s (1.10 m^3/s), 2.96 in/yr (75 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 408 ft^3/s (11.6 m^3/s) June 29, 1953, gage height, 6.52 ft (1.987 m); maximum gage height, 6.67 ft (2.033 m) June 25, 1957; no flow Mar. 15-24, 1949, Feb. 26 to Mar. 26, 1960, Dec. 8, 1963, Feb. 10-21, 1965, Feb. 19-28, 1968, Jan. 11-30, 1975.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 287 ft^3/s (8.13 m^3/s) Aug. 26, gage height, 4.92 ft (1.500 m); minimum discharge, 14 ft^3/s (0.40 m^3/s) Mar. 28, gage height, 2.52 ft (0.768 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	25	20	17	17	21	28	42	25	134	73	99
2	28	25	20	17	17	21	27	39	28	130	73	92
3	26	26	19	17	17	21	28	44	28	128	73	90
4	25	26	18	17	17	21	27	45	26	126	71	86
5	24	25	18	17	17	20	29	42	26	121	68	83
6	25	25	18	17	17	19	30	39	25	116	69	82
7	28	24	18	17	17	19	33	38	25	112	67	89
8	33	23	18	17	17	19	35	37	25	109	63	89
9	31	25	18	17	17	19	37	37	25	107	62	88
10	30	23	18	17	17	19	38	33	26	104	58	86
11	29	22	18	17	17	19	37	31	25	115	57	85
12	25	22	18	17	17	19	34	29	24	128	55	83
13	22	23	18	17	17	18	38	30	105	137	53	82
14	21	22	18	17	17	18	42	30	165	130	52	79
15	21	22	18	17	17	19	41	31	157	121	50	78
16	23	22	18	17	17	18	41	30	142	116	45	75
17	25	22	18	17	17	18	44	28	130	112	44	72
18	28	22	18	17	18	18	40	26	127	107	43	71
19	27	22	17	17	19	18	38	26	124	102	39	71
20	26	23	17	17	19	18	36	27	124	100	37	68
21	25	22	17	17	20	17	37	27	126	96	33	66
22	24	22	17	17	21	17	43	25	136	92	33	63
23	25	22	17	17	21	18	47	25	138	92	35	61
24	28	21	17	17	21	18	43	26	143	90	40	62
25	28	20	17	17	21	18	38	30	144	88	40	60
26	26	20	17	17	20	18	37	29	142	82	250	62
27	26	20	17	17	20	16	37	26	139	79	242	59
28	25	20	17	17	21	16	39	30	140	77	161	52
29	25	21	17	17	---	22	44	31	143	74	128	45
30	25	21	17	17	---	26	46	30	138	72	116	42
31	26	---	17	17	---	24	---	27	---	72	104	---
TOTAL	809	678	550	527	510	592	1114	990	2771	3269	2334	2220
MEAN	26.1	22.6	17.7	17.0	18.2	19.1	37.1	31.9	92.4	105	75.3	74.0
MAX	33	26	20	17	21	26	47	45	165	137	250	99
MIN	21	20	17	17	17	16	27	25	24	72	33	42
CFSM	.15	.13	.10	.10	.10	.11	.21	.18	.52	.59	.42	.41
IN.	.17	.14	.11	.11	.11	.12	.23	.21	.58	.68	.49	.46

CAL YR 1980 TOTAL 12859 MEAN 35.1 MAX 100 MIN 13 CFSM .20 IN 2.67
WTR YR 1981 TOTAL 16364 MEAN 44.8 MAX 250 MIN 16 CFSM .25 IN 3.40

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 (46 m) downstream from bridge on State Highway 55 and 1 mi (1.6 km) downstream from confluence of North and South Forks.

DRAINAGE AREA.--2,520 mi^2 (6,530 km^2), approximately.

WATER-DISCHARGE RECORDS

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 WSP 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 (272.211 m) National Geodetic Vertical Datum of 1929. Apr. 13 to July 21, 1906, nonrecording gage at Berning Mill 14 mi (22.5 km) downstream at different datum. June 4, 1909, to Sept. 30, 1917, nonrecording gage at site 600 ft (183 m) downstream at different datum. Apr. 23, 1929, to Aug. 21, 1934, nonrecording gage at site 600 ft (183 m) downstream at present datum.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--56 years (water years 1910-17, 1931, 1935-81), 632 ft^3/s (17.90 m^3/s), 3.41 in/yr (87 mm/yr); median of yearly mean discharges, 489 ft^3/s (13.8 m^3/s), 2.64 in/yr (67 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,400 ft^3/s (634 m^3/s) Apr. 16, 1965, gage height, 19.27 ft (5.874 m) from floodmark; minimum, 1.8 ft^3/s (0.051 m^3/s) Nov. 15, 1936, gage height, 1.05 ft (0.320 m), caused by ice jam upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,920 ft^3/s (54.4 m^3/s) Sept. 3, 4, gage height, 5.03 ft (1.533 m); maximum gage height, 5.13 ft (1.564 m) June 22; minimum discharge, 55 ft^3/s (1.56 m^3/s) Dec. 1, gage height, 1.77 ft (0.539 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	227	186	128	98	70	256	430	452	174	1400	733	1830
2	293	186	139	97	70	311	455	450	189	1320	695	1870
3	274	184	109	96	70	307	477	442	185	1240	648	1900
4	238	181	112	96	70	290	498	429	170	1180	602	1900
5	220	181	120	98	70	279	502	420	161	1140	572	1850
6	206	178	126	97	70	245	501	413	152	1070	629	1730
7	198	178	127	96	70	271	534	402	146	998	701	1540
8	187	178	112	95	70	259	530	387	144	930	733	1330
9	180	174	102	93	70	235	500	367	143	857	716	1170
10	171	172	112	92	71	236	466	347	144	779	695	1050
11	160	171	110	91	71	233	443	329	145	756	671	956
12	158	169	108	89	71	254	429	314	142	824	638	867
13	152	169	110	88	71	265	424	298	181	973	601	785
14	152	169	106	87	71	254	429	282	544	1000	561	719
15	150	164	108	87	72	272	431	268	1180	1030	524	660
16	151	162	108	88	78	278	432	255	1520	1090	475	605
17	161	160	107	88	94	253	432	242	1690	1180	425	558
18	158	158	104	87	105	251	415	230	1740	1250	378	519
19	172	142	102	84	115	230	396	221	1750	1280	345	487
20	186	152	100	82	120	227	394	211	1790	1280	316	460
21	191	148	98	79	133	215	390	199	1850	1200	288	448
22	192	158	96	77	152	205	400	184	1880	1090	267	420
23	192	158	96	74	160	199	460	172	1860	977	259	401
24	192	145	96	73	166	194	501	166	1800	901	263	390
25	197	115	98	72	181	189	507	164	1780	901	343	379
26	198	114	102	72	200	187	500	163	1760	903	616	387
27	200	116	103	72	210	187	477	164	1690	875	1030	392
28	201	128	103	72	241	191	453	177	1610	863	1260	387
29	199	142	103	71	---	242	442	184	1550	857	1480	384
30	193	151	101	71	---	308	448	178	1470	840	1650	367
31	191	---	99	70	---	368	---	175	---	788	1750	---
TOTAL	5940	4789	3345	2632	3012	7691	13696	8685	29540	31772	20864	26741
MEAN	192	160	108	84.9	108	248	457	280	985	1025	673	891
MAX	293	186	139	98	241	368	534	452	1880	1400	1750	1900
MIN	150	114	96	70	70	187	390	163	142	756	259	367
CFSM	.08	.06	.04	.03	.04	.10	.18	.11	.39	.41	.27	.35
IN.	.09	.07	.05	.04	.04	.11	.20	.13	.44	.47	.31	.39

CAL YR 1980 TOTAL 144655 MEAN 395 MAX 1940 MIN 96 CFSM .16 IN 2.14
WTR YR 1981 TOTAL 158707 MEAN 435 MAX 1900 MIN 70 CFSM .17 IN 2.34

05280000 CROW RIVER AT ROCKFORD, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1964, 1967, 1969 to September 1981 (discontinued).

REMARKS.--Since August 1975, suspended-sediment samples collected when river stage was at or above 3.5 ft on a daily basis and more frequent during rapidly rising stage.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	22.0	23.0	20.0
2	---	---	---	---	---	---	---	---	---	23.0	23.0	18.0
3	---	---	---	---	---	---	---	---	---	23.0	23.0	19.0
4	---	---	---	---	---	---	---	---	---	23.0	24.0	18.0
5	---	---	---	---	---	---	---	---	---	24.0	25.0	18.0
6	---	---	---	---	---	---	9.0	---	---	24.0	25.0	18.0
7	---	---	---	---	---	---	10.0	---	---	26.0	24.0	20.0
8	---	---	---	---	---	---	11.0	---	---	27.0	23.0	19.0
9	---	---	---	---	---	---	10.0	---	---	24.0	22.0	20.0
10	---	---	---	---	---	---	12.0	---	---	22.0	21.0	20.0
11	---	---	---	---	---	---	---	---	---	23.0	23.0	21.0
12	---	---	---	---	---	---	---	---	---	26.0	22.0	20.0
13	---	---	---	---	---	---	---	---	---	23.0	23.0	21.0
14	---	---	---	---	---	---	---	---	19.0	24.0	24.0	19.0
15	---	---	---	---	---	---	---	---	18.0	22.0	23.0	18.0
16	---	---	.5	---	---	---	---	---	18.0	22.0	22.0	16.0
17	---	---	---	---	---	---	---	---	19.0	23.0	---	14.0
18	---	---	---	---	---	---	---	---	19.0	24.0	---	16.0
19	---	2.5	---	---	---	---	---	---	17.0	24.0	---	---
20	---	---	---	---	.5	---	---	---	18.0	24.0	---	---
21	9.0	---	---	---	---	---	---	---	18.0	24.0	---	---
22	---	---	---	---	---	---	10.0	21.0	18.0	23.0	---	---
23	---	---	---	.5	---	7.0	---	---	18.0	22.0	---	---
24	---	---	---	---	---	---	---	---	19.0	23.0	---	---
25	---	---	---	---	---	---	---	---	18.0	22.0	---	---
26	---	---	---	---	---	---	13.0	---	19.0	22.0	---	---
27	---	---	---	---	---	---	14.0	---	22.0	20.5	20.0	---
28	---	---	---	---	---	---	13.0	22.0	---	19.0	18.5	13.5
29	---	---	---	---	---	---	---	---	22.0	19.0	19.0	---
30	---	---	---	---	---	---	---	---	22.0	20.0	19.0	---
31	---	---	---	---	---	---	---	---	---	22.0	21.0	---
MEAN										23.0		

05280000 CROW RIVER AT ROCKFORD, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	14	4.1	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	14	5.0	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	3	1.0	---	---
21	17	8.9	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	36	7.2	---	---	15	7.9
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	---	---	---	---	---	---	78	333	52	103	74	366
2	---	---	---	---	---	---	76	307	53	99	62	313
3	---	---	---	---	---	---	77	291	56	98	55	282
4	---	---	---	---	---	---	85	303	54	88	55	282
5	---	---	---	---	---	---	85	292	60	93	54	270
6	34	51	---	---	---	---	83	269	69	117	48	224
7	46	75	---	---	---	---	80	243	73	138	45	187
8	60	97	---	---	---	---	81	229	76	150	41	147
9	55	84	---	---	---	---	97	252	70	135	38	123
10	42	59	---	---	---	---	121	286	67	126	45	128
11	---	---	---	---	---	---	99	227	62	112	46	118
12	---	---	---	---	---	---	103	258	60	103	50	116
13	---	---	---	---	---	---	103	305	60	97	54	114
14	---	---	---	---	378	589	110	335	59	89	49	94
15	---	---	---	---	457	1640	117	367	54	76	48	84
16	---	---	---	---	325	1500	119	394	59	76	37	60
17	---	---	---	---	184	945	110	395	---	---	31	46
18	---	---	---	---	163	860	101	381	---	---	39	54
19	---	---	---	---	144	765	93	363	---	---	---	---
20	---	---	---	---	125	681	90	349	---	---	---	---
21	---	---	---	---	106	594	84	305	---	---	---	---
22	28	28	67	32	89	508	78	259	---	---	---	---
23	---	---	---	---	83	467	73	216	---	---	---	---
24	---	---	---	---	80	362	72	197	---	---	---	---
25	---	---	---	---	82	442	84	229	---	---	---	---
26	52	78	---	---	84	447	94	258	---	---	---	---
27	51	73	---	---	84	429	77	184	96	267	---	---
28	49	67	---	---	82	400	70	163	83	277	18	19
29	---	---	---	---	81	381	65	150	83	332	---	---
30	---	---	---	---	80	357	61	138	83	370	---	---
31	---	---	---	---	---	---	55	117	79	373	---	---
TOTAL							---	8395			---	

05283500 MISSISSIPPI RIVER AT ANOKA, MN

LOCATION.--Lat 45°11'30", long 93°23'40", in SE¼NW¼ sec.19, T.120 N., R.22 W., Anoka County, Hydrologic Unit 07010206, at bridge on U.S. Highways 52 and 169 at Anoka, 0.3 mi (0.5 km) upstream from Rum River, and at mile 871.3 (1,402 km) upstream from Ohio River.

DRAINAGE AREA.--17,100 mi^2 (44,300 km^2), approximately.

PERIOD OF RECORD.--Water years 1972 to current year (discontinued).

REMARKS.--Water discharge estimated on the basis of discharge for Rum River near St. Francis (station 05286000) and Mississippi River near Anoka (station 05288500).

COOPERATION.--Samples collected by the Metropolitan Waste Control Commission, St. Paul, MN.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	FLUO-RIDE, TOTAL (MG/L AS F) (00951)
OCT									
14...	1000	--	3860	325	8.2	9.0	10.1	89	.3
DEC									
10...	1020	2800	--	375	7.9	.0	14.1	99	.1
FEB									
13...	1115	2050	--	386	7.9	.0	14.3	101	.2
APR									
06...	1030	--	5920	375	8.3	9.0	12.0	106	.1
JUN									
11...	1430	--	5330	300	8.1	21.0	9.1	105	.2
SEP									
08...	1220	--	7340	440	8.5	18.5	9.5	103	.2

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOV-ERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)
OCT									
14...	1	100	10	80	1	9	3	270	4
DEC									
10...	1	<50	0	50	0	10	10	330	10
FEB									
13...	1	100	0	50	1	11	7	360	8
APR									
06...	0	100	0	70	1	0	4	580	14
JUN									
11...	0	100	10	70	1	7	3	560	10
SEP									
08...	1	100	<10	130	<1	11	7	490	4

DATE	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	CYANIDE TOTAL (MG/L AS CN) (00720)
OCT								
14...	60	<.1	1	3	0	0	10	.00
DEC								
10...	60	<.1	0	7	0	1	40	.00
FEB								
13...	90	<.1	1	6	0	0	20	<.01
APR								
06...	190	<.1	2	9	0	0	10	<.01
JUN								
11...	210	<.1	1	6	0	0	20	<.01
SEP								
08...	100	<.1	5	3	1	<1	40	<.01

05283500 MISSISSIPPI RIVER AT ANOKA, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	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)
SEP 08...	1220	7340	440	8.5	18.5	9.5	103	.2	1	100	<10	60

DATE	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	CHRO-MIUM, HEXA-VALENT, DIS. (UG/L AS CR) (01032)	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)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	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)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
SEP 08...	<1	<1	<1	3	20	4	10	<.1	1	1	<1	<10

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT) (80030)
OCT 01...	1030	4710	355	8.0	15.0	10.0	101	<3.9

DATE	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	GROSS ALPHA, DIS-SOLVED (PCI/L AS U-NAT) (01515)	GROSS ALPHA, SUSP. TOTAL (PCI/L AS U-NAT) (01516)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	URANIUM NATURAL DIS-SOLVED (UG/L AS U) (22703)
OCT 01...	.8	<2.7	.5	5.4	.9	5.1	.9	.7

05284000 MILLE LACS LAKE AT GARRISON, MN

LOCATION.--Lat 46°18'05", long 93°49'05", in SW¼SE¼ sec.12, T.44 N., R.28 W., Crow Wing County, Hydrologic Unit 07010207, at pumphouse of Minnesota Division of Game and Fish, 0.2 mi (0.3 km) southwest of Borden Lake outlet and 0.8 mi (1.3 km) northeast of Garrison.

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). Prior to October 1939, published as "at Wealthwood."

GAGE.--Water-stage recorder. Datum of gage is 1,240.40 ft (378.074 m) National Geodetic Vertical Datum of 1929. Gage readings have been reduced to elevations NGVD. Prior to Oct. 1, 1941, nonrecording gage at Wealthwood, 8.3 mi (13.4 km) northeast of present site, at various datums; gage readings have been reduced to elevations, adjustment of 1912. October 1, 1941, to Sept. 30, 1958, water-stage recorder at datum 1,240.50 ft (378.104 m) adjustment of 1912. To convert these records to National Geodetic Vertical Datum of 1929, subtract 0.10 ft (0.030 m).

REMARKS.--Water level affected by fixed-crest spillway constructed in 1953 at outlet of Ogechie Lake, 2.7 mi (4.3 km) downstream from outlet of Mille Lacs Lake, with crest at elevation 1,250.50 ft (381.152 m). 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 (382.180 m) Aug. 14, 1972, affected by wind action and seiche action; maximum daily, 1,253.43 ft (382.045 m) Aug. 22, 1972; minimum observed, 1,245.74 ft (379.702 m) Oct. 16-19, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,252.01 ft (381.613 m) July 11, affected by wind action and seiche action; maximum daily, 1,251.62 ft (381.494 m) July 14; minimum, 1,250.41 ft (381.125 m) Sept. 27, affected by wind action and seiche action; minimum daily, 1,250.57 ft (381.174 m) Dec. 1.

MONTHEND ELEVATION, IN FEET NGVD, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

Oct. 31	1250.70	Feb. 28	1250.76	June 30	1251.60
Nov. 30	1250.65	Mar. 31	1250.85	July 31	1251.38
Dec. 19	1250.63	Apr. 30	1251.10	Aug. 31	1251.34
Jan. 13	1250.62	May 31	1251.12	Sept.30	1251.00

NOTE.--Elevations other than those shown are available.

05286000 RUM RIVER NEAR ST. FRANCIS, MN

LOCATION--Lat 45°19'40", long 93°22'20", in SE¼ sec.19, T.33 N., R.24 W., Anoka County, Hydrologic Unit 07010207, on left bank at upstream side of highway bridge, 4 mi (6.4 km) south of St. Francis and 15.8 mi (25.4 km) upstream from mouth.

DRAINAGE AREA.--1,360 mi^2 (3,520 km^2), 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 (262.354 m) National Geodetic Vertical Datum of 1929 (levels by Anoka County Highway Department). Prior to Nov. 9, 1933, nonrecording gage at site 50 ft (15 m) downstream at same datum.

REMARKS.--Records good except those for winter period, which are fair. Occasional regulation by Ogechie (also controls Mille Lacs Lake) and Onamia Lakes.

AVERAGE DISCHARGE.--49 years (water years 1931, 1934-81), 592 ft^3/s (16.77 m^3/s), 5.91 in/yr (150 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 10,100 ft^3/s (286 m^3/s) Apr. 20, 1965, Apr. 13, 1969; maximum gage height, 11.63 ft (3.545 m) Apr. 13, 1969; minimum discharge, 29 ft^3/s (0.82 m^3/s) Aug. 18, 1934, gage height, 1.91 ft (0.582 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,090 ft^3/s (59.2 m^3/s) June 20, gage height, 5.14 ft (1.567 m); minimum, 93 ft^3/s (2.63 m^3/s) Dec. 2, gage height, 2.06 ft (0.628 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	388	295	185	130	108	223	552	1120	397	1420	368	391
2	401	287	154	130	106	271	622	1080	400	1270	382	358
3	410	284	212	130	104	297	637	1060	392	1180	375	328
4	413	283	215	127	102	292	673	1060	383	1150	369	304
5	408	277	221	125	100	271	662	1020	371	1090	369	292
6	400	277	213	123	100	258	655	980	398	997	368	273
7	385	275	195	120	100	268	686	964	470	899	420	260
8	369	270	188	118	100	271	698	993	476	793	439	260
9	347	267	185	116	100	242	677	1020	448	706	465	251
10	320	261	180	114	100	223	656	975	419	636	493	244
11	316	258	170	112	100	250	619	895	385	596	485	240
12	301	250	165	110	100	238	578	818	365	564	449	233
13	288	252	163	110	100	230	550	759	432	559	425	224
14	284	267	160	110	103	228	567	706	842	549	412	217
15	279	297	160	110	106	249	573	655	1440	553	382	210
16	283	279	160	110	108	244	573	610	1800	543	352	204
17	294	271	160	110	112	269	588	567	1890	531	328	198
18	331	259	160	110	114	264	589	532	1950	544	311	195
19	333	247	158	110	117	266	582	507	2010	529	296	196
20	326	242	148	110	120	256	585	479	2070	507	278	195
21	333	242	142	110	123	249	588	452	2090	483	262	192
22	334	230	140	110	130	238	596	431	1970	457	253	186
23	341	240	140	110	136	234	699	420	1750	434	251	184
24	341	229	140	110	166	233	846	411	1580	495	260	184
25	336	195	130	110	241	236	960	400	1490	569	281	187
26	327	200	130	110	250	236	1090	389	1470	500	337	198
27	320	205	130	110	185	233	1210	383	1490	442	376	205
28	320	216	130	110	209	232	1250	386	1520	417	395	203
29	322	220	130	110	---	286	1230	389	1560	401	425	200
30	312	220	130	110	---	389	1180	399	1550	381	431	213
31	302	---	130	110	---	477	---	398	---	365	414	---
TOTAL	10464	7595	5024	3545	3540	8153	21971	21258	33808	20560	11451	7025
MEAN	338	253	162	114	126	263	732	686	1127	663	369	234
MAX	413	297	221	130	250	477	1250	1120	2090	1420	493	391
MIN	279	195	130	110	100	223	550	383	365	365	251	184
CFSM	.25	.19	.12	.08	.09	.19	.54	.50	.83	.49	.27	.17
IN.	.29	.21	.14	.10	.10	.22	.60	.58	.92	.56	.31	.19
AC-FT	20760	15060	9970	7030	7020	16170	43580	42170	67060	40780	22710	13930

CAL YR 1980	TOTAL	160259	MEAN 438	MAX	2170	MIN 130	CFSM .32	IN 4.38	AC-FT	317900		
WTR YR 1981	TOTAL	154394	MEAN 423	MAX	2090	MIN 100	CFSM .31	IN 4.22	AC-FT	306200		

05287890 ELM CREEK NEAR CHAMPLIN, MN

LOCATION.--Lat 45°09'48", long 93°26'11", in NE¼NW¼ sec.35, T.120 N., R.22 W., Hennepin County, Hydrologic Unit 07010206, on left bank, 33 ft (10 m) downstream from bridge on Elm Creek Road, 2.5 mi (4.0 km) southwest of Champlin.

DRAINAGE AREA.--84.9 mi^2 (220 km^2).

PERIOD OF RECORD.--October 1978 to current year.

GAGE.--Water-stage recorder. Datum of gage is 850.71 ft (259.296 m) National Geodetic Vertical Datum of 1929. Prior to March 15, 1979, nonrecording gage at present site and datum.

REMARKS.--Records good except those for winter period, which are fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 307 ft^3/s (8.69 m^3/s) Apr. 4, 1979, gage height, 8.36 ft (2.548 m); minimum, 2.1 ft^3/s (0.059 m^3/s) Feb. 24, 1980, gage height, 2.86 ft (0.872 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 44 ft^3/s (1.25 m^3/s) June 15, gage height, 4.40 ft (1.341 m); minimum daily, 2.2 ft^3/s (0.062 m^3/s) Jan. 3-21; minimum gage height, 2.90 ft (0.884 m) Feb. 19, Aug. 20-22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	5.5	3.0	2.4	2.5	7.6	19	32	6.4	19	5.5	5.0
2	15	5.3	2.9	2.3	2.5	8.9	18	29	6.3	17	5.9	4.7
3	14	5.2	2.9	2.2	2.5	7.9	18	29	6.6	17	5.4	4.2
4	14	5.1	2.9	2.2	2.5	4.6	29	28	6.0	17	5.1	4.2
5	13	4.9	3.0	2.2	2.6	4.1	35	27	5.6	15	4.7	3.9
6	12	4.8	3.1	2.2	2.6	4.0	38	26	5.2	13	4.6	3.4
7	12	4.7	3.2	2.2	2.6	3.7	39	24	4.7	13	4.8	3.9
8	11	4.8	3.3	2.2	2.6	3.4	39	23	4.6	12	4.5	3.7
9	11	4.8	3.3	2.2	2.7	3.5	37	22	4.6	11	4.3	3.3
10	10	4.6	3.3	2.2	2.7	3.6	37	21	4.6	9.8	4.0	3.3
11	9.6	4.3	3.3	2.2	2.7	3.5	36	20	4.4	13	3.8	3.2
12	8.9	4.3	3.3	2.2	2.8	3.7	36	18	4.5	14	3.7	2.9
13	8.5	4.3	3.3	2.2	2.8	4.0	35	17	6.7	13	3.5	2.8
14	8.1	4.2	3.2	2.2	2.9	3.8	36	16	22	12	3.4	2.7
15	7.9	3.9	2.9	2.2	2.9	3.7	34	15	44	13	3.6	2.6
16	7.6	4.1	2.9	2.2	3.0	3.5	32	14	41	12	3.4	2.4
17	7.6	4.0	2.9	2.2	3.2	3.3	31	13	37	11	3.2	2.3
18	7.9	3.7	2.9	2.2	3.5	3.2	28	12	36	9.9	3.1	2.4
19	7.3	3.8	2.9	2.2	3.4	3.2	27	11	36	9.0	2.9	2.5
20	7.0	3.9	2.9	2.2	3.6	3.2	25	10	37	8.3	2.8	2.5
21	6.8	3.8	2.9	2.2	3.6	3.1	24	9.5	37	7.7	2.7	2.4
22	6.3	3.9	2.9	2.3	4.2	3.2	27	8.9	37	7.4	2.7	2.5
23	6.4	3.7	2.9	2.3	3.9	3.2	36	8.6	35	7.3	2.9	2.6
24	7.1	3.2	2.9	2.4	3.3	3.4	38	8.3	34	7.7	2.9	3.0
25	6.5	3.0	2.9	2.5	3.0	3.3	36	7.9	30	8.4	3.5	3.0
26	6.5	3.0	2.8	2.5	3.0	3.3	35	7.9	27	7.1	5.3	3.7
27	6.2	3.0	2.7	2.5	5.9	3.7	34	8.3	24	6.4	6.6	3.9
28	6.2	3.0	2.6	2.5	7.8	5.0	33	8.0	23	5.9	6.2	3.0
29	5.8	3.0	2.5	2.5	---	8.3	33	8.6	23	5.7	5.5	2.9
30	6.0	3.0	2.4	2.5	---	26	33	7.6	21	5.6	5.3	3.1
31	5.8	---	2.4	2.5	---	22	---	7.0	---	5.4	5.4	---
TOTAL	278.0	122.8	91.3	71.0	91.3	170.9	958	497.6	614.2	333.6	131.2	96.0
MEAN	8.97	4.09	2.95	2.29	3.26	5.51	31.9	16.1	20.5	10.8	4.23	3.20
MAX	16	5.5	3.3	2.5	7.8	26	39	32	44	19	6.6	5.0
MIN	5.8	3.0	2.4	2.2	2.5	3.1	18	7.0	4.4	5.4	2.7	2.3
CFSM	.11	.05	.04	.03	.04	.07	.38	.19	.24	.13	.05	.04
IN.	.12	.05	.04	.03	.04	.07	.42	.22	.27	.15	.06	.04

CAL YR 1980 TOTAL 6633.6 MEAN 18.1 MAX 179 MIN 2.2 CFSM .21 IN 2.91
WTR YR 1981 TOTAL 3455.9 MEAN 9.47 MAX 44 MIN 2.2 CFSM .11 IN 1.51

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 (0.6 km) downstream from Coon Creek, 1.3 mi (2.1 km) downstream from Coon Rapids dam at Coon Rapids, 6.5 mi (10.5 km) downstream from Anoka, and at mile 864.8 (1,391.5 km) upstream from Ohio River.

DRAINAGE AREA.--19,100 mi^2 (49,500 km^2), approximately.

WATER-DISCHARGE RECORDS

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 (245.221 m) National Geodetic Vertical Datum of 1929. Prior to June 14, 1932, at site 1.2 mi (1.9 km) upstream at different datum.

REMARKS.--Records good. Flow slightly regulated by six reservoirs on headwaters; total usable capacity 1,640,600 acre-ft (2.02 km^3). Diurnal regulation caused by dam above station.

AVERAGE DISCHARGE.--50 years, 7,517 ft^3/s (212.9 m^3/s), 5.34 in/yr (136 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 91,000 ft^3/s (2,580 m^3/s) Apr. 17, 1965, gage height, 19.53 ft (5.953 m); minimum, 529 ft^3/s (15.0 m^3/s) Aug. 29, 1976, gage height, 0.04 ft (0.012 m), result of regulation.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 14,600 ft^3/s (413 m^3/s) June 29, gage height, 5.75 ft (1.753 m); minimum daily discharge, 1,450 ft^3/s (41.1 m^3/s) Feb. 2; minimum gage height, 1.29 ft (0.393 m) Jan. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5260	4980	3790	3420	2200	3800	5390	12500	5350	12600	5730	8030
2	4980	4970	2870	3010	1450	3650	5430	11900	6130	12200	5940	8200
3	5370	4730	2710	3050	1740	3540	5470	12500	5820	11600	6160	7930
4	4720	4710	3440	2250	2330	3390	6540	13000	5750	11700	6720	7790
5	4780	4810	3690	2720	2270	3020	6700	13000	5360	10900	6470	7800
6	4520	4850	3500	3040	2400	3100	6580	12300	6430	9880	6340	7470
7	4130	4810	3960	3060	2720	3110	6450	12000	7160	9950	6510	7170
8	4100	4530	3290	3120	2390	3440	6870	11500	6550	8580	7220	6690
9	4360	4550	3310	3140	2240	3430	6440	10900	6920	8350	7000	6290
10	4220	4710	3110	2380	2550	3340	6660	10700	6160	7500	7520	5980
11	3640	4530	2320	2430	1470	3190	6110	10200	5890	7310	8050	6560
12	3670	4400	2960	2860	2330	3390	6350	9420	5500	7360	7820	6220
13	3880	4720	3970	2880	2280	3150	5580	9170	5810	7790	7920	5580
14	4290	4760	3550	2970	2370	3620	6160	8700	8890	7270	7710	5460
15	4060	5060	3620	2660	2890	3350	6290	7970	10400	7130	7680	6000
16	4230	4410	3850	2360	2720	3520	5580	7510	12800	7300	6860	5050
17	3850	4480	3870	3000	2280	3590	5260	7030	13500	7130	6490	5000
18	3850	4980	3300	2560	2350	3630	6710	6340	13500	7150	6660	5100
19	4830	4300	1980	2630	2330	3560	6230	6100	13800	7110	6490	4670
20	4370	4190	1780	2690	2450	3540	6690	5740	12800	6870	6110	4340
21	4310	4290	2150	2790	2770	3440	6240	5630	13000	7250	5100	4060
22	4380	4100	3330	2340	3000	3540	6460	5450	13000	6870	5430	3810
23	4210	4080	3070	2760	3230	3590	6980	5110	13000	6830	5080	3590
24	4510	4630	3150	2410	3080	3450	7810	4970	12800	6320	5090	3210
25	4800	4300	2410	2110	3250	3280	7380	5260	13100	6570	5410	3480
26	4830	3640	2740	2100	3490	3420	8920	5420	13600	6740	6230	3350
27	5020	3170	3080	2240	3430	3890	9500	5270	14100	6540	6790	3810
28	5110	3490	3130	2190	3640	3590	10400	5800	13900	6400	7220	3670
29	5310	3820	3340	2130	---	3730	11500	6030	13900	6080	7390	3640
30	5340	3600	3160	2080	---	4260	11300	5760	13200	5790	7850	3570
31	4840	---	3670	2300	---	4580	---	5750	---	5780	7890	---
TOTAL	139770	132600	98100	81680	71650	109130	209980	258930	298120	246850	206880	163520
MEAN	4509	4420	3165	2635	2559	3520	6999	8353	9937	7963	6674	5451
MAX	5370	5060	3970	3420	3640	4580	11500	13000	14100	12600	8050	8200
MIN	3640	3170	1780	2080	1450	3020	5260	4970	5350	5780	5080	3210
CFSM	.24	.23	.17	.14	.13	.18	.37	.44	.52	.42	.35	.29
IN.	.27	.26	.19	.16	.14	.21	.41	.50	.58	.48	.40	.32

CAL YR 1980 TOTAL 2020950 MEAN 5522 MAX 19400 MIN 1780 CFSM .29 IN 3.94
WTR YR 1981 TOTAL 2017210 MEAN 5527 MAX 14100 MIN 1450 CFSM .29 IN 3.93

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN--Continued

WATER-QUALITY RECORDS

LOCATION.--Sediment samples collected at Camden Avenue bridge, in Minneapolis, 7.0 mi (11 km) downstream from gage. Tritium samples collected at gage near right bank. Prior to October 1, 1978, sediment samples collected at Lowry Avenue bridge.

DRAINAGE AREA.--19,600 mi^2 (50,800 km^2), approximately.

PERIOD OF RECORD.--Water years 1963-67, 1975 to current year.

PERIOD OF RECORD.--
WATER TEMPERATURES: October 1975 to current year.
SUSPENDED SEDIMENT DISCHARGE: August 1975 to current year.

REMARKS.--During the winter period, daily suspended-sediment load was estimated on the basis of water records and monthly sediment samples. Water temperature was obtained once-daily for most of the open water period and monthly for winter period.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 128 mg/L Apr. 24, 1979; minimum daily mean, 1 mg/L on several days in 1978, 1980, and 1981.
SEDIMENT LOADS: Maximum daily, 17,100 tons (15,500 tonnes) Apr. 24, 1979; minimum daily, 3.9 tons (3.5 tonnes) Feb. 2, 1981.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: Maximum daily mean, 78 mg/L June 17; minimum daily mean, 1 mg/L many days.
SEDIMENT LOADS: Maximum daily, 2,840 tons (2,580 tonnes) June 17; minimum daily, 3.9 tons (3.5 tonnes) Feb. 2.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	TRITIUM IN WATER MOLECULES (TU) (07012)	TRITIUM WATER MOLECULES COUNT ERROR (TU) (07013)	DATE	TIME	TRITIUM IN WATER MOLECULES (TU) (07012)	TRITIUM WATER MOLECULES COUNT ERROR (TU) (07013)	DATE	TIME	TRITIUM IN WATER MOLECULES (TU) (07012)	TRITIUM WATER MOLECULES COUNT ERROR (TU) (07013)
OCT				JAN				APR			
23...	1213	61.3	4.0	26...	--	68.5	4.3	29...	1125	63.2	3.9
NOV				FEB				JUL			
26...	1035	59.6	4.3	19...	1100	61.2	4.3	16...	0915	52.7	4.4
DEC				MAR				AUG			
23...	--	60.3	4.4	25...	1015	61.5	4.3	19...	1145	72.3	5.7

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.0	6.0	---		---	3.0	10.0	11.0	20.0	23.0	24.0	20.0
2	14.0	7.0	---		---	2.0	9.0	16.0	20.0	23.0	24.0	19.0
3	12.0	6.0	---		---	2.0	11.0	15.0	19.0	24.0	23.0	19.0
4	12.0	---	---		---	2.0	7.0	14.0	19.0	26.0	24.0	18.0
5	13.0	---	---		---	1.0	8.0	13.0	21.0	28.0	27.0	21.0
6	11.0	---	---		---	3.0	7.0	14.0	24.0	---	25.0	---
7	12.0	7.0	---		---	3.0	10.0	14.0	24.0	---	24.0	22.0
8	15.0	7.0	---		---	5.0	11.0	14.0	21.0	---	25.0	19.0
9	15.0	6.0	---		---	4.0	10.0	15.0	21.0	---	25.0	19.0
10	15.0	5.0	---		---	3.0	11.0	15.0	20.0	---	22.0	20.0
11	11.0	5.0	---		---	5.0	11.0	12.0	21.0	26.0	22.0	24.0
12	11.0	4.0	---		---	4.0	13.0	13.0	21.0	26.0	23.0	23.0
13	10.0	4.0	---		---	5.0	12.0	13.0	22.0	25.0	24.0	25.0
14	10.0	4.0	---		---	---	9.0	15.0	22.0	25.0	25.0	19.0
15	10.0	5.0	---		---	7.0	10.0	16.0	20.0	23.0	24.0	18.0
16	10.0	5.0	---		---	8.0	11.0	19.0	21.0	23.0	25.0	17.0
17	10.0	4.0	---		---	5.0	11.0	---	22.0	24.0	22.0	15.0
18	9.0	5.0	---		---	5.0	12.0	14.0	20.0	28.0	22.0	14.0
19	9.0	5.0	---		7.0	2.0	13.0	15.0	20.0	28.0	22.0	20.0
20	11.0	4.0	---		6.0	6.0	11.0	17.0	20.0	26.0	22.0	19.0
21	9.0	4.0	---		5.0	7.0	10.0	18.0	19.0	25.0	22.0	16.0
22	9.0	5.0	---		4.0	8.0	10.0	22.0	17.0	24.0	23.0	15.0
23	9.0	4.0	.0		3.5	5.0	---	---	18.0	22.0	24.0	15.0
24	8.0	3.0	---		3.0	7.0	8.0	---	18.0	22.0	22.0	15.0
25	6.0	2.0	---		3.0	8.0	10.0	---	20.0	23.0	22.0	16.0
26	7.0	2.0	---		2.0	8.0	13.0	18.0	20.0	24.0	22.0	17.0
27	6.0	---	---		1.0	8.0	12.0	16.0	22.0	21.0	21.0	15.0
28	6.0	---	---		2.0	12.0	13.0	20.0	22.0	23.0	20.0	12.0
29	6.0	---	---		---	12.0	12.0	18.0	22.0	21.0	20.0	13.0
30	8.0	---	---		---	10.0	11.0	21.0	22.0	22.0	23.0	14.0
31	5.0	---	---		---	10.0	---	21.0	---	23.0	22.0	---
MEAN	10.0								20.5		23.0	

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	9	128	9	121	1	10	1	9.2	1	5.9	12	123
2	7	94	9	121	1	7.7	1	8.1	1	3.9	7	69
3	8	116	9	115	1	7.3	1	8.2	1	4.7	7	67
4	12	153	8	102	1	9.3	1	6.1	1	6.3	5	46
5	6	77	8	104	1	10	1	7.3	1	6.1	5	41
6	5	61	7	92	1	9.5	1	8.2	1	6.5	6	50
7	5	56	6	78	1	11	1	8.3	1	7.3	5	42
8	6	66	6	73	1	8.9	1	8.4	1	6.5	4	37
9	7	82	6	74	1	8.9	1	8.5	1	6.0	5	46
10	8	91	5	64	1	8.4	1	6.4	1	6.9	4	36
11	7	69	5	61	1	6.3	1	6.6	1	4.0	3	26
12	6	59	7	83	1	8.0	1	7.7	2	13	3	27
13	6	63	6	76	1	11	1	7.8	3	18	4	34
14	6	69	5	64	1	9.6	1	8.0	4	26	5	49
15	5	55	3	41	1	9.8	1	7.2	5	39	4	36
16	4	46	2	24	1	10	1	6.4	6	44	9	86
17	5	52	4	48	1	10	1	8.1	7	43	8	78
18	4	42	3	40	1	8.9	1	6.9	8	51	7	69
19	3	39	4	46	1	5.3	1	7.1	10	63	6	58
20	2	24	3	34	1	4.8	1	7.3	4	26	6	57
21	3	35	3	35	1	5.8	1	7.5	3	22	6	56
22	2	24	3	33	1	9.0	1	6.3	4	32	6	57
23	3	34	3	33	1	8.3	1	7.5	3	26	7	68
24	2	24	2	25	1	8.5	1	6.5	2	17	7	65
25	2	26	2	23	1	6.5	1	5.7	3	26	8	71
26	2	26	1	9.8	1	7.4	1	5.7	3	28	10	92
27	3	41	1	8.6	1	8.3	1	6.0	9	83	12	126
28	3	41	1	9.4	1	8.5	1	5.9	7	69	8	78
29	7	100	1	10	1	9.0	1	5.8	---	---	15	151
30	33	476	1	9.7	1	8.5	1	5.6	---	---	28	322
31	20	261	---	---	1	9.9	1	6.2	---	---	18	223
TOTAL	---	2530	---	1657.5	---	264.4	---	220.5	---	690.1	---	2386
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	18	262	40	1350	16	231	31	1050	18	278	21	455
2	26	381	41	1320	18	298	28	922	19	305	22	487
3	36	532	38	1280	18	283	29	908	19	316	21	450
4	28	494	34	1190	15	233	29	916	19	345	20	421
5	21	380	36	1260	16	232	26	765	18	314	18	379
6	21	373	34	1130	18	312	24	640	18	308	17	343
7	26	453	31	1000	22	425	23	618	18	316	16	310
8	28	519	28	869	22	389	22	510	20	390	15	271
9	26	452	24	706	20	374	22	496	19	359	14	238
10	24	432	25	722	20	333	21	425	20	406	12	194
11	23	379	26	716	19	302	25	493	23	500	10	177
12	23	394	25	636	20	297	20	397	20	422	10	168
13	24	362	22	545	34	533	17	358	20	428	12	181
14	24	399	20	470	44	1060	16	314	22	458	12	177
15	21	357	21	452	40	1120	18	347	20	415	11	178
16	17	256	21	426	58	2000	21	414	18	333	10	136
17	15	213	19	361	78	2840	22	424	17	298	10	135
18	13	236	17	291	58	2110	24	463	18	324	10	138
19	12	202	17	280	63	2350	25	480	18	315	10	126
20	12	217	17	263	58	2000	23	427	12	198	10	117
21	12	202	17	258	51	1790	21	411	12	165	10	110
22	11	192	17	250	45	1580	20	371	12	176	8	82
23	12	226	17	235	41	1440	20	369	12	165	9	87
24	13	274	17	228	39	1350	20	341	13	179	10	87
25	16	319	18	256	39	1380	21	373	14	204	10	94
26	29	698	18	263	42	1540	21	382	26	437	10	90
27	29	744	17	242	42	1600	17	300	23	422	10	103
28	32	899	16	251	40	1500	17	294	19	370	10	99
29	36	1120	16	260	40	1500	17	279	18	359	9	88
30	38	1160	15	233	37	1320	18	281	19	403	8	77
31	---	---	15	233	---	---	18	281	20	426	---	---
TOTAL	---	13127	---	17976	---	32722	---	15049	---	10334	---	5998

TOTAL LOAD FOR YEAR: 102954.5 TONS.

05288550 MISSISSIPPI RIVER AT FRIDLEY, MN

LOCATION.--Lat 45°06'12", long 93°16'37", in SW¼NE¼ sec.10, T.30 N., R.24 W., Anoka County, Hydrologic Unit 07010206, on left bank at St. Paul Pumping Station in Fridley, 0.9 mi (1.5 km) upstream from Rice Creek, and 3.4 mi (5.5 km) downstream from Coon Rapids Dam, and at mile 862.8 (1,388 km) upstream from Ohio River.

PERIOD OF RECORD.--Water years 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: November 1974 to current year.
pH: November 1974 to current year.
WATER TEMPERATURES: November 1974 to current year.
DISSOLVED OXYGEN: November 1974 to current year.

INSTRUMENTATION.--Water quality monitor since November 1974.

REMARKS.--Extremes are published for years with 80 percent or more daily record.

COOPERATION.--Water-quality monitor is operated by the Metropolitan Waste Control Commission, St. Paul, MN.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water year 1981): Maximum, 473 micromhos Sept. 30, 1981; minimum, 212 micromhos Mar. 13, 1981.
pH (water year 1981): Maximum, 8.7 units Apr. 16, 18-20, 1981; minimum, 7.3 units July 17, 1981.
WATER TEMPERATURES (water year 1981): Maximum, 29.5°C July 6, 1981; minimum, 0.0°C several days during winter period.
DISSOLVED OXYGEN (water year 1981): Maximum, 17.6 mg/L Mar. 7, 8, 1981; minimum, 2.9 mg/L July 27, 1981.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 473 micromhos Sept. 30; minimum, 212 micromhos Mar. 13.
pH: Maximum, 8.7 units Apr. 16, 18-20; minimum, 7.3 units July 17.
WATER TEMPERATURES: Maximum, 29.5°C July 6; minimum, 0.0°C several days during winter period.
DISSOLVED OXYGEN: Maximum, 17.6 mg/L Mar. 7, 8; minimum, 2.9 mg/L July 27.

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	291	284	287	283	279	280	319	308	314	334	329	331
2	286	281	283	286	277	282	312	309	310	337	309	330
3	282	275	279	290	284	287	323	312	315	325	308	316
4	279	274	277	288	283	285	326	321	324	332	318	326
5	286	278	281	286	280	283	327	320	323	329	308	318
6	291	284	288	286	280	284	323	318	320	332	308	322
7	295	289	292	288	280	282	320	313	316	331	327	329
8	303	288	297	281	276	278	313	308	310	334	327	330
9	312	292	301	282	276	279	315	310	313	332	328	330
10	305	281	297	280	273	276	315	313	314	333	331	332
11	288	279	284	273	269	271	318	313	316	335	332	334
12	285	276	280	270	268	269	321	316	318	336	330	334
13	286	282	285	318	269	300	318	315	317	333	328	330
14	296	290	320	319	310	316	321	316	318	332	328	329
15	304	296	300	311	307	309	321	316	318	331	327	329
16	308	300	305	318	307	312	318	315	317	334	330	332
17	305	303	304	317	310	313	317	311	314	334	330	332
18	303	298	301	310	305	308	323	313	318	333	328	330
19	300	295	297	311	304	307	332	317	322	332	327	329
20	302	296	299	311	305	308	326	320	323	329	325	327
21	303	299	301	305	302	303	325	318	321	329	326	327
22	302	299	301	305	301	303	321	315	317	331	327	328
23	301	281	294	307	303	305	319	311	315	329	325	327
24	295	291	293	307	293	299	320	311	315	330	326	327
25	293	285	288	293	290	292	323	319	321	336	330	333
26	287	281	283	310	289	302	322	307	315	337	332	334
27	285	280	282	314	308	312	308	302	305	334	328	331
28	284	280	281	322	314	316	306	300	302	330	326	328
29	282	278	280	322	315	317	304	298	300	333	327	329
30	288	278	283	322	315	318	324	299	313	331	328	329
31	287	281	284	---	---	---	333	314	325	330	327	329
MONTH	312	274	291	322	268	297	333	298	316	337	308	329

05288550 MISSISSIPPI RIVER AT FRIDLEY, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	330	327	329	331	329	330	324	313	318	325	319	322
2	334	327	331	332	325	330	328	313	321	325	321	323
3	338	332	335	332	328	330	358	319	338	322	320	321
4	337	332	334	338	330	333	350	338	343	322	317	320
5	336	331	333	339	330	335	345	338	341	321	319	320
6	334	294	331	339	333	336	349	341	345	323	319	321
7	331	329	330	338	330	334	351	348	349	329	322	325
8	332	329	330	341	332	337	354	349	351	332	214	324
9	334	330	332	339	334	336	357	348	353	345	214	236
10	334	332	333	336	332	334	357	352	355	354	340	347
11	337	332	334	302	299	301	356	352	354	355	347	351
12	339	335	337	---	---	---	357	352	354	354	348	352
13	343	332	337	308	212	304	362	355	359	355	348	352
14	341	331	335	335	299	303	359	330	342	356	346	353
15	---	---	---	311	302	308	332	327	330	357	349	352
16	---	---	---	310	306	307	336	332	334	352	348	350
17	---	---	---	311	309	310	341	333	337	---	---	---
18	350	343	346	310	305	307	339	334	336	---	---	---
19	349	344	347	306	303	304	342	335	339	---	---	---
20	345	338	341	303	300	302	339	332	336	352	342	347
21	340	334	337	303	300	302	336	329	333	356	347	351
22	335	328	331	308	302	305	332	322	329	355	348	351
23	338	326	329	312	306	309	329	324	327	345	334	341
24	338	323	333	315	309	312	331	326	329	336	332	334
25	338	330	334	315	311	313	336	328	332	323	319	321
26	333	328	331	315	312	314	333	329	332	314	309	312
27	333	323	328	316	312	314	338	329	334	316	310	313
28	330	325	328	322	314	317	334	315	321	---	---	---
29	---	---	---	323	299	317	319	314	316	---	---	---
30	---	---	---	318	311	315	322	318	320	---	---	---
31	---	---	---	316	312	314	---	---	---	---	---	---
MONTH							362	313	337			

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	331	325	327	374	366	370	414	389	405
2	340	330	337	335	329	331	376	366	371	419	397	408
3	339	333	337	336	333	334	372	363	367	430	409	419
4	342	335	337	335	333	333	370	363	366	443	417	431
5	349	337	344	342	334	338	365	356	361	451	432	444
6	348	339	343	348	331	343	366	352	361	455	436	449
7	347	339	343	345	340	343	365	345	360	459	434	450
8	345	338	342	348	341	344	366	357	362	472	438	455
9	341	333	338	349	342	345	378	360	369	459	435	445
10	341	332	338	350	341	345	374	364	370	451	433	443
11	340	334	337	346	325	341	371	361	367	459	427	445
12	339	331	335	351	341	347	374	365	368	454	430	442
13	338	304	332	355	345	350	375	364	370	448	428	440
14	331	291	321	363	304	352	375	367	371	455	432	447
15	341	331	336	359	343	352	376	366	372	457	432	446
16	341	319	329	371	355	363	382	369	375	459	425	444
17	329	321	325	378	367	373	384	369	377	462	434	448
18	332	325	329	381	363	373	386	371	378	457	439	447
19	337	327	332	383	370	377	377	367	372	454	426	443
20	337	331	334	389	374	382	381	371	375	461	431	446
21	336	332	334	387	367	376	382	374	378	463	437	449
22	344	335	340	376	363	369	381	369	377	464	438	453
23	348	341	344	369	321	361	384	373	378	469	441	456
24	346	345	345	370	348	362	385	374	379	467	444	457
25	---	---	---	372	353	363	386	371	378	470	442	459
26	---	---	---	370	356	363	373	336	365	467	443	457
27	---	---	---	368	350	359	391	361	377	470	427	458
28	334	318	330	361	349	354	399	382	391	467	441	454
29	332	320	327	367	352	361	397	381	388	465	438	454
30	327	321	323	369	355	362	404	387	398	473	449	460
31	---	---	---	373	361	367	406	393	399	---	---	---
MONTH				389	304	355	406	336	374	473	389	445

05288550 MISSISSIPPI RIVER AT FRIDLEY, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	7.8	7.6	7.7	8.1	8.0	8.0	8.0	7.8	7.9	8.0	7.8	7.9
2	7.9	7.6	7.7	8.1	8.0	8.0	8.1	7.9	8.0	8.1	7.6	7.7
3	7.9	7.6	7.7	8.2	8.0	8.1	8.1	7.9	8.0	8.1	7.9	7.9
4	7.9	7.6	7.7	8.1	7.8	7.9	8.0	7.8	7.9	8.0	7.9	7.9
5	8.0	7.7	7.8	7.9	7.8	7.8	7.9	7.8	7.8	8.0	7.8	7.9
6	8.0	7.7	7.8	7.9	7.8	7.8	7.7	7.6	7.7	8.0	7.8	7.9
7	8.1	7.7	7.9	7.8	7.7	7.7	7.7	7.6	7.7	7.9	7.8	7.9
8	8.1	7.8	7.9	7.7	7.6	7.6	7.8	7.6	7.7	7.9	7.8	7.9
9	8.2	7.9	8.0	7.8	7.6	7.6	8.1	7.7	7.9	7.9	7.7	7.8
10	8.1	7.9	8.0	7.8	7.6	7.7	8.0	7.9	8.0	7.9	7.8	7.8
11	8.1	7.9	8.0	7.8	7.6	7.7	8.0	7.9	8.0	7.9	7.8	7.8
12	8.2	7.9	8.0	7.7	7.6	7.6	8.0	7.9	8.0	7.9	7.7	7.8
13	8.2	8.0	8.1	7.6	7.4	7.5	8.0	7.9	7.9	8.1	7.7	7.9
14	8.1	8.0	8.0	7.6	7.5	7.5	8.0	7.9	7.9	8.1	7.9	8.0
15	8.0	7.8	7.9	7.6	7.5	7.5	8.0	7.9	7.9	8.0	7.9	7.9
16	7.9	7.7	7.8	7.8	7.5	7.6	8.0	7.8	7.9	8.0	7.9	8.0
17	7.8	7.6	7.7	7.8	7.6	7.7	8.0	7.9	7.9	8.1	7.9	8.0
18	7.8	7.6	7.6	7.8	7.6	7.7	8.1	7.9	8.0	8.1	7.9	8.0
19	7.8	7.6	7.7	7.8	7.6	7.7	8.0	7.8	8.0	8.1	7.9	8.0
20	8.0	7.6	7.8	7.8	7.5	7.7	7.9	7.8	7.9	8.1	8.0	8.0
21	8.0	7.7	7.9	7.7	7.5	7.5	7.9	7.7	7.8	8.2	8.0	8.1
22	8.0	7.8	7.9	7.8	7.5	7.6	7.9	7.7	7.8	8.1	8.0	8.0
23	7.9	7.7	7.8	7.8	7.6	7.7	7.8	7.7	7.7	8.2	8.0	8.1
24	7.8	7.6	7.7	7.8	7.6	7.7	7.8	7.6	7.7	8.2	8.0	8.1
25	7.9	7.6	7.7	7.8	7.6	7.7	7.6	7.5	7.5	8.2	8.1	8.2
26	8.0	7.7	7.8	7.9	7.6	7.7	7.7	7.5	7.6	8.3	8.2	8.2
27	8.0	7.7	7.9	7.9	7.7	7.7	7.8	7.6	7.7	8.2	8.1	8.1
28	8.1	7.8	7.9	7.8	7.6	7.7	7.7	7.6	7.7	8.2	8.1	8.1
29	8.1	7.9	8.0	7.8	7.6	7.7	7.8	7.6	7.7	8.2	8.1	8.2
30	8.1	7.9	7.9	8.0	7.7	7.8	8.1	7.7	7.9	8.2	8.1	8.2
31	8.1	7.9	8.0	---	---	---	8.0	8.0	8.0	8.2	8.1	8.2
MONTH	8.2	7.6	7.9	8.2	7.4	7.7	8.1	7.5	7.8	8.3	7.6	8.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	8.2	8.0	8.1	7.9	7.7	7.8	7.8	7.6	7.6	8.2	8.0	8.1
2	8.2	8.0	8.1	8.1	7.8	7.9	7.9	7.5	7.7	8.2	8.0	8.1
3	8.2	7.9	8.1	8.1	7.8	7.9	7.9	7.6	7.8	8.1	8.0	8.1
4	8.1	7.9	8.0	8.1	7.8	7.9	7.7	7.5	7.6	8.2	8.0	8.1
5	8.0	7.9	7.9	8.2	7.9	8.0	7.8	7.6	7.7	8.2	8.1	8.2
6	8.0	7.9	7.9	8.3	7.9	8.1	7.9	7.6	7.8	8.3	8.1	8.2
7	8.0	7.9	7.9	8.3	8.0	8.1	7.9	7.7	7.8	8.3	8.2	8.2
8	8.0	7.9	7.9	8.3	8.0	8.1	7.8	7.7	7.8	8.3	8.1	8.2
9	8.0	7.9	7.9	8.3	8.0	8.1	7.9	7.7	7.8	8.3	8.0	8.1
10	7.9	7.9	7.9	8.0	8.0	8.0	7.9	7.8	7.9	8.4	8.0	8.2
11	7.9	7.9	7.9	8.0	7.9	7.9	8.1	7.9	8.0	8.4	8.1	8.2
12	7.9	7.9	7.9	---	---	---	8.3	8.1	8.2	8.4	8.1	8.3
13	7.9	7.8	7.9	8.4	8.0	8.2	8.5	8.1	8.4	8.3	8.0	8.2
14	8.0	7.9	7.9	8.3	8.0	8.2	8.5	8.2	8.4	8.2	7.9	8.0
15	---	---	---	8.4	7.9	8.2	8.6	8.4	8.5	8.1	7.9	8.0
16	---	---	---	8.3	8.1	8.2	8.7	8.4	8.5	8.0	7.8	7.8
17	---	---	---	8.2	8.1	8.1	8.6	8.4	8.5	---	---	---
18	8.0	7.9	8.0	8.2	8.1	8.2	8.7	8.4	8.5	---	---	---
19	8.1	7.9	8.0	8.2	8.1	8.1	8.7	8.4	8.5	---	---	---
20	8.1	8.0	8.0	8.1	8.0	8.1	8.7	8.4	8.5	8.4	8.0	8.2
21	8.1	7.8	8.0	8.1	8.1	8.1	8.5	8.2	8.4	8.4	8.1	8.2
22	7.8	7.6	7.7	8.1	8.0	8.1	8.2	8.0	8.1	8.4	8.2	8.2
23	8.0	7.8	7.9	8.3	8.0	8.1	8.0	7.9	8.0	8.3	8.0	8.1
24	8.1	7.8	7.9	8.2	8.0	8.1	8.2	8.0	8.1	8.1	7.9	8.0
25	8.1	7.9	7.9	8.1	7.9	8.0	8.3	8.1	8.1	8.0	7.9	7.9
26	8.0	7.8	7.9	8.1	7.8	8.0	8.2	8.1	8.1	8.1	7.9	8.0
27	7.8	7.7	7.8	8.2	7.9	8.0	8.2	8.1	8.1	8.2	7.9	8.0
28	7.7	7.6	7.6	8.2	7.9	8.0	8.1	7.7	7.8	---	---	---
29	---	---	---	8.0	7.8	7.9	8.1	7.6	7.9	---	---	---
30	---	---	---	7.9	7.6	7.8	8.1	7.9	8.0	---	---	---
31	---	---	---	7.9	7.6	7.8	---	---	---	---	---	---
MONTH							8.7	7.5	8.1			

05288550 MISSISSIPPI RIVER AT FRIDLEY, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	7.8	7.7	7.7	7.9	7.8	7.9	7.9	7.8	7.8
2	8.3	8.1	8.2	7.8	7.7	7.8	8.0	7.8	7.9	7.9	7.8	7.9
3	8.4	8.1	8.2	7.8	7.8	7.8	8.1	7.9	8.0	7.9	7.9	7.9
4	8.6	8.2	8.4	7.8	7.5	7.6	8.2	8.0	8.1	8.0	7.9	7.9
5	8.6	8.3	8.4	7.9	7.4	7.7	8.3	8.0	8.1	8.1	7.9	8.0
6	8.6	8.3	8.4	8.0	7.8	7.9	8.3	8.1	8.2	8.1	8.0	8.0
7	8.5	8.2	8.4	8.0	7.9	8.0	8.2	8.1	8.1	8.1	8.0	8.0
8	8.3	8.2	8.2	8.1	7.9	8.0	8.2	8.1	8.1	8.2	8.0	8.1
9	8.2	8.1	8.1	8.1	7.9	8.0	8.2	8.0	8.1	8.2	8.0	8.1
10	8.3	8.1	8.2	8.2	7.9	8.0	8.2	8.1	8.1	8.2	7.9	8.1
11	8.3	8.1	8.2	8.1	7.9	8.0	8.2	8.1	8.1	8.1	7.9	8.0
12	8.3	8.0	8.1	7.9	7.8	7.9	8.2	8.1	8.1	8.1	7.9	8.0
13	8.1	7.9	8.0	7.9	7.7	7.8	8.2	8.1	8.1	8.2	7.9	8.0
14	7.9	7.4	7.7	7.9	7.7	7.8	8.2	8.1	8.2	8.2	8.0	8.1
15	7.6	7.4	7.5	7.8	7.6	7.7	8.3	8.1	8.2	8.1	7.9	8.0
16	7.6	7.5	7.6	7.9	7.5	7.7	8.3	8.1	8.2	8.1	7.9	8.0
17	7.7	7.6	7.7	8.0	7.3	7.6	8.3	8.1	8.2	8.1	7.9	8.0
18	7.8	7.6	7.7	8.0	7.8	7.9	8.2	7.9	8.0	8.1	7.9	8.0
19	7.8	7.7	7.8	8.1	7.8	7.9	8.0	7.8	7.9	8.2	7.9	8.1
20	7.8	7.7	7.7	8.1	7.9	8.0	8.0	7.8	7.9	8.3	8.0	8.1
21	7.6	7.4	7.5	8.0	7.9	7.9	8.0	7.8	7.9	8.3	8.0	8.1
22	7.9	7.4	7.8	8.0	7.8	7.9	8.1	7.8	7.9	8.2	8.0	8.1
23	8.0	7.8	7.9	8.0	7.8	7.9	8.0	7.8	7.9	8.0	7.9	8.0
24	7.9	7.9	7.9	8.0	7.8	7.9	8.0	7.8	7.9	8.0	7.8	7.9
25	---	---	---	8.0	7.8	7.9	7.9	7.8	7.8	8.0	7.8	7.9
26	---	---	---	8.0	7.9	7.9	7.8	7.7	7.7	7.9	7.7	7.8
27	---	---	---	8.1	7.8	7.9	7.8	7.7	7.7	7.9	7.6	7.7
28	7.9	7.7	7.8	8.1	7.9	8.0	7.8	7.7	7.8	8.0	7.7	7.8
29	7.8	7.6	7.8	8.2	8.0	8.1	7.7	7.7	7.7	8.0	7.8	7.9
30	7.7	7.6	7.7	8.2	8.0	8.1	7.9	7.7	7.8	7.9	7.8	7.8
31	---	---	---	8.2	8.0	8.1	7.9	7.8	7.8	---	---	---
MONTH				8.2	7.3	7.9	8.3	7.7	8.0	8.3	7.6	8.0

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	16.0	15.0	15.5	5.5	5.0	5.0	3.0	.5	2.0	---	---	---
2	15.0	13.5	14.5	5.5	4.5	5.0	1.0	.5	1.0	---	---	---
3	13.5	12.0	12.5	7.5	5.5	6.5	1.0	.5	1.0	---	---	---
4	12.5	11.5	12.0	7.0	6.5	6.5	1.0	1.0	1.0	---	---	---
5	13.0	11.0	11.5	6.5	5.5	6.0	1.0	.5	1.0	---	---	---
6	13.5	11.5	12.5	7.0	6.0	6.5	2.0	.5	1.0	2.0	1.0	1.0
7	15.5	12.5	13.5	6.0	5.5	5.5	2.5	2.0	2.5	1.0	1.0	1.0
8	16.5	13.5	15.0	6.0	5.0	5.5	2.0	.5	1.0	1.0	1.0	1.0
9	16.5	14.5	15.5	5.5	5.0	5.5	1.0	.5	1.0	1.0	1.0	1.0
10	15.0	13.0	14.5	5.0	4.0	4.5	.5	.5	.5	1.0	1.0	1.0
11	13.0	10.5	11.5	4.0	3.0	3.5	1.0	.5	.5	1.0	1.0	1.0
12	11.0	9.0	10.0	3.5	3.0	3.0	1.0	.5	1.0	1.0	1.0	1.0
13	10.0	9.0	9.5	4.0	3.0	3.5	1.0	.5	1.0	1.0	1.0	1.0
14	9.0	8.5	8.5	4.0	3.5	3.5	1.0	.5	1.0	1.0	1.0	1.0
15	8.5	8.0	8.5	4.0	3.0	3.5	1.0	.5	1.0	1.0	.5	1.0
16	10.0	9.0	9.5	4.5	3.5	4.0	1.0	1.0	1.0	1.0	1.0	1.0
17	10.0	9.0	9.5	4.5	3.5	4.0	1.0	1.0	1.0	1.0	1.0	1.0
18	9.0	7.5	8.5	4.0	2.5	3.5	---	---	---	1.0	1.0	1.0
19	8.5	7.0	7.5	4.0	3.0	3.5	---	---	---	1.0	1.0	1.0
20	9.5	8.0	8.5	4.0	3.5	4.0	1.5	1.0	1.5	1.0	1.0	1.0
21	10.0	8.5	9.0	4.0	3.0	3.5	1.5	1.0	1.5	1.0	1.0	1.0
22	9.0	8.0	9.0	4.5	3.5	4.0	1.5	1.0	1.5	1.0	1.0	1.0
23	8.0	7.5	7.5	5.0	4.0	4.5	2.0	1.5	1.5	1.0	1.0	1.0
24	7.5	7.0	7.0	3.5	2.5	3.0	---	---	---	1.5	1.0	1.5
25	6.5	5.0	6.0	2.5	1.5	2.0	---	---	---	3.5	1.5	2.5
26	6.0	4.5	5.0	2.0	1.5	2.0	---	---	---	3.5	2.0	2.5
27	5.0	4.5	4.5	3.0	2.0	2.5	1.5	1.5	1.5	2.0	.5	1.0
28	5.0	4.0	4.5	3.0	2.5	2.5	1.5	1.5	1.5	.5	.5	.5
29	5.0	4.0	4.5	3.0	2.5	3.0	2.0	1.5	1.5	1.5	.0	.5
30	5.5	4.0	5.0	3.5	2.5	3.0	---	---	---	.5	.0	.5
31	6.0	5.0	5.5	---	---	---	---	---	---	1.0	.0	.5
MONTH	16.5	4.0	9.5	7.5	1.5	4.0						

05288550 MISSISSIPPI RIVER AT FRIDLEY, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	.5	.0	.5	2.5	2.0	2.0	12.5	9.5	10.5	15.5	14.0	15.0
2	.5	.0	.5	2.5	1.0	2.0	14.0	10.0	12.0	15.5	14.5	15.0
3	.5	.5	.5	2.0	1.0	1.5	14.0	8.5	11.5	15.0	14.0	14.5
4	.5	.0	.5	3.0	1.0	2.0	8.5	5.5	6.5	14.0	13.0	13.5
5	.5	.0	.5	3.5	1.5	2.5	7.5	5.0	6.0	14.5	13.0	14.0
6	.5	.5	.5	4.0	2.0	3.0	8.5	6.5	7.5	14.5	14.0	14.0
7	.5	.0	.5	4.0	1.5	2.5	10.0	8.5	9.0	15.0	13.5	14.5
8	.5	.5	.5	4.5	2.0	3.5	11.0	9.5	10.0	16.5	15.0	16.0
9	1.0	.0	.5	4.5	3.0	4.0	11.0	9.5	10.5	18.5	16.5	17.5
10	1.0	1.0	1.0	4.0	3.0	3.5	11.5	9.5	10.5	20.5	17.0	18.0
11	1.5	.5	1.0	3.0	2.0	2.5	10.5	10.0	10.5	21.5	18.5	19.5
12	1.0	1.0	1.0	---	---	---	11.5	9.5	10.5	21.5	19.5	20.0
13	1.0	.0	.5	6.5	4.0	5.0	12.0	10.5	11.5	21.0	20.0	20.5
14	.5	.5	.5	6.0	3.5	4.5	11.0	9.0	10.5	20.5	19.5	20.0
15	---	---	---	7.5	2.5	6.0	11.5	9.5	10.5	20.0	18.5	19.0
16	---	---	---	5.5	4.5	5.0	12.0	11.0	11.5	18.0	17.5	18.0
17	---	---	---	5.0	5.0	5.0	13.0	11.5	12.0	---	---	---
18	---	---	---	5.0	4.0	4.5	13.0	11.5	12.0	---	---	---
19	---	---	---	4.0	3.0	3.5	14.0	12.0	13.0	---	---	---
20	---	---	---	3.0	2.5	2.5	13.5	11.5	12.5	21.5	17.5	19.5
21	---	---	---	3.5	3.0	3.0	11.5	9.5	10.5	22.5	19.5	20.5
22	3.5	3.0	3.5	5.0	3.5	4.5	10.0	9.5	9.5	22.0	20.0	21.0
23	3.5	2.5	3.0	8.0	5.0	6.5	9.0	8.0	8.5	22.0	20.5	21.0
24	4.0	2.0	3.0	8.5	6.0	7.5	9.5	8.0	8.5	21.0	20.0	20.5
25	4.0	2.5	3.0	8.0	7.0	7.5	11.0	9.5	10.0	20.0	19.0	19.5
26	2.0	1.0	1.5	8.0	7.0	7.5	11.5	10.0	11.0	18.5	18.0	18.0
27	1.5	1.5	1.5	9.0	6.5	8.0	13.5	12.0	12.5	19.5	18.0	18.5
28	2.0	1.5	2.0	10.5	7.5	9.0	14.5	13.0	14.0	---	---	---
29	---	---	---	11.0	10.0	10.5	15.0	13.5	14.0	---	---	---
30	---	---	---	10.0	9.0	9.5	15.5	14.0	15.0	---	---	---
31	---	---	---	10.0	8.5	9.0	---	---	---	---	---	---
MONTH							15.5	5.0	10.5			

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	26.0	24.5	25.0	23.0	22.0	22.5	21.0	19.5	20.0
2	21.0	20.5	21.0	26.5	21.5	25.5	23.5	22.0	22.5	20.0	19.0	19.5
3	21.5	20.0	20.5	26.5	26.0	26.5	24.5	22.5	23.5	19.5	19.0	19.5
4	23.0	20.0	21.0	26.5	25.5	25.5	25.5	24.0	24.5	19.5	18.5	19.0
5	24.0	21.5	22.5	29.0	24.5	27.0	26.5	25.0	25.5	20.0	18.5	19.0
6	23.5	22.0	22.5	29.5	25.0	29.0	26.0	24.5	25.5	20.0	19.0	19.5
7	24.0	22.5	23.0	28.0	27.5	28.0	24.5	23.5	24.0	21.0	19.5	20.0
8	23.0	22.0	23.0	29.0	27.5	28.0	24.5	23.5	24.0	20.5	19.5	20.0
9	22.0	21.0	21.5	28.0	27.0	27.5	24.0	23.0	23.5	21.5	19.5	20.0
10	22.5	20.5	21.5	27.5	26.5	27.0	23.5	22.5	23.0	23.0	20.5	21.5
11	22.5	21.5	22.0	27.5	26.0	27.0	24.0	22.5	23.0	23.0	21.5	22.0
12	23.0	21.5	22.0	27.0	26.5	27.0	24.5	23.5	24.0	23.0	21.0	22.0
13	22.0	21.0	22.0	27.5	26.0	26.5	25.5	24.0	24.5	22.5	21.0	21.5
14	24.0	21.0	22.0	26.5	24.0	26.0	25.0	24.0	24.5	22.0	20.0	21.0
15	24.0	22.0	23.5	24.5	24.0	24.0	25.0	23.5	24.0	20.0	18.0	19.5
16	23.5	22.5	23.0	26.5	23.0	24.5	24.5	22.5	23.5	18.0	16.5	17.5
17	24.5	23.0	23.5	27.0	26.0	26.5	23.5	22.0	22.5	16.5	15.0	16.0
18	24.5	23.5	24.0	27.5	26.0	27.0	23.5	22.0	22.5	17.0	15.0	16.0
19	25.0	23.5	24.5	28.0	27.0	27.5	23.5	22.0	22.5	18.0	15.5	16.5
20	25.0	25.0	25.0	28.0	26.5	27.5	23.5	22.0	22.5	18.5	16.5	17.0
21	25.0	23.5	24.5	26.5	24.0	25.5	23.5	22.0	22.5	18.5	16.5	17.5
22	27.5	23.5	26.5	24.0	22.5	23.0	22.5	21.0	21.5	17.5	16.0	17.0
23	28.5	27.5	28.0	23.0	21.5	22.5	23.0	21.0	21.5	16.0	14.5	15.0
24	28.0	28.0	28.0	24.0	22.5	23.0	23.5	21.5	22.5	15.5	14.0	14.5
25	---	---	---	24.5	23.0	24.0	22.5	21.5	22.0	16.0	14.5	15.0
26	---	---	---	24.5	23.0	23.5	21.5	20.5	21.0	16.5	15.5	16.0
27	---	---	---	24.0	21.0	22.5	20.5	20.0	20.0	15.0	13.5	14.5
28	23.0	22.5	22.5	22.0	20.0	21.0	20.0	19.0	19.5	14.0	12.5	13.0
29	24.5	23.0	23.5	22.5	21.0	21.5	19.5	19.0	19.0	14.0	12.5	13.0
30	25.5	23.5	24.5	23.0	21.5	22.0	21.0	19.0	20.0	13.5	13.0	13.5
31	---	---	---	23.5	22.0	23.0	22.0	20.5	21.0	---	---	---
MONTH				29.5	20.0	25.5	26.5	19.0	22.5	23.0	12.5	18.0

05288550 MISSISSIPPI RIVER AT FRIDLEY, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.8	9.4	10.0	13.0	11.8	12.2	13.9	12.6	13.0	---	---	---
2	10.8	9.0	9.9	12.9	11.6	12.1	15.4	12.9	14.2	---	---	---
3	11.4	9.9	10.5	13.2	11.6	12.1	15.6	13.9	14.4	14.5	10.0	12.1
4	11.7	9.9	10.7	13.9	11.6	12.5	15.0	13.6	14.1	14.1	5.9	10.3
5	12.5	10.2	11.1	14.1	12.2	12.8	13.7	13.0	13.4	14.8	8.8	12.2
6	12.0	10.1	10.9	13.4	11.9	12.5	13.3	12.6	12.9	13.5	10.8	11.9
7	11.5	9.3	10.2	13.0	11.8	12.2	13.8	13.0	13.3	11.3	10.5	10.9
8	11.5	8.5	9.9	12.8	11.5	12.0	14.6	13.0	13.5	11.8	10.6	11.2
9	12.6	8.4	10.0	13.0	11.5	12.0	14.5	11.2	13.5	11.9	10.5	11.3
10	11.6	9.8	10.4	13.7	11.6	12.4	14.3	13.4	13.7	12.0	11.3	11.6
11	12.7	10.0	11.0	13.1	11.9	12.3	14.5	13.5	13.9	12.2	11.4	11.6
12	14.3	10.4	12.0	12.4	11.6	11.9	14.3	13.4	13.7	11.7	11.2	11.5
13	13.8	11.7	12.5	12.0	11.3	11.6	14.1	13.4	13.7	11.8	10.8	11.2
14	12.1	11.3	11.7	12.7	11.3	11.8	14.4	13.3	13.8	11.1	10.3	10.8
15	11.3	11.1	11.2	12.8	11.4	11.9	14.0	13.2	13.5	11.3	10.2	10.7
16	12.3	10.8	11.5	13.5	11.7	12.2	13.2	11.9	12.7	11.8	10.9	11.4
17	11.7	10.9	11.2	13.0	11.7	12.2	12.7	11.7	12.1	11.7	10.9	11.3
18	12.5	11.1	11.6	12.9	11.5	12.1	---	---	---	11.7	10.9	11.3
19	13.4	11.4	12.1	13.2	11.6	12.1	---	---	---	11.4	10.7	11.1
20	13.3	11.1	12.2	12.4	11.2	11.6	13.8	12.9	13.5	11.5	10.5	11.2
21	12.8	10.8	11.5	12.6	11.0	11.6	13.4	12.9	13.1	12.0	11.1	11.4
22	12.3	10.9	11.5	12.9	11.2	11.8	13.2	12.4	12.8	13.1	11.7	12.2
23	12.4	11.1	11.7	13.0	11.3	11.8	12.6	11.9	12.2	13.5	12.4	12.9
24	12.2	11.9	12.0	12.9	11.3	11.8	12.5	11.4	12.0	14.0	12.4	12.9
25	12.3	11.9	12.1	12.7	11.3	11.8	---	---	---	14.6	12.7	13.5
26	12.6	11.9	12.2	13.4	11.3	12.2	13.7	12.5	13.3	14.0	13.0	13.3
27	12.5	11.8	12.1	13.8	11.8	12.4	13.6	12.8	13.2	13.5	12.4	12.9
28	13.9	11.9	12.9	12.8	11.6	12.0	13.6	12.6	13.1	13.3	12.3	12.8
29	13.6	12.0	12.6	12.8	11.4	11.9	14.0	12.5	13.3	13.1	5.8	11.8
30	13.1	11.6	12.2	14.0	12.0	12.7	13.4	10.6	11.8	14.4	11.2	13.3
31	12.9	11.7	12.1	---	---	---	10.7	9.7	10.2	13.8	12.6	13.2
MONTH	14.3	8.4	11.4	14.1	11.0	12.1						

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	13.0	11.6	12.6	13.5	11.6	12.7	10.3	6.4	8.6	11.4	9.3	10.2
2	13.4	11.6	12.6	14.0	12.3	12.9	10.2	6.2	8.0	10.5	8.9	10.1
3	14.2	12.4	13.4	14.8	11.9	13.5	12.4	6.3	9.2	9.2	8.2	8.8
4	13.8	13.1	13.5	15.7	13.1	14.1	11.2	9.9	10.6	11.3	8.0	9.4
5	13.8	12.5	13.2	17.1	13.6	15.1	12.1	10.1	11.0	10.6	9.3	10.0
6	13.3	11.9	12.9	17.3	14.9	15.9	12.6	9.8	11.2	10.1	7.7	9.2
7	13.2	12.1	12.7	17.6	14.9	16.0	11.8	9.7	10.8	10.2	8.9	9.5
8	13.5	12.2	12.9	17.6	14.9	16.0	10.7	9.4	10.1	10.2	7.1	8.9
9	13.4	12.0	12.8	15.6	13.2	14.6	12.5	9.3	11.1	10.0	7.6	8.0
10	14.5	12.6	13.4	13.4	12.9	13.2	12.7	10.3	11.4	10.2	8.2	9.2
11	14.3	13.5	14.0	14.5	12.7	13.1	11.3	10.4	10.9	10.3	8.1	9.2
12	14.4	14.1	14.3	---	---	---	12.2	10.7	11.5	9.9	7.8	8.7
13	14.5	13.4	14.0	15.8	9.2	13.9	11.8	8.9	10.7	8.8	7.0	8.0
14	14.5	13.4	13.8	15.6	12.8	14.0	11.4	8.4	9.9	8.7	6.5	7.5
15	---	---	---	15.3	12.3	13.5	12.1	10.2	11.0	8.4	7.4	7.9
16	---	---	---	13.6	12.1	12.8	11.2	8.9	10.1	8.1	7.3	7.6
17	---	---	---	13.5	12.0	12.6	11.0	8.8	9.9	---	---	---
18	13.0	11.2	11.8	13.5	12.0	12.9	11.0	8.8	9.4	---	---	---
19	14.1	11.1	12.1	14.0	12.8	13.1	11.2	8.6	9.7	---	---	---
20	12.9	10.8	12.0	13.9	12.8	13.5	11.9	9.5	10.3	10.3	8.1	9.0
21	11.5	10.2	10.8	13.8	12.9	13.4	9.9	9.1	9.5	10.2	8.0	9.0
22	11.6	9.3	10.5	15.2	13.1	13.7	9.8	9.1	9.4	9.5	7.6	8.3
23	12.0	9.8	10.7	17.0	13.1	14.7	9.0	7.4	8.3	8.6	6.6	7.6
24	14.5	10.6	12.7	15.6	11.4	13.2	8.6	6.9	7.7	8.6	6.5	7.6
25	14.4	12.6	13.3	13.1	10.0	11.4	8.9	6.6	7.7	9.0	7.8	8.2
26	14.2	11.9	13.2	14.8	9.4	11.5	10.0	8.0	8.8	9.7	8.6	9.2
27	12.6	11.6	12.0	14.3	10.5	12.2	11.2	8.4	10.4	10.4	8.4	9.1
28	11.9	11.4	11.7	13.5	9.9	11.1	10.5	8.2	8.9	---	---	---
29	---	---	---	11.3	9.2	10.1	11.1	8.2	9.7	---	---	---
30	---	---	---	11.2	8.9	10.0	10.2	9.4	9.9	---	---	---
31	---	---	---	11.4	7.8	10.0	---	---	---	---	---	---
MONTH							12.7	6.2	9.9			

05288550 MISSISSIPPI RIVER AT FRIDLEY, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	9.7	9.0	9.3	9.2	7.9	8.4	9.7	8.4	9.0
2	9.1	7.8	8.6	10.7	7.6	9.7	9.4	7.9	8.5	9.9	8.6	9.1
3	9.3	7.4	8.2	10.0	9.3	9.5	9.5	7.9	8.5	9.6	8.4	9.1
4	10.2	7.1	8.1	9.3	6.1	7.3	9.6	7.6	8.6	9.7	8.4	8.9
5	9.1	6.1	7.8	10.9	4.1	8.0	9.3	7.4	8.1	9.2	8.2	8.7
6	9.0	7.0	7.9	10.4	8.4	9.1	9.2	7.1	7.9	9.5	8.1	8.7
7	9.1	7.2	7.9	9.6	8.1	8.8	8.4	6.8	7.4	9.4	8.2	8.7
8	8.8	7.4	8.0	8.8	7.6	8.1	7.8	6.2	7.0	9.5	8.0	8.7
9	8.2	7.3	7.8	8.9	7.3	7.9	9.2	6.3	7.5	9.5	7.6	8.5
10	8.6	7.0	7.7	8.9	7.1	7.9	9.4	7.7	8.4	9.5	7.5	8.4
11	8.5	7.0	7.6	6.9	5.2	6.1	9.7	8.0	8.8	9.8	7.7	8.6
12	8.6	7.1	7.6	5.7	4.3	4.9	9.4	7.9	8.4	10.4	7.9	8.8
13	7.8	6.8	7.3	5.8	4.0	4.9	9.7	7.7	8.5	9.9	7.7	8.5
14	7.4	6.2	6.8	9.0	5.8	7.4	9.0	7.7	8.1	10.2	7.9	8.5
15	---	---	---	7.0	4.7	5.8	8.9	7.7	8.1	10.8	8.6	9.7
16	---	---	---	7.7	4.1	5.2	10.2	7.9	8.9	11.1	9.4	10.0
17	9.4	7.7	8.8	---	---	---	10.4	7.6	9.1	10.4	8.7	9.6
18	9.7	8.3	9.3	8.0	5.5	6.9	10.6	7.4	9.0	11.2	8.8	9.8
19	10.9	7.7	9.9	9.1	5.1	6.7	10.4	8.6	9.2	10.8	9.1	9.9
20	10.0	8.3	9.4	8.4	5.7	7.2	10.9	8.2	9.0	11.3	8.9	9.8
21	8.1	4.6	6.3	8.7	6.4	7.5	9.5	6.8	8.4	11.7	8.8	9.9
22	10.9	4.2	8.9	8.8	7.2	7.8	7.7	6.4	6.9	12.4	9.5	10.5
23	10.0	8.4	9.1	8.7	7.2	7.8	9.4	6.4	7.7	10.9	9.6	10.0
24	9.2	8.9	9.0	8.0	6.7	7.3	9.1	7.9	8.3	11.9	9.4	10.2
25	---	---	---	7.7	5.4	6.8	8.7	7.8	8.2	11.5	9.7	10.3
26	---	---	---	8.0	4.6	6.3	8.8	8.0	8.4	10.5	9.0	9.7
27	---	---	---	9.1	2.9	6.9	9.3	8.3	8.9	10.2	8.7	9.3
28	8.3	7.8	8.1	10.7	7.8	9.3	9.2	8.6	8.9	11.1	8.5	9.7
29	---	---	---	10.4	8.6	9.4	9.2	8.5	8.9	12.2	9.5	10.6
30	9.3	7.7	8.2	10.5	8.5	9.2	9.8	8.8	9.2	10.7	9.3	9.7
31	---	---	---	9.8	8.3	8.9	9.5	8.4	8.8	---	---	---
MONTH							10.9	6.2	8.4	12.4	7.5	9.4

05288840 BASSETT CREEK IN GOLDEN VALLEY, MN

LOCATION.--Lat 45°00'01", long 93°19'39", in SW¼NW¼ sec.17, T.118 N., R.24 W., Hennepin County, Hydrologic Unit 07010206, on right upstream headwall of culvert on County Road 66 (Golden Valley Road), 0.45 mi (0.72 km) northeast from outlet of Sweeney Lake, in Golden Valley.

DRAINAGE AREA.--31.7 mi^2 (82.1 km^2).

PERIOD OF RECORD.--January to December 1980, May 1981 to current year. Calendar year 1980 published in OFR 82-504.

GAGE.--Water-stage recorder.

REMARKS.--Records good except those for period of no gage height record, May 30 to June 14, which are fair.

EXTREMES FOR CURRENT PERIOD.--May to September 1981: Maximum discharge during period, 274 ft^3/s (7.76 m^3/s) June 14, gage height, 6.43 ft (1.960 m), from floodmarks; minimum, 2.2 ft^3/s (0.062 m^3/s) Sept. 20-21, gage height, 3.36 ft (1.024 m).

DISCHARGE MEASUREMENTS MADE PRIOR TO BEGINNING OF CONTINUOUS RECORD.--

Calendar year	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
1980	Jan. 16	1130	9.1	0.26	unknown		Apr. 10	1517	32	0.91	4.30	1.311
	Jan. 31	1030	3.0	0.085	unknown		Apr. 15	1047	14	0.40	4.13	1.259
	Feb. 26	1417	7.8	0.22	unknown		Apr. 30	1425	7.1	0.20	3.83	1.167
	Mar. 15	1222	7.2	0.20	unknown		May 15	1315	4.5	0.13	3.69	1.125
	Mar. 15	1708	11	0.31	unknown		June 6	1600	70	1.98	4.75	1.448
	Mar. 16	1008	22	0.62	unknown		July 23	1050	7.3	0.21	3.59	1.094
	Mar. 19	1000	45	1.27	unknown		Aug. 13	1052	5.7	0.16	3.58	1.091
	Mar. 20	1333	73	2.07	4.76	1.451	Sept. 8	1054	10	0.28	3.67	1.119
	Mar. 27	1635	32	0.91	4.30	1.311	Oct. 14	1232	3.2	0.091	3.54	1.079
	Apr. 1	1409	22	0.62	4.16	1.268	Nov. 5	1035	3.5	0.099	3.53	1.076

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1								---	4.0	22	21	11
2								---	3.6	20	14	11
3								---	3.3	23	13	10
4								---	3.1	23	13	9.7
5								---	3.1	18	13	9.3
6								---	3.0	19	13	8.4
7								---	3.0	19	14	8.0
8								---	3.0	17	13	7.5
9								---	3.0	15	13	6.9
10								---	3.0	14	12	6.6
11								---	3.1	71	13	6.7
12								---	3.2	34	13	4.8
13								---	6.5	25	13	2.5
14								---	128	39	13	2.5
15								---	130	33	12	3.8
16								---	76	24	12	3.5
17								---	58	21	12	2.5
18								---	53	18	12	2.6
19								---	46	15	12	3.5
20								---	39	15	12	2.3
21								---	38	17	12	9.6
22								---	37	15	12	4.8
23								---	34	15	12	4.0
24								---	33	16	11	5.2
25								---	29	16	16	8.0
26								---	26	14	27	11
27								---	22	14	70	5.7
28								---	32	13	36	4.8
29								8.1	40	13	17	5.1
30								5.8	26	13	13	10
31								4.8	---	13	12	---
TOTAL								---	891.9	644	501	191.3
MEAN								---	29.7	20.8	16.2	6.38
MAX								---	130	71	70	11
MIN								---	3.0	13	11	2.3
CFSM								---	.94	.66	.51	.20
IN.								---	1.05	.76	.59	.22
AC-FT								---	1770	1280	994	379

05288950 MISSISSIPPI RIVER AT FORD PLANT AT ST. PAUL, MN

LOCATION.--Lat 44°54'57", long 93°11'59", in NE¼NW¼ sec.17, T.28 N., R.23 W., Ramsey County, Hydrologic Unit 07010206, Ford Motor Company hydroelectric plant, 800 ft (244 m) downstream from Ford Parkway bridge, 3.5 mi (5.6 km) upstream from Minnesota River at mile 847.6 (1,363.8 km) upstream from the Ohio River.

DRAINAGE AREA.--19,700 mi^2 (51,000 km^2).

PERIOD OF RECORD.--Water years 1974-78, October 1980 to September 1981.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: November 1973 to September 1978, October 1980 to September 1981.
pH: November 1973 to September 1978, October 1980 to September 1981.
WATER TEMPERATURES: November 1973 to September 1978, October 1980 to September 1981.
DISSOLVED OXYGEN: November 1973 to September 1978, October 1980 to September 1981.

INSTRUMENTATION.--Water-quality monitor from November 1973 to September 1978, October 1980 to September 1981.

REMARKS.--Extremes are published for years with 80 percent or more daily record.

COOPERATION.--Water-quality monitor operated by the Metropolitan Waste Control Commission, St. Paul, MN.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water year 1981): Maximum, 454 micromhos July 14, 1981; minimum, 282 micromhos May 5, 1981.
pH (water year 1981): Maximum, 8.5 units Mar. 13-15, 19, Apr. 17, 18, 21, May 21, 22, June 1, 5-7, 1981; minimum, 7.5 units June 17, 1981.
WATER TEMPEATURES (water year 1981): Maximum, 27.0°C July 19-21, 1981; minimum, 0.0°C Feb. 6-10, 17, 1981.
DISSOLVED OXYGEN (water year 1981): Maximum, 17.4 mg/L Mar. 23, 1981; minimum, 6.0 mg/L July 19, 1981.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 454 micromhos July 14; minimum, 282 micromhos May 5.
pH: Maximum, 8.5 units Mar. 13-15, 19, Apr. 17, 18, 21, May 21, 22, June 1, 5-7; minimum, 7.5 units June 17.
WATER TEMPERATURES: Maximum, 27.0°C July 19-21; minimum, 0.0°C Feb. 6-10, 17.
DISSOLVED OXYGEN: Maximum, 17.4 mg/L Mar. 23; minimum, 6.0 mg/L July 19.

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	370	365	367	363	361	361	331	326	329	---	---	---
2	367	364	365	367	360	363	331	286	325	---	---	---
3	368	365	366	365	361	362	329	326	327	---	---	---
4	367	364	365	364	335	352	330	327	328	---	---	---
5	369	363	366	337	333	335	331	328	329	---	---	---
6	369	365	366	337	333	335	331	330	330	---	---	---
7	374	363	367	335	332	333	331	328	329	---	---	---
8	369	362	365	---	---	---	329	324	326	373	371	372
9	373	364	367	335	332	333	358	324	339	375	371	373
10	369	363	365	333	331	332	355	352	354	373	371	372
11	364	359	361	335	332	333	352	350	351	373	370	371
12	365	361	362	335	331	333	357	352	355	373	368	370
13	365	361	362	335	331	332	354	351	353	371	312	360
14	365	361	363	332	331	331	356	354	354	351	345	347
15	367	358	364	334	330	331	356	350	354	354	350	352
16	370	363	365	334	331	332	---	---	---	354	350	351
17	370	360	364	333	331	332	365	361	362	351	350	350
18	361	357	358	335	327	332	362	358	359	347	343	345
19	359	356	358	339	333	335	356	350	354	347	343	345
20	---	---	---	336	334	335	---	---	---	351	344	346
21	---	---	---	341	331	335	---	---	---	351	346	348
22	---	---	---	343	335	338	---	---	---	352	344	350
23	366	364	365	337	331	333	---	---	---	347	345	345
24	364	360	362	335	330	331	---	---	---	343	339	340
25	363	359	360	333	329	331	---	---	---	335	332	334
26	363	359	361	336	329	332	---	---	---	329	325	327
27	362	359	360	332	331	331	---	---	---	335	324	330
28	364	358	360	332	329	330	---	---	---	327	324	325
29	362	358	360	332	330	331	---	---	---	350	324	325
30	365	356	362	333	330	331	---	---	---	328	324	326
31	365	362	362	---	---	---	---	---	---	325	323	324
MONTH												

05288950 MISSISSIPPI RIVER AT FORD PLANT AT ST. PAUL, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	326	319	321	347	345	346	368	346	351	320	308	314
2	320	318	319	345	343	344	363	349	351	311	305	308
3	321	318	320	350	343	345	358	352	353	305	300	303
4	321	316	320	347	344	345	364	349	354	301	285	296
5	323	318	320	347	337	345	349	340	343	289	282	285
6	323	321	321	347	345	346	356	342	380	310	283	299
7	321	318	320	350	346	347	350	348	349	309	306	307
8	321	318	320	350	347	348	354	349	351	312	307	310
9	320	319	320	350	347	349	353	350	351	314	309	311
10	342	319	327	350	345	349	354	349	352	313	308	311
11	338	334	335	349	347	347	354	350	351	314	304	310
12	339	320	336	---	---	---	354	351	352	313	306	309
13	342	320	338	350	347	348	354	351	353	314	309	310
14	---	---	---	359	347	349	357	353	355	329	324	327
15	349	321	339	356	349	350	355	345	350	333	326	329
16	352	344	348	---	---	---	349	344	346	337	329	332
17	350	325	336	353	347	351	354	349	351	342	335	338
18	328	324	326	352	349	350	355	350	353	343	338	341
19	330	324	326	353	348	350	354	348	351	349	338	345
20	347	326	328	352	347	349	348	344	346	347	343	345
21	331	328	328	354	347	350	348	344	346	343	336	340
22	328	327	327	358	350	352	348	343	345	340	336	338
23	328	324	325	359	352	355	345	340	343	340	331	336
24	---	---	---	361	348	356	343	339	341	335	332	334
25	349	347	347	363	355	358	345	340	343	330	326	328
26	350	347	348	358	355	357	343	340	342	328	325	326
27	350	324	347	364	356	360	344	339	342	322	318	320
28	347	345	346	369	355	363	341	335	337	318	315	316
29	---	---	---	---	---	---	337	329	333	316	309	313
30	---	---	---	362	355	358	330	318	325	314	308	311
31	---	---	---	360	339	354	---	---	---	311	301	307
MONTH							368	318	348	349	282	319

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	309	302	306	337	325	328	373	357	367	406	403	405
2	313	305	308	328	326	327	374	368	372	407	403	405
3	325	311	320	328	326	327	373	371	372	421	405	411
4	326	320	324	328	326	327	372	365	369	433	420	426
5	320	311	317	326	321	324	368	354	361	442	433	437
6	332	324	327	323	319	321	360	352	355	446	442	444
7	335	327	332	328	323	326	356	348	352	447	442	445
8	338	323	332	339	326	336	357	349	354	453	441	446
9	342	334	338	338	331	335	357	351	355	446	429	440
10	346	335	335	341	333	337	364	354	361	438	421	431
11	335	327	332	336	285	320	362	357	360	448	428	434
12	335	326	331	376	313	329	358	348	353	434	409	423
13	330	321	326	436	368	409	356	350	353	418	406	422
14	330	314	322	454	434	444	356	349	353	415	403	408
15	322	285	304	444	343	357	350	347	349	428	412	421
16	305	293	300	357	351	354	349	337	343	422	416	420
17	326	305	316	362	357	358	351	341	345	418	414	415
18	324	320	322	361	359	360	352	348	350	421	414	418
19	327	320	324	362	358	360	354	343	349	421	407	414
20	332	328	331	369	362	364	351	341	346	412	398	407
21	335	332	333	377	366	373	353	346	349	409	397	404
22	338	335	337	382	376	379	359	352	355	419	409	413
23	343	335	342	383	378	380	362	353	357	419	412	416
24	343	337	341	382	360	375	363	358	360	424	419	422
25	345	340	342	375	368	373	368	359	364	432	425	430
26	345	342	343	376	367	372	365	355	359	435	426	431
27	346	342	344	368	364	366	356	330	343	437	430	435
28	345	336	340	362	356	358	378	350	365	437	432	435
29	339	324	335	364	355	358	383	371	377	439	433	436
30	338	335	336	366	361	363	384	369	375	426	418	424
31	---	---	---	371	366	367	406	382	397	---	---	---
MONTH	346	285	328	454	285	355	406	330	359	453	397	424

05288950 MISSISSIPPI RIVER AT FORD PLANT AT ST. PAUL, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	7.9	7.8	7.8	7.9	7.9	7.9	8.1	8.1	8.1	---	---	---
2	7.9	7.8	7.9	7.9	7.9	7.9	8.3	8.0	8.2	---	---	---
3	7.9	7.9	7.9	---	---	---	8.3	8.3	8.3	---	---	---
4	7.9	7.9	7.9	---	---	---	8.3	8.2	8.3	---	---	---
5	7.9	7.9	7.9	8.0	7.9	8.0	8.3	7.8	8.3	---	---	---
6	7.9	7.9	7.9	8.1	8.0	8.0	8.3	8.2	8.3	---	---	---
7	7.9	7.8	7.8	8.0	8.0	8.0	8.2	8.1	8.1	8.0	7.8	7.9
8	7.9	7.8	7.8	---	---	---	8.1	8.1	8.1	---	---	---
9	7.8	7.8	7.8	8.0	7.9	7.9	8.3	8.0	8.1	---	---	---
10	7.8	7.8	7.8	7.9	7.8	7.9	8.1	8.0	8.0	---	---	---
11	7.9	7.8	7.8	7.9	7.9	7.9	---	---	---	---	---	---
12	7.9	7.8	7.9	7.9	7.9	7.9	---	---	---	---	---	---
13	7.9	7.9	7.9	7.9	7.8	7.9	---	---	---	---	---	---
14	7.9	7.9	7.9	7.8	7.8	7.8	---	---	---	---	---	---
15	8.2	7.9	7.9	7.9	7.8	7.8	---	---	---	---	---	---
16	7.9	7.9	7.9	7.9	7.8	7.8	---	---	---	---	---	---
17	7.9	7.8	7.8	7.9	7.8	7.9	---	---	---	---	---	---
18	7.8	7.8	7.8	7.9	7.8	7.9	---	---	---	---	---	---
19	7.8	7.8	7.8	8.0	7.8	7.9	---	---	---	---	---	---
20	---	---	---	8.0	7.9	7.9	---	---	---	---	---	---
21	---	---	---	7.9	7.8	7.9	---	---	---	---	---	---
22	---	---	---	8.0	7.8	7.9	---	---	---	---	---	---
23	7.9	7.9	7.9	7.9	7.8	7.9	---	---	---	7.9	7.8	7.8
24	7.9	7.8	7.9	7.9	7.8	7.9	---	---	---	7.9	7.8	7.9
25	7.9	7.9	7.9	7.9	7.8	7.9	---	---	---	7.9	7.9	7.9
26	7.9	7.9	7.9	7.9	7.8	7.9	---	---	---	7.9	7.9	7.9
27	7.9	7.9	7.9	7.9	7.9	7.9	---	---	---	8.0	7.9	7.9
28	7.9	7.9	7.9	7.9	7.8	7.9	---	---	---	8.1	8.0	8.1
29	7.9	7.9	7.9	8.0	7.9	8.0	---	---	---	8.1	7.7	8.0
30	7.9	7.8	7.9	8.1	8.0	8.0	---	---	---	8.1	7.9	8.0
31	7.9	7.9	7.9	---	---	---	---	---	---	8.1	8.0	8.1
MONTH												

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	8.1	8.0	8.1	7.8	7.7	7.8	8.4	7.8	7.9	8.1	7.9	8.0
2	8.1	8.0	8.0	7.9	7.8	7.8	8.2	7.8	7.9	8.2	7.9	8.0
3	8.1	8.0	8.0	8.0	7.8	7.9	8.2	7.8	7.9	8.2	7.9	8.0
4	8.0	7.9	8.0	8.0	7.7	7.9	7.9	7.7	7.8	8.1	7.8	8.0
5	8.1	7.9	8.0	8.0	7.7	7.9	7.9	7.7	7.8	7.8	7.7	7.8
6	8.3	7.8	7.9	8.0	7.9	7.9	8.0	7.8	7.9	7.9	7.7	7.8
7	8.0	7.7	7.9	8.1	8.0	8.0	8.0	7.9	7.9	8.1	7.8	7.9
8	8.0	7.9	8.0	8.2	8.0	8.1	8.0	7.9	7.9	8.1	7.9	8.0
9	8.0	8.0	8.0	8.2	8.0	8.1	8.0	7.9	8.0	8.1	7.9	8.0
10	8.0	7.9	8.0	8.4	8.0	8.1	8.2	8.0	8.1	8.1	7.9	8.0
11	8.0	7.9	7.9	8.3	8.2	8.2	8.2	8.1	8.1	8.2	7.9	8.0
12	8.0	7.9	7.9	---	---	---	8.3	8.2	8.2	8.2	8.0	8.1
13	---	---	---	8.5	8.3	8.4	8.3	8.2	8.2	8.1	8.0	8.0
14	---	---	---	8.5	8.3	8.4	8.4	8.2	8.3	8.2	8.0	8.1
15	---	---	---	8.5	8.4	8.5	8.4	8.2	8.3	8.2	8.0	8.1
16	---	---	---	---	---	---	8.4	8.3	8.4	8.2	8.0	8.1
17	---	---	---	8.4	8.0	8.1	8.5	8.3	8.4	8.2	8.1	8.1
18	---	---	---	8.2	8.0	8.0	8.5	8.3	8.3	8.1	8.0	8.0
19	---	---	---	8.5	8.0	8.1	8.4	8.3	8.4	8.2	7.9	8.1
20	---	---	---	8.4	7.9	8.0	8.4	8.3	8.3	8.3	8.1	8.2
21	---	---	---	8.2	8.0	8.0	8.5	8.3	8.4	8.5	8.2	8.3
22	---	---	---	8.3	8.0	8.1	8.4	8.2	8.3	8.5	8.1	8.3
23	---	---	---	8.3	8.1	8.2	8.3	8.1	8.2	8.4	8.1	8.2
24	---	---	---	8.4	8.0	8.2	8.1	8.0	8.0	8.3	8.0	8.2
25	8.0	7.8	7.9	8.3	8.1	8.2	8.2	8.0	8.1	8.0	7.8	7.9
26	8.0	7.9	7.9	8.3	8.1	8.2	8.3	8.1	8.2	7.9	7.7	7.8
27	---	---	---	8.3	8.1	8.2	8.3	8.2	8.3	8.0	7.7	7.9
28	7.8	7.7	7.8	8.4	8.2	8.3	8.3	8.1	8.2	8.1	7.8	7.9
29	---	---	---	8.3	8.1	8.2	8.2	8.1	8.1	8.1	7.8	7.9
30	---	---	---	8.2	8.0	8.1	8.1	8.0	8.0	8.3	7.9	8.1
31	---	---	---	8.0	7.8	7.9	---	---	---	8.3	8.0	8.1
MONTH							8.5	7.7	8.1	8.5	7.7	8.0

05288950 MISSISSIPPI RIVER AT FORD PLANT AT ST. PAUL, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.5	8.0	8.2	7.9	7.8	7.8	8.1	7.8	8.0	7.8	7.8	7.8
2	8.4	8.1	8.3	8.0	7.8	7.9	8.0	7.8	7.9	7.9	7.8	7.8
3	8.4	8.0	8.2	8.0	7.8	7.9	8.0	7.8	7.9	7.9	7.8	7.9
4	8.3	8.1	8.2	8.0	7.8	7.9	8.2	7.9	8.1	7.9	7.9	7.9
5	8.5	8.0	8.2	8.0	7.8	7.9	8.2	8.1	8.1	8.0	7.9	7.9
6	8.5	8.1	8.3	8.1	7.8	7.9	8.4	8.1	8.2	8.1	8.0	8.0
7	8.5	8.2	8.3	8.2	7.9	8.0	8.3	8.1	8.2	8.1	8.0	8.0
8	8.3	8.1	8.2	8.2	8.0	8.1	8.3	8.1	8.2	8.2	8.0	8.1
9	8.2	8.0	8.1	8.2	8.0	8.1	8.2	8.1	8.2	8.2	8.1	8.1
10	8.1	8.0	8.0	8.2	8.1	8.1	8.3	8.1	8.2	8.2	8.0	8.1
11	8.2	8.0	8.1	8.3	7.8	8.0	8.2	8.1	8.1	8.3	8.0	8.2
12	8.2	7.9	8.1	8.0	7.9	7.9	8.2	8.0	8.1	8.3	8.0	8.2
13	8.2	7.9	8.0	7.9	7.8	7.8	8.1	8.1	8.1	8.2	8.0	8.1
14	8.0	7.8	7.9	7.9	7.8	7.8	8.1	7.9	8.0	8.3	8.0	8.1
15	7.8	7.6	7.7	7.8	7.7	7.8	8.1	8.0	8.0	8.3	8.0	8.1
16	7.7	7.6	7.6	7.9	7.8	7.9	8.1	8.0	8.0	8.2	8.1	8.1
17	8.0	7.5	7.8	8.0	7.9	7.9	8.3	8.0	8.2	8.3	8.0	8.2
18	7.9	7.7	7.8	8.0	7.9	8.0	8.4	8.1	8.2	8.3	8.0	8.2
19	7.9	7.7	7.8	8.1	7.9	8.0	8.4	8.2	8.3	8.4	8.1	8.2
20	7.8	7.8	7.8	8.1	8.0	8.0	8.4	8.2	8.2	8.4	8.0	8.2
21	7.9	7.8	7.8	8.1	7.9	8.0	8.3	8.1	8.2	8.4	8.1	8.3
22	7.8	7.8	7.8	8.0	7.9	8.0	8.3	8.0	8.2	8.4	8.0	8.2
23	7.9	7.8	7.8	8.0	7.9	7.9	8.3	8.0	8.1	8.4	8.2	8.3
24	7.9	7.8	7.9	8.0	7.9	7.9	8.3	7.9	8.1	8.3	8.2	8.2
25	7.9	7.8	7.8	8.1	7.9	8.0	8.0	7.8	7.9	8.2	8.1	8.1
26	7.9	7.8	7.9	8.1	8.0	8.0	7.8	7.7	7.8	8.2	8.0	8.1
27	8.0	7.8	7.9	8.2	8.0	8.1	7.7	7.6	7.6	8.2	7.9	8.0
28	7.9	7.9	7.9	8.0	8.0	8.0	7.8	7.6	7.7	8.2	7.9	8.0
29	7.9	7.8	7.8	8.1	8.0	8.0	7.8	7.7	7.8	8.2	7.9	8.1
30	7.9	7.8	7.9	8.2	8.0	8.1	7.8	7.7	7.7	8.2	8.0	8.1
31	---	---	---	8.2	8.1	8.1	7.9	7.8	7.8	---	---	---
MONTH	8.5	7.5	8.0	8.3	7.7	8.0	8.4	7.6	8.0	8.4	7.8	8.1

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	16.5	15.5	16.5	8.5	8.5	8.5	3.0	2.5	3.0	---	---	---
2	16.5	16.0	16.5	8.5	8.0	8.5	4.0	1.5	2.5	---	---	---
3	16.0	16.0	16.0	9.0	8.0	8.5	2.0	2.0	2.0	---	---	---
4	15.5	15.0	15.5	9.0	8.5	9.0	2.5	2.0	2.0	---	---	---
5	15.0	15.0	15.0	9.0	9.0	9.0	3.0	2.5	2.5	---	---	---
6	15.5	15.0	15.0	9.0	8.5	8.5	2.5	2.5	2.5	---	---	---
7	16.0	15.0	15.5	9.0	8.5	8.5	2.5	2.0	2.5	2.0	1.5	2.0
8	16.5	15.5	16.0	---	---	---	2.5	2.0	2.5	2.0	2.0	2.0
9	16.5	16.0	16.0	8.5	8.0	8.5	2.5	1.5	2.0	2.0	2.0	2.0
10	16.5	16.0	16.0	8.5	8.0	8.0	---	---	---	2.5	2.0	2.0
11	16.0	15.5	15.5	8.0	7.5	8.0	---	---	---	2.5	2.0	2.0
12	15.0	14.5	14.5	7.5	7.5	7.5	---	---	---	2.0	2.0	2.0
13	14.5	14.0	14.0	7.5	4.0	5.5	---	---	---	2.0	1.5	2.0
14	14.0	13.5	14.0	4.0	4.0	4.0	---	---	---	1.5	1.5	1.5
15	13.5	10.5	12.5	8.0	3.5	4.0	---	---	---	1.5	1.5	1.5
16	11.0	10.5	11.0	4.0	3.5	3.5	---	---	---	1.5	1.5	1.5
17	11.0	11.0	11.0	4.0	4.0	4.0	3.0	3.0	3.0	---	---	---
18	11.0	10.5	10.5	4.0	4.0	4.0	3.0	3.0	3.0	1.5	1.5	1.5
19	10.5	10.0	10.5	4.0	3.5	3.5	3.5	3.0	3.0	---	---	---
20	---	---	---	4.0	3.5	3.5	---	---	---	---	---	---
21	---	---	---	4.0	3.5	3.5	---	---	---	---	---	---
22	---	---	---	4.0	3.5	3.5	---	---	---	---	---	---
23	11.0	10.0	10.5	4.0	3.5	4.0	---	---	---	2.5	2.0	2.5
24	10.5	9.5	10.5	4.0	3.5	3.5	---	---	---	2.5	2.0	2.5
25	10.0	9.5	10.0	3.5	3.0	3.0	---	---	---	2.5	2.0	2.0
26	9.5	9.0	9.5	3.5	3.0	3.0	---	---	---	2.5	2.0	2.0
27	9.5	9.0	9.0	3.0	3.0	3.0	---	---	---	2.5	2.0	2.5
28	10.5	8.5	9.0	3.5	3.0	3.0	---	---	---	2.5	2.5	2.5
29	9.0	8.5	9.0	3.5	3.0	3.0	---	---	---	2.5	2.0	2.5
30	9.0	8.0	8.5	3.5	3.0	3.5	---	---	---	2.5	2.5	2.5
31	8.5	8.0	8.5	---	---	---	---	---	---	2.0	2.0	2.0
MONTH												

05288950 MISSISSIPPI RIVER AT FORD PLANT AT ST. PAUL, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2.0	1.5	1.5	5.5	5.0	5.5	10.5	9.5	10.5	12.5	12.0	12.0
2	1.0	1.0	1.0	5.5	5.0	5.0	10.5	10.0	10.5	12.5	12.0	12.5
3	.5	.5	.5	5.5	5.0	5.0	11.0	10.5	10.5	13.0	12.5	12.5
4	.5	.5	.5	5.0	5.0	5.0	11.0	9.0	10.0	13.0	13.0	13.0
5	2.0	.5	.5	5.5	2.5	4.0	9.0	9.0	9.0	13.0	12.5	13.0
6	.5	.0	.5	3.0	2.5	3.0	9.5	9.0	9.5	13.5	12.5	13.0
7	2.0	.0	.5	3.5	3.0	3.0	10.5	10.5	10.5	14.0	13.0	13.5
8	.5	.0	.0	3.5	3.0	3.5	11.0	10.5	11.0	14.0	13.5	13.5
9	.5	.0	.5	4.0	3.0	3.5	11.5	11.0	11.0	14.0	13.5	13.5
10	.5	.0	.5	4.0	3.0	3.5	11.5	11.0	11.5	13.5	13.5	13.5
11	---	---	---	4.0	3.5	3.5	11.5	11.0	11.5	13.5	13.0	13.0
12	---	---	---	---	---	---	11.5	11.0	11.5	13.5	12.5	13.0
13	---	---	---	4.0	3.5	4.0	11.5	11.5	11.5	13.5	13.0	13.0
14	---	---	---	4.0	3.5	4.0	11.5	11.0	11.0	14.0	13.0	13.5
15	---	---	---	4.0	3.5	4.0	11.0	11.0	11.0	14.5	13.5	14.0
16	---	---	---	---	---	---	11.0	10.5	11.0	15.0	14.5	14.5
17	1.0	.0	1.0	5.0	4.0	4.5	12.0	11.0	11.5	15.5	15.5	15.5
18	1.5	.5	1.0	4.5	4.0	4.5	12.0	11.5	11.5	16.5	15.5	16.0
19	2.0	1.0	1.5	4.0	3.5	4.0	12.0	11.5	11.5	17.0	16.0	16.5
20	2.5	2.0	2.0	4.0	3.0	3.5	11.5	11.5	11.5	17.0	16.0	16.5
21	3.5	1.0	3.0	5.0	3.5	3.5	12.0	11.5	12.0	18.5	17.0	17.5
22	3.5	3.0	3.0	6.0	4.5	5.0	12.0	11.5	11.5	19.0	17.5	18.5
23	3.5	3.0	3.5	7.0	6.0	6.5	11.5	11.0	11.0	19.0	18.0	18.5
24	6.0	3.5	4.5	7.5	5.0	7.0	10.5	10.5	10.5	19.0	18.5	18.5
25	6.0	5.5	6.0	8.0	7.5	8.0	10.5	10.0	10.5	18.5	18.0	18.0
26	6.0	6.0	6.0	8.5	8.0	8.5	11.0	10.5	11.0	18.0	17.5	18.0
27	6.0	1.5	5.5	10.5	8.0	9.0	12.0	11.5	11.5	17.5	17.5	17.5
28	5.0	5.0	5.0	10.5	5.5	10.0	12.5	11.5	12.0	18.0	17.5	17.5
29	---	---	---	10.5	9.5	10.0	12.5	12.0	12.5	18.5	17.5	18.0
30	---	---	---	11.5	10.5	11.0	12.5	12.0	12.0	19.0	18.0	18.5
31	---	---	---	---	---	---	---	---	---	19.0	18.5	18.5
MONTH							12.5	9.0	11.0	19.0	12.0	15.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	19.5	18.5	19.0	23.5	21.5	23.0	23.5	23.5	23.5	22.5	21.0	21.5
2	20.0	19.5	19.5	24.0	23.0	23.5	23.5	23.5	23.5	21.0	20.5	20.5
3	20.0	19.5	20.0	24.0	23.5	23.5	24.0	23.5	23.5	20.5	20.5	20.5
4	20.5	20.5	20.5	24.0	23.5	24.0	24.5	24.0	24.5	20.5	20.0	20.5
5	21.0	20.0	20.5	24.5	23.5	24.5	24.5	24.5	24.5	20.5	20.0	20.5
6	22.0	19.0	20.5	25.0	24.5	25.0	25.0	24.5	24.5	20.5	20.5	20.5
7	22.5	21.0	21.5	25.5	25.0	25.5	24.5	24.0	24.5	20.5	20.5	20.5
8	22.0	21.5	21.5	26.5	25.0	26.0	24.0	23.5	24.0	21.0	20.5	21.0
9	22.0	21.5	21.5	26.5	26.0	26.0	24.0	23.5	24.0	21.0	20.5	21.0
10	21.5	21.0	21.5	26.5	26.0	26.0	23.5	23.5	23.5	21.5	21.0	21.0
11	21.5	21.0	21.0	26.0	25.0	25.5	23.5	23.5	23.5	22.0	21.5	21.5
12	21.5	21.0	21.0	26.0	25.5	25.5	24.0	23.5	24.0	22.0	21.5	22.0
13	22.0	21.0	21.0	25.5	25.5	25.5	24.5	24.0	24.0	22.0	21.5	21.5
14	21.5	21.5	21.5	26.0	25.5	26.0	24.5	24.0	24.5	21.5	21.0	21.5
15	21.5	21.0	21.5	26.0	25.0	25.5	24.5	24.0	24.0	21.0	20.0	20.5
16	21.0	21.0	21.0	25.5	25.0	25.0	24.0	23.5	24.0	20.0	19.5	20.0
17	21.0	20.5	21.0	26.0	25.5	25.5	23.5	23.0	23.5	19.5	17.0	19.0
18	21.0	20.5	20.5	26.5	26.0	26.0	23.5	23.0	23.5	19.0	16.5	17.0
19	21.0	20.5	20.5	27.0	26.5	26.5	23.5	23.0	23.5	19.0	16.5	17.5
20	20.5	20.0	20.5	27.0	26.5	26.5	23.5	23.0	23.5	19.5	16.5	18.5
21	20.0	20.0	20.0	27.0	26.0	26.5	23.5	23.0	23.5	19.5	17.0	19.0
22	20.0	20.0	20.0	26.0	25.5	25.5	23.5	22.5	23.0	19.5	18.0	18.5
23	20.0	19.5	19.5	25.0	24.5	25.0	23.5	22.5	23.0	18.5	16.0	16.5
24	20.0	19.5	19.5	25.0	24.5	25.0	23.5	22.5	23.0	15.5	15.5	15.5
25	21.0	20.0	20.0	25.5	25.0	25.0	23.5	23.0	23.0	15.0	15.0	15.0
26	21.0	20.5	21.0	25.5	25.0	25.0	23.0	22.5	23.0	15.0	15.0	15.0
27	21.5	21.0	21.0	25.0	24.5	25.0	22.5	22.0	22.0	14.5	14.0	14.5
28	21.5	21.0	21.0	24.5	24.5	24.5	22.0	21.5	22.0	13.5	13.0	13.5
29	21.0	21.0	21.0	23.0	22.5	22.5	21.5	21.5	21.5	14.0	12.5	13.0
30	21.5	21.5	21.5	23.0	22.5	23.0	22.0	21.5	21.5	14.0	11.5	12.0
31	---	---	---	23.5	23.0	23.5	22.5	22.0	22.5	---	---	---
MONTH	22.5	18.5	20.5	27.0	21.5	25.0	25.0	21.5	23.5	22.5	11.5	18.5

05288950 MISSISSIPPI RIVER AT FORD PLANT AT ST. PAUL, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.8	9.5	10.0	11.9	10.7	11.4	12.0	10.9	11.3	---	---	---
2	10.2	9.4	9.8	11.0	10.4	10.7	16.3	10.0	11.7	---	---	---
3	11.0	9.1	9.7	12.0	9.7	10.7	13.2	13.0	13.0	---	---	---
4	11.8	10.2	10.8	11.9	11.1	11.5	13.2	12.6	12.8	---	---	---
5	12.5	10.1	10.9	12.0	10.6	11.2	12.9	11.5	12.7	---	---	---
6	13.3	9.9	11.5	12.1	10.9	11.3	12.9	12.1	12.3	---	---	---
7	12.9	10.6	11.3	11.5	10.5	10.9	12.2	11.7	11.9	11.3	9.5	11.2
8	12.1	10.0	11.0	---	---	---	11.9	11.4	11.7	11.2	10.8	11.1
9	12.2	9.1	10.5	10.7	10.1	10.4	12.8	11.5	11.8	11.3	10.9	11.0
10	11.7	8.6	9.8	12.2	10.0	11.0	12.8	12.2	12.4	11.6	11.0	11.3
11	9.8	8.1	8.7	12.2	11.3	11.7	13.0	12.3	12.7	11.8	11.1	11.4
12	11.1	8.4	9.7	12.2	11.3	11.7	12.4	11.9	12.1	11.5	10.8	11.1
13	10.9	9.2	10.3	11.7	11.2	11.4	12.4	12.0	12.2	12.7	9.6	11.4
14	11.6	8.8	10.3	11.9	11.2	11.5	12.3	12.0	12.1	12.0	11.5	11.8
15	13.7	9.6	11.1	12.4	11.4	11.8	13.1	12.0	12.5	12.4	11.5	11.9
16	13.7	12.3	12.9	12.6	11.7	12.1	13.5	11.7	13.0	12.7	11.9	12.3
17	12.6	10.2	11.2	12.4	11.4	11.8	13.4	13.0	13.2	13.7	12.1	12.8
18	11.7	10.5	11.0	13.0	11.2	11.7	13.5	13.0	13.2	13.5	12.0	12.6
19	12.6	10.5	11.2	12.5	11.6	12.0	13.3	11.7	13.1	12.3	11.8	12.1
20	---	---	---	12.4	11.7	12.0	---	---	---	12.1	11.8	11.9
21	---	---	---	11.7	11.1	11.4	---	---	---	12.2	11.9	12.0
22	---	---	---	11.5	10.9	11.2	---	---	---	12.7	10.7	12.1
23	12.5	11.6	11.9	11.6	10.9	11.2	---	---	---	12.1	11.8	11.9
24	12.6	10.7	11.2	12.2	10.8	11.3	---	---	---	11.9	11.6	11.8
25	11.6	10.7	11.1	12.4	11.5	12.0	---	---	---	11.7	11.6	11.7
26	13.1	10.8	12.0	12.6	10.9	12.2	---	---	---	11.7	11.4	11.5
27	14.7	11.7	12.9	12.8	11.8	12.2	---	---	---	11.5	11.0	11.3
28	14.8	10.8	13.9	12.3	10.9	11.7	---	---	---	11.5	11.0	11.3
29	13.9	13.0	13.4	11.7	11.2	11.4	---	---	---	12.1	11.4	11.8
30	14.0	12.1	13.0	11.7	10.9	11.2	---	---	---	12.5	11.8	12.2
31	13.0	11.8	12.7	---	---	---	---	---	---	12.3	11.8	12.2
MONTH												

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	11.9	11.1	11.8	15.0	14.1	14.6	14.0	10.0	11.0	10.2	8.9	9.4
2	12.3	11.7	11.9	15.2	13.9	14.5	12.2	10.2	11.0	11.6	8.7	10.2
3	13.7	12.0	12.8	15.3	14.1	14.6	11.8	9.8	10.7	10.9	9.4	10.1
4	13.5	12.5	13.0	15.3	13.9	14.6	10.3	9.3	9.8	9.8	8.5	9.2
5	13.2	11.8	12.8	14.9	13.9	14.4	13.0	10.0	11.4	9.7	8.5	9.0
6	12.9	12.5	12.7	14.5	13.3	13.8	13.5	11.7	12.5	10.6	8.7	9.7
7	12.6	12.0	12.3	15.1	13.4	14.3	12.9	10.7	11.8	10.7	9.4	10.0
8	12.6	12.3	12.5	15.9	13.6	14.7	12.2	10.3	10.9	10.6	9.2	9.9
9	12.5	12.1	12.4	15.6	13.9	14.7	11.1	9.8	10.4	10.3	9.0	9.6
10	12.4	11.6	12.0	15.2	13.5	14.2	12.0	9.3	10.6	10.3	9.1	9.7
11	11.7	11.3	11.5	14.4	13.2	13.6	11.3	9.6	10.5	10.7	9.5	10.0
12	12.5	11.4	11.7	---	---	---	10.8	9.1	9.9	10.9	9.2	10.0
13	12.4	11.3	11.4	15.1	13.2	14.1	9.8	8.6	9.3	10.0	9.6	9.8
14	---	---	---	15.5	12.9	14.1	11.9	8.0	10.0	10.6	9.1	9.9
15	12.6	11.3	11.7	15.4	13.3	14.3	12.3	10.6	11.4	10.3	8.9	9.7
16	11.5	11.1	11.3	---	---	---	11.5	9.9	10.9	10.3	8.4	9.3
17	12.7	11.2	12.0	15.6	13.2	14.6	10.7	9.4	10.0	9.7	8.2	8.9
18	13.0	12.7	12.8	15.3	12.5	13.6	10.7	9.2	9.8	9.1	7.7	8.4
19	13.0	12.4	12.7	15.7	12.7	14.1	10.4	9.0	9.7	10.3	8.0	9.1
20	13.0	11.2	12.6	16.2	12.9	14.6	10.1	8.6	9.3	10.3	8.2	9.2
21	13.0	12.1	12.5	16.5	13.2	14.7	12.0	8.7	10.8	11.0	8.5	9.5
22	12.1	11.9	12.0	17.1	13.0	14.5	10.3	9.7	10.0	9.8	8.0	8.7
23	12.8	11.9	12.3	17.4	13.1	14.9	10.3	9.7	10.1	8.6	7.5	8.2
24	14.6	10.2	13.4	17.0	13.0	14.8	10.7	10.1	10.4	8.4	6.9	7.7
25	15.4	13.8	14.6	15.2	12.7	14.0	13.1	10.6	11.7	8.3	7.3	7.8
26	15.5	14.0	14.7	14.3	11.6	12.9	12.5	10.9	11.7	8.3	7.4	7.9
27	15.0	11.9	14.5	15.5	11.6	13.4	12.2	10.3	11.4	9.1	7.6	8.4
28	14.3	13.8	14.1	14.4	12.0	13.0	11.9	10.0	10.9	9.7	8.0	8.8
29	---	---	---	13.5	10.9	11.9	10.8	9.7	10.1	9.1	7.9	8.4
30	---	---	---	11.7	9.6	10.6	10.4	9.0	9.8	10.1	7.6	8.7
31	---	---	---	---	---	---	---	---	---	10.1	8.1	8.9
MONTH							14.0	8.0	10.6	11.6	6.9	9.2

05288950 MISSISSIPPI RIVER AT FORD PLANT AT ST. PAUL, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	10.1	7.6	8.5	9.2	8.0	8.6	7.9	7.0	7.4	8.7	7.4	8.1
2	9.0	7.2	8.0	9.2	7.9	8.5	7.6	6.7	7.1	8.6	7.5	8.1
3	8.9	6.6	7.3	8.9	7.5	8.1	7.3	6.4	6.8	7.8	7.1	7.5
4	8.3	6.5	7.4	8.1	7.0	7.6	9.7	6.4	7.9	8.6	7.0	7.6
5	9.6	6.9	8.1	8.2	7.5	7.8	8.6	7.3	7.9	8.6	7.6	8.1
6	10.2	7.5	8.9	8.3	6.9	7.4	8.8	6.9	7.7	8.4	7.4	7.8
7	9.3	7.5	8.4	8.9	7.1	7.8	7.8	6.2	7.1	7.7	6.9	7.3
8	8.2	7.1	7.6	8.9	7.1	7.9	8.9	7.0	7.8	9.3	6.6	7.8
9	8.5	6.4	7.3	8.3	6.9	7.5	8.7	7.3	7.9	9.4	7.7	8.3
10	8.5	6.7	7.7	8.3	6.5	7.4	9.6	7.0	8.1	9.1	7.2	8.0
11	10.5	7.8	9.0	8.3	6.6	7.4	9.7	7.5	8.5	9.1	6.8	7.9
12	10.8	9.0	9.8	8.0	6.3	6.9	9.2	7.5	8.3	9.1	7.2	7.9
13	11.2	9.1	10.0	6.9	6.6	6.6	8.8	6.7	7.5	8.8	6.7	7.5
14	10.8	9.5	10.1	7.5	6.4	6.9	7.4	6.4	6.8	8.4	6.6	7.3
15	10.5	9.5	10.1	7.8	6.8	7.2	7.9	6.2	6.9	10.8	6.9	8.8
16	10.6	9.0	9.8	8.6	7.2	7.9	7.8	6.2	6.8	10.4	8.2	9.2
17	9.0	8.0	8.5	8.6	7.2	7.7	10.6	6.4	8.4	10.7	8.1	9.3
18	8.4	8.0	8.2	7.8	6.5	7.1	10.6	8.6	9.6	10.5	8.4	9.4
19	8.5	7.9	8.2	8.2	6.0	7.0	10.5	8.2	9.1	10.8	8.2	9.3
20	8.4	7.9	8.2	8.7	6.1	7.3	9.9	7.9	8.7	10.7	8.0	9.3
21	8.5	8.0	8.3	8.9	6.8	7.6	9.2	7.4	8.2	10.7	8.0	9.2
22	8.2	7.8	8.0	8.7	7.4	8.0	8.4	7.3	7.7	11.9	8.0	9.6
23	9.0	7.8	8.8	9.2	7.7	8.3	8.4	6.6	7.2	10.7	8.4	9.7
24	9.0	8.5	8.8	8.5	7.7	8.1	9.4	6.5	7.8	9.6	8.1	8.6
25	8.8	8.3	8.5	9.1	7.6	8.1	7.8	7.4	7.6	8.8	8.0	8.5
26	8.9	8.0	8.3	8.5	7.5	7.9	7.9	7.0	7.4	9.1	7.1	8.3
27	9.0	8.1	8.4	9.2	7.0	8.1	7.7	7.4	7.6	9.6	7.2	8.2
28	8.5	8.0	8.2	8.2	7.9	8.1	8.9	7.5	8.3	10.3	7.9	9.2
29	8.3	7.7	7.9	9.5	7.9	8.6	8.7	7.6	8.2	10.8	9.6	10.2
30	8.6	7.7	8.1	8.8	7.6	8.2	8.9	7.7	8.2	10.5	8.5	10.0
31	---	---	---	8.9	6.9	8.0	9.4	7.6	8.5	---	---	---
MONTH	11.2	6.4	8.5	9.5	6.0	7.7	10.6	6.2	7.8	11.9	6.6	8.5

05290000 LITTLE MINNESOTA RIVER NEAR PEEVER, SD

LOCATION.--Lat 45°36'05", long 96°52'18", in SW¼ sec.13, T.125 N., R.50 W., Roberts County, Hydrologic Unit 07020001, on Sisseton Indian Reservation, on right bank 2 mi (3 km) northwest of town of Browns Valley, MN, 5.3 mi (8.5 km) northeast of Peever, 7.2 mi (11.6 km) downstream from Jorgenson River, and 8 mi (13 km) upstream from Big Stone Lake.

DRAINAGE AREA.--447 mi^2 (1,158 km^2).

PERIOD OF RECORD.--October 1939 to current year.

REVISED RECORDS.--WSP 1308: 1943(M).

GAGE.--Water-stage recorder. Datum of gage is 1,002.20 ft (305.471 m) National Geodetic Vertical Datum of 1929. Oct. 1, 1939, to Mar. 20, 1940, nonrecording gage at site 4.5 mi (7.2 km) downstream at different datum. Mar. 21 to Apr. 12, 1940, nonrecording gage at site 100 ft (30 m) downstream at present datum. April 13 to Aug. 27, 1940, nonrecording gage at present site and datum.

REMARKS.--Records good except those for winter periods, which are fair.

AVERAGE DISCHARGE.--42 years, 43.5 ft^3/s (1.232 m^3/s), 1.32 in/yr (34 mm/yr), 31,520 acre-ft/yr (38.9 hm^3/yr); median of yearly mean discharges, 32 ft^3/s (0.91 m^3/s), 0.97 in/yr (25 mm/yr), 23,200 acre-ft/yr (29 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,730 ft^3/s (134 m^3/s) Apr. 8, 1952, gage height, 12.16 ft (3.706 m); maximum gage height, 13.35 ft (4.069 m) Mar. 25, 1943, from floodmark (backwater from ice); no flow at times in 1940, 1942, 1950, 1954, 1957, 1959, 1963, 1968, 1976, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17 ft^3/s (0.48 m^3/s) June 15, gage height, 3.04 ft (0.927 m), no peak above base of 450 ft^3/s (12.7 m^3/s); minimum daily, 0.05 ft^3/s (0.001 m^3/s) Jan. 20 to Feb. 14; minimum gage height, 2.17 ft (0.661 m) Aug. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.24	.39	.54	.40	.05	1.6	8.5	.98	4.4	1.4	2.0	.18
2	.22	.39	.46	.38	.05	1.4	7.1	1.2	3.5	1.1	1.7	.16
3	.22	.42	.46	.34	.05	1.6	7.1	1.4	2.7	.90	1.7	.16
4	.22	.42	.46	.30	.05	2.0	6.8	1.4	2.2	.83	1.4	.18
5	.22	.42	.54	.26	.05	2.0	5.6	1.1	1.9	1.3	1.2	.16
6	.20	.46	.54	.22	.05	1.9	5.2	.98	1.5	1.4	.83	.18
7	.20	.46	.52	.20	.05	2.0	4.8	.90	1.3	1.1	.59	.24
8	.20	.50	.50	.18	.05	2.0	4.3	.83	1.1	.98	.54	.20
9	.20	.50	.50	.14	.05	2.2	3.9	.98	1.1	.83	.46	.18
10	.18	.54	.46	.10	.05	2.2	3.3	1.1	.98	.76	.46	.18
11	.18	.50	.46	.10	.05	2.4	2.9	1.2	.83	.83	.39	.14
12	.22	.50	.50	.08	.05	2.9	2.7	1.1	.76	2.2	.28	.14
13	.22	.50	.50	.07	.05	3.3	2.7	1.2	1.6	2.7	.22	.12
14	.22	.50	.50	.07	.05	3.1	2.2	1.1	4.1	3.5	.18	.12
15	.26	.50	.50	.06	.18	4.1	1.9	1.1	13	2.6	.16	.14
16	.39	.59	.50	.06	.30	4.8	1.9	1.2	7.9	2.7	.14	.16
17	.42	.54	.52	.06	.42	4.4	1.9	.98	5.4	2.6	.11	.18
18	.42	.54	.52	.06	.59	4.4	1.4	.83	4.3	2.2	.11	.24
19	.36	.54	.52	.06	.59	4.3	1.2	.90	4.8	1.7	.11	.20
20	.36	.59	.53	.05	.46	4.4	1.2	.83	3.3	1.9	.09	.18
21	.36	.59	.53	.05	.50	4.6	1.2	.83	2.4	1.3	.08	.20
22	.33	.59	.53	.05	.50	4.1	1.2	.83	2.0	1.2	.08	.18
23	.36	.59	.50	.05	.54	3.9	1.2	1.2	2.2	1.4	.12	.20
24	.39	.59	.48	.05	.59	4.1	.90	1.6	5.4	3.3	.22	.24
25	.39	.54	.46	.05	.70	4.1	.76	1.5	3.5	3.9	.50	.26
26	.33	.54	.44	.05	.98	4.1	.76	9.9	4.4	4.6	.64	.28
27	.33	.54	.42	.05	1.9	3.9	.98	6.1	4.1	4.1	.59	.26
28	.33	.54	.40	.05	1.6	3.7	.98	6.4	3.3	3.3	.36	.24
29	.33	.54	.40	.05	---	5.0	.98	5.4	2.6	2.9	.28	.24
30	.36	.54	.40	.05	---	6.1	1.1	7.4	1.7	2.6	.24	.30
31	.39	---	.40	.05	---	7.9	---	5.6	---	2.4	.22	---
TOTAL	9.05	15.40	14.99	3.74	10.55	108.5	86.66	68.07	98.27	64.53	16.00	5.84
MEAN	.29	.51	.48	.12	.38	3.50	2.89	2.20	3.28	2.08	.52	.19
MAX	.42	.59	.54	.40	1.9	7.9	8.5	9.9	13	4.6	2.0	.30
MIN	.18	.39	.40	.05	.05	1.4	.76	.83	.76	.76	.08	.12
CFSM	.001	.001	.001	.000	.001	.008	.006	.005	.007	.005	.001	.000
IN.	.00	.00	.00	.00	.00	.01	.01	.01	.01	.01	.00	.00
AC-FT	18	31	30	7.4	21	215	172	135	195	128	32	12

CAL YR 1980 TOTAL 7211.73 MEAN 19.7 MAX 420 MIN .17 CFSM .04 IN .60 AC-FT 14300
WTR YR 1981 TOTAL 501.60 MEAN 1.37 MAX 13 MIN .05 CFSM .003 IN .04 AC-FT 995

05291000 WHETSTONE RIVER NEAR BIG STONE CITY, SD

LOCATION.--Lat 45°17'32", long 96°29'14", in SE¼NW¼ sec.18, T.121 N., R.46 W., Grant County, Hydrologic Unit 07020001, on right bank 20 ft (6 m) downstream from former highway bridge site, 1.5 mi (2.4 km) west of Big Stone City, and 4.5 mi (7.2 km) upstream from Big Stone Lake.

DRAINAGE AREA.--389 mi^2 (1,008 km^2).

WATER-DISCHARGE RECORDS

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 (303.873 m) adjustment of 1912. Mar. 8, 1910, to Nov. 30, 1912, nonrecording gage 2 mi (3 km) downstream at different datum. Mar. 18, 1931, to May 3, 1939, nonrecording gage, at site 20 ft (6 m) upstream at present datum. May 4, 1939, to Nov. 8, 1952, water-stage recorder at site 80 ft (24 m) downstream at present datum.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--50 years (water years 1932-81), 47.8 ft^3/s (1.354 m^3/s), 1.67 in/yr (42 mm/yr), 34,630 acre-ft/yr (42.7 hm^3/yr); median of yearly mean discharges, 35 ft^3/s (0.99 m^3/s), 1.21 in/yr (31 mm/yr), 25,100 acre-ft/yr (31 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,870 ft^3/s (195 m^3/s) Apr. 8, 1969, gage height, 14.32 ft (4.365 m) from floodmark; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, about 26 ft (8 m) in June 1919, present site and datum, from information by local resident, discharge 29,000 ft^3/s (821 m^3/s).

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 200 ft^3/s (5.66 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
June 14	1700	385	10.9	4.85	1.478	July 25	0245	*425	12.0	*5.01	1.527

Minimum discharge, 0.82 ft^3/s (0.023 m^3/s) Dec. 19, minimum gage height, 1.06 ft (0.323 m) May 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	2.9	2.4	3.2	3.2	8.0	18	4.4	12	6.3	10	3.0
2	1.3	3.0	2.7	3.2	3.2	7.8	18	4.4	9.5	5.2	10	2.8
3	1.4	3.0	3.3	3.2	3.2	7.4	18	4.2	8.2	5.0	10	2.8
4	1.6	4.1	3.2	3.2	3.2	8.0	17	4.4	7.1	4.6	10	2.4
5	1.9	3.8	2.7	3.2	3.2	8.0	14	4.6	7.1	4.2	11	2.3
6	2.9	4.3	2.5	3.2	3.2	7.8	14	5.0	5.7	3.8	11	2.5
7	2.5	3.7	2.4	3.2	3.2	7.4	13	4.4	5.2	2.4	10	2.5
8	1.8	3.8	2.9	3.2	3.2	6.9	12	4.1	4.3	2.3	10	2.4
9	1.8	3.7	3.4	3.2	3.2	6.3	11	3.4	4.3	2.2	9.2	2.2
10	1.8	3.5	3.6	3.2	3.2	6.1	9.8	3.7	4.0	2.2	7.8	2.1
11	1.8	3.7	4.0	3.2	3.2	6.0	9.2	3.4	3.6	2.1	6.7	2.0
12	2.5	3.7	4.0	3.2	3.2	5.7	8.7	3.2	3.4	5.8	6.0	1.8
13	2.4	3.7	3.3	3.2	3.2	5.5	7.8	3.2	13	5.7	5.2	1.8
14	2.6	3.7	4.0	3.2	3.2	5.5	7.8	3.2	254	7.6	4.4	1.8
15	2.8	3.3	3.6	3.2	3.2	5.7	7.3	3.2	192	7.4	4.3	1.7
16	4.0	3.3	3.4	3.2	6.0	5.8	7.4	3.0	96	5.3	3.8	1.7
17	4.4	3.4	3.2	3.2	12	5.7	6.7	2.9	39	5.2	3.8	1.7
18	4.0	3.6	3.0	3.2	13	6.0	6.7	2.9	18	4.2	3.6	1.6
19	4.1	3.6	.82	3.2	14	6.0	6.9	2.7	12	5.0	3.0	1.4
20	3.8	3.6	1.7	3.2	16	6.5	6.1	2.6	11	5.2	2.9	1.4
21	3.7	3.6	3.2	3.2	14	6.3	6.3	2.5	11	5.0	2.7	1.3
22	3.8	3.3	3.2	3.2	14	6.3	6.5	2.0	11	6.0	2.4	1.2
23	3.7	3.6	3.2	3.2	13	6.3	6.5	1.8	11	7.4	2.9	1.0
24	3.6	3.3	1.6	3.2	12	6.7	6.0	2.7	11	84	3.3	1.1
25	3.7	3.3	3.2	3.2	11	6.1	5.7	66	11	319	3.8	1.2
26	3.4	3.3	3.2	3.2	11	5.8	5.5	47	10	128	8.7	1.4
27	3.4	3.3	3.2	3.2	9.7	6.1	5.2	28	9.8	41	6.0	1.2
28	3.4	3.6	3.2	3.2	8.7	6.0	5.2	27	8.9	18	4.7	1.1
29	3.4	3.4	3.2	3.2	---	8.9	5.2	19	8.2	12	4.2	1.2
30	3.3	3.6	3.2	3.2	---	10	4.9	14	7.1	10	3.7	1.4
31	3.4	---	3.2	3.2	---	16	---	14	---	11	3.4	---
TOTAL	89.7	105.7	93.72	99.2	202.4	216.6	276.4	296.9	808.4	733.1	188.5	54.0
MEAN	2.89	3.52	3.02	3.20	7.23	6.99	9.21	9.58	26.9	23.6	6.08	1.80
MAX	4.4	4.3	4.0	3.2	16	16	18	66	254	319	11	3.0
MIN	1.3	2.9	.82	3.2	3.2	5.5	4.9	1.8	3.4	2.1	2.4	1.0
CFSM	.007	.009	.008	.008	.02	.02	.02	.03	.07	.06	.02	.005
IN.	.01	.01	.01	.01	.02	.02	.03	.03	.08	.07	.02	.01
AC-FT	178	210	186	197	401	430	548	589	1600	1450	374	107

CAL YR 1980 TOTAL 8358.22 MEAN 22.8 MAX 555 MIN .82 CFSM .06 IN .80 AC-FT 16580
WTR YR 1981 TOTAL 3164.62 MEAN 8.67 MAX 319 MIN .82 CFSM .02 IN .30 AC-FT 6280

05291000 WHETSTONE RIVER NEAR BIG STONE CITY, SD--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-62, 1967-69, 1974 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1973 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1973 to current year.

REMARKS.--During the winter period, daily sediment concentrations were estimated on the basis of water records and monthly sediment samples. Water temperature was obtained when sediment samples were collected.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum daily (water years 1973-79), 34.0°C July 7, 1974; minimum daily, 0.0°C many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,540 mg/L Mar. 27, 1979; minimum daily mean, 0 mg/L on July 30, 31, Aug. 1-7, 24-26, 1976.
SEDIMENT LOADS: Maximum daily, 4,370 tons (3,960 tonnes) Apr. 13, 1979; minimum daily, 0 ton (0 tonne) on July 30, 31, Aug. 1-7, 24-26, 1976.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum daily, 31.0°C July 11, 17; minimum daily, 0.0°C many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 478 mg/L July 25; minimum daily mean, 3 mg/L Feb. 26.
SEDIMENT LOADS: Maximum daily, 426 tons (386 tonnes) July 25; minimum daily, 0.03 ton (0.03 tonnes) Nov. 1.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.0	6.5	.5	---	---	---	10.5	20.0	25.5	24.0	29.0	23.0
2	13.0	8.5	.0	---	.0	---	13.5	---	21.0	26.0	29.5	22.5
3	12.0	8.0	.5	.5	---	1.0	8.0	18.0	25.5	22.0	28.0	20.5
4	9.0	7.5	.5	.0	---	---	---	18.0	22.0	26.0	26.0	22.5
5	10.5	7.5	.0	.5	---	.5	9.5	19.5	25.0	26.0	22.5	24.0
6	15.5	8.5	.5	.5	---	---	---	19.0	25.0	28.0	24.0	23.5
7	16.5	8.5	.0	.0	---	---	14.0	19.5	27.0	30.0	24.0	23.0
8	12.5	9.5	.5	1.0	---	---	13.0	19.5	21.5	25.0	26.0	24.0
9	12.5	5.5	.0	---	---	1.0	15.5	17.5	21.5	28.0	23.0	25.5
10	8.5	5.0	.5	.5	---	1.0	---	19.0	23.5	29.0	21.5	21.5
11	10.0	7.0	.5	---	.0	---	9.5	19.5	---	31.0	---	24.5
12	9.0	5.5	.0	1.0	---	3.0	14.5	14.5	21.0	25.5	29.0	24.5
13	8.5	3.5	.5	---	---	---	11.0	21.5	20.0	27.0	26.5	24.0
14	8.0	3.5	---	.5	---	---	12.5	23.0	20.0	---	---	18.5
15	---	2.5	.5	.0	---	---	15.0	19.0	20.0	24.0	22.5	17.5
16	9.5	3.5	.5	.5	---	6.0	18.5	18.0	21.0	26.0	25.5	16.0
17	7.5	2.5	.5	1.0	1.0	5.5	17.0	18.0	20.0	31.0	26.0	17.5
18	12.0	3.0	---	---	.5	---	13.0	22.0	20.5	28.0	26.5	18.5
19	8.5	3.5	.5	.5	.5	4.0	16.0	23.0	19.0	26.5	26.5	19.0
20	10.5	2.5	.0	.0	.5	---	14.0	24.0	20.0	28.5	27.0	---
21	9.5	3.0	.0	1.0	---	5.0	12.5	23.0	19.0	25.0	28.0	17.0
22	8.5	3.5	1.0	.5	---	---	12.0	26.5	22.5	24.5	24.0	16.0
23	7.5	2.0	---	---	1.0	---	14.5	19.5	19.0	25.0	24.5	13.0
24	7.5	1.0	.5	.5	.5	10.0	16.5	15.5	22.0	26.0	25.5	16.5
25	5.5	1.0	1.0	1.0	---	12.0	17.5	14.5	25.0	27.0	24.0	---
26	6.0	---	---	.5	.5	10.0	18.5	16.5	26.0	22.0	24.0	15.5
27	5.5	1.0	.5	---	.5	---	21.0	---	24.0	20.5	20.5	14.0
28	4.5	1.5	1.0	.0	---	---	19.5	18.5	24.5	20.5	22.0	13.5
29	5.5	1.5	.0	.5	---	13.0	19.0	21.5	25.0	22.0	25.0	16.0
30	6.5	1.5	1.0	---	---	---	18.0	22.0	25.5	24.0	25.5	12.5
31	6.5	---	.5	---	---	8.0	---	23.0	---	24.0	23.0	---

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	NUMBER OF SAMPLING POINTS (00063)	STREAM-FLOW, INSTANTANEOUS (CFS) (00061)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	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 16.0 MM (80172)
SEP 30...	1045	7	1.4	2	7	19	41	62	74	82	91	100

05291000 WHETSTONE RIVER NEAR BIG STONE CITY, SD--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	71	.29	4	.03	53	.34	276	2.4	219	1.9	14	.30
2	64	.22	8	.06	45	.33	286	2.5	204	1.8	20	.42
3	142	.54	16	.13	123	1.1	303	2.6	190	1.6	26	.52
4	161	.70	10	.11	71	.61	313	2.7	177	1.5	22	.48
5	147	.75	6	.06	65	.47	331	2.9	168	1.5	15	.32
6	119	.93	13	.15	168	1.1	340	2.9	162	1.4	16	.34
7	64	.43	16	.16	218	1.4	327	2.8	155	1.3	16	.32
8	61	.30	16	.16	95	.74	241	2.1	148	1.3	19	.35
9	55	.27	72	.72	38	.35	204	1.8	141	1.2	20	.34
10	53	.26	122	1.2	93	.90	185	1.6	139	1.2	32	.53
11	57	.28	153	1.5	156	1.7	166	1.4	139	1.2	41	.66
12	40	.27	132	1.3	84	.91	149	1.3	139	1.2	41	.63
13	52	.34	141	1.4	74	.66	147	1.3	139	1.2	36	.53
14	32	.22	146	1.5	121	1.3	186	1.6	139	1.2	33	.49
15	51	.39	171	1.5	138	1.3	129	1.1	140	1.2	27	.42
16	66	.71	162	1.4	255	2.3	97	.84	168	2.7	21	.33
17	60	.71	158	1.5	274	2.4	188	1.6	97	3.1	17	.26
18	68	.73	170	1.7	276	2.2	266	2.3	21	.74	15	.24
19	50	.55	167	1.6	279	.62	282	2.4	12	.45	13	.21
20	24	.25	162	1.6	290	1.3	282	2.4	10	.43	11	.19
21	46	.46	189	1.8	302	2.6	297	2.6	9	.34	11	.19
22	42	.43	191	1.7	312	2.7	306	2.6	8	.30	11	.19
23	26	.26	192	1.9	327	2.8	307	2.7	8	.28	12	.20
24	16	.16	196	1.7	344	1.5	284	2.5	16	.52	12	.22
25	7	.07	208	1.9	348	3.0	214	1.8	13	.39	9	.15
26	21	.19	214	1.9	322	2.8	193	1.7	3	.09	14	.22
27	19	.17	216	1.9	316	2.7	187	1.6	4	.10	18	.30
28	5	.05	215	2.1	293	2.5	184	1.6	6	.14	17	.28
29	4	.04	214	2.0	307	2.7	242	2.1	---	---	16	.38
30	5	.04	82	.80	295	2.5	252	2.2	---	---	17	.46
31	4	.04	---	---	279	2.4	235	2.0	---	---	20	.86
TOTAL	---	11.05	---	35.48	---	50.23	---	63.94	---	30.28	---	11.33

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	24	1.2	65	.77	35	1.1	73	1.2	14	.38	91	.74
2	19	.92	54	.64	36	.92	78	1.1	14	.38	112	.85
3	16	.78	75	.85	37	.82	54	.73	16	.43	118	.89
4	16	.73	106	1.3	44	.84	44	.55	14	.38	125	.81
5	16	.60	77	.96	38	.73	51	.58	15	.45	79	.49
6	14	.53	106	1.4	42	.65	53	.54	18	.53	54	.36
7	12	.42	52	.62	59	.83	68	.44	20	.54	47	.32
8	22	.71	63	.70	73	.85	80	.50	27	.73	30	.19
9	31	.92	56	.51	78	.91	82	.49	34	.84	34	.20
10	23	.61	99	.99	76	.82	41	.24	38	.80	33	.19
11	17	.42	96	.88	87	.85	49	.28	41	.74	34	.18
12	69	1.6	78	.67	87	.80	53	.83	43	.70	36	.17
13	97	2.0	72	.62	91	3.2	51	.78	70	.98	46	.22
14	74	1.6	76	.66	215	182	59	1.2	90	1.1	41	.20
15	92	1.8	77	.67	284	151	61	1.2	93	1.1	35	.16
16	80	1.6	74	.60	98	27	67	.96	70	.72	37	.17
17	48	.87	60	.47	53	5.6	65	.91	84	.86	42	.19
18	77	1.4	57	.45	33	1.6	50	.57	89	.87	35	.15
19	65	1.2	66	.48	30	.97	60	.81	98	.79	50	.19
20	67	1.1	88	.62	31	.92	44	.62	77	.60	48	.18
21	73	1.2	67	.45	30	.89	38	.51	78	.57	46	.16
22	74	1.3	65	.35	41	1.2	40	.65	73	.47	104	.34
23	75	1.3	51	.25	47	1.4	50	1.0	55	.43	90	.24
24	77	1.2	73	.53	49	1.5	117	41	63	.56	125	.37
25	70	1.1	94	17	48	1.4	478	426	42	.43	142	.46
26	63	.94	61	7.7	55	1.5	180	68	49	1.2	150	.57
27	81	1.1	47	3.6	61	1.6	71	7.9	64	1.0	150	.49
28	90	1.3	33	2.4	35	.84	47	2.3	68	.86	194	.58
29	116	1.6	19	.97	51	1.1	36	1.2	61	.69	142	.46
30	121	1.6	14	.53	64	1.2	25	.68	45	.45	148	.56
31	---	---	25	.95	---	---	16	.48	64	.59	---	---
TOTAL	---	33.65	---	49.59	---	395.04	---	564.25	---	21.17	---	11.08

TOTAL LOAD FOR YEAR: 1277.09 TONS.

05291500 BIG STONE LAKE AT ORTONVILLE, MN

LOCATION.--Lat 45°18'18", long 96°26'57", in NW¼SW¼ sec.9, T.121 N., R.46 W., Big Stone County, Hydrologic Unit 07020001, at powerplant intake at west edge of Ortonville, 0.5 mi (0.8 km) north of concrete dam at outlet, 0.5 mi (0.8 km) southwest of Ortonville.

PERIOD OF RECORD.--March 1937 to current year.

GAGE.--Nonrecording gage read once a day. Datum of gage is 957.69 ft (291.904 m) National Geodetic Vertical Datum of 1929. Prior to Sept. 17, 1947, nonrecording gage at site 0.5 mi (0.8 km) south at same datum. Sept. 18, 1947, to June 30, 1963, water-stage recorder at site 0.5 mi (0.8 km) south at same datum. Sept. 21, 1959, to June 30, 1963, supplementary nonrecording gage read once daily, at present site and datum.

REMARKS.--Natural lake with concrete dam at outlet. Fixed crest of dam is at 5.95 ft (1.814 m), with one 5 ft (1.5 m) and two 2.5 ft (0.76 m) gates with lowest sill at 0.71 ft (0.22 m).

Silt barrier dam 700 ft (213 m) upstream in outlet channel of lake completed July 7, 1958; crest at 5.9 ft (1.80 m). Supplementary nonrecording gage readings used for stages below crest of silt barrier to June 30, 1963. Water level subject to fluctuation caused by wind action.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 12.73 ft (3.880 m) Apr. 17, 1952; minimum observed, 3.53 ft (1.076 m) Mar. 2, 1957 (strong upstream wind in channel). Minimum observations of 3.10 ft (0.945 m) Mar. 2, 1940, and 2.20 ft (0.671 m) Nov. 20, 1940, at spillway site are the result of blockage of channel to spillway by ice and snow and do not represent lake elevations.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 7.30 ft (2.225 m) Oct. 2; minimum observed, 5.88 ft (1.792 m) Sept. 23.

GAGE HEIGHT, IN FEET, OCTOBER 1980 TO SEPTEMBER 1981

Oct. 31	6.64	Feb. 28	6.71	June 30	6.73
Nov. 30	6.64	Mar. 31	6.45	July 31	6.75
Dec. 31	6.43	Apr. 30	6.56	Aug. 31	6.51
Jan. 31	6.53	May 31	6.20	Sept. 30	6.22

NOTE.--Gage-height record other than that shown above is available in the District office.

05292000 MINNESOTA RIVER AT ORTONVILLE, MN

LOCATION.--Lat 45°17'44", long 96°26'38", in NE¼NW¼ sec.16, T.121 N., R.46 W., Big Stone County, Hydrologic Unit 07020001, on left bank 400 ft (122 m) downstream from bridge on U.S. Highway 12 and 1,300 ft (396 m) downstream from dam at outlet of Big Stone Lake, at Ortonville.

DRAINAGE AREA.--1,160 mi^2 (3,000 km^2), 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 (291.505 m) National Geodetic Vertical Datum of 1929. Prior to Mar. 31, 1939, nonrecording gage on downstream side of dam 1,300 ft (396 m) upstream at datum 1.31 ft (0.40 m) higher.

REMARKS.--Records good. Some regulation by Big Stone Lake (station 05291500).

AVERAGE DISCHARGE.--43 years, 108 ft^3/s (3.059 m^3/s), 78,250 acre-ft/yr (96.5 hm^3/yr); median of yearly mean discharges, 83 ft^3/s (2.35 m^3/s), 60,100 acre-ft/yr (74 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,060 ft^3/s (86.7 m^3/s) Apr. 13, 1952, gage height, 12.92 ft (3.938 m); no flow Dec. 13, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 57 ft^3/s (1.61 m^3/s) June 13, gage height, 1.89 ft (0.576 m); maximum gage height, 1.93 ft (0.588 m) Sept. 11 (backwater from beaver dam); minimum, 0.22 ft^3/s (0.006 m^3/s) Sept. 29; minimum gage height, 1.01 ft (0.308 m) Sept. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.6	1.8	4.6	2.3	2.0	1.2	2.2	3.8	2.8	1.2	1.9	1.6
2	2.3	1.4	4.4	2.2	2.0	1.2	1.5	3.0	2.8	1.9	2.2	1.6
3	2.3	1.4	4.0	2.2	2.0	1.2	1.3	3.4	3.0	8.3	3.4	1.6
4	3.0	2.1	3.8	2.2	2.0	1.3	1.1	3.8	1.8	5.5	2.3	1.6
5	2.3	2.3	4.2	2.2	2.0	1.5	.71	3.4	2.1	3.5	2.2	1.4
6	2.7	1.8	3.8	2.2	2.0	1.9	.83	2.8	1.3	2.1	2.2	1.4
7	2.3	2.3	3.4	2.2	2.0	1.7	1.0	2.3	1.0	1.4	2.8	1.4
8	2.3	1.9	3.4	2.1	2.0	1.8	1.2	2.3	3.0	1.4	3.1	1.4
9	3.0	1.9	2.8	2.1	2.0	1.9	1.3	3.0	4.6	2.1	2.5	1.3
10	7.2	1.4	2.5	2.1	2.0	1.9	1.4	2.5	3.0	4.1	2.6	1.3
11	4.6	1.6	2.5	2.1	2.0	1.7	1.3	2.3	2.8	3.0	2.5	1.2
12	2.5	1.3	2.5	2.1	2.0	1.4	1.3	2.3	1.4	5.1	2.3	1.2
13	2.1	2.3	2.5	2.1	2.0	1.2	2.8	2.8	23	1.6	2.3	1.2
14	3.8	2.8	2.5	2.1	2.0	1.2	1.9	2.3	9.1	1.2	2.1	1.2
15	3.1	1.8	2.5	2.0	2.1	2.5	1.8	2.3	3.5	1.9	1.9	1.2
16	3.8	3.0	2.5	2.0	2.3	1.9	2.1	2.1	4.6	5.5	1.6	1.2
17	1.8	2.8	2.5	2.0	2.5	1.5	5.0	1.1	5.1	3.4	1.4	1.2
18	1.2	3.4	2.5	2.0	2.8	1.1	1.8	1.8	4.1	1.7	1.1	1.0
19	1.8	3.8	2.4	2.0	3.0	1.1	1.6	2.1	2.7	1.7	1.5	1.1
20	2.5	4.2	2.4	2.0	2.3	1.0	1.8	1.4	2.4	3.1	1.9	1.0
21	5.5	2.1	2.4	2.0	1.9	.85	2.5	1.6	2.5	2.1	1.9	1.0
22	1.3	2.5	2.4	2.0	1.8	.93	2.8	1.6	2.2	3.4	1.4	1.0
23	2.3	14	2.4	2.0	1.8	1.1	2.3	1.4	1.9	1.4	1.8	1.0
24	4.6	9.8	2.4	2.0	1.6	1.2	1.9	2.8	2.1	2.0	1.9	1.0
25	3.7	5.5	2.4	2.0	1.4	1.2	1.8	4.6	1.6	3.1	1.8	1.0
26	3.4	5.0	2.4	2.0	1.6	1.1	1.2	4.2	1.8	1.9	1.8	1.0
27	3.1	5.0	2.3	2.0	2.1	.92	1.9	2.8	1.8	1.6	1.8	1.3
28	2.8	5.5	2.3	2.0	1.5	1.3	2.1	6.0	2.0	1.5	1.6	1.8
29	2.1	4.6	2.3	2.0	---	2.6	3.0	1.2	1.9	1.3	1.4	1.1
30	1.4	3.8	2.3	2.0	---	1.1	4.2	2.8	1.6	1.5	1.6	1.2
31	1.2	---	2.3	2.0	---	2.6	---	3.0	---	2.2	1.6	---
TOTAL	90.6	103.1	87.6	64.2	56.7	45.10	57.64	82.8	103.5	81.7	62.4	37.5
MEAN	2.92	3.44	2.83	2.07	2.03	1.45	1.92	2.67	3.45	2.64	2.01	1.25
MAX	7.2	14	4.6	2.3	3.0	2.6	5.0	6.0	23	8.3	3.4	1.8
MIN	1.2	1.3	2.3	2.0	1.4	.85	.71	1.1	1.0	1.2	1.1	1.0
CFSM	.003	.003	.002	.002	.002	.001	.002	.002	.003	.002	.002	.001
IN.	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	180	204	174	127	112	89	114	164	205	162	124	74

CAL YR 1980	TOTAL	14235.15	MEAN	38.9	MAX	469	MIN	.83	CFSM	.03	IN	.46	AC-FT	28240
WTR YR 1981	TOTAL	872.84	MEAN	2.39	MAX	23	MIN	.71	CFSM	.002	IN	.03	AC-FT	1730

05293000 YELLOW BANK RIVER NEAR ODESSA, MN

LOCATION.--Lat 45°13'35", long 96°21'12", in SE¼SE¼ sec.1, T.120 N., R.46 W., Lac qui Parle County, Hydrologic Unit 07020001, on left bank 150 ft (46 m) downstream from highway bridge, 2.5 mi (4.0 km) southwest of Odessa, and 4.5 mi (7.2 km) upstream from mouth.

DRAINAGE AREA.--398 mi^2 (1,031 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1939 to current year.

REVISED RECORDS.--WSP 1388: 1947(M), 1950.

GAGE.--Water-stage recorder. Datum of gage is 953.34 ft (290.578 m) National Geodetic Vertical Datum of 1929 (Corps of Engineers bench mark). Prior to Aug. 28, 1940, nonrecording gage at site 150 ft (46 m) upstream at same datum.

REMARKS.--Records good except those for winter periods, which are fair.

AVERAGE DISCHARGE.--42 years, 56.5 ft^3/s (1.600 m^3/s), 1.93 in/yr (49 mm/yr), 40,930 acre-ft/yr (50.5 hm^3/yr); median of yearly mean discharges, 48 ft^3/s (1.36 m^3/s), 1.64 in/yr (42 mm/yr), 34,800 acre-ft/yr (43 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,970 ft^3/s (197 m^3/s) Apr. 9, 1969, gage height, 19.07 ft (5.813 m) from floodmark; no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 64 ft^3/s (1.81 m^3/s) July 4, gage height, 2.87 ft (0.875 m); maximum gage height, 3.24 ft (0.988 m) Feb. 24 (backwater from ice); no peak above base of 300 ft^3/s (8.50 m^3/s); minimum discharge 0.17 ft^3/s (0.005 m^3/s) Sept. 22-24; minimum gage height, 1.61 ft (0.491 m) Sept. 12, 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.37	2.9	2.3	2.3	2.2	12	17	5.1	1.5	1.4	3.2	.45
2	.33	3.0	1.9	2.3	2.2	5.1	18	4.9	1.6	1.3	2.5	.45
3	.33	3.2	2.0	2.3	2.2	13	17	5.4	1.6	1.5	2.4	.45
4	.41	3.4	2.3	2.3	2.2	12	16	4.9	1.5	37	2.0	.45
5	.50	3.7	2.6	2.3	2.2	11	15	4.7	1.8	9.5	1.7	.45
6	.55	4.0	2.4	2.3	2.2	9.2	14	4.5	1.5	4.5	1.5	.41
7	.55	3.7	2.3	2.3	2.2	9.2	12	3.5	1.4	2.6	1.3	.66
8	.55	3.9	2.1	2.3	2.2	11	10	3.5	1.5	1.7	1.3	.55
9	.55	3.4	2.1	2.2	2.2	14	9.2	3.3	1.6	1.5	1.2	.45
10	.55	3.0	2.0	2.2	2.2	11	9.5	3.3	1.5	1.3	1.2	.41
11	.55	3.0	2.0	2.2	2.2	11	8.8	2.9	1.4	1.5	1.3	.37
12	.55	3.0	1.9	2.2	2.2	11	8.5	2.8	1.5	3.9	1.2	.33
13	.66	3.0	1.9	2.2	2.2	11	8.5	2.8	4.9	2.3	.94	.29
14	.66	3.0	2.1	2.2	2.2	11	7.6	2.8	25	1.9	.72	.33
15	.72	2.9	2.8	2.2	2.2	13	7.3	3.0	35	1.6	.60	.33
16	1.4	2.7	2.8	2.2	2.4	8.5	7.0	2.7	24	2.1	.55	.37
17	1.6	2.6	2.7	2.2	7.0	6.7	6.4	2.4	13	2.3	.55	.37
18	1.7	2.6	2.7	2.2	12	6.7	5.8	2.4	9.2	1.3	.50	.33
19	1.9	2.4	2.7	2.2	13	9.5	5.4	2.4	7.2	2.7	.50	.26
20	2.0	2.6	2.6	2.2	14	8.8	5.6	2.1	5.6	3.0	.41	.23
21	2.3	2.7	2.6	2.2	9.5	12	6.1	2.0	5.1	2.5	.41	.20
22	2.4	2.7	2.5	2.2	7.6	9.8	7.0	1.7	4.5	3.2	.50	.20
23	2.0	2.7	2.5	2.2	8.8	9.2	6.4	2.0	4.3	3.7	.50	.20
24	2.0	2.9	2.5	2.2	20	8.2	6.4	2.0	4.3	3.2	.50	.20
25	2.1	2.7	2.4	2.2	12	7.9	6.4	1.9	3.5	2.2	.60	.23
26	2.3	2.9	2.4	2.2	9.8	7.2	7.0	1.8	3.3	7.6	.55	.26
27	2.3	2.9	2.4	2.2	11	7.0	7.0	2.0	2.2	5.4	.50	.33
28	2.4	2.9	2.4	2.2	13	6.7	7.0	2.6	2.0	3.9	.50	.29
29	2.6	3.0	2.4	2.2	---	8.2	6.4	2.0	1.9	2.8	.50	.23
30	2.6	3.0	2.4	2.2	---	9.2	5.6	2.0	1.5	2.4	.45	.23
31	2.9	---	2.3	2.2	---	11	---	1.7	---	2.5	.45	---
TOTAL	42.33	90.4	73.0	69.0	173.1	301.1	273.9	91.1	174.9	124.3	31.03	10.31
MEAN	1.37	3.01	2.35	2.23	6.18	9.71	9.13	2.94	5.83	4.01	1.00	.34
MAX	2.9	4.0	2.8	2.3	20	14	18	5.4	35	37	3.2	.66
MIN	.33	2.4	1.9	2.2	2.2	5.1	5.4	1.7	1.4	1.3	.41	.20
AC-FT	84	179	145	137	343	597	543	181	347	247	62	20

CAL YR 1980 TOTAL 10044.89 MEAN 27.4 MAX 661 MIN .00 AC-FT 19920
WTR YR 1981 TOTAL 1454.47 MEAN 3.98 MAX 37 MIN .20 AC-FT 2880

05294000 POMME DE TERRE RIVER AT APPLETON, MN

LOCATION.--Lat 45°12'10", long 96°01'20", in SW¼NW¼ sec.14, T.120 N., R.43 W., Swift County, Hydrologic Unit 07020002, on left bank 60 ft (18 m) upstream from bridge on U.S. Highway 59 and State Highway 119 at Appleton and 8 mi (13 km) upstream from mouth.

DRAINAGE AREA.--905 mi^2 (2,344 km^2), 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 (298.094 m) National Geodetic Vertical Datum of 1929. Prior to Dec. 22, 1952, nonrecording gage at site 4 mi (6 km) upstream at datum 25.17 ft (7.672 m) higher.

REMARKS.--Records good except those for winter period, which are fair. Flow affected by lakes above station. Occasional regulation at low flow by old milldam 500 ft (152 m) upstream.

AVERAGE DISCHARGE.--46 years (water years 1936-81), 104 ft^3/s (2.945 m^3/s), 1.56 in/yr (40 mm/yr), 75,350 acre-ft/yr (92.9 hm^3/yr); median of yearly mean discharge, 91 ft^3/s (2.58 m^3/s), 1.37 in/yr (35 mm/yr), 65,900 acre-ft/yr (81 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,520 ft^3/s (156 m^3/s) Apr. 11, 1969, gage height, 13.78 ft (4.200 m); maximum gage height, 14.58 ft (4.444 m) Apr. 9, 1969 (backwater from ice); no flow for several periods.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 200 ft^3/s (5.66 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
June 15	1215	*666	18.9	*6.51	1.984	July 13	1900	392	11.1	5.98	1.823
June 25	0945	418	11.8	6.04	1.841	July 20	2200	202	5.72	5.37	1.637

Minimum discharge, 11 ft^3/s (0.31 m^3/s) Jan. 11, gage height, 4.04 ft (1.231 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	50	17	14	13	64	78	67	52	148	75	37
2	57	48	13	14	13	52	80	63	52	134	71	35
3	57	44	13	14	13	64	82	63	52	143	68	32
4	58	41	15	14	13	64	79	61	54	128	69	32
5	56	38	24	14	13	61	82	58	55	115	69	29
6	51	37	25	13	13	61	81	59	54	105	66	28
7	50	37	24	13	13	61	78	58	55	98	65	33
8	47	34	22	13	13	61	74	56	56	88	61	31
9	46	39	20	13	13	67	69	54	54	80	59	27
10	43	43	19	13	13	76	73	52	55	73	57	27
11	47	43	19	13	13	80	72	51	53	105	56	26
12	47	44	19	13	13	85	68	51	50	222	53	24
13	50	43	19	13	13	87	68	48	124	348	50	23
14	47	40	19	13	13	91	68	46	450	306	47	21
15	42	33	18	13	13	97	64	44	632	202	44	21
16	45	27	18	13	14	80	62	43	413	186	42	20
17	43	42	18	13	16	87	60	41	275	181	39	19
18	49	37	17	13	19	67	59	41	243	172	38	19
19	53	33	17	13	29	62	63	38	212	157	34	19
20	61	54	16	13	48	75	65	36	186	168	31	18
21	66	44	15	13	65	71	65	33	180	195	29	17
22	68	46	15	13	64	68	70	32	174	176	29	16
23	68	45	15	13	53	65	72	41	168	168	27	16
24	68	36	14	13	55	64	73	48	274	154	33	15
25	65	28	14	13	57	64	78	47	396	143	38	16
26	67	32	14	13	62	64	75	48	257	131	37	16
27	71	40	14	13	68	64	70	47	193	118	40	25
28	69	36	14	13	70	64	66	51	183	105	41	23
29	65	38	14	13	---	68	66	53	174	97	40	21
30	59	35	14	13	---	70	66	54	163	86	40	19
31	53	---	14	13	---	73	---	53	---	81	39	---
TOTAL	1726	1187	529	408	815	2177	2126	1537	5339	4613	1487	705
MEAN	55.7	39.6	17.1	13.2	29.1	70.2	70.9	49.6	178	149	48.0	23.5
MAX	71	54	25	14	70	97	82	67	632	348	75	37
MIN	42	27	13	13	13	52	59	32	50	73	27	15
CFSM	.06	.04	.02	.02	.03	.08	.08	.06	.20	.17	.05	.03
IN.	.07	.05	.02	.02	.03	.09	.09	.06	.22	.19	.06	.03
AC-FT	3420	2350	1050	809	1620	4320	4220	3050	10590	9150	2950	1400

CAL YR 1980 TOTAL 32280 MEAN 88.2 MAX 630 MIN 13 CFSM .10 IN 1.33 AC-FT 64030
WTR YR 1981 TOTAL 22649 MEAN 62.1 MAX 632 MIN 13 CFSM .07 IN .93 AC-FT 44920

05299400 CANBY CREEK NEAR CANBY, MN

LOCATION.--Lat 44°40'52", long 96°21'30", in NW¼NW¼SW¼ sec. 13, T.114 N., R.46 W., Yellow Medicine County, Hydrologic Unit 07020003, on left bank of County Road E4 bridge and 6 mi (10 km) southwest of Canby.

PERIOD OF RECORD.--December 1980 to September 1981 (discontinued).

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: December 1980 to September 1981 (discontinued).

INSTRUMENTATION.--Temperature recorder since December 1980.

REMARKS.--Hourly temperature values are available in the District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 31.5°C July 6, 1981; minimum, 0.0°C many days during the winter.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 31.5°C July 6; minimum, 0.0°C many days during the winter.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1							---	---	---	1.0	.0	.5
2							---	---	---	1.5	.0	.5
3							---	---	---	.0	.0	.0
4							---	---	---	.5	.0	.0
5							---	---	---	.5	.0	.5
6							---	---	---	.5	.0	.5
7							---	---	---	.0	.0	.0
8							---	---	---	.5	.0	.0
9							.0	.0	.0	.0	.0	.0
10							.0	.0	.0	.0	.0	.0
11							.0	.0	.0	.0	.0	.0
12							1.0	.0	.5	.5	.0	.0
13							.5	.0	.0	.5	.0	.5
14							1.5	.5	.5	.5	.0	.5
15							1.5	.5	1.0	.5	.0	.0
16							1.0	1.0	1.0	.0	.0	.0
17							2.0	.5	1.0	.5	.0	.0
18							.5	.0	.0	1.0	.0	.5
19							.0	.0	.0	1.5	.0	.5
20							1.5	.0	1.0	1.0	.0	.5
21							1.0	.5	1.0	1.5	.0	.5
22							1.5	.5	.5	2.0	.0	1.0
23							.5	.0	.0	2.0	.5	1.0
24							.0	.0	.0	2.5	.5	1.0
25							.0	.0	.0	2.5	.0	1.0
26							1.0	.0	.5	1.0	.0	.5
27							1.0	.5	.5	1.0	.0	.0
28							.5	.5	.5	.5	.0	.0
29							1.0	.5	.5	.0	.0	.0
30							1.5	.5	1.0	.0	.0	.0
31							1.0	.5	1.0	.0	.0	.0
MONTH							2.0	.0	.5	2.5	.0	.5

05299400 CANBY CREEK NEAR CANBY, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	.0	.0	.0	2.5	.0	.5	10.5	5.0	7.5	19.0	11.0	14.0
2	.0	.0	.0	2.5	.0	.5	13.5	7.0	10.0	18.0	10.5	14.5
3	.0	.0	.0	3.5	.0	1.0	11.0	7.0	9.5	16.5	14.5	15.5
4	.0	.0	.0	3.0	.0	1.0	7.0	5.0	5.5	15.0	11.5	13.5
5	.0	.0	.0	4.0	.0	1.5	9.0	3.5	6.0	19.0	10.0	14.0
6	.5	.0	.0	4.0	.5	1.5	11.0	4.5	7.5	18.5	11.0	14.0
7	.0	.0	.0	5.0	.5	2.0	12.0	8.5	10.5	16.5	8.5	11.5
8	.0	.0	.0	4.5	1.0	2.5	13.5	9.0	11.0	17.0	11.0	14.0
9	.5	.0	.0	3.5	1.0	2.0	13.0	8.0	10.5	15.5	10.0	12.5
10	.0	.0	.0	5.0	.5	2.0	14.5	9.0	11.5	16.5	8.5	12.0
11	.0	.0	.0	6.0	1.5	3.0	10.5	8.0	9.5	17.5	9.5	13.0
12	.0	.0	.0	6.5	2.0	3.5	14.0	7.0	10.5	13.5	11.0	11.5
13	.0	.0	.0	7.0	2.0	4.0	12.5	7.5	10.5	18.5	10.0	13.5
14	.5	.0	.0	7.0	2.5	4.0	12.0	5.5	8.5	21.5	12.0	15.5
15	.5	.0	.5	7.5	2.0	4.5	11.5	5.0	8.0	20.5	9.5	14.5
16	2.0	.0	.5	8.5	2.5	4.5	15.5	7.5	10.5	17.5	14.5	16.0
17	2.0	.0	1.0	7.0	2.5	4.5	16.0	11.0	13.0	17.0	13.0	14.5
18	2.5	.0	1.0	5.5	.5	2.5	13.0	10.0	11.5	18.5	11.0	14.5
19	3.0	.0	1.0	5.0	1.0	2.5	12.5	9.5	10.5	20.5	11.0	15.5
20	3.0	.5	1.0	7.0	1.0	3.0	12.5	7.5	9.5	20.5	13.0	16.5
21	2.0	.0	1.0	7.0	3.0	4.5	13.5	8.0	10.5	19.5	12.5	16.0
22	3.0	.0	1.0	9.5	2.0	5.0	12.5	10.0	11.0	23.0	14.0	18.0
23	3.5	.0	1.0	9.5	3.0	6.0	13.5	8.0	10.5	23.5	13.5	19.0
24	4.0	.0	1.5	9.0	5.0	7.0	16.0	8.5	11.5	18.0	11.0	13.0
25	4.0	.0	1.5	11.0	6.0	8.0	17.5	11.0	14.0	14.5	10.5	12.5
26	4.0	.5	1.5	10.0	6.0	7.5	20.0	13.0	16.0	16.0	12.5	14.0
27	1.5	.0	1.0	10.5	5.5	8.0	22.5	14.0	17.5	20.0	14.5	17.0
28	1.0	.0	.5	11.0	8.5	10.0	17.5	12.0	15.5	19.5	17.0	18.0
29	---	---	---	12.5	9.0	10.5	17.0	10.5	14.5	21.5	15.5	18.0
30	---	---	---	13.0	9.5	10.5	14.5	12.0	13.5	22.5	15.5	18.5
31	---	---	---	9.5	6.0	8.5	---	---	---	23.5	16.5	19.5
MONTH	4.0	.0	.5	13.0	.0	4.5	22.5	3.5	11.0	23.5	8.5	15.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	23.5	16.0	19.5	29.0	21.0	24.5	29.0	21.5	25.0	23.5	17.0	19.5
2	21.0	18.0	19.0	26.5	21.0	23.5	30.0	23.0	26.5	23.0	16.0	19.0
3	23.0	17.5	20.0	27.0	22.5	24.5	28.5	23.0	25.5	19.5	16.0	18.0
4	25.0	18.5	21.0	29.5	22.0	25.5	27.5	23.0	25.0	22.0	14.5	17.5
5	24.0	18.0	20.5	31.0	21.5	26.0	30.0	23.0	26.0	23.5	16.0	19.5
6	26.5	17.0	21.5	31.5	22.5	26.5	28.0	22.0	24.5	23.5	19.0	20.5
7	26.0	19.0	22.0	30.0	22.0	25.5	26.5	20.5	23.0	23.0	18.0	20.0
8	23.0	19.0	20.5	25.5	20.5	23.5	27.0	20.5	23.5	24.5	17.0	20.0
9	21.0	17.5	19.0	29.0	18.0	23.0	25.0	20.0	22.0	25.0	17.5	20.5
10	24.0	15.0	19.5	28.5	20.5	24.5	23.0	18.5	20.5	26.5	18.0	22.0
11	19.0	17.5	18.5	30.0	23.0	26.5	25.0	17.0	20.5	25.0	19.0	21.0
12	20.0	17.0	18.5	27.5	24.5	26.0	28.0	18.5	23.0	24.5	17.0	20.0
13	21.0	17.5	19.0	29.0	24.0	25.5	26.0	20.5	23.0	24.5	17.0	19.5
14	21.0	18.5	20.0	28.5	23.5	25.5	26.0	22.5	23.5	20.5	16.0	18.0
15	19.5	16.0	18.0	26.0	22.5	24.0	27.0	20.5	23.0	18.5	14.0	16.0
16	22.0	14.0	18.0	28.0	20.5	24.0	23.0	19.5	21.0	15.5	12.0	13.5
17	21.5	14.5	18.0	30.0	21.5	25.0	24.5	17.0	20.0	18.0	10.5	14.0
18	21.5	14.5	18.0	29.5	22.0	25.5	25.0	17.0	20.5	18.5	11.0	14.5
19	18.0	16.5	17.5	29.5	23.0	25.5	25.5	17.5	21.0	19.5	12.5	15.5
20	21.5	15.5	18.5	28.0	22.5	25.0	25.5	18.0	21.5	20.0	13.5	16.5
21	21.5	17.0	18.5	28.5	22.0	24.0	26.0	18.0	21.5	20.5	14.0	16.5
22	22.5	15.5	19.0	25.5	20.0	22.5	22.5	18.5	20.5	19.0	14.0	16.0
23	24.0	17.0	20.0	27.5	18.5	21.5	23.5	20.0	21.0	16.0	13.5	14.5
24	25.5	19.0	21.5	26.0	19.0	22.0	24.5	19.5	21.0	19.0	13.0	15.5
25	25.5	17.5	21.0	24.0	20.0	22.0	24.5	20.0	21.0	17.0	15.0	16.0
26	27.5	18.0	22.5	24.0	19.0	21.0	21.5	20.0	20.5	17.5	12.0	15.5
27	23.5	20.5	22.0	20.5	18.0	19.5	21.0	19.0	20.0	16.5	8.0	11.5
28	24.5	21.0	22.5	22.0	16.5	19.0	20.5	17.5	19.5	16.0	8.0	11.5
29	27.5	21.0	23.5	19.5	18.0	19.0	23.5	18.0	21.0	17.5	10.5	13.5
30	29.0	19.5	23.5	24.5	18.5	21.0	25.5	18.5	22.0	14.0	10.5	12.5
31	---	---	---	25.5	21.0	23.0	23.5	18.0	21.5	---	---	---
MONTH	29.0	14.0	20.0	31.5	16.5	23.5	30.0	17.0	22.5	26.5	8.0	17.0

05300000 LAC QUI PARLE RIVER NEAR LAC QUI PARLE, MN

LOCATION.--Lat 44°59'42", long 95°55'09", in SW¼SW¼ sec.27, T.118 N., R.42 W., Lac qui Parle County, Hydrologio Unit 07020003, on right bank 40 ft (12 m) downstream from highway bridge and 0.5 mi (0.8 km) southwest of village of Lac qui Parle.

DRAINAGE AREA.--983 mi^2 (2,546 km^2).

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 (290.164 m) National Geodetic Vertical Datum of 1929 (Minnesota Department of Transportation benchmark). Apr. 27, 1910, to Nov. 15, 1914, nonrecording gage at site 2 mi (3 km) downstream at different datum. Mar. 17, 1931, to Mar. 9, 1937, nonreoording gage at site 40 ft (12 m) upstream at present datum.

REMARKS.--Records good except those for winter periods, which are fair.

AVERAGE DISCHARGE.--50 years (water years 1913, 1932, 1934-81), 121 ft^3/s (3.427 m^3/s), 1.67 in/yr (42 mm/yr), 87,660 acre-ft/yr (108 hm^3/yr); median of yearly mean discharges, 101 ft^3/s (2.86 m^3/s), 1.40 in/yr (36 mm/yr), 73,200 acre-ft/yr (90 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,100 ft^3/s (484 m^3/s) Apr. 10, 1969, gage height, 18.94 ft (5.773 m), from floodmark; maximum gage height, 19.37 ft (5.904 m) Apr. 9, 1965, from floodmark, (backwater from ice); no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 492 ft^3/s (13.9 m^3/s) June 14, gage height, 2.81 ft (0.856 m); no flow Sept. 24, gage height, 0.33 ft (0.101 m) result of beaver activity; minimum gage height, 0.17 ft (0.052 m) Dec. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	3.0	2.7	4.3	4.2	21	60	22	9.3	11	17	4.1
2	1.0	3.0	4.6	4.3	4.2	18	64	21	7.3	8.8	15	3.5
3	.90	3.2	3.7	4.3	4.2	21	68	20	6.9	7.4	14	2.7
4	.90	3.0	4.3	4.3	4.2	25	66	22	5.5	6.6	13	2.2
5	1.3	3.0	5.6	4.3	4.2	27	62	18	4.6	6.5	11	1.8
6	1.3	3.0	6.0	4.3	4.2	26	57	17	5.2	5.6	9.0	1.9
7	1.1	3.7	6.0	4.3	4.2	24	52	16	5.2	4.9	8.0	2.4
8	.90	3.4	5.6	4.3	4.2	23	45	16	5.8	4.7	6.2	2.1
9	1.1	3.2	6.1	4.3	4.2	23	42	15	6.2	3.6	4.7	2.0
10	2.5	3.2	6.1	4.3	4.2	22	41	14	5.6	3.0	3.5	2.4
11	1.3	3.4	5.3	4.3	4.2	21	36	13	6.3	4.0	3.2	2.5
12	1.1	3.2	6.1	4.2	4.2	22	33	11	8.1	3.4	2.4	1.9
13	2.0	3.4	6.0	4.2	4.2	18	29	10	27	3.7	2.0	1.0
14	2.6	3.4	5.9	4.2	4.2	21	29	10	294	3.7	1.4	.60
15	3.8	4.3	5.8	4.2	4.2	23	27	9.3	308	3.5	1.1	.47
16	5.3	4.6	5.6	4.2	4.2	21	26	8.7	194	4.3	.89	.60
17	5.0	4.6	5.5	4.2	4.2	31	23	8.0	139	5.8	.74	.60
18	4.7	4.4	5.4	4.2	8.4	28	21	8.0	111	5.8	.37	.84
19	4.5	4.6	5.3	4.2	12	26	22	7.6	89	6.5	.39	.84
20	4.3	4.6	5.2	4.2	18	23	22	7.0	71	7.1	.21	.87
21	4.0	5.0	5.0	4.2	13	23	23	6.1	58	6.6	.15	.74
22	3.4	5.0	4.9	4.2	11	23	26	5.5	48	12	.15	.38
23	3.7	5.0	4.8	4.2	18	22	26	9.1	40	12	.33	.12
24	4.0	4.6	4.7	4.2	20	20	27	7.7	39	15	.72	.04
25	4.0	4.6	4.6	4.2	21	17	26	5.6	31	15	1.8	.61
26	3.7	4.6	4.5	4.2	21	17	30	5.7	25	14	6.3	.40
27	3.7	5.0	4.5	4.2	25	17	40	6.5	21	33	6.2	.25
28	3.4	6.7	4.4	4.2	23	17	35	7.7	18	42	5.1	.01
29	3.2	5.3	4.4	4.2	---	20	18	8.5	17	32	5.9	.40
30	3.2	5.3	4.4	4.2	---	21	20	13	15	25	5.3	.82
31	3.2	---	4.3	4.2	---	24	---	12	---	20	4.9	---
TOTAL	87.40	123.3	157.3	131.3	261.8	685	1096	361.0	1621.0	336.5	150.95	39.09
MEAN	2.82	4.11	5.07	4.24	9.35	22.1	36.5	11.6	54.0	10.9	4.87	1.30
MAX	5.3	6.7	6.1	4.3	25	31	68	22	308	42	17	4.1
MIN	.90	3.0	2.7	4.2	4.2	17	18	5.5	4.6	3.0	.15	.01
CFSM	.003	.004	.005	.004	.01	.02	.04	.01	.06	.01	.005	.001
IN.	.00	.00	.01	.00	.01	.03	.04	.01	.06	.01	.01	.00
AC-FT	173	245	312	260	519	1360	2170	716	3220	667	299	78

CAL YR 1980 TOTAL 24516.41 MEAN 67.0 MAX 1350 MIN .45 CFSM .07 IN .93 AC-FT 48630
WTR YR 1981 TOTAL 5050.64 MEAN 13.8 MAX 308 MIN .01 CFSM .01 IN .19 AC-FT 10020

05301000 MINNESOTA RIVER NEAR LAC QUI PARLE, MN

LOCATION.--Lat 45°01'17", long 95°52'05", in NW¼NE¼ sec.24, T.118 N., R.42 W., Chippewa County, Hydrologic Unit 07020004, on left bank 200 ft (61 m) downstream from dam at Lac qui Parle Outlet, 2.4 mi (3.9 km) northeast of village of Lac qui Parle, and 3.5 mi (5.6 km) west of Watson.

DRAINAGE AREA.--4,050 mi^2 (10,500 km^2), approximately.

PERIOD OF RECORD.--October 1942 to current year.

GAGE.--Water-stage recorder. Datum of gage is 900.00 ft (274.320 m) National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to Nov. 10, 1944, at datum 0.20 ft (0.061 m) lower.

REMARKS.--Records good. Part of flow from 2,050 mi^2 (5,310 km^2) of Chippewa River basin at times diverted into Minnesota River above station. Some regulation by Big Stone Lake since Apr. 17, 1937, Lac qui Parle since January 1938, Marsh Lake since Nov. 1, 1939, and Odessa Dam since May 1974.

AVERAGE DISCHARGE.--39 years, 622 ft^3/s (17.62 m^3/s), 450,600 acre-ft/yr (556 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,400 ft^3/s (833 m^3/s) Apr. 12, 1969, gage height, 39.75 ft (12.116 m); no flow Nov. 17, 1942, Sept. 29, 1947, Oct. 19 to Nov. 18, 1951, Nov. 24, 1952, Dec. 9-11, 1976, Feb. 28 to Mar. 5, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,480 ft^3/s (41.9 m^3/s) June 18, gage height, 26.27 ft (8.007 m); minimum, 12 ft^3/s (0.34 m^3/s) Aug. 25, gage height, 20.05 ft (6.111 m), due to regulation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	131	124	128	123	97	391	239	175	200	593	253	40
2	150	125	128	125	79	389	238	176	201	348	247	42
3	149	124	128	123	58	389	237	176	207	346	242	31
4	149	123	128	125	57	346	236	175	230	346	242	22
5	150	125	128	125	57	276	236	175	269	354	242	20
6	149	124	127	123	57	238	238	173	320	388	240	20
7	158	123	127	125	57	204	236	175	324	421	236	22
8	161	124	128	125	56	204	233	129	325	409	239	22
9	155	124	128	123	56	175	236	81	324	390	241	24
10	141	129	128	123	56	141	234	81	325	395	227	24
11	142	122	129	123	56	143	233	81	326	396	159	24
12	140	121	127	123	56	145	234	82	268	406	79	24
13	139	120	129	107	56	165	231	82	344	661	85	21
14	149	121	130	91	56	184	231	83	694	958	73	22
15	161	122	129	91	56	182	232	84	1200	1000	72	21
16	163	121	129	91	56	186	232	84	1430	1080	73	21
17	167	121	128	91	56	188	231	84	1460	946	59	21
18	167	123	129	93	57	188	228	62	1470	662	71	21
19	166	123	127	93	57	190	226	47	1470	659	58	20
20	173	126	125	93	57	191	226	55	1460	708	73	21
21	194	124	125	93	57	194	203	56	1460	750	73	20
22	208	125	125	93	57	194	180	57	1460	705	73	20
23	206	125	123	93	57	197	180	57	1450	565	73	20
24	205	127	123	95	60	197	180	218	1460	476	73	19
25	205	127	123	95	73	197	180	430	1460	359	58	19
26	205	127	125	99	103	202	179	323	1440	367	66	18
27	206	127	127	97	163	193	176	217	1430	372	96	20
28	183	127	125	97	307	194	177	217	1410	371	79	19
29	160	128	125	97	---	193	178	218	1150	335	79	19
30	134	128	125	97	---	213	177	218	716	270	79	19
31	123	---	125	97	---	238	---	200	---	267	67	---
TOTAL	5089	3730	3931	3289	2070	6727	6477	4471	26283	16303	4027	676
MEAN	164	124	127	106	73.9	217	216	144	876	526	130	22.5
MAX	208	129	130	125	307	391	239	430	1470	1080	253	42
MIN	123	120	123	91	56	141	176	47	200	267	58	18
AC-FT	10090	7400	7800	6520	4110	13340	12850	8870	52130	32340	7990	1340

CAL YR 1980 TOTAL 120947 MEAN 330 MAX 1580 MIN 22 AC-FT 239900
WTR YR 1981 TOTAL 83073 MEAN 228 MAX 1470 MIN 18 AC-FT 164800

05304500 CHIPPEWA RIVER NEAR MILAN, MN

LOCATION.--Lat 45°06'39", long 95°47'57", in SE¼SE¼ sec.16, T.119 N., R.41 W., Chippewa County, Hydrologic Unit 07020005, on right bank 800 ft (240 m) upstream from bridge on State Highway 40, 2.0 mi (3.2 km) upstream from small tributary, and 5.5 mi (8.8 km) east of Milan.

DRAINAGE AREA.--1,870 mi^2 (4,840 km^2), approximately.

WATER-DISCHARGE RECORDS

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 (292.514 m) National Geodetic Vertical Datum of 1929. Prior to June 15, 1942, nonrecording gage on bridge 800 ft (240 m) downstream at same datum.

REMARKS.--Records good except those for winter period, which are fair. Flow regulated by several small lakes above gage.

AVERAGE DISCHARGE.--44 years, 265 ft^3/s (7.505 m^3/s), 1.92 in/yr (49 mm/yr), 192,000 acre-ft/yr (237 hm^3/yr); median of yearly mean discharges, 219 ft^3/s (6.20 m^3/s), 1.59 in/yr (40 mm/yr), 159,000 acre-ft/yr (196 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,400 ft^3/s (323 m^3/s) Apr. 9, 1969, gage height, 15.45 ft (4.709 m); no flow at times during 1940.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 400 ft^3/s (11.3 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
May 24	0600	530	15.0	3.02	0.920	June 24	2315	1,340	37.9	4.59	1.399
June 14	1030	*2,700	76.5	*6.82	2.079	July 13	0715	1,490	42.2	4.85	1.478

Minimum daily discharge, 37 ft^3/s (1.05 m^3/s) Jan. 11 to Feb. 14; minimum gage height, 1.59 ft (0.485 m) Nov. 25 (backwater from ice).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	120	132	104	40	37	117	199	189	286	541	236	186
2	118	130	94	39	37	112	210	184	280	460	223	190
3	117	133	92	39	37	123	213	186	277	432	215	186
4	116	133	89	39	37	127	210	188	271	419	208	178
5	119	132	85	39	37	138	210	189	261	381	200	170
6	125	138	80	38	37	145	210	185	246	343	192	168
7	125	137	76	38	37	154	206	180	228	315	188	178
8	122	137	73	38	37	154	196	172	219	271	185	222
9	118	135	69	38	37	156	188	166	213	246	174	213
10	110	134	68	38	37	159	185	165	210	228	170	188
11	107	130	64	37	37	173	182	157	208	525	173	170
12	102	130	61	37	37	191	179	151	196	984	170	159
13	104	133	58	37	37	183	177	146	470	1430	170	150
14	106	132	56	37	37	205	169	141	2510	1180	166	143
15	109	127	54	37	39	210	168	138	2470	940	161	136
16	119	117	52	37	43	202	165	133	1930	782	156	130
17	122	121	51	37	45	186	163	129	1680	690	150	121
18	138	134	49	37	47	173	162	125	1540	604	143	115
19	136	123	48	37	50	156	159	125	1380	525	141	112
20	136	119	47	37	52	159	155	119	1230	489	132	106
21	135	127	46	37	69	159	162	114	1120	474	125	98
22	135	115	46	37	76	156	173	107	1030	437	119	91
23	134	115	45	37	80	154	185	146	968	510	123	89
24	136	112	44	37	76	156	193	408	1160	456	132	87
25	137	83	43	37	76	154	195	360	1210	385	154	87
26	138	102	43	37	80	154	193	295	951	343	156	91
27	143	102	42	37	92	156	198	276	830	315	163	91
28	135	98	42	37	130	156	192	277	755	293	178	89
29	139	98	41	37	---	168	189	293	690	274	178	85
30	135	108	41	37	---	183	191	309	609	258	178	83
31	134	---	40	37	---	199	---	305	---	250	180	---
TOTAL	3870	3667	1843	1163	1473	5018	5577	6058	25428	15780	5239	4112
MEAN	125	122	59.5	37.5	52.6	162	186	195	848	509	169	137
MAX	143	138	104	40	130	210	213	408	2510	1430	236	222
MIN	102	83	40	37	37	112	155	107	196	228	119	83
CFSM	.07	.07	.03	.02	.03	.09	.10	.10	.45	.27	.09	.07
IN.	.08	.07	.04	.02	.03	.10	.11	.12	.51	.31	.10	.08
AC-FT	7680	7270	3660	2310	2920	9950	11060	12020	50440	31300	10390	8160

CAL YR 1980 TOTAL 74439 MEAN 203 MAX 865 MIN 40 CFSM .11 IN 1.48 AC-FT 147600
WTR YR 1981 TOTAL 79228 MEAN 217 MAX 2510 MIN 37 CFSM .12 IN 1.58 AC-FT 157100

05304500 CHIPPEWA RIVER NEAR MILAN, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-67, 1972 to current year (discontinued).

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---		---	---		---	---	---	---	---	---	
2	12.0		---	---		---	---	---	---	---	---	
3	---		---	---		---	---	---	---	---	---	
4	---		---	---		---	---	---	---	---	---	
5	---		---	---		---	---	---	---	---	---	
6	---		---	---		---	---	---	---	---	---	
7	---		---	---		---	10.5	---	---	---	---	
8	---		---	---		---	---	---	---	---	---	
9	---		---	---		---	---	---	---	---	---	
10	---		---	---		---	---	---	---	---	---	
11	---		.0	---		---	---	---	---	---	---	
12	---		---	---		1.0	---	---	---	---	---	
13	---		---	---		---	---	---	20.5	24.0	24.5	
14	---		---	---		---	---	---	20.0	25.0	---	
15	---		---	---		---	---	---	20.5	23.0	---	
16	---		---	.0		---	---	---	18.0	---	---	
17	---		---	---		---	---	---	---	25.0	---	
18	---		---	---		---	---	---	---	---	---	
19	---		---	---		---	---	---	18.0	25.5	---	
20	---		---	---		---	---	---	---	---	---	
21	---		---	---		---	---	---	---	---	---	
22	---		---	---		---	---	---	18.5	---	---	
23	---		---	---		---	---	17.5	---	---	---	
24	---		---	---		---	---	14.0	---	---	---	
25	---		---	---		---	---	13.5	---	---	---	
26	---		---	---		---	---	15.5	---	---	---	
27	---		---	---		---	---	---	---	---	---	
28	---		---	---		---	---	---	---	---	---	
29	---		---	---		---	---	---	---	---	---	
30	---		---	---		---	---	---	---	---	---	
31	---		---	---		---	---	20.5	---	---	---	

05304500 CHIPPEWA RIVER NEAR MILAN, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	---	---			---	---	---	---			---	---
2	69	20			---	---	---	---			---	---
3	---	---			---	---	---	---			---	---
4	---	---			---	---	---	---			---	---
5	---	---			---	---	---	---			---	---
6	---	---			---	---	---	---			---	---
7	---	---			---	---	---	---			---	---
8	---	---			---	---	---	---			---	---
9	---	---			---	---	---	---			---	---
10	---	---			---	---	---	---			---	---
11	---	---			131	23	---	---			---	---
12	---	---			---	---	---	---			31	16
13	---	---			---	---	---	---			---	---
14	---	---			---	---	---	---			---	---
15	---	---			---	---	---	---			---	---
16	---	---			---	---	47	4.7			---	---
17	---	---			---	---	---	---			---	---
18	---	---			---	---	---	---			---	---
19	---	---			---	---	---	---			---	---
20	---	---			---	---	---	---			---	---
21	---	---			---	---	---	---			---	---
22	---	---			---	---	---	---			---	---
23	---	---			---	---	---	---			---	---
24	---	---			---	---	---	---			---	---
25	---	---			---	---	---	---			---	---
26	---	---			---	---	---	---			---	---
27	---	---			---	---	---	---			---	---
28	---	---			---	---	---	---			---	---
29	---	---			---	---	---	---			---	---
30	---	---			---	---	---	---			---	---
31	---	---			---	---	---	---			---	---

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER
1	---	---	---	---	141	109	113	165	72	46	
2	---	---	---	---	128	97	113	140	68	41	
3	---	---	---	---	122	91	112	131	---	---	
4	---	---	---	---	113	83	112	127	---	---	
5	---	---	---	---	112	79	112	115	---	---	
6	---	---	---	---	---	---	112	104	---	---	
7	23	13	---	---	---	---	112	95	---	---	
8	---	---	---	---	---	---	112	82	---	---	
9	---	---	---	---	---	---	112	74	---	---	
10	---	---	---	---	---	---	112	69	---	---	
11	---	---	---	---	---	---	173	262	---	---	
12	---	---	---	---	---	---	225	598	---	---	
13	---	---	---	---	659	1460	260	1000	67	31	
14	---	---	---	---	1020	6860	154	491	---	---	
15	---	---	---	---	232	1550	148	376	---	---	
16	---	---	---	---	131	683	137	289	---	---	
17	---	---	---	---	130	590	127	237	---	---	
18	---	---	---	---	132	549	127	207	---	---	
19	---	---	---	---	132	492	121	172	---	---	
20	---	---	---	---	124	412	128	169	---	---	
21	---	---	---	---	117	354	120	154	---	---	
22	---	---	---	---	113	314	116	137	---	---	
23	---	---	214	114	116	303	159	219	---	---	
24	---	---	466	528	172	539	149	183	---	---	
25	---	---	142	138	154	503	139	144	---	---	
26	---	---	107	85	130	334	129	119	---	---	
27	---	---	107	80	119	267	120	102	---	---	
28	---	---	112	84	117	239	114	90	---	---	
29	---	---	122	97	116	216	105	78	---	---	
30	---	---	133	111	113	186	94	65	---	---	
31	---	---	141	116	---	---	84	57	---	---	
TOTAL	---		---		---		---	6251	---		

05311000 MINNESOTA RIVER AT MONTEVIDEO, MN

LOCATION.--Lat 44°56'00", long 95°44'00", in NW¼NW¼ sec.19, T.117 N., R.40 W., Yellow Medicine County, Hydrologic Unit 07020004, on right bank 100 ft (30 m) upstream from bridge on U.S. Highway 212, at Montevideo, and 400 ft (122 m) downstream from Chippewa River.

DRAINAGE AREA.--6,180 mi^2 (16,000 km^2), 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 (277.100 m) National Geodetic Vertical Datum of 1929. July 22, 1909, to Feb. 4, 1932, nonrecording gage at bridge 600 ft (183 m) downstream at present datum. Feb. 5, 1932, to Nov. 26, 1934, nonrecording gage at bridge 100 ft (30 m) downstream at present datum.

REMARKS.--Records good except those for winter period, which are fair. Flow regulated by Big Stone Lake since Apr. 17, 1937, Lac qui Parle since January 1938, and Marsh Lake since Nov. 1, 1939.

AVERAGE DISCHARGE.--60 years (water years 1910-17, 1930-81), 679 ft^3/s (19.23 m^3/s), 491,900 acre-ft/yr (607 hm^3/yr); median of yearly mean discharges, 544 ft^3/s (15.4 m^3/s), 394,000 acre-ft/yr (486 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,100 ft^3/s (994 m^3/s) Apr. 12, 1969, gage height, 21.68 ft (6.608 m), from high-water mark; no flow for several days in 1933-34, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,070 ft^3/s (58.6 m^3/s) June 18, gage height, 8.49 ft (2.588 m); minimum discharge, 54 ft^3/s (1.53 m^3/s) May 20, result of regulation; minimum gage height, 1.39 ft (0.424 m) Sept. 27, 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	130	160	147	135	114	630	346	258	259	1020	383	101
2	165	159	147	132	110	640	346	264	249	570	364	86
3	179	157	148	132	96	542	348	272	245	462	361	83
4	181	155	148	130	80	490	343	265	268	451	351	75
5	183	154	149	130	76	423	345	258	325	446	351	69
6	185	154	149	130	75	393	354	257	375	454	348	72
7	186	155	150	130	75	322	353	257	394	490	344	82
8	203	155	150	130	75	311	354	253	397	495	342	65
9	201	155	150	130	75	308	354	166	400	476	345	63
10	187	156	151	130	75	239	352	146	398	474	348	63
11	165	156	151	130	74	222	348	146	398	501	299	63
12	168	156	151	130	74	225	352	146	394	484	201	61
13	168	157	151	130	74	224	352	146	427	767	135	61
14	179	157	150	118	74	265	351	146	719	1350	134	60
15	209	156	150	115	74	279	335	146	1510	1440	125	59
16	206	155	149	115	74	274	320	146	1930	1510	124	59
17	206	154	149	115	74	277	312	143	2060	1490	121	60
18	205	149	149	115	74	267	311	146	2060	1070	110	61
19	208	152	149	115	74	263	317	82	2040	969	117	63
20	226	159	145	115	74	265	313	63	1960	972	114	63
21	263	152	142	115	74	271	318	75	1930	1040	122	64
22	266	156	142	115	78	274	270	68	1940	1040	121	64
23	261	154	141	115	106	276	257	67	1910	909	120	66
24	260	146	141	115	110	276	258	102	1960	848	122	64
25	261	146	140	115	115	277	261	419	1980	688	129	63
26	262	146	140	115	120	281	262	448	1950	665	111	62
27	252	146	140	115	155	287	263	292	1910	665	131	59
28	218	146	140	115	330	283	261	284	1880	645	138	59
29	187	146	138	115	---	287	260	285	1800	496	128	60
30	162	147	138	115	---	288	260	285	1190	408	126	60
31	160	---	136	115	---	338	---	276	---	387	126	---
TOTAL	6292	4596	4521	3772	2679	9997	9476	6307	35258	23682	6391	1990
MEAN	203	153	146	122	95.7	322	316	203	1175	764	206	66.3
MAX	266	160	151	135	330	640	354	448	2060	1510	383	101
MIN	130	146	136	115	74	222	257	63	245	387	110	59
AC-FT	12480	9120	8970	7480	5310	19830	18800	12510	69930	46970	12680	3950

CAL YR 1980 TOTAL 158382 MEAN 433 MAX 1910 MIN 80 AC-FT 314200
WTR YR 1981 TOTAL 114961 MEAN 315 MAX 2060 MIN 59 AC-FT 228000

05311400 SOUTH BRANCH YELLOW MEDICINE RIVER AT MINNEOTA, MN

LOCATION.--Lat 44°33'50", long 95°59'50", in SE¼ sec.26, T.113 N., R.43 W., Lyon County, Hydrologic Unit 07020004, on downstream side of bridge on State Highway 68, 0.5 mi (0.8 km) northwest of Minneota and 6 mi (9.7 km) upstream from mouth.

DRAINAGE AREA.--111 mi^2 (287 km^2), approximately.

PERIOD OF RECORD.--April 1960 to current year. Monthly and daily discharge for the period Apr. 1, 1960, to June 30, 1960, published in WSP 1914.

GAGE.--Nonrecording gage and crest-stage gage. Datum of gage is 1,150.00 ft (350.520 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--21 years, 20.5 ft^3/s (0.581 m^3/s), 2.51 in/yr (64 mm/yr), 14,850 acre-ft/yr (18.3 hm^3/yr); median of yearly mean discharges, 15 ft^3/s (0.42 m^3/s), 1.84 in/yr (47 mm/yr), 10,900 acre-ft/yr (13 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,430 ft^3/s (125 m^3/s) Apr. 8, 1969, gage height, 13.41 ft (4.087 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 248 ft^3/s (7.02 m^3/s) July 23, gage height, 5.72 (1.743 m); no other peak above base of 82 ft^3/s (2.32 m^3/s); no flow Oct. 2-13, Jan. 7 to Feb. 15, July 9, 10, 14, 17-19, 21, Sept. 20-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	.90	.72	.13	.00	1.5	4.1	2.2	.40	.12	3.9	.56
2	.00	.90	.65	.12	.00	1.4	3.7	1.9	.36	.06	3.2	.40
3	.00	.90	.60	.10	.00	1.6	3.1	3.3	.60	.08	2.3	.23
4	.00	.84	.32	.05	.00	1.8	3.8	3.3	.64	.08	2.7	.19
5	.00	.84	.26	.03	.00	1.9	3.3	2.7	.64	.08	1.9	.17
6	.00	.96	.30	.01	.00	2.0	3.0	2.1	.40	.06	1.8	.14
7	.00	.96	.50	.00	.00	2.0	2.7	1.7	.36	.03	1.2	.14
8	.00	.96	.60	.00	.00	2.2	2.4	1.5	.32	.02	.68	.10
9	.00	.96	.65	.00	.00	2.4	2.3	1.7	.29	.00	.52	.10
10	.00	1.0	.72	.00	.00	2.6	2.2	1.4	.36	.00	.36	.09
11	.00	.96	.74	.00	.00	2.8	1.9	1.2	.21	.04	.19	.09
12	.00	.96	.74	.00	.00	2.9	2.4	.96	.29	.04	.18	.09
13	.00	.96	.65	.00	.00	3.3	2.8	.90	1.1	.06	.17	.06
14	.02	1.1	.73	.00	.00	3.6	3.4	.90	1.9	.00	.17	.04
15	.09	1.1	.73	.00	.00	4.1	3.4	.84	2.4	.02	.16	.03
16	.21	1.0	.68	.00	.15	3.0	2.9	.78	1.4	.03	.15	.02
17	.52	1.1	.50	.00	.56	3.0	2.7	.78	.78	.00	.14	.03
18	.48	1.0	.46	.00	.54	4.4	2.3	.73	.56	.00	.14	.02
19	.36	1.0	.40	.00	.52	5.6	2.2	.68	.36	.00	.12	.02
20	.29	1.0	.34	.00	.50	1.9	2.2	.64	.32	.04	.14	.00
21	.23	1.0	.20	.00	.48	1.9	3.2	.56	.32	.00	.12	.00
22	.26	1.0	.18	.00	.52	1.6	3.3	.45	.52	.94	.10	.00
23	.32	1.0	.10	.00	.56	1.4	3.4	.48	.48	188	.12	.00
24	.48	1.0	.10	.00	.56	1.2	3.0	.78	.45	120	.21	.00
25	.56	1.0	.10	.00	.70	1.2	2.8	.78	.23	44	1.7	.00
26	.52	1.0	.10	.00	.96	1.5	2.2	.68	.19	29	4.3	.00
27	.48	1.0	.12	.00	1.4	1.3	1.8	.48	.17	16	1.8	.00
28	.52	.78	.13	.00	1.6	1.7	1.7	.48	.17	11	1.0	.00
29	.56	.78	.14	.00	---	7.7	2.9	.60	.19	7.7	.78	.00
30	.64	.74	.14	.00	---	6.4	2.9	.73	.15	6.0	.73	.00
31	.73	---	.14	.00	---	4.9	---	.56	---	4.7	.64	---
TOTAL	7.29	28.70	12.74	.44	9.05	84.8	84.0	36.79	16.56	428.10	31.62	2.52
MEAN	.24	.96	.41	.014	.32	2.74	2.80	1.19	.55	13.8	1.02	.084
MAX	.73	1.1	.74	.13	1.6	7.7	4.1	3.3	2.4	188	4.3	.56
MIN	.00	.74	.10	.00	.00	1.2	1.7	.45	.15	.00	.10	.00
CFSM	.002	.009	.004	.000	.003	.03	.03	.01	.005	.12	.009	.001
IN.	.00	.01	.00	.00	.00	.03	.03	.01	.01	.14	.01	.00
AC-FT	14	57	25	.9	18	168	167	73	33	849	63	5.0

CAL YR 1980	TOTAL	3874.62	MEAN	10.6	MAX	171	MIN	.00	CFSM	.10	IN	1.30	AC-FT	7690
WTR YR 1981	TOTAL	742.61	MEAN	2.03	MAX	188	MIN	.00	CFSM	.02	IN	.25	AC-FT	1470

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 (15 m) downstream from highway bridge, 6 mi (9.7 km) upstream from mouth, and 8 mi (13 km) south of town of Granite Falls.

DRAINAGE AREA.--653 mi^2 (1,691 km^2).

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 (292.803 m) National Geodetic Vertical Datum of 1929. Mar. 16, 1931, to June 13, 1938, nonrecording gage, on bridge 50 ft (15 m) upstream at present datum. Oct. 12, 1939, to Nov. 30, 1952, nonrecording gage 500 ft (152 m) downstream at present datum.

REMARKS.--Records good except those for winter period, which are fair. Natural discharge affected by unknown amount of interbasin flow between Yellow Medicine, Redwood, and Cottonwood River basins during extreme floods.

AVERAGE DISCHARGE.--45 years (water years 1936-38, 1940-81), 104 ft^3/s (2.945 m^3/s), 2.16 in/yr (55 mm/yr), 75,350 acre-ft/yr (92.9 hm^3/yr); median of yearly mean discharges, 78 ft^3/s (2.21 m^3/s), 1.62 in/yr (41 mm/yr), 56,500 acre-ft/yr (70 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,200 ft^3/s (487 m^3/s) Apr. 10, 1969, gage height, 14.90 ft (4.542 m); no flow at times in 1931, 1933, 1948, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1919 reached a stage of 17.5 (5.3 m), from information by local residents, discharge, 25,200 ft^3/s (714 m^3/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 188 ft^3/s (5.32 m^3/s) July 26, gage height, 3.13 ft (0.954 m), no peak above base of 300 ft^3/s (8.50 m^3/s); minimum discharge, 1.5 ft^3/s (0.042 m^3/s) Sept. 13, 14, 18, 19; minimum gage height, 2.08 ft (0.634 m) Aug. 21, 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	4.9	6.4	4.6	4.1	15	32	14	4.9	24	51	6.0
2	2.2	4.9	6.4	4.6	4.1	11	34	13	5.3	20	37	6.0
3	2.0	4.9	6.1	4.6	4.1	12	32	14	5.3	18	33	5.3
4	2.0	4.9	5.3	4.5	4.1	13	36	13	4.9	15	29	4.3
5	1.9	4.7	5.1	4.5	4.1	16	37	13	4.9	13	41	3.7
6	1.8	5.0	5.3	4.5	4.1	15	32	12	4.3	11	33	3.0
7	1.9	5.3	5.3	4.5	4.1	15	31	11	4.0	8.7	24	2.8
8	2.1	5.3	5.4	4.5	4.1	16	30	13	4.0	7.3	18	2.6
9	2.2	5.3	5.3	4.5	4.1	17	27	15	4.3	6.1	14	2.2
10	2.2	5.9	5.2	4.4	4.1	18	25	15	4.6	5.5	11	2.2
11	2.6	5.1	5.0	4.4	4.1	17	24	13	5.3	15	11	2.0
12	2.8	5.0	4.9	4.4	4.1	16	26	12	6.0	11	8.8	2.0
13	2.9	4.9	4.9	4.4	4.1	18	25	11	68	8.3	6.0	1.7
14	2.8	5.5	4.9	4.3	4.1	18	25	9.3	66	7.3	6.4	1.7
15	3.1	5.3	4.9	4.3	4.1	20	22	8.6	93	6.9	5.3	1.7
16	4.1	6.1	4.9	4.3	4.1	19	20	7.7	86	5.9	4.3	1.7
17	3.7	6.4	4.9	4.3	4.3	17	19	7.0	64	5.0	4.0	1.7
18	3.5	6.4	4.9	4.3	5.3	16	19	6.8	45	4.4	3.2	1.7
19	3.5	6.4	4.9	4.3	6.8	14	20	6.4	40	4.7	3.0	1.7
20	3.2	6.4	4.9	4.2	8.8	13	19	5.6	42	9.4	2.6	2.0
21	3.4	6.4	4.9	4.2	9.3	12	18	5.3	44	8.3	2.0	2.2
22	3.2	6.4	4.9	4.2	16	12	18	4.6	41	7.3	2.2	2.2
23	3.1	6.4	4.8	4.2	12	11	17	4.6	60	13	4.9	1.8
24	3.3	6.4	4.8	4.2	14	11	15	4.3	46	16	5.6	2.0
25	4.3	6.4	4.8	4.2	11	11	15	4.6	37	15	4.3	2.0
26	4.3	6.4	4.8	4.2	12	9.9	15	4.9	33	152	4.0	2.0
27	4.3	6.4	4.7	4.1	16	11	17	4.9	31	168	4.0	1.8
28	4.4	6.2	4.7	4.1	16	11	16	4.9	30	133	4.9	1.8
29	4.6	6.4	4.7	4.1	---	13	16	5.6	29	85	4.6	1.8
30	5.0	6.4	4.7	4.1	---	14	15	5.3	26	62	7.3	1.8
31	4.9	---	4.6	4.1	---	16	---	4.9	---	49	7.8	---
TOTAL	97.3	172.4	157.3	134.1	197.1	447.9	697	274.3	938.8	915.1	397.2	75.4
MEAN	3.14	5.75	5.07	4.33	7.04	14.4	23.2	8.85	31.3	29.5	12.8	2.51
MAX	5.0	6.4	6.4	4.6	16	20	37	15	93	168	51	6.0
MIN	1.8	4.7	4.6	4.1	4.1	9.9	15	4.3	4.0	4.4	2.0	1.7
CFSM	.005	.009	.008	.007	.01	.02	.04	.01	.05	.05	.02	.004
IN.	.01	.01	.01	.01	.01	.03	.04	.02	.05	.05	.02	.00

CAL YR 1980 TOTAL 20597.0 MEAN 56.3 MAX 745 MIN 1.8 CFSM .09 IN 1.17
WTR YR 1981 TOTAL 4503.9 MEAN 12.3 MAX 168 MIN 1.7 CFSM .02 IN .26

05313500 YELLOW MEDICINE RIVER NEAR GRANITE FALLS, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1961-62, 1971-75, 1977 to September 1981 (discontinued).

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: November 1979 to September 1981.
SUSPENDED-SEDIMENT DISCHARGE: October 1979 to September 1981.

REMARKS.--Sediment observer collects suspended-sediment samples daily when the stage is equal to or greater than 3.0 feet and several times daily during periods of rapidly changing stage. Water temperatures are obtained when sediment samples are collected.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---		---	---		---	---	---		---
2	---	---	---		---	---		---	---	---		---
3	10.5	---	---		.5	---		---	---	---		---
4	---	---	---		---	---		---	---	---		---
5	---	---	---		---	---		---	---	---		---
6	---	---	---		---	---		---	---	---		---
7	---	---	---		---	---		---	---	---		---
8	---	---	---		---	---		---	---	---		---
9	---	---	---		---	---		---	---	---		---
10	---	---	---		---	---		---	---	---		---
11	---	---	---		---	---		---	---	---		---
12	---	---	---		---	---		---	---	---		---
13	---	---	---		---	---		16.0	---	---		---
14	---	---	---		---	---		---	---	---		---
15	---	---	1.0		---	---		---	---	---		---
16	---	---	---		---	8.0		---	19.0	---		---
17	---	3.0	---		---	---		---	---	---		---
18	---	---	---		---	---		---	---	---		---
19	---	---	---		---	---		---	---	---		---
20	---	---	---		---	---		---	---	---		---
21	---	---	---		---	---		---	---	---		17.0
22	---	---	---		---	---		---	---	24.0		---
23	---	---	---		---	---		---	---	---		---
24	---	---	---		---	---		---	---	---		---
25	---	---	---		---	---		---	---	---		---
26	---	---	---		---	---		---	---	---		---
27	---	---	---		---	---		---	---	---		---
28	---	---	---		---	---		---	---	---		---
29	---	---	---		---	---		---	---	---		---
30	---	---	---		---	---		---	---	---		---
31	---	---	---		---	---		---	---	---		---

05313500 YELLOW MEDICINE RIVER NEAR GRANITE FALLS, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	---	---	---	---	---	---			---	---	---	---
2	---	---	---	---	---	---			---	---	---	---
3	62	.33	---	---	---	---			133	1.5	---	---
4	---	---	---	---	---	---			---	---	---	---
5	---	---	---	---	---	---			---	---	---	---
6	---	---	---	---	---	---			---	---	---	---
7	---	---	---	---	---	---			---	---	---	---
8	---	---	---	---	---	---			---	---	---	---
9	---	---	---	---	---	---			---	---	---	---
10	---	---	---	---	---	---			---	---	---	---
11	---	---	---	---	---	---			---	---	---	---
12	---	---	---	---	---	---			---	---	---	---
13	---	---	---	---	---	---			---	---	---	---
14	---	---	---	---	---	---			---	---	---	---
15	---	---	---	---	178	2.4			---	---	---	---
16	---	---	---	---	---	---			---	---	22	1.1
17	---	---	126	2.2	---	---			---	---	---	---
18	---	---	---	---	---	---			---	---	---	---
19	---	---	---	---	---	---			---	---	---	---
20	---	---	---	---	---	---			---	---	---	---
21	---	---	---	---	---	---			---	---	---	---
22	---	---	---	---	---	---			---	---	---	---
23	---	---	---	---	---	---			---	---	---	---
24	---	---	---	---	---	---			---	---	---	---
25	---	---	---	---	---	---			---	---	---	---
26	---	---	---	---	---	---			---	---	---	---
27	---	---	---	---	---	---			---	---	---	---
28	---	---	---	---	---	---			---	---	---	---
29	---	---	---	---	---	---			---	---	---	---
30	---	---	---	---	---	---			---	---	---	---
31	---	---	---	---	---	---			---	---	---	---

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1			---	---	---	---	---	---			---	---
2			---	---	---	---	---	---			---	---
3			---	---	---	---	---	---			---	---
4			---	---	---	---	---	---			---	---
5			---	---	---	---	---	---			---	---
6			---	---	---	---	---	---			---	---
7			---	---	---	---	---	---			---	---
8			---	---	---	---	---	---			---	---
9			---	---	---	---	---	---			---	---
10			---	---	---	---	---	---			---	---
11			---	---	---	---	---	---			---	---
12			---	---	---	---	---	---			---	---
13			124	3.7	---	---	---	---			---	---
14			---	---	---	---	---	---			---	---
15			---	---	---	---	---	---			---	---
16			---	---	191	44	---	---			---	---
17			---	---	---	---	---	---			---	---
18			---	---	---	---	---	---			---	---
19			---	---	---	---	---	---			---	---
20			---	---	---	---	---	---			---	---
21			---	---	---	---	---	---			50	.30
22			---	---	---	---	151	3.0			---	---
23			---	---	166	29	---	---			---	---
24			---	---	---	---	---	---			---	---
25			---	---	---	---	---	---			---	---
26			---	---	---	---	210	86			---	---
27			---	---	---	---	184	83			---	---
28			---	---	---	---	172	62			---	---
29			---	---	---	---	---	---			---	---
30			---	---	---	---	---	---			---	---
31			---	---	---	---	---	---			---	---

05315000 REDWOOD RIVER NEAR MARSHALL, MN

LOCATION.--Lat 44°25'49", long 95°50'43", in SE¼SW¼ sec.12, T.111 N., R.42 W., Lyon County, Hydrologic Unit 07020006, on right bank 2.0 mi (3.2 km) upstream from Redwood River diversion structure on southwest edge of town of Marshall, MN. Prior to Apr. 10, 1980, at site 5 mi (8.0 km) downstream.

DRAINAGE AREA.--303 mi^2 (785 km^2).

PERIOD OF RECORD.--March 1940 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is 1,188.23 ft (362.172 m) National Geodetic Vertical Datum of 1929. Nonrecording gage and crest-stage gage 5 mi (8.0 km) downstream from present site. Datum of gage is 1,144.88 ft (348.959 m) National Geodetic Vertical Datum of 1929. Nonrecording gage and crest-stage gage on diversion channel. Datum of gage is 1,100.00 ft (335.280 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for winter period, which are fair. Water diverted at medium and high stages into diversion channel 2.0 mi (3.2 km) below station. Diversion began Mar. 18, 1964. Unknown amount of natural diversion into Cottonwood River basin occurs at extremely high stages 0.8 mi (1.3 km) below station.

AVERAGE DISCHARGE.--41 years, 45.5 ft^3/s (1.289 m^3/s), 2.04 in/yr (52 mm/yr) 32,960 acre-ft (40.6 hm^3/yr); median of yearly mean discharges, 36 ft^3/s (1.02 m^3/s), 1.61 in/yr (41 mm/yr), 26,100 acre-ft/yr (32 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--River only, maximum discharge, 5,370 ft^3/s (152 m^3/s) June 17, 1957, gage height, 10.14 ft (3.091 m); maximum gage height, 11.05 ft (3.368 m) Apr. 6, 1951, from floodmark; no flow at times.

Diversion only, maximum discharge, 4,440 ft^3/s (126 m^3/s) Apr. 10, 1969, gage height, 78.45 ft (23.912 m); no flow on many days.

Combined flow, maximum discharge, 5,590 ft^3/s (158 m^3/s) Apr. 10, 1969; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 53 ft^3/s (1.50 m^3/s) Aug. 26, gage height, 6.89 ft (2.100 m); maximum gage height, 7.63 ft (2.326 m) Oct. 8, (backwater from beaver dam); minimum discharge, 0.29 ft^3/s (0.008 m^3/s) July 5, gage height, 5.92 ft (1.804 m); minimum gage height, 5.73 ft (1.747 m) Sept. 21-23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	5.4	4.1	3.7	3.9	5.1	12	5.6	2.3	.67	6.3	11
2	3.2	5.4	4.2	3.7	3.9	4.8	11	5.6	2.7	.58	6.6	9.0
3	3.2	5.3	5.0	3.6	3.9	5.4	10	5.6	3.5	.67	6.6	6.9
4	3.0	5.4	5.0	3.5	3.9	5.4	10	5.6	3.0	.67	5.4	6.0
5	3.0	5.4	5.0	3.5	3.9	5.1	9.4	4.8	2.1	.42	4.5	5.1
6	3.0	5.4	5.0	3.4	3.9	4.8	9.0	4.8	2.1	.67	4.5	4.8
7	3.0	5.4	5.0	3.4	3.9	4.8	8.3	4.5	2.3	1.4	4.8	5.1
8	3.0	5.4	4.8	3.4	3.9	4.5	7.6	4.5	2.1	1.1	4.0	4.2
9	3.0	5.4	4.6	3.3	3.9	4.5	7.3	4.5	3.5	.78	3.5	3.7
10	3.0	5.6	4.4	3.3	3.9	4.5	7.3	4.5	3.2	.50	3.5	3.5
11	3.0	5.6	4.3	3.3	3.9	4.5	7.3	4.2	2.1	1.2	3.2	3.2
12	3.0	5.6	4.8	3.3	3.9	4.8	6.9	4.2	1.9	1.3	3.5	3.0
13	3.2	5.6	5.2	3.3	3.9	5.1	7.6	4.2	2.5	1.7	3.2	3.0
14	3.4	5.6	5.3	3.3	3.9	5.6	7.3	3.9	2.7	1.6	9.0	2.7
15	3.5	5.6	5.8	3.3	3.9	7.3	7.3	3.7	3.0	1.4	11	2.7
16	4.5	5.6	6.0	3.3	4.2	8.0	6.9	3.5	2.5	1.4	7.3	3.0
17	5.4	5.4	6.3	3.3	4.2	8.0	6.6	3.5	1.9	1.6	6.0	2.7
18	5.4	5.4	7.0	3.3	5.6	8.0	6.6	3.5	1.4	1.4	6.0	2.7
19	5.6	5.4	6.8	3.3	5.6	8.1	6.3	3.0	1.3	3.2	5.7	2.7
20	6.1	5.4	6.5	3.3	4.5	8.0	6.3	3.0	1.3	8.3	5.1	2.7
21	5.6	5.4	6.2	3.4	5.1	8.0	6.6	3.0	1.3	2.7	5.1	2.3
22	6.6	5.6	5.5	3.6	5.1	8.0	6.6	3.2	1.3	3.2	5.4	2.1
23	8.7	5.1	5.0	3.8	4.2	8.0	6.3	3.2	1.1	18	9.4	2.1
24	11	5.1	4.8	3.9	3.0	8.0	6.3	3.2	.87	17	11	2.5
25	8.3	5.4	4.6	3.9	3.7	7.6	6.0	3.5	.58	9.0	21	2.7
26	6.9	5.4	4.5	3.9	4.5	7.6	6.0	3.5	.58	6.0	38	2.7
27	5.4	5.4	4.3	3.9	5.4	7.8	7.6	3.5	.50	4.5	42	2.5
28	5.4	5.4	4.2	3.9	4.8	8.8	6.0	3.0	.50	6.6	32	2.3
29	5.4	5.1	4.1	3.9	---	11	5.6	3.0	.58	7.6	24	2.1
30	5.4	5.1	3.9	3.9	---	12	5.6	2.7	.67	6.3	19	2.1
31	5.4	---	3.8	3.9	---	12	---	2.5	---	7.3	17	---
TOTAL	147.8	162.3	156.0	109.8	118.4	215.1	223.6	121.0	55.38	118.76	333.6	111.1
MEAN	4.77	5.41	5.03	3.54	4.23	6.94	7.45	3.90	1.85	3.83	10.8	3.70
MAX	11	5.6	7.0	3.9	5.6	12	12	5.6	3.5	18	42	11
MIN	3.0	5.1	3.8	3.3	3.0	4.5	5.6	2.5	.50	.42	3.2	2.1
CFSM	.02	.02	.02	.01	.01	.02	.03	.01	.006	.01	.04	.01
IN.	.02	.02	.02	.01	.01	.03	.03	.01	.01	.01	.04	.01

CAL YR 1980 TOTAL 12197.00 MEAN 33.3 MAX 346 MIN 3.0 CFSM .11 IN 1.50
WTR YR 1981 TOTAL 1872.84 MEAN 5.13 MAX 42 MIN .42 CFSM .02 IN .23

05316500 REDWOOD RIVER NEAR REDWOOD FALLS, MN

LOCATION.--Lat 44°31'25", long 95°10'20", in SE¼NE¼ sec.9, T.112 N., R.36 W., Redwood County, Hydrologic Unit 07020006, on right bank 4 ft (1.2 m) upstream from highway bridge, 3 mi (4.8 km) west of town of Redwood Falls, and 8.5 mi (13.7 km) upstream from mouth.

DRAINAGE AREA.--697 mi^2 (1,805 km^2).

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.

GAGE.--Water-stage recorder. Datum of gage is 972.33 ft (296.366 m) National Geodetic Vertical Datum of 1929. July 1909 to September 1914, nonrecording gage at bridge 20 ft (6 m) downstream at datum 0.22 ft (0.067 m) lower. August 1930 to Oct. 25, 1949, nonrecording gage, at bridge 20 ft (6 m) downstream at present datum.

REMARKS.--Records good except those for winter periods, which are fair. Natural discharge affected by unknown amount of interbasin flow between Yellow Medicine, Redwood, and Cottonwood River basins during extreme floods.

AVERAGE DISCHARGE.--47 years (water years 1912, 1936-81), 103 ft^3/s (2.917 m^3/s), 2.01 in/yr (51 mm/yr), 74,620 acre-ft/yr (92.0 hm^3/yr); median of yearly mean discharges, 74 ft^3/s (2.10 m^3/s), 1.44 in/yr (37 mm/yr) 53,600 acre-ft/yr (66 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,700 ft^3/s (558 m^3/s) June 18, 1957, gage height, 15.92 ft (4.852 m), from floodmark; no flow for several days in January 1940 and for part of each day Aug. 19, 20, 1959.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 400 ft^3/s (11.3 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
June 23	1630	*1,270	36.0	*4.50	1.372	Aug. 5	0630	535	15.2	3.35	1.021

Minimum daily discharge, 2.9 ft^3/s (0.082 m^3/s) Feb. 10-16; minimum gage height, 1.32 ft (0.402 m) July 10, 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	15	9.7	8.1	3.5	19	50	28	12	15	28	106
2	7.8	15	17	7.9	3.4	16	55	30	12	12	22	91
3	7.3	15	16	7.7	3.3	17	58	31	12	11	19	84
4	7.3	24	11	7.5	3.2	20	62	33	12	10	16	68
5	8.2	19	11	7.3	3.1	25	61	35	12	9.7	148	57
6	12	15	11	7.1	3.1	23	57	35	15	8.7	51	51
7	8.7	16	11	6.8	3.0	23	54	28	13	7.7	26	46
8	7.2	16	11	6.7	3.0	23	52	23	11	6.7	21	35
9	7.2	18	11	6.5	3.0	25	51	20	12	5.7	16	29
10	6.8	19	11	6.3	2.9	29	49	18	12	4.8	12	24
11	7.2	19	11	6.2	2.9	28	47	16	13	15	9.7	21
12	8.6	16	11	6.0	2.9	29	47	15	13	15	9.2	19
13	7.2	15	11	5.8	2.9	32	51	14	16	14	7.7	18
14	7.1	16	11	5.7	2.9	34	52	14	30	15	59	16
15	7.7	16	10	5.6	2.9	35	50	14	67	15	80	15
16	12	16	10	5.4	2.9	35	47	14	55	19	47	14
17	19	14	10	5.3	3.0	33	44	13	43	14	33	12
18	32	16	10	5.2	4.5	30	40	12	36	10	26	12
19	23	16	10	5.0	7.0	25	37	12	29	8.2	19	11
20	22	16	10	4.9	9.0	24	34	12	25	7.7	16	11
21	19	17	10	4.7	10	23	34	10	28	8.7	13	10
22	16	18	9.8	4.6	19	22	33	9.7	24	48	12	9.7
23	21	16	9.7	4.5	16	21	28	9.7	214	117	12	10
24	22	17	9.6	4.4	17	20	26	17	152	74	32	11
25	18	15	9.4	4.3	16	20	26	24	80	89	193	11
26	17	15	9.2	4.2	17	20	26	19	42	89	201	13
27	16	14	9.0	4.0	20	22	26	16	26	80	265	11
28	15	14	8.8	3.9	20	24	26	14	20	63	241	11
29	14	16	8.6	3.8	---	30	27	12	18	49	197	9.2
30	14	16	8.5	3.7	---	35	27	13	18	39	157	9.2
31	15	---	8.3	3.6	---	40	---	12	---	32	126	---
TOTAL	417.3	490	324.6	172.7	207.4	802	1276	573.4	1072	912.9	2114.6	845.1
MEAN	13.5	16.3	10.5	5.57	7.41	25.9	42.5	18.5	35.7	29.4	68.2	28.2
MAX	32	24	17	8.1	20	40	62	35	214	117	265	106
MIN	6.8	14	8.3	3.6	2.9	16	26	9.7	11	4.8	7.7	9.2
CFSM	.02	.02	.02	.008	.01	.04	.06	.03	.05	.04	.10	.04
IN.	.02	.03	.02	.01	.01	.04	.07	.03	.06	.05	.11	.05
AC-FT	828	972	644	343	411	1590	2530	1140	2130	1810	4190	1680

CAL YR 1980 TOTAL 37332.9 MEAN 102 MAX 1850 MIN 6.8 CFSM .15 IN 1.99 AC-FT 74050
WTR YR 1981 TOTAL 9208.0 MEAN 25.2 MAX 265 MIN 2.9 CFSM .04 IN .49 AC-FT 18260

05317000 COTTONWOOD RIVER NEAR NEW ULM, MN

LOCATION.--Lat 44°17'29", long 94°26'24", in SW¼NE¼ sec.33, T.110 N., R.30 W., Brown County, Hydrologic Unit 07020008, on left bank 600 ft (183 m) upstream from highway bridge, 1.8 mi (2.9 km) south of New Ulm, and 3.2 mi (5.1 km) upstream from mouth.

DRAINAGE AREA.--1,280 mi^2 (3,320 km^2), 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 (242.874 m) National Geodetic Vertical Datum of 1929. July 1, 1909, to Dec. 13, 1913, nonrecording gage at site 2.7 mi (4.3 km) upstream at different datum. Mar. 15, 1931, to Mar. 31, 1938, nonrecording gage 2.2 mi (3.5 km) upstream at datum 11.41 ft (3.477 m) higher. Aug. 23, 1938, to June 25, 1948, nonrecording gage at present site and datum.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--47 years (water years 1912-13, 1936-37, 1939-81), 270 ft^3/s (7.646 m^3/s), 2.86 in/yr (73 mm/yr), 195,600 acre-ft/yr (241 hm^3/yr); median of yearly mean discharges, 222 ft^3/s (6.29 m^3/s), 2.36 in/yr (60 mm/yr), 161,000 acre-ft/yr (199 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,700 ft^3/s (813 m^3/s) Apr. 10, 1969, gage height, 19.15 ft (5.837 m); maximum gage height, 20.86 ft (6.358 m) Apr. 8, 1965, from floodmark (backwater from ice); minimum discharge observed, 0.5 ft^3/s (0.014 m^3/s) Nov. 27, 1952; minimum gage height, 0.72 ft (0.219 m) Nov. 20, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 796 ft^3/s (22.5 m^3/s) June 25, gage height, 4.92 ft (1.500 m), no peak above base of 1,300 ft^3/s (36.8 m^3/s); minimum, 7.0 ft^3/s (0.20 m^3/s) Nov. 19, 24, gage height, 1.01 ft (0.308 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	38	34	18	17	103	119	51	21	92	73	94
2	24	44	35	19	18	84	115	50	24	77	66	91
3	22	40	38	17	18	89	107	53	24	67	61	86
4	23	39	33	17	19	88	111	53	21	63	54	79
5	24	38	34	17	19	84	98	49	21	54	69	71
6	26	36	34	17	19	81	92	45	22	48	50	64
7	25	35	35	17	19	74	89	42	20	41	39	62
8	23	34	34	17	19	70	86	43	21	35	51	54
9	21	35	31	17	19	75	82	43	19	30	47	47
10	18	34	28	17	20	70	78	41	21	27	38	42
11	16	32	24	17	20	69	75	38	19	44	32	38
12	15	33	26	17	19	70	78	34	24	47	28	32
13	16	34	26	17	20	65	75	33	28	49	31	28
14	20	34	27	17	22	63	72	31	105	49	138	25
15	19	34	24	17	25	62	69	30	100	42	105	22
16	28	34	25	17	28	61	66	29	177	39	164	21
17	29	35	27	17	35	60	64	28	180	35	131	19
18	33	29	22	17	57	60	61	30	143	31	110	17
19	34	30	21	17	88	57	64	29	107	27	91	16
20	37	34	20	17	113	54	60	27	87	32	75	14
21	33	30	18	17	127	52	62	26	82	36	63	13
22	34	37	18	17	121	50	64	24	76	80	53	10
23	36	38	20	17	109	50	61	23	78	110	48	20
24	37	31	19	17	97	51	62	25	602	190	54	30
25	38	34	17	17	94	52	62	26	688	292	94	30
26	41	47	18	17	96	51	59	26	427	226	119	35
27	40	45	20	19	110	50	60	24	273	168	92	28
28	39	48	18	20	112	52	56	33	198	136	108	20
29	36	39	18	19	---	63	55	35	148	112	105	17
30	36	41	18	16	---	69	53	28	113	94	101	16
31	37	---	17	16	---	103	---	24	---	83	96	---
TOTAL	886	1092	779	535	1480	2082	2255	1073	3869	2456	2386	1141
MEAN	28.6	36.4	25.1	17.3	52.9	67.2	75.2	34.6	129	79.2	77.0	38.0
MAX	41	48	38	20	127	103	119	53	688	292	164	94
MIN	15	29	17	16	17	50	53	23	19	27	28	10
CFSM	.02	.03	.02	.01	.04	.05	.06	.03	.10	.06	.06	.03
IN.	.03	.03	.02	.02	.04	.06	.07	.03	.11	.07	.07	.03
AC-FT	1760	2170	1550	1060	2940	4130	4470	2130	7670	4870	4730	2260

CAL YR 1980 TOTAL 98578 MEAN 269 MAX 3800 MIN 15 CFSM .21 IN 2.86 AC-FT 195500
WTR YR 1981 TOTAL 20034 MEAN 54.9 MAX 688 MIN 10 CFSM .04 IN .58 AC-FT 39740

05317200 LITTLE COTTONWOOD RIVER NEAR COURTLAND, MN

LOCATION.--Lat 44°14'47", long 94°20'19", in SW¼NE¼ sec.17, T.109 N., R.29 W., Blue Earth County, Hydrologic Unit 07020007, on right bank 30 ft (9.1 m) downstream from bridge on State Highway 68, 0.7 mi (1.1 km) above mouth, 1.5 mi (2.4 km) south of Courtland.

DRAINAGE AREA.--230 mi^2 (596 km^2), 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 (240.259 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for periods Oct. 26 to Nov. 28, and Mar. 11-17, which are fair.

AVERAGE DISCHARGE.--8 years, 36.0 ft^3/s (1.020 m^3/s), 2.13 in/yr (54 mm/yr), 26,080 acre-ft/yr (32.2 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 933 ft^3/s (26.4 m^3/s) Mar. 26, 1979, gage height, 8.29 ft (2.527 m) (backwater from ice); minimum, 0.01 ft^3/s (0.001 m^3/s) Sept. 17, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 180 ft^3/s (5.10 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
June 15	0345	234	6.63	3.85	1.173	July 22	1630	*452	12.8	*5.23	1.594
June 24	1630	385	10.9	4.84	1.475						

Minimum discharge, 0.88 ft^3/s (0.025 m^3/s) Jan. 4, 5, 6; minimum gage height, 1.11 ft (0.338 m) June 11, 12, 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	7.4	5.3	2.3	2.4	25	28	7.0	1.3	53	46	56
2	1.1	7.0	4.7	2.2	2.2	10	31	6.4	1.2	40	41	45
3	1.4	7.0	4.4	1.7	2.1	18	33	7.5	1.2	30	34	37
4	1.5	6.7	3.7	1.1	2.0	19	36	8.9	1.2	25	32	33
5	1.6	6.4	4.2	.88	1.8	27	35	7.5	1.2	20	31	29
6	1.6	6.0	5.7	1.8	1.8	24	27	7.2	1.1	14	27	24
7	1.6	5.7	6.3	2.8	1.8	20	23	7.7	1.1	12	24	22
8	1.4	5.4	5.8	2.2	1.8	22	50	6.5	1.1	9.8	27	20
9	1.5	5.4	4.8	1.7	1.8	20	48	6.7	1.1	7.4	24	19
10	1.4	5.1	4.0	1.5	1.8	20	37	6.1	1.2	6.1	19	17
11	1.2	4.8	3.4	1.5	1.6	17	27	5.7	1.0	12	16	15
12	1.4	4.5	3.5	1.6	1.6	15	26	4.9	1.1	15	13	13
13	1.2	4.5	3.7	1.7	1.5	14	23	5.1	1.2	16	13	12
14	1.3	4.5	3.4	1.7	1.5	12	21	4.8	62	12	127	11
15	1.5	4.5	3.4	1.9	1.9	10	20	4.1	178	10	123	9.4
16	2.8	4.6	3.8	1.8	2.3	9.3	16	3.6	79	9.1	66	9.0
17	2.8	4.8	4.6	1.8	6.0	8.3	12	3.1	43	7.9	56	8.1
18	2.5	4.6	4.7	1.7	11	7.5	10	3.1	31	6.7	58	7.5
19	3.9	5.0	4.3	1.8	26	6.7	12	2.7	24	5.9	54	7.3
20	5.2	4.6	2.6	2.0	25	6.1	10	2.3	21	6.2	46	6.4
21	5.9	4.3	2.1	2.1	28	6.2	11	2.1	19	7.9	38	5.8
22	6.9	4.7	2.3	2.2	24	6.5	9.8	1.7	21	109	32	5.7
23	8.0	4.7	2.6	2.3	16	6.4	9.2	1.9	51	150	28	6.1
24	8.7	4.7	2.4	2.3	13	6.3	9.8	1.8	324	123	27	7.1
25	8.9	4.0	1.6	2.4	13	8.2	13	2.0	326	99	28	6.9
26	8.9	5.4	1.5	2.5	14	8.2	11	1.8	204	80	49	9.3
27	8.5	6.4	1.5	2.6	36	6.7	9.0	1.5	156	79	61	8.2
28	8.5	6.0	1.7	2.7	33	6.9	8.0	1.5	119	81	78	6.9
29	8.1	6.3	1.8	2.6	---	10	8.1	1.5	87	76	84	6.0
30	7.7	6.7	2.0	2.5	---	15	7.6	1.3	66	64	74	6.0
31	7.4	---	2.1	2.5	---	21	---	1.4	---	53	66	---
TOTAL	125.6	161.7	107.9	62.38	274.9	412.3	621.5	129.4	1826.0	1240.0	1442	468.7
MEAN	4.05	5.39	3.48	2.01	9.82	13.3	20.7	4.17	60.9	40.0	46.5	15.6
MAX	8.9	7.4	6.3	2.8	36	27	50	8.9	326	150	127	56
MIN	1.1	4.0	1.5	.88	1.5	6.1	7.6	1.3	1.0	5.9	13	5.7
AC-FT	249	321	214	124	545	818	1230	257	3620	2460	2860	930

CAL YR 1980 TOTAL 12435.60 MEAN 34.0 MAX 263 MIN 1.1 AC-FT 24670
WTR YR 1981 TOTAL 6872.38 MEAN 18.8 MAX 326 MIN .88 AC-FT 13630

05319500 WATONWAN RIVER NEAR GARDEN CITY, MN

LOCATION.--Lat°44 02'47", long 94°11'43", in SW¼NE¼ sec.28, T.107 N., R.28 W., Blue Earth County, Hydrologic Unit 07020010, on left bank 25 ft (7.62 m) downstream from bridge on County Highway 13, 1.5 miles (2.4 km) west of Garden City, 7.3 mi (11.7 km) upstream from mouth, and 9.2 mi (14.8 km) downstream from Perch Creek.

DRAINAGE AREA.-- 812 mi^2 (2,103 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1940 to September 1945, 1953, 1960, 1961, 1969, one or more discharge measurements each year, September 1976 to current year.

REVISED RECORDS.--WDR MN-78-2: 1977.

GAGE.--Water-stage recorder. Datum of gage is 905.05 ft (275.859 m) National Geodetic Vertical Datum of 1929. Prior to September 30, 1945, nonrecording gage at site 200 ft (61 m) upstream and at datum 0.17 ft (0.052 m) higher.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--10 years (water years 1941-45, 1977-81), 281 ft^3/s (7.958 m^3/s), 4.70 in/yr (119 mm/yr), 203,600 acre-ft/yr (251 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,620 ft^3/s (159 m^3/s) May 21, 1944, gage height 9.84 ft (2.999 m) datum then in use; minimum daily, 1.9 ft^3/s (0.054 m^3/s) Jan. 20 to Feb. 8, 1977; minimum gage height, 0.27 ft (0.082 m) July 23, 1940, datum then in use.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 7, 1965, reached a stage of 18.89 ft (5.758 m) at datum 0.17 ft (0.052 m) higher, from floodmarks, discharge, 19,000 ft^3/s (538 m^3/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 900 ft^3/s (25.5 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
June 25	1830	*2910	82.4	*7.06	2.152	July 23	2300	1190	33.7	4.35	1.326

Minimum discharge, 3.8 ft^3/s (0.11 m^3/s) Dec. 1, gage height, 0.55 ft (0.168 m), result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	25	18	14	13	45	56	42	20	496	420	344
2	25	25	17	14	13	45	57	39	20	387	360	295
3	23	24	16	14	13	46	57	38	21	309	314	256
4	22	24	16	14	13	50	59	54	20	259	278	226
5	22	23	16	14	13	50	68	63	20	223	356	202
6	21	26	16	14	13	49	73	70	18	189	292	182
7	21	26	16	14	13	48	66	62	17	164	247	174
8	20	28	16	14	13	47	63	55	18	141	221	173
9	18	26	16	14	13	46	58	50	17	123	200	166
10	18	30	16	14	13	45	53	46	18	109	178	150
11	17	28	16	14	13	44	50	42	17	148	144	137
12	15	26	16	14	13	43	48	40	16	174	135	124
13	15	26	16	14	13	42	48	39	18	164	119	113
14	15	27	16	14	13	41	49	36	70	156	124	102
15	16	26	16	14	13	40	47	36	492	132	154	94
16	22	26	16	14	14	39	45	34	776	123	196	88
17	30	28	15	14	14	38	44	33	726	114	198	81
18	27	26	15	14	15	37	40	32	490	108	183	78
19	26	31	14	14	16	36	44	29	349	108	158	74
20	27	26	14	14	18	35	47	28	268	117	144	68
21	24	23	15	13	20	35	47	26	226	121	128	67
22	24	25	15	13	23	34	49	23	202	123	117	62
23	31	25	15	13	27	33	50	30	385	638	110	58
24	28	22	15	13	34	34	50	29	1510	980	108	59
25	27	18	15	13	41	36	47	26	2690	1080	119	60
26	25	27	15	13	45	32	44	26	2610	1010	283	63
27	26	29	15	13	46	40	42	26	1940	910	386	62
28	26	23	15	13	46	37	39	25	1280	735	450	70
29	24	29	15	13	---	40	40	25	894	638	463	70
30	24	28	15	13	---	46	44	22	663	573	437	66
31	25	---	15	13	---	52	---	22	---	483	389	---
TOTAL	710	776	482	423	554	1285	1524	1148	15811	11035	7411	3764
MEAN	22.9	25.9	15.5	13.6	19.8	41.5	50.8	37.0	527	356	239	125
MAX	31	31	18	14	46	52	73	70	2690	1080	463	344
MIN	15	18	14	13	13	32	39	22	16	108	108	58
CFSM	.03	.03	.02	.02	.02	.05	.06	.05	.65	.44	.29	.15
IN.	.03	.04	.02	.02	.03	.06	.07	.05	.72	.51	.34	.17
AC-FT	1410	1540	956	839	1100	2550	3020	2280	31360	21890	14700	7470

CAL YR 1980 TOTAL 91580 MEAN 250 MAX 4800 MIN 14 CFSM .31 IN 4.20 AC-FT 181600
WTR YR 1981 TOTAL 44923 MEAN 123 MAX 2690 MIN 13 CFSM .15 IN 2.06 AC-FT 89100

05319500 WATONWAN RIVER NEAR GARDEN CITY, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-69, 1977 to 1981 (discontinued).

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	TEMP-ATURE (DEG C) (00010)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)
NOV					
13...	1435	26	5.0	57	4.0
DEC					
15...	1545	16	0.0	15	.65
JAN					
26...	1635	13	0.0	79	2.8
MAR					
23...	1635	33	10.0	48	4.3
MAY					
13...	1315	39	14.5	57	6.0
JUL					
08...	1355	138	26.5	126	47
SEP					
01...	1535	332	20.0	165	148

05320000 BLUE EARTH RIVER NEAR RAPIDAN, MN

LOCATION.--Lat 44°05'44", long 94°06'33", in SE¼SE¼ sec.6, T.107 N., R.27 W., Blue Earth County, Hydrologic Unit 07020009, on left bank 0.2 mi (0.3 km) downstream from abandoned powerplant of Northern States Power Co., 2 mi (3.2 km) west of Rapidan, 3.5 mi (5.6 km) downstream from Watonwan River, and 7.8 mi (12.6 km) upstream from Le Sueur River.

DRAINAGE AREA.--2,430 mi^2 (6,290 km^2), 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 (246.227 m) National Geodetic Vertical Datum of 1929. July 20, 1909, to Apr. 28, 1910, nonrecording gage at site 0.2 mi (0.3 km) upstream at different datum. Apr. 29 to Nov. 12, 1910, nonrecording gage at site 800 ft (244 m) upstream at different datum. Oct. 4 to Nov. 14, 1939, nonrecording gage at present site and datum.

REMARKS.--Records good.

AVERAGE DISCHARGE.--38 years (water years 1940-45, 1950-81), 834 ft^3/s (23.62 m 3/s), 4.66 in/yr (118 mm/yr), 604,200 acre-ft/yr (745 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 43,100 ft^3/s (1,220 m^3/s) Apr. 9, 1965, gage height, 21.36 ft (6.511 m), from floodmark; minimum, 6.9 ft^3/s (0.20 m^3/s) Oct. 12, 1955, gage height, 1.04 ft (0.317 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,100 ft^3/s (201 m^3/s) June 26, gage height, 7.45 ft (2.271 m); minimum, 56 ft^3/s (1.59 m^3/s) Feb. 10, gage height, 1.40 ft (0.427 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	488	330	202	105	78	258	196	1300	719	5320	2510	3820
2	459	325	120	105	78	260	217	1330	656	4960	2190	3810
3	433	315	113	100	78	234	246	1270	608	4780	1960	3270
4	409	310	163	96	78	201	281	1210	567	4390	1840	2530
5	386	305	202	90	78	192	313	1260	528	3730	1840	2040
6	371	305	226	89	75	207	377	1580	481	3050	1650	1730
7	359	295	202	88	73	191	568	1780	446	2540	1480	1520
8	340	286	190	82	74	189	577	1730	419	2180	1320	1350
9	325	282	190	81	75	202	556	1560	398	1970	1170	1230
10	306	282	195	80	67	174	526	1380	385	1770	1040	1140
11	292	277	190	78	60	172	496	1220	360	1660	939	1040
12	276	268	178	83	78	163	474	1090	340	1610	879	939
13	263	259	165	81	77	156	447	992	330	1480	798	834
14	255	250	160	79	73	156	421	913	493	1340	773	738
15	250	250	160	79	73	159	391	851	1910	1190	748	664
16	265	250	150	80	81	151	369	792	2930	1080	812	600
17	271	250	148	83	104	145	345	740	3130	1220	1160	549
18	268	242	156	80	132	140	324	684	2920	1700	1180	504
19	275	242	156	77	147	136	332	627	2490	1700	989	470
20	296	238	145	76	189	133	325	578	1930	1620	839	441
21	314	226	126	75	278	129	317	536	1620	1460	723	415
22	309	238	119	74	326	128	320	501	1500	1480	633	390
23	312	230	111	74	291	127	318	518	1440	2090	579	370
24	306	218	108	74	266	127	321	505	3680	3410	546	364
25	296	166	105	76	252	131	320	609	6330	3910	532	351
26	298	163	102	79	233	128	310	1120	7040	4150	724	346
27	332	198	101	82	254	131	307	1330	6770	4380	1350	339
28	361	178	101	85	261	134	311	1190	6600	4220	2350	347
29	357	250	101	84	---	151	589	998	6550	3770	2900	357
30	350	242	100	81	---	156	1110	875	6070	3230	3380	343
31	335	---	103	77	---	171	---	793	---	2850	3650	---
TOTAL	10157	7670	4588	2573	3929	5132	12004	31862	69640	84240	43484	32841
MEAN	328	256	148	83.0	140	166	400	1028	2321	2717	1403	1095
MAX	488	330	226	105	326	260	1110	1780	7040	5320	3650	3820
MIN	250	163	100	74	60	127	196	501	330	1080	532	339
CFSM	.14	.11	.06	.03	.06	.07	.17	.42	.96	1.12	.58	.45
IN.	.16	.12	.07	.04	.06	.08	.18	.49	1.07	1.29	.67	.50
AC-FT	20150	15210	9100	5100	7790	10180	23810	63200	138100	167100	86250	65140

CAL YR 1980 TOTAL 318614 MEAN 871 MAX 9110 MIN 100 CFSM .36 IN 4.88 AC-FT 632000
WTR YR 1981 TOTAL 308120 MEAN 844 MAX 7040 MIN 60 CFSM .35 IN 4.72 AC-FT 611200

05320500 LE SUEUR RIVER NEAR RAPIDAN, MN

LOCATION.--Lat 44°06'40", long 94°02'28", in SW¼ sec.35, T.108 N., R.27 W., Blue Earth County, Hydrologic Unit 07020011, on right bank 600 ft (183 m) downstream from highway bridge, 1.8 mi (2.9 km) northeast of Rapidan, and 2.3 mi (3.7 km) upstream from mouth.

DRAINAGE AREA.--1,100 mi^2 (2,850 km^2), 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 (236.452 m) National Geodetic Vertical Datum of 1929. Prior to Nov. 15, 1939, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--38 years (water years 1940-45, 1950-81), 431 ft^3/s (12.21 m^3/s), 5.32 in/yr (135 mm/yr), 312,300 acre-ft/yr (385 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,700 ft^3/s (700 m^3/s) Apr. 8, 1965, gage height, 22.10 ft (6.736 m), from floodmark; maximum gage height, 22.72 ft (6.925 m) May 22, 1960, from floodmark; minimum daily discharge, 1.6 ft^3/s (0.045 m^3/s) Feb. 9-25, 1959; minimum gage height, 0.65 ft (0.198 m) Sept. 7-13, 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,300 ft^3/s (36.8 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
May 7	1230	1890	53.5	4.85	1.478	Aug. 5	0845	2160	61.2	5.20	1.585
June 26	2300	3220	91.2	6.43	1.960	Aug. 29	1245	2460	69.7	5.57	1.698
July 24	2130	*4630	131	*7.82	2.384						

Minimum daily discharge, 24 ft^3/s (0.68 m^3/s) Jan. 28-Feb. 9; minimum gage height, 1.04 ft (0.317 m) Dec. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	224	151	79	36	24	154	130	1080	601	1540	1390	1960
2	196	146	75	35	24	130	150	1100	545	1430	1210	1750
3	178	142	72	34	24	164	165	1010	500	1250	1050	1550
4	167	136	68	34	24	198	208	965	459	1070	921	1350
5	158	134	64	34	24	184	378	1180	420	917	1690	1170
6	148	131	62	33	24	151	525	1650	378	791	1640	1010
7	140	131	60	33	24	124	572	1870	343	684	1170	879
8	131	127	60	32	24	121	526	1790	321	595	917	765
9	120	126	59	32	24	121	480	1600	303	513	779	672
10	109	120	58	31	25	112	442	1420	293	443	682	591
11	97	118	57	31	25	95	407	1270	291	460	623	522
12	91	116	56	30	25	115	379	1130	282	510	573	458
13	88	112	55	30	25	114	350	1010	272	524	521	410
14	96	106	54	30	25	98	325	904	343	518	594	369
15	96	103	52	29	26	97	293	815	656	929	697	331
16	98	102	52	29	37	93	270	740	833	963	725	295
17	104	105	50	28	50	95	253	670	808	1210	688	266
18	103	91	50	28	70	87	240	600	747	1450	612	243
19	105	84	49	28	100	84	242	530	660	1550	537	226
20	111	92	48	27	150	77	235	490	575	1670	470	210
21	120	85	47	27	210	74	228	460	500	1450	418	194
22	120	98	46	26	160	76	243	435	467	1430	370	178
23	122	96	45	26	135	73	268	430	556	2370	337	163
24	124	83	44	26	118	71	290	451	1680	3660	403	158
25	119	77	42	25	124	72	311	685	1790	4420	464	154
26	127	98	40	25	110	73	319	849	2770	3910	547	152
27	146	96	39	25	151	76	320	859	2930	3270	1000	152
28	169	80	39	24	154	81	333	850	2260	2670	1920	139
29	171	100	38	24	---	95	408	809	1920	2220	2420	137
30	166	102	37	24	---	107	898	746	1760	1880	2400	138
31	158	---	36	24	---	113	---	671	---	1610	2200	---
TOTAL	4102	3288	1633	900	1936	3325	10188	29069	26263	47907	29968	16592
MEAN	132	110	52.7	29.0	69.1	107	340	938	875	1545	967	553
MAX	224	151	79	36	210	198	898	1870	2930	4420	2420	1960
MIN	88	77	36	24	24	71	130	430	272	443	337	137
CFSM	.12	.10	.05	.03	.06	.10	.31	.85	.80	1.41	.88	.50
IN.	.14	.11	.06	.03	.07	.11	.34	.98	.89	1.62	1.01	.56
AC-FT	8140	6520	3240	1790	3840	6600	20210	57660	52090	95020	59440	32910

CAL YR 1980 TOTAL 135984 MEAN 372 MAX 2780 MIN 30 CFSM .34 IN 4.60 AC-FT 269700
WTR YR 1981 TOTAL 175171 MEAN 480 MAX 4420 MIN 24 CFSM .44 IN 5.92 AC-FT 347500

05325000 MINNESOTA RIVER AT MANKATO, MN

LOCATION.--Lat 44°09'58", long 94°00'57", in NW¼NE¼ sec.13, T.108 N., R.27 W., Nicollet County, Hydrologic Unit 07020007, on left bank 12 ft (3.7 m) downstream from bridge on U.S. Highway 169 in North Mankato, 1.1 mi (1.8 km) downstream from Blue Earth River and at mile 107.1 (172.3 km) upstream from Mississippi River.

DRAINAGE AREA.--14,900 mi^2 (38,600 km^2), approximately.

WATER-DISCHARGE RECORDS

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 (227.966 m) National Geodetic Vertical Datum of 1929. Prior to Oct. 19, 1921, nonrecording gage, at site 1.1 mi (1.8 km) upstream at datum 6.4 ft (2.0 m) higher. Mar. 15, 1922, to Nov. 30, 1924, nonrecording gage, and Dec. 1, 1924 to May 24, 1971, recorder at site 0.5 mi (0.8 km) downstream at present datum. May 25, 1971 to Aug. 14, 1977, recorder at site 0.2 mi (0.3 km) downstream at present datum. Aug. 14, 1977 to July 27, 1978, nonrecording gage at present site and datum.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--60 years (water years 1905, 1911-17, 1930-81), 2,696 ft^3/s (76.35 m^3/s), 2.46 in/yr (62 mm/yr), 1,953,000 acre-ft/yr (2.41 km^3/yr); median of yearly mean discharges, 2,420 ft^3/s (68.5 m^3/s) 2.21 in/yr (56 mm/yr), 1,750,000 acre-ft/yr (2.16 km^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 94,100 ft^3/s (2,660 m^3/s) Apr. 10, 1965, gage height, 29.09 ft (8.867 m); minimum observed, 26 ft^3/s (0.74 m^3/s) Aug. 4, 1934.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since Apr. 26, 1881, 29.9 ft (9.114 m) present site and datum, from floodmark, discharge, 110,000 ft^3/s (3,120 m^3/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 14,200 ft^3/s (402 m^3/s) June 27, gage height, 14.29 ft (4.356 m); minimum, 342 ft^3/s (9.69 m^3/s) Jan. 26, gage height, 2.45 ft (0.747 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1010	958	635	440	365	1070	1140	2680	1880	9710	5170	6950
2	952	938	580	440	365	971	1260	2740	1760	8880	4540	6610
3	881	927	580	430	365	971	1280	2700	1670	8200	4080	5940
4	839	891	580	430	365	1030	1380	2640	1570	7330	3840	4980
5	811	843	580	430	365	1010	1540	2710	1480	6240	4590	4180
6	777	822	580	420	365	1070	1660	3250	1390	5160	4480	3630
7	749	794	580	420	365	1130	1860	3710	1300	4350	3960	3300
8	733	769	580	420	365	1170	1890	3710	1240	3790	3880	2950
9	732	748	580	410	365	1260	1840	3460	1200	3370	3580	2730
10	708	752	580	410	365	1200	1760	3160	1200	3020	3140	2540
11	700	737	580	410	365	1120	1700	2870	1230	2990	2800	2360
12	670	708	570	400	365	1090	1640	2620	1230	3010	2580	2170
13	657	702	560	400	365	1070	1580	2420	1240	2920	2400	1960
14	658	693	550	390	365	978	1520	2230	1520	3030	2690	1690
15	662	671	540	390	370	936	1440	2070	3140	3690	3020	1490
16	704	669	520	380	380	882	1400	1940	4640	3890	2870	1410
17	713	691	500	380	398	868	1390	1830	5370	4030	2950	1340
18	711	670	500	380	455	868	1320	1730	5630	4640	2920	1270
19	720	642	480	370	552	875	1340	1610	5390	4900	2590	1220
20	758	653	480	370	636	861	1310	1500	4830	4990	2310	1180
21	831	634	470	360	855	828	1270	1410	4390	4460	2090	1130
22	848	641	470	360	1090	801	1290	1330	4210	4230	1910	1100
23	868	660	470	360	1040	781	1330	1400	4450	5830	1790	1090
24	876	625	465	350	992	748	1340	1360	7670	8410	1860	1060
25	853	507	460	350	957	741	1350	1500	11400	10500	1860	1060
26	848	545	460	342	943	748	1360	2050	13600	10400	2240	1050
27	896	605	460	350	1060	738	1330	2350	13800	9690	3530	1040
28	992	517	450	365	1110	738	1320	2310	12800	8780	5540	1020
29	1010	633	450	365	---	824	1460	2110	12000	7640	6750	1000
30	994	670	450	365	---	861	2240	2060	11100	6590	7190	996
31	973	---	440	365	---	922	---	2010	---	5810	7180	---
TOTAL	25134	21315	16180	12052	15948	29160	44540	71470	144330	180480	110330	70446
MEAN	811	711	522	389	570	941	1485	2305	4811	5822	3559	2348
MAX	1010	958	635	440	1110	1260	2240	3710	13800	10500	7190	6950
MIN	657	507	440	342	365	738	1140	1330	1200	2920	1790	996
CFSM	.05	.05	.04	.03	.04	.06	.10	.16	.32	.39	.24	.16
IN.	.06	.05	.04	.03	.04	.07	.11	.18	.36	.45	.28	.18
AC-FT	49850	42280	32090	23910	31630	57840	88350	141800	286300	358000	218800	139700

CAL YR 1980 TOTAL 904943 MEAN 2473 MAX 15500 MIN 440 CFSM .17 IN 2.26 AC-FT 1795000
WTR YR 1981 TOTAL 741385 MEAN 2031 MAX 13800 MIN 342 CFSM .14 IN 1.85 AC-FT 1471000

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 current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1967 to current year.

REMARKS.--During the winter period, suspended-sediment samples were collected weekly and daily sediment load was estimated on the basis of water records and weekly sediment samples. Water temperature was obtained once-daily during open water period and weekly for the winter period.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum daily, 30.5°C July 15, 1980; minimum daily, 0.0°C on many days each year.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,850 mg/L Aug. 7, 1968; minimum daily mean, 13 mg/L Nov. 24, 1974, Feb. 18, 19, 1979.
SEDIMENT LOADS: Maximum daily, 247,000 tons (224,100 tonnes) Apr. 9, 1969; minimum daily, 5.2 tons (4.7 tonnes) Nov. 6, 1976.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum daily, 28.0°C July 14; minimum daily, 0.0°C, on many days.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,820 mg/L June 24; minimum daily mean, 17 mg/L Feb. 26.
SEDIMENT LOADS: Maximum daily, 54,800 tons (49,700 tonnes) June 25; minimum daily, 43 tons (39 tonnes) Feb. 26.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.0	7.0	1.0	---	---	2.5	12.0	15.0	20.0	23.0		---
2	13.0	7.0	---	---	.0	2.0	13.0	15.5	20.0	24.0		20.0
3	11.0	8.5	---	---	---	2.0	13.0	15.5	22.0	23.0		19.0
4	11.0	7.0	---	---	---	2.0	8.0	16.0	24.0	23.0		19.0
5	13.0	7.0	---	.0	---	2.0	10.0	15.5	24.0	23.0		20.0
6	10.0	8.0	.0	---	---	2.0	11.0	15.5	25.0	26.0		21.0
7	20.0	9.0	1.0	---	---	3.0	12.0	15.0	25.0	26.0		21.0
8	16.0	10.0	1.0	---	.0	4.0	13.0	14.5	20.0	27.0		21.0
9	17.0	7.0	1.0	---	---	4.5	13.0	13.0	19.5	25.0		23.0
10	14.0	6.0	.5	---	---	5.0	12.0	13.0	20.5	25.0		23.0
11	11.0	5.5	1.0	---	---	6.0	13.0	14.0	21.0	25.0		21.0
12	11.0	6.0	3.0	.0	---	7.0	14.0	13.0	22.5	27.0		---
13	10.0	5.0	2.0	---	---	6.0	13.0	15.0	24.0	27.0		---
14	9.0	4.5	1.0	---	---	8.0	12.0	15.0	23.5	28.0		---
15	9.5	6.0	1.0	---	.0	8.0	14.0	18.0	20.5	26.0		---
16	11.0	4.0	1.0	---	---	8.0	11.0	17.0	19.0	25.5		---
17	9.0	4.0	.0	---	---	7.5	14.0	16.5	21.0	26.5		---
18	7.5	4.0	2.0	.0	---	6.5	14.0	15.5	21.0	27.0		---
19	8.0	3.0	1.0	---	---	6.0	14.0	17.5	20.0	26.0		---
20	11.0	4.0	.0	---	---	6.0	12.5	19.5	21.0	24.0		---
21	10.0	3.0	.0	---	---	8.0	10.0	20.0	20.0	24.0		---
22	9.0	4.5	---	---	.0	10.0	11.0	20.0	21.0	23.0		---
23	9.0	3.5	---	---	3.0	10.0	9.5	18.5	21.0	---		---
24	7.0	2.0	---	---	4.0	11.0	12.0	15.0	19.0	---		---
25	5.5	3.0	---	.0	3.0	11.0	17.0	15.0	19.5	---		---
26	6.0	3.0	---	---	2.0	7.5	18.0	18.0	20.5	---		---
27	5.0	2.5	---	---	1.0	8.5	19.5	18.0	20.5	---		---
28	3.0	1.0	.0	.5	2.0	14.0	15.0	19.0	22.0	---		---
29	2.0	2.0	---	---	---	13.0	16.5	20.5	22.5	---		---
30	7.0	3.0	---	---	---	12.0	15.0	20.0	22.5	---		---
31	6.0	---	---	---	---	12.0	---	21.5	---	---		---
MEAN	10.0	5.0				7.0	13.0	16.5	21.5			

05325000 MINNESOTA RIVER AT MANKATO, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	140	382	73	189	37	63	50	59	50	49	25	72
2	119	306	72	182	37	58	50	59	50	49	26	68
3	116	276	77	193	40	63	50	58	50	49	25	66
4	107	242	94	226	42	66	50	58	50	49	23	64
5	82	180	75	171	45	70	50	58	50	49	22	60
6	101	212	65	144	48	75	50	57	50	49	26	75
7	114	231	75	161	52	81	50	57	50	49	31	95
8	120	237	79	164	99	155	50	57	50	49	34	107
9	121	239	71	143	62	97	50	55	50	49	36	122
10	111	212	51	104	65	102	50	55	50	49	37	120
11	102	193	47	94	74	116	50	55	50	49	43	130
12	66	119	101	193	54	83	50	54	50	49	32	94
13	80	142	71	135	42	64	50	54	50	49	52	150
14	67	119	47	88	70	104	50	53	50	49	57	151
15	61	109	74	134	62	90	50	53	50	50	58	147
16	60	114	102	184	42	59	50	51	50	51	100	238
17	63	121	59	110	46	62	53	54	50	54	70	164
18	68	131	37	67	66	89	58	60	50	61	53	124
19	74	144	50	87	168	218	63	63	50	75	42	99
20	79	162	81	143	173	224	67	67	50	86	33	77
21	88	197	102	175	105	133	71	69	50	115	60	134
22	80	183	108	187	68	86	74	72	60	177	83	180
23	79	185	85	151	54	69	77	75	42	118	65	137
24	77	182	79	133	50	63	79	75	37	99	71	143
25	70	161	68	93	50	62	81	77	24	62	61	122
26	56	128	75	110	50	62	75	69	17	43	80	162
27	59	143	95	155	50	62	66	62	28	80	82	163
28	82	220	69	96	50	61	56	55	27	81	88	175
29	75	205	74	126	50	61	50	49	---	---	88	196
30	79	212	61	110	50	61	50	49	---	---	116	270
31	70	184	---	---	50	59	50	49	---	---	77	192
TOTAL	---	5871	---	4248	---	2718	---	1838	---	1838	---	4097
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	110	339	845	6110	262	1330	358	9390	280	3910	442	8290
2	112	381	636	4710	223	1060	363	8700	280	3430	316	5640
3	102	353	445	3240	198	893	387	8570	280	3080	318	5100
4	86	320	318	2270	188	797	336	6650	290	3010	328	4410
5	132	549	377	2760	170	679	298	5020	1130	14000	315	3560
6	203	910	620	5440	190	713	278	3870	1320	16000	267	2620
7	230	1160	735	7360	198	695	293	3440	376	4020	212	1890
8	173	883	592	5930	170	569	273	2790	282	2950	197	1570
9	156	775	453	4230	157	509	265	2410	225	2170	195	1440
10	135	642	377	3220	159	515	246	2010	190	1610	208	1430
11	139	638	308	2390	172	571	267	2160	193	1460	175	1120
12	119	527	250	1770	165	548	248	2020	178	1240	155	908
13	107	456	220	1440	163	546	212	1670	172	1110	152	804
14	110	451	200	1200	202	829	275	2250	290	2110	155	707
15	95	369	214	1200	1020	9630	430	4280	345	2810	147	591
16	99	374	215	1130	1480	18500	402	4220	272	2110	133	506
17	114	428	216	1070	780	11300	380	4130	238	1900	107	387
18	108	385	226	1060	620	9420	418	5240	220	1730	98	336
19	122	441	241	1050	680	9900	417	5520	185	1290	93	306
20	93	329	245	992	610	7960	453	6100	140	873	95	303
21	72	247	233	887	520	6160	313	3770	137	773	89	272
22	70	244	215	772	530	6020	430	4910	139	717	88	261
23	87	312	188	711	720	8650	1480	23300	122	590	90	265
24	84	304	194	712	1820	37700	860	19500	150	753	98	280
25	102	372	192	778	1780	54800	670	19000	122	613	80	229
26	105	386	338	1870	1080	39700	470	13200	163	986	82	232
27	92	330	426	2700	700	26100	380	9940	436	4160	68	191
28	105	374	370	2310	550	19000	300	7110	850	12700	80	220
29	141	556	295	1680	470	15200	340	7010	645	11800	77	208
30	740	4480	257	1430	394	11800	370	6580	573	11100	88	237
31	---	---	289	1570	---	---	300	4710	520	10100	---	---
TOTAL	---	18315	---	73992	---	302094	---	209470	---	125105	---	44313

TOTAL LOAD FOR YEAR: 793899 TONS.

05325000 MINNESOTA RIVER AT MANKATO, MN--Continued

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)
MAY									
14...	1430	2210	195	1160	--	--	--	--	88
JUN									
24...	1610	8020	2240	48500	60	70	80	91	95

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	NUMBER OF SAM-PLING POINTS (00063)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	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)
MAY											
14...	1430	5	2210	0	0	10	43	81	94	99	100

05327000 HIGH ISLAND CREEK NEAR HENDERSON, MN

LOCATION.--Lat 44°34'19", long 93°55'18", in NE¼NW¼ sec.26, T.113 N., R.26 W., Sibley County, Hydrologic Unit 07020012, on left bank 20 ft (6.1 m) downstream from bridge on County Road 6, 1.6 mi (2.6 km) upstream from mouth, and 3.1 mi (5.0 km) north of Henderson.

DRAINAGE AREA.--237 mi^2 (614 km^2).

PERIOD OF RECORD.--October 1973 to current year. May 1970 to September 1973, operated as a low-flow station only.

GAGE.--Water-stage recorder. Datum of gage is 728.56 ft (222.065 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for Jan. 6 to Feb. 16, which are fair.

AVERAGE DISCHARGE.--8 years, 52.5 ft^3/s (1.487 m^3/s), 3.01 in/yr (76 mm/yr), 38,040 acre-ft/yr (46.9 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,760 ft^3/s (49.8 m^3/s) Aug. 25, 1981, gage height, 9.09 ft (2.771 m); minimum discharge, 0.20 ft^3/s (0.006 m^3/s) Jan. 4, 1981, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 300 ft^3/s (8.50 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
July 22	2145	340	9.63	3.31	1.009	Aug. 25	1645	*1,760	49.8	*9.09	2.771
Aug. 14	1130	736	20.8	5.35	1.631						

Minimum discharge, 0.20 ft^3/s (0.006 m^3/s) Jan. 4, result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	3.2	2.8	1.9	1.3	14	13	11	2.8	14	43	362
2	2.7	3.2	2.6	1.8	1.3	7.7	14	10	2.6	13	44	332
3	2.9	3.2	2.6	1.7	1.3	7.2	12	10	3.0	12	41	309
4	3.2	2.9	2.6	1.7	1.3	6.3	17	14	5.0	12	37	291
5	3.2	2.9	2.6	1.3	1.3	5.7	20	13	3.7	11	60	273
6	3.2	2.9	2.6	1.5	1.3	5.3	19	12	3.1	9.5	158	258
7	3.2	2.9	2.6	1.6	1.3	3.7	19	10	2.4	7.9	124	251
8	3.2	2.9	2.9	1.7	1.3	3.4	18	9.6	2.4	6.7	93	242
9	3.2	2.9	2.9	1.7	1.3	4.1	16	11	2.4	5.3	72	229
10	3.3	2.9	2.6	1.7	1.3	4.1	15	9.7	2.4	4.4	57	215
11	3.5	2.6	2.4	1.7	1.3	4.2	13	8.1	2.4	69	46	203
12	3.8	2.6	2.4	1.7	1.4	5.0	13	7.6	2.4	62	41	185
13	3.5	2.6	2.4	1.7	1.5	5.4	12	7.3	2.6	50	35	170
14	3.5	2.6	2.4	1.7	2.5	6.0	13	6.6	98	37	536	154
15	3.8	2.6	2.4	1.7	4.7	7.7	12	6.0	158	30	461	139
16	5.6	2.6	2.5	1.7	8.0	5.9	11	7.7	79	27	279	126
17	6.7	2.6	2.6	1.7	15	5.3	11	5.5	45	26	180	114
18	5.2	2.6	2.5	1.7	18	4.0	9.3	4.6	28	29	127	100
19	4.8	2.6	2.1	1.7	12	4.0	9.3	4.2	22	35	96	90
20	4.8	2.9	2.0	1.7	11	3.5	9.4	4.2	15	36	77	79
21	4.5	2.9	1.9	1.7	12	2.8	10	4.4	16	35	62	72
22	4.2	2.9	1.9	1.7	12	3.1	13	3.7	27	62	51	65
23	4.5	2.9	1.9	1.7	7.9	2.6	12	4.1	24	106	46	59
24	4.5	2.9	1.9	1.7	6.4	7.1	11	4.7	28	84	59	57
25	4.5	2.9	1.9	1.7	6.1	9.5	11	4.1	21	67	688	54
26	4.5	2.9	1.9	1.7	7.1	9.2	10	4.0	19	56	1100	56
27	4.2	2.9	1.9	1.7	60	8.9	10	3.8	17	50	807	58
28	4.2	2.9	1.9	1.7	28	9.3	10	4.5	15	48	690	56
29	3.8	2.9	1.9	1.5	---	13	9.9	5.3	15	41	568	53
30	3.5	2.9	1.9	1.5	---	14	10	4.6	14	35	483	51
31	3.5	---	1.9	1.5	---	13	---	3.4	---	32	419	---
TOTAL	122.0	85.2	71.4	51.7	227.9	205.0	382.9	218.7	678.2	1112.8	7580	4703
MEAN	3.94	2.84	2.30	1.67	8.14	6.61	12.8	7.05	22.6	35.9	245	157
MAX	6.7	3.2	2.9	1.9	60	14	20	14	158	106	1100	362
MIN	2.7	2.6	1.9	1.3	1.3	2.6	9.3	3.4	2.4	4.4	35	51
CFSM	.02	.01	.01	.007	.03	.03	.05	.03	.10	.15	1.03	.66
IN.	.02	.01	.01	.01	.04	.03	.06	.03	.11	.17	1.19	.74
AC-FT	242	169	142	103	452	407	759	434	1350	2210	15030	9330

CAL YR 1980	TOTAL	10930.8	MEAN 29.9	MAX 294	MIN 1.7	CFSM .13	IN 1.72	AC-FT 21680
WTR YR 1981	TOTAL	15438.8	MEAN 42.3	MAX 1100	MIN 1.3	CFSM .18	IN 2.42	AC-FT 30620

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 (2.4 km) northwest of Jordan, and at mile 39.4 (63.4 km) upstream from Mississippi River.

DRAINAGE AREA.--16,200 mi^2 (42,000 km^2), approximately.

WATER-DISCHARGE RECORDS

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.

GAGE.--Water-stage recorder. Datum of gage is 690.00 ft (210.312 m) National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1966, water-stage recorder 2.8 mi (4.5 km) downstream with auxiliary nonrecording gage at present site and present datum.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--47 years, 3,380 ft^3/s (95.72 m^3/s), 2.83 in/yr (72 mm/yr), 2,449,000 acre-ft/yr (3.02 km^3/yr); median of yearly mean discharges, 2,970 ft^3/s (84.1 m^3/s), 2.49 in/yr (63 mm/yr), 2,152,000 acre-ft/yr (2.66 km^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 117,000 ft^3/s (3,310 m^3/s) Apr. 11, 1965; maximum gage height, 35.07 ft (10.689 m) Apr. 12, 1965 (backwater from Mississippi River); minimum discharge, 79 ft^3/s (2.24 m^3/s) Nov. 17, 1955; minimum gage height, 2.66 ft (0.811 m) Nov. 22, 1935.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,400 ft^3/s (351 m^3/s) June 30, gage height, 17.17 ft (5.233 m); minimum daily discharge, 380 ft^3/s (10.8 m^3/s) Feb. 10-15; minimum gage height, 4.31 ft (1.314 m) Feb. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1240	1090	748	520	390	1460	981	1730	2100	12200	6920	10300
2	1180	1070	740	520	390	1540	1050	2330	2020	11500	6100	9640
3	1110	1060	700	510	390	1250	1210	2600	1920	10400	5390	8970
4	1070	1050	665	500	390	1090	1320	2730	1820	9380	4760	8130
5	1030	1030	650	500	385	1030	1360	2760	1720	8460	4480	6980
6	995	1010	650	490	385	1110	1430	2720	1610	7340	5420	5880
7	967	973	650	485	385	1120	1580	2920	1530	6110	5720	5060
8	943	950	650	480	385	1140	1730	3500	1440	5100	5110	4510
9	921	935	640	475	382	1210	1860	3700	1370	4390	4780	4040
10	908	905	640	470	380	1260	1850	3800	1330	3870	4490	3650
11	881	887	630	465	380	1290	1800	3600	1290	3840	3970	3310
12	858	885	630	460	380	1250	1750	3110	1290	3920	3460	3030
13	847	885	625	455	380	1180	1700	2950	1320	3830	3100	2770
14	834	873	620	450	380	1140	1650	2730	1610	3560	3540	2540
15	819	860	620	440	380	1130	1580	2520	2390	3650	5310	2320
16	850	849	625	430	400	1070	1510	2330	3560	4190	5520	2140
17	865	838	625	420	442	1030	1470	2160	4800	4550	4960	1990
18	863	834	629	410	493	984	1420	2030	5530	4580	4460	1870
19	858	835	629	397	555	954	1410	1920	5860	4940	4190	1750
20	858	830	620	397	635	936	1370	1800	5850	5250	3680	1650
21	868	804	610	397	731	937	1360	1680	5450	5450	3170	1570
22	902	802	600	397	874	932	1350	1570	5040	5080	2800	1480
23	962	812	600	397	1070	906	1350	1510	4740	5250	2510	1400
24	992	808	595	397	1340	918	1360	1500	4900	6440	2390	1360
25	995	775	590	397	1380	903	1370	1530	6850	8260	2670	1340
26	984	753	585	397	1380	879	1390	1500	9110	9610	4930	1310
27	967	670	580	397	1360	858	1410	1760	10500	10400	5990	1290
28	962	700	580	397	1430	865	1400	2240	11500	10600	7530	1250
29	1000	748	580	397	---	877	1370	2420	12200	10200	9290	1220
30	1070	685	560	395	---	920	1380	2280	12400	9220	10300	1190
31	1090	---	540	395	---	958	---	2140	---	7980	10600	---
TOTAL	29689	26206	19406	13637	17852	33127	43771	74070	133050	209550	157540	103940
MEAN	958	874	626	440	638	1069	1459	2389	4435	6760	5082	3465
MAX	1240	1090	748	520	1430	1540	1860	3800	12400	12200	10600	10300
MIN	819	670	540	395	380	858	981	1500	1290	3560	2390	1190
CFSM	.06	.05	.04	.03	.04	.07	.09	.15	.27	.42	.31	.21
IN.	.07	.06	.04	.03	.04	.08	.10	.17	.31	.48	.36	.24
AC-FT	58890	51980	38490	27050	35410	65710	86820	146900	263900	415600	312500	206200

CAL YR 1980	TOTAL	1019700	MEAN	2786	MAX	14200	MIN	540	CFSM	.17	IN	2.34	AC-FT 2023000
WTR YR 1981	TOTAL	861838	MEAN	2361	MAX	12400	MIN	380	CFSM	.15	IN	1.98	AC-FT 1709000

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1963-69, 1972 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: July 1973 to current year.
pH: January 1974 to current year.
WATER TEMPERATURES: July 1973 to current year.
DISSOLVED OXYGEN: July 1973 to current year.

INSTRUMENTATION.--Water-quality monitor since July 1973.

REMARKS.--Extremes are for years with 80 percent or more daily record. Letter K indicates non-ideal colony count, letter E indicates estimated value, and letters ND indicate none detected. Water is pumped to a monitor that is inside a heated shelter; therefore, water temperature during the winter period may be affected.

COOPERATION.--Water-quality monitor is operated by the Metropolitan Waste Control Commission, St. Paul, MN.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1978, 1980-81): Maximum, 1,280 micromhos Dec. 20, 1979; minimum, 324 micromhos June 3, 1980.
pH (water years 1978, 1980-81): Maximum, 8.7 units May 22-26, 1980, June 20, 1981; minimum, 7.5 units Jan. 1-19, 1978, Sept. 8, 1980, June 26-29, Aug. 26, 1981.
WATER TEMPERATURES (water years 1978-81): Maximum, 30.0°C July 15, 1980; minimum, 0.0°C Dec. 1-3, 1980, Jan. 17, 1981.
DISSOLVED OXYGEN (water years 1978-81): Maximum, 19.6 mg/L Oct. 19, 1978; minimum, 2.5 mg/L Sept. 5, 1978.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 1,150 micromhos Jan. 18; minimum, 344 micromhos May 3.
pH: Maximum, 8.7 units June 20; minimum, 7.5 units June 26-29, Aug. 26.
WATER TEMPERATURES: Maximum, 29.5°C July 8, Sept. 9; minimum, 0.0°C Dec. 1-3, Jan. 17.
DISSOLVED OXYGEN: Maximum, 17.0 mg/L Oct. 29; minimum, 4.6 mg/L June 15.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE, AIR (DEG C) (00020)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)
OCT									
21...	1100	863	890	820	8.2	5.5	8.0	.80	13.6
23...	1025	956	--	--	--	--	8.0	--	--
NOV									
19...	1230	836	860	856	8.4	-.5	3.5	.20	14.8
DEC									
17...	1330	625	1100	1030	8.0	9.0	.0	.40	13.9
JAN									
19...	1030	397	1260	1170	8.3	.0	.0	1.3	11.2
FEB									
17...	1245	442	1200	1050	7.6	15.0	.5	.90	7.8
MAR									
24...	1300	912	930	780	8.4	14.5	9.5	.80	14.3
MAY									
12...	1500	3130	1000	836	8.3	16.5	15.0	66	9.5
JUN									
19...	1100	5860	770	692	8.1	15.0	19.0	180	7.8
SEP									
01...	1426	10300	669	730	8.2	--	21.0	50	7.2

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	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)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)
OCT										
21...	117	140	230	350	79	77	38	34	.8	5.0
23...	--	--	--	--	--	--	--	--	--	--
NOV										
19...	113	K260	450	360	81	82	38	31	.7	5.0
DEC										
17...	98	410	1300	400	49	94	40	39	.9	5.4
JAN										
19...	79	270	K1100	470	82	110	48	50	1.0	7.3
FEB										
17...	56	70	170	500	140	120	48	48	.9	6.7
MAR										
24...	128	57	K10	390	130	90	41	35	.8	6.1
MAY										
12...	96	52	75	400	140	100	36	19	.4	3.0
JUN										
19...	87	--	E760	350	140	89	32	16	.4	4.4
SEP										
01...	83	720	460	380	120	100	32	11	.2	4.2

DATE	ALKA-LINITY 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)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
OCT										
21...	270	100	39	.4	14	538	479	1250	2.0	2.0
23...	--	--	--	--	--	--	--	--	--	--
NOV										
19...	280	130	39	.3	9.0	535	515	1210	2.9	2.9
DEC										
17...	350	150	48	.3	13	692	613	1170	3.0	2.9
JAN										
19...	390	190	54	.4	16	788	719	845	2.0	2.0
FEB										
17...	360	170	51	.3	18	700	686	835	1.8	1.5
MAR										
24...	260	150	33	.3	8.3	534	522	1320	.40	.40
MAY										
12...	260	83	37	.5	20	549	459	4640	--	.84
JUN										
19...	210	88	28	.4	22	500	459	7910	12	12
SEP										
01...	260	56	29	.4	24	524	466	14600	12	12

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	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)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)
OCT										
21...	.030	.030	1.60	.40	.160	.020	--	--	--	--
23...	--	--	--	--	--	--	--	7	18	88
NOV										
19...	.000	.000	1.00	.38	.100	.010	8.3	43	97	81
DEC										
17...	.190	.170	.89	.80	.120	.050	6.8	--	--	--
JAN										
19...	.340	.340	.92	.92	.170	.100	6.5	--	--	--
FEB										
17...	.640	.640	1.30	1.2	.230	.140	--	--	--	--
MAR										
24...	.040	.020	.88	.43	.140	.020	7.8	47	116	84
MAY										
12...	.060	.010	1.60	1.0	.310	.090	--	259	2190	93
JUN										
19...	.100	.060	2.40	.95	.790	.120	17	615	9730	95
SEP										
01...	.080	.030	1.10	1.1	.380	.200	--	367	10200	82

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO) (01037)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)
OCT											
21...	1100	3	2	--	80	2	2	10	0	0	0
FEB											
17...	1245	3	2	100	100	0	0	10	10	1	0
MAY											
12...	1500	3	2	--	80	1	1	20	<10	1	0
SEP											
01...	1426	6	5	100	100	--	<1	20	10	--	<1

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
OCT										
21...	3	1	880	0	2	1	230	9	<.1	<.1
FEB										
17...	2	2	360	140	1	0	360	360	.1	.1
MAY										
12...	16	5	5100	<10	17	0	400	4	.1	.1
SEP										
01...	--	4	5500	10	--	4	380	40	<.1	<.1

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)
OCT										
21...	5	3	1	1	0	0	50	2	5.8	2.9
FEB										
17...	6	4	0	0	1	0	30	<10	4.8	.3
MAY										
12...	12	2	3	2	0	0	--	<4	3.3	1.4
SEP										
01...	--	8	3	2	<1	<1	40	10	--	--

DATE	TIME	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	GROSS ALPHA, DIS-SOLVED (PCI/L AS U-NAT) (01515)	GROSS ALPHA, SUSP. TOTAL (PCI/L AS U-NAT) (01516)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L) (09511)	URANIUM NATURAL DIS-SOLVED (UG/L AS U) (22703)
MAR											
24...	1300	<6.3	1.0	4.3	.7	5.0	1.4	4.8	1.3	.10	6.1
SEP											
01...	1426	<14	20	--	14	7.8	13	7.5	12	.70	15

DATE	TIME	ALDRIN, TOTAL (UG/L) (39330)	CHLOR-DANE, TOTAL (UG/L) (39350)	DDD, TOTAL (UG/L) (39360)	DDE, TOTAL (UG/L) (39365)	DDT, TOTAL (UG/L) (39370)	DI-AZINON, TOTAL (UG/L) (39570)	DI-ELDRIN TOTAL (UG/L) (39380)	ENDRIN, TOTAL (UG/L) (39390)	ETHION, TOTAL (UG/L) (39398)
NOV										
19...	1230	ND	ND	ND	ND	ND	ND	ND	ND	ND

DATE	HEPTA-CHLOR, TOTAL (UG/L) (39410)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L) (39420)	LINDANE TOTAL (UG/L) (39340)	MALA-THION, TOTAL (UG/L) (39530)	METH-OXY-CHLOR, TOTAL (UG/L) (39480)	METHYL PARA-THION, TOTAL (UG/L) (39600)	METHYL TRI-THION, TOTAL (UG/L) (39790)	PARA-THION, TOTAL (UG/L) (39540)	TOX-APHENE, TOTAL (UG/L) (39400)	TOTAL TRI-THION (UG/L) (39786)
NOV										
19...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO JUNE 1981

DATE	NOV 19,80		MAR 24,81		MAY 12,81		JUN 19,81	
TIME	1230		1300		1500		1100	
TOTAL CELLS/ML	44000		32000		37000		39000	
DIVERSITY: DIVISION	0.7		1.0		1.4		1.3	
.CLASS	0.7		1.0		1.4		1.3	
..ORDER	0.9		1.4		2.0		1.6	
...FAMILY	1.0		1.6		2.7		2.2	
....GENUS	1.1		1.7		3.3		3.0	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)								
.CHLOROPHYCEAE								
..CHLOROCOCCALES								
...MICRACTINIACEAE								
....MICRACTINIUM	--	-	960	3	780	2	2000	5
...OOCYSTACEAE								
....ANKISTRODESMUS	300	1	720	2	1200	3	*	0
....DICTYOSPHAERIUM	--	-	--	-	3100	8	--	-
....GLOEOACTINIUM	--	-	--	-	3900	10	4300	11
....KIRCHNERIELLA	--	-	--	-	190	1	--	-
....OOCYSTIS	--	-	--	-	--	-	670	2
....SELENASTRUM	300	1	--	-	--	-	670	2
...SCENEDESMACEAE								
....ACTINASTRUM	--	-	--	-	4300	12	1300	3
....CRUCIGENIA	4700	11	--	-	--	-	--	-
....SCENEDESMUS	--	-	960	3	--	-	1300	3
....TETRASTRUM	--	-	--	-	1600	4	--	-
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CHLAMYDOMONAS	590	1	2900	9	580	2	--	-
CHRYSOPHYTA								
.BACILLARIOPHYCEAE								
..CENTRALES								
...COSCINODISCACEAE								
....CYCLOTELLA	36000#	82	23000#	72	9900#	27	10000#	26
....MELOSIRA	590	1	--	-	390	1	12000#	30
..PENNALES								
...ACHNANTHACEAE								
....ACHNANTHES	--	-	--	-	--	-	330	1
...DIATOMACEAE								
....DIATOMA	--	-	240	1	--	-	--	-
...FRAGILARIACEAE								
....ASTERIONELLA	--	-	--	-	970	3	--	-
....SYNEDRA	300	1	--	-	580	2	330	1
...NAVICULACEAE								
....GYROSIGMA	--	-	--	-	--	-	*	0
....NAVICULA	--	-	240	1	--	-	330	1
...NITZSCHIACEAE								
....HANTZSCHIA	--	-	--	-	190	1	--	-
....NITZSCHIA	--	-	1200	4	5600#	15	1500	4
...SURIRELLACEAE								
....SURIRELLA	300	1	--	-	580	2	330	1
CRYPTOPHYTA (CRYPTOMONADS)								
.CRYPTOPHYCEAE								
..CRYPTOMONADALES								
...CRYPTOCHRYSIDACEAE								
....CHROOMONAS	--	-	--	-	190	1	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)								
.CYANOPHYCEAE								
..CHROOCOCCALES								
...CHROOCOCCACEAE								
....ANACYSTIS	590	1	480	2	--	-	--	-
..HORMOGONALES								
...NOSTOCACEAE								
....APHANIZOMENON	--	-	--	-	2900	8	--	-
...OSCILLATORIACEAE								
....OSCILLATORIA	--	-	--	-	--	-	3700	9
EUGLENOPHYTA (EUGLENOIDS)								
.EUGLENOPHYCEAE								
..EUGLENALES								
...EUGLENACEAE								
....EUGLENA	--	-	240	1	--	-	--	-
....TRACHELOMONAS	300	1	960	3	190	1	*	0

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	---	---	---	842	818	832	934	898	915	984	942	964
2	---	---	---	864	830	846	941	913	924	950	936	943
3	848	810	831	874	834	852	1080	950	1030	954	934	943
4	830	810	821	864	814	844	1030	946	989	1010	950	977
5	834	796	816	838	794	822	996	938	965	1050	980	1020
6	822	768	801	804	768	790	952	924	939	1070	1030	1060
7	800	760	784	786	752	774	974	918	954	1040	1020	1030
8	788	748	770	774	748	760	1020	970	992	1010	982	996
9	790	730	745	764	750	759	1050	1020	1030	1010	990	1000
10	730	694	715	778	750	762	1060	1030	1050	1040	1010	1020
11	726	666	699	770	748	759	1070	745	886	1090	1050	1080
12	702	664	679	782	754	768	792	770	781	1110	1090	1100
13	718	664	689	800	774	790	875	805	839	1130	1080	1100
14	748	718	733	820	794	810	909	887	899	1110	1080	1100
15	782	742	758	820	804	810	940	920	931	1110	1090	1100
16	808	744	776	822	796	809	959	920	941	1140	1050	1090
17	820	798	809	826	810	818	950	931	942	1130	1090	1120
18	828	808	816	830	814	824	1000	915	952	1150	1100	1120
19	838	816	827	843	820	831	1030	985	1010	1120	1070	1090
20	836	810	821	830	820	825	1030	997	1010	1060	1040	1050
21	821	801	817	820	794	805	1040	999	1020	1040	1020	1030
22	844	790	818	825	802	813	1010	957	983	1050	1010	1030
23	830	806	823	842	817	827	966	935	946	1050	1020	1030
24	840	806	824	849	824	837	1020	952	986	1030	966	1000
25	822	804	811	850	825	836	1070	1020	1050	946	902	927
26	812	784	800	868	832	842	1100	1060	1080	902	854	877
27	824	776	803	882	850	864	1120	1090	1110	844	796	825
28	816	788	803	895	875	884	1130	1090	1110	788	754	774
29	800	778	788	921	888	903	1100	1080	1090	776	754	765
30	834	796	820	940	915	928	1080	1030	1060	794	772	780
31	848	814	832	---	---	---	1030	978	1010	786	764	773
MONTH				940	748	821	1130	745	981	1150	754	991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	784	764	778	556	446	492	680	638	658	806	742	775
2	792	772	782	634	554	589	864	628	785	772	424	636
3	792	772	782	646	624	634	855	825	844	462	344	391
4	822	782	797	664	620	637	834	806	822	520	432	478
5	858	828	845	674	618	641	823	801	812	632	544	589
6	854	824	842	696	646	670	808	760	788	712	658	684
7	828	806	818	732	670	698	803	729	773	780	730	736
8	842	816	829	738	686	711	836	792	813	796	780	787
9	818	792	810	730	688	712	827	792	810	908	788	843
10	816	792	800	722	694	709	846	800	818	944	888	918
11	932	860	902	738	712	725	864	816	831	932	914	924
12	962	898	938	788	738	758	872	852	864	918	892	904
13	942	912	923	810	676	747	890	822	851	882	856	869
14	974	950	963	708	678	690	876	808	835	900	846	855
15	1000	938	974	742	710	722	840	764	805	872	844	856
16	990	936	975	770	742	751	832	806	819	880	854	865
17	986	914	961	784	758	770	840	788	812	896	860	884
18	874	724	817	782	758	770	840	782	810	910	874	891
19	832	720	776	800	720	781	836	786	809	940	880	911
20	870	800	832	750	720	738	856	764	805	906	866	889
21	761	549	646	754	736	746	822	772	806	922	876	908
22	601	485	554	788	756	777	854	814	831	898	844	872
23	523	427	474	816	786	797	870	794	824	874	808	848
24	469	411	442	827	797	814	816	766	796	856	808	837
25	461	415	442	810	784	799	818	776	794	864	804	848
26	576	555	571	774	732	755	802	760	784	870	804	832
27	544	506	518	750	712	737	788	738	762	850	822	837
28	496	422	459	740	710	724	788	732	764	878	772	820
29	---	---	---	718	678	703	770	724	747	834	734	776
30	---	---	---	694	660	680	778	734	753	892	838	870
31	---	---	---	708	660	682	---	---	---	914	872	894
MONTH	1000	411	759	827	446	715	890	628	801	944	344	807

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	924	892	904	---	---	---	902	864	885	856	808	835
2	950	908	926	704	668	692	954	902	931	880	820	852
3	960	940	950	694	668	677	994	948	970	992	974	983
4	930	816	873	728	670	698	986	964	978	1020	990	1010
5	844	822	830	780	718	748	980	950	972	1040	1010	1030
6	854	816	838	838	780	815	972	728	850	1070	1030	1050
7	822	774	795	860	826	840	714	616	671	---	---	---
8	806	782	791	868	848	858	834	716	765	---	---	---
9	804	786	795	896	862	879	886	830	860	---	---	---
10	802	802	802	908	884	896	932	878	907	---	---	---
11	---	---	---	912	822	858	944	834	911	---	---	---
12	866	827	844	872	836	855	840	784	808	979	939	956
13	885	855	873	886	812	859	868	822	844	1000	956	976
14	899	719	850	918	886	899	870	608	786	1020	981	1000
15	776	697	737	952	828	925	618	522	571	1030	811	1010
16	740	637	688	906	830	879	790	616	708	1040	1010	1030
17	691	621	653	884	784	809	790	754	775	956	934	942
18	818	579	698	818	642	731	838	798	818	952	918	936
19	966	690	901	740	648	705	930	536	901	950	926	940
20	949	829	890	738	700	719	922	892	907	956	878	917
21	895	821	858	732	610	681	930	904	915	924	882	904
22	850	716	783	728	666	698	944	904	924	928	878	905
23	686	640	656	716	662	690	938	904	919	894	866	880
24	875	595	648	708	632	679	902	862	883	916	870	886
25	---	---	---	678	416	532	854	748	804	982	916	966
26	---	---	---	480	406	426	---	---	---	980	924	953
27	---	---	---	564	486	535	---	---	---	926	884	912
28	---	---	---	692	572	629	742	660	708	912	856	894
29	---	---	---	754	686	717	782	700	736	---	---	---
30	---	---	---	822	756	791	790	746	775	---	---	---
31	---	---	---	874	820	846	840	752	797	---	---	---
MONTH												

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.1	7.9	8.0	8.0	7.8	7.9	8.0	8.0	8.0	7.8	7.7	7.8
2	8.0	7.9	7.9	8.0	7.9	7.9	8.0	8.0	8.0	7.8	7.7	7.8
3	8.0	7.9	7.9	8.0	7.9	7.9	8.0	8.0	8.0	7.8	7.8	7.8
4	8.0	7.9	8.0	8.0	7.8	7.9	7.8	7.7	7.7	7.8	7.7	7.8
5	8.1	7.9	8.0	8.0	7.8	7.9	7.8	7.7	7.7	7.9	7.8	7.8
6	8.0	7.8	7.9	8.0	7.8	7.9	7.7	7.7	7.7	7.9	7.8	7.9
7	8.0	7.7	7.9	8.0	7.8	7.9	7.7	7.6	7.7	7.8	7.8	7.8
8	8.1	7.6	7.9	8.0	7.8	7.9	7.7	7.6	7.7	8.0	7.8	7.9
9	8.4	7.6	7.9	7.9	7.8	7.9	7.7	7.7	7.7	8.0	7.9	7.9
10	8.5	7.6	7.9	8.0	7.8	7.9	7.7	7.7	7.7	8.0	7.9	7.9
11	8.0	7.7	7.8	7.9	7.8	7.9	7.9	7.7	7.8	8.0	7.9	7.9
12	8.1	7.7	7.9	7.9	7.8	7.8	7.9	7.8	7.9	8.0	7.9	7.9
13	8.0	7.7	7.9	7.9	7.8	7.8	8.0	7.9	7.9	7.9	7.9	7.9
14	7.9	7.8	7.8	8.0	7.8	7.9	8.0	7.9	7.9	7.9	7.9	7.9
15	8.0	7.8	7.9	8.0	7.9	8.0	8.0	7.9	7.9	7.9	7.8	7.8
16	7.9	7.8	7.9	8.0	7.9	8.0	7.9	7.9	7.9	8.0	7.8	7.9
17	7.9	7.8	7.9	8.0	7.9	8.0	7.9	7.8	7.9	8.1	7.9	8.0
18	7.9	7.8	7.8	8.0	7.9	8.0	8.0	7.8	7.9	8.1	7.9	8.0
19	8.0	7.8	7.9	8.0	7.9	7.9	8.0	7.9	8.0	8.0	7.9	8.0
20	8.0	7.9	7.9	7.9	7.9	7.9	8.0	7.9	7.9	8.0	7.9	7.9
21	8.0	7.8	7.9	8.2	8.0	8.1	7.9	7.9	7.9	8.0	7.9	7.9
22	7.9	7.8	7.8	8.2	8.0	8.1	7.9	7.9	7.9	8.2	7.8	8.0
23	7.9	7.8	7.8	8.2	7.6	8.1	7.9	7.8	7.9	8.1	8.1	8.1
24	7.9	7.8	7.9	8.1	8.0	8.1	7.9	7.8	7.9	8.1	8.1	8.1
25	8.0	7.8	7.9	8.1	8.0	8.1	7.8	7.8	7.8	8.1	8.1	8.1
26	8.1	7.9	8.0	8.2	8.1	8.1	7.9	7.8	7.8	8.2	8.1	8.1
27	8.0	7.9	8.0	8.2	8.0	8.1	7.8	7.8	7.8	8.1	8.1	8.1
28	8.0	7.8	7.9	8.1	8.0	8.0	7.9	7.8	7.8	8.1	8.1	8.1
29	8.0	7.8	7.9	8.1	7.6	8.0	7.9	7.8	7.8	8.4	8.1	8.2
30	8.0	7.9	7.9	8.1	7.8	8.0	7.9	7.8	7.8	8.4	8.3	8.3
31	8.0	7.9	7.9	---	---	---	7.8	7.8	7.8	8.3	8.3	8.3
MONTH	8.5	7.6	7.9	8.2	7.6	8.0	8.0	7.6	7.8	8.4	7.7	8.0

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	8.3	8.3	8.3	8.1	8.0	8.1	8.0	7.9	7.9	8.3	8.0	8.1
2	8.3	8.3	8.3	8.2	8.1	8.2	8.2	7.9	8.0	8.1	7.7	7.9
3	8.3	8.2	8.3	8.2	8.2	8.2	8.1	7.9	8.0	7.7	7.6	7.6
4	8.3	8.2	8.3	8.2	8.2	8.2	8.0	7.9	7.9	7.7	7.6	7.7
5	8.3	8.2	8.3	8.3	8.2	8.2	8.1	7.9	8.0	7.8	7.7	7.7
6	8.3	8.2	8.3	8.3	8.2	8.2	8.1	7.9	8.0	7.8	7.7	7.8
7	8.3	8.2	8.2	8.3	8.2	8.3	8.1	7.9	8.0	7.9	7.8	7.8
8	8.2	8.2	8.2	8.4	8.2	8.3	8.0	7.9	7.9	7.8	7.8	7.8
9	8.2	8.2	8.2	8.4	8.3	8.3	8.1	7.8	7.9	7.8	7.8	7.8
10	8.2	8.2	8.2	8.4	8.3	8.3	8.1	7.9	8.0	7.9	7.8	7.8
11	8.2	8.1	8.2	8.4	8.3	8.4	8.0	7.9	7.9	8.0	7.9	7.9
12	8.2	8.1	8.2	8.5	8.4	8.4	8.1	7.8	8.0	8.0	7.9	8.0
13	8.3	8.2	8.2	8.5	8.4	8.4	8.0	7.9	8.0	8.1	8.0	8.0
14	8.3	8.2	8.2	8.6	8.4	8.5	8.3	8.0	8.1	8.2	8.0	8.1
15	8.3	8.2	8.2	8.6	8.5	8.5	8.4	8.1	8.2	8.2	8.1	8.1
16	8.3	8.2	8.3	8.6	8.4	8.5	8.4	8.2	8.3	8.2	8.1	8.1
17	8.3	8.2	8.3	8.6	8.4	8.5	8.5	8.1	8.3	8.1	8.1	8.1
18	8.3	8.2	8.3	8.6	8.4	8.5	8.4	8.1	8.3	8.2	8.1	8.1
19	8.3	8.2	8.2	8.5	8.0	8.4	8.4	8.1	8.3	8.3	8.1	8.2
20	8.3	8.1	8.2	8.3	8.1	8.2	8.4	8.1	8.2	8.2	8.0	8.1
21	8.2	8.2	8.2	8.4	8.1	8.2	8.2	8.1	8.2	8.2	8.0	8.1
22	8.3	8.2	8.2	8.5	8.2	8.3	8.3	8.1	8.2	8.1	7.9	8.0
23	8.3	8.2	8.2	8.5	8.2	8.4	8.2	8.0	8.1	8.1	7.9	8.0
24	8.3	8.2	8.3	8.5	8.2	8.4	8.3	8.0	8.2	8.0	7.9	8.0
25	8.3	8.2	8.2	8.5	8.3	8.4	8.2	8.0	8.1	8.1	7.9	8.0
26	8.2	8.1	8.1	8.4	8.0	8.2	8.3	8.0	8.1	8.2	8.0	8.1
27	8.1	8.1	8.1	8.2	8.0	8.1	8.2	7.9	8.1	8.2	8.1	8.1
28	8.1	8.0	8.0	8.2	7.9	8.0	8.2	7.9	8.1	8.1	8.0	8.1
29	---	---	---	8.1	7.9	8.0	8.3	8.0	8.1	8.0	7.8	8.0
30	---	---	---	8.0	7.8	7.9	8.3	8.0	8.1	8.1	8.0	8.0
31	---	---	---	8.0	7.9	7.9	---	---	---	8.1	8.0	8.0
MONTH	8.3	8.0	8.2	8.6	7.8	8.3	8.5	7.8	8.1	8.3	7.6	8.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.2	8.1	8.1	7.8	7.7	7.7	8.0	8.0	8.0	8.0	7.9	8.0
2	8.2	8.1	8.1	7.9	7.7	7.8	8.1	8.0	8.0	8.1	7.9	8.0
3	8.2	8.1	8.1	7.9	7.7	7.8	8.1	8.0	8.1	8.1	8.0	8.0
4	8.1	8.0	8.1	8.2	7.9	8.1	8.2	8.0	8.1	8.1	8.0	8.1
5	8.1	8.0	8.1	8.2	8.0	8.1	8.2	8.1	8.1	8.2	8.1	8.1
6	8.1	8.0	8.1	8.3	8.0	8.2	8.1	7.8	8.0	8.4	8.2	8.3
7	8.1	8.0	8.0	8.3	8.0	8.1	7.8	7.8	7.8	---	---	---
8	8.0	7.9	8.0	8.2	8.0	8.1	7.9	7.7	7.8	---	---	---
9	8.0	7.9	8.0	8.1	8.0	8.0	7.9	7.8	7.9	---	---	---
10	8.0	8.0	8.0	8.2	8.0	8.1	8.0	7.8	7.9	---	---	---
11	8.4	8.0	8.3	8.1	8.0	8.1	8.0	7.9	7.9	---	---	---
12	8.5	8.3	8.4	8.1	8.0	8.0	8.0	7.8	7.9	8.4	8.2	8.3
13	8.5	8.3	8.4	8.1	7.9	8.0	8.0	7.8	7.9	8.4	8.2	8.3
14	8.4	8.2	8.3	8.2	8.0	8.0	7.9	7.8	7.9	8.4	8.2	8.3
15	8.1	7.9	8.0	8.1	7.9	8.0	7.8	7.7	7.7	8.4	8.2	8.3
16	8.0	7.9	7.9	8.2	8.0	8.1	7.8	7.7	7.7	---	---	---
17	7.9	7.9	7.9	8.2	8.0	8.0	7.8	7.7	7.7	8.0	7.8	7.9
18	8.5	7.8	8.1	8.2	7.9	8.0	7.7	7.7	7.7	8.1	7.8	7.9
19	8.6	8.1	8.5	8.2	7.9	8.0	8.1	7.9	8.0	8.1	7.8	7.9
20	8.7	8.4	8.6	8.1	7.9	8.0	8.0	8.0	8.0	8.1	7.8	7.9
21	8.5	8.4	8.5	8.0	7.9	7.9	8.0	7.9	7.9	8.0	7.8	7.9
22	8.2	8.1	8.2	8.0	7.9	7.9	8.0	7.9	8.0	8.0	7.7	7.8
23	8.2	8.0	8.1	7.9	7.9	7.9	8.1	7.9	8.0	7.9	7.7	7.8
24	8.1	8.0	8.0	7.9	7.8	7.9	8.0	7.9	8.0	8.0	7.7	7.8
25	8.2	7.6	7.9	7.9	7.8	7.8	7.9	7.8	7.9	7.9	7.7	7.8
26	7.7	7.5	7.6	7.9	7.7	7.8	7.8	7.5	7.6	7.9	7.8	7.8
27	7.7	7.5	7.6	7.9	7.7	7.8	8.0	7.6	7.8	8.1	7.8	7.9
28	7.6	7.5	7.6	7.9	7.8	7.8	8.0	7.9	7.9	8.1	7.8	7.9
29	7.7	7.5	7.6	8.0	7.8	7.9	8.0	7.9	7.9	---	---	---
30	7.8	7.6	7.7	8.1	7.9	8.0	8.1	7.9	8.0	---	---	---
31	---	---	---	8.1	8.0	8.0	8.1	8.0	8.0	---	---	---
MONTH	8.7	7.5	8.1	8.3	7.7	8.0	8.2	7.5	7.9			

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	16.5	15.5	16.0	6.0	5.0	5.5	1.5	.0	1.0	3.5	3.0	3.0
2	16.0	14.0	14.5	6.5	5.5	6.0	.5	.0	.5	3.0	2.5	2.5
3	14.0	12.5	13.5	7.5	6.5	7.0	.5	.0	.5	2.5	2.0	2.0
4	13.0	12.0	12.5	7.5	7.0	7.0	3.0	1.0	1.5	2.5	1.5	2.0
5	12.5	11.0	12.0	7.5	6.5	7.0	2.5	1.5	2.5	3.0	2.0	2.5
6	13.0	11.5	12.5	7.5	7.0	7.0	2.5	2.0	2.0	3.0	2.5	2.5
7	14.0	12.5	13.0	8.0	7.0	7.5	2.0	2.0	2.0	2.5	2.0	2.5
8	17.0	13.5	14.5	9.0	8.0	8.5	2.0	1.5	2.0	3.5	1.0	2.5
9	19.0	14.0	16.0	8.5	7.5	8.0	2.0	1.5	2.0	3.5	3.0	3.0
10	19.0	13.5	15.0	7.5	7.0	7.0	2.0	1.5	1.5	3.0	2.5	3.0
11	13.5	12.0	12.5	7.0	6.0	6.5	2.0	1.5	2.0	3.5	2.5	3.0
12	12.0	11.0	11.5	6.5	6.0	6.5	3.0	1.0	2.0	4.0	2.5	3.5
13	11.0	9.5	10.5	6.5	6.0	6.5	2.5	1.0	2.0	4.0	3.0	3.5
14	11.0	9.5	10.0	6.0	5.0	5.5	2.5	1.5	2.0	4.0	3.5	3.5
15	12.0	10.0	11.0	5.0	4.5	5.0	3.0	2.0	2.5	3.5	3.0	3.0
16	14.5	11.0	12.5	5.0	4.5	4.5	3.0	2.5	3.0	3.0	.5	2.0
17	14.5	9.5	11.0	4.5	3.5	4.5	3.5	2.0	3.0	1.5	.0	1.0
18	9.5	8.5	9.0	3.5	2.5	3.0	2.5	2.0	2.5	2.0	.5	1.0
19	9.5	8.0	9.0	3.5	2.5	3.0	2.5	1.5	2.0	1.5	.5	1.0
20	11.0	9.0	10.0	3.0	2.5	3.0	2.5	2.0	2.0	1.5	.5	1.0
21	11.0	9.5	10.0	3.0	1.5	2.5	3.0	2.0	2.5	2.0	1.0	1.5
22	9.5	8.5	9.0	3.5	2.0	3.0	3.0	2.5	2.5	4.0	.5	2.5
23	9.0	8.5	9.0	3.5	2.5	3.0	2.5	2.0	2.5	3.5	3.0	3.0
24	9.0	8.0	8.5	2.5	1.5	2.0	2.5	2.0	2.0	4.0	3.0	3.5
25	8.0	7.0	7.5	1.5	1.0	1.0	2.5	2.0	2.0	4.0	3.0	3.5
26	7.0	6.5	6.5	1.5	.5	1.0	3.0	2.5	2.5	3.5	3.0	3.5
27	6.5	5.5	6.0	1.5	.5	1.0	3.0	2.5	2.5	3.5	2.5	3.0
28	5.5	5.0	5.5	1.0	.5	.5	3.0	3.0	3.0	3.0	2.5	3.0
29	5.0	4.5	5.0	1.5	1.0	1.0	3.5	2.5	3.0	2.5	2.0	2.5
30	6.0	4.5	5.0	2.0	1.0	1.5	4.0	3.0	3.5	3.0	1.5	2.0
31	6.0	5.0	5.5	---	---	---	3.5	3.0	3.5	2.5	2.0	2.5
MONTH	19.0	4.5	10.5	9.0	.5	4.5	4.0	.0	2.0	4.0	.0	2.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2.5	1.5	2.0	1.5	1.0	1.0	10.5	9.5	10.0	17.5	15.5	16.5
2	2.0	1.5	1.5	1.5	1.0	1.0	19.5	9.5	13.5	17.0	15.5	16.5
3	2.5	1.0	1.5	2.0	1.0	1.5	15.0	11.0	12.5	16.5	16.5	16.5
4	2.0	1.5	1.5	2.0	1.5	2.0	11.0	9.0	9.5	16.0	15.5	16.0
5	2.5	1.5	2.0	3.5	1.5	2.5	10.5	8.5	9.5	16.5	15.0	15.5
6	3.0	2.0	2.5	3.0	2.0	2.5	11.5	9.0	10.0	16.5	15.0	16.0
7	2.5	1.5	2.0	3.5	2.0	3.0	11.5	10.0	11.0	15.0	14.0	15.0
8	2.0	1.5	2.0	4.5	2.5	3.5	12.5	10.5	11.5	15.0	14.0	14.0
9	2.0	1.5	1.5	5.0	4.0	4.5	12.0	10.5	11.5	14.0	13.0	13.5
10	2.0	1.5	1.5	5.5	4.5	5.0	13.0	11.0	12.0	13.0	12.0	12.5
11	2.0	1.0	1.5	6.5	4.0	5.0	12.0	11.0	11.5	13.0	11.5	12.5
12	2.0	1.5	1.5	7.5	5.5	6.5	12.5	10.5	11.5	12.5	12.0	12.0
13	2.5	1.0	1.5	8.0	6.5	7.0	12.0	11.0	11.5	13.5	11.5	12.5
14	2.0	.5	1.5	8.5	6.0	7.0	12.0	10.0	11.0	16.0	12.5	15.0
15	2.0	1.0	1.5	9.0	7.5	8.5	12.5	10.0	11.0	16.5	14.0	15.5
16	1.5	1.0	1.0	10.5	8.0	9.0	11.5	11.0	11.0	17.5	15.5	16.5
17	1.5	1.0	1.0	9.5	8.5	9.0	12.5	10.5	11.5	16.5	15.5	16.5
18	1.5	.5	1.0	8.5	7.5	8.0	12.5	10.5	12.0	17.0	15.0	16.0
19	2.0	1.5	1.5	8.0	6.0	7.5	13.0	11.5	12.0	18.0	15.5	16.5
20	2.5	1.5	2.0	9.0	6.5	7.5	13.5	11.0	12.0	19.5	16.5	18.0
21	1.0	1.5	1.0	9.5	7.0	8.0	12.5	11.0	11.5	19.5	17.5	18.5
22	1.0	1.5	1.0	14.5	7.5	10.5	11.0	10.5	10.5	19.5	18.0	19.0
23	1.0	.5	1.0	17.0	8.0	12.0	10.5	9.5	10.0	20.0	18.5	19.0
24	1.0	.5	1.0	20.5	8.5	14.5	12.0	9.5	11.0	19.0	17.5	18.0
25	1.0	.5	.5	18.5	13.5	16.0	13.0	10.5	12.0	17.5	16.5	17.0
26	1.5	.5	1.0	15.0	7.5	10.0	15.5	12.0	13.5	17.0	16.5	16.5
27	1.0	1.0	1.0	9.0	8.0	8.5	17.0	14.5	16.0	18.5	16.5	17.5
28	1.0	1.0	1.0	11.0	9.0	10.5	16.5	15.5	16.0	19.0	18.0	18.5
29	---	---	---	12.0	11.0	11.5	17.0	15.0	16.0	20.5	19.0	19.5
30	---	---	---	12.0	11.0	11.5	17.5	15.5	16.5	21.0	19.0	20.0
31	---	---	---	11.5	10.0	10.5	---	---	---	21.0	19.5	20.5
MONTH	3.0	.5	1.5	20.5	1.0	7.5	19.5	8.5	12.0	21.0	11.5	16.5

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	21.0	20.0	20.5	23.5	22.5	23.0	23.5	23.0	23.0	21.0	20.5	21.0
2	20.5	20.5	20.5	24.5	23.0	23.5	24.5	23.0	24.0	21.0	20.0	20.5
3	21.5	19.5	20.5	25.0	24.0	24.5	26.0	24.0	25.0	20.5	20.0	20.5
4	22.5	20.0	21.5	27.0	24.5	26.0	27.0	25.0	26.0	20.5	19.5	20.0
5	23.5	21.5	22.5	27.0	24.5	26.0	27.5	25.5	26.5	21.0	19.5	20.0
6	24.5	21.5	23.0	28.5	25.0	27.0	26.5	25.5	26.0	24.5	20.0	22.5
7	24.5	22.5	23.5	29.0	25.5	27.5	25.5	24.5	25.0	25.0	21.5	23.0
8	23.5	22.0	23.0	29.5	27.0	28.0	25.5	24.0	24.5	26.5	17.0	22.0
9	22.0	21.0	21.5	27.5	26.0	27.0	24.5	23.0	24.0	29.5	18.0	24.0
10	21.0	21.0	21.0	28.0	26.0	27.0	25.0	23.0	24.0	26.5	21.5	23.5
11	20.5	20.0	20.0	27.0	25.5	26.5	25.5	23.5	24.5	---	---	---
12	20.0	18.5	19.5	26.5	26.5	26.5	26.0	23.5	25.0	21.0	20.0	20.5
13	20.5	19.0	19.5	27.0	25.5	26.0	27.5	24.5	26.0	21.0	20.0	20.5
14	20.0	19.5	20.0	27.0	25.5	26.5	26.0	24.5	25.5	20.5	19.5	20.0
15	20.0	19.0	19.5	26.5	25.5	26.0	25.0	24.0	24.5	---	---	---
16	19.5	18.0	19.0	27.5	25.0	26.5	23.5	23.0	23.5	18.5	16.0	17.5
17	19.5	18.5	19.0	28.5	26.0	27.0	23.5	22.0	23.0	16.5	15.5	16.0
18	22.0	18.0	19.5	28.5	26.0	27.0	22.5	20.0	21.0	16.0	15.0	15.5
19	23.0	19.5	21.0	28.5	26.5	27.5	22.5	20.0	21.0	16.5	14.5	15.5
20	24.0	20.0	22.0	28.0	26.5	27.0	24.0	23.0	23.5	16.5	14.5	15.5
21	21.5	19.5	20.0	26.5	25.5	26.0	24.5	23.0	23.5	17.0	15.5	16.0
22	22.5	21.0	22.0	25.5	24.5	25.0	24.5	23.0	23.5	16.5	15.0	16.0
23	22.0	20.0	21.0	25.0	24.0	24.5	25.0	22.5	23.5	16.0	14.5	15.0
24	22.0	20.0	21.0	24.5	23.5	24.0	25.0	23.0	24.0	15.5	14.5	15.0
25	24.0	19.5	21.5	23.5	22.5	23.0	24.5	23.5	24.0	15.5	15.5	15.5
26	21.0	19.0	20.0	23.0	22.0	22.5	23.5	21.0	22.0	16.0	15.5	16.0
27	21.5	20.5	21.0	22.5	21.5	22.0	21.0	20.5	21.0	15.5	14.0	14.5
28	21.5	21.0	21.5	21.5	20.5	21.0	20.5	20.0	20.0	14.0	13.0	13.5
29	22.5	21.5	22.0	21.0	20.0	20.5	20.5	20.0	20.0	17.5	13.5	15.0
30	23.0	22.0	22.5	23.0	21.0	22.0	21.5	19.5	20.5	16.5	14.0	15.5
31	---	---	---	23.5	22.0	22.5	21.5	21.0	21.5	---	---	---
MONTH	24.5	18.0	21.0	29.5	20.0	25.0	27.5	19.5	23.5			

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	12.6	9.7	11.1	15.8	14.3	15.2	12.3	11.7	12.0	10.8	10.3	10.5
2	12.5	9.9	11.5	15.3	13.4	14.8	12.5	12.0	12.2	11.0	10.5	10.7
3	12.8	9.8	11.1	14.9	13.6	14.4	12.3	11.4	11.8	11.1	10.7	11.0
4	12.8	10.3	11.5	15.1	11.7	14.2	13.8	11.7	13.2	11.2	10.8	11.0
5	13.0	10.6	11.7	15.2	12.2	14.3	13.0	11.8	12.5	11.2	10.8	11.0
6	13.2	10.4	11.6	15.0	12.5	14.1	12.9	12.0	12.4	11.8	10.8	11.3
7	13.5	10.3	11.8	14.1	11.9	13.3	12.5	11.8	12.1	11.7	10.9	11.3
8	13.7	7.2	11.1	13.2	11.9	12.7	12.7	11.8	12.2	11.9	10.8	11.1
9	15.5	7.0	11.1	13.2	11.5	12.4	12.4	12.0	12.2	11.5	10.7	11.1
10	14.8	6.4	12.3	13.9	12.0	12.9	12.4	12.1	12.3	11.4	11.0	11.3
11	14.2	10.3	12.0	13.6	12.5	13.0	12.7	11.8	12.3	11.3	10.9	11.1
12	15.0	11.2	13.0	13.2	11.2	12.3	12.1	11.1	11.6	11.3	10.5	10.8
13	15.1	11.8	13.3	13.0	11.8	12.4	12.1	11.3	11.7	11.0	10.5	10.7
14	12.6	11.3	12.1	12.7	10.9	11.4	12.1	11.4	11.8	11.1	10.5	10.7
15	12.4	11.1	11.9	11.5	10.8	11.1	11.9	11.1	11.5	10.9	10.4	10.6
16	11.2	9.8	10.6	11.8	11.0	11.4	11.6	10.7	11.3	11.7	10.4	11.1
17	11.8	9.8	11.0	12.1	11.2	11.6	11.4	10.9	11.1	11.7	10.8	11.1
18	12.6	11.7	12.0	12.5	11.8	12.1	12.3	10.7	11.5	11.1	10.6	10.9
19	12.7	11.9	12.3	12.4	11.8	12.2	12.2	11.6	11.9	10.9	10.3	10.6
20	12.9	11.9	12.3	12.2	11.8	12.0	12.2	11.7	12.0	10.8	10.1	10.5
21	13.2	11.5	12.5	13.4	11.8	12.6	12.1	11.3	11.8	11.0	10.5	10.8
22	13.8	12.3	12.8	13.6	12.5	13.0	11.7	11.2	11.4	14.2	10.8	12.6
23	13.0	11.7	12.5	13.5	12.7	12.9	11.6	11.1	11.4	13.8	12.4	13.0
24	13.6	11.3	12.9	13.7	12.9	13.2	11.8	11.4	11.6	13.3	12.3	12.8
25	13.6	12.1	13.0	13.7	11.8	12.6	11.6	11.3	11.4	13.0	12.3	12.7
26	14.4	12.7	13.4	12.8	12.6	12.7	11.5	10.7	11.2	13.3	12.5	12.9
27	14.5	13.3	13.7	12.9	12.5	12.7	11.3	10.9	11.1	13.4	12.4	13.0
28	16.4	13.0	14.8	12.8	11.7	12.2	11.2	10.7	11.0	13.7	13.0	13.3
29	17.0	13.9	16.2	12.2	11.8	12.0	11.1	10.7	11.0	14.9	13.4	14.1
30	16.0	13.6	14.9	12.3	11.9	12.0	10.8	10.2	10.6	14.9	12.6	13.8
31	15.8	13.1	14.9	---	---	---	10.7	10.2	10.4	13.8	13.3	13.6
MONTH	17.0	6.4	12.5	15.8	10.8	12.8	13.8	10.2	11.7	14.9	10.1	11.7

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	13.8	12.8	13.3	12.8	12.4	12.6	11.1	8.9	10.0	13.1	10.1	11.3
2	13.2	12.7	13.0	13.1	12.7	12.9	10.9	8.3	9.4	10.1	6.3	8.2
3	13.4	12.4	13.0	13.1	12.6	12.9	10.6	9.2	10.1	6.5	5.7	6.0
4	13.3	11.5	12.7	13.0	12.5	12.8	12.1	11.4	11.8	6.2	5.9	6.0
5	13.1	11.7	12.7	14.5	12.7	13.3	12.4	11.5	12.1	7.8	6.2	7.4
6	12.6	10.8	12.1	14.2	13.6	13.9	12.7	11.7	12.2	7.9	7.4	7.8
7	12.3	11.5	11.9	13.9	13.2	13.5	13.0	12.1	12.4	8.5	7.8	8.1
8	12.5	11.2	12.1	13.7	13.0	13.4	12.7	11.5	12.1	9.0	8.9	9.0
9	12.6	11.6	12.3	13.5	12.7	13.1	12.7	11.2	12.0	9.0	8.5	8.7
10	12.6	10.9	12.1	13.7	12.8	13.3	13.9	11.0	12.5	9.1	8.5	8.8
11	12.9	11.9	12.4	13.3	12.6	13.0	13.4	11.9	12.7	9.4	8.8	9.2
12	12.5	11.2	12.0	13.2	12.4	12.7	13.7	11.1	12.4	10.2	9.1	9.7
13	12.1	10.7	11.6	12.7	11.1	11.9	12.8	11.3	12.0	9.9	9.3	9.6
14	12.2	10.8	11.6	11.7	11.0	11.4	16.4	10.3	13.7	10.0	9.0	9.7
15	11.6	10.9	11.2	11.0	10.3	10.6	16.8	12.7	14.8	10.1	9.3	9.7
16	11.8	10.9	11.5	10.6	9.9	10.3	13.9	11.4	12.6	9.6	9.0	9.3
17	11.9	10.5	11.2	10.6	9.8	10.2	14.5	10.8	12.4	8.4	8.8	9.1
18	11.9	11.1	11.5	10.8	10.1	10.5	14.4	10.8	12.6	9.7	8.9	9.4
19	13.3	11.5	12.5	11.6	10.4	10.7	13.2	10.3	11.6	10.6	9.5	10.1
20	14.2	12.8	13.6	11.9	11.0	11.5	13.0	9.8	11.4	10.9	9.8	10.3
21	14.4	13.4	13.9	11.6	10.9	11.2	11.2	9.1	10.3	12.4	9.8	11.1
22	14.3	13.4	14.0	11.4	9.2	10.3	9.5	8.2	8.9	11.7	9.6	10.6
23	14.4	13.5	14.1	10.8	7.9	9.6	12.0	7.7	10.0	10.5	8.6	9.5
24	14.6	13.3	14.2	10.5	7.1	8.6	14.8	10.2	12.6	8.6	7.0	7.8
25	14.6	13.8	14.3	8.5	7.1	7.9	14.1	11.3	12.6	7.7	6.6	7.1
26	14.5	13.1	13.8	16.0	7.8	12.5	14.3	11.1	12.6	10.7	6.8	8.9
27	13.6	12.6	13.0	14.3	11.5	13.0	13.8	11.1	12.2	12.4	9.7	10.9
28	12.8	12.3	12.6	13.9	11.8	12.6	12.7	11.1	11.7	11.1	9.0	10.3
29	---	---	---	12.1	10.1	11.3	13.3	10.7	12.0	8.8	6.8	7.5
30	---	---	---	11.8	9.7	10.7	13.9	10.0	12.0	7.3	6.5	6.8
31	---	---	---	10.9	9.4	10.2	---	---	---	7.0	5.5	6.2
MONTH	14.6	10.5	12.7	16.0	7.1	11.7	16.8	7.7	11.9	13.1	5.5	8.8

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	7.3	5.4	6.4	7.9	6.9	7.2	7.5	7.1	7.3	8.6	8.3	8.4
2	7.9	6.5	7.0	7.2	6.6	6.9	7.5	7.2	7.3	8.7	8.4	8.5
3	9.1	7.8	8.3	7.0	6.5	6.8	7.5	7.2	7.3	8.6	8.1	8.4
4	8.8	8.1	8.3	7.1	6.7	6.9	7.7	7.3	7.5	8.4	8.1	8.3
5	8.3	7.0	7.6	7.1	6.8	7.0	7.8	7.4	7.6	8.4	8.2	8.3
6	7.7	6.2	6.9	7.1	6.5	6.8	7.5	6.7	7.2	8.3	7.4	7.9
7	8.8	7.2	7.8	6.9	6.2	6.6	7.7	7.3	7.4	---	---	---
8	7.2	6.0	6.7	6.6	6.3	6.4	7.7	7.3	7.5	---	---	---
9	8.2	5.9	7.1	7.6	6.4	7.0	7.9	7.6	7.7	---	---	---
10	6.9	6.9	6.9	7.5	7.0	7.2	7.9	7.7	7.8	---	---	---
11	---	---	---	7.5	7.0	7.2	7.9	7.4	7.6	---	---	---
12	8.9	7.1	8.0	7.2	6.7	7.0	7.6	7.2	7.4	9.7	7.8	8.8
13	7.8	6.6	7.1	7.3	6.8	7.0	7.4	6.7	7.0	9.7	7.7	8.7
14	7.7	5.3	6.0	7.3	6.9	7.1	7.0	6.6	6.8	9.3	8.0	8.6
15	5.3	4.6	4.9	7.3	6.9	7.2	7.0	6.6	6.8	---	---	---
16	6.0	4.7	5.4	7.7	6.7	7.1	7.1	6.8	7.0	9.7	6.6	9.0
17	5.5	5.3	5.5	7.0	6.6	6.9	7.5	7.1	7.3	12.5	11.0	11.9
18	8.1	5.4	6.5	7.1	6.6	6.8	7.8	7.6	7.7	13.2	10.5	11.8
19	7.8	4.7	7.4	7.0	6.6	6.8	7.9	7.2	7.8	13.0	10.7	11.8
20	7.6	6.7	7.2	6.9	6.5	6.7	8.9	7.9	8.3	13.3	10.4	11.8
21	7.5	7.2	7.3	7.2	6.6	6.9	7.9	7.7	7.8	12.9	10.6	11.7
22	8.4	8.1	8.3	7.2	6.7	7.0	7.9	7.6	7.7	13.4	10.7	11.9
23	8.7	8.0	8.2	7.7	6.6	7.0	7.8	7.3	7.6	12.0	10.6	11.2
24	8.3	7.8	8.0	7.2	6.6	6.8	8.0	7.5	7.6	12.7	10.3	11.6
25	8.0	6.8	7.6	7.3	6.6	7.0	7.7	7.3	7.4	10.1	8.5	9.3
26	8.0	7.1	7.6	7.5	7.0	7.3	7.7	6.7	7.4	9.5	8.1	8.8
27	8.0	7.3	7.7	7.7	7.2	7.5	8.6	7.6	8.2	12.6	8.6	10.1
28	7.9	7.2	7.5	7.8	7.5	7.7	8.7	8.3	8.5	14.0	10.2	11.8
29	8.0	7.5	7.8	8.0	7.6	7.7	8.8	8.3	8.6	---	---	---
30	8.6	7.6	7.9	7.9	7.4	7.7	8.7	8.4	8.5	---	---	---
31	---	---	---	7.6	7.3	7.4	8.5	8.2	8.4	---	---	---
MONTH				8.0	6.2	7.1	8.9	6.6	7.6			

05330908 MINNESOTA RIVER AT BURNSVILLE, MN

LOCATION.--Lat 44°48'41", long 93°15'04", in NE¼SE¼ sec.23, T.27 N., R.20 W., Dakota County, Hydrologic Unit 07020012, on right bank 8.9 mi (14.3 km) from mouth at Northern States' Black Dog Power Plant.

DRAINAGE AREA.--Not determined.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: June 1980 to current year.
pH: June 1980 to current year.
WATER TEMPERATURE: June 1980 to current year.
DISSOLVED OXYGEN: June 1980 to current year.

INSTRUMENTATION.--Water-quality monitor since June 1980.

REMARKS.--Water is pumped to a monitor that is inside a heated shelter. Extremes are published for years with 80 percent or more daily record. Malfunctions of the monitor resulted in less tha 80 percent recorded daily record for the current year.

COOPERATION.--Water-quality monitor is operated by the Metropolitan Waste Control Commission, St. Paul, MN.

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	840	812	827	821	809	812	858	818	844	887	872	879
2	846	837	842	828	817	822	872	834	860	894	878	887
3	861	844	853	830	823	826	869	824	853	882	869	875
4	870	800	854	832	824	828	---	---	---	884	871	877
5	864	839	852	841	818	832	915	892	908	883	872	879
6	855	832	842	842	822	834	896	876	887	887	866	875
7	856	823	842	843	807	830	871	854	860	879	871	873
8	848	782	824	817	813	814	862	839	851	897	861	881
9	853	776	814	---	---	---	827	812	821	906	886	892
10	799	780	786	820	805	815	805	792	798	915	881	896
11	800	774	784	813	803	809	815	787	801	939	912	926
12	788	759	771	811	801	804	832	812	823	950	922	939
13	800	766	774	825	807	812	855	842	850	948	928	940
14	801	763	772	821	721	816	857	843	850	970	935	949
15	787	765	771	825	812	819	856	837	846	952	934	940
16	786	719	762	828	822	824	854	839	850	953	931	943
17	819	723	779	830	826	828	860	850	855	953	929	946
18	815	786	798	837	828	834	859	797	825	---	---	---
19	819	798	806	837	833	834	814	802	807	---	---	---
20	822	749	799	841	834	836	829	809	817	---	---	---
21	825	749	793	833	794	809	836	824	829	---	---	---
22	830	795	813	835	808	816	865	835	851	---	---	---
23	831	808	818	849	838	844	878	862	870	---	---	---
24	833	805	813	844	825	837	872	866	869	---	---	---
25	831	807	815	828	808	819	870	859	866	---	---	---
26	831	814	820	826	808	819	877	868	873	---	---	---
27	835	813	821	848	820	839	881	869	876	---	---	---
28	827	806	813	847	834	842	885	867	876	---	---	---
29	828	800	812	853	843	848	892	884	888	---	---	---
30	829	800	814	857	838	847	903	879	889	---	---	---
31	824	808	817	---	---	---	898	884	891	---	---	---
MONTH	870	719	810									

05330908 MINNESOTA RIVER AT BURNSVILLE, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1				---	---	---	740	717	731	---	---	---
2				---	---	---	857	745	801	---	---	---
3				---	---	---	861	849	854	---	---	---
4				---	---	---	860	846	851	---	---	---
5				528	520	523	856	841	849	---	---	---
6				527	518	523	847	842	846	---	---	---
7				543	523	529	847	834	843	---	---	---
8				591	550	569	839	819	831	---	---	---
9				611	595	600	843	819	832	---	---	---
10				634	617	626	875	844	859	---	---	---
11				825	635	723	870	862	866	959	848	886
12				810	733	771	897	863	875	953	849	880
13				749	699	726	882	859	870	954	842	875
14				734	688	714	982	870	926	976	830	879
15				726	697	708	963	927	945	841	794	836
16				743	689	719	990	835	897	---	---	---
17				731	719	726	851	839	845	838	831	834
18				739	728	734	861	840	848	956	839	844
19				756	738	748	865	842	852	851	834	843
20				756	751	754	858	831	846	845	823	834
21				753	743	748	846	827	835	847	823	831
22				754	748	751	881	842	860	825	814	818
23				762	724	746	866	850	856	823	803	813
24				758	722	744	---	---	---	817	795	803
25				765	752	758	---	---	---	797	791	794
26				767	754	761	---	---	---	805	792	799
27				762	752	756	---	---	---	847	807	822
28				782	741	753	---	---	---	955	813	849
29				739	652	690	---	---	---	862	835	850
30				681	662	670	---	---	---	851	817	838
31				695	684	689	---	---	---	862	817	843

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	880	863	872	---	---	---	809	799	805	833	800	816
2	889	880	885	---	---	---	828	812	821	852	834	843
3	903	888	894	---	---	---	849	829	842	869	853	862
4	913	902	907	---	---	---	857	847	851	883	870	877
5	915	910	912	---	---	---	858	851	856	892	884	888
6	917	905	911	---	---	---	861	822	848	900	893	896
7	908	890	900	---	---	---	857	812	838	905	899	903
8	911	898	904	---	---	---	806	761	777	909	905	908
9	898	876	887	---	---	---	828	790	806	910	904	908
10	886	879	881	---	---	---	856	830	849	905	895	900
11	895	861	879	---	---	---	877	857	867	904	865	893
12	863	854	859	---	---	---	882	876	879	905	893	899
13	853	833	840	---	---	---	---	---	---	896	884	891
14	844	793	817	---	---	---	---	---	---	888	877	884
15	803	745	779	---	---	---	---	---	---	885	877	881
16	773	739	754	---	---	---	---	---	---	882	876	879
17	735	706	722	---	---	---	---	---	---	881	876	878
18	714	680	692	---	---	---	---	---	---	880	876	878
19	719	670	690	---	---	---	---	---	---	877	865	871
20	752	721	740	---	---	---	881	876	878	871	856	863
21	749	728	739	---	---	---	892	881	885	873	861	868
22	755	737	743	---	---	---	895	891	893	873	849	864
23	762	749	758	---	---	---	896	890	893	860	848	855
24	---	---	---	---	---	---	898	889	894	864	858	861
25	---	---	---	---	---	---	886	869	878	864	856	860
26	---	---	---	---	---	---	874	825	849	860	846	852
27	---	---	---	---	---	---	835	598	690	888	859	878
28	---	---	---	---	---	---	737	649	705	890	873	882
29	---	---	---	---	---	---	766	738	758	876	858	867
30	---	---	---	774	762	768	785	758	771	856	840	847
31	---	---	---	798	775	788	799	777	785	---	---	---
MONTH										910	800	875

05330908 MINNESOTA RIVER AT BURNSVILLE, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.0	7.9	7.9	7.9	7.8	7.8	8.2	8.1	8.1	7.7	7.7	7.7
2	8.0	7.9	7.9	7.9	7.8	7.8	8.1	8.0	8.1	7.7	7.7	7.7
3	7.9	7.8	7.8	7.8	7.8	7.8	8.1	7.9	8.0	7.7	7.6	7.7
4	8.0	7.8	7.9	7.9	7.8	7.8	8.1	7.9	8.0	7.6	7.5	7.5
5	8.0	7.8	7.9	7.9	7.8	7.8	8.1	8.0	8.1	7.6	7.5	7.5
6	7.9	7.8	7.8	7.9	7.8	7.8	8.0	8.0	8.0	7.7	7.5	7.6
7	7.9	7.8	7.8	7.8	7.8	7.8	8.0	8.0	8.0	7.6	7.5	7.6
8	8.0	7.8	7.8	7.8	7.8	7.8	8.0	7.9	7.9	7.9	7.6	7.7
9	7.9	7.7	7.8	---	---	---	8.0	7.9	7.9	7.8	7.7	7.8
10	7.8	7.7	7.8	8.0	7.9	7.9	8.0	7.9	8.0	7.8	7.7	7.8
11	7.9	7.7	7.8	8.0	7.9	7.9	7.9	7.9	7.9	7.8	7.8	7.8
12	8.0	7.7	7.8	8.0	7.9	7.9	7.9	7.9	7.9	7.8	7.8	7.8
13	7.9	7.8	7.8	7.9	7.9	7.9	8.0	7.9	7.9	7.8	7.7	7.7
14	7.8	7.6	7.7	8.0	7.5	7.9	8.0	7.9	8.0	7.8	7.7	7.7
15	7.8	7.6	7.7	8.0	7.9	8.0	8.0	7.9	8.0	7.7	7.6	7.6
16	8.0	7.6	7.7	8.0	7.9	8.0	8.0	7.9	8.0	7.9	7.6	7.8
17	7.9	7.7	7.7	8.0	7.9	8.0	8.0	8.0	8.0	7.9	7.9	7.9
18	7.7	7.6	7.7	8.0	7.9	8.0	8.0	7.9	8.0	---	---	---
19	7.8	7.6	7.7	8.0	7.9	8.0	7.9	7.9	7.9	---	---	---
20	7.9	7.6	7.7	8.1	8.1	8.1	7.9	7.8	7.9	---	---	---
21	7.9	7.8	7.8	8.1	8.1	8.1	7.9	7.8	7.8	---	---	---
22	7.9	7.6	7.7	8.1	8.0	8.1	7.9	7.8	7.8	---	---	---
23	7.7	7.6	7.6	8.1	8.0	8.1	7.9	7.8	7.8	---	---	---
24	7.7	7.5	7.6	8.2	8.1	8.1	7.9	7.8	7.9	---	---	---
25	7.7	7.6	7.7	8.2	8.1	8.1	7.8	7.7	7.7	---	---	---
26	7.9	7.7	7.7	8.2	8.1	8.2	7.8	7.7	7.8	---	---	---
27	7.9	7.8	7.8	8.2	8.2	8.2	7.8	7.7	7.7	---	---	---
28	7.9	7.5	7.8	8.2	8.1	8.2	7.7	7.7	7.7	---	---	---
29	7.9	7.6	7.9	8.2	8.1	8.1	7.7	7.7	7.7	---	---	---
30	7.9	7.8	7.8	8.2	8.1	8.1	7.7	7.7	7.7	---	---	---
31	7.9	7.8	7.8	---	---	---	7.7	7.7	7.7	---	---	---
MONTH	8.0	7.5	7.8				8.2	7.7	7.9			

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1				---	---	---	8.0	7.8	7.9	---	---	---
2				---	---	---	8.1	7.9	8.0	---	---	---
3				---	---	---	8.0	7.9	7.9	---	---	---
4				---	---	---	7.9	7.7	7.8	---	---	---
5				7.8	7.7	7.7	7.9	7.7	7.8	---	---	---
6				7.8	7.7	7.8	8.0	7.9	7.9	---	---	---
7				7.8	7.7	7.7	7.9	7.9	7.9	---	---	---
8				7.8	7.7	7.7	7.9	7.8	7.9	---	---	---
9				7.8	7.7	7.7	7.9	7.9	7.9	---	---	---
10				7.8	7.8	7.8	8.0	7.9	7.9	---	---	---
11				7.8	7.8	7.8	8.0	7.7	7.9	7.9	7.7	7.7
12				7.8	7.8	7.8	7.9	7.8	7.9	7.8	7.8	7.8
13				8.0	7.8	7.8	7.9	7.8	7.9	7.8	7.8	7.8
14				8.0	7.8	7.9	8.2	7.7	7.9	7.9	7.8	7.9
15				8.1	7.9	8.0	8.3	8.1	8.2	8.0	7.6	7.9
16				8.1	7.9	8.1	8.3	8.2	8.2	---	---	---
17				8.3	8.1	8.2	8.4	8.2	8.3	8.0	8.0	8.0
18				8.2	8.1	8.2	8.5	8.3	8.4	8.0	7.8	8.0
19				8.2	8.1	8.1	8.4	8.3	8.4	8.0	8.0	8.0
20				8.1	8.1	8.1	8.5	8.3	8.4	8.1	8.0	8.0
21				8.2	8.1	8.1	8.4	8.2	8.3	8.1	8.0	8.1
22				8.3	8.1	8.2	8.2	8.0	8.1	8.0	7.9	8.0
23				8.3	8.2	8.2	8.0	8.0	8.0	8.0	7.9	7.9
24				8.4	8.2	8.3	---	---	---	7.9	7.8	7.8
25				8.3	8.2	8.2	---	---	---	7.8	7.7	7.8
26				8.2	8.1	8.2	---	---	---	7.9	7.8	7.8
27				8.2	8.1	8.1	---	---	---	8.0	7.8	7.9
28				8.1	8.0	8.0	---	---	---	8.3	8.0	8.1
29				8.2	7.9	8.0	---	---	---	8.1	8.0	8.1
30				8.0	7.8	7.9	---	---	---	8.1	7.9	8.0
31				7.9	7.8	7.8	---	---	---	7.9	7.9	7.9
MONTH												

05330908 MINNESOTA RIVER AT BURNSVILLE, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.0	7.9	7.9	---	---	---	7.9	7.9	7.9	8.0	7.9	8.0
2	8.0	7.9	8.0	---	---	---	7.9	7.9	7.9	8.0	7.9	8.0
3	8.0	7.9	8.0	---	---	---	8.0	7.9	8.0	8.0	8.0	8.0
4	8.1	8.0	8.0	---	---	---	8.0	8.0	8.0	8.1	8.0	8.0
5	8.1	8.0	8.1	---	---	---	8.0	8.0	8.0	8.1	8.0	8.1
6	8.1	8.1	8.1	---	---	---	8.0	7.9	8.0	8.1	8.1	8.1
7	8.1	8.0	8.1	---	---	---	8.0	7.9	7.9	8.2	8.1	8.2
8	8.0	7.9	8.0	---	---	---	7.9	7.7	7.8	8.2	8.1	8.2
9	7.9	7.9	7.9	---	---	---	7.9	7.8	7.8	8.2	8.2	8.2
10	8.0	7.9	7.9	---	---	---	7.9	7.9	7.9	8.3	8.2	8.3
11	8.0	7.8	7.9	---	---	---	8.0	7.9	8.0	8.3	8.2	8.3
12	8.1	8.0	8.1	---	---	---	8.0	8.0	8.0	8.3	8.3	8.3
13	8.1	8.0	8.1	---	---	---	8.0	8.0	8.0	8.3	8.2	8.3
14	8.1	8.0	8.1	---	---	---	---	---	---	8.3	8.2	8.2
15	8.1	7.9	8.0	---	---	---	---	---	---	8.2	8.2	8.2
16	8.0	7.7	7.9	---	---	---	---	---	---	8.2	8.2	8.2
17	7.8	7.7	7.8	---	---	---	---	---	---	8.2	8.0	8.1
18	7.7	7.7	7.7	---	---	---	---	---	---	8.1	8.0	8.1
19	7.8	7.7	7.7	---	---	---	---	---	---	8.2	8.1	8.1
20	7.8	7.8	7.8	---	---	---	8.1	8.0	8.0	8.2	8.1	8.1
21	7.8	7.8	7.8	---	---	---	8.1	8.0	8.1	8.1	8.1	8.1
22	7.9	7.8	7.9	---	---	---	8.1	8.1	8.1	8.1	8.0	8.0
23	7.9	7.9	7.9	---	---	---	8.2	8.1	8.1	8.0	8.0	8.0
24	---	---	---	---	---	---	8.2	8.1	8.1	7.9	7.9	7.9
25	---	---	---	---	---	---	8.2	8.1	8.1	8.0	7.8	7.9
26	---	---	---	---	---	---	8.1	7.9	8.0	8.0	7.9	7.9
27	---	---	---	---	---	---	7.9	7.6	7.7	8.0	7.8	7.9
28	---	---	---	---	---	---	7.8	7.7	7.8	8.1	8.0	8.1
29	---	---	---	---	---	---	7.8	7.8	7.8	8.2	8.1	8.1
30	---	---	---	7.9	7.8	7.8	7.8	7.8	7.8	8.1	8.1	8.1
31	---	---	---	7.9	7.9	7.9	7.9	7.8	7.9	---	---	---
MONTH										8.3	7.8	8.1

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	15.0	13.5	14.0	---	---	---	---	---	---	5.0	3.0	4.0
2	14.0	13.5	14.0	5.5	3.5	4.5	---	---	---	3.0	1.5	2.5
3	12.0	11.5	11.5	7.5	4.5	6.0	---	---	---	3.5	1.5	2.5
4	14.5	7.5	9.0	7.5	5.5	6.5	---	---	---	2.5	1.5	1.5
5	9.5	6.0	7.5	8.0	6.0	7.0	2.5	1.5	2.0	2.5	1.5	2.0
6	12.0	6.5	8.0	8.5	6.5	7.5	2.5	2.0	2.5	4.0	1.5	2.5
7	11.0	7.0	8.5	11.5	7.0	9.0	2.5	1.5	2.0	2.0	1.5	1.5
8	15.5	10.0	12.0	11.5	11.0	11.0	2.5	1.0	1.5	2.0	.5	1.0
9	17.0	11.0	13.5	---	---	---	2.5	1.0	1.5	1.5	.5	.5
10	15.5	13.5	14.5	11.0	9.0	10.0	2.0	1.5	1.5	.5	.0	.0
11	13.5	11.0	12.0	10.0	8.0	9.5	2.5	1.5	2.0	2.0	.0	.5
12	11.5	8.5	10.0	8.5	7.5	8.0	3.0	1.5	2.0	3.5	2.0	2.5
13	---	---	---	12.0	6.5	7.0	2.0	1.0	1.5	3.0	2.0	2.0
14	---	---	---	10.0	6.5	7.0	2.0	1.5	1.5	4.0	2.0	2.5
15	---	---	---	10.0	5.0	6.0	3.5	1.0	2.0	3.0	.5	1.5
16	---	---	---	7.0	5.0	6.0	3.5	3.0	3.5	1.0	.0	.5
17	---	---	---	5.5	4.0	4.5	4.5	3.0	3.5	1.5	.0	1.0
18	---	---	---	4.0	2.0	3.0	2.5	.5	1.5	---	---	---
19	---	---	---	3.5	2.0	2.5	3.0	.5	1.5	---	---	---
20	---	---	---	4.0	3.0	3.5	5.5	2.5	3.5	---	---	---
21	---	---	---	3.5	2.0	3.0	3.5	2.5	3.0	---	---	---
22	12.0	9.0	10.0	4.0	3.0	3.5	5.0	2.5	3.5	---	---	---
23	9.5	8.5	9.0	4.0	2.5	3.5	4.5	2.5	3.5	---	---	---
24	9.0	6.5	8.0	---	---	---	2.5	1.0	2.0	---	---	---
25	---	---	---	---	---	---	3.5	2.0	3.0	---	---	---
26	---	---	---	---	---	---	4.0	3.0	3.5	---	---	---
27	---	---	---	---	---	---	4.5	3.5	4.0	---	---	---
28	---	---	---	---	---	---	4.5	3.5	4.0	---	---	---
29	---	---	---	---	---	---	4.0	3.0	3.5	---	---	---
30	---	---	---	---	---	---	5.5	3.5	4.5	---	---	---
31	5.0	3.0	4.0	---	---	---	5.5	4.5	5.0	---	---	---

05330908 MINNESOTA RIVER AT BURNSVILLE, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1				---	---	---	12.5	10.0	11.0	---	---	---
2				---	---	---	11.5	10.5	11.0	---	---	---
3				---	---	---	12.0	10.0	11.5	---	---	---
4				---	---	---	9.5	6.5	8.5	---	---	---
5				3.0	1.0	2.0	8.0	5.0	6.5	---	---	---
6				3.5	1.5	2.5	8.5	5.0	6.5	---	---	---
7				5.0	2.0	3.5	11.0	8.0	9.5	---	---	---
8				7.0	3.0	4.5	14.0	10.5	12.0	---	---	---
9				8.0	3.0	6.0	12.5	10.0	11.5	---	---	---
10				6.0	1.5	4.0	14.0	9.5	12.0	---	---	---
11				4.0	1.0	2.5	12.0	11.0	11.5	14.5	12.5	14.0
12				6.0	3.0	4.5	12.5	10.0	11.5	13.5	12.5	13.0
13				10.0	5.5	7.5	13.5	12.0	12.5	15.0	11.5	12.5
14				11.5	6.0	8.5	12.5	10.0	11.0	17.5	13.5	15.5
15				12.5	7.5	10.0	11.5	8.0	10.0	17.0	15.0	16.0
16				11.0	8.0	9.5	12.5	10.0	11.0	---	---	---
17				12.0	9.0	10.0	14.5	11.5	13.0	19.0	18.0	18.5
18				11.0	8.0	9.5	15.5	11.5	13.5	20.0	15.0	18.5
19				8.5	5.5	7.5	15.0	14.0	14.5	21.0	17.5	19.0
20				6.0	2.0	4.0	14.5	12.5	13.5	23.5	19.5	21.5
21				7.5	2.5	4.5	14.0	11.0	12.0	21.5	20.0	21.0
22				11.0	4.0	6.5	12.0	11.5	11.5	22.0	20.5	21.5
23				9.0	5.0	7.0	11.5	10.5	11.0	23.5	21.5	22.5
24				11.5	7.0	9.0	---	---	---	22.5	20.5	21.5
25				10.0	8.5	9.0	---	---	---	20.5	18.0	19.0
26				10.0	8.5	9.0	---	---	---	18.0	16.5	17.0
27				10.5	7.0	9.0	---	---	---	20.0	16.5	18.0
28				12.0	8.0	10.0	---	---	---	19.5	17.5	18.5
29				14.5	10.5	12.0	---	---	---	21.5	16.5	19.0
30				13.5	12.0	13.0	---	---	---	23.0	18.5	20.5
31				13.0	12.0	12.5	---	---	---	23.0	19.0	21.0
MONTH												

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	22.5	19.5	21.0	---	---	---	---	---	---	20.0	18.5	19.5
2	23.0	21.0	22.0	---	---	---	---	---	---	19.5	18.0	18.5
3	23.5	20.0	21.5	---	---	---	---	---	---	20.0	18.0	19.0
4	22.0	17.0	20.0	---	---	---	---	---	---	20.0	19.5	20.0
5	22.5	19.0	20.5	---	---	---	---	---	---	20.0	19.5	19.5
6	24.0	20.0	22.0	---	---	---	---	---	---	20.0	19.5	19.5
7	24.5	21.5	23.0	---	---	---	24.5	23.0	24.0	20.5	20.0	20.0
8	24.0	22.0	23.0	---	---	---	23.0	21.0	22.0	20.5	20.0	20.0
9	23.0	21.0	22.0	---	---	---	22.0	20.0	20.5	20.5	20.0	20.5
10	22.5	19.5	20.5	---	---	---	20.5	18.0	19.0	21.0	20.5	20.5
11	21.0	20.5	21.0	---	---	---	21.0	18.5	19.5	21.0	20.5	21.0
12	21.5	20.5	21.0	---	---	---	22.5	20.0	21.0	21.0	20.5	21.0
13	22.0	20.5	21.0	---	---	---	22.0	21.5	21.5	21.0	20.5	21.0
14	22.5	21.5	22.0	---	---	---	---	---	---	21.0	20.5	20.5
15	22.5	20.5	21.5	---	---	---	---	---	---	20.5	20.0	20.5
16	21.5	19.0	20.0	---	---	---	---	---	---	20.0	19.5	19.5
17	21.0	19.0	20.0	---	---	---	---	---	---	19.5	17.0	18.0
18	23.0	18.5	21.0	---	---	---	---	---	---	17.0	16.5	16.5
19	21.5	20.0	21.0	---	---	---	---	---	---	17.0	16.5	16.5
20	21.0	19.5	20.5	---	---	---	23.5	22.5	23.0	17.0	16.0	16.5
21	21.0	20.5	21.0	---	---	---	24.0	22.0	23.0	16.5	16.5	16.5
22	20.5	18.5	19.5	---	---	---	24.0	22.5	23.0	16.5	16.5	16.5
23	20.0	18.5	19.5	---	---	---	25.0	22.5	23.5	16.5	16.0	16.0
24	---	---	---	---	---	---	25.5	23.5	24.5	16.0	15.0	15.5
25	---	---	---	---	---	---	25.0	24.5	25.0	15.5	15.0	15.0
26	---	---	---	---	---	---	24.5	22.5	23.5	15.5	15.5	15.5
27	---	---	---	---	---	---	22.5	18.5	19.5	15.0	15.0	15.0
28	---	---	---	---	---	---	18.5	17.0	17.5	15.0	14.5	15.0
29	---	---	---	---	---	---	17.0	16.5	17.0	15.0	14.5	14.5
30	---	---	---	22.0	21.0	22.0	18.5	16.0	17.0	14.5	14.5	14.5
31	---	---	---	24.0	22.0	23.0	20.0	18.0	19.0	---	---	---
MONTH										21.0	14.5	18.0

05330908 MINNESOTA RIVER AT BURNSVILLE, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	11.2	9.5	10.2	13.7	11.2	13.0	12.9	10.9	11.7	11.8	10.7	11.2
2	10.9	9.4	10.1	14.4	12.3	13.1	12.1	10.6	11.3	12.3	11.4	11.7
3	11.8	9.7	10.3	12.8	11.5	12.3	---	---	---	12.1	10.9	11.5
4	12.1	9.5	11.0	12.7	11.3	11.7	---	---	---	11.0	10.0	10.4
5	14.5	10.7	12.1	12.4	10.8	11.5	14.1	12.7	13.2	10.1	9.2	9.7
6	14.3	10.0	12.7	11.8	10.7	11.2	13.3	12.6	13.0	10.6	9.3	9.6
7	14.3	12.0	12.7	13.3	10.3	11.7	13.0	12.3	12.7	10.6	9.8	10.1
8	15.8	10.7	12.7	12.0	11.4	11.7	12.9	12.2	12.5	11.4	10.1	10.7
9	15.2	10.8	12.4	---	---	---	13.5	12.2	12.7	12.4	10.8	11.3
10	12.4	10.6	11.6	11.9	9.7	10.9	13.0	12.5	12.7	11.8	11.0	11.4
11	12.1	9.6	10.5	11.2	10.1	10.6	12.5	11.7	12.1	12.4	11.4	11.9
12	14.4	10.0	11.5	10.6	9.5	9.9	12.6	11.6	12.1	12.1	10.6	11.3
13	12.5	10.6	11.6	11.3	9.1	9.4	13.3	12.2	12.7	11.0	9.8	10.5
14	12.0	10.5	10.9	10.2	8.9	9.6	13.3	12.8	13.1	11.1	9.4	10.1
15	11.5	10.1	10.6	11.7	9.7	10.4	13.7	12.7	13.1	10.2	9.1	9.7
16	10.4	9.2	9.8	12.0	10.6	11.2	13.5	12.7	13.1	11.5	9.3	10.5
17	9.4	8.8	9.1	11.9	11.3	11.6	13.5	12.7	13.0	11.6	10.8	11.4
18	8.8	8.2	8.6	11.9	11.3	11.6	13.9	12.5	13.2	---	---	---
19	9.4	7.7	8.3	12.2	11.7	11.9	14.8	13.1	13.8	---	---	---
20	9.6	8.3	8.8	12.4	12.0	12.3	13.6	12.1	12.8	---	---	---
21	11.8	8.8	10.3	13.6	11.7	12.5	12.8	11.7	12.2	---	---	---
22	11.2	10.0	10.4	11.7	10.7	11.3	12.3	11.6	11.9	---	---	---
23	10.6	9.7	10.1	11.8	10.6	11.2	13.0	11.7	12.3	---	---	---
24	9.9	9.0	9.5	12.4	11.2	11.8	13.3	11.9	12.9	---	---	---
25	10.0	9.1	9.6	12.5	11.7	12.1	12.1	11.3	11.7	---	---	---
26	12.1	9.6	10.8	12.9	12.1	12.5	12.0	11.1	11.6	---	---	---
27	13.1	11.5	12.1	12.8	11.7	12.0	11.6	11.1	11.3	---	---	---
28	13.8	9.1	12.3	12.4	11.6	12.0	11.4	10.7	11.2	---	---	---
29	15.5	9.2	14.1	12.1	11.5	11.8	11.5	10.9	11.3	---	---	---
30	14.4	11.7	13.0	11.8	11.2	11.5	11.6	10.6	11.1	---	---	---
31	13.4	11.5	12.2	---	---	---	11.9	10.6	11.2	---	---	---
MONTH	15.8	7.7	11.0									

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1				---	---	---	8.9	7.7	8.2	12.5	10.5	11.2
2				---	---	---	13.0	7.8	10.3	12.2	5.3	9.9
3				---	---	---	11.4	10.0	10.9	10.7	9.8	10.2
4				---	---	---	10.4	9.0	9.9	11.0	10.3	10.5
5				12.5	11.7	12.1	11.8	9.3	10.3	---	---	---
6				12.5	12.0	12.3	12.3	10.9	11.5	---	---	---
7				12.5	11.9	12.3	12.3	11.1	11.6	---	---	---
8				12.8	12.0	12.5	13.4	11.6	12.5	---	---	---
9				12.5	11.8	12.2	15.8	12.4	14.1	---	---	---
10				12.8	11.7	12.3	13.3	11.2	12.4	---	---	---
11				12.9	12.3	12.6	11.6	10.4	11.0	9.1	8.1	8.6
12				12.8	12.0	12.5	13.2	10.1	11.6	9.9	8.9	9.4
13				12.7	11.6	12.1	12.1	9.7	11.1	9.8	8.8	9.2
14				12.5	11.2	11.9	13.0	8.1	10.5	10.3	9.1	9.7
15				12.7	10.5	11.5	14.3	11.0	12.4	10.2	8.8	9.0
16				13.4	11.1	12.3	14.7	12.8	13.8	---	---	---
17				14.8	12.8	13.7	14.1	12.1	13.1	9.8	8.9	9.3
18				14.7	12.8	13.5	16.1	12.4	14.0	10.5	8.7	9.4
19				14.0	12.5	13.3	15.5	12.9	14.0	11.0	9.0	10.0
20				14.1	12.3	13.2	15.7	12.6	13.8	11.5	9.4	10.2
21				15.4	13.1	14.1	14.0	12.3	13.2	13.3	10.8	12.1
22				16.3	13.6	14.8	12.4	10.0	11.3	11.7	9.7	10.8
23				17.5	14.3	15.7	9.7	8.8	9.1	11.2	9.0	9.8
24				17.5	14.9	15.9	10.8	8.3	9.5	9.1	7.8	8.4
25				16.8	15.0	15.7	12.7	10.6	11.6	8.3	7.4	7.8
26				16.0	14.1	14.9	---	---	---	8.2	7.3	7.7
27				15.9	13.3	14.5	14.0	12.2	13.0	10.0	7.8	8.8
28				14.6	13.1	13.9	12.2	10.7	11.2	9.9	8.8	9.3
29				14.6	12.2	13.0	11.0	9.6	10.4	9.5	8.6	9.1
30				12.3	9.9	11.0	12.6	9.7	10.9	8.5	6.6	7.6
31				9.9	8.2	8.9	---	---	---	7.0	6.4	6.7
MONTH												

05330908 MINNESOTA RIVER AT BURNSVILLE, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	7.7	7.1	7.3	---	---	---	7.4	7.0	7.2	8.6	7.2	7.7
2	7.5	6.9	7.2	---	---	---	7.1	6.7	6.9	8.7	7.3	7.8
3	7.9	7.0	7.3	---	---	---	6.8	6.5	6.6	8.1	7.2	7.6
4	8.9	7.1	7.9	---	---	---	7.4	6.1	6.6	7.7	7.1	7.4
5	9.2	7.3	8.2	---	---	---	7.0	6.4	6.7	7.5	6.8	7.2
6	10.9	7.5	8.9	---	---	---	6.8	5.9	6.4	7.9	7.4	7.7
7	9.6	7.9	8.7	---	---	---	6.6	5.5	6.0	8.2	7.6	7.8
8	8.3	6.1	7.2	---	---	---	5.7	5.2	5.4	8.3	7.5	7.9
9	8.2	5.9	6.8	---	---	---	6.3	5.3	5.7	8.6	7.4	8.0
10	8.6	6.8	7.5	---	---	---	6.8	5.9	6.4	9.2	7.6	8.4
11	7.3	4.9	6.0	---	---	---	7.2	6.3	6.7	9.5	7.8	8.6
12	9.2	6.8	8.2	---	---	---	7.4	6.0	6.6	9.8	7.6	8.6
13	9.3	8.2	8.6	---	---	---	---	---	---	9.8	7.9	8.8
14	9.4	8.0	8.5	---	---	---	---	---	---	9.1	7.7	8.4
15	8.3	6.8	7.6	---	---	---	---	---	---	8.8	7.2	7.9
16	7.3	5.9	6.5	---	---	---	---	---	---	9.0	6.7	7.8
17	6.6	5.6	6.1	---	---	---	---	---	---	11.8	7.3	9.3
18	6.7	5.5	6.1	---	---	---	---	---	---	11.7	9.0	10.2
19	6.6	6.2	6.4	---	---	---	---	---	---	14.1	9.1	11.5
20	7.1	6.3	6.7	---	---	---	8.1	7.4	7.7	14.4	10.7	12.5
21	7.0	6.5	6.8	---	---	---	8.1	6.9	7.6	13.0	10.5	11.4
22	7.6	6.6	7.1	---	---	---	8.0	7.0	7.5	11.8	10.5	11.1
23	7.5	6.7	7.1	---	---	---	8.7	6.9	7.7	11.9	10.3	11.0
24	---	---	---	---	---	---	8.7	7.2	8.0	10.3	9.2	10.1
25	---	---	---	---	---	---	8.6	6.7	7.5	9.7	8.1	9.1
26	---	---	---	---	---	---	7.8	6.6	7.2	9.6	7.9	8.6
27	---	---	---	---	---	---	7.5	5.2	6.4	8.6	6.4	7.5
28	---	---	---	---	---	---	8.1	6.8	7.6	10.8	8.8	9.8
29	---	---	---	---	---	---	8.0	7.0	7.7	11.7	8.7	10.2
30	---	---	---	7.7	7.4	7.5	7.8	6.9	7.2	12.6	11.3	11.9
31	---	---	---	7.7	7.2	7.5	8.0	7.3	7.6	---	---	---
MONTH										14.4	6.4	9.1

05330920 MINNESOTA RIVER AT FORT SNELLING STATE PARK, ST. PAUL, MN

LOCATION.--Lat 44°52'13", long 93°11'32", in NE¼SE¼ sec.32, T.28 N., R.23 W., Hennepin County, Hydrologic Unit 07020012, on left bank 3 mi (5 km) upstream from mouth.

DRAINAGE AREA.--16,900 mi^2 (43,800 km^2).

PERIOD OF RECORD.--Water years 1973 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1978 to current year.
pH: October 1978 to current year.
WATER TEMPERATURE: October 1978 to current year.
DISSOLVED OXYGEN: October 1978 to current year.

INSTRUMENTATION.--Water-quality monitor since October 1978.

REMARKS.--Water discharge estimated on the basis of discharge for Minnesota River near Jordan (station 05330000) adjusted for travel time. Water is pumped to a monitor that is inside a heated shelter; therefore, water temperature during the winter period may be affected. Extremes are published for years with 80 percent or more daily record.

COOPERATION.--Samples collected and water-quality monitor operated by the Metropolitan Waste Control Commission, St. Paul, MN.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1980-81): Maximum, 1,240 micromhos Dec. 18, 19, 22, 23, 1979; minimum, 220 micromhos Mar. 26, 1980.
pH (water years 1980-81): Maximum, 8.5 units Jan. 1, 3, Feb. 27, 1980; minimum, 7.1 units Jan. 28-29, 1980.
WATER TEMPERATURES (water years 1980-81): Maximum, 27.0°C July 14-15, 1980, July 10, 1981; minimum, 0.5°C many days during winter.
DISSOLVED OXYGEN (water years 1980-81): Maximum, 17.7 mg/L May 12, 1980; minimum, 3.3 mg/L July 31, 1980.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 986 micromhos Aug. 6; minimum, 479 micromhos Mar. 3.
pH: Maximum, 8.4 units Apr. 14-26, 28-30, May 1, 2, 5; minimum, 7.7 units Oct. 1-Nov. 18.
WATER TEMPERATURES: Maximum, 27.0°C July 10; minimum, 0.5°C many days during winter.
DISSOLVED OXYGEN: Maximum, 16.5 mg/L Mar. 24; minimum, 3.5 mg/L June 19, Aug. 27.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	FLUO-RIDE, TOTAL (MG/L AS F) (00951)
NOV								
15...	1200	975	820	7.7	8.0	9.2	70	.0
FEB								
10...	1200	465	949	7.6	.5	8.6	61	.4
MAY								
15...	0845	3100	877	8.1	15.0	8.1	82	.2
SEP								
02...	0840	10800	833	8.1	20.0	7.4	84	.3

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOV-ERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)
NOV									
15...	1	100	0	130	0	11	4	580	1
FEB									
10...	2	100	0	170	0	0	11	290	5
MAY									
15...	2	200	10	100	1	16	8	2400	4
SEP									
02...	6	100	<10	80	1	12	39	6400	16

05330920 MINNESOTA RIVER AT FORT SNELLING STATE PARK AT ST. PAUL, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	CYANIDE TOTAL (MG/L AS CN) (00720)
NOV								
15...	140	<.1	4	9	1	0	50	.00
FEB								
10...	240	<.1	1	7	0	0	30	.02
MAY								
15...	320	<.1	1	7	2	0	30	<.01
SEP								
02...	420	<.1	6	14	3	<1	60	<.01

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)
SEP											
02...	0840	10800	833	8.1	20.0	7.4	84	.3	6	100	<10

DATE	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
SEP											
02...	60	<1	10	6	40	1	20	<.1	<1	<1	10

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	GROSS ALPHA, DISSOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)
OCT								
01...	1300	1530	810	8.2	16.0	13.2	<9.3	3.5

DATE	GROSS ALPHA, DISSOLVED (PCI/L AS U-NAT) (01515)	GROSS ALPHA, SUSP. TOTAL (PCI/L AS U-NAT) (01516)	GROSS BETA, DISSOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, DISSOLVED (PCI/L AS SR/YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	URANIUM NATURAL DISSOLVED (UG/L AS U) (22703)	URANIUM DISSOLVED, EXTRACTION (UG/L) (80020)
OCT								
01...	<6.3	2.4	6.8	2.4	6.6	2.3	11	9.1

05330920 MINNESOTA RIVER AT FORT SNELLING STATE PARK AT ST. PAUL, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	832	810	821	827	799	815	860	835	851	970	952	960
2	866	848	856	822	810	815	860	836	850	963	942	954
3	868	862	865	831	819	824	868	839	854	960	942	954
4	881	865	871	834	817	827	872	861	866	965	945	957
5	882	862	870	838	827	834	896	858	875	958	887	924
6	876	856	865	838	808	823	899	868	892	897	881	890
7	872	819	861	843	832	836	905	884	898	893	877	884
8	876	796	836	845	808	826	912	890	900	894	882	887
9	875	809	853	833	814	823	924	896	912	---	---	---
10	870	828	849	829	812	821	910	888	900	886	858	871
11	856	822	836	830	805	818	899	783	833	910	877	890
12	835	796	817	812	797	804	827	797	811	929	883	896
13	831	781	797	812	805	808	844	823	834	953	907	931
14	797	774	784	821	803	814	871	842	856	939	916	928
15	787	769	778	823	807	816	869	850	860	923	909	918
16	781	729	765	821	807	814	866	839	854	942	917	932
17	779	734	757	827	812	821	857	847	852	933	916	923
18	817	751	792	843	823	831	867	851	861	950	922	930
19	820	793	811	841	815	831	885	861	872	923	899	912
20	824	807	817	835	814	826	886	874	879	913	881	892
21	820	763	799	836	820	828	908	874	892	912	876	893
22	811	781	795	818	794	801	916	886	901	924	887	905
23	829	794	816	829	800	819	909	886	900	929	909	918
24	831	805	817	841	821	834	928	906	917	951	922	939
25	832	803	816	841	824	834	947	920	936	965	929	886
26	825	811	820	831	813	822	945	925	934	962	940	951
27	828	815	822	825	815	821	948	926	938	971	931	948
28	820	808	814	843	826	839	955	935	944	980	943	957
29	824	807	817	859	839	850	957	937	944	962	934	949
30	824	802	814	869	840	852	959	937	949	964	942	956
31	823	810	817	---	---	---	964	951	958	955	931	946
MONTH	882	729	821	869	794	824	964	783	888			

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	941	925	934	518	498	505	827	813	820	847	830	840
2	939	931	936	509	500	505	855	828	845	840	824	833
3	939	923	932	507	479	491	846	828	837	836	788	826
4	950	929	937	546	498	518	853	788	833	824	725	776
5	959	936	945	574	546	554	847	831	840	720	683	699
6	958	939	953	583	570	576	845	828	835	745	717	731
7	943	925	932	595	576	586	840	832	836	778	746	761
8	937	916	927	606	595	599	835	815	824	796	778	788
9	960	924	940	635	618	626	824	808	815	809	787	800
10	956	884	921	650	629	637	839	824	829	830	808	815
11	904	885	895	653	635	643	860	838	846	867	832	854
12	921	879	892	654	641	646	857	840	848	871	860	867
13	913	884	900	652	638	644	860	804	849	878	861	871
14	906	873	880	663	648	651	874	842	858	878	871	874
15	961	903	927	665	651	656	877	861	869	889	875	881
16	956	859	886	682	695	671	860	834	845	890	880	884
17	876	846	860	700	684	691	836	818	826	895	886	891
18	888	850	872	711	698	702	823	809	816	900	893	897
19	872	840	858	719	710	714	821	800	809	903	884	897
20	841	805	826	728	721	724	818	803	811	885	878	883
21	806	772	792	733	718	726	805	755	790	883	870	877
22	770	727	748	732	714	724	817	766	801	879	865	870
23	747	711	728	731	707	722	822	795	809	877	814	857
24	709	697	703	719	695	708	828	816	824	871	852	861
25	704	636	663	756	700	735	837	824	830	864	847	854
26	635	589	612	765	750	761	845	827	837	895	856	873
27	588	513	548	797	772	787	833	817	826	908	885	897
28	540	517	529	806	784	795	835	815	825	908	816	892
29	---	---	---	813	776	797	830	795	823	896	869	886
30	---	---	---	800	772	787	839	823	831	900	886	894
31	---	---	---	810	786	803	---	---	---	898	869	879
MONTH	961	513	838	813	479	667	877	755	830	908	683	849

05330920 MINNESOTA RIVER AT FORT SNELLING STATE PARK AT ST. PAUL, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	916	901	910	893	861	877	936	877	927	866	809	840
2	930	916	921	920	894	908	953	933	945	845	827	836
3	940	925	935	923	911	919	973	952	964	868	846	857
4	961	927	946	909	902	903	984	975	979	883	869	876
5	969	957	965	909	893	900	985	977	982	890	883	887
6	974	964	967	925	900	912	986	939	972	898	890	894
7	966	939	956	930	871	903	974	932	958	905	882	900
8	962	944	951	934	924	930	935	884	901	910	904	907
9	962	946	953	941	935	938	943	912	925	910	905	908
10	949	929	938	953	940	946	974	946	964	906	891	898
11	950	936	944	953	848	918	980	969	975	900	859	885
12	952	933	942	938	916	928	---	---	---	902	876	892
13	950	846	909	942	925	932	---	---	---	889	880	885
14	927	680	877	940	861	926	---	---	---	882	874	879
15	893	843	872	952	917	940	---	---	---	889	878	884
16	869	847	857	972	952	962	---	---	---	887	879	884
17	846	807	824	973	935	952	---	---	---	888	882	885
18	826	786	798	953	913	933	---	---	---	887	873	882
19	819	776	792	927	868	909	---	---	---	884	874	880
20	857	821	843	891	821	872	925	917	921	879	864	871
21	849	834	841	894	883	887	935	925	929	868	781	853
22	854	839	844	891	853	878	940	920	935	883	869	877
23	858	835	850	903	856	878	938	931	936	879	860	869
24	830	814	819	901	844	886	956	936	945	878	870	874
25	880	845	859	887	868	879	948	826	921	882	871	876
26	901	761	839	879	773	818	918	839	884	881	846	863
27	784	677	738	803	768	781	885	651	748	890	864	870
28	720	692	710	922	806	823	798	681	759	902	893	898
29	795	746	774	872	827	852	827	798	816	902	885	893
30	859	825	843	899	874	885	839	812	824	893	851	877
31	---	---	---	923	901	913	848	830	837	---	---	---
MONTH	974	677	874	973	768	900				910	781	879

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	7.7	7.7	7.7	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9
2	7.7	7.7	7.7	7.7	7.7	7.7	7.9	7.8	7.9	7.9	7.9	7.9
3	7.7	7.7	7.7	7.7	7.7	7.7	7.9	7.9	7.9	7.9	7.9	7.9
4	7.7	7.7	7.7	7.7	7.7	7.7	7.9	7.9	7.9	7.9	7.9	7.9
5	7.7	7.7	7.7	7.7	7.7	7.7	7.9	7.9	7.9	7.9	7.9	7.9
6	7.7	7.7	7.7	7.7	7.7	7.7	7.9	7.9	7.9	7.9	7.9	7.9
7	7.7	7.7	7.7	7.7	7.7	7.7	7.9	7.9	7.9	7.9	7.9	7.9
8	7.7	7.7	7.7	7.7	7.7	7.7	7.9	7.9	7.9	7.9	7.9	7.9
9	7.7	7.7	7.7	7.7	7.7	7.7	7.9	7.9	7.9	---	---	---
10	7.7	7.7	7.7	7.7	7.7	7.7	7.9	7.9	7.9	7.9	7.9	7.9
11	7.7	7.7	7.7	7.7	7.7	7.7	7.9	7.9	7.9	7.9	7.9	7.9
12	7.7	7.7	7.7	7.7	7.7	7.7	7.9	7.9	7.9	8.2	7.9	7.9
13	7.7	7.7	7.7	7.7	7.7	7.7	8.0	7.9	7.9	8.0	7.9	7.9
14	7.7	7.7	7.7	7.7	7.7	7.7	8.0	7.9	7.9	8.0	7.9	8.0
15	7.7	7.7	7.7	7.7	7.7	7.7	7.9	7.9	7.9	8.0	7.9	8.0
16	7.7	7.7	7.7	7.7	7.7	7.7	7.9	7.9	7.9	8.0	7.9	8.0
17	7.7	7.7	7.7	7.7	7.7	7.7	7.9	7.9	7.9	7.9	7.9	7.9
18	7.7	7.7	7.7	7.8	7.7	7.8	7.9	7.9	7.9	7.9	7.9	7.9
19	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9	7.9	7.9	7.9
20	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9	7.9	7.9	7.9
21	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9	7.9	7.9	7.9
22	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9	8.0	7.9	7.9
23	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9	8.0	7.9	7.9
24	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9	7.9	7.9	7.9
25	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9	7.9	7.9	7.9
26	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9	7.9	7.9	7.9
27	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9	7.9	7.9	7.9
28	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9	7.9	7.9	7.9
29	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9	7.9	7.9	7.9
30	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9	7.9	7.9	7.9
31	7.7	7.7	7.7	---	---	---	7.9	7.9	7.9	7.9	7.9	7.9
MONTH	7.7	7.7	7.7	7.8	7.7	7.7	8.0	7.8	7.9			

05330920 MINNESOTA RIVER AT FORT SNELLING STATE PARK AT ST. PAUL, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.3	8.4
2	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.3	8.3
3	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	8.3	8.3	8.3
4	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	8.3	8.3	8.3
5	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.3	8.3
6	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	8.3	8.3	8.3
7	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	8.3	8.3	8.3
8	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	8.3	8.3	8.3
9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	8.3	8.3	8.3
10	7.9	7.9	7.9	7.9	7.9	7.9	8.0	8.0	8.0	8.3	8.3	8.3
11	7.9	7.9	7.9	7.9	7.9	7.9	8.1	8.1	8.1	8.3	8.2	8.2
12	7.9	7.9	7.9	7.9	7.9	7.9	8.2	8.2	8.2	8.2	8.2	8.2
13	7.9	7.9	7.9	7.9	7.9	7.9	8.3	8.3	8.3	8.2	8.2	8.2
14	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.4	8.4	8.2	8.2	8.2
15	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.3	8.4	8.2	8.1	8.2
16	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.4	8.4	8.2	8.2	8.2
17	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.3	8.4	8.2	8.2	8.2
18	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.3	8.4	8.2	8.2	8.2
19	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.3	8.4	8.2	8.2	8.2
20	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.4	8.4	8.2	8.2	8.2
21	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.4	8.4	8.2	8.2	8.2
22	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.4	8.4	8.2	8.2	8.2
23	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.4	8.4	8.2	8.2	8.2
24	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.4	8.4	8.2	8.2	8.2
25	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.4	8.4	8.2	8.2	8.2
26	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.3	8.4	8.2	8.2	8.2
27	7.9	7.9	7.9	7.9	7.9	7.9	8.3	8.3	8.3	8.2	8.2	8.2
28	7.9	7.9	7.9	7.9	7.9	7.9	8.4	8.3	8.3	8.2	8.2	8.2
29	---	---	---	7.9	7.9	7.9	8.4	8.3	8.3	8.2	8.2	8.2
30	---	---	---	7.9	7.9	7.9	8.4	8.3	8.3	8.2	8.2	8.2
31	---	---	---	7.9	7.9	7.9	---	---	---	8.2	8.2	8.2
MONTH	7.9	7.9	7.9	7.9	7.9	7.9	8.4	7.9	8.2	8.4	8.1	8.2

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
2	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
3	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
4	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
5	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
6	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
7	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
8	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
9	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
10	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
11	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
12	8.2	8.2	8.2	8.1	8.1	8.1	---	---	---	8.1	8.1	8.1
13	8.2	8.2	8.2	8.1	8.1	8.1	---	---	---	8.1	8.1	8.1
14	8.2	8.2	8.2	8.1	8.1	8.1	---	---	---	8.1	8.1	8.1
15	8.2	8.2	8.2	8.1	8.1	8.1	---	---	---	8.1	8.1	8.1
16	8.2	8.2	8.2	8.1	8.1	8.1	---	---	---	8.1	8.1	8.1
17	8.2	8.2	8.2	8.1	8.1	8.1	---	---	---	8.1	8.1	8.1
18	8.2	8.2	8.2	8.1	8.1	8.1	---	---	---	8.1	8.1	8.1
19	8.2	8.2	8.2	8.1	8.1	8.1	---	---	---	8.1	8.1	8.1
20	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
21	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
22	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
23	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
24	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
25	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
26	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
27	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
28	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
29	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
30	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
31	---	---	---	8.1	8.1	8.1	8.1	8.1	8.1	---	---	---
MONTH	8.2	8.1	8.2	8.1	8.1	8.1				8.1	8.1	8.1

05330920 MINNESOTA RIVER AT FORT SNELLING STATE PARK AT ST. PAUL, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	15.0	14.5	14.5	8.0	7.5	7.5	2.5	2.0	2.5	1.5	1.5	1.5
2	14.5	14.0	14.5	8.0	7.5	7.5	1.5	1.5	1.5	1.5	1.5	1.5
3	14.0	14.0	14.0	8.0	8.0	8.0	1.5	1.5	1.5	1.5	1.0	1.5
4	14.0	13.5	14.0	8.0	8.0	8.0	2.0	1.5	1.5	1.5	1.0	1.0
5	13.5	13.0	13.5	8.5	8.0	8.0	2.5	2.0	2.0	1.5	1.0	1.5
6	13.5	13.0	13.0	9.0	8.5	8.5	3.0	2.0	2.5	1.5	1.0	1.5
7	13.5	13.5	13.5	9.5	8.5	9.0	2.0	1.5	2.0	1.5	1.0	1.5
8	14.0	13.5	14.0	9.0	8.5	8.5	2.0	1.5	1.5	1.5	1.5	1.5
9	14.0	14.0	14.0	8.5	8.5	8.5	2.0	1.5	1.5	---	---	---
10	14.0	14.0	14.0	8.5	8.5	8.5	1.5	1.5	1.5	1.0	1.0	1.0
11	14.0	13.0	13.5	8.5	8.0	8.5	1.5	1.5	1.5	1.5	1.0	1.0
12	13.0	13.0	13.0	8.5	8.0	8.0	2.0	1.5	1.5	1.5	1.0	1.0
13	13.0	12.5	12.5	8.5	8.0	8.0	1.5	1.5	1.5	1.5	1.5	1.5
14	12.5	12.0	12.0	8.5	7.5	8.0	1.5	1.0	1.5	1.5	1.0	1.5
15	12.0	10.5	11.0	8.0	7.5	7.5	1.5	1.0	1.0	1.0	1.0	1.0
16	10.5	10.0	10.5	8.0	7.5	7.5	1.5	1.5	1.5	1.5	1.0	1.5
17	10.5	10.0	10.0	7.5	7.0	7.5	1.5	1.5	1.5	1.5	1.5	1.5
18	10.0	9.5	9.5	7.0	7.0	7.0	1.5	1.0	1.5	2.0	1.5	1.5
19	10.0	9.5	9.5	7.0	7.0	7.0	1.5	1.0	1.0	1.5	1.0	1.5
20	10.0	9.5	9.5	7.0	6.5	7.0	1.5	1.0	1.5	1.5	1.0	1.5
21	10.0	9.5	9.5	6.5	6.5	6.5	1.5	1.5	1.5	2.0	1.5	1.5
22	9.5	9.5	9.5	6.5	6.0	6.5	2.0	1.5	1.5	1.5	1.5	1.5
23	10.0	9.5	9.5	6.5	6.5	6.5	1.5	1.5	1.5	2.0	1.5	1.5
24	9.5	9.0	9.5	6.5	6.0	6.5	2.0	1.5	1.5	2.0	1.5	1.5
25	9.0	8.5	9.0	6.0	6.0	6.0	1.5	1.0	1.5	1.5	1.5	1.5
26	8.5	8.5	8.5	6.0	5.5	5.5	1.5	1.0	1.0	1.5	1.0	1.0
27	8.5	8.0	8.5	5.5	5.0	5.0	1.5	1.0	1.5	1.5	1.0	1.0
28	8.0	7.5	8.0	4.5	4.0	4.5	1.5	1.5	1.5	1.5	1.0	1.0
29	8.0	7.5	7.5	4.0	3.5	3.5	1.5	1.5	1.5	1.0	.5	1.0
30	8.0	7.5	7.5	3.5	3.0	3.0	1.5	1.5	1.5	1.0	1.0	1.0
31	8.0	7.5	8.0	---	---	---	1.5	1.5	1.5	1.0	.5	1.0
MONTH	15.0	7.5	11.0	9.5	3.0	7.0	3.0	1.0	1.5			

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.5	.5	1.0	2.0	1.5	1.5	11.0	10.5	11.0	17.5	17.0	17.5
2	1.0	.5	1.0	2.0	1.5	1.5	11.0	10.0	10.5	18.0	17.5	17.5
3	1.0	.5	.5	1.5	1.5	1.5	11.0	10.5	11.0	18.0	18.0	18.0
4	1.0	.5	.5	1.5	1.0	1.5	10.5	10.0	10.0	18.0	18.0	18.0
5	1.0	.5	1.0	1.5	1.0	1.0	10.0	9.5	10.0	18.0	16.5	17.0
6	1.0	.5	1.0	1.5	1.0	1.0	10.0	9.5	9.5	17.0	16.0	16.5
7	1.0	.5	1.0	1.5	1.0	1.5	10.5	10.0	10.0	17.0	16.5	16.5
8	1.0	.5	1.0	2.0	1.5	2.0	11.0	10.0	10.5	17.0	16.5	16.5
9	1.0	.5	1.0	2.0	2.0	2.0	11.0	10.5	11.0	16.5	16.0	16.0
10	1.5	1.0	1.0	3.0	2.0	2.5	11.5	11.0	11.0	16.0	15.5	15.5
11	1.5	1.0	1.0	3.5	2.5	3.0	11.5	11.0	11.0	15.5	14.0	14.5
12	1.5	1.0	1.0	4.0	3.5	3.5	11.5	11.0	11.0	14.5	14.0	14.0
13	1.5	1.0	1.0	4.5	4.0	4.0	11.5	11.0	11.5	14.5	14.0	14.0
14	1.5	1.0	1.0	4.5	3.5	4.0	12.0	11.0	11.5	15.0	14.5	14.5
15	1.5	1.0	1.5	5.0	4.5	4.5	12.0	11.5	11.5	15.5	15.0	15.0
16	1.5	1.0	1.5	5.0	4.5	4.5	12.0	11.5	11.5	15.5	15.5	15.5
17	1.5	1.0	1.5	6.0	4.5	5.5	12.0	11.5	12.0	15.5	15.0	15.5
18	1.5	1.5	1.5	6.0	5.5	5.5	12.0	11.5	12.0	15.5	15.0	15.0
19	2.0	1.5	1.5	6.0	5.5	5.5	12.5	12.0	12.0	16.5	15.0	15.5
20	2.0	1.5	1.5	6.0	5.5	5.5	12.5	11.5	12.0	17.0	16.0	16.5
21	2.0	1.5	1.5	6.0	5.5	5.5	12.0	11.5	11.5	17.5	16.5	17.0
22	1.5	1.5	1.5	6.5	5.5	6.0	11.5	11.5	11.5	17.5	17.5	17.5
23	1.5	1.0	1.5	6.5	6.0	6.5	11.5	11.0	11.5	18.0	17.5	17.5
24	2.5	1.0	1.5	7.5	6.5	7.0	11.5	11.0	11.0	17.5	17.0	17.5
25	2.5	2.0	2.0	7.5	7.0	7.0	12.0	11.0	11.5	17.0	17.0	17.0
26	2.0	1.5	2.0	9.0	7.0	8.0	12.5	11.5	12.0	17.0	16.5	16.5
27	2.0	1.5	1.5	9.5	8.5	9.0	13.0	12.0	12.5	17.0	16.5	16.5
28	1.5	1.5	1.5	10.0	9.5	9.5	13.0	13.0	13.0	17.0	16.5	17.0
29	---	---	---	10.5	10.0	10.5	13.5	13.0	13.0	18.5	17.0	17.5
30	---	---	---	11.0	10.5	10.5	17.5	13.0	15.0	19.0	18.5	18.5
31	---	---	---	11.0	10.5	11.0	---	---	---	19.5	19.0	19.0
MONTH	2.5	.5	1.5	11.0	1.0	5.0	17.5	9.5	11.5	19.5	14.0	16.5

05330920 MINNESOTA RIVER AT FORT SNELLING STATE PARK AT ST. PAUL, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	20.0	19.5	20.0	22.5	22.0	22.5	24.0	23.5	24.0	21.5	20.0	20.5
2	20.5	20.5	20.5	23.0	22.5	22.5	24.5	24.0	24.0	20.0	20.0	20.0
3	21.0	21.0	21.0	23.0	23.0	23.0	25.0	24.5	24.5	20.0	19.5	20.0
4	21.0	21.0	21.0	24.0	23.5	24.0	25.5	25.0	25.0	20.0	19.5	19.5
5	21.5	20.5	21.0	25.0	24.0	24.5	26.0	25.5	25.5	19.5	19.5	19.5
6	21.5	21.0	21.5	25.5	25.0	25.5	26.0	25.5	25.5	20.0	19.0	19.5
7	22.0	21.0	21.5	26.0	26.0	26.0	25.5	25.0	25.5	20.5	19.5	20.0
8	21.5	21.5	21.5	26.5	26.0	26.0	25.0	24.5	25.0	20.5	20.0	20.0
9	21.5	21.0	21.0	26.5	26.0	26.5	25.0	24.5	24.5	20.5	20.0	20.5
10	21.5	20.5	21.0	27.0	26.0	26.5	24.5	24.0	24.5	21.0	20.0	20.5
11	21.0	21.0	21.0	26.5	25.5	26.0	24.5	24.0	24.5	21.5	20.5	21.0
12	21.5	20.5	21.0	26.5	26.0	26.0	---	---	---	21.5	20.5	21.0
13	21.5	21.0	21.0	26.0	25.5	26.0	---	---	---	21.5	21.0	21.0
14	21.5	20.5	21.0	26.0	25.0	25.5	---	---	---	21.0	20.5	21.0
15	21.0	20.5	21.0	25.5	25.0	25.0	---	---	---	21.0	20.0	20.5
16	20.5	20.5	20.5	26.0	25.0	25.5	---	---	---	20.0	19.5	19.5
17	20.5	20.5	20.5	26.5	25.5	26.0	---	---	---	19.5	18.5	19.0
18	20.5	20.5	20.5	26.5	26.0	26.5	---	---	---	18.5	18.0	18.5
19	20.5	20.0	20.0	26.5	26.0	26.5	---	---	---	18.5	18.0	18.0
20	20.5	20.0	20.0	26.5	26.0	26.5	22.5	22.0	22.5	18.5	18.0	18.0
21	20.5	20.0	20.0	26.5	25.5	26.0	22.5	22.0	22.5	18.0	17.5	18.0
22	20.0	19.5	20.0	25.5	25.0	25.5	22.5	22.0	22.5	18.5	18.0	18.0
23	20.0	19.5	19.5	25.0	25.0	25.0	22.5	22.0	22.5	18.0	17.5	17.5
24	20.0	19.5	20.0	25.0	24.5	25.0	23.0	22.5	22.5	17.5	15.0	16.0
25	21.0	20.0	20.5	25.0	24.5	24.5	22.5	22.5	22.5	15.5	15.0	15.5
26	21.0	20.0	20.5	24.5	23.5	24.0	22.5	22.0	22.5	15.5	15.5	15.5
27	20.5	20.0	20.5	23.5	23.5	23.5	22.0	21.0	21.5	15.5	15.0	15.0
28	20.5	20.5	20.5	23.5	23.0	23.5	21.0	21.0	21.0	15.0	14.5	15.0
29	21.0	20.5	21.0	23.5	23.0	23.0	21.0	20.5	20.5	15.0	14.5	14.5
30	22.5	21.0	21.5	23.5	23.0	23.0	21.0	20.5	21.0	15.0	14.5	14.5
31	---	---	---	23.5	23.0	23.5	21.5	21.0	21.5	---	---	---
MONTH	22.5	19.5	20.5	27.0	22.0	25.0				21.5	14.5	18.5

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.7	10.2	10.2	13.2	11.1	12.3	11.4	10.8	11.1	10.7	10.3	10.6
2	10.9	10.2	10.5	13.2	12.4	12.8	13.0	11.0	12.2	10.6	10.2	10.4
3	10.5	9.7	10.1	13.1	12.0	12.7	12.9	12.1	12.5	11.3	10.2	10.6
4	11.1	10.4	10.8	13.9	12.0	12.7	12.3	11.0	11.5	11.3	10.9	11.1
5	12.5	11.1	11.6	13.0	11.9	12.5	11.4	10.9	11.2	11.5	10.2	10.8
6	12.8	11.7	12.4	12.2	11.1	11.7	10.9	9.7	10.3	10.8	9.9	10.2
7	13.2	12.1	12.8	12.0	11.4	11.6	10.7	10.2	10.4	10.0	9.6	9.8
8	13.4	10.7	12.7	12.3	11.2	11.6	10.6	10.3	10.4	10.1	9.7	9.9
9	13.2	10.8	12.0	11.8	10.6	11.3	10.8	10.2	10.5	---	---	---
10	11.6	10.7	11.2	11.6	10.5	11.1	10.8	10.0	10.4	10.7	10.1	10.3
11	11.0	9.9	10.4	11.9	10.9	11.3	11.0	10.3	10.6	10.8	10.3	10.6
12	11.4	9.7	10.5	11.4	7.7	9.7	10.9	9.9	10.4	11.3	10.7	11.0
13	12.0	10.5	11.1	11.1	7.4	8.8	10.6	10.2	10.4	11.8	11.1	11.4
14	10.8	10.3	10.5	10.4	9.1	9.6	12.0	10.5	11.2	11.8	10.7	11.3
15	11.0	9.6	10.2	10.9	9.5	10.2	11.8	11.2	11.5	10.6	9.8	10.3
16	10.9	9.6	10.3	11.4	10.5	11.0	11.8	11.0	11.4	10.8	10.0	10.5
17	9.6	8.6	9.2	11.3	10.8	11.0	11.7	11.2	11.4	10.5	9.9	10.1
18	8.9	8.4	8.6	11.4	10.7	10.9	11.8	11.2	11.5	10.8	10.0	10.3
19	9.1	7.8	8.3	10.9	10.5	10.7	12.5	11.6	12.0	11.3	10.1	10.7
20	8.7	7.9	8.3	10.9	10.6	10.8	11.9	11.5	11.6	10.6	9.5	9.9
21	9.9	8.4	9.0	10.8	10.2	10.5	12.4	11.7	12.1	9.9	9.6	9.7
22	9.3	8.5	9.0	11.2	9.9	10.7	11.9	11.2	11.4	10.1	9.5	9.8
23	8.4	7.5	7.9	9.9	9.4	9.7	11.0	10.1	10.3	9.7	8.2	8.8
24	8.1	7.5	7.8	10.1	9.4	9.8	10.7	10.2	10.3	11.2	10.0	10.6
25	8.2	7.6	7.9	10.9	9.9	10.3	11.7	10.8	11.4	11.5	10.7	11.1
26	8.8	7.9	8.3	10.9	10.5	10.7	11.5	10.8	11.0	10.2	10.0	10.1
27	10.5	8.6	9.6	11.1	10.7	10.9	10.8	10.4	10.6	9.3	8.5	8.9
28	10.4	9.8	10.2	11.2	10.4	10.8	10.7	10.4	10.6	8.9	8.2	8.6
29	11.8	9.8	10.8	11.1	10.5	10.7	10.7	10.3	10.5	8.7	8.4	8.5
30	12.3	11.0	11.5	11.2	10.7	10.9	11.0	10.3	10.6	9.3	8.7	8.9
31	11.5	10.8	11.1	---	---	---	10.8	10.5	10.6	9.3	9.0	9.2
MONTH	13.4	7.5	10.2	13.9	7.4	11.0	13.0	9.7	11.0			

05330920 MINNESOTA RIVER AT FORT SNELLING STATE PARK AT ST. PAUL, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	9.1	8.9	9.0	12.5	12.3	12.4	9.0	6.8	8.0	10.6	7.1	8.5
2	8.9	8.4	8.7	13.3	12.7	13.1	10.4	8.6	9.7	8.4	7.6	8.1
3	10.1	8.6	9.4	13.2	12.7	13.0	11.0	9.6	10.4	9.7	7.3	8.9
4	10.1	9.8	10.0	13.0	12.4	12.6	11.0	9.6	10.4	8.2	6.5	7.1
5	10.0	9.7	9.8	12.8	12.5	12.6	10.5	8.7	9.3	7.0	6.5	5.6
6	10.2	9.9	10.0	13.2	12.8	13.0	11.0	9.6	10.3	5.5	5.0	5.3
7	10.0	9.1	9.4	13.5	13.2	13.3	12.0	10.3	11.3	6.4	4.9	5.8
8	9.3	9.0	9.1	13.5	13.1	13.3	10.5	9.6	10.1	7.6	4.8	5.7
9	9.1	8.7	8.9	13.3	12.7	13.0	12.4	9.1	11.8	6.5	5.1	5.7
10	8.8	8.4	8.7	12.9	12.6	12.8	12.9	11.8	12.3	6.9	6.2	6.6
11	8.5	8.1	8.3	12.9	12.7	12.8	12.2	10.4	11.5	8.1	6.8	7.4
12	8.4	8.0	8.2	12.9	12.6	12.7	12.4	11.0	11.5	8.5	7.4	7.9
13	8.4	7.8	8.1	12.8	12.4	12.6	12.5	11.3	12.1	8.5	7.6	8.0
14	8.5	7.7	8.3	12.6	12.0	12.4	11.5	11.1	11.3	8.7	7.9	8.3
15	8.3	7.4	7.7	12.8	11.9	12.3	11.5	10.4	10.9	9.1	8.0	8.6
16	8.2	7.1	7.4	13.1	12.7	12.9	12.0	10.9	11.4	9.3	8.2	8.7
17	7.2	6.9	7.0	14.0	13.0	13.4	12.9	11.5	12.4	9.4	8.9	9.1
18	7.0	6.7	6.9	14.6	14.0	14.3	13.0	12.0	12.4	9.5	8.8	9.1
19	6.7	6.5	6.6	14.2	13.6	14.0	14.2	13.0	13.6	10.4	8.7	9.6
20	7.2	6.5	6.9	14.1	13.8	14.0	13.6	11.9	12.6	10.6	9.5	10.0
21	8.2	7.3	7.7	14.5	14.0	14.2	13.6	12.6	13.1	10.4	9.4	9.8
22	9.3	8.3	8.7	16.2	14.4	15.2	11.5	8.7	10.1	9.5	8.3	8.8
23	9.9	9.3	9.6	16.2	14.9	15.4	9.1	7.4	8.2	8.8	7.9	8.4
24	11.3	10.0	10.6	16.5	15.2	15.9	8.3	7.3	7.7	7.7	6.6	7.3
25	11.6	10.6	11.2	15.3	12.4	13.7	10.5	8.4	9.5	6.9	6.2	6.6
26	12.3	11.6	12.0	15.1	11.5	13.3	11.9	10.4	11.1	9.0	5.8	7.2
27	12.6	12.3	12.4	15.1	13.9	14.3	12.9	11.5	12.0	9.2	7.8	8.5
28	12.5	12.2	12.4	14.2	13.5	13.8	12.2	10.0	11.1	9.1	7.7	8.3
29	---	---	---	14.5	12.6	13.4	11.0	9.9	10.3	9.7	8.3	8.9
30	---	---	---	13.0	10.0	12.0	12.1	9.4	11.3	8.9	7.3	7.8
31	---	---	---	10.1	7.9	9.1	---	---	---	7.2	5.8	6.1
MONTH	12.6	6.5	9.0	16.5	7.9	13.3	14.2	6.8	10.9	10.6	4.8	7.8

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	6.4	5.9	6.1	7.1	6.9	7.0	6.6	5.8	6.2	7.5	7.2	7.3
2	6.6	6.0	6.3	7.0	6.8	6.9	6.1	5.5	5.8	7.7	7.3	7.5
3	6.7	6.0	6.2	7.0	6.7	6.8	6.2	5.6	5.9	7.9	7.5	7.7
4	7.4	6.0	6.7	6.8	6.6	6.7	7.5	5.9	6.8	8.1	7.7	7.9
5	6.5	5.7	6.1	6.8	6.7	6.7	7.3	6.2	6.6	8.3	8.0	8.1
6	6.3	5.0	5.5	7.3	6.6	6.9	6.3	5.4	5.9	8.5	8.0	8.3
7	6.1	5.2	5.7	7.1	5.5	6.4	5.8	5.0	5.5	8.4	8.0	8.2
8	6.1	5.5	5.8	6.0	5.4	5.6	5.1	4.6	4.9	8.6	8.0	8.3
9	6.7	5.1	6.9	6.2	5.3	5.7	5.6	4.8	5.2	8.9	8.0	8.4
10	8.0	6.2	6.9	6.1	5.7	5.9	6.1	5.4	5.8	9.3	8.2	8.7
11	7.5	5.3	6.4	6.5	5.4	6.0	6.6	5.7	5.9	10.4	8.8	9.5
12	6.0	5.2	5.6	5.3	4.7	5.0	---	---	---	10.1	8.3	9.4
13	7.6	6.0	6.9	5.1	4.4	4.8	---	---	---	10.0	8.6	9.3
14	7.8	6.9	7.3	6.4	4.8	5.4	---	---	---	9.5	8.3	8.9
15	7.5	6.0	6.8	6.3	5.6	6.0	---	---	---	8.8	7.9	8.3
16	7.3	5.6	6.3	7.1	5.9	6.3	---	---	---	15.0	5.8	8.9
17	6.5	5.0	5.6	6.4	5.3	5.8	---	---	---	11.7	7.5	9.7
18	5.5	4.4	4.7	5.7	5.0	5.3	---	---	---	11.0	10.1	10.5
19	4.9	3.5	4.5	6.1	5.1	5.6	---	---	---	11.6	10.4	10.8
20	4.9	4.4	4.6	5.9	5.4	5.6	7.8	7.1	7.6	12.4	11.5	12.0
21	4.8	4.1	4.4	5.8	5.3	5.5	7.2	6.6	6.9	13.3	11.3	12.3
22	5.7	4.5	4.8	6.0	5.3	5.6	6.8	6.2	6.5	11.3	9.3	10.0
23	7.9	5.6	6.4	6.1	5.4	5.7	6.7	6.2	6.4	10.0	8.7	9.3
24	7.3	6.5	6.9	6.3	5.6	5.9	7.2	6.4	6.8	9.9	8.4	9.2
25	7.8	5.3	6.7	6.5	5.8	6.1	7.1	5.9	6.5	8.5	7.1	7.7
26	5.6	3.7	4.5	6.3	5.6	5.8	5.9	5.2	5.6	8.7	7.1	7.7
27	4.7	3.9	4.3	6.8	5.7	6.2	6.7	3.5	5.5	8.3	6.4	7.7
28	5.4	4.1	4.9	7.2	6.4	6.8	7.4	6.8	7.2	9.0	5.8	7.2
29	6.2	5.2	5.7	7.0	6.1	6.6	7.5	7.0	7.2	9.4	8.3	8.9
30	6.9	5.7	7.8	7.2	6.4	6.8	7.3	7.0	7.2	10.1	8.5	9.5
31	---	---	---	6.9	6.2	6.6	7.5	7.0	7.3	---	---	---
MONTH	8.0	3.5	5.9	7.3	4.4	6.1				15.0	5.8	8.9

05331000 MISSISSIPPI RIVER AT ST. PAUL, MN

LOCATION.--Lat 44°56'40", long 93°05'20", in SE¼NE¼ sec.6, T.28 N., R.22 W., Ramsey County, Hydrologic Unit 07010206, on left bank in St. Paul, 300 ft (91 m) upstream from Robert Street Bridge, 6 mi (10 km) downstream from Minnesota River, and at mile 839.3 (1,350 km) upstream from Ohio River.
DRAINAGE AREA.--36,800 mi² (95,300 km²), approximately.

WATER-DISCHARGE RECORDS

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 (208.367 m) National Geodetic Vertical Datum of 1929. Prior to Mar. 18, 1925, nonrecording gage at several sites within 300 ft (91 m) of present site at present datum. Mar. 18, 1925, to Mar. 10, 1933, water-stage recorder and Mar. 11, 1933, to Sept. 14, 1939, nonrecording gage, at present site and datum. Since September 1938, auxiliary water-stage recorder 5.6 mi (9.0 km) downstream.
REMARKS.--Records good. Slight regulation except during extreme floods by reservoirs on headwaters and by power-plants. Beginning July 20, 1938, sewage from Minneapolis and St. Paul, which formerly entered above station, was diverted to a sewage-disposal plant, thence to river below station. Figures of daily discharge do not include this diversion.
COOPERATION.--Records of Mississippi River at Twin City lock and dam computed and furnished by Ford Motor Co. Diversion through sewage disposal plant furnished by Metropolitan Waste Control Commission.
AVERAGE DISCHARGE (ADJUSTED FOR DIVERSION).--83 years (water years 1895, 1897, 1901-81), 10,590 ft³/s (299.9 m³/s), 3.91 in/yr (99 mm/yr); median of yearly mean discharges, 9,950 ft³/s (282 m³/s), 3.67 in/yr (93 mm/yr).
EXTREMES FOR PERIOD OF RECORD (1867-70, 1872-1981).--Maximum discharge, 171,000 ft³/s (4,840 m³/s) Apr. 16, 1965, gage height, 26.01 ft (7.928 m) from floodmark.
Maximum flood known since at least 1851, that of 1965. Flood of Apr. 11, 1870 reached a stage of 19.4 ft (5.9 m), discharge, 100,000 ft³/s (2,830 m³/s).
EXTREMES FOR PERIOD OF RECORD (1897,1917-81).--Minimum daily discharge, 632 ft³/s (17.9 m³/s) Aug. 26, 1934.
EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 25,900 ft³/s (733 m³/s) June 30; maximum gage height, 5.26 ft (1.60 m) June 28; minimum daily, 1,920 ft³/s (54.4 m³/s) Feb. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7110	5350	4640	4080	2850	5490	6500	14100	7310	25600	14400	19900
2	6650	6020	3820	3660	1920	5630	6640	13700	8190	25000	13200	19900
3	6660	6090	2320	3700	2210	5160	6090	14200	8120	23100	12500	18800
4	6470	5780	2980	2900	2800	5030	8050	15100	7850	21900	12100	18200
5	6220	5870	4530	3380	2730	4900	8060	15900	7260	20100	10900	16400
6	5940	6030	4160	3670	2870	4760	7880	15600	7900	17900	10900	14900
7	5520	6060	5200	3680	3190	4770	8080	15500	8670	16900	11800	14300
8	5240	5970	4400	3730	2850	4860	8350	14900	8410	14600	12000	11900
9	4990	5810	3830	3730	2710	4800	7870	14100	8090	13100	12100	10800
10	5470	6060	3870	2960	3010	4720	8450	14700	7980	12000	12200	10000
11	4960	5720	3060	3010	1930	4630	8350	14100	7320	12900	13100	10300
12	4700	5630	3680	3430	2790	4990	8460	13700	6920	11300	12900	9610
13	4880	5710	4690	3450	2740	4460	8030	13400	7200	11800	12700	9220
14	5180	5480	4270	3530	2830	5210	8390	12200	11700	12100	12000	8490
15	5120	6130	4340	3220	3340	4860	8360	11600	11700	11600	11000	8440
16	5030	5520	4560	2910	3170	5110	7800	10600	13400	11200	11800	7780
17	4930	5410	4810	3550	3060	5040	7290	10400	14800	11300	12800	7340
18	4650	5830	4290	3110	3190	5160	7990	8990	17400	11900	11500	7250
19	5590	5580	2680	3170	3030	4990	8280	8710	19100	11800	11200	7230
20	5200	5140	2480	3220	2950	4860	9170	7420	18900	12200	10200	6340
21	5210	5300	2840	3320	3480	4830	8000	7680	19000	12600	9250	6500
22	5210	5120	4020	2870	3520	4840	8380	7020	18600	12800	8870	5720
23	5170	5190	3760	3280	3880	4890	10000	7170	17800	12100	8340	5330
24	5260	5600	3850	3100	3820	4660	9790	6510	17200	12100	8130	5170
25	5490	5560	3110	2400	3870	4420	9210	6820	17400	13500	7890	4760
26	6120	5000	3440	3040	4230	4720	10100	6940	20000	15500	8640	5340
27	5720	4120	3760	2830	4960	5080	8900	7130	23300	16800	12000	5100
28	6240	4400	3810	2930	5320	5140	11200	7150	24600	17500	13600	4870
29	6330	4910	4010	2600	---	4800	12300	7870	25700	17200	15600	5310
30	6500	4630	3830	2550	---	5710	13000	7730	25900	16400	18200	4890
31	5800	---	4340	2770	---	5620	---	8000	---	15300	19600	---
TOTAL	173560	165020	119380	99780	89250	154140	258970	338940	417720	470100	371420	290090
MEAN	5599	5501	3851	3219	3188	4972	8632	10930	13920	15160	11980	9670
MAX	7110	6130	5200	4080	5320	5710	13000	15900	25900	25600	19600	19900
MIN	4650	4120	2320	2400	1920	4420	6090	6510	6920	11200	7890	4760
†	259	228	232	240	304	282	319	332	361	356	374	347
MEAN‡	5858	5729	4083	3459	3492	5254	8951	11262	14281	15516	12354	10017
CFSM‡	.16	.16	.11	.09	.09	.14	.24	.31	.39	.42	.34	.27
IN.‡	.18	.17	.13	.11	.10	.16	.27	.35	.43	.49	.39	.30

CAL YR 1980 TOTAL 3098270 MEAN 8465 MAX 30200 MIN 2320 MEAN‡ 8758 CFSM‡ .24 IN‡ 3.24
WTR YR 1981 TOTAL 2948370 MEAN 8078 MAX 25900 MIN 1920 MEAN‡ 8380 CFSM‡ .23 IN‡ 3.09

† Diversion equivalent in cubic feet per second, through sewage disposal plant.
‡ Adjusted for diversion.

05331000 MISSISSIPPI RIVER AT ST. PAUL, MN--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1956 to current year.

INSTRUMENTATION.--Temperature recorder since October 1956.

COOPERATION.--Chemical samples collected by the Metropolitan Waste Control Commission, St. Paul, MN.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 31.0°C July 24-28, 1964, July 31, 1975, July 19, 21, 1977; minimum, 0.0°C many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 27.5°C July 8-10; minimum, 0.0°C many days during winter period.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	FLUORIDE, TOTAL (MG/L AS F) (00951)
OCT								
17...	1310	4930	420	8.2	11.5	10.2	97	.1
DEC								
09...	1305	3830	435	7.9	1.0	13.5	98	.1
FEB								
13...	1315	2740	480	7.9	.5	13.5	96	.2
APR								
08...	1110	8350	410	8.1	12.0	11.5	110	.1
JUN								
12...	1150	6920	430	7.9	22.0	8.4	98	.2
SEP								
03...	0845	18800	600	8.0	20.0	7.8	89	.2

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)
OCT									
17...	2	100	0	40	2	10	3	600	4
DEC									
09...	1	100	0	60	0	<10	5	340	5
FEB									
13...	1	100	0	110	5	11	7	560	8
APR									
08...	0	100	20	70	3	12	4	820	42
JUN									
12...	0	100	10	70	1	7	5	1200	12
SEP									
03...	4	100	<10	50	<1	14	17	3300	5

DATE	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	CYANIDE TOTAL (MG/L AS CN) (00720)
OCT								
17...	150	<.1	3	1	0	1	20	.00
DEC								
09...	70	<.1	0	6	0	0	20	.00
FEB								
13...	150	<.1	2	6	0	3	20	<.01
APR								
08...	170	<.1	6	8	0	0	40	<.01
JUN								
12...	230	<.1	2	7	1	0	20	<.01
SEP								
03...	270	<.1	6	3	2	<1	30	<.01

05331000 MISSISSIPPI RIVER AT ST. PAUL, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	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)
SEP												
03...	0845	18800	600	8.0	20.0	7.8	89	.2	4	100	<10	50

DATE	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	CHRO-MIUM, HEXA-VALENT, DIS. (UG/L AS CR) (01032)	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)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
SEP											
03...	<1	14	<1	5	30	1	20	<.1	<1	<1	10

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.5	14.5	14.5	6.5	6.0	6.0	3.0	2.5	3.0	1.0	.5	.5
2	14.5	14.0	14.5	6.0	6.0	6.0	2.0	1.0	1.5	1.0	.0	.5
3	14.0	14.0	14.0	7.0	6.0	6.5	1.0	.5	1.0	.5	.0	.5
4	13.5	12.0	13.0	7.5	7.0	7.0	1.5	.5	1.0	1.0	.0	.5
5	13.5	13.0	13.5	8.0	7.5	8.0	2.0	1.0	1.5	1.0	.5	.5
6	13.5	12.0	12.5	8.5	7.5	8.0	2.0	1.5	2.0	.5	.0	.5
7	14.0	13.0	13.5	8.0	7.5	8.0	2.5	2.0	2.0	.5	.0	.5
8	14.5	13.5	14.0	8.0	7.5	7.5	2.0	.5	1.0	.5	.0	.5
9	15.5	14.0	15.0	7.5	7.0	7.0	1.5	.5	1.0	1.5	.5	.5
10	15.5	14.0	15.0	7.0	6.5	7.0	1.0	.5	1.0	1.0	.0	.5
11	14.0	13.0	13.5	6.5	6.5	6.5	1.5	.0	.5	.5	.0	.0
12	12.5	12.0	12.5	6.5	6.0	6.0	1.0	.5	1.0	.5	.0	.5
13	12.0	10.5	11.0	6.5	5.5	6.0	1.0	.0	.5	.5	.0	.0
14	10.5	10.0	10.0	6.0	5.5	6.0	1.0	.5	.5	.5	.0	.5
15	10.0	9.5	10.0	6.0	5.5	5.5	1.5	.5	.5	.5	.0	.5
16	10.0	9.5	10.0	5.5	5.0	5.5	1.0	.5	.5	.5	.0	.0
17	10.5	9.5	10.0	6.0	5.5	5.5	1.5	.5	1.0	.5	.0	.0
18	9.5	9.0	9.0	6.0	5.0	5.5	1.5	.5	1.0	.5	.0	.0
19	9.0	8.5	9.0	6.0	5.0	5.5	1.0	.0	.5	1.0	.0	.5
20	9.0	8.5	9.0	5.5	4.5	5.0	1.0	.0	.5	1.0	.0	.5
21	9.0	9.0	9.0	6.0	4.5	5.0	1.0	.0	.5	1.0	.0	.5
22	9.0	9.0	9.0	5.5	4.5	5.0	1.0	.0	.5	1.5	.0	1.0
23	9.5	9.5	9.5	5.5	4.5	5.0	1.0	.0	.5	1.0	.0	.5
24	9.5	9.0	9.5	5.0	4.5	4.5	.5	.0	.5	1.5	.5	1.0
25	9.0	7.5	8.0	4.5	3.5	4.0	.5	.0	.5	1.5	1.0	1.5
26	7.5	7.0	7.5	4.0	3.0	3.0	.5	.5	.5	1.5	1.0	1.5
27	7.0	6.5	7.0	3.0	2.5	3.0	.5	.0	.5	2.0	1.0	1.5
28	6.5	6.0	6.5	3.0	2.5	2.5	.5	.5	.5	1.0	.5	.5
29	6.5	5.5	6.0	3.5	2.5	3.0	.5	.5	.5	1.0	.0	.5
30	6.5	6.0	6.5	3.5	2.5	3.0	1.0	.5	.5	1.0	.0	.5
31	7.0	6.0	6.5	---	---	---	1.0	.5	.5	1.0	.5	.5
MONTH	15.5	5.5	10.5	8.5	2.5	5.5	3.0	.0	1.0	2.0	.0	.5

05331000 MISSISSIPPI RIVER AT ST. PAUL, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.0	.5	.5	2.5	1.5	2.0	11.5	10.5	11.0	14.0	13.0	13.5
2	.5	.0	.0	2.5	2.0	2.5	11.5	10.0	11.0	14.5	13.5	14.0
3	1.5	.0	.5	2.5	2.0	2.5	11.5	11.0	11.5	15.0	14.5	14.5
4	.5	.0	.5	2.5	1.5	2.0	11.5	9.5	10.0	15.0	14.5	15.0
5	.5	.0	.5	2.5	1.5	2.0	9.0	8.0	8.5	15.0	14.0	14.5
6	.5	.0	.5	3.0	2.0	2.5	9.5	7.5	8.5	15.5	14.5	15.0
7	1.0	.0	.5	3.5	2.5	3.0	10.5	9.0	10.0	16.0	15.0	15.5
8	.5	.0	.0	4.5	3.5	4.0	12.0	10.5	11.0	16.0	15.0	15.5
9	.5	.0	.5	4.0	3.0	3.5	12.5	11.0	12.0	15.0	14.5	15.0
10	.5	.0	.0	4.0	4.0	4.0	13.0	11.5	12.5	14.5	13.5	14.0
11	.5	.0	.0	5.0	4.0	4.0	12.0	11.5	12.0	14.5	13.5	14.0
12	1.0	.0	.5	5.0	4.0	4.5	12.5	11.5	12.0	14.5	14.0	14.5
13	.5	.0	.0	5.0	4.0	4.5	12.5	12.0	12.5	15.0	14.5	14.5
14	.5	.0	.5	6.0	4.5	5.0	12.5	11.5	12.0	16.0	14.5	15.0
15	1.5	.5	1.0	6.0	5.0	5.5	12.0	11.0	11.5	17.5	16.0	16.5
16	2.0	.5	1.5	6.0	5.0	5.5	11.5	10.5	11.0	18.0	16.5	17.0
17	2.5	1.5	1.5	7.0	6.0	6.5	12.5	11.0	11.5	17.5	17.0	17.0
18	3.0	2.0	2.5	7.0	6.5	6.5	12.5	11.5	12.0	17.5	16.5	17.0
19	3.0	2.0	2.5	6.5	5.5	6.0	13.0	11.5	12.5	18.0	16.0	17.0
20	3.5	2.5	3.0	5.5	5.0	5.5	13.5	11.5	12.5	19.0	16.5	17.5
21	4.0	3.0	3.5	5.5	4.5	5.0	12.5	11.5	12.0	20.5	18.0	19.0
22	4.5	3.5	4.0	6.5	5.0	6.0	11.5	11.0	11.0	20.5	19.0	20.0
23	4.5	3.5	4.0	8.0	6.5	7.5	11.0	9.5	10.0	20.5	19.5	20.0
24	4.5	3.5	4.0	9.5	8.0	8.5	10.0	9.5	9.5	20.5	19.0	19.5
25	4.5	3.0	4.0	10.0	9.0	9.5	10.5	9.5	10.0	19.0	18.5	18.5
26	4.0	3.0	3.5	10.0	9.0	9.5	12.0	10.0	11.0	18.5	18.0	18.5
27	3.5	2.5	3.0	10.0	9.0	9.5	13.0	11.5	12.5	19.0	17.5	18.5
28	2.5	2.0	2.5	10.0	9.5	9.5	13.5	13.0	13.0	19.0	18.0	18.5
29	---	---	---	11.0	10.0	10.5	13.5	13.0	13.0	20.5	18.5	19.5
30	---	---	---	12.0	11.0	11.5	14.0	13.0	13.0	20.5	19.5	20.0
31	---	---	---	12.5	11.5	12.0	---	---	---	21.0	19.5	20.0
MONTH	4.5	.0	1.5	12.5	1.5	6.0	14.0	7.5	11.5	21.0	13.0	16.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	21.5	20.0	20.5	24.0	22.5	23.5	23.0	22.5	22.5	22.5	22.0	22.0
2	21.0	20.5	20.5	24.5	23.0	24.0	23.5	22.5	23.0	22.0	20.5	21.5
3	21.0	20.0	20.5	24.5	23.5	24.0	24.5	23.0	23.5	22.0	20.0	21.0
4	22.0	20.0	21.0	25.0	24.0	24.5	25.5	24.0	24.5	21.5	19.5	20.5
5	22.5	21.0	21.5	26.0	24.5	25.5	26.0	25.0	25.5	21.0	19.5	20.5
6	23.5	21.5	22.5	26.5	25.5	26.0	26.0	25.0	25.5	21.0	19.5	20.5
7	23.5	22.0	23.0	27.0	26.5	26.5	25.0	24.5	25.0	22.0	20.0	21.0
8	23.0	22.0	22.5	27.5	27.0	27.0	24.5	24.0	24.5	22.5	20.0	21.5
9	22.5	22.0	22.0	27.5	26.5	27.0	24.5	23.5	24.0	22.0	20.5	21.5
10	22.5	21.0	22.0	27.5	26.5	27.0	24.0	23.0	23.5	22.5	21.0	22.0
11	22.0	21.0	21.5	26.5	26.0	26.5	24.0	23.0	23.5	24.5	21.5	23.5
12	22.5	21.0	22.0	26.5	26.0	26.5	24.5	23.5	24.0	24.5	23.5	24.5
13	23.0	22.0	22.5	26.5	26.0	26.0	25.5	24.5	25.0	24.5	23.5	24.0
14	22.5	21.5	22.5	26.0	25.0	25.5	25.5	25.0	25.0	24.0	23.0	23.5
15	22.0	21.0	21.5	25.0	24.0	24.5	25.5	24.5	25.0	23.0	22.0	22.5
16	21.5	20.5	21.0	24.5	23.5	24.0	24.5	24.0	24.0	22.0	21.0	21.5
17	21.5	20.5	21.0	25.5	24.0	24.5	24.0	23.0	23.5	21.0	19.5	20.0
18	21.0	20.5	21.0	26.0	24.5	25.5	24.0	22.5	23.0	19.5	18.5	19.0
19	21.0	20.0	20.5	27.0	25.5	26.0	24.0	22.5	23.5	19.0	18.0	18.5
20	20.0	19.5	20.0	27.0	26.0	26.5	24.0	23.0	23.5	19.0	17.0	18.0
21	19.5	19.5	19.5	26.0	25.0	26.0	24.0	23.0	23.5	19.5	17.5	18.5
22	19.5	19.0	19.0	25.0	24.5	24.5	24.0	23.0	23.5	19.5	19.0	19.5
23	19.0	19.0	19.0	24.5	20.5	23.5	23.5	23.0	23.5	19.0	18.0	18.5
24	20.0	19.0	19.5	23.5	22.5	23.0	24.5	23.5	24.0	18.0	17.0	18.0
25	21.0	19.5	20.0	24.0	23.0	23.5	24.5	24.0	24.0	18.0	16.0	17.5
26	22.0	20.5	21.5	23.5	22.5	23.0	24.0	23.5	23.5	16.5	16.0	16.5
27	22.0	21.0	21.5	22.5	22.0	22.0	23.0	21.5	22.5	16.0	15.5	16.0
28	21.5	21.5	21.5	22.5	21.5	21.5	21.5	21.0	21.5	15.5	15.5	15.5
29	22.5	21.5	22.0	22.0	21.0	21.5	21.5	21.0	21.0	15.5	15.0	15.5
30	23.0	22.0	22.5	22.0	21.0	21.5	21.5	20.0	21.0	15.0	14.0	14.5
31	---	---	---	23.0	21.5	22.0	22.5	20.5	21.5	---	---	---
MONTH	23.5	19.0	21.0	27.5	20.5	24.5	26.0	20.0	23.5	24.5	14.0	20.0

05331005 MISSISSIPPI RIVER AT INDUSTRIAL MOLASSES, ST. PAUL, MN

LOCATION.--Lat 44°55'52", long 93°02'52", in NE¼NE¼ sec.9, T.28 N., R.22 W., Ramsey County, Hydrologic Unit 07010206, on left bank at molasses plant, 0.5 mi (0.8 km) upstream from Metropolitan waste treatment plant, 2.0 mi (3.2 km) downstream from Lafayette bridge and at mile 836.6 (1,346 km) upstream from Ohio River.

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

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: March 1976 to current year.
pH: March 1976 to current year.
WATER TEMPERATURES: March 1976 to current year.
DISSOLVED OXYGEN: March 1976 to current year.

INSTRUMENTATION.--Water-quality monitor since March 1976.

REMARKS.--Extremes are published for years with 80 percent or more daily record.

COOPERATION.--Water-quality monitor is operated by the Metropolitan Waste Control Commission, St. Paul, MN.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1980-81): Maximum, 723 micromhos Dec. 17, 1979; minimum, 230 micromhos Mar. 24, 1980.
pH (water years 1980-81): Maximum, 8.8 units Nov. 21, 1979; minimum, 7.4 units Aug. 17, 18, 1980, Apr. 24, 1981.
WATER TEMPERATURES (water years 1980-81): Maximum, 29.5°C July 14, 1980; minimum, 0.5°C several days during winter.
DISSOLVED OXYGEN (water years 1980-81): Maximum, 15.6 mg/L Mar. 24, 1981; minimum, 2.9 mg/L Aug. 17, 25, 1980.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 679 micromhos Feb. 1; minimum, 256 micromhos Apr. 3.
pH: Maximum, 8.5 units Apr. 26; minimum, 7.4 units Apr. 24.
WATER TEMPERATURES: Maximum, 27.0°C July 8-10, 19, 20; minimum, 1.0°C several days during winter.
DISSOLVED OXYGEN: Maximum, 15.6 mg/L Mar. 24; minimum, 3.5 mg/L Aug. 28.

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	414	393	406	---	---	---	472	411	439	429	382	403
2	420	394	408	---	---	---	449	405	424	437	393	416
3	424	404	415	419	396	406	448	406	425	502	382	431
4	433	398	413	425	389	408	478	410	438	495	438	458
5	430	407	419	424	392	410	502	447	466	520	446	481
6	425	397	413	431	388	412	550	444	494	535	426	460
7	430	405	418	419	387	403	464	407	438	507	425	458
8	435	412	425	421	392	407	447	421	423	451	406	424
9	429	407	417	428	394	410	512	417	426	482	400	439
10	431	391	413	421	385	406	457	424	431	449	417	431
11	425	394	413	409	374	391	496	447	465	481	421	453
12	427	404	417	428	386	406	432	398	409	489	447	470
13	427	408	420	433	385	407	435	343	394	488	377	420
14	416	383	403	428	382	409	369	338	353	449	364	395
15	407	379	392	425	383	400	417	375	395	468	374	414
16	419	387	402	412	387	402	426	400	414	505	405	455
17	417	382	400	408	386	398	415	368	393	522	400	447
18	413	385	404	415	392	408	382	355	368	522	387	424
19	422	393	408	423	383	416	409	343	372	458	425	441
20	410	390	400	427	388	410	510	358	401	610	442	519
21	429	391	416	431	390	411	660	537	606	668	511	589
22	420	395	409	425	393	413	558	501	515	513	491	501
23	415	381	398	430	392	407	567	505	517	523	394	479
24	---	---	---	419	388	407	578	498	518	475	361	407
25	---	---	---	408	385	398	521	504	513	388	344	361
26	---	---	---	415	392	408	575	514	559	473	355	419
27	---	---	---	423	394	416	573	543	559	520	448	484
28	---	---	---	580	422	476	543	535	539	461	398	414
29	---	---	---	594	405	505	542	423	495	---	---	---
30	---	---	---	437	391	415	430	395	414	585	489	527
31	---	---	---	---	---	---	455	417	436	569	498	521
MONTH							660	338	453			

05331005 MISSISSIPPI RIVER AT INDUSTRIAL MOLASSES, ST PAUL, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	679	385	566	395	385	388	432	384	406	387	367	378
2	660	549	611	388	384	386	400	370	388	400	366	386
3	557	494	537	392	375	380	468	256	417	398	375	388
4	656	493	594	390	376	380	459	421	437	392	362	377
5	576	442	490	396	380	383	442	418	433	382	344	364
6	482	442	457	407	376	392	437	414	429	373	347	361
7	582	446	504	413	374	392	447	409	431	380	355	368
8	525	463	476	414	376	399	450	426	439	384	362	375
9	518	428	465	409	380	397	454	431	443	392	369	381
10	448	376	415	410	381	396	457	429	444	390	368	380
11	382	310	328	409	383	397	457	431	447	408	380	397
12	479	307	362	413	386	401	463	437	452	419	385	400
13	509	414	470	423	381	399	458	433	448	423	395	407
14	---	---	---	430	377	404	471	442	458	431	394	414
15	639	453	610	408	379	392	459	435	446	421	399	409
16	601	525	557	420	383	401	454	424	441	436	401	418
17	645	561	597	408	372	390	462	430	447	434	405	421
18	639	461	586	409	372	394	456	418	440	443	414	431
19	523	493	502	404	374	391	433	409	423	449	416	430
20	591	490	516	404	376	389	440	415	428	474	426	447
21	---	---	---	409	381	398	455	401	427	448	419	436
22	527	498	517	410	380	398	469	424	450	448	409	429
23	507	395	470	410	382	396	460	424	443	439	405	424
24	439	345	375	429	372	399	450	423	440	447	411	429
25	536	391	456	434	394	417	448	422	436	449	422	435
26	485	430	444	439	401	418	451	421	438	440	412	428
27	471	389	397	420	391	408	434	407	423	437	413	426
28	400	390	396	427	384	408	434	383	414	455	427	443
29	---	---	---	420	395	409	409	369	393	456	434	445
30	---	---	---	432	394	416	397	369	385	456	427	444
31	---	---	---	414	384	403	---	---	---	455	428	443
MONTH				439	372	397	471	256	432	474	344	410

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	461	429	446	426	395	412	531	477	509	628	522	563
2	471	436	456	433	408	422	526	502	511	639	630	635
3	458	433	447	438	415	428	528	477	502	646	635	643
4	468	439	452	439	407	425	536	486	511	660	647	653
5	494	445	467	434	410	426	494	449	477	666	653	660
6	502	469	488	447	420	435	516	465	489	662	653	657
7	479	442	461	450	424	438	517	466	483	665	645	651
8	479	441	461	452	426	439	480	440	462	669	642	659
9	478	452	469	447	418	435	462	440	454	660	638	651
10	470	439	456	439	416	429	468	440	452	655	635	645
11	471	442	457	439	380	405	465	437	455	642	473	588
12	465	437	454	430	398	418	464	442	453	507	472	488
13	471	440	456	436	416	426	462	431	450	501	476	491
14	459	407	431	463	417	437	444	421	432	520	464	498
15	436	402	424	483	411	470	471	427	451	501	466	487
16	432	371	403	518	494	508	484	436	454	491	461	481
17	406	380	391	530	503	518	458	435	446	512	471	492
18	410	379	398	534	503	522	472	450	462	497	470	484
19	403	383	395	537	503	521	467	439	456	493	469	483
20	422	391	407	525	493	509	471	439	459	497	477	488
21	417	386	402	534	505	521	472	445	458	494	455	472
22	411	389	401	534	513	526	517	446	479	489	449	472
23	418	391	404	535	502	522	471	447	459	487	469	480
24	414	390	405	536	495	521	468	438	456	492	466	479
25	429	392	411	542	519	530	459	435	449	513	470	487
26	430	409	422	539	507	528	463	424	442	508	456	476
27	429	384	407	519	473	499	462	401	438	518	456	485
28	397	361	381	505	425	457	454	396	424	521	460	481
29	401	375	389	466	431	448	485	437	468	489	456	475
30	411	381	398	506	461	480	497	472	487	496	459	479
31	---	---	---	529	493	512	532	483	512	---	---	---
MONTH	502	361	428	542	380	470	536	396	466	669	449	539

05331005 MISSISSIPPI RIVER AT INDUSTRIAL MOLASSES, ST PAUL, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.0	8.0	8.0	---	---	---	7.7	7.6	7.7	7.7	7.6	7.6
2	8.1	8.0	8.1	---	---	---	7.6	7.5	7.6	7.7	7.6	7.6
3	8.1	8.0	8.1	8.1	8.0	8.0	7.5	7.5	7.5	7.6	7.6	7.6
4	8.1	8.0	8.0	8.1	8.0	8.0	7.5	7.5	7.5	7.6	7.6	7.6
5	8.1	8.0	8.1	8.2	8.0	8.1	7.6	7.5	7.6	7.7	7.6	7.6
6	8.3	8.0	8.2	8.2	8.1	8.2	7.6	7.6	7.6	7.9	7.6	7.7
7	8.3	8.0	8.1	8.3	8.2	8.2	7.7	7.6	7.7	7.9	7.9	7.9
8	8.2	8.0	8.1	8.2	8.2	8.2	7.6	7.5	7.6	7.9	7.8	7.9
9	8.1	8.0	8.1	8.2	8.1	8.1	7.8	7.5	7.5	7.9	7.8	7.8
10	8.1	8.0	8.1	8.1	8.1	8.1	7.5	7.5	7.5	7.9	7.8	7.8
11	8.1	8.0	8.0	8.2	8.1	8.1	7.6	7.5	7.5	7.9	7.8	7.8
12	8.1	8.0	8.0	8.2	8.1	8.1	7.8	7.8	7.8	7.8	7.8	7.8
13	8.0	7.9	8.0	8.1	7.8	8.0	7.8	7.8	7.8	7.8	7.7	7.8
14	8.2	7.9	8.0	7.8	7.7	7.8	7.8	7.8	7.8	7.9	7.8	7.8
15	8.2	8.1	8.2	7.8	7.7	7.7	7.8	7.8	7.8	7.8	7.8	7.8
16	8.2	8.0	8.1	7.8	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.8
17	8.0	7.9	8.0	7.9	7.7	7.8	7.8	7.8	7.8	7.8	7.7	7.7
18	7.9	7.8	7.8	7.9	7.8	7.8	7.8	7.7	7.8	7.8	7.7	7.7
19	7.9	7.8	7.9	7.9	7.8	7.9	7.8	7.8	7.8	7.8	7.7	7.7
20	7.9	7.7	7.8	7.9	7.8	7.8	7.8	7.7	7.8	7.9	7.7	7.8
21	8.0	7.8	7.9	7.9	7.8	7.9	7.8	7.7	7.8	8.0	7.9	7.9
22	8.0	7.8	7.9	7.8	7.8	7.8	7.8	7.7	7.8	8.0	8.0	8.0
23	8.0	7.9	8.0	7.8	7.7	7.8	7.8	7.7	7.8	8.0	7.9	8.0
24	---	---	---	7.8	7.7	7.8	7.7	7.7	7.7	8.0	7.9	8.0
25	---	---	---	7.9	7.7	7.8	7.7	7.6	7.6	8.0	8.0	8.0
26	---	---	---	7.8	7.8	7.8	7.6	7.6	7.6	8.0	8.0	8.0
27	---	---	---	7.8	7.8	7.8	7.6	7.6	7.6	8.0	8.0	8.0
28	---	---	---	7.8	7.8	7.8	7.6	7.6	7.6	8.0	8.0	8.0
29	---	---	---	7.8	7.8	7.8	7.6	7.6	7.6	8.0	7.4	7.9
30	---	---	---	7.8	7.7	7.8	7.6	7.6	7.6	8.0	8.0	8.0
31	---	---	---	---	---	---	7.6	7.6	7.6	8.0	7.9	8.0
MONTH							7.8	7.5	7.7	8.0	7.4	7.8

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	8.0	7.9	7.9	8.0	8.0	8.0	8.0	7.8	7.9	8.0	7.8	7.9
2	8.0	7.9	8.0	8.0	7.9	8.0	8.1	7.9	8.0	8.1	7.9	8.0
3	8.0	7.9	8.0	8.2	8.0	8.1	8.0	7.8	7.9	8.0	7.8	7.9
4	8.0	7.9	7.9	8.1	8.0	8.1	7.9	7.8	7.8	7.8	7.6	7.7
5	8.0	8.0	8.0	8.2	8.0	8.1	7.9	7.8	7.8	7.8	7.6	7.7
6	8.0	7.9	8.0	8.1	8.1	8.1	8.0	7.8	7.9	7.9	7.7	7.8
7	8.0	7.9	7.9	8.2	8.1	8.2	8.1	7.9	8.0	7.9	7.8	7.9
8	8.0	7.9	7.9	8.3	8.2	8.3	8.0	7.9	7.9	8.0	7.8	7.9
9	7.9	7.8	7.9	8.3	8.2	8.3	8.0	7.8	7.9	8.0	7.9	7.9
10	7.9	7.9	7.9	8.2	8.1	8.2	8.0	7.9	8.0	8.1	7.9	8.0
11	8.0	7.9	7.9	8.2	8.1	8.2	8.0	7.9	7.9	8.1	7.9	8.0
12	7.9	7.8	7.8	8.2	8.1	8.2	8.0	7.8	7.9	8.1	8.0	8.1
13	7.9	7.8	7.8	8.3	8.2	8.2	7.9	7.8	7.8	8.2	8.1	8.1
14	---	---	---	8.4	8.2	8.3	7.8	7.7	7.8	8.2	7.9	8.1
15	8.0	7.7	7.9	8.4	8.3	8.4	7.8	7.7	7.8	8.1	7.9	8.0
16	7.9	7.8	7.9	8.4	8.1	8.3	8.4	7.7	8.0	8.1	7.9	8.0
17	7.9	7.8	7.9	8.3	8.1	8.2	8.4	8.3	8.4	8.0	7.9	8.0
18	8.0	7.9	7.9	8.3	8.2	8.3	8.4	8.3	8.4	8.1	7.9	8.0
19	8.0	7.9	7.9	8.4	8.3	8.3	8.4	8.3	8.3	8.2	8.0	8.1
20	8.0	7.9	7.9	8.4	8.1	8.3	8.4	8.2	8.3	8.2	8.0	8.1
21	8.0	7.8	7.9	8.1	8.0	8.1	8.4	7.8	8.1	8.2	8.0	8.1
22	8.0	7.9	8.0	8.2	8.0	8.1	7.8	7.6	7.7	8.1	8.0	8.1
23	8.2	8.0	8.0	8.2	8.1	8.1	7.6	7.5	7.5	8.0	7.8	8.0
24	8.2	8.0	8.1	8.3	8.1	8.2	8.0	7.4	7.7	7.9	7.7	7.8
25	8.1	8.0	8.0	8.2	8.1	8.2	8.1	7.9	8.0	7.7	7.6	7.7
26	8.2	8.1	8.1	8.2	8.1	8.1	8.5	8.0	8.2	7.7	7.6	7.6
27	8.2	8.0	8.2	8.2	8.1	8.2	8.3	8.0	8.1	7.8	7.6	7.7
28	8.1	8.0	8.0	8.2	8.1	8.1	8.1	8.0	8.1	7.7	7.7	7.7
29	---	---	---	8.2	8.0	8.1	8.0	7.9	8.0	7.9	7.7	7.8
30	---	---	---	8.1	7.9	8.0	8.0	7.9	7.9	7.9	7.8	7.9
31	---	---	---	8.0	7.9	7.9	---	---	---	8.0	7.8	7.9
MONTH				8.4	7.9	8.2	8.5	7.4	8.0	8.2	7.6	7.9

05331005 MISSISSIPPI RIVER AT INDUSTRIAL MOLASSES, ST PAUL, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.0	7.8	7.9	7.7	7.6	7.7	8.2	8.1	8.2	8.1	8.0	8.1
2	8.0	7.9	7.9	7.8	7.7	7.7	8.2	8.1	8.2	8.1	8.0	8.1
3	8.0	8.0	8.0	7.8	7.7	7.8	8.3	8.1	8.2	8.2	8.1	8.1
4	8.2	8.0	8.1	7.8	7.7	7.8	8.3	8.2	8.2	8.1	7.8	7.9
5	8.3	8.0	8.1	7.8	7.8	7.8	8.4	8.3	8.3	7.9	7.8	7.9
6	8.2	7.9	8.1	7.9	7.8	7.8	8.4	8.3	8.3	7.9	7.8	7.9
7	8.0	7.9	8.0	8.0	7.9	7.9	8.3	8.1	8.2	8.0	7.8	7.9
8	7.9	7.7	7.8	8.0	7.9	7.9	8.1	7.9	8.0	8.0	7.9	8.0
9	8.0	7.7	7.9	8.1	7.8	8.0	8.0	7.9	8.0	8.1	7.9	8.0
10	8.1	7.9	8.0	8.3	7.8	8.1	8.1	7.9	8.0	8.1	8.0	8.0
11	8.1	8.0	8.0	8.0	7.8	7.9	8.2	8.0	8.1	8.1	8.0	8.1
12	8.0	7.9	8.0	7.9	7.8	7.8	8.2	8.1	8.1	8.3	8.0	8.1
13	7.9	7.8	7.9	8.0	7.8	7.9	8.2	8.1	8.1	8.3	8.0	8.1
14	7.9	7.7	7.8	7.9	7.8	7.8	8.1	7.9	8.0	8.2	8.0	8.1
15	7.8	7.6	7.7	8.0	7.7	7.8	8.1	8.0	8.1	8.1	7.7	7.9
16	8.0	7.7	7.9	8.1	7.9	7.9	8.1	7.9	8.0	7.8	7.7	7.7
17	7.9	7.8	7.9	8.0	7.9	7.9	8.2	7.8	8.0	7.8	7.6	7.7
18	7.9	7.8	7.8	8.0	7.9	8.0	8.2	7.9	8.0	8.0	7.6	7.8
19	7.9	7.8	7.8	8.0	7.9	7.9	8.3	8.0	8.1	7.9	7.7	7.8
20	7.9	7.8	7.9	8.0	7.9	7.9	8.2	8.0	8.1	7.9	7.7	7.8
21	7.9	7.8	7.9	8.0	7.8	7.9	8.2	8.0	8.1	7.9	7.7	7.8
22	7.9	7.9	7.9	8.0	7.8	7.9	8.2	8.1	8.1	7.9	7.7	7.8
23	7.9	7.8	7.8	8.0	7.9	7.9	8.2	8.1	8.1	7.8	7.7	7.8
24	7.9	7.8	7.9	8.0	7.8	7.9	8.1	8.0	8.1	7.8	7.6	7.7
25	7.9	7.8	7.9	7.9	7.8	7.8	8.3	8.0	8.2	7.8	7.6	7.7
26	7.9	7.7	7.9	7.8	7.7	7.8	8.2	8.0	8.1	7.8	7.7	7.7
27	7.7	7.7	7.7	7.8	7.6	7.7	8.1	7.7	7.9	7.8	7.7	7.7
28	7.7	7.6	7.7	8.1	7.8	8.0	7.9	7.6	7.7	7.9	7.6	7.7
29	7.8	7.6	7.7	8.1	8.0	8.1	7.9	7.9	7.9	7.9	7.6	7.8
30	7.7	7.6	7.7	8.2	8.1	8.1	7.9	7.9	7.9	7.9	7.8	7.8
31	---	---	---	8.2	8.1	8.2	8.1	7.9	8.0	---	---	---
MONTH	8.3	7.6	7.9	8.3	7.6	7.9	8.4	7.6	8.1	8.3	7.6	7.9

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	15.5	15.0	15.5	---	---	---	2.5	2.0	2.5	1.0	1.0	1.0
2	16.0	15.0	15.5	---	---	---	2.0	1.5	1.5	1.0	1.0	1.0
3	15.0	14.5	15.0	7.5	7.5	7.5	1.5	1.0	1.5	1.5	1.0	1.0
4	14.5	13.5	14.0	8.0	7.5	7.5	1.5	1.5	1.5	1.0	1.0	1.0
5	13.5	13.0	13.5	8.5	8.0	8.0	1.5	1.5	1.5	1.5	1.0	1.0
6	13.5	13.0	13.0	8.5	8.5	8.5	2.0	1.5	1.5	1.5	1.0	1.0
7	14.0	13.5	13.5	8.5	8.5	8.5	2.5	2.0	2.0	1.0	1.0	1.0
8	14.5	13.5	14.0	8.5	8.0	8.5	2.0	1.5	1.5	1.5	1.0	1.0
9	15.0	14.5	14.5	8.0	7.5	8.0	1.5	1.5	1.5	1.5	1.0	1.0
10	15.0	14.5	15.0	7.5	7.0	7.5	1.5	1.5	1.5	1.5	1.0	1.5
11	14.5	13.5	14.0	7.5	7.0	7.0	1.5	1.5	1.5	1.5	1.0	1.0
12	13.5	13.0	13.0	7.0	6.5	7.0	1.5	1.0	1.5	1.0	1.0	1.0
13	12.5	11.5	12.0	6.5	6.0	6.5	1.5	1.0	1.0	1.0	1.0	1.0
14	11.5	11.0	11.0	6.0	5.5	6.0	1.5	1.0	1.0	1.0	1.0	1.0
15	10.5	10.0	10.5	6.0	5.5	5.5	1.5	1.0	1.0	1.5	1.0	1.0
16	11.0	10.5	10.5	5.5	5.0	5.5	1.5	1.0	1.5	1.5	1.0	1.0
17	11.0	10.0	10.5	5.5	5.0	5.5	1.5	1.0	1.5	1.5	1.0	1.0
18	10.0	10.0	10.0	5.5	5.0	5.5	1.5	1.0	1.0	1.0	1.0	1.0
19	10.0	9.5	9.5	5.5	5.5	5.5	1.0	1.0	1.0	1.5	1.0	1.0
20	10.0	9.5	9.5	5.0	5.0	5.0	1.5	1.0	1.5	1.5	1.0	1.5
21	10.0	9.5	9.5	5.0	4.5	5.0	1.5	1.0	1.5	1.5	1.0	1.0
22	10.0	9.5	9.5	5.0	4.5	5.0	1.5	1.0	1.0	1.0	1.0	1.0
23	10.5	9.5	10.0	5.0	4.5	5.0	1.5	1.0	1.0	1.5	1.0	1.0
24	---	---	---	5.0	4.5	4.5	1.5	1.0	1.0	1.5	1.0	1.0
25	---	---	---	4.5	4.0	4.5	1.0	1.0	1.0	1.5	1.0	1.5
26	---	---	---	4.0	3.5	4.0	1.5	1.0	1.0	1.5	1.5	1.5
27	---	---	---	2.5	2.5	2.5	1.0	1.0	1.0	1.5	1.5	1.5
28	---	---	---	2.0	1.0	1.5	1.0	1.0	1.0	1.5	1.5	1.5
29	---	---	---	2.0	1.5	1.5	1.0	1.0	1.0	2.0	1.5	2.0
30	---	---	---	2.5	1.5	2.0	1.0	1.0	1.0	2.0	1.0	1.5
31	---	---	---	---	---	---	1.0	1.0	1.0	1.5	1.0	1.5
MONTH							2.5	1.0	1.5	2.0	1.0	1.0

05331005 MISSISSIPPI RIVER AT INDUSTRIAL MOLASSES, ST PAUL, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.5	1.0	1.5	2.0	2.0	2.0	11.5	11.5	11.5	13.5	12.5	13.0
2	1.0	1.0	1.0	2.5	2.0	2.0	11.5	11.0	11.5	14.0	13.0	13.5
3	1.5	1.0	1.0	2.5	2.0	2.0	11.5	11.5	11.5	14.5	14.0	14.0
4	1.5	1.0	1.5	2.5	2.0	2.0	11.5	10.5	11.0	14.5	14.0	14.5
5	1.5	1.0	1.0	2.0	1.5	2.0	10.5	9.0	9.5	14.5	13.5	14.0
6	1.5	1.0	1.5	2.5	2.0	2.0	9.5	8.5	9.0	15.0	14.0	14.5
7	1.5	1.0	1.0	3.0	2.0	2.5	10.5	9.5	10.0	15.5	14.5	15.0
8	1.0	1.0	1.0	3.5	2.5	3.0	11.5	10.5	11.0	15.5	15.0	15.0
9	1.5	1.0	1.0	3.5	3.5	3.5	12.0	11.5	12.0	15.0	14.5	14.5
10	1.0	1.0	1.0	3.5	3.5	3.5	12.5	12.0	12.0	14.5	13.5	14.0
11	1.5	1.0	1.0	4.5	3.5	4.0	12.5	12.0	12.0	14.0	13.5	14.0
12	1.5	1.0	1.5	5.0	4.0	4.5	12.5	11.5	12.0	14.0	14.0	14.0
13	1.5	1.0	1.5	5.5	4.0	5.0	12.5	12.0	12.0	14.5	14.0	14.0
14	---	---	---	6.5	5.5	5.5	12.0	11.5	12.0	15.0	14.0	14.5
15	1.5	1.0	1.0	6.5	6.0	6.0	12.0	11.5	11.5	16.5	15.0	16.0
16	2.0	1.0	1.5	6.5	6.0	6.5	11.5	11.0	11.5	17.0	16.0	16.5
17	2.0	1.5	2.0	7.0	6.0	6.5	12.0	11.0	11.5	17.0	16.5	16.5
18	3.0	2.0	2.5	7.0	6.5	6.5	12.5	12.0	12.0	16.5	16.0	16.0
19	2.5	2.5	2.5	7.0	6.5	6.5	12.5	12.0	12.5	16.5	16.0	16.0
20	3.0	1.5	2.5	6.5	6.0	6.0	13.0	12.0	12.5	17.5	16.5	16.5
21	3.5	2.0	3.0	6.5	5.5	6.0	13.0	12.0	12.5	18.5	17.5	18.0
22	4.0	3.5	4.0	7.0	5.5	6.0	12.0	11.0	11.5	19.0	18.5	18.5
23	4.0	3.5	4.0	8.5	6.5	7.5	11.0	10.0	10.5	19.0	19.0	19.0
24	3.5	3.5	3.5	9.0	8.0	8.5	10.5	9.5	10.0	19.5	18.5	19.0
25	3.5	3.0	3.5	9.0	8.0	8.5	10.5	10.0	10.0	18.0	17.5	18.0
26	3.5	3.0	3.5	9.5	8.5	9.0	12.0	10.5	11.0	18.0	17.5	17.5
27	4.0	3.0	3.5	10.0	9.0	9.5	13.0	11.5	12.0	17.5	17.5	17.5
28	3.0	2.0	2.5	10.5	9.5	10.0	13.0	12.5	13.0	18.0	17.5	17.5
29	---	---	---	11.0	10.0	10.5	13.0	12.5	13.0	19.0	18.0	18.5
30	---	---	---	11.5	10.5	11.0	13.0	12.5	13.0	19.5	19.0	19.5
31	---	---	---	12.0	11.5	11.5	---	---	---	20.0	19.0	19.5
MONTH				12.0	1.5	6.0	13.0	8.5	11.5	20.0	12.5	16.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	20.0	20.0	20.0	23.5	22.5	23.0	23.0	22.5	23.0	21.0	20.5	20.5
2	21.0	20.0	20.5	24.0	23.0	23.5	23.5	23.0	23.0	20.5	20.0	20.5
3	21.0	20.5	21.0	24.0	23.5	24.0	24.5	23.5	24.0	20.5	20.0	20.0
4	21.5	21.0	21.0	24.5	24.0	24.0	25.5	24.0	24.5	20.0	19.5	19.5
5	22.0	21.5	21.5	25.5	24.5	25.0	26.0	25.0	25.5	20.0	19.5	19.5
6	23.0	22.0	22.5	26.0	25.0	25.5	26.0	25.5	26.0	20.0	19.5	19.5
7	23.5	22.5	23.0	26.5	26.0	26.0	26.0	25.0	25.5	20.5	19.5	20.0
8	23.0	22.5	22.5	27.0	26.5	26.5	25.0	24.5	25.0	20.5	20.0	20.5
9	22.5	22.0	22.0	27.0	26.0	26.5	24.5	24.0	24.5	21.0	20.0	20.5
10	22.0	21.5	21.5	27.0	26.0	26.5	24.0	23.5	24.0	21.5	20.5	21.0
11	22.0	21.5	21.5	26.5	25.5	26.0	24.5	23.5	24.0	22.5	21.5	22.0
12	21.5	21.5	21.5	26.0	25.5	25.5	24.5	23.5	24.0	22.5	22.0	22.5
13	22.5	21.5	22.0	---	---	---	25.5	24.5	25.0	22.5	22.0	22.0
14	22.5	21.5	22.0	---	---	---	25.5	24.5	25.0	22.5	21.5	22.0
15	22.0	21.0	21.5	25.0	24.0	24.5	25.0	24.5	25.0	21.5	20.5	21.0
16	21.5	20.5	21.0	24.5	24.0	24.5	24.5	23.5	24.0	20.5	19.5	19.5
17	21.0	21.0	21.0	25.5	24.0	25.0	23.5	23.0	23.5	19.5	18.0	18.5
18	21.0	20.5	21.0	26.0	25.0	25.5	23.5	22.5	23.0	18.0	17.0	17.5
19	21.0	20.5	20.5	27.0	26.0	26.5	23.5	22.5	23.0	17.0	17.0	17.0
20	20.5	20.0	20.0	27.0	26.0	26.5	23.5	22.5	23.0	17.5	17.0	17.0
21	20.0	19.5	20.0	26.5	26.0	26.0	23.5	22.5	23.0	18.0	17.0	17.5
22	19.5	19.5	19.5	25.5	24.5	25.0	23.0	22.5	23.0	18.0	17.5	17.5
23	19.5	19.0	19.5	24.5	23.5	24.0	23.0	22.5	23.0	17.5	17.0	17.5
24	20.0	19.5	19.5	24.0	23.0	23.5	23.0	22.5	23.0	17.0	16.5	17.0
25	21.5	20.0	20.5	24.0	23.5	23.5	23.5	22.0	22.5	17.0	16.5	16.5
26	22.0	21.5	21.5	24.0	23.0	23.5	22.0	21.5	21.5	17.0	16.5	16.5
27	22.0	21.0	21.5	23.0	22.5	22.5	21.5	20.0	20.5	16.5	16.0	16.0
28	22.0	21.5	21.5	22.5	22.0	22.5	20.0	19.5	19.5	16.0	15.5	16.0
29	22.5	21.5	22.0	22.5	21.5	22.0	20.0	20.0	20.0	15.5	15.5	15.5
30	23.0	22.0	22.5	22.5	21.5	22.0	20.0	19.5	20.0	15.5	15.0	15.0
31	---	---	---	23.0	22.0	22.5	21.0	20.0	20.5	---	---	---
MONTH	23.5	19.0	21.0				26.0	19.5	23.5	22.5	15.0	19.0

05331005 MISSISSIPPI RIVER AT INDUSTRIAL MOLASSES, ST PAUL, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.9	9.3	9.6	---	---	---	12.7	12.0	12.4	11.9	11.6	11.8
2	9.4	8.5	8.9	---	---	---	13.0	11.9	12.4	12.0	11.8	11.9
3	8.7	8.0	8.3	13.2	12.8	13.0	13.0	12.6	12.8	11.9	11.7	11.8
4	8.3	8.0	8.1	13.2	12.5	12.8	12.8	12.5	12.7	12.2	11.9	12.0
5	8.9	8.1	8.5	12.8	12.0	12.4	13.3	12.8	13.1	12.4	11.9	12.1
6	9.0	8.1	8.5	12.6	11.7	12.2	13.3	13.1	13.2	12.5	11.8	12.2
7	11.9	8.0	9.7	11.9	10.9	11.5	12.6	11.7	12.3	12.0	11.5	11.7
8	12.2	10.9	11.4	11.5	10.8	11.2	13.0	12.0	12.4	11.5	11.2	11.3
9	11.3	10.1	11.0	11.5	10.8	11.2	12.8	12.5	12.6	11.2	11.0	11.1
10	10.3	9.3	9.8	11.6	11.0	11.3	12.2	12.0	12.1	11.2	10.9	11.0
11	9.4	8.7	9.0	11.0	10.7	10.8	12.3	11.8	12.1	11.4	11.1	11.3
12	8.8	8.1	8.4	10.9	10.5	10.7	12.2	11.7	12.0	11.4	11.1	11.2
13	8.3	7.9	8.1	10.8	10.1	10.5	12.0	11.7	11.8	11.3	11.0	11.2
14	11.0	7.5	8.7	11.7	9.9	10.6	12.1	11.8	12.0	11.4	11.1	11.2
15	10.7	10.1	10.4	11.9	11.3	11.6	12.1	11.8	11.9	11.4	11.1	11.2
16	10.9	10.0	10.4	12.4	11.6	12.1	12.7	11.9	12.4	11.3	11.0	11.2
17	11.2	10.2	10.6	12.8	11.7	12.3	12.6	12.0	12.2	11.3	10.9	11.1
18	10.2	9.3	9.7	12.1	11.5	11.8	12.2	11.9	12.0	11.2	11.0	11.1
19	9.7	8.9	9.3	12.2	11.5	11.9	12.6	11.8	12.1	11.8	11.2	11.6
20	10.0	9.2	9.6	12.1	11.8	12.0	12.6	12.3	12.5	11.5	10.9	11.2
21	10.7	9.3	9.8	12.4	11.2	11.8	13.0	12.6	12.8	11.6	11.0	11.3
22	10.6	9.8	10.3	11.4	11.0	11.2	12.9	12.6	12.7	11.3	11.0	11.1
23	10.0	8.5	9.3	11.8	11.2	11.5	12.9	12.5	12.7	11.0	10.7	10.9
24	---	---	---	11.8	10.9	11.4	12.8	12.1	12.4	11.1	10.7	10.9
25	---	---	---	11.3	10.7	11.0	12.2	11.8	12.0	11.1	10.7	10.9
26	---	---	---	11.7	11.0	11.2	12.0	11.6	11.7	11.1	10.8	11.0
27	---	---	---	12.5	11.4	11.8	12.1	11.9	12.0	11.2	10.8	11.1
28	---	---	---	13.2	12.3	12.7	12.0	11.8	11.9	11.5	11.4	11.5
29	---	---	---	13.2	12.5	12.8	12.1	11.8	11.9	---	---	---
30	---	---	---	12.6	12.3	12.4	12.0	11.7	11.9	11.4	9.7	11.2
31	---	---	---	---	---	---	11.9	11.5	11.7	11.5	11.2	11.4
MONTH							13.3	11.5	12.3			

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	11.6	11.0	11.4	12.6	12.3	12.5	11.4	10.5	10.8	9.5	7.9	8.6
2	11.9	11.5	11.7	12.4	12.1	12.3	12.3	10.6	11.3	9.4	8.6	9.0
3	11.7	11.4	11.5	12.6	12.0	12.2	11.6	9.9	10.8	8.8	7.5	8.3
4	11.8	11.1	11.3	12.5	11.8	12.0	9.8	9.1	9.3	8.0	7.0	7.5
5	11.8	11.6	11.7	12.3	11.7	11.9	10.3	8.9	9.6	9.2	7.5	8.5
6	11.6	11.3	11.4	13.3	13.1	13.2	11.9	10.0	10.8	9.4	8.9	9.2
7	11.6	11.1	11.2	13.3	13.0	13.2	11.4	10.8	11.1	9.4	8.8	9.1
8	11.5	11.2	11.3	13.5	13.0	13.3	10.7	10.3	10.5	9.3	8.7	8.9
9	11.9	9.7	11.3	13.6	13.0	13.3	11.7	9.9	10.7	8.8	8.2	8.5
10	12.1	11.8	12.0	13.6	13.0	13.3	11.5	10.8	11.2	9.3	8.4	8.8
11	12.4	12.0	12.3	13.3	12.6	13.0	10.9	10.0	10.5	9.5	8.4	8.9
12	12.3	11.2	12.1	13.0	12.5	12.8	10.2	9.4	9.8	9.6	8.8	9.2
13	12.4	10.8	11.9	12.6	11.9	12.3	10.2	8.9	9.5	9.7	9.0	9.3
14	---	---	---	12.3	11.5	11.9	10.2	9.5	9.9	9.4	8.9	9.2
15	12.1	11.1	11.6	11.8	10.9	11.4	10.5	9.7	10.1	9.2	8.0	8.6
16	12.7	12.3	12.4	13.1	10.5	11.6	10.4	9.7	10.1	8.5	7.5	7.9
17	12.4	10.5	11.6	13.2	12.3	12.8	10.1	9.3	9.7	7.5	7.0	7.3
18	11.1	10.6	10.8	13.1	12.0	12.6	9.7	8.8	9.4	9.1	7.1	7.9
19	11.1	10.7	10.9	13.5	12.0	12.8	8.8	7.6	8.1	9.4	8.9	9.2
20	12.3	10.4	10.7	14.6	12.3	13.3	10.1	7.0	8.2	11.5	9.0	10.0
21	11.4	10.0	10.3	14.8	13.7	14.2	12.6	8.8	9.7	10.9	9.7	10.2
22	10.5	9.8	10.1	14.9	13.8	14.3	9.9	8.8	9.5	9.6	8.8	9.2
23	11.2	10.1	10.6	15.3	13.7	14.5	9.0	8.3	8.7	8.6	7.5	8.2
24	11.5	10.7	11.1	15.6	13.9	14.8	11.0	8.0	9.6	7.5	6.8	7.2
25	11.8	10.9	11.3	14.9	13.8	14.2	11.2	10.8	11.0	7.1	6.4	6.7
26	11.8	11.3	11.6	14.8	12.9	13.6	11.4	10.6	11.0	8.0	6.1	6.9
27	12.6	10.2	11.7	13.1	12.0	12.4	12.0	9.5	10.7	8.5	7.5	8.1
28	12.7	12.2	12.4	12.5	10.9	11.7	11.8	9.3	10.5	8.3	7.4	7.8
29	---	---	---	11.8	10.1	10.9	9.5	9.0	9.2	9.1	7.1	8.0
30	---	---	---	11.6	9.5	10.2	9.1	8.4	8.8	9.4	8.8	9.2
31	---	---	---	11.2	9.7	10.2	---	---	---	9.2	8.2	8.7
MONTH				15.6	9.5	12.7	12.6	7.0	10.0	11.5	6.1	8.5

05331005 MISSISSIPPI RIVER AT INDUSTRIAL MOLASSES, ST PAUL, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.6	8.1	8.3	7.1	6.8	7.0	7.0	6.5	6.8	8.3	8.2	8.2
2	8.2	7.9	8.0	7.1	6.7	6.9	6.8	6.3	6.6	8.7	8.3	8.4
3	7.8	7.4	7.6	6.8	6.4	6.7	7.4	6.7	7.0	8.8	8.3	8.5
4	7.9	7.1	7.5	6.6	6.2	6.4	7.7	7.0	7.4	8.8	8.2	8.5
5	8.3	7.0	7.6	6.3	5.7	6.0	7.9	7.3	7.6	8.8	8.4	8.6
6	7.8	6.8	7.4	7.1	5.1	6.0	7.5	6.9	7.1	8.9	8.2	8.6
7	6.8	5.4	6.0	7.3	6.8	7.0	7.3	6.2	6.8	9.0	8.1	8.4
8	7.2	4.8	5.9	7.1	6.7	6.9	6.9	6.5	6.7	9.1	8.1	8.6
9	6.8	6.3	6.6	7.6	6.6	7.1	6.9	6.6	6.7	9.7	8.9	9.3
10	7.4	6.0	6.7	7.7	7.2	7.4	7.9	6.5	7.1	10.1	9.0	9.7
11	7.7	6.4	7.0	7.4	6.1	6.7	8.2	7.5	7.8	10.9	8.8	9.8
12	6.9	5.7	6.3	5.9	5.7	5.8	7.9	7.5	7.7	11.1	9.8	10.5
13	6.0	5.0	5.4	6.9	4.9	5.6	7.9	7.2	7.6	10.7	9.6	10.1
14	5.2	4.6	4.9	6.8	6.3	6.6	9.5	6.7	7.7	10.3	8.7	9.4
15	7.5	4.5	5.7	6.7	6.3	6.5	7.1	6.5	6.9	10.0	9.5	9.7
16	8.2	7.2	7.7	7.9	7.2	7.6	7.0	5.8	6.3	10.1	9.2	9.5
17	8.0	7.5	7.7	7.7	7.2	7.5	7.3	5.4	6.2	9.9	9.2	9.5
18	7.6	7.4	7.6	7.4	6.9	7.2	7.7	7.1	7.3	10.2	9.4	9.8
19	8.2	7.3	7.7	6.9	6.3	6.6	8.2	7.8	7.9	10.5	9.9	10.1
20	8.5	8.0	8.3	7.0	5.9	6.4	8.4	7.6	7.9	10.7	9.7	10.1
21	8.0	7.8	7.9	6.9	6.2	6.4	8.3	7.7	8.0	10.6	9.6	9.9
22	8.3	7.3	7.7	6.8	6.4	6.6	7.8	6.9	7.5	9.8	8.7	9.4
23	7.8	7.4	7.6	7.8	6.8	7.1	7.2	6.5	6.8	9.7	8.1	9.0
24	7.7	7.3	7.5	7.8	6.9	7.4	6.4	5.6	6.0	9.1	8.5	8.9
25	7.5	7.2	7.3	7.1	6.8	6.9	7.9	5.2	6.7	9.4	8.9	9.2
26	7.3	6.6	7.0	7.1	6.6	6.8	7.1	6.1	6.6	8.9	8.3	8.6
27	6.8	6.5	6.6	7.1	6.7	6.9	5.9	4.6	5.4	9.2	8.4	8.8
28	6.8	6.4	6.7	7.1	6.6	6.9	7.3	3.5	5.2	10.1	8.1	8.9
29	7.1	6.9	7.0	7.2	6.9	7.1	7.2	6.7	6.9	10.3	8.8	9.6
30	7.2	7.1	7.2	7.2	7.0	7.1	6.9	6.5	6.7	10.3	9.4	10.0
31	---	---	---	7.2	6.9	7.0	8.2	6.5	7.2	---	---	---
MONTH	8.6	4.5	7.1	7.9	4.9	6.8	9.5	3.5	7.0	11.1	8.1	9.3

05331540 MISSISSIPPI RIVER AT HIGHWAY 494, AT NEWPORT, MN

LOCATION.--Lat 44°52'58", long 93°00'56", in NE¼NE¼SW¼ sec. 26, T.28 N., R.22 W., Washington County, Hydrologic Unit 07010206, at midstream, and at mile 832.5 (1,340 km) upstream from Ohio River.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--Water year 1977 to current year (discontinued).

REMARKS.--Water discharge computed on the basis of discharge for Mississippi River at St. Paul (station 05331000) adjusted for inflow and travel time. 1980 water-year data are also reported for this station.

COOPERATION.--Samples collected by the Metropolitan Waste Control Commission, St. Paul, MN.

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	FLUORIDE, TOTAL (MG/L AS F) (00951)
OCT								
31...	0935	10700	628	8.0	9.5	11.1	99	.1
NOV								
23...	0930	16300	557	8.0	11.0	6.9	64	.0
DEC								
11...	0910	11500	686	7.9	.5	14.5	104	.1
FEB								
05...	0945	6730	620	7.9	.0	13.4	94	.7
APR								
02...	1100	20800	445	7.5	5.0	13.3	107	.2
JUN								
11...	1220	22200	580	7.7	20.0	8.0	90	.5
AUG								
25...	0855	5500	530	7.9	23.0	6.3	70	.2

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)
OCT									
31...	2	100	0	80	1	8	9	620	7
NOV									
23...	5	100	0	80	1	0	6	520	5
DEC									
11...	5	100	10	50	0	4	2	370	0
FEB									
05...	1	100	0	80	0	12	3	260	0
APR									
02...	2	200	0	70	1	13	4	790	1
JUN									
11...	3	100	10	60	0	10	8	1900	4
AUG									
25...	4	100	0	60	0	12	4	630	5

DATE	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	CYANIDE TOTAL (MG/L AS CN) (00720)
OCT								
31...	120	<.1	2	11	1	0	20	.01
NOV								
23...	150	<.1	3	12	0	0	20	.02
DEC								
11...	70	<.1	2	4	1	0	20	.01
FEB								
05...	90	<.1	1	10	0	0	20	.01
APR								
02...	130	.1	0	11	0	0	10	.01
JUN								
11...	170	<.1	2	9	1	0	20	.01
AUG								
25...	190	<.1	3	13	1	0	20	.00

05331540 MISSISSIPPI RIVER AT HIGHWAY 494, AT NEWPORT, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	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)
SEP 17...	0940	10200	420	7.8	17.0	8.6	91	.2	2	0	0	100

DATE	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	CHRO-MIUM, HEXA-VALENT, DIS. (UG/L AS CR) (01032)	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)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	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)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
SEP 17...	0	2	0	6	40	1	20	<.1	6	0	0	20

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	FLUO-RIDE, TOTAL (MG/L AS F) (00951)
OCT 15...	1035	5400	435	8.8	11.0	11.9	110	.5
DEC 09...	1115	4090	500	8.1	2.0	12.5	93	.0
FEB 10...	1040	3320	419	7.9	.5	10.2	73	.4
APR 07...	1145	8450	440	8.0	9.5	11.5	103	.2
JUN 12...	1115	7370	485	7.6	22.0	7.0	81	.1
SEP 03...	0945	19300	575	7.9	20.0	8.4	95	.2

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOV-ERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)
OCT 15...	2	100	0	120	0	13	4	520	7
DEC 09...	1	<50	0	70	1	10	5	300	5
FEB 10...	1	100	0	140	0	6	7	240	9
APR 07...	0	100	10	110	1	11	4	600	18
JUN 12...	0	100	10	90	1	8	8	610	10
SEP 03...	4	100	<10	60	<1	13	9	1200	4

05331540 MISSISSIPPI RIVER AT HIGHWAY 494, AT NEWPORT, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	CYANIDE TOTAL (MG/L AS CN) (00720)
OCT 15...	140	<.1	2	6	0	0	40	.00
DEC 09...	90	<.1	0	10	0	1	50	.00
FEB 10...	110	<.1	1	13	0	0	30	<.01
APR 07...	130	<.1	2	13	0	0	60	<.01
JUN 12...	200	<.1	1	11	1	0	40	<.01
SEP 03...	120	<.1	7	5	2	<1	20	<.01

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)
SEP 03...	0945	19300	575	7.9	20.0	8.4	95	.2	4	100	<10

DATE	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
SEP 03...	50	<1	12	6	30	1	30	<.1	<1	<1	10

05331545 MISSISSIPPI RIVER AT FIFTH STREET AT NEWPORT, MN

WATER-QUALITY RECORDS

LOCATION.--Lat 44°51'37", long 93°00'24", in NE¼NE¼ sec.2, T.27 N., R.22 W., Washington County, Hydrologic Unit 07010206, on left bank at the end of Fifth Street, and at mile 830.6 (1,337 km) upstream from Ohio River.

PERIOD OF RECORD.--December 1978 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: December 1978 to current year.
pH: December 1978 to current year.
WATER TEMPERATURES: December 1978 to current year.
DISSOLVED OXYGEN: December 1978 to current year.

INSTRUMENTATION.--Water-quality monitor since December 1978.

REMARKS.-Water is pumped to a monitor that is inside a heated shelter. Extremes are published for those years with 80 percent or more daily record.

COOPERATION.--Water-quality monitor is operated by the Metropolitan Waste Control Commission, St. Paul, Minn.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water year 1981): Maximum, 763 micromhos Sept. 11, 1981; minimum, 288 micromhos Mar. 2, 1981.
pH (water year 1981): Maximum, 8.6 units Apr. 18, 1981; minimum, 7.3 units June 28, 29, 1981.
WATER TEMPERATURES (water year 1981): Maximum, 27.5°C July 10, 1981; minimum, 0.0°C Jan. 13, 1981.
DISSOLVED OXYGEN (water year 1981): Maximum, 15.7 mg/L Mar. 25, 1981; minimum, 4.1 mg/L Apr. 20, 28, 1981.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 763 micromhos Sept. 11; minimum, 288 micromhos Mar. 2.
pH: Maximum, 8.6 units Apr. 18; minimum, 7.3 units June 28, 29.
WATER TEMPERATURES: Maximum, 27.5°C July 10; minimum, 0.0°C Jan. 13.
DISSOLVED OXYGEN: Maximum, 15.7 mg/L Mar. 25; minimum, 4.1 mg/L Apr. 20, 28.

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	478	445	463	---	---	---	599	463	530	471	437	456
2	479	455	464	---	---	---	596	502	524	441	418	425
3	498	478	490	---	---	---	575	438	495	474	443	459
4	506	478	493	---	---	---	544	433	455	479	436	375
5	589	476	499	532	504	523	596	447	527	516	495	340
6	599	477	538	532	501	509	580	394	477	529	492	515
7	594	484	520	597	504	540	438	391	415	491	455	470
8	518	508	512	599	492	540	564	406	472	487	471	481
9	567	526	546	599	496	515	568	417	503	495	464	481
10	530	475	514	525	500	513	557	421	482	518	475	497
11	545	480	522	510	462	494	---	---	---	527	502	514
12	529	503	519	490	462	478	---	---	---	533	437	499
13	529	505	520	528	486	504	---	---	---	548	430	476
14	539	513	528	534	487	511	---	---	---	515	442	478
15	596	465	504	586	481	507	---	---	---	538	506	525
16	588	478	533	581	467	496	511	474	496	504	478	491
17	582	460	513	599	461	555	524	479	511	542	477	522
18	599	497	522	595	465	510	506	467	488	535	496	545
19	597	492	510	586	467	499	494	465	484	535	479	492
20	597	455	518	584	465	506	542	494	513	526	440	506
21	---	---	---	599	491	530	557	514	534	577	495	543
22	---	---	---	598	488	551	---	---	---	538	495	522
23	---	---	---	528	476	511	551	506	516	520	498	509
24	---	---	---	496	473	484	531	484	495	538	474	506
25	---	---	---	590	478	556	530	485	514	553	528	540
26	---	---	---	580	461	476	474	459	468	506	475	489
27	---	---	---	585	489	512	537	455	503	597	503	533
28	---	---	---	535	515	527	526	499	517	536	515	524
29	---	---	---	549	507	534	483	458	470	559	513	537
30	---	---	---	598	500	556	477	461	470	542	531	536
31	---	---	---	---	---	---	456	438	446	586	508	547
MONTH										597	418	495

05331545 MISSISSIPPI RIVER AT FIFTH STREET AT NEWPORT, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	339	304	321	598	418	461	508	368	390
2	---	---	---	310	288	302	556	408	474	373	349	360
3	---	---	---	508	298	376	549	423	486	505	376	416
4	595	532	554	425	389	404	597	446	498	504	360	387
5	589	523	547	421	398	409	558	430	476	501	341	383
6	588	493	540	430	405	422	529	412	442	---	---	---
7	579	492	513	447	416	439	541	425	449	---	---	---
8	519	505	509	448	433	439	584	463	527	438	410	423
9	---	---	---	459	427	448	582	467	500	472	434	459
10	---	---	---	449	434	443	598	487	503	---	---	---
11	569	469	517	465	442	459	598	494	507	---	---	---
12	568	426	502	482	458	470	526	502	515	495	471	482
13	529	392	429	497	446	473	517	503	511	517	486	500
14	560	415	457	495	454	471	549	497	516	527	491	505
15	604	414	483	550	426	464	598	473	520	599	466	519
16	710	611	668	540	416	438	584	469	487	563	462	477
17	670	548	619	558	428	456	493	461	478	487	464	477
18	599	542	571	443	402	428	495	462	478	596	462	482
19	598	525	560	455	422	436	473	419	443	---	---	---
20	598	475	552	463	428	445	436	417	426	599	499	536
21	598	468	536	545	434	453	519	407	456	582	515	540
22	589	415	505	554	432	481	525	471	500	537	508	523
23	559	435	494	540	422	452	595	474	484	550	507	528
24	567	399	502	524	421	496	590	466	507	595	478	536
25	585	396	471	506	474	495	480	468	473	597	497	517
26	576	426	493	516	462	489	589	471	539	539	500	515
27	525	357	446	528	469	501	469	425	445	587	492	545
28	346	295	318	576	461	490	522	407	449	577	478	492
29	---	---	---	589	442	513	539	390	459	518	492	505
30	---	---	---	557	452	478	502	368	403	547	498	525
31	---	---	---	538	421	456	---	---	---	---	---	---
MONTH				589	288	447	598	368	480			

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	507	470	491	595	457	547	594	467	584	---	---	---
2	510	495	502	597	501	525	578	469	564	690	674	683
3	549	496	510	552	535	545	585	535	577	703	611	657
4	565	490	507	557	536	552	601	570	584	718	696	709
5	523	496	508	538	523	527	579	527	557	726	709	716
6	558	513	538	545	524	533	565	544	552	718	700	706
7	597	456	504	569	548	561	585	547	567	720	668	694
8	550	413	484	568	549	558	572	504	547	682	682	682
9	---	---	---	572	471	555	497	461	470	704	660	678
10	595	500	551	579	468	567	540	459	488	689	658	675
11	596	467	557	597	538	575	504	474	489	763	626	643
12	594	461	534	551	366	459	484	465	475	694	572	596
13	594	463	538	560	452	552	474	459	467	608	578	594
14	589	358	499	563	549	556	454	395	425	600	587	591
15	506	362	399	569	532	552	486	394	421	603	559	575
16	518	412	496	577	529	557	511	436	477	585	497	543
17	552	432	519	599	502	565	455	443	450	558	535	546
18	565	447	523	532	513	519	528	468	506	561	524	548
19	582	466	539	597	500	523	521	466	494	551	513	529
20	598	476	565	597	502	548	547	510	528	520	499	511
21	539	503	521	589	479	578	548	533	541	555	482	522
22	598	500	527	595	497	542	592	544	562	499	463	481
23	---	---	---	517	503	509	591	527	545	---	---	---
24	582	477	558	521	486	501	537	524	531	---	---	---
25	565	455	541	544	508	518	538	485	512	---	---	---
26	599	467	558	547	502	530	524	471	488	---	---	---
27	598	430	529	503	434	459	578	470	514	---	---	---
28	518	331	401	482	440	456	491	423	457	---	---	---
29	512	337	393	511	467	485	576	493	543	---	---	---
30	552	429	523	554	512	537	620	602	612	---	---	---
31	---	---	---	584	552	571	669	612	644	---	---	---
MONTH				599	366	534	669	394	522			

05331545 MISSISSIPPI RIVER AT FIFTH STREET AT NEWPORT, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	7.8	7.8	7.8	---	---	---	7.9	7.8	7.9	8.1	8.0	8.0
2	7.9	7.8	7.8	---	---	---	7.9	7.8	7.8	8.0	8.0	8.0
3	7.9	7.8	7.8	---	---	---	8.1	7.8	7.9	8.0	8.0	8.0
4	7.9	7.8	7.8	---	---	---	8.1	7.9	8.0	8.1	8.0	8.0
5	7.9	7.8	7.9	7.8	7.8	7.8	8.1	7.9	8.0	8.1	8.0	8.1
6	7.9	7.9	7.9	7.9	7.8	7.8	8.1	8.0	8.0	8.0	8.0	8.0
7	8.0	7.9	7.9	7.9	7.8	7.9	8.1	8.0	8.0	8.1	8.0	8.0
8	8.0	7.9	7.9	7.9	7.8	7.8	8.0	7.9	7.9	8.1	8.0	8.1
9	7.9	7.8	7.9	7.9	7.8	7.8	7.9	7.8	7.8	8.1	8.0	8.0
10	8.0	7.8	7.9	7.9	7.8	7.8	8.1	7.8	7.9	8.1	8.0	8.0
11	8.1	7.9	8.0	7.9	7.8	7.9	---	---	---	8.1	8.0	8.0
12	8.0	7.9	8.0	7.8	7.8	7.8	---	---	---	8.0	8.0	8.0
13	8.0	7.9	8.0	7.8	7.8	7.8	---	---	---	8.0	8.0	8.0
14	8.0	7.9	7.9	7.9	7.8	7.9	---	---	---	8.0	8.0	8.0
15	8.1	8.0	8.0	7.9	7.8	7.8	---	---	---	8.0	8.0	8.0
16	8.1	8.0	8.0	7.9	7.8	7.8	8.0	8.0	8.0	8.0	8.0	8.0
17	8.0	7.8	7.9	7.9	7.8	7.8	8.0	8.0	8.0	8.0	8.0	8.0
18	7.8	7.7	7.8	7.9	7.8	7.8	8.1	8.0	8.0	8.0	8.0	8.0
19	7.8	7.6	7.7	7.9	7.8	7.8	8.1	8.0	8.0	8.0	8.0	8.0
20	7.8	7.7	7.7	7.9	7.8	7.8	8.0	8.0	8.0	8.0	8.0	8.0
21	---	---	---	7.9	7.8	7.8	8.0	8.0	8.0	8.0	8.0	8.0
22	---	---	---	7.8	7.8	7.8	8.1	8.0	8.0	8.0	8.0	8.0
23	---	---	---	7.9	7.8	7.8	8.1	8.0	8.0	8.0	8.0	8.0
24	---	---	---	7.9	7.8	7.8	8.1	8.0	8.0	8.0	8.0	8.0
25	---	---	---	7.9	7.8	7.8	8.1	8.0	8.0	8.0	8.0	8.0
26	---	---	---	7.9	7.8	7.8	8.1	8.0	8.1	8.0	8.0	8.0
27	---	---	---	7.8	7.8	7.8	8.1	8.0	8.1	8.0	8.0	8.0
28	---	---	---	7.9	7.8	7.8	8.1	8.0	8.0	8.0	8.0	8.0
29	---	---	---	7.9	7.8	7.8	8.1	8.0	8.1	8.0	8.0	8.0
30	---	---	---	7.9	7.8	7.8	8.0	8.0	8.0	8.0	8.0	8.0
31	---	---	---	---	---	---	8.0	8.0	8.0	8.0	8.0	8.0
MONTH										8.1	8.0	8.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	8.0	8.0	8.0	8.1	8.0	8.0	8.1	7.9	7.9	7.9	7.8	7.8
2	8.0	8.0	8.0	8.1	8.0	8.0	8.0	7.9	8.0	8.0	7.8	7.9
3	8.0	8.0	8.0	8.1	7.9	7.9	8.0	7.9	8.0	7.9	7.7	7.8
4	8.0	8.0	8.0	8.1	8.0	8.0	8.0	7.8	7.9	7.7	7.6	7.6
5	8.0	8.0	8.0	8.1	8.0	8.0	8.1	7.9	8.0	7.7	7.5	7.6
6	8.0	8.0	8.0	8.2	8.0	8.1	8.1	7.9	8.0	7.7	7.6	7.6
7	8.0	8.0	8.0	8.1	8.0	8.0	8.1	8.0	8.0	8.0	7.6	7.8
8	8.0	8.0	8.0	8.1	8.0	8.1	8.1	7.9	8.0	8.0	7.9	8.0
9	8.0	8.0	8.0	8.3	8.1	8.1	8.0	7.9	7.9	8.1	7.9	8.0
10	8.0	8.0	8.0	8.2	8.1	8.2	8.0	7.9	7.9	8.1	8.0	8.0
11	8.0	8.0	8.0	8.2	8.1	8.2	8.0	7.9	7.9	8.1	8.0	8.0
12	8.0	8.0	8.0	8.2	8.1	8.1	7.9	7.8	7.9	8.1	8.0	8.1
13	8.0	8.0	8.0	8.3	8.2	8.2	7.9	7.8	7.8	8.2	8.0	8.1
14	8.0	8.0	8.0	8.3	8.2	8.2	7.9	7.7	7.8	8.3	8.1	8.2
15	8.0	8.0	8.0	8.4	8.2	8.3	7.9	7.8	7.9	8.2	8.1	8.1
16	8.0	8.0	8.0	8.4	8.3	8.3	8.4	7.9	8.2	8.2	8.1	8.2
17	8.0	8.0	8.0	8.3	8.2	8.3	8.5	8.3	8.4	8.1	8.1	8.1
18	8.0	8.0	8.0	8.4	8.3	8.3	8.6	8.4	8.5	8.1	8.0	8.1
19	8.0	8.0	8.0	8.4	8.0	8.2	8.5	8.4	8.4	8.1	8.0	8.0
20	8.0	8.0	8.0	8.2	8.1	8.1	8.5	8.4	8.5	8.4	7.9	8.2
21	8.0	8.0	8.0	8.2	8.1	8.1	8.5	7.6	8.0	8.4	8.3	8.3
22	8.0	8.0	8.0	8.1	8.0	8.1	8.0	7.6	7.8	8.3	8.2	8.2
23	8.0	8.0	8.0	8.1	8.0	8.1	7.9	7.8	7.9	8.2	8.1	8.2
24	8.0	8.0	8.0	8.2	8.1	8.1	7.9	7.7	7.8	8.4	7.9	8.0
25	8.0	7.9	8.0	8.1	8.1	8.1	7.9	7.7	7.8	8.4	7.8	8.0
26	8.0	7.9	8.0	8.2	8.1	8.1	8.1	7.8	7.9	7.9	7.7	7.8
27	8.0	7.9	8.0	8.2	8.1	8.1	8.1	7.9	8.0	8.0	7.6	7.9
28	8.2	8.0	8.1	8.2	8.1	8.1	8.0	7.8	7.9	8.0	7.8	7.9
29	---	---	---	8.1	8.0	8.1	7.9	7.7	7.8	8.2	7.8	8.0
30	---	---	---	8.1	8.0	8.0	7.9	7.7	7.8	8.2	8.1	8.0
31	---	---	---	8.1	7.9	8.0	---	---	---	8.1	7.9	8.0
MONTH	8.2	7.9	8.0	8.4	7.9	8.1	8.6	7.6	8.0	8.4	7.5	8.0

05331545 MISSISSIPPI RIVER AT FIFTH STREET AT NEWPORT, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	7.5	7.4	7.4	8.0	7.7	7.9	8.1	8.0	8.0
2	---	---	---	7.5	7.4	7.5	7.9	7.8	7.9	8.1	8.0	8.0
3	---	---	---	7.6	7.5	7.5	7.9	7.8	7.9	8.1	8.0	8.1
4	8.0	7.9	7.9	7.5	7.4	7.5	7.9	7.9	7.9	8.2	8.1	8.2
5	8.1	7.8	8.0	7.6	7.4	7.5	8.0	7.9	8.0	8.2	8.2	8.2
6	8.1	7.9	8.0	7.6	7.4	7.4	8.0	7.9	8.0	8.3	8.2	8.2
7	8.1	7.7	7.9	7.6	7.5	7.6	8.0	7.9	8.0	8.3	8.2	8.2
8	7.9	7.7	7.8	7.6	7.6	7.6	8.0	7.9	8.0	8.3	8.2	8.2
9	8.0	7.8	7.9	7.7	7.6	7.6	8.0	7.9	7.9	8.3	8.2	8.2
10	8.1	7.9	7.9	7.7	7.6	7.7	8.0	7.9	8.0	8.3	8.2	8.2
11	8.0	7.9	7.9	7.7	7.6	7.7	8.1	8.0	8.0	8.3	8.2	8.2
12	7.9	7.8	7.8	7.6	7.5	7.5	8.1	8.0	8.0	8.3	8.2	8.2
13	7.8	7.6	7.7	7.6	7.5	7.6	8.1	8.0	8.0	8.3	8.1	8.2
14	7.8	7.6	7.7	7.6	7.6	7.6	8.1	8.0	8.0	8.4	8.1	8.2
15	7.7	7.7	7.7	7.6	7.5	7.6	8.0	7.9	8.0	8.4	8.2	8.3
16	7.9	7.8	7.9	7.6	7.5	7.6	8.1	8.0	8.0	8.4	8.3	8.3
17	8.0	7.8	7.8	7.6	7.6	7.6	8.0	7.9	8.0	8.3	8.2	8.2
18	7.9	7.8	7.8	7.6	7.6	7.6	8.0	7.9	7.9	8.2	8.1	8.2
19	7.8	7.7	7.8	7.7	7.6	7.6	8.1	7.9	8.0	8.2	8.1	8.1
20	7.7	7.7	7.7	7.6	7.6	7.6	8.1	7.9	8.0	8.2	8.1	8.1
21	7.9	7.7	7.8	7.7	7.6	7.6	8.0	8.0	8.0	8.3	8.0	8.2
22	7.7	7.6	7.7	7.7	7.6	7.6	8.0	8.0	8.0	8.4	8.3	8.3
23	7.8	7.5	7.7	7.7	7.6	7.6	8.0	7.9	8.0	---	---	---
24	7.6	7.5	7.6	7.8	7.7	7.7	8.0	7.9	8.0	---	---	---
25	7.6	7.6	7.6	7.8	7.7	7.7	8.0	7.9	7.9	---	---	---
26	7.7	7.6	7.6	7.8	7.7	7.8	7.9	7.8	7.8	---	---	---
27	7.6	7.4	7.5	7.8	7.7	7.7	7.9	7.6	7.7	---	---	---
28	7.4	7.3	7.4	7.8	7.7	7.7	7.8	7.6	7.7	---	---	---
29	7.4	7.3	7.3	7.9	7.8	7.8	7.9	7.8	7.8	---	---	---
30	7.5	7.4	7.4	7.9	7.8	7.8	7.9	7.9	7.9	---	---	---
31	---	---	---	7.9	7.9	7.9	8.0	7.9	7.9	---	---	---
MONTH				7.9	7.4	7.6	8.1	7.6	7.9			

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	16.0	15.5	15.5	---	---	---	4.5	4.0	4.5	1.0	.5	.5
2	15.5	15.5	15.5	---	---	---	3.5	3.0	3.0	1.0	.5	.5
3	15.5	15.0	15.5	---	---	---	3.0	3.0	3.0	1.0	.5	.5
4	15.5	15.0	15.0	---	---	---	3.5	3.0	3.0	1.0	.5	1.0
5	15.0	14.5	14.5	---	---	---	3.5	3.5	3.5	.5	.5	.5
6	15.0	14.0	14.5	8.0	7.5	7.5	3.5	3.0	3.5	.5	.5	.5
7	15.0	14.5	14.5	8.0	7.5	8.0	3.5	3.0	3.5	1.0	.5	.5
8	15.0	14.5	15.0	8.0	7.5	8.0	3.5	3.0	3.0	.5	.5	.5
9	15.5	15.0	15.0	7.5	7.0	7.5	3.0	2.5	3.5	1.0	.5	.5
10	16.0	15.5	15.5	7.0	7.0	7.0	3.0	1.0	2.0	1.0	.5	1.0
11	15.5	14.5	15.0	7.0	7.0	7.0	---	---	---	1.0	.5	1.0
12	15.0	14.5	14.5	7.0	6.5	7.0	---	---	---	1.0	.5	.5
13	14.5	14.0	14.5	7.0	6.5	6.5	---	---	---	.5	.0	.5
14	14.0	13.5	14.0	7.0	6.5	6.5	---	---	---	.5	.5	.5
15	12.0	11.5	11.5	6.5	6.0	6.5	---	---	---	1.0	.5	1.0
16	12.0	11.5	11.5	6.5	6.0	6.0	1.0	1.0	1.0	1.0	.5	1.0
17	11.5	11.0	11.5	6.5	6.0	6.0	1.5	.5	1.0	1.5	1.0	1.0
18	16.0	11.0	11.5	6.5	6.0	6.0	1.0	.5	1.0	1.0	1.0	1.0
19	16.0	11.0	11.5	6.0	6.0	6.0	1.0	.5	.5	1.5	1.0	1.0
20	11.5	10.5	11.0	6.0	5.5	6.0	1.0	.5	.5	1.5	1.0	1.5
21	---	---	---	6.0	5.5	6.0	1.5	1.0	1.0	1.5	1.0	1.5
22	---	---	---	6.0	5.5	5.5	1.0	1.0	1.0	1.5	1.5	1.5
23	---	---	---	6.0	5.5	5.5	1.0	1.0	1.0	1.5	1.0	1.5
24	---	---	---	5.5	5.0	5.5	.5	.5	.5	1.5	1.0	1.0
25	---	---	---	5.5	5.0	5.0	1.0	.5	1.0	1.0	1.0	1.0
26	---	---	---	5.0	4.5	5.0	1.5	1.0	1.0	1.0	.5	1.0
27	---	---	---	5.0	4.5	4.5	1.5	1.0	1.0	1.0	.5	1.0
28	---	---	---	5.0	4.5	4.5	1.5	1.0	1.0	1.5	1.0	1.0
29	---	---	---	5.0	4.5	4.5	1.0	1.0	1.0	1.5	1.0	1.5
30	---	---	---	4.5	4.5	4.5	1.0	1.0	1.0	1.5	1.0	1.0
31	---	---	---	---	---	---	1.0	1.0	1.0	1.0	.5	1.0
MONTH										1.5	.0	1.0

05331545 MISSISSIPPI RIVER AT FIFTH STREET AT NEWPORT, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	4.0	3.0	3.5	11.0	10.5	11.0	13.5	13.0	13.5
2	---	---	---	3.5	3.0	3.0	11.5	10.5	11.0	14.5	13.5	13.5
3	---	---	---	3.5	3.5	3.5	11.0	10.5	10.5	14.0	14.0	14.0
4	1.5	1.0	1.0	3.5	3.5	3.5	10.5	10.0	10.5	14.5	14.0	14.0
5	1.0	1.0	1.0	3.5	3.0	3.5	10.0	9.5	10.0	15.5	14.0	14.5
6	1.0	1.0	1.0	3.5	3.0	3.5	9.5	9.0	9.5	15.5	14.5	15.0
7	1.0	1.0	1.0	4.0	3.5	3.5	10.0	9.0	9.5	15.5	15.0	15.0
8	1.0	.5	1.0	4.5	3.5	4.0	11.0	10.0	10.5	15.5	15.0	15.0
9	1.0	.5	1.0	4.5	4.0	4.5	11.5	10.5	11.0	15.5	14.5	15.0
10	1.0	.5	1.0	4.5	4.0	4.0	11.5	11.0	11.0	15.0	14.5	15.0
11	1.0	.5	1.0	5.0	4.0	4.5	11.5	11.0	11.5	15.0	14.0	14.5
12	1.0	.5	1.0	5.5	4.5	5.0	11.5	11.0	11.0	14.5	14.5	14.5
13	1.5	1.0	1.0	5.5	5.0	5.0	11.5	11.0	11.5	15.5	14.5	14.5
14	1.5	1.0	1.0	5.5	5.0	5.5	12.0	10.5	11.5	15.5	14.5	15.0
15	2.0	1.0	1.5	6.0	5.5	5.5	12.0	11.5	11.5	16.0	15.0	15.5
16	2.0	1.5	1.5	6.0	5.5	6.0	11.5	11.0	11.5	16.5	16.0	16.0
17	3.0	1.5	1.5	6.0	5.5	6.0	12.0	11.0	11.5	16.5	16.0	16.0
18	3.0	1.5	2.0	6.0	5.5	6.0	12.5	11.0	11.5	16.5	16.0	16.0
19	3.5	2.5	3.0	6.5	6.0	6.0	12.0	11.5	12.0	16.5	16.0	16.0
20	3.5	3.0	3.0	6.5	6.0	6.0	12.0	11.5	12.0	17.0	16.0	16.5
21	3.5	3.0	3.0	6.0	5.5	6.0	12.0	11.5	11.5	17.5	16.5	17.0
22	3.0	2.0	3.0	6.5	5.5	6.0	11.5	11.0	11.5	18.0	17.0	17.5
23	3.5	3.0	3.0	7.0	6.0	6.5	11.0	10.5	11.0	18.0	17.5	17.5
24	3.5	3.0	3.5	7.5	6.5	7.0	11.0	10.5	11.0	18.0	17.5	17.5
25	5.0	3.0	4.0	7.5	7.0	7.5	11.0	10.5	11.0	17.5	17.0	17.5
26	5.0	4.0	4.5	8.0	7.5	7.5	11.5	10.5	11.0	17.5	17.0	17.0
27	4.5	4.0	4.5	8.0	7.5	8.0	12.0	11.5	12.0	17.5	17.0	17.0
28	4.0	3.5	4.0	8.5	8.0	8.0	12.5	12.0	12.5	17.0	17.0	17.0
29	---	---	---	8.5	8.5	8.5	13.0	12.5	13.0	18.0	17.0	17.5
30	---	---	---	8.5	8.5	8.5	13.5	12.5	13.0	18.5	17.5	18.0
31	---	---	---	11.5	8.5	10.0	---	---	---	18.5	17.5	18.0
MONTH				11.5	3.0	5.5	13.5	9.0	11.5	18.5	13.0	16.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	18.5	18.0	18.0	22.0	21.5	22.0	24.0	23.0	23.5	21.0	20.5	21.0
2	20.5	18.0	19.0	22.5	22.0	22.0	24.0	23.0	23.5	21.0	20.5	20.5
3	20.5	19.5	20.0	23.0	22.5	22.5	24.0	22.5	24.0	21.0	20.5	20.5
4	20.5	19.5	20.0	23.0	22.5	23.0	24.5	23.0	24.5	20.5	20.0	20.5
5	21.0	20.5	21.0	23.5	23.0	23.0	25.0	24.5	24.5	20.5	20.0	20.5
6	21.5	20.5	21.0	24.0	23.5	24.0	26.5	23.5	25.0	20.5	20.0	20.0
7	22.0	20.5	21.5	25.0	24.5	24.5	25.0	24.5	25.0	21.0	20.5	20.5
8	21.0	21.0	21.0	25.0	24.5	24.5	25.0	24.5	24.5	20.5	20.0	20.5
9	22.0	21.0	21.5	26.0	24.5	25.0	24.5	24.0	24.5	21.0	20.0	20.5
10	22.5	21.5	22.0	27.5	26.5	27.0	25.0	23.5	24.0	21.0	20.5	20.5
11	22.5	21.5	22.0	27.0	26.5	26.5	24.0	23.5	24.0	21.5	20.5	21.0
12	22.0	21.5	22.0	26.5	26.0	26.5	24.5	23.5	24.0	21.5	20.5	21.5
13	22.5	21.5	22.0	26.5	26.0	26.5	24.5	24.0	24.5	22.0	21.5	21.5
14	22.0	22.0	22.0	26.5	26.0	26.0	24.5	24.5	24.5	21.5	21.0	21.5
15	22.0	21.5	22.0	26.0	25.5	25.5	24.5	24.0	24.5	21.0	20.5	20.5
16	21.5	21.0	21.5	25.5	25.0	25.5	24.5	23.5	24.0	20.5	19.5	20.0
17	21.5	20.5	21.0	25.5	25.0	25.5	24.0	23.0	23.5	20.0	18.5	19.5
18	21.0	21.0	21.0	26.0	25.5	26.0	24.5	23.0	23.5	19.0	18.5	18.5
19	21.0	20.5	21.0	26.5	26.0	26.0	25.0	23.0	24.0	18.5	18.0	18.0
20	21.0	20.0	20.5	26.5	26.5	26.5	25.0	25.0	25.0	18.5	17.5	18.0
21	20.5	20.0	20.0	26.5	26.0	26.5	25.0	25.0	25.0	18.5	18.0	18.0
22	20.0	19.5	20.0	26.5	25.5	26.0	25.0	25.0	25.0	19.0	18.0	18.0
23	20.0	19.5	19.5	25.5	25.0	25.5	25.5	24.5	25.0	---	---	---
24	20.0	19.5	20.0	25.0	24.5	25.0	25.5	25.0	25.0	---	---	---
25	20.0	19.5	20.0	25.0	25.0	25.0	25.0	22.5	24.0	---	---	---
26	21.0	20.5	21.0	25.0	24.5	25.0	22.5	22.0	22.0	---	---	---
27	21.5	20.5	21.0	25.0	24.0	24.0	24.5	21.5	21.5	---	---	---
28	21.5	21.5	21.5	24.0	23.0	24.0	21.5	20.5	21.0	---	---	---
29	21.5	21.0	21.5	23.0	22.5	23.0	20.5	20.5	20.5	---	---	---
30	21.5	21.0	21.5	23.0	22.5	23.0	21.0	20.5	20.5	---	---	---
31	---	---	---	23.0	23.0	23.0	21.0	20.5	21.0	---	---	---
MONTH	22.5	18.0	21.0	27.5	21.5	25.0	26.5	20.5	23.5			

05331545 MISSISSIPPI RIVER AT FIFTH STREET AT NEWPORT, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.8	9.4	9.6	---	---	---	13.3	12.1	13.0	9.0	6.4	7.5
2	9.5	9.2	9.4	---	---	---	12.9	12.6	12.8	11.4	8.1	9.6
3	9.5	9.3	9.4	---	---	---	12.4	12.0	12.2	11.8	10.2	10.7
4	10.0	9.5	9.7	---	---	---	12.4	11.7	12.0	10.2	8.9	9.8
5	10.4	9.9	10.1	---	---	---	---	---	---	10.4	8.1	9.6
6	10.8	10.3	10.5	10.9	10.4	10.6	---	---	---	10.4	10.1	10.3
7	10.9	10.4	10.7	11.9	10.3	11.1	---	---	---	---	---	---
8	10.6	10.4	10.5	11.9	11.5	11.7	---	---	---	---	---	---
9	10.1	9.5	9.8	12.0	11.6	11.8	---	---	---	---	---	---
10	9.7	9.1	9.4	14.0	11.9	12.3	---	---	---	---	---	---
11	9.4	9.1	9.3	12.4	12.2	12.3	---	---	---	---	---	---
12	9.5	9.2	9.3	12.4	12.3	12.3	---	---	---	---	---	---
13	10.2	9.5	9.9	12.4	9.3	11.2	---	---	---	---	---	---
14	10.4	10.2	10.3	9.8	9.5	9.8	---	---	---	11.8	10.1	10.8
15	10.5	10.2	10.4	9.9	9.7	9.8	---	---	---	12.0	8.4	9.4
16	10.6	10.3	10.5	10.2	9.8	10.0	13.0	12.2	12.6	9.4	8.5	9.1
17	10.6	10.3	10.4	10.6	10.2	10.3	---	---	---	10.6	9.1	9.6
18	10.7	10.3	10.5	10.6	10.3	10.4	9.4	8.5	9.0	14.0	10.6	11.4
19	10.6	10.1	10.4	10.4	9.8	10.3	9.5	7.8	8.5	12.0	11.0	11.2
20	10.8	10.4	10.6	10.4	10.1	10.2	9.2	8.6	9.0	10.9	10.1	10.5
21	---	---	---	10.6	10.2	10.3	9.7	8.8	9.1	10.6	8.9	9.9
22	---	---	---	10.6	10.1	10.3	11.8	9.0	10.3	10.3	7.6	8.2
23	---	---	---	---	---	---	12.1	11.1	11.7	10.0	7.7	8.0
24	---	---	---	---	---	---	13.7	10.6	11.4	11.5	7.5	8.9
25	---	---	---	---	---	---	11.5	10.4	11.0	10.6	8.2	9.4
26	---	---	---	---	---	---	10.9	10.3	10.6	11.4	9.9	10.7
27	---	---	---	12.9	10.6	11.7	10.6	10.3	10.4	11.6	10.6	11.2
28	---	---	---	14.0	12.8	13.5	11.9	10.9	11.2	10.9	7.1	9.4
29	---	---	---	14.5	13.8	14.1	11.0	9.7	10.3	7.2	6.5	6.8
30	---	---	---	14.1	13.6	13.7	8.1	7.1	7.6	7.9	6.5	7.3
31	---	---	---	---	---	---	7.5	6.3	7.0	10.5	8.4	8.9
MONTH												

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	12.0	11.6	11.8	12.8	9.8	11.5	14.1	11.5	12.3
2	---	---	---	14.2	11.8	12.4	11.0	9.5	10.2	14.0	11.5	12.2
3	---	---	---	14.2	11.9	12.7	11.5	9.6	10.6	11.8	10.5	11.3
4	10.5	8.7	9.3	12.2	11.8	12.0	11.3	7.9	9.6	10.0	7.4	8.8
5	11.5	10.6	11.1	12.3	11.7	12.0	9.8	7.3	8.5	10.5	6.6	8.0
6	11.7	10.6	11.0	12.7	11.9	12.4	13.4	9.7	11.2	11.2	10.1	10.8
7	11.9	9.6	10.6	13.1	12.3	12.7	13.7	11.8	12.7	11.5	8.8	10.6
8	10.8	9.7	10.2	13.1	12.4	12.8	11.9	10.6	11.2	9.7	8.9	9.3
9	11.7	10.5	11.0	13.5	12.7	13.1	13.1	10.0	11.3	9.6	8.3	9.0
10	11.0	9.7	10.6	13.8	12.9	13.5	12.9	11.9	12.4	11.7	9.5	10.4
11	11.2	10.1	10.5	13.7	12.2	12.9	12.4	11.7	12.1	14.0	10.6	11.7
12	10.4	9.9	10.2	12.6	12.0	12.3	11.8	11.1	11.4	11.5	9.1	10.7
13	10.3	9.5	9.8	13.1	11.7	12.4	11.2	9.9	10.8	10.9	9.9	10.5
14	10.4	9.5	9.8	12.8	10.8	11.5	13.3	9.3	11.1	11.5	9.8	10.8
15	11.1	9.4	10.4	11.2	10.5	10.8	14.1	10.2	11.9	11.8	10.3	11.0
16	10.7	8.7	9.4	11.2	10.3	10.7	10.6	9.5	10.2	10.5	9.8	10.1
17	11.8	9.9	10.2	13.4	10.7	12.2	10.4	9.2	9.7	9.9	8.9	9.4
18	11.0	9.8	10.3	13.9	13.3	13.7	9.3	7.5	8.7	10.4	8.6	9.4
19	11.2	10.6	10.9	14.0	12.4	13.2	7.2	5.1	6.1	12.0	9.9	10.9
20	11.4	10.6	10.9	13.8	13.0	13.4	8.6	4.1	6.0	11.5	9.8	10.7
21	11.0	10.1	10.6	15.1	13.7	14.6	13.9	6.7	10.6	12.2	10.6	11.2
22	10.9	9.6	10.2	15.5	14.6	15.1	11.9	7.6	9.4	10.6	8.0	9.8
23	11.6	10.1	10.9	15.2	13.8	14.9	8.2	6.6	7.5	8.2	6.7	7.6
24	11.8	10.2	11.0	15.2	14.0	14.8	9.4	6.7	7.9	6.5	4.4	5.7
25	11.8	10.7	11.3	15.7	13.7	14.6	9.3	7.9	8.9	8.0	5.0	5.8
26	12.5	10.7	11.6	14.2	13.3	13.8	7.9	6.7	7.3	7.8	5.6	6.4
27	11.6	10.7	11.2	13.8	12.1	12.9	6.5	4.4	5.5	10.1	6.3	7.5
28	12.2	11.0	11.7	12.1	11.4	11.8	10.5	4.1	7.8	10.6	9.0	9.9
29	---	---	---	11.5	10.4	10.9	10.6	9.7	10.0	11.7	8.9	10.4
30	---	---	---	10.8	8.5	9.5	11.9	9.1	10.5	11.6	9.8	10.7
31	---	---	---	13.3	6.9	9.9	---	---	---	9.8	6.4	7.8
MONTH				15.7	6.9	12.6	14.1	4.1	9.8	14.1	4.4	9.7

05331545 MISSISSIPPPI RIVER AT FIFTH STREET AT NEWPORT, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.0	5.3	6.8	7.0	6.9	7.0	6.0	5.8	5.8	---	---	---
2	9.0	6.3	7.5	7.2	6.9	7.0	5.8	5.7	5.8	---	---	---
3	7.7	6.7	7.1	7.1	6.9	6.9	5.8	5.7	5.8	---	---	---
4	8.5	6.0	7.0	7.4	6.9	7.0	6.0	5.8	5.8	---	---	---
5	10.2	7.0	9.2	7.7	6.7	7.0	5.8	5.8	5.8	---	---	---
6	8.1	6.9	7.5	7.2	6.7	6.8	6.4	5.8	6.0	---	---	---
7	---	---	---	6.8	6.7	6.7	6.4	6.4	6.4	---	---	---
8	---	---	---	6.7	6.7	6.7	6.4	6.4	6.4	---	---	---
9	---	---	---	6.7	6.2	6.6	6.4	6.4	6.4	---	---	---
10	---	---	---	6.2	6.1	6.2	6.4	5.8	6.4	---	---	---
11	---	---	---	6.1	6.1	6.1	6.4	6.3	6.4	---	---	---
12	---	---	---	6.1	6.1	6.1	6.4	6.3	6.4	---	---	---
13	---	---	---	6.1	6.1	6.1	6.4	6.3	6.4	---	---	---
14	---	---	---	6.1	6.1	6.1	6.4	6.4	6.4	---	---	---
15	---	---	---	6.2	5.9	6.1	6.4	6.4	6.4	---	---	---
16	---	---	---	6.0	5.9	5.9	6.4	6.4	6.4	---	---	---
17	---	---	---	8.0	5.9	6.3	6.4	6.4	6.4	---	---	---
18	---	---	---	8.0	5.9	7.1	6.4	6.3	6.3	7.8	7.6	7.7
19	6.8	6.8	6.8	7.9	5.9	7.2	6.8	6.3	6.5	7.9	7.3	7.6
20	6.8	6.7	6.8	7.9	5.9	6.8	6.7	6.7	6.7	7.8	6.7	7.3
21	6.8	6.7	6.7	5.9	5.9	5.9	6.8	6.7	6.7	7.8	6.7	7.2
22	6.7	6.7	6.7	7.9	5.9	6.6	6.7	6.7	6.7	7.8	6.8	7.4
23	7.0	6.7	6.8	7.9	5.9	7.5	6.7	6.7	6.7	---	---	---
24	7.2	6.9	7.0	6.0	6.0	6.0	6.7	6.7	6.7	---	---	---
25	7.2	6.9	7.0	6.0	6.0	6.0	6.7	6.7	6.7	---	---	---
26	7.2	6.9	7.0	6.0	6.0	6.0	6.7	6.7	6.7	---	---	---
27	8.2	6.8	7.1	6.0	6.0	6.0	6.7	6.7	6.7	---	---	---
28	7.2	6.9	6.9	6.0	5.8	5.9	6.7	5.9	6.3	---	---	---
29	6.9	6.9	6.9	5.8	5.8	5.8	5.9	5.9	5.9	---	---	---
30	6.9	6.8	6.9	5.8	5.7	5.7	5.9	5.9	5.9	---	---	---
31	---	---	---	5.8	5.7	5.7	5.9	5.9	5.9	---	---	---
MONTH				8.0	5.7	6.4	6.8	5.7	6.3			

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN

WATER-QUALITY RECORDS

LOCATION.--Lat 44°48'13", long 93°00'43", in NW¼NE¼ sec.26, T.27 N., R.22 W., Washington County, Hydrologic Unit 07010206, on left bank at the J. L. Shiely Co. loading dock, and at mile 826.2 (1,330 km) upstream from Ohio River.

PERIOD OF RECORD.--February 1977 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: September 1977 to current year.
pH: September 1977 to current year.
WATER TEMPERATURES: September 1977 to current year.
DISSOLVED OXYGEN: September 1977 to current year.

INSTRUMENTATION.--Water-quality monitor since September 1977.

REMARKS.--Water discharge computed on the basis of discharge for Mississippi River at St. Paul (station 05331000) adjusted for inflow and travel time. Extremes are published for years with 80 percent or more daily record.

COOPERATION.--Samples collected and water-quality monitor operated by the Metropolitan Waste Control Commission, St. Paul, MN.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water year 1981): Maximum, 696 micromhos Sept. 9, 1981; minimum, 318 micromhos Sept. 17, 1981.
pH (water year 1981): Maximum, 8.7 units May 13, Sept. 6, 7, 9, 13, 1981; minimum, 7.3 units Oct. 1, 9, 10, 1980, and Mar. 17, June 30, July 1, 2, 1981.
WATER TEMPERATURES (water year 1981): Maximum, 27.5°C July 8, 9, 1981; minimum, 0.0°C several days during winter period.
DISSOLVED OXYGEN (water year 1981): Maximum, 15.3 mg/L Mar. 24, 1981; minimum, 4.3 mg/L June 14, 1981.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 696 micromhos Sept. 9; minimum, 318 micromhos Sept. 17.
pH: Maximum, 8.7 units May 13, Sept. 6, 7, 9, 13; minimum, 7.3 units Oct. 1, 9, 10, Mar. 17, June 30, July 1, 2.
WATER TEMPERATURES: Maximum, 27.5°C July 8, 9; minimum, 0.0°C several days during winter period.
DISSOLVED OXYGEN: Maximum, 15.3 mg/L Mar. 24; minimum, 4.3 mg/L June 14.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	FLUORIDE, TOTAL (MG/L AS F) (00951)
OCT								
15...	1010	5530	435	8.5	11.0	9.2	85	.4
DEC								
09...	1045	4700	528	8.2	.0	12.9	91	.1
FEB								
12...	1200	2250	493	7.5	1.0	12.7	92	.4
APR								
07...	1115	8320	450	7.8	9.0	10.6	94	.1
JUN								
12...	1050	7770	485	7.5	21.5	7.4	86	.1
SEP								
03...	1020	20500	580	7.9	20.0	7.8	89	.3

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)
OCT									
15...	2	100	0	90	0	10	9	680	2
DEC									
09...	1	100	0	80	2	10	6	330	8
FEB									
12...	1	100	0	150	1	15	7	330	3
APR									
07...	0	100	10	80	1	9	4	690	11
JUN									
12...	0	100	10	80	1	11	5	650	12
SEP									
03...	4	100	<10	50	<1	15	10	2000	5

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	CYANIDE TOTAL (MG/L AS CN) (00720)
OCT								
15...	170	<.1	2	6	0	0	30	.00
DEC								
09...	90	<.1	0	4	0	0	30	.00
FEB								
12...	150	.1	1	20	0	0	20	<.01
APR								
07...	140	<.1	4	8	0	0	50	<.01
JUN								
12...	190	<.1	1	11	1	0	30	<.01
SEP								
03...	170	<.1	6	6	2	<1	20	<.01

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	BORON, DISSOLVED (UG/L AS B) (01020)
SEP												
03...	1020	20500	580	7.9	20.0	7.8	89	.3	4	100	<10	50

DATE	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	CHROMIUM, HEXAVALENT, DIS. (UG/L AS CR) (01032)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
SEP											
03...	<1	13	<1	5	30	1	10	<.1	<1	<1	10

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	434	384	426	459	440	451				---	---	---
2	426	415	421	459	440	450				---	---	---
3	441	425	433	450	440	445				---	---	---
4	451	442	446	459	440	446				---	---	---
5	444	434	439	459	440	452				---	---	---
6	457	437	447	458	440	452				---	---	---
7	457	439	447	481	440	454				---	---	---
8	460	443	455	459	440	448				---	---	---
9	481	459	466	459	440	451				---	---	---
10	482	458	466	459	440	449				---	---	---
11	463	435	446	459	440	445				---	---	---
12	465	456	460	454	414	436				---	---	---
13	461	451	456	455	440	450				---	---	---
14	473	456	464	459	440	449				---	---	---
15	473	446	456	455	441	449				---	---	---
16	450	434	440	459	440	450				---	---	---
17	472	442	458	450	418	438				---	---	---
18	465	434	450	454	440	448				---	---	---
19	464	452	457	455	440	446				---	---	---
20	459	446	451	448	415	438				494	454	486
21	446	425	435	459	444	450				504	494	498
22	477	437	458	454	448	450				554	500	524
23	474	457	464	454	444	448				584	494	542
24	466	443	455	459	440	445				494	488	490
25	463	434	449	480	444	450				518	494	506
26	457	438	449	491	455	476				518	500	509
27	456	444	450	489	440	462				514	498	505
28	465	440	454	459	440	452				558	500	528
29	459	450	455	455	440	451				580	510	551
30	459	440	445	455	450	453				518	500	509
31	458	404	427	---	---	---				518	514	516
MONTH	482	384	449	491	414	449						

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	540	500	516	430	409	418	443	433	440	405	387	394
2	542	514	532	428	409	416	481	440	463	392	376	382
3	556	538	542	410	403	408	467	446	456	413	389	402
4	604	560	584	413	400	405	519	469	495	413	383	396
5	608	604	607	414	400	406	473	463	469	398	368	381
6	590	565	574	416	408	412	467	455	462	367	361	364
7	603	523	564	430	415	421	464	442	453	377	368	373
8	527	514	522	432	427	429	465	452	461	403	383	394
9	551	515	532	440	424	431	475	464	469	425	402	417
10	552	544	547	433	420	427	479	465	473	433	420	427
11	498	473	486	426	416	422	481	471	476	449	420	435
12	499	486	493	---	---	---	488	473	481	449	415	431
13	486	464	479	457	419	439	491	483	486	443	424	433
14	461	446	451	466	425	453	495	486	490	446	410	427
15	475	452	466	461	434	451	500	473	489	442	426	434
16	603	462	536	436	415	426	485	474	479	429	421	426
17	611	589	604	467	431	447	486	472	479	439	423	434
18	595	531	563	467	440	449	490	473	484	440	430	434
19	560	533	550	---	---	---	476	449	465	455	440	448
20	550	501	531	---	---	---	450	441	445	468	447	456
21	502	484	492	---	---	---	464	441	450	497	463	477
22	496	461	478	---	---	---	472	446	460	470	454	462
23	484	436	463	---	---	---	479	451	465	477	457	468
24	448	424	437	457	437	449	457	445	451	464	439	452
25	507	428	475	454	446	451	451	446	449	456	437	449
26	514	496	507	460	441	451	---	---	---	467	447	455
27	500	456	477	469	432	448	---	---	---	473	444	456
28	468	413	439	469	438	446	---	---	---	472	456	461
29	---	---	---	439	423	432	---	---	---	489	475	483
30	---	---	---	445	426	438	417	392	405	509	475	494
31	---	---	---	440	419	432	---	---	---	506	493	501
MONTH	611	413	516							509	361	434

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	500	483	493	449	430	439	549	543	546	568	547	558
2	518	484	504	467	450	459	542	531	536	580	568	576
3	530	502	514	477	465	471	550	541	545	592	578	587
4	541	503	519	478	461	472	555	544	549	608	593	601
5	547	526	539	463	459	461	550	531	542	616	606	611
6	555	531	546	478	459	468	541	529	533	616	608	611
7	553	512	534	485	478	483	550	528	538	620	596	607
8	513	474	493	482	476	479	544	518	534	692	590	645
9	499	482	491	487	477	483	516	482	490	696	669	682
10	498	468	487	485	478	483	514	487	497	686	679	682
11	483	464	472	491	432	472	513	505	509	680	602	666
12	496	473	484	471	419	447	507	495	501	667	628	648
13	483	464	474	474	466	470	503	493	498	647	628	637
14	476	404	447	473	463	468	498	467	479	636	633	634
15	427	400	413	475	454	465	485	458	469	642	620	633
16	431	399	413	486	457	476	515	483	501	628	510	586
17	433	409	419	514	486	498	484	473	477	537	318	521
18	440	421	430	517	506	509	508	477	498	546	530	537
19	441	432	435	514	496	505	516	490	506	541	526	534
20	461	435	447	507	482	498	511	493	503	521	515	518
21	470	453	463	491	480	486	518	511	515	525	503	514
22	464	450	455	538	489	499	528	517	523	527	496	508
23	460	425	442	506	493	500	541	512	529	527	489	502
24	434	422	427	500	487	494	513	508	511	545	544	544
25	446	423	432	512	499	502	514	490	505	544	534	540
26	456	439	452	516	502	511	500	471	485	561	540	548
27	435	398	414	500	458	471	487	470	479	559	514	538
28	395	356	368	477	456	465	470	413	432	542	508	518
29	405	357	386	498	478	485	506	441	479	553	522	537
30	429	406	418	529	501	517	523	509	520	540	523	533
31	---	---	---	545	528	538	546	519	536	---	---	---
MONTH	555	356	460	545	419	483	555	413	509	696	318	579

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.3	7.3	8.2	8.1	8.0	8.0	7.9	7.8	7.8	---	---	---
2	8.1	8.1	8.1	8.0	8.0	8.0	7.8	7.8	7.8	---	---	---
3	8.2	8.1	8.1	8.0	8.0	8.0	8.0	7.8	7.9	---	---	---
4	8.1	8.1	8.1	8.1	8.0	8.0	---	---	---	---	---	---
5	8.2	8.1	8.1	8.0	8.0	8.0	---	---	---	---	---	---
6	8.2	8.1	8.2	8.0	8.0	8.0	---	---	---	---	---	---
7	8.2	8.1	8.2	8.1	8.0	8.1	---	---	---	---	---	---
8	8.2	7.4	8.0	8.1	8.0	8.1	---	---	---	---	---	---
9	7.4	7.3	7.3	8.1	8.0	8.1	---	---	---	---	---	---
10	7.4	7.3	7.4	8.1	8.0	8.1	---	---	---	---	---	---
11	7.5	7.4	7.4	8.0	7.9	8.0	---	---	---	---	---	---
12	7.5	7.4	7.5	7.9	7.9	7.9	---	---	---	---	---	---
13	7.5	7.5	7.5	7.9	7.8	7.9	---	---	---	---	---	---
14	8.0	7.5	7.7	7.9	7.8	7.9	---	---	---	---	---	---
15	8.0	8.0	8.0	7.9	7.8	7.9	---	---	---	---	---	---
16	8.0	7.9	8.0	7.8	7.8	7.8	---	---	---	---	---	---
17	8.0	7.9	7.9	7.8	7.8	7.8	---	---	---	---	---	---
18	7.9	7.8	7.8	7.9	7.8	7.8	---	---	---	---	---	---
19	7.8	7.7	7.7	7.9	7.8	7.8	---	---	---	---	---	---
20	7.8	7.7	7.8	7.9	7.9	7.9	---	---	---	8.1	8.0	8.1
21	7.8	7.7	7.7	7.9	7.9	7.9	---	---	---	8.2	8.0	8.1
22	7.9	7.7	7.7	8.0	7.8	7.9	---	---	---	8.0	8.0	8.0
23	7.8	7.7	7.7	7.9	7.8	7.9	---	---	---	8.1	8.0	8.0
24	7.8	7.7	7.7	7.9	7.9	7.9	---	---	---	8.1	8.1	8.1
25	7.8	7.8	7.8	7.9	7.8	7.8	---	---	---	8.3	8.0	8.0
26	7.8	7.7	7.7	7.9	7.8	7.9	---	---	---	8.2	8.0	8.1
27	7.8	7.7	7.8	7.9	7.8	7.9	---	---	---	8.2	8.1	8.1
28	7.8	7.7	7.8	7.9	7.8	7.8	---	---	---	8.2	8.0	8.1
29	7.9	7.9	7.9	7.8	7.8	7.8	---	---	---	8.2	8.0	8.1
30	8.0	7.9	8.0	7.8	7.8	7.8	---	---	---	8.2	8.0	8.1
31	8.0	8.0	8.0	---	---	---	---	---	---	8.4	8.0	8.1
MONTH	8.3	7.3	7.8	8.1	7.8	7.9						

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	8.4	8.0	8.1	8.2	8.2	8.2	8.0	7.8	7.9	8.4	7.9	8.1
2	8.2	8.0	8.1	8.2	8.2	8.2	8.0	7.9	8.0	8.5	7.9	8.2
3	8.1	8.1	8.1	8.2	8.2	8.2	8.0	7.7	7.9	8.4	8.2	8.3
4	8.1	8.0	8.0	8.3	8.2	8.2	7.7	7.5	7.6	8.2	7.9	8.0
5	8.0	7.9	8.0	8.3	8.2	8.3	7.8	7.5	7.7	8.1	7.7	7.9
6	7.9	7.9	7.9	8.3	8.3	8.3	7.9	7.5	7.7	8.1	7.7	7.9
7	8.0	7.9	7.9	8.3	8.3	8.3	8.0	7.7	7.8	8.0	7.8	7.9
8	8.0	7.9	7.9	8.3	8.3	8.3	8.0	7.8	7.9	8.3	8.0	8.1
9	7.9	7.9	7.9	8.4	8.3	8.4	8.0	7.7	7.9	8.2	8.0	8.1
10	7.9	7.8	7.8	8.5	8.2	8.4	8.0	7.8	7.9	8.4	7.9	8.1
11	7.9	7.9	7.9	8.4	8.4	8.4	7.9	7.8	7.9	8.5	8.0	8.2
12	7.9	7.9	7.9	---	---	---	8.0	7.7	7.9	8.5	8.1	8.3
13	8.0	7.9	8.0	8.2	7.7	7.9	8.0	7.8	7.9	8.7	8.1	8.4
14	8.1	8.0	8.0	8.4	7.7	7.7	8.1	7.9	8.0	8.5	8.2	8.3
15	8.1	8.0	8.1	7.8	7.7	7.8	8.5	8.1	8.3	8.5	8.0	8.2
16	8.1	8.0	8.1	7.9	7.8	7.8	8.4	8.3	8.4	8.4	8.0	8.2
17	8.1	8.0	8.1	7.8	7.3	7.7	8.6	8.3	8.4	8.2	8.1	8.1
18	8.1	8.0	8.0	7.6	7.5	7.6	8.6	8.3	8.4	8.4	7.9	8.1
19	8.0	7.9	7.9	---	---	---	8.5	8.4	8.4	8.4	7.9	8.1
20	7.9	7.9	7.9	---	---	---	8.6	8.2	8.4	8.6	8.0	8.2
21	7.9	7.9	7.9	---	---	---	8.4	8.2	8.3	8.6	8.1	8.3
22	7.9	7.9	7.9	---	---	---	8.2	8.0	8.1	8.4	8.2	8.3
23	8.0	7.9	8.0	---	---	---	8.0	7.8	7.9	8.2	8.0	8.1
24	8.0	7.9	8.0	8.2	8.1	8.1	8.1	7.9	8.0	8.0	7.7	7.8
25	8.0	8.0	8.0	8.2	8.1	8.2	8.2	7.8	8.0	7.8	7.7	7.8
26	8.1	8.0	8.0	8.2	8.1	8.2	---	---	---	7.9	7.7	7.8
27	8.2	8.1	8.1	8.3	8.2	8.2	---	---	---	8.0	7.7	7.8
28	8.2	8.1	8.2	8.3	8.2	8.2	---	---	---	7.9	7.7	7.8
29	---	---	---	8.3	8.2	8.2	8.1	8.0	8.0	8.1	7.7	7.9
30	---	---	---	8.1	8.1	8.1	8.2	7.8	7.9	8.1	7.7	7.9
31	---	---	---	8.1	8.0	8.1	---	---	---	8.2	7.7	7.9
MONTH	8.4	7.8	8.0							8.7	7.7	8.1

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.2	7.8	8.0	7.7	7.3	7.5	8.2	8.0	8.1	8.2	8.1	8.1
2	8.1	7.8	7.9	7.7	7.3	7.5	8.1	8.0	8.0	8.4	8.0	8.2
3	8.3	7.8	8.0	7.7	7.5	7.6	8.1	8.0	8.1	8.4	8.1	8.2
4	8.4	7.8	8.1	7.8	7.5	7.6	8.1	8.0	8.0	8.5	8.1	8.2
5	8.4	8.0	8.2	7.8	7.4	7.6	8.1	8.0	8.0	8.5	8.1	8.3
6	8.4	7.9	8.1	7.9	7.4	7.6	8.1	8.0	8.1	8.7	8.2	8.4
7	8.4	8.0	8.1	7.9	7.5	7.7	8.1	8.0	8.0	8.7	8.4	8.5
8	8.3	7.8	7.9	7.9	7.6	7.7	8.1	7.9	8.0	8.5	8.2	8.3
9	8.0	7.6	7.8	8.1	7.4	7.7	8.0	7.9	7.9	8.7	8.2	8.4
10	8.1	7.7	7.9	8.1	7.7	7.9	8.2	7.9	8.0	8.6	8.3	8.4
11	8.0	7.7	7.8	7.9	7.8	7.8	8.3	7.9	8.1	8.6	8.3	8.5
12	8.0	7.8	7.9	7.8	7.6	7.7	8.4	8.0	8.2	8.6	8.3	8.4
13	8.1	7.8	7.9	7.9	7.7	7.8	8.3	8.1	8.2	8.7	8.2	8.4
14	8.0	7.6	7.8	7.8	7.6	7.7	8.2	8.0	8.1	8.5	8.3	8.4
15	7.8	7.6	7.7	7.7	7.6	7.7	8.1	7.9	8.0	8.4	8.2	8.3
16	8.1	7.5	7.8	8.1	7.6	7.8	8.2	7.9	8.0	8.3	8.2	8.2
17	8.2	7.7	7.9	8.2	7.7	7.9	8.1	7.8	7.9	8.0	7.9	7.9
18	7.9	7.6	7.8	8.2	7.8	8.0	8.1	7.8	7.9	8.1	7.8	7.9
19	7.8	7.6	7.7	8.2	7.8	7.9	8.3	7.8	8.0	8.1	7.8	7.9
20	7.9	7.6	7.7	8.0	7.8	7.9	8.4	7.9	8.1	8.2	7.8	8.0
21	7.8	7.7	7.7	7.9	7.7	7.8	8.4	7.9	8.2	8.1	7.9	8.0
22	8.0	7.6	7.8	8.0	7.7	7.8	8.3	8.0	8.2	8.0	7.7	7.8
23	7.7	7.5	7.6	8.1	7.8	7.9	8.3	8.0	8.2	7.9	7.8	7.8
24	8.0	7.7	7.8	8.1	7.8	7.9	8.3	8.1	8.2	8.0	8.0	8.0
25	8.1	7.6	7.8	8.0	7.8	7.9	8.3	8.0	8.1	8.0	7.9	7.9
26	8.1	7.6	7.8	8.1	7.8	7.9	8.1	7.9	8.0	7.9	7.7	7.9
27	7.8	7.5	7.7	7.8	7.7	7.7	7.9	7.8	7.9	7.8	7.5	7.6
28	7.8	7.6	7.7	8.1	7.7	7.8	7.9	7.6	7.8	7.9	7.6	7.7
29	7.7	7.5	7.6	8.1	7.7	7.9	8.2	7.9	8.1	8.0	7.6	7.8
30	7.7	7.3	7.5	8.3	7.9	8.1	8.4	8.0	8.2	8.0	7.7	7.8
31	---	---	---	8.3	8.2	8.2	8.5	8.3	8.4	---	---	---
MONTH	8.4	7.3	7.8	8.3	7.3	7.8	8.5	7.6	8.1	8.7	7.5	8.1

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	---	---	---	6.0	5.0	5.5	3.5	2.0	2.5	---	---	---
2	15.0	13.5	14.0	6.0	5.0	5.5	3.0	1.5	1.5	---	---	---
3	14.5	13.0	14.0	7.0	5.0	5.5	2.0	1.0	1.5	---	---	---
4	14.5	13.5	14.0	7.0	5.0	5.5	---	---	---	---	---	---
5	14.5	12.5	13.5	7.0	5.0	6.0	---	---	---	---	---	---
6	14.5	12.5	13.0	7.5	5.5	6.5	---	---	---	---	---	---
7	15.0	12.5	13.5	8.0	7.0	7.5	---	---	---	---	---	---
8	15.0	13.0	14.0	8.0	7.0	7.5	---	---	---	---	---	---
9	15.5	13.0	14.0	7.5	5.5	7.0	---	---	---	---	---	---
10	14.5	13.5	14.0	6.0	5.0	5.5	---	---	---	---	---	---
11	13.5	12.5	13.0	6.0	5.5	5.5	---	---	---	---	---	---
12	13.5	12.0	12.5	5.5	5.5	5.5	---	---	---	---	---	---
13	12.5	11.5	12.0	5.5	5.0	5.0	---	---	---	---	---	---
14	11.5	10.5	11.0	5.0	4.0	4.5	---	---	---	---	---	---
15	11.0	10.0	10.5	5.0	4.0	4.5	---	---	---	---	---	---
16	11.0	10.0	10.5	5.5	4.0	4.5	---	---	---	---	---	---
17	10.5	9.0	9.5	4.5	2.5	3.5	---	---	---	---	---	---
18	9.0	8.5	9.0	4.0	2.0	2.5	---	---	---	---	---	---
19	10.0	8.0	9.0	5.5	2.0	3.5	---	---	---	---	---	---
20	10.5	8.5	9.5	5.0	5.0	5.0	---	---	---	1.0	.0	.0
21	9.5	8.5	9.0	5.0	2.5	4.0	---	---	---	1.0	.0	.5
22	9.0	8.0	8.5	4.0	2.0	3.0	---	---	---	.5	.0	.5
23	9.0	8.0	8.5	4.0	2.5	3.5	---	---	---	.5	.0	.5
24	9.0	8.0	8.5	4.0	2.5	3.0	---	---	---	2.0	.5	1.0
25	8.0	7.0	7.5	2.5	2.0	2.0	---	---	---	2.0	1.0	2.0
26	8.0	6.5	7.0	2.5	2.0	2.5	---	---	---	1.0	.5	.5
27	7.0	6.0	6.5	2.5	2.0	2.5	---	---	---	.5	.0	.5
28	8.5	5.0	6.0	3.0	.5	2.0	---	---	---	1.0	.0	.5
29	5.5	5.0	5.5	2.0	.0	.5	---	---	---	1.0	.0	.5
30	6.0	5.0	5.5	1.0	.5	.5	---	---	---	1.0	.0	.5
31	6.0	5.0	5.5	---	---	---	---	---	---	1.0	.0	.5
MONTH				8.0	.0	4.5						

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.0	.0	.0	3.0	2.5	2.5	12.0	11.0	11.5	14.0	13.0	13.5
2	.5	.0	.5	2.5	1.5	2.0	12.0	11.0	11.5	14.5	13.5	14.0
3	.5	.5	.5	2.5	2.0	2.0	12.0	11.0	11.5	15.0	14.5	14.5
4	.5	.5	.5	2.5	2.0	2.0	11.0	9.5	10.0	15.0	15.0	15.0
5	.5	.5	.5	3.0	2.0	2.5	10.5	9.0	9.5	15.0	14.5	15.0
6	1.0	.5	1.0	2.5	2.0	2.0	9.5	8.5	9.0	15.5	14.0	14.5
7	1.0	.5	.5	3.0	2.0	2.5	9.5	8.5	9.0	15.5	14.5	15.0
8	.5	.5	.5	4.0	3.0	3.0	11.0	9.5	10.5	15.5	15.5	15.5
9	.5	.5	.5	4.0	3.5	4.0	12.0	10.5	11.5	15.5	14.5	15.0
10	.5	.5	.5	4.0	3.5	4.0	13.0	11.5	12.5	15.0	14.0	14.5
11	.5	.5	.5	4.0	3.5	3.5	12.5	12.0	12.0	15.0	13.5	14.0
12	1.0	.5	.5	5.0	4.5	5.0	13.0	12.0	12.5	14.5	13.5	14.0
13	1.0	.5	.5	5.0	4.0	5.0	13.0	12.0	12.5	15.5	14.0	14.5
14	1.0	.5	1.0	5.5	4.0	5.0	12.5	11.0	12.0	16.0	14.5	15.0
15	1.5	1.0	1.0	6.0	5.0	5.5	12.5	11.5	12.0	17.0	15.0	16.0
16	2.5	1.5	2.0	6.5	5.0	6.0	12.0	11.5	11.5	17.5	16.5	17.0
17	2.5	2.0	2.0	7.0	5.5	6.0	12.5	11.0	12.0	17.0	17.0	17.0
18	3.5	2.5	3.0	6.5	5.5	6.0	12.5	11.0	12.0	17.5	16.5	17.0
19	3.5	3.0	3.5	---	---	---	13.0	12.5	12.5	18.0	16.5	17.0
20	4.0	3.5	4.0	---	---	---	13.0	11.5	12.5	18.0	16.5	17.5
21	4.0	4.0	4.0	---	---	---	12.5	11.0	11.5	19.0	17.0	18.0
22	4.0	3.5	3.5	---	---	---	12.0	11.0	11.5	19.5	18.5	19.0
23	4.5	3.5	4.0	---	---	---	11.0	9.5	10.5	19.5	19.5	19.5
24	5.0	4.0	4.5	8.0	7.0	7.5	10.5	9.5	10.0	19.5	19.5	19.5
25	4.5	4.0	4.0	8.5	8.0	8.5	11.0	10.0	10.5	19.5	18.5	19.0
26	4.0	3.5	4.0	9.5	8.5	9.0	14.5	10.0	11.5	19.0	18.5	18.5
27	4.0	3.5	3.5	10.5	9.0	9.5	23.5	15.5	19.5	19.0	18.0	18.5
28	4.0	3.0	3.5	11.0	10.0	10.5	19.5	12.5	15.0	18.5	18.0	18.5
29	---	---	---	11.5	10.5	11.0	13.5	13.0	13.5	20.0	18.5	19.0
30	---	---	---	11.5	10.5	11.0	13.5	12.5	13.0	20.5	19.0	20.0
31	---	---	---	11.5	11.0	11.0	---	---	---	21.0	20.0	20.5
MONTH	5.0	.0	2.0				23.5	8.5	12.0	21.0	13.0	16.5

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	21.0	20.0	20.5	23.5	22.5	23.0	22.5	22.0	22.5	20.5	20.0	20.5
2	21.0	20.0	20.5	24.0	22.5	23.5	23.5	22.5	23.0	20.5	20.0	20.5
3	20.5	20.0	20.5	24.0	23.5	24.0	24.0	23.0	23.5	20.0	20.0	20.0
4	21.5	20.0	20.5	25.0	24.0	24.5	24.0	23.5	23.5	20.0	19.0	19.5
5	22.0	20.5	21.0	26.0	24.0	25.0	25.0	24.5	24.5	19.5	19.0	19.5
6	22.0	21.0	21.5	26.5	25.0	25.5	26.0	25.5	25.5	20.0	19.0	19.5
7	23.0	21.5	22.0	27.0	25.5	26.5	25.5	24.5	25.0	20.5	19.5	20.0
8	23.0	22.0	22.0	27.5	26.0	26.5	25.0	24.5	25.0	20.0	19.0	20.0
9	22.5	21.5	22.0	27.5	26.0	26.5	24.5	24.0	24.0	21.0	19.5	20.0
10	23.0	21.5	22.5	27.0	26.0	26.5	24.0	23.5	23.5	21.5	20.0	20.5
11	22.5	21.5	22.0	26.5	26.0	26.5	24.0	23.0	23.5	22.0	19.5	21.5
12	22.5	21.5	22.0	26.0	25.5	26.0	24.5	23.5	24.0	22.5	21.0	22.0
13	22.5	21.5	22.0	26.5	26.0	26.0	25.0	24.0	24.5	22.5	21.5	22.0
14	23.0	22.0	22.5	26.0	25.0	25.5	24.5	24.5	24.5	22.0	21.0	21.5
15	22.5	21.0	22.0	25.0	24.0	24.5	25.0	24.5	24.5	22.0	20.5	21.0
16	21.5	20.5	21.0	24.5	24.0	24.0	24.5	23.5	24.0	20.5	19.0	19.5
17	21.0	20.5	20.5	25.0	24.0	24.5	23.5	22.5	23.0	18.5	18.0	18.5
18	21.0	20.5	20.5	26.0	25.0	25.5	23.5	22.5	23.0	18.0	17.5	17.5
19	20.5	20.0	20.5	27.0	25.5	26.0	23.0	22.0	22.5	17.5	16.5	17.0
20	20.5	19.5	20.0	26.5	26.0	26.5	23.5	22.0	22.5	17.0	16.0	17.0
21	19.5	19.0	19.5	26.0	25.5	26.0	23.0	22.0	22.5	17.0	16.5	16.5
22	19.5	19.0	19.0	25.5	24.5	25.0	22.5	22.0	22.5	17.5	16.5	16.5
23	19.0	18.5	19.0	24.5	24.0	24.0	23.0	22.0	22.5	17.5	16.5	17.0
24	20.0	18.5	19.5	23.5	23.0	23.0	23.0	22.0	22.5	17.0	17.0	17.0
25	20.5	19.0	20.0	23.5	23.0	23.5	23.0	22.5	22.5	17.0	17.0	17.0
26	22.0	20.5	21.5	23.5	23.0	23.0	22.5	22.5	22.5	17.0	16.5	17.0
27	21.5	21.0	21.5	23.0	22.0	22.5	22.5	21.0	21.5	16.5	16.0	16.0
28	21.5	21.5	21.5	22.5	21.5	22.0	21.0	20.0	20.5	15.5	15.0	15.5
29	22.5	21.5	22.0	22.0	21.5	21.5	20.0	19.5	20.0	16.0	15.0	15.5
30	23.0	22.0	22.5	22.0	21.0	21.5	20.0	19.0	19.5	16.0	15.5	15.5
31	---	---	---	22.5	21.5	22.0	20.5	20.0	20.5	---	---	---
MONTH	23.0	18.5	21.0	27.5	21.0	24.5	26.0	19.0	23.0	22.5	15.0	18.5

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	---	---	---	11.2	10.8	11.0	9.7	9.2	9.5	---	---	---
2	8.2	8.0	8.1	11.2	10.0	10.8	9.7	8.4	8.7	---	---	---
3	8.0	7.6	7.8	11.6	10.2	10.7	11.1	8.0	9.3	---	---	---
4	7.7	7.4	7.6	11.9	10.8	11.5	---	---	---	---	---	---
5	7.9	7.5	7.7	11.1	10.2	10.7	---	---	---	---	---	---
6	8.6	7.7	8.0	11.1	10.1	10.5	---	---	---	---	---	---
7	8.3	8.1	8.2	11.1	10.2	10.8	---	---	---	---	---	---
8	9.7	7.5	8.5	11.0	10.0	10.3	---	---	---	---	---	---
9	9.0	8.5	8.7	11.0	10.0	10.4	---	---	---	---	---	---
10	8.7	7.8	8.2	10.4	10.0	10.2	---	---	---	---	---	---
11	7.9	7.5	7.7	10.4	10.0	10.2	---	---	---	---	---	---
12	7.4	6.6	6.9	10.3	9.6	10.1	---	---	---	---	---	---
13	7.8	6.3	6.8	10.2	8.8	9.5	---	---	---	---	---	---
14	10.7	6.1	8.5	9.8	8.8	9.1	---	---	---	---	---	---
15	10.5	10.2	10.3	9.2	8.4	8.9	---	---	---	---	---	---
16	10.5	9.9	10.3	9.2	8.0	8.5	---	---	---	---	---	---
17	10.3	9.6	9.9	9.2	8.2	8.8	---	---	---	---	---	---
18	10.1	9.5	9.8	9.2	8.3	9.0	---	---	---	---	---	---
19	9.5	8.9	9.0	9.2	8.0	8.4	---	---	---	---	---	---
20	9.3	8.5	8.9	9.0	8.0	8.5	---	---	---	11.2	10.9	11.1
21	9.0	8.3	8.7	8.3	7.8	8.1	---	---	---	11.0	10.8	10.9
22	10.2	8.0	9.0	9.7	7.9	8.5	---	---	---	11.2	10.8	11.0
23	10.1	9.7	9.9	9.2	8.8	9.0	---	---	---	10.9	10.3	10.7
24	9.7	8.7	9.2	9.2	8.2	8.9	---	---	---	10.8	10.1	10.3
25	9.5	9.2	9.3	10.2	8.8	9.4	---	---	---	10.4	10.0	10.1
26	10.1	9.2	9.7	10.0	9.0	9.6	---	---	---	11.2	10.1	10.8
27	10.3	9.5	10.0	10.1	9.0	9.7	---	---	---	11.2	10.8	11.0
28	10.5	8.9	10.2	9.8	8.9	9.4	---	---	---	11.2	10.8	11.0
29	11.1	10.0	10.9	9.0	8.0	8.5	---	---	---	11.2	10.8	10.9
30	11.2	10.2	10.8	8.3	8.1	8.2	---	---	---	11.2	10.8	10.9
31	11.2	10.8	11.0	---	---	---	---	---	---	11.0	10.4	10.8
MONTH				11.9	7.8	9.6						

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	11.2	10.4	10.7	11.7	11.5	11.6	10.4	9.1	9.8	10.8	9.7	10.3
2	11.4	10.8	11.1	11.9	11.6	11.8	10.5	9.1	9.6	10.9	9.9	10.4
3	11.5	11.3	11.4	11.8	11.5	11.7	10.8	9.1	9.9	10.1	9.0	9.6
4	11.3	11.0	11.2	11.7	11.5	11.6	10.3	9.1	9.8	8.9	7.9	8.2
5	11.0	10.8	10.9	11.7	11.6	11.6	10.8	8.1	9.6	10.9	7.4	8.6
6	10.6	10.4	10.5	11.8	11.7	11.7	11.7	10.0	10.8	10.5	9.8	10.0
7	11.3	10.4	10.5	11.8	11.7	11.7	10.9	9.8	10.4	10.1	9.4	9.7
8	10.7	10.4	10.5	11.9	11.8	11.9	11.2	9.5	10.5	8.6	6.9	7.9
9	10.8	10.6	10.7	12.0	11.9	11.9	11.6	9.1	10.4	7.0	6.4	6.7
10	10.7	10.5	10.5	12.0	11.9	12.0	12.1	10.7	11.2	6.6	6.1	6.4
11	10.8	10.5	10.6	11.9	11.8	11.8	11.3	10.2	10.8	7.6	6.1	6.6
12	10.5	10.4	10.4	---	---	---	11.2	9.2	10.4	8.4	6.9	7.6
13	10.4	10.1	10.3	11.9	11.5	11.7	9.5	8.4	8.9	8.5	7.6	8.0
14	10.2	10.1	10.2	11.8	11.6	11.7	10.2	8.4	9.4	9.3	7.9	8.6
15	10.8	10.1	10.3	11.8	11.6	11.6	10.7	9.4	9.9	10.7	8.9	9.6
16	10.8	9.9	10.3	11.9	11.5	11.7	10.4	8.7	9.6	9.8	8.5	9.2
17	10.4	9.8	10.1	12.2	11.5	11.8	9.9	8.9	9.4	9.4	7.1	8.3
18	10.9	10.2	10.5	12.6	12.2	12.3	9.8	8.8	9.2	7.6	6.5	7.1
19	10.8	10.3	10.5	---	---	---	8.8	7.3	8.0	7.4	6.2	6.7
20	10.3	10.1	10.2	---	---	---	10.8	7.0	8.8	8.7	6.0	7.2
21	10.3	10.1	10.2	---	---	---	12.0	9.1	10.5	9.3	7.3	8.3
22	10.4	10.0	10.2	---	---	---	10.4	8.8	9.4	8.5	6.6	7.9
23	10.6	10.2	10.4	---	---	---	9.3	8.1	8.7	7.4	6.1	6.7
24	10.5	10.2	10.3	15.3	12.6	13.6	9.0	8.5	8.7	6.7	5.4	6.0
25	10.7	10.2	10.4	15.1	12.7	13.8	9.7	8.4	9.2	6.1	4.7	5.4
26	11.1	10.5	10.8	14.0	11.1	12.6	10.5	9.2	9.9	5.6	4.8	5.3
27	11.4	11.1	11.3	12.4	10.0	11.2	9.4	4.6	6.8	6.8	5.5	6.2
28	11.5	10.9	11.2	10.6	9.6	10.1	11.6	7.3	9.9	6.5	5.7	6.2
29	---	---	---	10.5	9.7	10.1	11.5	8.5	10.4	7.5	5.3	6.5
30	---	---	---	10.4	8.6	9.6	10.1	9.1	9.5	8.3	6.9	7.7
31	---	---	---	11.2	8.6	9.7	---	---	---	8.0	6.8	7.3
MONTH	11.5	9.8	10.6				12.1	4.6	9.7	10.9	4.7	7.8

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	7.7	6.5	7.0	7.1	6.6	6.9	6.8	5.5	6.4	6.8	6.3	6.6
2	7.7	6.7	7.2	7.1	6.7	6.9	6.3	5.8	6.1	6.6	6.3	6.5
3	7.3	6.2	6.7	6.9	6.6	6.7	6.9	6.0	6.4	7.0	6.9	6.7
4	7.0	5.9	6.5	6.9	6.5	6.6	6.7	6.0	6.3	7.0	6.7	6.8
5	6.9	5.6	6.2	6.8	6.6	6.7	6.3	5.7	5.9	7.1	6.3	6.9
6	7.0	6.1	6.6	6.7	6.1	6.5	6.5	6.0	6.3	7.0	6.7	6.8
7	6.8	5.6	6.3	6.9	6.3	6.6	6.1	5.4	5.8	8.1	6.8	7.4
8	6.7	5.3	5.9	6.6	6.1	6.4	5.6	5.1	5.4	8.6	7.5	8.0
9	6.3	5.5	5.9	6.6	5.9	6.2	5.9	5.0	5.5	8.0	7.4	7.7
10	5.8	5.2	5.6	7.1	5.9	6.3	6.4	5.8	6.1	7.7	7.3	7.5
11	6.7	4.9	5.7	6.4	5.1	5.8	6.7	6.1	6.4	7.9	6.9	7.3
12	6.8	4.8	5.9	5.4	4.7	5.0	6.7	6.3	6.5	7.5	6.7	7.3
13	5.9	4.6	5.3	5.6	4.8	5.2	7.0	6.3	6.6	7.5	6.3	6.8
14	5.5	4.3	5.0	5.9	5.1	5.6	6.7	5.9	6.5	7.6	6.9	7.2
15	6.8	5.1	6.0	5.7	4.6	5.2	6.2	5.3	5.9	7.0	6.1	6.5
16	9.0	6.7	8.0	6.2	5.2	5.7	6.6	5.9	6.3	8.1	5.6	6.9
17	9.2	8.0	8.7	7.2	5.9	6.5	6.2	5.5	5.8	8.1	7.6	7.9
18	8.5	7.0	7.8	6.6	6.1	6.3	6.3	5.8	6.1	8.5	7.7	8.0
19	7.3	6.8	7.1	6.1	5.6	5.9	7.1	5.9	6.5	8.2	7.7	7.9
20	7.3	6.9	7.1	6.6	5.2	5.8	7.4	6.7	7.1	8.3	7.7	7.9
21	7.4	6.9	7.2	6.0	4.8	5.4	7.1	6.4	6.8	8.0	7.2	7.7
22	7.4	6.6	7.1	6.5	4.8	5.4	6.7	5.8	6.3	8.2	6.6	7.3
23	8.4	7.0	7.7	6.6	5.8	6.2	6.1	5.3	5.8	7.5	6.7	7.2
24	7.4	7.0	7.2	6.7	5.8	6.4	6.0	5.2	5.7	7.1	7.0	7.1
25	7.6	7.2	7.4	6.8	5.5	6.3	5.9	5.2	5.6	7.1	6.4	6.7
26	7.4	6.7	7.1	6.9	6.5	6.7	5.7	4.9	5.3	6.8	6.0	6.4
27	6.6	6.0	6.3	6.9	6.2	6.6	5.5	4.7	5.1	6.3	5.2	5.8
28	6.1	5.4	5.9	7.0	6.0	6.4	6.1	4.9	5.5	6.6	6.0	6.2
29	7.0	5.7	6.5	7.0	6.0	6.5	6.4	5.8	6.2	5.9	4.9	5.2
30	7.0	6.8	6.9	6.7	6.2	6.5	6.6	6.1	6.4	8.1	4.4	5.7
31	---	---	---	7.0	6.1	6.6	7.2	6.2	6.6	---	---	---
MONTH	9.2	4.3	6.7	7.2	4.6	6.2	7.4	4.7	6.1	8.6	4.4	7.0

05331570 MISSISSIPPI RIVER AT NININGER, MN
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

LOCATION.--Lat 44°46'22", long 92°54'07", in NW¼NE¼ sec.18, T.115 N., R.17 W., Dakota County, Hydrologic Unit 07010206, on right bank at the end of Jason Avenue, and at mile 817.8 (1,316 km) upstream from Ohio River.

DRAINAGE AREA.--37,000 mi^2 (95,800 km^2), approximately.

PERIOD OF RECORD.--January 1977 to current year.

REMARKS.--Water-discharge computed on the basis of discharge for Mississippi River at St. Paul (station 05331000) adjusted for inflow and travel time. Letter K indicates non-ideal colony count.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE, AIR (DEG C) (00020)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)
OCT										
28...	1115	6110	520	487	8.4	2.5	6.0	.60	10.6	86
NOV										
25...	1100	5940	520	514	8.1	1.5	1.5	.40	12.1	88
DEC										
23...	1000	4340	620	617	8.1	-2.5	.0	.90	12.5	87
JAN										
28...	1000	3140	620	651	8.0	-6.5	.5	1.3	11.2	80
FEB										
25...	1045	4190	619	643	8.9	4.0	2.0	.50	11.5	85
MAR										
26...	1100	4800	540	522	8.8	9.0	7.0	1.6	14.2	119
JUN										
02...	1230	7790	465	504	8.2	22.5	21.0	15	8.0	92
JUL										
28...	1045	17500	430	484	8.0	23.0	23.0	38	5.7	68
SEP										
29...	1035	5320	550	526	8.1	17.0	14.0	27	7.1	72

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	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)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
OCT										
28...	--	K6	200	21	49	19	17	.5	3.0	180
NOV										
25...	K36	K20	210	8.0	53	19	22	.7	3.1	190
DEC										
23...	K8	K14	240	18	59	22	26	.7	4.1	220
JAN										
28...	--	K1	250	17	61	23	32	.9	3.9	230
FEB										
25...	<1	K1	260	51	65	24	35	.9	4.2	210
MAR										
26...	K1400	K4	210	25	53	20	20	.6	4.2	190
JUN										
02...	K13	K26	210	31	53	19	16	.5	3.2	180
JUL										
28...	K73	170	220	65	57	20	12	.3	3.6	160
SEP										
29...	87	72	240	49	56	24	19	.5	3.4	190

05331570 MISSISSIPPI RIVER AT NINNINGER, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)
OCT										
28...	36	23	.2	8.5	313	268	5160	.81	.81	.700
NOV										
25...	37	24	.2	4.9	317	280	5080	.69	.69	.870
DEC										
23...	42	31	.3	9.0	361	330	4230	.96	.92	1.40
JAN										
28...	51	35	.3	11	389	361	3300	1.2	1.2	1.70
FEB										
25...	43	42	.3	12	--	352	3980	.98	--	--
MAR										
26...	44	25	.2	5.9	324	289	4200	.46	.46	.480
JUN										
02...	37	23	.3	5.7	310	274	6520	2.0	2.0	.420
JUL										
28...	40	16	.3	17	300	286	14200	5.4	5.4	.170
SEP										
29...	51	28	.3	10	342	310	4910	.95	.91	1.20

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	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)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT									
28...	.700	1.60	1.4	.190	.110	--	26	429	95
NOV									
25...	.820	1.40	1.4	.190	.110	8.9	8	128	90
DEC									
23...	1.40	1.90	1.6	.240	.190	10	6	70	100
JAN									
28...	1.50	2.20	1.5	.270	.230	--	6	51	100
FEB									
25...	--	2.50	--	.270	--	--.	4	45	100
MAR									
26...	.480	1.60	.90	.190	.050	7.2	64	829	96
JUN									
02...	.410	1.60	1.4	.250	.100	--	37	778	97
JUL									
28...	.170	.99	.92	.350	.280	13	87	4110	98
SEP									
29...	1.10	2.70	1.6	.280	.150	--	62	891	99

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA) (01007)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO) (01037)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)
OCT											
28...	1115	1	1	100	60	0	0	20	<10	0	0
FEB											
25...	1045	1	0	100	100	0	0	30	20	0	0
JUN											
02...	1230	3	3	200	60	1	1	10	<10	1	0
SEP											
29...	1035	4	3	100	100	--	<1	10	<10	--	3

05331570 MISSISSIPPI RIVER AT NINNINGER, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
OCT										
28...	9	5	740	20	8	1	130	20	<.1	<.1
FEB										
25...	13	6	370	50	19	3	170	140	--	--
JUN										
02...	6	4	890	20	3	0	190	10	<.1	<.1
SEP										
29...	--	6	1700	20	--	2	250	20	.2	.2

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)
OCT										
28...	10	6	0	0	0	0	10	8	--	.2
FEB										
25...	13	13	0	0	1	0	80	20	5.8	.3
JUN										
02...	10	5	1	1	0	0	50	20	9.7	3.5
SEP										
29...	--	4	<1	<1	<1	<1	30	20	8.6	.5

05331570 MISSISSIPPI RIVER AT NINNINGER, MN--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	NOV 25,80		MAR 26,81		JUN 2,81		JUL 28,81		SEP 29,81	
TIME	1100		1100		1230		1045		1035	
TOTAL CELLS/ML	8900		38000		49000		28000		11000	
DIVERSITY: DIVISION	0.4		0.4		1.4		1.6		1.1	
.CLASS	0.4		0.4		1.4		1.6		1.1	
..ORDER	0.7		0.6		2.1		2.3		1.5	
...FAMILY	0.7		0.7		2.2		2.8		2.3	
....GENUS	1.8		0.7		2.7		3.7		3.6	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)										
.CHLOROPHYCEAE										
..CHLOROCOCCALES										
...CHARACIACEAE										
....SCHROEDERIA	--	-	--	-	--	-	--	-	100	1
...COELASTRACEAE										
....COELASTRUM	--	-	--	-	--	-	1700	6	--	-
...HYDRODICTYACEAE										
....PEDIASTRUM	--	-	--	-	--	-	340	1	--	-
...MICRACTINIACEAE										
....GOLENKINIA	--	-	--	-	--	-	--	-	100	1
....MICRACTINIUM	--	-	560	1	--	-	--	-	--	-
...OOCYSTACEAE										
....ANKISTRODESMUS	210	2	560	1	*	0	250	1	700	6
....DICTYOSPHAERIUM	69	1	--	-	*	0	670	2	400	3
....GLOEOACTINIUM	--	-	--	-	--	-	1300	4	1600	14
....KIRCHNERIELLA	--	-	--	-	--	-	170	1	--	-
....OOCYSTIS	--	-	--	-	250	1	340	1	400	3
....SELENASTRUM	--	-	--	-	330	1	*	0	--	-
....TETRAEDRON	--	-	--	-	*	0	*	0	150	1
...SCENEDESMACEAE										
....ACTINASTRUM	--	-	--	-	4700	9	1300	4	400	3
....CRUCIGENIA	--	-	--	-	--	-	340	1	600	5
....SCENEDESMUS	--	-	--	-	3200	6	1200	4	1200	10
....TETRASTRUM	--	-	--	-	--	-	340	1	400	3
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CARTERIA	--	-	--	-	--	-	*	0	--	-
....CHLAMYDOMONAS	140	2	1100	3	250	1	760	3	150	1
....MESOSTIGMA	--	-	--	-	--	-	*	0	--	-
CHRYSOPHYTA										
.BACILLARIOPHYCEAE										
..CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	1400#	16	--	-	2500	5	3200	11	1100	10
....MELOSIRA	960	11	--	-	8600#	17	2300	8	3100#	27
....STEPHANODISCUS	5600#	62	34000#	90	250	1	*	0	--	-
..PENNALES										
...DIATOMACEAE										
....DIATOMA	--	-	--	-	--	-	*	0	300	3
...FRAGILARIACEAE										
....ASTERIONELLA	270	3	--	-	670	1	--	-	--	-
....FRAGILARIA	69	1	--	-	--	-	--	-	--	-
....SYNEDRA	--	-	280	1	--	-	--	-	300	3
...NAVICULACEAE										
....NAVICULA	--	-	--	-	420	1	340	1	150	1
...NITZSCHIACEAE										
....NITZSCHIA	69	1	840	2	--	-	420	1	150	1
.CHRYSOPHYCEAE										
..CHRYSOMONADALES										
...OCHROMONADACEAE										
....OCHROMONAS	--	-	--	-	--	-	*	0	--	-
CRYPTOPHYTA (CRYPTOMONADS)										
.CRYPTOPHYCEAE										
..CRYPTOMONADALES										
...CRYPTOMONADACEAE										
....CRYPTOMONAS	--	-	--	-	*	0	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
.CYANOPHYCEAE										
..CHROOCOCCALES										
...CHROOCOCCACEAE										
....AGMENELLUM	--	-	--	-	--	-	2700	9	--	-
....ANACYSTIS	69	1	--	-	13000#	27	4200	15	--	-
..HORMOGONALES										
...OSCILLATORIACEAE										
....OSCILLATORIA	--	-	--	-	14000#	29	6100#	21	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05331570 MISSISSIPPI RIVER AT NINNINGER, MN--Continued

PHYTOPLANKTON ANALYSES--OCTOBER 1980 TO SEPTEMBER 1981--Continued

DATE	NOV 25,80		MAR 26,81		JUN 2,81		JUL 28,81		SEP 29,81	
TIME	1100		1100		1230		1045		1035	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
EUGLENOPHYTA (EUGLENOIDS)										
.EUGLENOPHYCEAE										
..EUGLENALES										
...EUGLENACEAE										
....EUGLENA	--	-	--	-	--	-	*	0	100	1
....PHACUS	--	-	--	-	--	-	*	0	--	-
....TRACHELOMONAS	69	1	--	-	--	-	--	-	150	1
PYRRHOPHYTA (FIRE ALGAE)										
.DINOPHYCEAE										
..PERIDINIALES										
...GLENODINIACEAE										
....GLENODINIUM	--	-	280	1	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05331578 MISSISSIPPI RIVER AT LOCK AND DAM 2 AT HASTINGS, MN

LOCATION.--Lat 44°45'37", long 92°52'02", in SE¼SW¼ sec.16, T.115 N., R.17 W., Dakota County, Hydrologic Unit 07010206, in old lock house at lock and dam and at mile 815.2 (1,312 km) upstream from Ohio River.

PERIOD OF RECORD.--Water years 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1974 to current year.
pH: October 1974 to current year.
WATER TEMPERATURES: October 1974 to current year.
DISSOLVED OXYGEN: October 1974 to current year.

INSTRUMENTATION.--Water-quality monitor since October 1974.

REMARKS.--Water discharge computed on the basis of discharge for Mississippi River at St. Paul (station 05331000) adjusted for inflow and travel time. Extremes are published for years with 80 percent or more daily record. Malfunctions of the monitor resulted in less than 80 percent recorded daily record for the current year.

COOPERATION.--Samples collected and water-quality monitor operated by the Metropolitan Waste Control Commission, St. Paul, MN.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water year 1980): Maximum, 799 micromhos June 27, July 6, 20, 1980; minimum, 341 micromhos Aug. 3, 1980.
pH (water year 1980): Maximum, 8.9 units Aug. 1, 1980; minimum, 7.3 units May 27, 28, 30, 31, June 1-7, 1980.
WATER TEMPERATURES (water year 1980): Maximum, 32.5°C July 10, 1980; minimum, 0.0°C several days during winter period.
DISSOLVED OXYGEN (water year 1980): Maximum, 19.2 mg/L Oct. 16, 1979; minimum, 1.7 mg/L June 4, 1980.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	FLUORIDE, TOTAL (MG/L AS F) (00951)
NOV								
06...	0930	6250	390	8.1	7.0	10.6	91	.1
FEB								
12...	1000	2270	540	7.6	.0	12.2	86	.3
MAY								
13...	1230	14300	485	8.1	14.5	11.4	114	.2
SEP								
03...	1045	20700	483	7.9	20.0	7.8	89	.2

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)
NOV									
06...	2	100	0	80	1	16	3	800	5
FEB									
12...	1	100	0	140	1	15	6	310	3
MAY									
13...	1	100	10	80	1	16	7	570	3
SEP									
03...	5	100	<10	60	<1	7	10	1600	5

DATE	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	CYANIDE TOTAL (MG/L AS CN) (00720)
NOV								
06...	160	<.1	2	8	0	0	30	.00
FEB								
12...	140	.1	1	19	0	0	20	<.01
MAY								
13...	150	<.1	1	8	0	0	40	<.01
SEP								
03...	160	<.1	7	8	2	<1	30	<.01

05331578 MISSISSIPPI RIVER AT LOCK AND DAM 2 AT HASTINGS, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	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)
SEP 03...	1045	20700	483	7.9	20.0	7.8	89	.2	5	100	<10	50

DATE	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	CHRO-MIUM, HEXA-VALENT, DIS. (UG/L AS CR) (01032)	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)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
SEP 03...	<1	6	<1	6	30	<1	50	<.1	<1	<1	<10

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	439	416	420				---	---	---	420	417	418
2	422	412	415				---	---	---	418	417	418
3	415	410	412				---	---	---	417	414	415
4	413	409	411				---	---	---	420	414	417
5	433	411	414				---	---	---	421	418	420
6	429	416	426				392	388	390	418	416	418
7	430	424	426				394	391	392	421	417	419
8	434	427	430				408	393	399	422	418	419
9	438	431	433				416	402	409	424	420	422
10	444	431	435				403	398	400	427	423	425
11	441	432	435				404	400	402	428	425	426
12	436	428	433				404	400	402	428	426	427
13	434	426	430				406	400	403	427	422	424
14	427	423	425				409	402	404	424	423	423
15	425	423	424				410	404	407	428	425	426
16	427	424	425				413	410	411	438	434	436
17	---	---	---				413	406	411	455	452	453
18	---	---	---				406	403	405	469	465	467
19	---	---	---				412	406	409	500	478	482
20	---	---	---				416	412	413	519	493	500
21	---	---	---				417	414	415	520	513	517
22	---	---	---				418	416	417	519	511	512
23	---	---	---				417	414	415	513	511	512
24	---	---	---				417	414	416	513	511	512
25	---	---	---				425	416	423	518	513	514
26	---	---	---				431	425	429	523	518	521
27	---	---	---				432	424	426	518	511	514
28	---	---	---				434	423	426	515	487	511
29	---	---	---				425	417	421	519	513	515
30	---	---	---				419	415	417	540	516	520
31	---	---	---				421	418	420	519	515	517
MONTH										540	414	462

05331578 MISSISSIPPI RIVER AT LOCK AND DAM 2 AT HASTINGS, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	523	511	520	460	454	457	505	498	502	487	480	484
2	526	522	524	452	441	449	504	496	501	482	478	480
3	536	515	520	450	442	447	508	500	504	482	478	480
4	524	514	516	445	437	442	502	486	491	483	478	481
5	515	512	514	442	435	438	490	481	484	485	479	482
6	520	363	512	438	434	436	491	486	489	483	474	479
7	523	516	519	441	435	438	491	486	488	479	472	475
8	528	521	525	444	435	439	490	483	487	478	474	475
9	527	525	526	442	436	439	492	482	485	480	475	477
10	---	---	---	444	436	441	500	488	494	488	476	482
11	---	---	---	455	441	445	500	494	497	498	484	491
12	---	---	---	461	448	453	504	496	500	496	489	493
13	---	---	---	459	448	454	518	502	507	507	485	500
14	---	---	---	471	457	463	502	497	499	523	503	511
15	---	---	---	468	452	462	501	496	499	558	512	532
16	---	---	---	470	457	464	508	500	504	560	524	533
17	---	---	---	467	453	459	511	503	507	541	530	536
18	---	---	---	459	451	456	510	504	507	534	527	530
19	494	471	488	454	446	450	508	503	497	550	527	540
20	503	483	495	460	444	451	504	500	502	572	527	546
21	518	490	505	468	455	460	505	490	495	535	494	509
22	505	488	495	475	456	463	497	490	493	500	488	494
23	496	480	490	472	457	463	492	481	487	493	482	487
24	492	482	488	469	462	466	491	481	485	472	466	469
25	491	482	486	469	464	466	489	486	488	452	449	450
26	487	474	481	467	464	462	508	487	493	463	440	444
27	475	468	470	477	469	473	500	493	497	449	419	431
28	468	457	463	486	478	482	502	489	495	448	416	424
29	---	---	---	495	486	493	492	484	488	422	415	418
30	---	---	---	501	491	499	489	483	486	422	412	417
31	---	---	---	504	496	500	---	---	---	425	417	421
MONTH				504	434	458	518	481	495	572	412	483

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	441	424	430	---	---	---	477	472	475	468	460	463
2	442	433	438	---	---	---	492	474	482	485	453	473
3	441	431	437	---	---	---	497	486	491	493	482	487
4	464	436	448	---	---	---	547	492	513	503	485	493
5	465	457	461	---	---	---	541	490	512	504	491	497
6	471	457	463	---	---	---	503	493	498	511	496	501
7	470	461	463	---	---	---	496	486	490	509	502	505
8	479	455	463	---	---	---	526	484	505	505	498	502
9	456	431	445	---	---	---	537	487	507	513	500	508
10	440	425	432	---	---	---	488	466	473	566	507	532
11	441	431	435	---	---	---	473	462	467	550	519	527
12	440	432	437	---	---	---	502	468	481	524	508	516
13	---	---	---	---	---	---	512	490	502	521	510	517
14	---	---	---	---	---	---	512	466	485	521	499	505
15	---	---	---	---	---	---	469	462	466	499	489	493
16	---	---	---	---	---	---	464	453	457	490	472	479
17	---	---	---	---	---	---	508	452	471	473	464	467
18	---	---	---	---	---	---	497	455	475	464	449	456
19	---	---	---	---	---	---	492	457	480	454	447	450
20	---	---	---	---	---	---	490	464	475	457	448	452
21	---	---	---	---	---	---	476	467	472	452	439	446
22	---	---	---	---	---	---	487	470	476	438	434	436
23	---	---	---	---	---	---	493	477	482	434	427	431
24	---	---	---	---	---	---	493	486	489	428	423	426
25	---	---	---	---	---	---	489	478	483	432	425	428
26	---	---	---	---	---	---	478	467	473	437	432	434
27	---	---	---	---	---	---	468	445	455	432	421	426
28	---	---	---	---	---	---	444	433	440	424	415	419
29	---	---	---	444	439	442	440	424	432	426	422	424
30	---	---	---	458	440	448	445	422	432	429	423	426
31	---	---	---	474	454	464	466	448	458	---	---	---
MONTH							547	422	477	566	415	471

05331578 MISSISSIPPI RIVER AT LOCK AND DAM 2 AT HASTINGS, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.3	8.1	8.2				---	---	---	8.0	8.0	8.0
2	8.1	7.9	8.0				---	---	---	8.0	7.9	7.9
3	7.9	7.8	7.9				---	---	---	7.9	7.8	7.8
4	7.9	7.8	7.8				---	---	---	7.8	7.8	7.8
5	7.8	7.7	7.8				8.1	7.9	8.0	7.8	7.8	7.8
6	7.8	7.7	7.8				8.0	7.9	8.0	7.9	7.8	7.8
7	7.8	7.6	7.7				8.0	7.8	7.9	7.8	7.8	7.8
8	9.0	7.6	7.9				7.9	7.8	7.8	7.8	7.8	7.8
9	8.1	7.9	8.0				7.8	7.6	7.7	7.8	7.7	7.8
10	8.1	7.9	8.0				8.1	7.6	7.8	7.7	7.7	7.7
11	8.0	7.9	7.9				8.0	7.9	8.0	7.7	7.7	7.7
12	8.0	7.9	7.9				8.1	8.0	8.0	7.9	7.5	7.7
13	8.0	7.8	7.9				8.0	7.9	8.0	7.9	7.7	7.8
14	7.9	7.8	7.8				7.9	7.9	7.9	7.8	7.8	7.8
15	7.8	7.8	7.8				7.9	7.8	7.8	7.8	7.7	7.8
16	7.8	7.7	7.8				8.1	7.8	7.9	7.7	7.7	7.7
17	---	---	---				8.0	7.9	8.0	7.7	7.7	7.7
18	---	---	---				8.0	7.9	8.0	7.8	7.7	7.7
19	---	---	---				7.9	7.8	7.9	7.8	7.6	7.8
20	---	---	---				7.9	7.9	7.9	7.9	7.6	7.8
21	---	---	---				8.0	7.9	7.9	8.0	7.8	7.8
22	---	---	---				8.0	8.0	8.0	8.0	7.8	7.8
23	---	---	---				8.0	8.0	8.0	7.9	7.8	7.8
24	---	---	---				8.0	7.8	7.9	7.8	7.8	7.8
25	---	---	---				8.1	7.7	7.8	7.9	7.8	7.8
26	---	---	---				8.4	8.0	8.2	7.9	7.8	7.8
27	---	---	---				8.2	7.8	8.0	8.0	7.7	7.8
28	---	---	---				8.1	7.9	8.0	---	---	---
29	---	---	---				8.1	7.9	8.0	8.1	7.8	7.8
30	---	---	---				8.1	8.0	8.1	8.0	7.7	7.8
31	---	---	---				8.1	8.0	8.1	8.0	7.9	7.9
MONTH												

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	8.0	7.7	7.9	8.0	7.9	7.9	8.0	7.9	7.9	8.1	7.8	8.0
2	7.8	7.7	7.8	8.0	7.9	7.9	8.1	7.8	7.9	8.0	7.8	7.9
3	7.7	7.6	7.7	8.0	7.9	7.9	8.0	7.7	7.9	8.1	7.8	7.9
4	7.9	7.6	7.7	8.0	7.9	7.9	7.8	7.7	7.8	7.8	7.6	7.7
5	7.9	7.9	7.9	8.0	7.9	7.9	7.8	7.7	7.7	7.9	7.5	7.7
6	7.9	7.7	7.8	8.0	7.9	8.0	7.8	7.7	7.7	8.1	7.5	7.8
7	7.9	7.8	7.9	8.0	8.0	8.0	7.9	7.7	7.8	7.9	7.6	7.7
8	7.9	7.8	7.8	8.0	8.0	8.0	8.0	7.7	7.9	7.8	7.6	7.7
9	7.8	7.7	7.8	8.1	8.0	8.0	8.1	7.8	7.9	7.8	7.6	7.7
10	7.8	7.1	7.7	8.1	8.0	8.0	8.1	7.8	8.0	7.9	7.6	7.8
11	7.8	7.8	7.8	8.1	8.0	8.0	8.1	7.9	8.0	8.0	7.6	7.9
12	7.8	7.8	7.8	8.2	8.1	8.1	8.1	7.9	7.9	8.0	7.8	7.9
13	---	---	---	8.2	8.2	8.2	8.4	7.8	8.1	8.1	7.7	7.9
14	---	---	---	8.2	8.2	8.2	8.0	7.7	7.9	8.2	7.8	8.0
15	7.8	7.7	7.7	8.4	8.2	8.3	8.0	7.8	7.9	8.5	7.9	8.2
16	---	---	---	8.4	8.3	8.3	8.0	7.8	7.9	8.4	8.1	8.3
17	---	---	---	8.4	8.4	8.4	7.9	7.8	7.8	8.4	8.0	8.2
18	---	---	---	8.4	8.1	8.3	8.0	7.7	7.9	8.4	8.0	8.2
19	8.0	7.4	7.6	8.2	8.1	8.2	7.9	7.7	7.9	8.7	8.2	8.5
20	7.9	7.5	7.7	8.2	8.1	8.2	8.0	7.8	7.9	8.5	8.2	8.4
21	7.7	7.5	7.6	8.2	8.2	8.2	8.0	7.8	7.9	8.4	8.2	8.3
22	7.5	7.5	7.5	8.4	8.2	8.3	7.9	7.7	7.8	8.3	8.0	8.2
23	7.9	7.5	7.7	8.5	8.3	8.4	7.8	7.6	7.7	8.1	8.0	8.0
24	7.9	7.8	7.9	8.5	8.4	8.5	7.8	7.6	7.7	8.3	8.0	8.2
25	7.9	7.9	7.9	8.5	7.5	8.0	7.7	7.5	7.6	8.1	7.8	8.0
26	7.9	7.9	7.9	7.5	7.4	7.5	8.3	7.6	7.8	8.1	7.9	7.9
27	7.9	7.9	7.9	7.6	7.4	7.5	8.1	7.4	7.9	8.1	7.9	8.0
28	7.9	7.9	7.9	7.6	7.4	7.5	8.0	7.8	7.9	8.1	8.0	8.0
29	---	---	---	7.6	7.5	7.6	8.1	7.7	7.9	8.1	7.9	8.0
30	---	---	---	7.6	7.5	7.6	8.1	7.8	7.9	8.2	8.0	8.1
31	---	---	---	7.6	7.5	7.6	---	---	---	8.3	8.0	8.2
MONTH				8.5	7.4	8.0	8.4	7.4	7.9	8.7	7.5	8.0

05331578 MISSISSIPPI RIVER AT LOCK AND DAM 2 AT HASTINGS, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.5	8.1	8.2	---	---	---	8.2	8.1	8.1	8.1	8.1	8.1
2	8.3	8.2	8.2	---	---	---	8.2	8.1	8.1	8.1	8.0	8.1
3	8.3	8.1	8.2	---	---	---	8.2	8.1	8.1	8.1	7.9	8.0
4	8.5	8.1	8.3	---	---	---	8.4	8.1	8.2	8.3	8.1	8.2
5	8.4	8.2	8.3	---	---	---	8.2	8.1	8.2	8.3	8.3	8.3
6	8.3	8.2	8.2	---	---	---	8.3	8.2	8.2	8.3	8.3	8.3
7	8.3	8.1	8.2	---	---	---	8.3	8.1	8.3	8.3	8.3	8.3
8	8.2	8.0	8.1	---	---	---	8.3	8.0	8.2	8.3	8.2	8.3
9	8.2	8.0	8.1	---	---	---	8.3	8.3	8.3	8.2	8.1	8.1
10	8.2	8.1	8.1	---	---	---	8.2	8.1	8.2	8.4	8.1	8.2
11	8.2	8.0	8.1	---	---	---	8.3	8.1	8.2	8.3	8.1	8.2
12	8.2	8.0	8.1	---	---	---	8.3	8.1	8.2	8.3	8.1	8.2
13	---	---	---	---	---	---	8.3	8.2	8.2	8.2	8.1	8.1
14	---	---	---	---	---	---	8.3	8.1	8.2	8.2	8.1	8.1
15	---	---	---	---	---	---	8.2	8.1	8.1	8.1	8.0	8.1
16	---	---	---	---	---	---	8.2	8.1	8.1	8.0	7.8	7.9
17	---	---	---	---	---	---	8.4	8.0	8.2	8.4	7.7	8.3
18	---	---	---	---	---	---	8.4	8.0	8.2	8.3	8.2	8.3
19	---	---	---	---	---	---	8.3	8.0	8.1	8.5	8.3	8.3
20	---	---	---	---	---	---	8.2	8.1	8.1	8.4	8.3	8.3
21	---	---	---	---	---	---	8.2	8.1	8.1	8.4	8.2	8.3
22	---	---	---	---	---	---	8.2	8.1	8.2	8.3	8.2	8.3
23	---	---	---	---	---	---	8.2	8.1	8.2	8.3	8.1	8.2
24	---	---	---	---	---	---	8.2	8.1	8.1	8.2	8.1	8.1
25	---	---	---	---	---	---	8.2	8.1	8.1	8.2	7.9	8.0
26	---	---	---	---	---	---	8.1	7.9	8.1	8.0	7.9	7.9
27	---	---	---	---	---	---	8.1	8.1	8.1	8.0	8.0	8.0
28	---	---	---	---	---	---	8.1	8.0	8.1	8.0	7.9	7.9
29	---	---	---	8.0	7.9	8.0	8.1	7.9	8.0	7.9	7.8	7.8
30	---	---	---	8.1	8.0	8.0	8.2	7.9	8.1	7.8	7.8	7.8
31	---	---	---	8.1	8.0	8.1	8.2	8.1	8.1	---	---	---
MONTH							8.4	7.9	8.2	8.5	7.7	8.1

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	15.5	14.5	15.0				---	---	---	1.0	1.0	1.0
2	14.5	13.0	14.0				---	---	---	1.0	.5	1.0
3	13.0	12.0	12.5				---	---	---	1.0	.5	.5
4	12.5	11.5	12.0				---	---	---	1.0	.5	1.0
5	12.5	12.0	12.0				---	---	---	1.0	.5	1.0
6	14.5	12.5	13.0				1.0	.5	1.0	1.0	1.0	1.0
7	14.5	13.0	13.5				1.0	.5	1.0	1.0	.5	1.0
8	15.0	14.0	14.5				1.0	.5	1.0	1.0	.5	.5
9	14.5	14.0	14.5				1.0	.5	1.0	1.0	.5	.5
10	14.5	12.5	13.5				1.0	.5	1.0	1.0	.5	1.0
11	12.5	10.5	11.0				1.0	.5	.5	1.0	.5	.5
12	10.5	9.5	10.0				1.0	.5	.5	1.0	1.0	1.0
13	10.0	9.5	9.5				1.0	.5	.5	1.0	1.0	1.0
14	9.5	9.0	9.0				1.0	.5	.5	1.0	1.0	1.0
15	9.5	9.0	9.0				.5	.5	.5	.5	.5	.5
16	9.5	9.5	9.5				.5	.5	.5	.5	.5	.5
17	---	---	---				1.0	.5	1.0	.5	.5	.5
18	---	---	---				1.0	.5	.5	1.0	.5	.5
19	---	---	---				.5	.5	.5	1.0	.5	1.0
20	---	---	---				.5	.5	.5	1.0	.5	1.0
21	---	---	---				1.0	.5	1.0	1.0	.5	.5
22	---	---	---				1.0	1.0	1.0	1.0	.5	.5
23	---	---	---				1.0	.5	1.0	1.0	.5	.5
24	---	---	---				.5	.5	.5	1.0	.5	1.0
25	---	---	---				1.0	.5	.5	1.0	1.0	1.0
26	---	---	---				1.0	.5	.5	1.0	.5	1.0
27	---	---	---				1.0	.5	1.0	1.0	1.0	1.0
28	---	---	---				1.0	1.0	1.0	1.0	1.0	1.0
29	---	---	---				1.0	.5	1.0	1.0	1.0	1.0
30	---	---	---				1.0	1.0	1.0	1.0	1.0	1.0
31	---	---	---				1.0	1.0	1.0	1.5	1.0	1.0
MONTH										1.5	.5	1.0

05331578 MISSISSIPPI RIVER AT LOCK AND DAM 2 AT HASTINGS, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.5	.5	1.0	2.5	1.5	2.0	10.0	9.5	9.5	14.5	12.5	13.5
2	1.0	.5	.5	2.0	1.5	1.5	11.0	9.0	10.0	15.0	13.5	14.0
3	1.0	.5	1.0	2.0	1.5	1.5	11.5	10.5	11.5	15.0	14.0	14.5
4	2.0	.5	.5	1.5	1.0	1.5	10.5	8.5	9.5	15.0	14.5	15.0
5	1.0	.5	1.0	2.0	1.0	1.5	9.0	7.5	8.5	16.0	14.0	15.0
6	1.0	.5	.5	2.0	1.0	1.5	10.0	8.0	9.0	16.0	14.0	15.0
7	1.0	.5	.5	2.5	1.5	2.0	10.0	9.5	10.0	16.5	14.5	15.5
8	.5	.5	.5	3.0	1.5	2.5	10.5	9.5	10.0	16.0	15.0	15.5
9	.5	.5	.5	3.0	2.5	3.0	11.0	9.5	10.0	15.0	14.0	14.5
10	---	---	---	3.0	2.0	3.0	13.0	10.5	11.5	14.5	12.5	13.5
11	---	---	---	3.5	3.0	3.0	12.0	11.5	11.5	15.5	13.0	14.0
12	.5	.0	.0	4.5	3.0	3.5	13.0	11.5	12.0	14.5	13.5	14.0
13	.0	.0	.0	5.0	3.5	4.0	13.0	11.5	12.5	16.0	13.5	15.0
14	---	---	---	5.5	4.5	5.0	11.5	10.5	11.0	17.5	15.0	16.0
15	.5	.0	.0	6.0	4.0	5.0	11.5	10.0	10.5	19.5	16.0	17.5
16	.0	.0	.0	6.5	4.5	5.5	11.5	11.0	11.0	18.0	17.0	17.5
17	.0	.0	.0	6.0	4.5	5.0	12.5	11.0	11.5	17.5	16.5	16.5
18	---	---	---	4.5	3.5	4.0	13.0	11.0	12.0	17.0	15.5	16.0
19	2.0	2.0	2.0	4.0	3.0	3.5	12.5	12.0	12.0	18.5	16.0	17.0
20	2.5	2.0	2.5	5.0	2.5	3.5	12.0	11.0	11.5	20.5	17.5	18.5
21	3.0	2.0	2.5	6.0	4.0	5.0	11.5	10.0	11.0	19.5	18.5	19.0
22	2.5	2.0	2.0	7.5	5.0	6.5	10.5	10.0	10.5	19.0	18.5	19.0
23	2.0	1.5	2.0	10.0	7.0	8.0	10.5	9.0	9.5	19.5	18.5	19.0
24	2.5	1.5	2.0	9.0	8.0	8.5	10.5	8.5	9.5	19.5	18.5	18.5
25	3.0	2.0	2.5	9.0	8.5	8.5	11.0	9.5	10.0	18.0	17.5	17.5
26	3.0	2.5	2.5	8.5	7.5	8.0	15.5	10.5	12.0	19.5	17.0	18.0
27	2.5	2.0	2.0	9.0	8.0	8.5	14.0	12.0	13.0	19.5	18.0	18.5
28	2.0	1.5	2.0	11.0	9.0	10.0	13.5	12.5	13.0	19.5	19.0	19.0
29	---	---	---	12.0	11.0	11.5	13.0	12.0	12.5	20.5	19.0	19.5
30	---	---	---	12.0	11.5	11.5	14.0	12.5	13.0	20.5	19.0	20.0
31	---	---	---	11.5	11.0	11.5	---	---	---	20.5	19.5	20.0
MONTH				12.0	1.0	5.0	15.5	7.5	11.0	20.5	12.5	16.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	20.5	20.0	20.0	---	---	---	23.5	23.0	23.5	21.5	20.5	20.5
2	20.5	20.0	20.5	---	---	---	25.0	23.0	23.5	21.5	19.5	20.5
3	21.0	19.5	20.5	---	---	---	25.5	23.5	24.5	21.0	20.0	20.5
4	22.5	20.5	21.5	---	---	---	28.0	25.0	26.0	21.0	19.5	20.5
5	23.0	22.0	22.5	---	---	---	26.0	25.0	25.5	20.5	19.5	20.0
6	23.5	22.0	22.5	---	---	---	26.0	25.0	25.5	21.0	19.0	20.0
7	23.0	22.5	22.5	---	---	---	25.5	24.5	25.0	21.0	20.0	20.5
8	23.0	22.0	22.5	---	---	---	26.0	24.5	25.5	20.5	19.5	20.0
9	22.0	21.5	21.5	---	---	---	25.5	25.0	25.5	22.0	20.5	21.5
10	22.5	21.0	22.0	---	---	---	25.0	24.0	24.5	24.0	21.0	22.5
11	22.5	22.0	22.5	---	---	---	25.5	24.0	24.5	21.5	20.5	21.0
12	23.0	22.0	22.5	---	---	---	26.0	24.5	25.0	21.5	20.0	20.5
13	---	---	---	---	---	---	26.5	25.0	25.5	21.5	20.0	20.5
14	---	---	---	---	---	---	26.0	25.0	25.5	21.0	20.0	20.5
15	---	---	---	---	---	---	26.0	24.5	25.5	20.0	19.0	19.5
16	---	---	---	---	---	---	25.5	24.0	24.5	20.5	19.0	19.5
17	---	---	---	---	---	---	26.0	23.5	24.5	19.0	18.0	18.0
18	---	---	---	---	---	---	27.0	23.5	24.5	18.0	17.5	17.5
19	---	---	---	---	---	---	25.0	23.5	24.0	18.5	17.5	18.0
20	---	---	---	---	---	---	24.5	23.5	24.0	19.0	17.5	18.5
21	---	---	---	---	---	---	24.5	23.0	23.5	18.5	17.5	18.0
22	---	---	---	---	---	---	23.5	22.5	23.0	18.0	17.0	17.5
23	---	---	---	---	---	---	24.5	22.5	23.0	17.5	16.0	17.0
24	---	---	---	---	---	---	24.5	23.5	24.0	16.0	15.0	15.5
25	---	---	---	---	---	---	24.0	23.5	24.0	16.5	15.5	16.0
26	---	---	---	---	---	---	23.5	23.0	23.5	17.0	16.5	16.5
27	---	---	---	---	---	---	23.0	22.0	22.5	16.5	14.5	15.0
28	---	---	---	---	---	---	22.0	21.0	21.5	14.5	13.5	14.0
29	---	---	---	23.5	22.0	23.0	21.0	20.5	21.0	15.0	14.0	14.5
30	---	---	---	23.5	22.5	23.0	21.5	20.5	21.0	15.0	14.5	14.5
31	---	---	---	24.0	22.5	23.0	22.0	21.0	21.5	---	---	---
MONTH							28.0	20.5	24.0	24.0	13.5	18.5

05331578 MISSISSIPPI RIVER AT LOCK AND DAM 2 AT HASTINGS, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.8	4.4	8.8				---	---	---	10.1	9.7	9.9
2	14.5	7.4	11.7				---	---	---	10.3	9.8	10.1
3	13.2	10.8	11.8				---	---	---	10.0	9.3	9.6
4	14.4	10.1	11.6				---	---	---	10.7	9.7	10.2
5	12.6	9.7	11.1				---	---	---	11.9	10.8	11.3
6	15.2	10.3	12.1				11.3	10.3	10.8	11.8	11.3	11.6
7	13.6	10.2	11.6				10.3	8.6	9.3	11.7	11.4	11.5
8	18.8	.0	11.8				9.1	8.4	8.7	11.5	10.8	11.1
9	18.7	7.9	14.5				9.5	8.8	9.2	11.3	10.8	11.0
10	18.5	9.1	13.2				9.8	8.5	9.1	11.5	10.8	11.2
11	16.7	14.6	15.6				10.3	9.3	9.7	11.7	11.1	11.3
12	19.9	1.3	15.5				10.4	9.6	10.1	11.9	10.5	11.4
13	17.5	14.1	15.3				10.0	9.4	9.6	11.2	10.4	11.0
14	15.8	12.5	13.6				10.0	9.5	9.8	11.1	10.9	11.0
15	16.0	11.7	13.3				9.5	9.0	9.3	10.1	8.8	9.1
16	15.7	12.7	14.2				9.5	9.3	9.5	9.7	8.9	9.4
17	---	---	---				10.4	9.5	9.9	9.7	9.4	9.5
18	---	---	---				10.7	10.0	10.3	10.2	8.7	9.0
19	---	---	---				12.6	10.2	11.6	10.0	9.0	9.6
20	---	---	---				13.6	12.7	12.9	10.1	9.3	9.5
21	---	---	---				14.0	13.4	13.6	10.6	9.0	9.9
22	---	---	---				14.2	13.2	13.7	10.4	10.0	10.2
23	---	---	---				13.3	11.9	12.5	10.6	10.2	10.4
24	---	---	---				11.8	10.4	10.9	11.6	10.5	10.9
25	---	---	---				10.6	8.4	10.0	11.5	10.5	11.2
26	---	---	---				7.9	4.1	6.9	10.6	9.5	10.0
27	---	---	---				9.6	6.6	7.9	10.5	9.7	10.0
28	---	---	---				10.5	8.7	9.8	10.7	9.7	10.2
29	---	---	---				11.3	9.9	10.4	11.3	10.5	11.0
30	---	---	---				10.5	9.9	10.3	12.5	9.6	11.2
31	---	---	---				10.4	10.0	10.2	11.2	9.5	10.6
MONTH										12.5	8.7	10.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	12.3	7.6	9.4	12.6	11.6	12.0	12.6	9.0	10.8	14.4	10.6	12.5
2	12.1	10.4	11.4	12.7	11.5	11.9	16.6	10.5	12.5	13.2	11.3	12.5
3	12.0	9.1	10.7	13.2	12.3	12.8	15.1	11.3	13.3	11.4	9.8	10.7
4	11.3	9.4	10.1	13.2	11.9	12.6	12.3	11.3	11.8	9.7	8.9	9.3
5	11.5	9.3	10.9	12.7	12.1	12.3	14.6	11.2	12.9	11.5	8.3	9.9
6	---	---	---	12.9	12.0	12.4	14.2	12.9	13.5	13.8	8.9	11.6
7	---	---	---	13.4	12.7	13.0	14.4	11.0	13.1	13.0	10.5	11.6
8	10.5	6.9	8.5	13.6	12.9	13.1	13.5	10.4	12.0	11.7	10.1	10.7
9	10.2	5.7	6.9	13.7	12.9	13.2	13.2	10.7	11.8	10.8	9.1	10.0
10	12.1	5.6	7.6	13.2	12.4	12.8	14.7	9.3	12.1	11.4	8.5	10.0
11	11.0	10.8	10.7	14.1	12.8	13.2	14.7	11.7	12.8	13.5	8.8	11.3
12	---	---	---	14.0	12.9	13.5	13.5	10.6	12.0	12.9	10.5	11.8
13	---	---	---	13.7	12.8	13.3	12.6	8.1	9.9	12.3	9.9	10.9
14	---	---	---	14.2	13.2	13.6	10.1	7.2	8.7	13.7	10.1	11.7
15	---	---	---	14.5	13.0	13.8	15.9	7.9	11.7	17.8	10.6	13.7
16	---	---	---	14.3	12.9	13.5	14.2	11.3	12.6	15.1	11.6	13.4
17	---	---	---	14.2	13.5	13.9	14.2	11.7	12.7	12.7	9.2	10.8
18	---	---	---	13.5	12.5	13.0	16.9	10.5	14.0	12.1	8.4	10.2
19	11.7	10.2	10.9	13.2	12.1	12.8	15.9	12.8	14.4	18.3	9.7	13.5
20	11.3	10.1	10.7	14.7	12.0	13.2	17.0	12.7	14.5	16.9	10.9	13.7
21	11.5	10.4	10.9	14.7	13.6	14.2	16.6	11.4	13.2	14.8	11.9	12.9
22	10.8	9.5	10.2	16.5	14.2	15.4	11.5	9.4	10.4	12.5	9.0	10.5
23	9.7	9.2	9.4	19.3	15.5	16.8	9.7	8.6	9.1	9.5	8.4	8.9
24	9.8	9.3	9.4	17.8	15.1	16.6	11.3	8.5	9.7	9.5	6.6	7.5
25	10.1	9.2	9.7	17.3	15.5	16.4	11.0	9.0	10.0	7.6	5.4	6.3
26	10.1	9.5	9.8	16.6	14.3	15.3	15.5	9.9	12.5	7.1	5.5	5.9
27	10.0	9.0	9.5	15.8	13.6	14.7	15.9	7.5	12.6	6.8	5.6	6.2
28	11.8	8.9	10.4	15.4	12.6	14.0	13.7	12.0	12.7	6.7	5.1	5.7
29	---	---	---	14.6	13.0	13.9	12.7	10.2	11.4	7.0	5.5	6.1
30	---	---	---	14.9	12.8	14.0	13.4	10.4	11.7	9.7	5.7	7.8
31	---	---	---	14.2	10.8	12.7	---	---	---	9.9	7.6	8.6
MONTH				19.3	10.8	13.7	17.0	7.2	12.0	18.3	5.1	10.2

05331578 MISSISSIPPI RIVER AT LOCK AND DAM 2 AT HASTINGS, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.3	5.5	8.1	---	---	---	7.3	6.7	7.0	8.2	7.3	7.8
2	8.5	5.5	6.5	---	---	---	7.6	6.5	6.8	8.3	7.2	7.8
3	10.5	5.8	7.0	---	---	---	6.6	5.8	6.3	7.8	7.4	7.6
4	13.0	8.3	10.3	---	---	---	7.6	5.5	6.4	8.7	7.1	7.6
5	12.0	9.1	10.7	---	---	---	7.4	5.4	6.5	8.3	7.3	7.7
6	12.7	10.5	11.5	---	---	---	7.4	6.6	7.0	8.3	7.2	7.6
7	11.5	8.1	10.4	---	---	---	7.6	6.6	7.0	8.9	7.4	8.1
8	9.6	7.1	8.0	---	---	---	7.3	5.9	6.5	8.8	7.4	8.2
9	9.6	6.4	8.2	---	---	---	6.6	5.9	6.3	10.4	9.1	9.7
10	11.4	6.7	9.6	---	---	---	7.0	5.7	6.4	14.1	8.5	10.6
11	11.0	8.9	9.8	---	---	---	6.9	5.2	6.0	11.2	7.9	9.4
12	8.7	5.5	7.2	---	---	---	8.2	6.0	7.0	11.9	8.8	10.0
13	---	---	---	---	---	---	8.4	7.2	7.7	10.6	7.1	8.0
14	---	---	---	---	---	---	7.6	6.8	7.1	7.7	5.6	6.5
15	---	---	---	---	---	---	6.8	5.6	6.3	6.1	5.2	5.6
16	---	---	---	---	---	---	6.7	4.9	5.8	9.1	4.8	6.6
17	---	---	---	---	---	---	8.2	5.6	6.8	9.6	7.4	8.3
18	---	---	---	---	---	---	10.9	5.8	7.5	8.8	7.5	8.1
19	---	---	---	---	---	---	9.8	6.2	7.8	9.9	7.2	8.3
20	---	---	---	---	---	---	8.3	6.3	6.9	8.5	6.8	7.6
21	---	---	---	---	---	---	8.4	6.9	7.5	10.3	6.0	8.7
22	---	---	---	---	---	---	8.3	6.6	7.3	9.5	8.1	8.9
23	---	---	---	---	---	---	7.7	5.8	6.7	9.8	8.1	8.9
24	---	---	---	---	---	---	7.8	6.3	7.0	10.6	9.0	9.8
25	---	---	---	---	---	---	7.6	6.5	7.1	9.5	7.0	8.0
26	---	---	---	---	---	---	8.2	5.4	6.6	8.3	6.6	7.1
27	---	---	---	---	---	---	6.8	5.7	6.3	9.6	8.3	9.0
28	---	---	---	---	---	---	7.0	5.7	6.1	11.7	8.7	10.2
29	---	---	---	7.9	6.8	7.5	6.5	5.4	5.8	10.8	8.6	9.6
30	---	---	---	7.9	6.4	7.2	6.4	5.5	5.9	9.2	7.3	8.1
31	---	---	---	7.4	6.9	7.1	8.0	6.6	7.3	---	---	---
MONTH							10.9	4.9	6.7	14.1	4.8	8.3

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 900 ft (274 m) downstream from abandoned powerplant dam, 1.8 mi (2.9 km) south of Sandstone.

DRAINAGE AREA.--863 mi^2 (2,240 km^2).

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 931.50 ft (283.921 m) National Geodetic Vertical Datum of 1929. (Minnesota Department of Transportation bench mark).

REMARKS.--Records good except those for winter periods, which are fair.

AVERAGE DISCHARGE.--14 years, 684 ft^3/s (19.37 m^3/s), 10.76 in/yr (273 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,200 ft^3/s (487 m^3/s) July 23, 1972, gage height, 15.38 ft (4.688 m); minimum, 25 ft^3/s (0.71 m^3/s) Nov. 11-12, 1977, gage height, 3.37 ft (1.027 m) result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1965 reached a stage of 12.96 ft (3.950 m) from flood marks, discharge, 13,400 ft^3/s (379 m^3/s).

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 3,600 ft^3/s (102 m^3/s) and maximum (*)

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Apr. 24	1900	4210	119	7.97	2.429
June 15	1200	*5590	158	*8.83	2.691

Minumum daily discharge, 80 ft^3/s (2.26 m^3/s) Jan. 23 to Feb. 17, minimum gage height 3.88 ft (1.183 m) Jan. 21-25, Feb. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	321	235	139	93	80	178	1530	2970	351	1270	365	650
2	305	232	140	90	80	164	1430	2910	332	1050	404	555
3	294	216	142	84	80	159	1250	2470	335	890	454	482
4	283	208	143	88	80	157	1140	2150	432	778	567	426
5	272	206	142	91	80	143	1010	2380	468	682	577	383
6	264	204	143	92	80	138	981	2610	426	603	503	348
7	247	204	150	93	80	135	1020	2230	391	529	455	334
8	235	240	149	93	80	137	1000	1910	356	467	426	319
9	225	234	141	93	80	136	965	1670	324	418	431	280
10	221	234	135	92	80	137	926	1440	314	330	434	250
11	209	235	127	92	80	138	925	1250	314	331	394	230
12	202	228	125	92	80	153	915	1090	324	316	358	205
13	201	226	124	91	80	194	894	962	502	296	327	190
14	206	234	123	90	80	264	955	854	3260	287	307	185
15	202	240	123	89	80	301	970	768	5380	342	286	180
16	204	229	123	88	80	311	919	697	4740	439	265	170
17	211	230	122	87	80	304	880	629	3870	534	240	165
18	218	203	118	86	96	277	836	576	3050	760	220	160
19	218	205	113	85	125	256	790	526	2380	581	204	160
20	222	222	108	84	200	226	753	480	1920	506	190	155
21	226	206	105	83	222	211	702	444	1630	763	182	155
22	222	200	103	81	231	202	759	410	1870	835	245	155
23	231	198	102	80	214	195	2040	398	2080	702	490	155
24	227	187	100	80	240	191	3880	430	2630	635	482	155
25	235	156	99	80	250	198	4050	473	2930	632	494	155
26	246	153	98	80	241	273	3710	478	2380	614	722	155
27	248	149	96	80	225	574	3470	472	1920	548	1500	155
28	248	146	96	80	198	653	3500	454	1590	490	1420	195
29	239	142	96	80	---	812	3250	441	1680	442	1140	230
30	226	140	96	80	---	1550	2960	417	1580	402	955	210
31	223	---	95	80	---	1740	---	379	---	373	783	---
TOTAL	7331	6142	3716	2677	3602	10507	48410	35368	49759	17845	15820	7547
MEAN	236	205	120	86.4	129	339	1614	1141	1659	576	510	252
MAX	321	240	150	93	250	1740	4050	2970	5380	1270	1500	650
MIN	201	140	95	80	80	135	702	379	314	287	182	155
CFSM	.27	.24	.14	.10	.15	.39	1.87	1.32	1.92	.67	.59	.29
IN.	.32	.26	.16	.12	.16	.45	2.09	1.52	2.14	.77	.68	.33
AC-FT	14540	12180	7370	5310	7140	20840	96020	70150	98700	35400	31380	14970

CAL YR 1980 TOTAL 110657 MEAN 302 MAX 2870 MIN 87 CFSM .35 IN 4.77 AC-FT 219500
WTR YR 1981 TOTAL 208724 MEAN 572 MAX 5380 MIN 80 CFSM .66 IN 9.00 AC-FT 414000

05337050 KETTLE RIVER NEAR CLOVERDALE, MN

LOCATION.--Lat 45°54'13", long 92°43'47", in SW¼SW¼ sec. 33, T.40 N., R.19 W., Pine County, Hydrologic Unit 07030003, St. Croix National Scenic Riverway, 200 ft (61 m) west of Town Road, 8.0 mi (12.9 km) south of Cloverdale, and 9.0 mi (14.5 km) northwest of Grantsburg, Wisconsin.

DRAINAGE AREA.--1,025 mi^2 (2,655 km^2), approximately.

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

REMARKS.--Letter K indicates non-ideal colony count.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
MAR										
31...	1620	1890	114	6.1	3.0	12.5	97	120	1700	5.9
AUG										
19...	0910	250	154	6.9	19.0	9.1	102	K16	K1900	4.7

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRATE TOTAL (MG/L AS N) (00620)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAR										
31...	--	--	--	<.010	.250	1.80	.100	19	97	89
AUG										
19...	679	458	.21	.020	.090	.90	.040	1	.67	100

05337400 KNIFE RIVER NEAR MORA, MN

LOCATION.--Lat 45°55'12", long 93°18'26", in SW¼SW¼ sec.26, T.40 N., R.24 W., Kanabec County, Hydrologic Unit 07030004, on left bank 400 ft (122 m) upstream from bridge on County Highway 77, 1.1 mi (1.8 km) upstream from mouth and 2.5 mi (4.0 km) north of Mora.

DRAINAGE AREA.--102 mi^2 (264 km^2).

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 (302.118 m) National Geodetic Vertical Datum of 1929. (Kanabec County bench mark).

REMARKS.--Records good except those for winter periods and periods of no gage-height record, Jan. 2-14, and Jul. 1-20, which are fair.

AVERAGE DISCHARGE.--7 years, 52.7 ft^3/s (1.492 m^3/s), 7.02 in/yr (178 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,840 ft^3/s (52.1 m^3/s) May 10, 1979, gage height, 6.31 ft (1.923 m); maximum gage height, 6.69 ft (2.039 m) Nov. 24, 1977, from floodmark (backwater from ice); minimum daily discharge, 1.1 ft^3/s (0.031 m^3/s) Jan. 12 to Feb. 9, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 26, 1972, reached a stage of 14.0 ft (4.267 m), from information by local resident (discharge not determined). Result of dam failure and backwater from collapsed bridge.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 529 ft^3/s (15.0 m^3/s) June 30, gage height, 4.58 ft (1.396 m), no other peak above base of 500 ft^3/s (14.2 m^3/s); minimum daily, 5.3 ft^3/s (0.150 m^3/s) Jan. 14 to Feb. 16; minimum gage height, 1.83 ft (0.558 m) Sept. 24-26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	27	16	5.6	5.3	30	93	201	23	470	12	96
2	37	26	15	5.6	5.3	27	101	184	23	400	17	80
3	33	26	15	5.6	5.3	24	105	173	24	350	28	68
4	32	25	14	5.6	5.3	22	115	161	24	300	43	57
5	30	24	14	5.5	5.3	20	98	174	25	250	48	47
6	28	23	14	5.5	5.3	18	87	165	26	215	138	41
7	27	23	13	5.4	5.3	17	86	150	24	185	216	38
8	26	23	13	5.4	5.3	15	81	138	21	153	188	33
9	24	23	12	5.4	5.3	14	72	127	19	130	146	30
10	21	23	12	5.4	5.3	13	70	110	18	110	110	28
11	20	23	12	5.4	5.3	13	70	98	16	95	87	28
12	19	23	11	5.4	5.3	13	69	87	15	81	69	27
13	18	23	11	5.4	5.3	12	73	79	28	70	56	25
14	23	23	11	5.3	5.3	12	79	70	80	60	47	23
15	23	21	10	5.3	5.3	12	77	63	216	52	39	19
16	24	21	9.9	5.3	5.3	13	76	61	289	45	31	17
17	26	21	9.5	5.3	10	13	74	53	247	39	24	13
18	28	21	9.2	5.3	31	13	72	44	201	35	20	12
19	30	21	8.8	5.3	35	13	71	39	164	30	18	11
20	30	21	8.0	5.3	39	13	64	35	148	27	15	11
21	31	20	7.2	5.3	34	12	59	33	133	23	14	10
22	31	19	6.6	5.3	51	12	70	29	146	20	24	9.8
23	31	19	6.2	5.3	53	12	123	29	153	20	31	8.8
24	31	18	6.0	5.3	54	13	228	29	166	20	35	8.5
25	32	18	5.9	5.3	43	13	267	28	181	21	49	8.5
26	32	17	5.8	5.3	34	14	247	28	172	18	93	11
27	31	17	5.8	5.3	31	15	238	27	151	15	151	12
28	31	16	5.7	5.3	32	16	224	26	134	14	165	12
29	30	16	5.6	5.3	---	36	202	26	252	11	151	14
30	29	16	5.6	5.3	---	63	206	26	511	9.7	132	18
31	28	---	5.6	5.3	---	84	---	23	---	10	111	---
TOTAL	873	637	304.4	166.6	531.8	617	3497	2516	3630	3278.7	2308	816.6
MEAN	28.2	21.2	9.82	5.37	19.0	19.9	117	81.2	121	106	74.5	27.2
MAX	37	27	16	5.6	54	84	267	201	511	470	216	96
MIN	18	16	5.6	5.3	5.3	12	59	23	15	9.7	12	8.5
CFSM	.28	.21	.10	.05	.19	.20	1.15	.80	1.19	1.04	.73	.27
IN.	.32	.23	.11	.06	.19	.23	1.28	.92	1.32	1.20	.84	.30
AC-FT	1730	1260	604	330	1050	1220	6940	4990	7200	6500	4580	1620

CAL YR 1980 TOTAL 10232.5 MEAN 28.0 MAX 276 MIN 3.1 CFSM .28 IN 3.73 AC-FT 20300
WTR YR 1981 TOTAL 19176.1 MEAN 52.5 MAX 511 MIN 5.3 CFSM .52 IN 6.99 AC-FT 38040

05338500 SNAKE RIVER NEAR PINE CITY, MN

LOCATION.--Lat 45°50'30", long 92°56'00", in SE¼NW¼ 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 (0.8 km) downstream from Cross Lake and 1.5 mi (2.4 km) northeast of Pine City.

DRAINAGE AREA.--958 mi^2 (2,480 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1913 to September 1917, July 1951 to current year.

GAGE.--Water-stage recorder. Datum of gage is 919.00 ft (280.111 m) National Geodetic Vertical Datum of 1929. June 25, 1913, to Sept. 30, 1917, nonrecording gage at site 500 ft (152 m) downstream at different datum. July 1 to Oct 28, 1951, nonrecording gage at present site and datum.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--34 years (water years 1914-17, 1952-81), 591 ft^3/s (16.74 m^3/s), 8.38 in/yr (213 mm/yr); median of yearly mean discharges, 529 ft^3/s (15.0 m^3/s), 7.50 in/yr (190 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,300 ft^3/s (405 m^3/s) July 27, 1972, gage height, 10.38 ft (3.164 m); minimum, 5.5 ft^3/s (0.16 m^3/s) Oct. 1, 1964, gage height, 2.57 ft (0.783 m), result of dam rehabilitation 0.5 mi (0.8 km) upstream.

EXTREMES OUTSIDE PERIOD OF RECORD.--A discharge measurement of 12,500 ft^3/s (354 m^3/s) was made May 9, 1950.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,040 ft^3/s (57.8 m^3/s) Apr. 30, gage height, 5.17 ft (1.576 m); minimum, 48 ft^3/s (1.36 m^3/s) Jan. 15-17, gage height, 2.86 ft (0.872 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	319	214	132	69	72	357	926	1960	261	1410	192	1000
2	297	203	104	70	72	334	959	1900	268	1460	193	856
3	282	234	97	69	72	304	976	1900	268	1430	196	736
4	275	221	97	64	72	282	1010	1860	247	1360	229	622
5	275	183	100	62	72	261	962	1780	261	1170	257	525
6	268	180	104	62	72	234	873	1670	261	995	330	453
7	264	173	112	57	72	208	851	1610	240	831	388	445
8	241	176	112	55	72	191	805	1560	240	702	492	372
9	191	199	112	55	75	164	766	1460	227	579	557	326
10	252	170	112	50	75	154	723	1350	234	487	549	290
11	186	163	107	50	78	151	663	1210	207	411	517	261
12	150	179	105	50	78	154	613	1080	175	394	476	234
13	140	192	99	50	78	151	619	966	247	376	417	208
14	164	189	94	50	78	151	649	864	500	362	366	185
15	175	183	89	48	78	164	648	754	836	350	321	168
16	175	184	87	48	78	171	663	636	1270	343	261	146
17	234	181	87	48	81	179	703	550	1590	342	234	130
18	234	175	84	50	90	186	630	508	1890	328	205	127
19	221	171	82	52	100	187	612	468	1920	309	179	122
20	247	175	80	55	108	185	586	420	1940	302	158	111
21	247	164	72	55	119	183	559	372	1780	286	138	101
22	221	170	70	57	136	182	614	326	1680	273	252	96
23	247	170	70	59	186	182	810	334	1590	271	241	93
24	290	159	70	59	247	180	1030	334	1670	268	245	92
25	282	145	67	62	297	181	1380	319	1690	263	312	90
26	275	136	64	64	326	186	1700	290	1730	246	433	132
27	275	140	63	64	349	177	1860	282	1740	235	550	150
28	275	145	62	67	365	192	1940	290	1690	234	850	90
29	268	150	64	70	---	284	1970	311	1580	211	1120	84
30	275	136	64	70	---	436	2000	275	1420	186	1170	145
31	268	---	66	70	---	660	---	261	---	185	1120	---
TOTAL	7513	5260	2728	1811	3598	7011	29100	27900	29652	16599	12948	8390
MEAN	242	175	88.0	58.4	129	226	970	900	988	535	418	280
MAX	319	234	132	70	365	660	2000	1960	1940	1460	1170	1000
MIN	140	136	62	48	72	151	559	261	175	185	138	84
CFSM	.25	.18	.09	.06	.14	.24	1.01	.94	1.03	.56	.44	.29
IN.	.29	.20	.11	.07	.14	.27	1.13	1.08	1.15	.64	.50	.33
AC-FT	14900	10430	5410	3590	7140	13910	57720	55340	58810	32920	25680	16640

CAL YR 1980	TOTAL	101440	MEAN 277	MAX	1910	MIN 55	CFSM .29	IN 3.94	AC-FT	201200		
WTR YR 1981	TOTAL	152510	MEAN 418	MAX	2000	MIN 48	CFSM .44	IN 5.92	AC-FT	302500		

05338500 SNAKE RIVER NEAR PINE CITY, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1963, 1965, 1967-68, 1975 to current year.

REMARKS.--Letter K indicates non-ideal colony count.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD-NESS (MG/L AS CACO3) (00900)
OCT												
16...	0750	84	218	7.4	9.0	50	.60	9.6	86	K5	K10	100
FEB												
21...	1450	--	--	--	--	--	--	--	--	--	--	--
25...	1450	304	310	7.0	2.0	--	--	9.6	73	48	K1100	130
MAR												
31...	1235	672	218	7.5	5.0	--	--	13.2	106	K5	37	110
AUG												
19...	1230	191	168	7.5	25.0	--	--	7.6	95	36	K5000	94

DATE	HARD-NESS, NONCAR-BONATE (MG/L CACO3) (00902)	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)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	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)
OCT											
16...	4	26	9.5	4.0	.2	1.6	3.7	3.7	.1	2.8	146
FEB											
21...	--	--	--	--	--	--	--	--	--	--	--
25...	0	34	12	5.4	.2	3.5	5.3	6.9	.1	11	188
MAR											
31...	--	27	9.6	4.2	.2	2.5	4.1	5.1	.1	4.9	139
AUG											
19...	--	24	8.3	3.9	.2	1.6	4.5	3.4	.1	8.8	145

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRATE TOTAL (MG/L AS N) (00620)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	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)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT											
16...	112	33.1	.06	.020	.040	.81	.050	.020	3	.68	99
FEB											
21...	--	--	--	--	--	--	--	--	2	--	78
25...	162	154	.45	.020	.270	1.00	.120	.040	2	1.6	78
MAR											
31...	117	252	--	<.010	.060	.92	.090	.030	3	5.4	76
AUG											
19...	105	74.8	--	<.010	.080	1.70	.080	.040	4	2.1	83

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO) (01037)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
AUG								
19...	1230	1	<50	<1	20	<1	4	1100

DATE	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	CYANIDE TOTAL (MG/L AS CN) (00720)
AUG							
19...	15	130	4	<1	10	<1	<.01

05340050 SUNRISE RIVER NEAR LINDSTROM, MN

LOCATION.--Lat 45°27'00", long 92°53'10", in SW¼NE¼ sec.7, T.34 N., R.20 W., Chisago County, Hydrologic Unit 07030005, on left bank 20 ft (6 m) downstream from highway bridge and 4.5 mi (7.2 km) northwest of Lindstrom.

DRAINAGE AREA.--231 mi^2 (598 km^2).

PERIOD OF RECORD.--July 1965 to current year.

GAGE.--Water-stage recorder. Datum of gage is 846.10 ft (257.891 m) National Geodetic Vertical Datum of 1929. (Chisago County bench mark).

REMARKS.--Records good except those for winter period, which are fair. Some regulation by Minnesota Game and Fish Wildlife Refuge ponds above the station. At high stages a small part of flow discharges into the Rum River and Coon Creek basins from West Arm of Coon Lake and South Coon Lake, respectively.

AVERAGE DISCHARGE.--16 years, 95.7 ft^3/s (2.710 m^3/s), 5.63 in/yr (143 mm/yr); median of yearly mean discharges, 102 ft^3/s (2.89 m^3/s), 6.00 in/yr (152 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 745 ft^3/s (21.1 m^3/s) July 3, 1975, gage height, 7.65 ft (2.332 m); minimum, 1.9 ft^3/s (0.054 m^3/s) Sept. 19, 20, 21, 1976; minimum gage height, 1.98 ft (0.604 m) Oct. 3, 1971.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 280 ft^3/s (7.93 m^3/s) May 5, gage height, 5.89 ft (1.795 m); minimum, 9.3 ft^3/s (0.26 m^3/s) Sept. 28, gage height, 2.50 ft (0.762 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	175	95	69	45	32	88	117	263	104	257	220	97
2	161	93	72	44	32	91	118	261	107	257	215	93
3	138	92	64	42	33	90	122	265	105	254	190	88
4	119	90	63	40	33	79	158	269	92	249	173	86
5	106	88	62	38	34	81	176	278	84	240	155	83
6	101	87	62	38	34	76	193	275	78	222	138	80
7	99	85	62	37	35	77	221	271	73	224	126	80
8	115	84	62	37	36	71	232	265	72	216	115	76
9	126	82	61	36	36	69	234	261	71	206	106	71
10	132	80	61	36	37	68	243	251	73	207	100	67
11	131	78	60	36	37	67	247	243	70	210	99	62
12	119	79	59	36	38	67	249	236	70	205	92	58
13	107	78	59	36	39	68	247	228	102	199	92	55
14	98	78	58	36	39	66	253	219	161	223	87	51
15	93	77	58	35	40	67	247	209	178	240	81	49
16	93	76	57	35	41	66	242	198	165	225	74	47
17	107	76	56	35	41	67	232	188	161	227	68	44
18	117	74	55	35	42	65	222	178	169	259	63	42
19	110	74	54	35	43	63	220	168	179	252	56	41
20	103	75	54	35	43	62	211	159	198	244	39	39
21	101	74	53	35	45	60	202	150	214	266	45	37
22	103	75	53	35	53	60	202	141	222	276	52	33
23	108	75	52	33	59	60	240	138	234	276	52	13
24	115	74	52	32	63	59	264	136	255	255	46	11
25	115	74	52	32	66	60	256	129	257	254	51	11
26	112	74	51	32	65	63	247	124	251	241	103	13
27	107	73	50	31	73	62	247	118	246	209	130	13
28	104	72	48	31	87	65	249	116	244	220	133	9.8
29	101	72	47	31	---	82	254	115	254	211	124	9.9
30	99	72	46	31	---	108	260	112	258	210	113	9.9
31	98	---	45	31	---	111	---	106	---	207	102	---
TOTAL	3513	2376	1757	1101	1256	2238	6605	6070	4747	7241	3240	1469.6
MEAN	113	79.2	56.7	35.5	44.9	72.2	220	196	158	234	105	49.0
MAX	175	95	72	45	87	111	264	278	258	276	220	97
MIN	93	72	45	31	32	59	117	106	70	199	39	9.8
CFSM	.49	.34	.25	.15	.19	.31	.95	.85	.68	1.01	.46	.21
IN.	.57	.38	.28	.18	.20	.36	1.06	.98	.76	1.17	.52	.24

CAL YR 1980 TOTAL 32303.0 MEAN 88.3 MAX 301 MIN 10 CFSM .38 IN 5.20
WTR YR 1981 TOTAL 41613.6 MEAN 114 MAX 278 MIN 9.8 CFSM .49 IN 6.70

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI
(National stream-quality accounting network station)

LOCATION.--Lat 45°24'25", long 92°38'49", in SW¼NW¼ sec.30, T.34 N., R.18 W., Polk County, Hydrologic Unit 07030005, St. Croix National Scenic Riverway, on left bank, 1,500 ft (457 m) downstream from powerplant of Northern States Power Co., in St. Croix Falls, and at mile 52.2 (84.0 km).

DRAINAGE AREA.--5,930 mi^2 (15,360 km^2), approximately.

WATER-DISCHARGE RECORDS

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.

GAGE.--Water-stage recorder. Datum of gage is 689.94 ft (210.294 m) National Geodetic Vertical Datum of 1929. 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 (91 m) downstream at same datum.

REMARKS.--Records are good. Diurnal fluctuation caused by St. Croix Falls powerplant 1,500 ft (457 m) upstream.

AVERAGE DISCHARGE.--79 years, 4,194 ft^3/s (118.8 m^3/s), 9.60 in/yr (244 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 54,900 ft^3/s (1,550 m^3/s) May 8, 1950, gage height, 25.19 ft (7.678 m); minimum daily, 75 ft^3/s (2.12 m^3/s) July 17, 1910.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 25,600 ft^3/s (725 m^3/s) June 16, gage height, 12.07 ft (3.679 m); minimum daily, 1,170 ft^3/s (33.1 m^3/s) Feb. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4000	2410	2500	1890	1520	3010	9050	14000	3860	8230	3260	6000
2	4180	2660	1940	2120	1600	3360	8710	13300	2730	7100	2280	5420
3	4160	2930	1370	2010	1840	2950	8670	12600	3690	7530	3890	5360
4	3430	2320	1510	1200	1790	2960	8580	11700	3390	7000	4050	4580
5	3360	2480	1630	1760	1740	2880	8010	11900	3920	6630	4540	3870
6	3460	2480	2550	1590	1530	2470	7180	11300	3630	6120	4280	3640
7	3440	2500	2420	1820	1670	2320	7390	10900	3300	5560	4730	3310
8	3410	2090	2400	1550	1620	1960	7580	10400	3140	5530	4500	3620
9	3000	2620	2350	1660	1740	2090	7470	9590	2980	4150	4500	3300
10	3350	2370	2310	1570	1560	1860	7350	8840	2830	3980	4180	3280
11	2850	2120	1530	1320	1930	2180	7090	8180	2910	4030	4290	3250
12	2260	2350	1910	1360	1480	2180	7000	7680	2870	3540	4070	2630
13	2580	2160	1990	1670	1910	2480	6960	6860	3350	3340	4140	3020
14	3740	2620	1590	1630	1710	1400	7270	6610	7190	3790	3530	2650
15	2740	1920	2180	1740	1780	2910	7450	6590	16000	3450	3040	2330
16	3350	2200	2110	1820	1430	2660	7540	5150	22300	4080	2900	2480
17	3460	2590	2140	1650	1170	3050	7380	5530	22500	3920	3000	2340
18	3200	2350	1750	1340	2180	3210	6860	4530	20100	4050	2950	2460
19	3590	1640	1960	1560	2120	3210	6840	4560	15600	4100	2550	2360
20	2780	2730	1690	1630	2340	3070	6490	3860	12600	3910	2490	2070
21	2790	2390	1350	1690	2080	3070	6340	3670	10800	4390	2270	1860
22	3130	2290	1730	1650	2810	2810	5860	3530	9760	4400	2490	2120
23	2870	2450	1780	1670	3140	3010	7180	3640	9520	4640	2250	2160
24	3180	2850	1900	1690	2540	3010	11500	3510	10400	4320	3310	2210
25	3230	2180	1570	1640	3080	2690	14900	3410	10800	4260	3440	2020
26	3030	2100	1660	1560	3320	2630	17200	3790	10600	3640	4220	2240
27	3400	1800	1720	1970	3250	2840	17200	3810	9830	3600	5000	2180
28	3130	2050	1570	1860	3790	3470	15700	3570	8210	3440	7220	2450
29	3030	2690	1830	1690	---	3500	14900	3950	7300	3390	8190	2410
30	3230	2510	1750	1860	---	5220	14600	3580	6730	3210	7930	2840
31	2850	---	2070	1870	---	7760	---	3250	---	3070	6940	---
TOTAL	100210	70850	58760	52040	58670	92220	276250	213790	252840	142400	126430	90460
MEAN	3233	2362	1895	1679	2095	2975	9208	6896	8428	4594	4078	3015
MAX	4180	2930	2550	2120	3790	7760	17200	14000	22500	8230	8190	6000
MIN	2260	1640	1350	1200	1170	1400	5860	3250	2730	3070	2250	1860
CFSM	.55	.40	.32	.28	.35	.50	1.55	1.16	1.42	.78	.69	.51
IN.	.63	.44	.37	.33	.37	.58	1.73	1.34	1.59	.89	.79	.57

CAL YR 1980 TOTAL 1074440 MEAN 2936 MAX 10300 MIN 1320 CFSM .50 IN 6.74
WTR YR 1981 TOTAL 1534920 MEAN 4205 MAX 22500 MIN 1170 CFSM .71 IN 9.63

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967-68, 1974 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: March 1975 to current year.
WATER TEMPERATURES: March 1975 to current year.

REMARKS.--Letter K indicates non-ideal colony count.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 340 micromhos Feb. 23, 1977, Feb. 15, 1981; minimum daily, 65 micromhos May 16, 17, 1979.
WATER TEMPERATURES: Maximum daily, 27.0°C July 11, 1976, Aug. 14, 1978; minimum daily, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 340 micromhos Feb. 15; minimum daily, 75 micromhos June 17.
WATER TEMPERATURES: Maximum daily, 26.0°C July 9; minimum daily, 0.0°C on several days during winter period.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT										
16...	1130	4860	172	223	7.3	7.5	.30	10.4	91	26
NOV										
03...	1215	2200	180	170	7.3	4.8	.60	12.4	100	K7
DEC										
04...	1300	909	210	195	7.3	.5	1.7	13.0	94	K7
JAN										
12...	1120	2330	242	231	7.0	.2	1.0	10.6	76	K8
FEB										
26...	1040	4350	210	191	7.0	.2	1.0	10.9	78	50
MAR										
16...	1230	4370	185	174	7.1	1.5	.80	12.1	90	K1
APR										
09...	1220	7380	132	131	6.9	8.3	5.0	11.1	98	K6
MAY										
04...	1315	11500	106	109	6.6	12.8	.80	9.6	94	K12
JUN										
11...	1200	5540	154	160	7.4	20.0	3.4	7.7	89	K17
JUL										
07...	1120	5540	126	142	7.0	27.0	4.0	6.6	86	28
AUG										
04...	1320	5240	154	158	7.5	23.4	3.2	8.5	102	73
SEP										
16...	1145	3330	166	170	6.4	18.5	2.8	7.9	88	39

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	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)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
OCT										
16...	K12	110	0	40	1.8	4.0	.2	.3	110	.1
NOV										
03...	23	75	2	19	6.6	3.2	.2	.9	73	3.4
DEC										
04...	K2	93	7	24	8.0	3.5	.2	.9	86	5.7
JAN										
12...	K1	110	7	28	8.9	4.0	.2	1.0	100	6.1
FEB										
26...	600	78	0	22	5.6	3.4	.2	2.1	81	5.3
MAR										
16...	K8	79	2	21	6.5	3.1	.2	1.8	77	2.7
APR										
09...	K10	62	12	16	5.4	2.5	.1	2.1	50	6.1
MAY										
04...	290	50	10	13	4.2	2.7	.2	1.4	40	5.7
JUN										
11...	37	80	7.0	21	6.8	3.1	.2	1.0	73	3.8
JUL										
07...	320	70	10	19	5.4	2.6	.1	1.2	60	3.4
AUG										
04...	170	79	6.0	21	6.4	2.8	.1	.8	73	5.5
SEP										
16...	240	91	14	24	7.5	2.9	.1	.8	77	5.1

DATE	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)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)
OCT									
16...	5.9	.1	5.7	120	124	1580	.02	.01	--
NOV									
03...	3.2	.0	11	113	92	671	.11	.11	.090
DEC									
04...	3.4	.1	14	131	113	322	.23	.27	.000
JAN									
12...	3.4	.1	18	146	130	918	.34	.12	.690
FEB									
26...	4.6	<.1	14	127	108	1490	.46	.45	.130
MAR									
16...	3.6	<.1	14	116	101	1370	.32	.35	.040
APR									
09...	3.3	<.1	8.6	93	75	1850	.23	.23	.050
MAY									
04...	2.5	<.1	5.7	77	60	2390	.15	.15	.050
JUN									
11...	2.7	<.1	7.2	120	90	1800	.11	.14	.070
JUL									
07...	2.8	<.1	10	117	81	1750	.12	.12	<.010
AUG									
04...	2.9	.1	12	130	96	1840	.10	.10	.050
SEP									
16...	3.1	<.1	10	130	100	1170	.10	.09	.040

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT									
16...	--	--	--	.010	.010	--	1	13	100
NOV									
03...	.040	.61	.68	.020	.010	--	1	5.9	100
DEC									
04...	.110	.43	.63	.060	.040	7.2	8	20	62
JAN									
12...	.070	.26	.38	.020	.020	5.2	8	50	64
FEB									
26...	.070	.55	.47	.030	.020	--	2	23	87
MAR									
16...	.060	.40	.25	.040	.020	4.8	2	24	86
APR									
09...	.060	1.60	.88	.050	.020	14	4	80	95
MAY									
04...	.060	.81	.77	.050	.030	--	19	590	85
JUN									
11...	.090	.73	.41	.040	.010	17	12	179	94
JUL									
07...	.050	1.30	.89	.060	<.010	18	11	165	92
AUG									
04...	.010	.78	.57	.150	.170	--	6	85	88
SEP									
16...	.070	.49	.55	.030	.020	9.7	5	45	100

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, TOTAL RECOVERABLE (UG/L AS CO) (01037)	COBALT, DISSOLVED (UG/L AS CO) (01035)
NOV											
03...	1215	1	1	<50	20	0	3	10	<10	0	0
FEB											
26...	1040	0	0	100	100	2	0	20	10	0	1
MAY											
04...	1315	0	0	100	30	1	<1	10	<10	1	0
AUG											
04...	1320	1	1	<50	20	2	2	20	<10	2	2

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MERCURY DISSOLVED (UG/L AS HG) (71890)
NOV										
03...	1	0	640	310	1	0	40	20	.4	<.1
FEB										
26...	3	2	600	300	19	21	60	40	.2	.1
MAY										
04...	3	4	780	290	1	0	90	30	.2	<.1
AUG										
04...	5	1	890	340	3	7	80	10	.2	<.1

DATE	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	SILVER, DISSOLVED (UG/L AS AG) (01075)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C) (00689)
NOV										
03...	1	0	0	0	0	0	10	0	8.7	.1
FEB										
26...	2	0	0	0	0	0	10	20	6.8	.5
MAY										
04...	3	0	0	0	0	0	20	10	13	.8
AUG										
04...	3	5	<1	<1	1	<1	20	7	9.5	1.4

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	NOV 3,80		MAR 16,81		MAY 4,81		JUN 11,81	
TIME	1215		1230		1315		1200	
TOTAL CELLS/ML	1200		580		1800		10000	
DIVERSITY: DIVISION	1.0		1.2		1.4		1.5	
.CLASS	1.0		1.2		1.4		1.5	
..ORDER	1.2		2.1		2.2		2.3	
...FAMILY	1.3		2.4		2.7		3.2	
....GENUS	2.6		2.4		3.3		3.8	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)								
.CHLOROPHYCEAE								
..CHLOROCOCCALES								
...CHARACIACEAE								
....SCHROEDERIA	--	-	90#	16	--	-	--	-
...COELASTRACEAE								
....COELASTRUM	--	-	--	-	--	-	930	9
...HYDRODICTYACEAE								
....PEDIASTRUM	--	-	--	-	--	-	--	-
...MICRACTINIACEAE								
....MICRACTINIUM	--	-	--	-	65	4	*	0
...OOCYSTACEAE								
....ANKISTRODESMUS	65	5	39	7	52	3	790	8
....DICTYOSPHAERIUM	100	9	--	-	160	9	560	5
....GLOEOACTINIUM	--	-	--	-	--	-	790	8
....KIRCHNERIELLA	--	-	--	-	--	-	*	0
....OOCYSTIS	--	-	--	-	--	-	--	-
....TETRAEDRON	--	-	--	-	--	-	--	-
....TREUBARIA	--	-	--	-	--	-	--	-
...SCENEDESMACEAE								
....CRUCIGENIA	--	-	--	-	--	-	--	-
....SCENEDESMUS	52	4	--	-	100	6	1100	11
....TETRASTRUM	--	-	--	-	--	-	560	5
..TETRASPORALES								
...COCCOMYXACEAE								
....ELAKATOTHRIX	--	-	--	-	--	-	140	1
...PALMELLACEAE								
....SPHAEROCYSTIS	--	-	--	-	--	-	370	4
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CHLAMYDOMONAS	52	4	51	9	26	1	420	4
CHRYSOPHYTA								
.BACILLARIOPHYCEAE								
..CENTRALES								
...COSCINODISCACEAE								
....CYCLOTELLA	340#	28	--	-	180	10	1600#	15
....MELOSIRA	280#	23	--	-	480#	27	370	4
....STEPHANODISCUS	270#	22	210#	36	--	-	--	-
..PENNALES								
...ACHNANTHACEAE								
....ACHNANTHES	--	-	--	-	--	-	*	0
....COCCONEIS	--	-	--	-	--	-	--	-
...CYMBELLACEAE								
....CYMBELLA	--	-	--	-	--	-	140	1
...DIATOMACEAE								
....DIATOMA	--	-	13	2	--	-	*	0
...FRAGILARIACEAE								
....ASTERIONELLA	--	-	140#	24	39	2	--	-
....FRAGILARIA	--	-	--	-	210	12	--	-
....SYNEDRA	--	-	--	-	78	4	93	1
...GOMPHONEMATACEAE								
....GOMPHONEMA	--	-	--	-	--	-	--	-
...NAVICULACEAE								
....NAVICULA	13	1	--	-	26	1	93	1
...NITZSCHIACEAE								
....NITZSCHIA	--	-	--	-	52	3	140	1
.CHRYSOPHYCEAE								
..CHRYSOMONADALES								
...MALLOMONADACEAE								
....MALLOMONAS	--	-	--	-	--	-	--	-
CRYPTOPHYTA (CRYPTOMONADS)								
.CRYPTOPHYCEAE								
..CRYPTOMONADALES								
...CRYPTOMONADACEAE								
....CRYPTOMONAS	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981--Continued

DATE	NOV 3,80		MAR 16,81		MAY 4,81		JUN 11,81	
TIME	1215		1230		1315		1200	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CYANOPHYTA (BLUE-GREEN ALGAE)								
.CYANOPHYCEAE								
..CHROOCOCCALES								
...CHROOCOCCACEAE								
....ANACYSTIS	39	3	39	7	120	7	1400	14
..HORMOGONALES								
...NOSTOCACEAE								
....APHANIZOMENON	--	-	--	-	180	10	--	-
...OSCILLATORIACEAE								
....OSCILLATORIA	--	-	--	-	--	-	420	4
EUGLENOPHYTA (EUGLENOIDS)								
.EUGLENOPHYCEAE								
..EUGLENALES								
...EUGLENACEAE								
....TRACHELOMONAS	--	-	--	-	--	-	140	1
UNKNOWN 15 96	--	-	--	-	--	-	--	-

DATE	JUL 7,81		AUG 4,81		SEP 16,81	
TIME	1120		1320		1145	
TOTAL CELLS/ML	20000		3500		6300	
DIVERSITY: DIVISION	1.4		1.1		1.9	
.CLASS	1.4		1.1		0.0	
..ORDER	1.9		2.0		0.0	
...FAMILY	2.5		2.4		0.0	
....GENUS	3.1		2.7		0.0	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)						
.CHLOROPHYCEAE						
..CHLOROCOCCALES						
...CHARACIACEAE						
....SCHROEDERIA	*	0	--	-	--	-
...COELASTRACEAE						
....COELASTRUM	970	5	510	15	--	-
...HYDRODICTYACEAE						
....PEDIASTRUM	200	1	--	-	--	-
...MICRACTINIACEAE						
....MICRACTINIUM	320	2	--	-	110	2
...OOCYSTACEAE						
....ANKISTRODESMUS	640	3	32	1	280	4
....DICTYOSPHAERIUM	1300	6	110	3	--	-
....GLOEOACTINIUM	--	-	--	-	--	-
....KIRCHNERIELLA	--	-	--	-	340	5
....OOCYSTIS	1400	7	--	-	140	2
....TETRAEDRON	*	0	32	1	--	-
....TREUBARIA	*	0	--	-	*	0
...SCENEDESMACEAE						
....CRUCIGENIA	1000	5	--	-	110	2
....SCENEDESMUS	1000	5	130	4	170	3
....TETRASTRUM	160	1	--	-	--	-
..TETRASPORALES						
...COCCOMYXACEAE						
....ELAKATOTHRIX	120	1	--	-	170	3
...PALMELLACEAE						
....SPHAEROCYSTIS	--	-	--	-	--	-
..VOLVOCALES						
...CHLAMYDOMONADACEAE						
....CHLAMYDOMONAS	200	1	1300#	38	170	3

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981--Continued

DATE	JUL 7,81		AUG 4,81		SEP 16,81	
TIME	1120		1320		1145	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHRYSOPHYTA						
.BACILLARIOPHYCEAE						
..CENTRALES						
...COSCINODISCACEAE						
....CYCLOTELLA	1200	6	270	8	900	14
....MELOSIRA	1000	5	720#	21	730	12
....STEPHANODISCUS	--	-	--	-	--	-
..PENNALES						
...ACHNANTHACEAE						
....ACHNANTHES	--	-	--	-	--	-
....COCCONEIS	--	-	48	1	--	-
...CYMBELLACEAE						
....CYMBELLA	--	-	--	-	--	-
...DIATOMACEAE						
....DIATOMA	--	-	--	-	650	10
...FRAGILARIACEAE						
....ASTERIONELLA	--	-	96	3	--	-
....FRAGILARIA	--	-	--	-	--	-
....SYNEDRA	*	0	--	-	--	-
...GOMPHONEMATACEAE						
....GOMPHONEMA	--	-	32	1	--	-
...NAVICULACEAE						
....NAVICULA	--	-	64	2	*	0
...NITZSCHIACEAE						
....NITZSCHIA	120	1	32	1	56	1
.CHRYSOPHYCEAE						
..CHRYSOMONADALES						
...MALLOMONADACEAE						
....MALLOMONAS	--	-	--	-	*	0
CRYPTOPHYTA (CRYPTOMONADS)						
.CRYPTOPHYCEAE						
..CRYPTOMONADALES						
...CRYPTOMONADACEAE						
....CRYPTOMONAS	*	0	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)						
.CYANOPHYCEAE						
..CHROOCOCCALES						
...CHROOCOCCACEAE						
....ANACYSTIS	8800#	43	--	-	1400#	22
..HORMOGONALES						
...NOSTOCACEAE						
....APHANIZOMENON	1700	8	--	-	--	-
...OSCILLATORIACEAE						
....OSCILLATORIA	--	-	--	-	340	5
EUGLENOPHYTA (EUGLENOIDS)						
.EUGLENOPHYCEAE						
..EUGLENALES						
...EUGLENACEAE						
....TRACHELOMONAS	--	-	96	3	56	1
UNKNOWN 15 96	--	-	--	-	620	10

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	185	190	200	240	242	215	135	105	180	130	175	145
2	180	180	205	235	240	220	130	110	185	140	180	155
3	175	185	210	275	240	195	130	105	185	120	180	165
4	190	180	220	240	238	190	130	115	180	130	180	160
5	180	185	220	250	245	195	130	115	170	140	175	175
6	175	305	225	255	240	205	140	115	182	150	165	180
7	180	200	215	235	245	200	135	118	165	155	160	180
8	185	185	220	260	250	200	145	118	170	160	155	170
9	180	190	215	230	235	205	140	125	180	160	160	205
10	180	190	230	245	240	200	145	125	175	160	165	200
11	190	190	225	255	235	205	135	125	175	170	165	185
12	205	195	200	255	250	215	135	135	180	165	160	180
13	185	185	240	260	230	210	130	135	180	180	160	185
14	180	190	225	245	220	230	130	140	180	165	165	190
15	195	182	220	255	340	190	135	145	120	165	165	205
16	180	185	225	245	240	185	135	150	80	175	170	200
17	195	185	240	260	235	170	135	155	75	175	180	210
18	210	225	220	259	230	215	135	155	90	165	175	210
19	200	300	220	260	215	190	135	160	100	150	175	215
20	205	200	260	260	220	185	140	180	110	165	180	215
21	195	210	230	258	235	185	140	155	120	165	190	215
22	195	190	240	250	200	190	140	175	125	160	190	215
23	188	200	230	258	240	210	140	160	125	165	195	215
24	199	200	235	305	205	180	135	165	125	170	190	220
25	185	210	255	250	215	180	135	175	120	165	190	220
26	200	185	260	240	220	180	95	165	115	170	180	225
27	205	200	260	240	200	180	95	180	115	165	175	200
28	200	205	245	240	205	190	100	165	115	170	160	220
29	205	195	245	240	---	175	100	170	120	175	160	230
30	210	205	285	242	---	175	105	165	115	170	140	230
31	200	---	220	260	---	155	---	---	---	175	145	---
MEAN	192	201	230	252	234	194	130	144	142	160	171	197

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.0	4.5	1.0	1.0	1.5	2.0	6.0	9.5	18.5	21.5	21.0	19.5
2	13.0	4.5	1.0	.0	.0	2.0	6.0	11.5	16.5	22.0	21.0	18.5
3	11.5	4.5	.5	.0	1.0	1.0	6.5	12.5	16.5	22.5	21.5	19.0
4	10.5	5.0	1.0	.0	.0	1.0	5.0	12.5	16.0	23.0	21.5	18.0
5	10.0	5.0	2.0	1.0	1.0	1.0	4.5	12.0	18.0	24.5	22.0	17.5
6	10.0	7.5	1.0	1.5	1.0	2.0	4.5	12.5	18.5	25.5	23.0	17.5
7	11.0	5.5	1.0	.0	1.0	1.0	6.5	14.0	20.5	25.0	22.5	18.0
8	10.5	5.5	2.0	.0	2.0	2.0	8.0	13.5	20.5	25.0	22.5	19.0
9	12.0	5.0	2.0	1.5	1.0	1.5	8.5	13.0	19.5	26.0	22.0	17.0
10	12.5	4.5	1.5	1.5	1.0	1.5	9.0	12.0	19.0	24.0	21.5	18.0
11	11.5	4.5	1.0	.5	1.0	2.0	9.5	12.0	18.5	24.5	22.0	19.0
12	9.5	4.0	1.0	1.5	1.0	2.0	9.5	12.5	19.0	24.0	22.0	19.5
13	9.0	3.0	1.0	1.5	.5	2.0	10.0	12.5	19.0	23.0	22.5	19.5
14	8.5	3.0	.5	1.0	.0	3.5	8.5	14.0	20.0	23.0	22.5	18.5
15	8.0	3.0	.0	.0	3.0	2.5	8.5	15.0	19.0	22.0	22.0	17.5
16	7.5	3.0	.0	1.0	2.5	5.0	9.0	15.0	17.0	21.0	22.5	16.5
17	8.0	2.5	2.0	2.0	2.0	1.5	10.0	15.5	17.5	22.0	20.5	15.0
18	8.0	2.5	.5	2.0	1.5	1.0	10.0	15.0	18.0	23.5	21.0	14.0
19	7.0	5.0	.5	3.0	2.0	1.5	11.0	14.0	17.0	24.5	20.0	15.0
20	7.0	2.0	1.5	1.0	2.0	1.5	11.0	13.5	17.0	23.0	20.5	13.0
21	6.5	2.0	.0	1.5	2.5	1.5	10.0	16.0	17.5	24.0	20.0	13.5
22	6.5	1.5	.0	1.0	1.0	3.0	9.0	18.0	17.0	22.0	19.5	13.5
23	7.0	2.0	.0	3.0	3.0	3.0	8.5	18.5	16.5	21.0	19.0	13.5
24	6.5	2.5	.5	4.0	1.0	3.0	8.0	18.0	16.0	20.0	19.5	13.5
25	6.0	3.0	.0	3.0	.5	3.5	7.0	17.5	17.0	20.5	20.0	13.5
26	6.0	1.5	1.0	1.5	1.5	4.0	7.0	16.5	18.0	19.5	19.5	14.0
27	5.0	2.0	1.0	1.0	1.0	5.0	9.0	15.0	19.0	20.0	19.0	13.5
28	4.5	1.5	1.0	.5	1.5	6.5	9.0	16.0	19.0	20.0	19.0	13.0
29	4.0	1.0	.5	.0	---	7.5	9.5	16.0	19.5	19.0	18.0	11.5
30	4.0	1.5	.5	1.0	---	8.0	9.5	17.5	21.0	20.5	19.0	11.5
31	5.0	---	.0	2.0	---	7.0	---	16.5	---	20.5	20.0	---
MEAN	8.5	3.5	1.0	1.0	1.5	3.0	8.5	14.5	18.0	22.5	21.0	16.0

05341550 ST. CROIX RIVER AT STILLWATER, MN

LOCATION.--Lat 45°03'22", long 92°48'11", in NE¼SE¼ sec.28, T.30 N., R.20 W., Washington County, Hydrologic Unit 07030005, on Interstate Bridge at Stillwater.

PERIOD OF RECORD.--Water years 1975 to current year(discontinued).

REMARKS.--Water discharge estimated on the basis of discharge for St. Croix River at St. Croix Falls and Apple River near Somerset and adjusted for travel time.

COOPERATION.--Samples were collected by the Metropolitan Waste Control Commission, St. Paul, MN, and analyzed by the U.S. Geological Survey.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	FLUO-RIDE, TOTAL (MG/L AS F) (00951)
NOV								
12...	0930	2580	210	7.9	2.5	11.7	88	.0
FEB								
13...	0915	1760	217	7.6	.0	11.4	80	.1
MAY								
12...	0900	9110	146	7.5	12.5	10.2	98	.1
SEP								
08...	0950	3740	158	8.4	17.0	8.2	86	.1

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOV-ERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)
NOV									
12...	1	100	10	50	0	3	3	460	3
FEB									
13...	1	<50	0	30	2	11	7	590	9
MAY									
12...	0	100	10	80	1	15	2	680	1
SEP									
08...	4	100	<10	60	<1	9	6	1100	6

DATE	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	CYANIDE TOTAL (MG/L AS CN) (00720)
NOV								
12...	160	<.1	1	6	0	0	30	.00
FEB								
13...	40	<.1	1	6	0	0	20	<.01
MAY								
12...	80	<.1	1	4	0	1	30	<.01
SEP								
08...	110	<.1	4	4	<1	<1	40	<.01

05341770 ST. CROIX RIVER AT AFTON, MN

LOCATION.--Lat 44°54'00", lng 92°46'45", in SW¼NW¼ sec.23, T.28 N., R.20 W., Waahington County, Hydrologic Unit 07030005. Sampling site is in the city of Afton 11.5 mi (8.5 km) upstream from mouth.

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

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: December 1976 to current year.
pH: December 1976 to current year.
WATER TEMPERATURES: December 1976 to current year.
DISSOLVED OXYGEN: December 1976 to current year.

INSTRUMENTATION.--Water-quality monitor since December 1976.

REMARKS.--Water is pumped to a monitor that is inside a heated shelter; water temperature during the winter period may be affected. Extremes are for years with 80 percent or more daily record. Malfunctions of the monitor resulted in less than 80 percent recorded daily record for the current year.

COOPERATION.--Water-quality monitor is operated by the Metropolitan Waste Control Commission, St. Paul, MN.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1978, 1980): Maximum, 221 micromhos Aug. 14, 15, 18, 1980; minimum, 61 micromhos Apr. 18, 19, 1978.
pH (water years 1978, 1980): Maximum, 9.1 units May 2, 3, 1980; minimum, 7.1 units Apr. 29, 1978.
WATER TEMPERATURES (water years 1978, 1980): Maximum, 28.0°C June 29, 1978; minimum, 0.5°C many days during winter periods.
DISSOLVED OXYGEN (water years 1978, 1980): Maximum, 16.8 mg/L May 1, 1980; minimum, 2.1 mg/L June 11, Sept. 17, 1978.

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	175	172	173	176	171	174	169	166	168	185	183	184
2	173	172	173	181	171	176	169	166	168	185	183	184
3	173	171	172	177	174	175	167	166	167	184	148	153
4	173	143	154	178	174	175	167	166	166	150	148	149
5	178	147	164	177	173	174	169	165	166	187	148	162
6	175	172	173	181	175	176	166	164	165	189	185	186
7	175	173	174	178	173	174	166	165	165	189	185	187
8	176	172	174	---	---	---	154	153	154	189	187	187
9	179	174	175	175	172	173	154	153	154	189	186	187
10	177	173	174	175	171	173	155	153	154	187	186	187
11	174	173	173	176	171	172	155	154	154	187	186	186
12	175	173	173	175	171	172	155	154	154	188	186	187
13	175	172	173	---	---	---	155	154	155	189	186	188
14	173	172	172	---	---	---	155	153	154	189	186	188
15	173	172	172	---	---	---	160	159	160	189	187	188
16	177	172	173	---	---	---	165	164	165	189	187	188
17	174	171	173	---	---	---	171	169	170	189	187	188
18	173	171	172	---	---	---	176	174	175	194	192	193
19	173	172	172	---	---	---	183	175	180	199	198	199
20	172	172	172	---	---	---	184	181	182	205	202	203
21	176	164	174	---	---	---	184	182	183	211	207	209
22	176	149	168	---	---	---	185	182	184	211	210	210
23	177	158	174	---	---	---	185	181	183	211	210	210
24	176	175	175	---	---	---	183	149	163	213	210	211
25	176	146	164	171	167	168	150	149	149	213	172	209
26	176	151	170	176	167	169	151	149	150	211	209	209
27	176	146	168	170	166	167	150	149	150	212	209	210
28	176	166	172	174	166	168	185	150	168	213	209	211
29	176	143	162	169	166	167	185	183	184	212	210	211
30	177	143	168	174	166	167	186	182	184	212	210	211
31	177	174	176	---	---	---	185	183	184	211	209	210
MONTH	179	143	171				186	149	166	213	148	193

05341770 ST. CROIX RIVER AT AFTON, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	212	209	211	227	222	225	203	200	201	162	157	160
2	214	211	213	223	222	222	208	200	203	164	157	161
3	213	212	212	224	221	222	206	201	203	166	162	164
4	213	211	212	226	222	222	203	201	202	169	165	167
5	213	210	211	225	221	221	198	196	197	168	164	166
6	213	210	211	243	216	221	196	191	194	166	160	163
7	213	209	210	250	219	242	194	191	192	167	158	163
8	212	211	211	250	247	248	191	187	189	164	160	162
9	212	211	211	246	214	231	187	181	184	163	158	161
10	220	178	195	212	209	210	189	181	185	159	155	157
11	186	184	185	203	202	202	184	179	181	160	155	157
12	232	192	207	---	---	---	183	178	180	159	155	157
13	239	203	232	192	190	191	182	179	181	161	156	158
14	---	---	---	196	193	194	178	176	177	162	155	158
15	245	203	206	194	192	193	180	174	177	163	155	159
16	246	244	244	194	192	193	180	178	179	162	155	159
17	247	244	245	194	192	193	183	177	180	160	157	158
18	245	211	242	193	192	192	181	176	178	158	140	156
19	245	243	244	198	197	197	179	175	178	161	153	157
20	260	225	251	235	199	213	176	174	175	165	155	160
21	290	212	257	210	200	203	176	173	174	164	157	161
22	260	259	259	204	199	201	180	175	178	165	160	163
23	261	243	259	202	199	201	178	176	177	166	162	165
24	261	257	259	203	200	201	177	154	160	165	161	163
25	259	218	222	202	201	202	158	153	156	163	160	161
26	237	219	223	202	201	202	168	156	162	168	161	165
27	260	226	228	203	200	201	169	162	165	173	163	168
28	260	225	226	205	200	202	166	161	162	170	165	167
29	---	---	---	205	200	203	164	159	161	178	168	172
30	---	---	---	203	200	201	163	159	161	171	165	168
31	---	---	---	203	200	201	---	---	---	171	162	166
MONTH							208	153	180	178	140	162

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	175	167	171	189	186	187	191	188	189	191	190	190
2	173	167	170	188	175	181	235	188	190	193	190	190
3	175	166	171	186	176	186	192	189	191	191	189	190
4	191	166	178	180	177	180	196	189	193	192	150	189
5	187	184	185	183	179	183	207	156	193	199	188	189
6	188	185	186	189	181	189	195	189	193	193	189	189
7	190	185	187	188	181	188	191	189	190	191	186	188
8	187	185	186	185	181	185	191	189	190	213	186	187
9	187	186	186	186	180	186	191	189	190	191	178	187
10	188	186	187	186	182	186	191	189	190	---	---	---
11	188	187	187	188	182	188	191	187	190	---	---	---
12	191	187	189	187	181	187	194	189	192	---	---	---
13	195	189	191	189	185	189	192	190	191	---	---	---
14	---	---	---	190	185	190	191	189	190	---	---	---
15	192	190	191	186	184	186	191	190	190	---	---	---
16	202	189	190	186	184	186	191	189	190	---	---	---
17	190	186	188	---	---	---	191	189	190	---	---	---
18	188	186	187	---	---	---	191	188	189	---	---	---
19	185	179	183	---	---	---	191	188	190	---	---	---
20	179	174	176	194	190	191	193	188	190	218	182	203
21	174	169	171	193	190	191	194	188	190	218	184	215
22	170	167	169	198	190	191	192	188	189	185	182	183
23	168	167	167	197	189	190	192	188	190	---	---	---
24	168	167	168	196	188	189	192	188	190	---	---	---
25	169	167	168	---	---	---	190	188	189	---	---	---
26	183	169	180	---	---	---	189	188	188	---	---	---
27	184	182	183	---	---	---	188	188	188	---	---	---
28	185	183	184	191	188	189	190	189	190	219	178	191
29	186	184	185	191	188	189	191	190	190	---	---	---
30	189	185	187	192	188	189	192	190	191	---	---	---
31	---	---	---	192	188	189	192	190	191	---	---	---
MONTH							235	156	190			

05341770 ST. CROIX RIVER AT AFTON, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	7.9	7.8	7.8	7.8	7.7	7.8	8.1	8.0	8.1	7.9	7.8	7.8
2	7.9	7.8	7.9	8.1	7.7	7.9	8.2	8.0	8.0	7.9	7.8	7.8
3	7.9	7.7	7.8	7.8	7.7	7.8	8.2	8.1	8.1	7.8	7.7	7.8
4	7.9	7.7	7.8	7.8	7.7	7.7	8.2	8.0	8.2	7.8	7.7	7.8
5	8.4	7.8	7.9	7.9	7.7	7.8	8.2	8.1	8.1	7.9	7.8	7.9
6	7.9	7.7	7.8	8.5	7.8	8.0	8.2	8.1	8.1	7.9	7.8	7.8
7	8.1	7.5	7.7	8.0	7.8	7.9	8.2	8.1	8.1	7.9	7.7	7.8
8	7.8	7.5	7.6	---	---	---	8.1	8.0	8.1	7.9	7.8	7.9
9	8.2	7.7	7.8	8.0	7.8	7.9	8.1	8.0	8.0	7.9	7.8	7.9
10	7.6	7.5	7.5	8.0	7.8	7.9	8.0	8.0	8.0	7.9	7.8	7.9
11	7.7	7.5	7.6	8.2	7.9	7.9	8.0	7.9	8.0	7.9	7.8	7.9
12	7.9	7.5	7.7	8.1	7.9	7.9	8.1	7.9	8.0	8.0	7.7	7.9
13	7.8	7.6	7.7	---	---	---	8.1	7.9	8.0	7.9	7.8	7.9
14	7.7	7.6	7.6	---	---	---	8.0	8.0	8.0	7.9	7.8	7.8
15	7.8	7.6	7.7	---	---	---	8.1	7.9	8.0	7.8	7.8	7.8
16	8.0	7.6	7.7	---	---	---	8.1	8.0	8.0	7.8	7.8	7.8
17	7.8	7.6	7.7	---	---	---	8.0	7.9	8.0	7.8	7.8	7.8
18	7.9	7.6	7.6	---	---	---	8.0	7.9	7.9	7.9	7.8	7.8
19	7.7	7.6	7.6	---	---	---	7.9	7.8	7.9	7.9	7.7	7.8
20	7.6	7.6	7.6	---	---	---	7.9	7.8	7.9	7.9	7.8	7.8
21	7.7	7.6	7.6	---	---	---	8.0	7.8	7.9	7.9	7.8	7.8
22	7.7	7.6	7.6	---	---	---	8.0	7.7	7.9	7.9	7.8	7.9
23	7.9	7.6	7.7	---	---	---	8.0	7.9	7.9	7.9	7.9	7.9
24	7.7	7.6	7.6	---	---	---	7.9	7.8	7.8	8.0	7.8	7.9
25	7.7	7.6	7.7	8.3	7.9	8.1	8.0	7.8	7.9	8.0	7.7	7.9
26	7.8	7.6	7.7	8.4	8.0	8.2	7.9	7.9	7.9	8.1	7.8	7.8
27	7.8	7.7	7.7	8.1	8.0	8.1	8.0	7.8	7.9	8.0	7.8	7.8
28	7.8	7.7	7.7	8.3	8.0	8.1	8.0	7.9	8.0	7.9	7.8	7.8
29	7.8	7.7	7.7	8.1	8.0	8.0	8.0	7.9	7.9	8.0	7.8	7.9
30	7.8	7.7	7.8	8.2	7.9	8.1	7.9	7.9	7.9	8.0	7.9	8.0
31	7.8	7.7	7.7	---	---	---	7.9	7.8	7.8	8.0	7.9	8.0
MONTH	8.4	7.5	7.7				8.2	7.7	8.0	8.1	7.7	7.9

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	8.0	7.8	7.8	7.7	7.6	7.7	8.0	7.9	8.0	7.7	7.6	7.7
2	7.9	7.7	7.8	7.7	7.6	7.6	8.3	8.0	8.1	7.9	7.6	7.7
3	7.9	7.8	7.8	7.8	7.6	7.7	8.3	8.0	8.1	7.6	7.5	7.6
4	7.9	7.8	7.8	7.7	7.6	7.6	8.2	8.1	8.1	7.6	7.5	7.6
5	7.9	7.8	7.8	7.7	7.6	7.6	8.3	8.0	8.1	7.7	7.6	7.6
6	8.0	7.7	7.9	7.7	7.6	7.6	8.3	8.0	8.1	7.8	7.6	7.7
7	7.9	7.8	7.9	7.8	7.7	7.7	8.1	8.0	8.0	7.9	7.6	7.7
8	7.9	7.8	7.8	7.8	7.7	7.8	8.1	7.9	8.0	7.9	7.6	7.7
9	7.8	7.7	7.8	7.8	7.6	7.8	8.0	7.8	7.9	7.8	7.6	7.7
10	7.8	7.7	7.8	7.7	7.6	7.7	8.0	7.7	7.8	7.9	7.6	7.8
11	7.8	7.7	7.7	7.7	7.6	7.6	7.8	7.7	7.8	8.1	7.7	7.9
12	8.0	7.7	7.8	---	---	---	7.8	7.6	7.7	8.3	7.8	7.9
13	7.9	7.8	7.8	7.8	7.6	7.7	7.7	7.6	7.7	8.1	7.7	7.9
14	---	---	---	8.1	7.6	7.8	7.7	7.6	7.6	8.3	7.8	8.0
15	8.0	7.8	7.9	7.9	7.7	7.7	8.1	7.6	7.8	8.6	7.9	8.2
16	8.2	7.9	8.0	7.8	7.6	7.7	8.0	7.6	7.7	8.7	8.1	8.4
17	8.1	8.0	8.1	7.8	7.7	7.7	7.9	7.6	7.8	8.2	7.9	8.0
18	8.0	8.0	8.0	7.8	7.7	7.7	8.1	7.9	8.0	8.1	7.9	8.0
19	8.0	7.8	8.0	7.8	7.7	7.7	8.2	7.9	8.1	8.5	7.8	8.1
20	8.0	7.4	7.8	7.9	7.8	7.8	8.3	7.9	8.0	8.5	7.9	8.2
21	8.1	7.6	7.6	7.9	7.8	7.8	8.2	7.9	8.0	8.2	7.9	8.0
22	7.6	7.6	7.6	7.8	7.8	7.8	7.9	7.8	7.9	8.1	7.8	7.9
23	7.9	7.5	7.6	7.9	7.8	7.8	8.0	7.8	7.9	8.0	7.7	7.8
24	7.6	7.5	7.6	7.9	7.8	7.8	8.1	7.9	8.0	8.1	7.7	7.9
25	7.6	7.5	7.6	8.2	7.8	7.9	8.1	7.9	8.0	7.8	7.7	7.7
26	7.6	7.5	7.5	7.9	7.8	7.8	8.2	7.9	8.1	8.0	7.7	7.8
27	7.7	7.5	7.6	8.3	7.8	8.0	8.2	8.0	8.1	8.5	7.8	8.1
28	7.7	7.6	7.7	8.1	7.9	8.0	8.0	7.9	8.0	8.5	8.0	8.2
29	---	---	---	8.1	7.9	8.0	7.9	7.8	7.8	8.2	7.7	8.0
30	---	---	---	8.0	7.9	7.9	7.9	7.7	7.8	8.6	8.0	8.3
31	---	---	---	8.2	7.9	8.0	---	---	---	8.7	8.3	8.5
MONTH							8.3	7.6	7.9	8.7	7.5	7.9

05341770 ST. CROIX RIVER AT AFTON, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.7	7.9	8.2				---	---	---	7.6	7.4	7.5
2	8.2	7.8	8.0				---	---	---	7.8	7.5	7.6
3	8.3	7.9	8.1				---	---	---	7.7	7.5	7.6
4	8.5	8.1	8.3				---	---	---	---	---	---
5	8.2	8.0	8.1				---	---	---	---	---	---
6	8.7	8.2	8.5				---	---	---	---	---	---
7	8.6	8.0	8.3				---	---	---	---	---	---
8	8.3	8.1	8.2				---	---	---	---	---	---
9	8.3	8.1	8.2				---	---	---	---	---	---
10	8.2	8.1	8.2				---	---	---	---	---	---
11	8.4	8.0	8.2				---	---	---	---	---	---
12	8.4	8.0	8.2				---	---	---	---	---	---
13	8.5	8.1	8.3				---	---	---	---	---	---
14	---	---	---				---	---	---	8.3	7.7	7.9
15	---	---	---				---	---	---	---	---	---
16	---	---	---				---	---	---	7.8	7.6	7.7
17	---	---	---				---	---	---	---	---	---
18	---	---	---				---	---	---	8.0	7.6	7.7
19	---	---	---				---	---	---	---	---	---
20	---	---	---				---	---	---	8.0	7.7	7.8
21	---	---	---				---	---	---	7.8	7.7	7.8
22	---	---	---				8.3	7.7	7.9	---	---	---
23	---	---	---				8.1	7.7	7.8	---	---	---
24	---	---	---				8.1	7.6	7.8	---	---	---
25	---	---	---				7.8	7.6	7.7	---	---	---
26	---	---	---				7.7	7.6	7.6	---	---	---
27	---	---	---				7.7	7.7	7.7	---	---	---
28	---	---	---				7.7	7.6	7.6	---	---	---
29	---	---	---				7.6	7.5	7.6	8.2	7.2	7.8
30	---	---	---				7.8	7.5	7.6	---	---	---
31	---	---	---				7.8	7.4	7.6	---	---	---
MONTH												

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	15.5	15.5	15.5	9.0	8.5	8.5	4.0	3.5	3.5	2.0	1.5	1.5
2	15.0	14.5	15.0	9.0	8.0	8.5	4.0	3.0	3.5	1.5	1.5	1.5
3	14.5	14.0	14.5	8.5	8.0	8.5	3.5	3.0	3.0	1.5	1.0	1.5
4	14.5	14.0	14.0	8.5	8.0	8.5	3.5	3.0	3.5	1.5	1.0	1.5
5	14.5	13.0	14.0	8.5	8.0	8.5	3.5	3.5	3.5	1.5	1.5	1.5
6	14.0	13.5	13.5	8.5	8.0	8.0	3.0	2.5	3.0	2.0	1.5	1.5
7	14.5	13.5	14.0	8.5	8.0	8.5	2.5	2.0	2.0	1.5	1.5	1.5
8	14.5	13.5	14.0	---	---	---	1.5	1.0	1.5	1.5	1.5	1.5
9	15.0	13.5	14.0	8.0	8.0	8.0	1.5	1.0	1.0	1.5	1.5	1.5
10	14.0	13.5	13.5	8.0	8.0	8.0	1.5	1.0	1.0	1.5	1.5	1.5
11	13.5	13.0	13.5	8.0	7.5	8.0	1.5	1.0	1.0	1.5	1.5	1.5
12	13.5	13.0	13.5	8.0	7.5	8.0	1.5	1.0	1.5	1.5	1.5	1.5
13	13.0	13.0	13.0	---	---	---	1.5	1.0	1.5	1.5	1.5	1.5
14	13.0	12.5	13.0	---	---	---	1.5	1.5	1.5	1.5	1.5	1.5
15	13.0	12.5	13.0	---	---	---	1.5	1.5	1.5	1.5	1.5	1.5
16	13.0	12.5	13.0	---	---	---	1.5	1.5	1.5	1.5	1.5	1.5
17	13.0	12.5	12.5	---	---	---	1.5	1.5	1.5	1.5	1.5	1.5
18	12.5	12.0	12.5	---	---	---	1.5	1.5	1.5	1.5	1.5	1.5
19	12.0	11.5	11.5	---	---	---	1.5	1.0	1.5	1.5	1.5	1.5
20	11.0	11.0	11.0	---	---	---	1.5	1.0	1.5	1.5	1.5	1.5
21	11.0	11.0	11.0	---	---	---	1.5	1.5	1.5	2.0	1.5	2.0
22	11.0	10.5	10.5	---	---	---	1.5	1.0	1.5	2.0	2.0	2.0
23	11.0	10.0	10.5	---	---	---	1.5	1.5	1.5	2.0	1.5	2.0
24	10.5	10.5	10.5	---	---	---	1.5	1.0	1.5	2.0	2.0	2.0
25	10.5	10.0	10.0	4.5	3.5	4.0	1.5	1.5	1.5	2.0	1.5	2.0
26	10.5	10.0	10.0	5.0	4.0	4.0	1.5	1.5	1.5	2.5	2.0	2.5
27	10.0	9.5	10.0	4.5	4.0	4.0	1.5	1.5	1.5	2.5	2.0	2.0
28	10.0	9.5	9.5	4.0	4.0	4.0	1.5	1.5	1.5	2.0	2.0	2.0
29	10.0	9.5	9.5	4.0	4.0	4.0	1.5	1.5	1.5	2.0	2.0	2.0
30	9.5	8.5	9.5	4.5	3.5	4.0	1.5	1.5	1.5	2.0	2.0	2.0
31	9.5	9.0	9.5	---	---	---	2.0	1.5	1.5	2.0	2.0	2.0
MONTH	15.5	8.5	12.0				4.0	1.0	2.0	2.5	1.0	1.5

05341770 ST. CROIX RIVER AT AFTON, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2.0	2.0	2.0	2.0	1.5	2.0	6.0	5.0	5.5	11.0	10.5	10.5
2	2.0	1.5	1.5	1.5	1.0	1.5	7.0	5.5	6.0	11.5	10.5	11.0
3	1.5	1.5	1.5	1.5	1.0	1.0	6.5	6.0	6.0	11.0	10.5	11.0
4	2.0	1.5	1.5	1.5	1.0	1.0	6.5	6.0	6.0	11.5	11.0	11.0
5	1.5	1.5	1.5	1.5	1.0	1.5	7.0	6.0	6.5	11.5	11.0	11.5
6	2.0	1.5	1.5	2.0	1.0	1.5	7.5	6.5	7.0	12.5	11.0	12.0
7	2.0	1.5	1.5	2.0	1.5	1.5	7.0	6.5	7.0	12.5	11.5	12.0
8	1.5	1.5	1.5	2.0	1.5	2.0	7.5	6.5	7.0	13.5	12.0	12.5
9	1.5	1.5	1.5	2.0	1.0	2.0	7.5	7.0	7.0	13.5	13.0	13.0
10	1.5	1.5	1.5	2.0	1.5	2.0	8.5	7.0	7.5	13.5	13.0	13.0
11	1.5	1.5	1.5	2.5	1.5	2.0	8.5	8.0	8.0	14.0	13.0	13.5
12	1.5	1.0	1.5	---	---	---	8.5	8.0	8.5	14.0	13.0	13.5
13	1.5	1.0	1.0	3.0	1.5	2.0	8.5	8.0	8.5	14.5	13.5	14.0
14	---	---	---	3.0	1.5	2.0	8.5	8.0	8.0	15.0	13.5	14.0
15	1.5	1.5	1.5	2.0	1.5	2.0	9.5	8.0	8.5	15.5	14.0	14.5
16	1.5	1.5	1.5	2.5	1.5	2.0	9.5	8.5	8.5	16.0	15.0	15.5
17	1.5	1.5	1.5	2.0	1.5	2.0	9.0	8.5	8.5	15.5	15.0	15.5
18	2.0	1.5	1.5	2.0	1.5	2.0	9.5	8.5	9.0	16.5	15.0	15.5
19	2.0	1.5	2.0	2.0	2.0	2.0	9.5	9.0	9.5	18.0	15.5	16.5
20	2.0	1.5	1.5	3.5	3.0	3.0	9.5	9.0	9.0	17.0	16.5	16.5
21	1.5	1.5	1.5	3.5	3.0	3.0	9.0	8.0	8.5	17.0	16.0	16.5
22	1.5	1.5	1.5	3.5	3.0	3.0	9.0	9.0	9.0	18.0	16.0	17.0
23	1.5	1.5	1.5	3.5	3.0	3.0	9.0	9.0	9.0	17.0	16.5	16.5
24	2.0	1.5	1.5	3.5	3.0	3.0	10.5	9.0	10.0	16.5	15.0	16.5
25	2.0	1.5	1.5	4.0	3.0	3.5	11.0	10.5	10.5	16.5	15.0	16.5
26	2.0	1.5	1.5	3.5	3.0	3.5	11.0	10.5	11.0	17.0	15.0	17.0
27	2.0	1.5	2.0	6.5	3.5	4.5	11.5	11.0	11.0	18.5	17.0	17.5
28	2.0	1.5	1.5	7.0	4.5	5.5	11.0	10.5	10.5	18.0	17.5	17.5
29	---	---	---	6.5	5.5	6.0	10.5	10.5	10.5	17.5	17.0	17.5
30	---	---	---	5.5	5.0	5.0	11.0	10.5	10.5	18.0	17.5	18.0
31	---	---	---	6.5	5.0	5.5	---	---	---	18.5	17.5	18.0
MONTH							11.5	5.0	8.5	18.5	10.5	14.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	18.5	17.0	18.0	22.5	21.0	21.5	24.5	24.5	24.5	24.0	23.5	23.5
2	20.0	17.5	18.5	23.0	21.5	22.0	25.0	22.5	24.5	23.5	23.0	23.5
3	20.0	19.0	19.5	---	---	---	25.5	24.5	25.0	24.0	23.0	23.0
4	21.0	19.5	20.5	---	---	---	---	---	---	---	---	---
5	20.0	20.0	20.0	---	---	---	---	---	---	22.0	21.0	21.0
6	21.0	20.0	20.5	---	---	---	---	---	---	---	---	---
7	21.5	20.5	20.5	---	---	---	25.0	25.0	25.0	21.0	20.5	21.0
8	20.5	20.0	20.5	---	---	---	25.0	24.5	25.0	21.0	20.0	21.0
9	20.5	20.0	20.5	---	---	---	25.5	25.0	25.0	21.0	19.5	21.0
10	21.0	20.0	20.5	---	---	---	25.0	25.0	25.0	---	---	---
11	21.0	20.5	20.5	---	---	---	25.5	24.5	25.0	---	---	---
12	21.5	20.5	21.0	---	---	---	25.5	24.5	25.0	---	---	---
13	21.5	21.0	21.5	---	---	---	25.5	24.5	25.0	---	---	---
14	---	---	---	---	---	---	25.0	23.5	25.0	---	---	---
15	21.5	21.0	21.5	---	---	---	25.5	25.0	25.0	---	---	---
16	21.0	19.0	20.5	---	---	---	25.0	24.5	25.0	20.5	20.0	20.5
17	21.0	20.0	20.5	---	---	---	25.5	24.5	25.0	---	---	---
18	20.5	20.5	20.5	---	---	---	25.5	24.5	25.0	19.5	19.0	19.5
19	20.5	20.0	20.5	---	---	---	25.5	24.5	25.0	---	---	---
20	20.5	20.0	20.5	---	---	---	25.5	24.5	25.0	20.0	19.0	19.5
21	20.0	20.0	20.0	---	---	---	25.0	24.0	24.5	19.5	19.0	19.0
22	20.0	20.0	20.0	26.5	25.5	25.5	25.0	24.0	24.5	---	---	---
23	20.0	19.5	20.0	25.5	25.0	25.5	25.0	24.0	24.5	---	---	---
24	20.0	19.5	20.0	25.5	25.0	25.0	25.0	24.5	24.5	---	---	---
25	20.0	20.0	20.0	---	---	---	24.0	24.0	24.0	---	---	---
26	21.0	20.0	20.0	---	---	---	23.5	23.5	23.5	---	---	---
27	20.0	20.0	20.0	---	---	---	23.0	23.0	23.0	---	---	---
28	20.5	20.0	20.0	25.5	24.5	25.0	24.5	24.0	24.5	---	---	---
29	21.0	20.0	20.5	25.0	24.5	24.5	24.5	24.0	24.0	18.5	18.0	18.0
30	22.5	20.5	21.5	25.0	24.5	24.5	24.5	24.0	24.0	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH												

05341770 ST. CROIX RIVER AT AFTON, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.1	8.6	8.8	11.0	10.5	10.7	11.1	10.7	10.9	11.8	11.2	11.5
2	9.7	8.4	9.1	12.2	10.5	11.3	11.7	10.6	10.9	12.0	11.1	11.5
3	10.0	8.8	9.2	11.2	10.6	10.8	11.7	11.2	11.4	11.3	10.7	11.0
4	10.2	8.6	9.3	11.9	10.5	11.2	12.0	11.1	11.6	11.7	10.9	11.3
5	11.8	9.2	10.0	12.3	11.6	11.9	11.7	10.9	11.6	12.2	10.9	11.7
6	10.1	9.0	9.5	14.9	11.9	12.3	11.6	11.3	11.5	11.8	10.8	11.3
7	11.1	8.3	9.5	12.2	11.5	11.8	11.6	11.3	11.4	12.0	10.9	11.3
8	10.1	8.3	9.1	---	---	---	12.1	11.6	11.9	12.0	11.3	11.6
9	11.7	9.4	10.0	12.5	11.7	11.9	11.9	11.5	11.7	11.5	11.2	11.4
10	9.2	8.3	8.7	12.7	11.6	12.2	11.7	11.3	11.5	11.8	11.3	11.5
11	10.2	8.6	8.9	13.7	12.0	12.4	11.8	11.2	11.5	11.9	11.5	11.6
12	10.6	8.7	9.6	13.1	12.1	12.4	12.2	10.9	11.7	12.0	11.2	11.6
13	10.1	9.1	9.6	---	---	---	11.9	10.7	11.4	11.6	11.2	11.4
14	9.6	9.2	9.4	---	---	---	11.8	11.4	11.6	11.4	11.0	11.2
15	10.4	9.1	9.5	---	---	---	12.1	11.4	11.8	11.0	10.6	10.8
16	11.2	9.1	9.6	---	---	---	12.1	11.6	11.8	11.2	11.0	11.1
17	10.2	9.2	9.5	---	---	---	12.1	11.2	11.6	11.3	10.9	11.1
18	10.8	9.2	9.4	---	---	---	11.3	10.7	11.0	11.5	11.0	11.2
19	9.7	9.3	9.4	---	---	---	11.8	10.6	11.2	11.5	10.9	11.2
20	9.4	9.2	9.3	---	---	---	12.1	11.5	11.8	11.5	11.0	11.2
21	9.8	9.3	9.6	---	---	---	12.4	11.7	12.0	11.7	10.9	11.3
22	10.2	9.4	9.8	---	---	---	12.3	11.5	11.9	12.2	11.2	11.8
23	11.0	9.3	10.1	---	---	---	11.9	11.3	11.7	12.4	11.9	12.1
24	9.8	9.3	9.4	---	---	---	11.6	10.8	11.2	12.3	11.4	11.9
25	10.1	9.4	9.7	12.1	10.7	11.2	12.0	11.2	11.6	12.2	10.9	11.9
26	10.5	9.6	10.0	12.2	10.7	11.3	12.1	11.7	11.9	12.4	10.7	11.4
27	10.5	9.9	10.1	11.2	10.7	11.0	12.3	11.5	11.8	15.7	11.6	12.7
28	10.5	10.0	10.2	11.9	10.7	11.1	12.2	11.5	11.9	14.9	11.7	12.4
29	10.6	9.9	10.2	11.2	10.7	10.9	12.2	11.6	11.8	15.5	11.9	12.8
30	11.0	10.3	10.5	11.6	10.3	11.0	12.3	11.2	11.8	15.6	12.5	13.3
31	11.0	10.3	10.6	---	---	---	12.1	11.3	11.6	14.8	12.2	13.0
MONTH	11.8	8.3	9.6				12.4	10.6	11.6	15.7	10.6	11.7

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	15.2	11.1	12.1	12.7	11.9	12.3	13.2	11.7	12.1	11.5	10.2	10.7
2	13.6	11.0	11.4	12.4	11.7	11.9	13.7	11.6	12.1	11.7	10.0	10.5
3	14.4	11.4	11.9	12.8	11.5	12.1	12.4	11.4	12.1	10.3	9.8	10.0
4	12.7	11.2	11.5	12.3	11.3	11.7	11.8	10.9	11.2	10.9	9.7	10.1
5	15.1	11.3	11.9	12.3	11.1	11.7	11.7	10.7	11.1	11.3	9.7	10.4
6	14.5	11.1	11.9	12.6	11.6	12.0	12.4	10.4	11.0	11.6	9.7	10.4
7	12.1	11.2	11.6	13.2	11.7	12.1	12.0	9.9	10.7	11.3	9.5	10.0
8	13.6	11.2	11.8	14.0	11.8	12.3	11.0	9.8	10.1	9.8	8.7	9.3
9	12.7	11.0	11.4	12.2	11.3	11.9	11.1	9.3	10.0	9.8	8.7	9.0
10	11.3	10.8	11.0	12.2	11.5	11.8	10.1	9.5	9.8	10.3	8.7	9.2
11	11.2	10.7	10.9	11.7	11.5	11.6	11.1	9.3	10.2	11.4	8.6	9.4
12	12.6	10.6	10.9	---	---	---	11.0	8.7	9.4	10.7	8.7	9.3
13	14.7	10.4	11.1	11.6	10.6	11.1	9.3	8.6	9.0	10.0	8.6	9.2
14	---	---	---	12.7	10.5	11.5	9.6	8.5	9.1	11.8	8.8	9.5
15	13.7	10.6	11.9	11.5	10.5	10.9	9.8	8.2	8.8	11.1	9.3	10.0
16	14.6	11.7	13.1	11.8	10.5	10.9	9.5	8.1	8.6	11.1	9.5	10.2
17	15.1	12.2	13.3	11.5	10.6	11.0	10.8	8.1	9.7	10.8	9.1	9.7
18	13.7	11.4	12.3	11.5	10.6	11.0	12.4	10.3	10.9	11.2	8.9	9.8
19	12.6	11.0	11.5	11.8	10.7	11.2	12.7	10.3	11.1	11.1	9.2	10.1
20	13.7	7.6	10.0	12.7	11.8	12.1	12.5	10.3	10.9	11.8	9.4	10.3
21	13.3	7.0	7.7	12.7	11.7	12.0	10.9	10.1	10.6	10.8	8.8	9.6
22	8.0	7.6	7.8	12.9	11.7	12.1	11.6	9.9	10.4	9.2	8.0	8.7
23	11.4	6.9	7.5	13.7	11.7	12.2	11.0	9.8	10.3	10.4	8.0	8.9
24	13.7	6.9	11.1	13.8	11.8	12.4	10.9	10.2	10.5	10.0	8.3	8.8
25	13.4	12.5	13.0	13.3	11.2	12.1	11.5	10.0	10.5	10.3	8.1	8.9
26	13.0	12.1	12.5	12.3	11.5	11.8	12.6	10.1	10.8	9.7	7.8	8.9
27	12.7	7.0	12.2	13.3	11.4	12.3	11.8	10.4	10.8	9.8	8.1	9.0
28	12.5	7.1	12.1	13.4	11.4	12.2	10.5	10.1	10.3	10.8	8.9	9.6
29	---	---	---	13.2	11.6	12.2	11.3	10.2	10.5	9.9	7.4	8.8
30	---	---	---	13.4	11.9	12.5	11.8	10.2	10.7	11.3	8.7	9.8
31	---	---	---	12.4	11.6	12.0	---	---	---	11.0	8.8	9.8
MONTH							13.7	8.1	10.4	11.8	7.4	9.6

05341770 ST. CROIX RIVER AT AFTON, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	11.7	7.4	8.5	8.6	7.2	7.8	7.2	6.0	6.2	6.9	5.2	5.6
2	9.5	7.4	8.1	8.0	7.1	7.5	8.8	4.9	6.3	6.1	5.5	5.7
3	9.8	7.5	8.3	8.7	6.4	7.1	8.5	6.0	6.9	6.4	5.5	5.7
4	10.3	7.6	9.0	8.0	6.5	7.1	10.3	6.0	7.5	8.1	5.6	6.0
5	8.7	7.4	7.9	8.7	6.0	6.6	9.0	7.1	7.8	6.6	5.9	6.0
6	10.8	7.9	8.8	8.5	5.9	6.6	9.3	6.5	7.3	6.4	5.5	5.8
7	9.9	7.6	8.1	8.4	5.0	6.2	9.3	7.4	8.3	5.8	5.4	5.5
8	9.9	8.0	8.5	7.1	4.9	5.6	9.7	7.1	7.9	5.7	5.3	5.5
9	9.4	7.5	8.2	8.0	5.0	6.5	9.4	7.2	7.7	5.6	4.8	5.4
10	9.5	7.4	8.2	8.0	6.2	6.7	8.7	6.9	7.5	---	---	---
11	10.5	7.5	8.3	8.8	6.1	7.0	8.5	6.5	7.5	---	---	---
12	9.3	7.1	8.3	7.3	5.7	6.2	9.4	6.2	7.0	---	---	---
13	8.5	7.0	7.9	8.4	5.3	6.6	9.6	5.9	7.3	---	---	---
14	---	---	---	7.8	5.9	6.3	7.7	6.2	7.1	---	---	---
15	8.5	6.0	6.6	6.7	5.4	5.5	9.6	7.2	7.7	---	---	---
16	9.2	5.4	6.8	7.0	5.3	5.6	9.6	7.1	7.8	---	---	---
17	7.1	4.8	6.0	---	---	---	10.9	6.8	8.1	---	---	---
18	8.2	5.4	6.6	---	---	---	10.2	6.4	7.9	---	---	---
19	7.6	5.6	6.4	---	---	---	9.7	6.6	7.8	---	---	---
20	7.2	5.5	5.9	9.8	7.7	8.3	9.7	6.5	7.9	---	---	---
21	6.9	5.1	5.9	9.5	7.4	8.1	9.1	6.3	8.2	---	---	---
22	7.1	5.3	6.0	8.9	6.3	7.2	9.0	6.0	8.3	---	---	---
23	6.8	5.3	5.8	9.5	5.4	7.3	8.6	4.7	8.0	---	---	---
24	7.5	5.3	6.0	8.2	6.0	7.0	8.4	7.4	7.8	---	---	---
25	7.9	5.6	6.6	---	---	---	7.5	7.0	7.3	---	---	---
26	7.5	5.7	6.6	---	---	---	7.2	6.9	7.0	---	---	---
27	6.8	6.4	6.6	---	---	---	7.1	7.1	7.1	---	---	---
28	9.4	6.7	7.1	7.6	6.0	6.4	7.1	6.5	6.8	---	---	---
29	9.2	7.0	7.6	8.8	5.9	6.4	6.5	6.3	6.4	---	---	---
30	8.3	7.1	7.6	9.0	5.8	7.0	6.5	6.0	6.2	---	---	---
31	---	---	---	8.7	6.4	7.4	6.6	4.7	5.8	---	---	---
MONTH							10.9	4.7	7.4			

05344490 ST. CROIX RIVER AT PRESCOTT, WI

LOCATION.--Lat 44°44'57", long 92°48'16", in SE¼SE¼ sec.9, T.27 N., R.23 W., Pierce County, Hydrologic Unit 07030005. Sampling site at U.S. Highway 10 bridge, 1,000 ft (305 m) upstream from mouth.

PERIOD OF RECORD.--February 1977 to current year (discontinued).

REMARKS.--Water discharge estimated on the basis of discharge for St. Croix River at St. Croix Falls and Apple River near Somerset and adjusted for travel time.

COOPERATION.--Samples were collected by the Metropolitan Waste Control Commission, St. Paul, MN, and analyzed by the U.S. Geological Survey.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	FLUORIDE, TOTAL (MG/L AS F) (00951)
NOV 06...	0850	2970	260	7.5	8.0	9.2	81	.0
FEB 12...	1115	2250	300	7.7	.0	11.9	84	.2
MAY 18...	0905	6240	130	7.3	14.0	8.8	87	--
SEP 08...	0930	3790	182	7.9	21.0	5.4	62	.3

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)
NOV 06...	1	100	0	40	0	15	1	340	1
FEB 12...	0	100	0	30	2	8	3	310	2
MAY 18...	1	100	10	70	6	3	17	380	7
SEP 08...	1	100	<10	20	<1	9	5	520	5

DATE	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	CYANIDE TOTAL (MG/L AS CN) (00720)
NOV 06...	80	<.1	1	2	0	0	10	.00
FEB 12...	40	<.1	1	5	0	0	10	<.01
MAY 18...	50	<.1	2	3	0	0	30	<.01
SEP 08...	240	<.1	4	2	<1	<1	30	<.01

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)
SEP 08...	0930	3790	182	7.9	21.0	5.4	62	<.1	1	100	<10

DATE	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
SEP 08...	20	<1	1	180	2	20	<.1	1	<1	<1	<10

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 07010206, on left bank at Prescott, 200 ft (61 m) downstream from St. Croix River, 300 ft (91 m) south of Chicago, Burlington & Quincy Railroad bridge, 800 ft (244 m) south of bridge on U.S. Highway 10, and at mile 811.4 (1,306 km) upstream from Ohio River.

DRAINAGE AREA.--44,800 mi^2 (116,000 km^2), 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 (197.968 m) National Geodetic Vertical Datum of 1929. Prior to Aug. 2, 1932, nonrecording gage at railroad bridge 300 ft (91 m) upstream at following datums: June 3, 1928, to Sept. 30, 1929, 19.27 ft (5.873 m) higher; Oct. 1, 1929, to Sept. 30, 1930, 17.68 ft (5.389 m) higher; Oct. 1, 1930, to Aug. 1, 1932, 19.28 ft (5.877 m) higher. Aug. 2, 1932, to Oct. 30, 1938, water-stage recorder at present site at datum 19.28 ft (5.877 m) higher; Nov. 1, 1938, to Sept. 7, 1971, water-stage recorder at present site at datum 50.00 ft (15.240 m) lower. Auxiliary water-stage recorder 10.7 mi (17.2 km) downstream from base gage.

REMARKS.--Records good. Some regulation by reservoirs, navigation dams, and powerplants at low and medium stages. Flood flow not materially affected by artificial storage.

AVERAGE DISCHARGE.--53 years, 16,270 ft^3/s (460.8 m^3/s), 4.93 in/yr (125 mm/yr); median of yearly mean discharges, 14,500 ft^3/s (411 m^3/s), 4.40 in/yr (112 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 228,000 ft^3/s (6,460 m^3/s) Apr. 18, 1965, gage height, 43.11 ft (13.140 m); minimum daily, 1,380 ft^3/s (39.1 m^3/s) July 13, 1940; minimum gage height, 15.08 ft (4.596 m) Aug. 29, 1934, present datum.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 43,400 ft^3/s (1,230 m^3/s) June 19; maximum gage height, 29.87 ft (9.104 m) June 19; minimum daily, 4,100 ft^3/s (116 m^3/s) Feb. 3; minimum gage height, 24.48 ft (7.462 m) Oct. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12000	10400	7940	7010	5110	10600	14100	30300	12400	36100	19900	28200
2	12300	9130	7980	6710	5420	10100	18000	28200	11700	38300	18700	27700
3	11500	10100	6490	6200	4100	10300	17000	29700	12700	33400	17300	26700
4	11300	10200	4270	6130	4690	9370	16300	29500	12500	33400	17300	25400
5	11100	9630	5170	5210	5210	9420	18300	28300	12300	30700	17500	24500
6	10600	8890	7010	6000	5160	9280	17800	30400	12100	28500	16100	21400
7	10300	9870	7530	5760	5320	8720	16800	29600	12300	25600	16400	20000
8	9880	9890	8250	6210	5610	8500	17200	29000	13300	23900	17800	19100
9	9460	9440	7960	6030	5170	8250	17300	28000	12700	21400	17800	16700
10	8820	9830	6560	6140	5370	8650	17000	25900	12200	18400	17800	15600
11	9590	9930	6890	5190	5300	8090	17500	25500	11700	17400	17700	14300
12	8600	9310	5310	5170	4460	8190	17200	24300	11300	18300	19000	14800
13	8130	9550	6120	5670	5110	8590	17000	23400	10800	16100	18200	13200
14	8140	9350	7330	5550	5110	8230	16400	22400	11200	16200	18000	13100
15	8670	9480	6500	5800	4330	9040	16900	20500	18400	17000	16600	12500
16	8750	9810	7340	5710	5860	8870	17400	20000	27400	16200	15600	12000
17	8760	9360	7570	5090	5610	9430	17000	17000	36200	16500	15800	11200
18	8580	9210	7610	5580	5480	9470	16300	17100	42500	16300	17500	10800
19	8370	9330	7570	5380	6270	9740	16400	14600	43400	17200	15400	10300
20	9410	8970	5060	5380	6050	9620	16500	14400	41400	17000	15000	10300
21	8980	8730	5020	5800	6120	9160	17300	12400	37200	17800	13900	9540
22	8990	9130	5030	5560	6530	9090	15600	12600	35200	17900	12600	9440
23	9180	8320	6360	5260	7340	8880	15600	11900	33400	18400	12400	8740
24	8660	8510	6290	5540	8080	8850	17800	11500	32200	17900	11500	8670
25	9120	9360	6330	5300	8020	9060	21600	11100	32700	17700	12200	8190
26	9470	8690	5130	4710	8380	8240	25500	11200	32500	18900	12300	7780
27	9920	7970	5860	5560	8860	8550	29200	11800	35100	20500	13500	8240
28	9890	6690	5930	5270	9720	9010	28300	11800	37800	21700	17900	8390
29	10300	7220	5980	5240	---	9220	30200	11900	37700	22500	22100	8210
30	10500	8400	6500	5130	---	9560	29800	12600	37700	21800	25800	8770
31	10700	---	6590	5000	---	12300	---	12700	---	20900	28200	---
TOTAL	299970	274700	201480	174290	167790	284380	569300	619600	730000	673900	527800	433770
MEAN	9676	9157	6499	5622	5993	9174	18980	19990	24330	21740	17030	14460
MAX	12300	10400	8250	7010	9720	12300	30200	30400	43400	38300	28200	28200
MIN	8130	6690	4270	4710	4100	8090	14100	11100	10800	16100	11500	7780
CFSM	.22	.20	.15	.13	.13	.21	.42	.45	.54	.49	.38	.32
IN.	.25	.23	.17	.14	.14	.24	.47	.51	.61	.56	.44	.36

CAL YR 1980 TOTAL 4567720 MEAN 12480 MAX 43100 MIN 4270 CFSM .28 IN 3.79
WTR YR 1981 TOTAL 4956980 MEAN 13580 MAX 43400 MIN 4100 CFSM .30 IN 4.12

05344980 MISSISSIPPI RIVER AT LOCK AND DAM 3 NEAR RED WING, MN

LOCATION.--Lat 44°36'36", long 92°36'36", in SW¼NW¼ sec.10, T.113 N., R.15 W., Goodhue County, Hydrologic Unit 07040001, on right bank on downstream side of dam, 5 mi (8 km) northwest of Red Wing, and at mile 796.7 (1,282 km) upstream from Ohio River.

DRAINAGE AREA.--46,600 mi^2 (120,700 km^2), approximately.

PERIOD OF RECORD.--Water years 1969 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: May 1976 to current year.
pH: May 1976 to current year.
WATER TEMPERATURES: August 1969 to current year.
DISSOLVED OXYGEN: May 1976 to current year.

INSTRUMENTATION.--Water-quality monitor since May 1976.

REMARKS.--Extremes are published for those years with 80 percent or more daily record. Water is pumped to a monitor that is inside a heated shelter; water temperature during the winter period may be affected.

COOPERATION.--Discharge data furnished by the St. Paul District, Corps of Engineers. Water samples collected and water-quality monitor operated by the Metropolitan Waste Control Commission, St. Paul, MN.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1980-81): Maximum, 562 micromhos Dec. 21, 1979; minimum, 307 micromhos Mar. 26, 1980.
pH (water years 1980-81): Maximum, 8.8 units May 2-4, 6, 7, 1980; minimum, 7.2 units Sept. 15 and 24, 1980.
WATER TEMPERATURES (water years 1970-78, 1980-81): Maximum, 30.5°C July 19, 1977; minimum, 0.0°C several days during winter.
DISSOLVED OXYGEN (water year 1981): Maximum, 14.3 mg/L Mar. 3, 23, 24, 1981; minimum, 3.4 mg/L June 15, 1981.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 495 micromhos Sept. 14; minimum, 310 micromhos Apr. 27, May 8.
pH: Maximum, 8.5 units Mar. 24, 25, 29-31; minimum, 7.3 units May 6.
WATER TEMPERATURES: Maximum, 28.5°C Aug. 4; minimum, 0.5°C Dec. 24, Feb. 2, 12.
DISSOLVED OXYGEN: Maximum, 14.3 mg/L Mar. 3, 23, 24; minimum, 3.4 mg/L June 15.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	FLUO-RIDE, TOTAL (MG/L AS F) (00951)
OCT								
16...	0920	9260	340	7.9	11.0	9.6	89	.1
DEC								
17...	0945	8260	390	7.8	2.0	11.9	88	.1
FEB								
12...	1035	4640	445	7.8	.0	13.1	92	--
APR								
08...	1100	18800	370	7.9	9.0	12.4	110	.4
JUN								
12...	0930	10600	360	7.9	22.0	7.3	85	.1
SEP								
08...	1100	15700	463	8.1	20.0	6.8	76	.3

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOV-ERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)
OCT									
16...	3	<50	0	40	0	11	3	960	1
DEC									
17...	2	100	0	80	1	3	8	350	56
FEB									
12...	1	100	0	--	1	11	7	330	2
APR									
08...	0	100	0	70	2	13	5	900	14
JUN									
12...	0	100	10	70	1	8	4	860	8
SEP									
08...	3	100	<10	80	<1	8	36	1100	13

05344980 MISSISSIPPI RIVER AT LOCK AND DAM 3 NEAR RED WING, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	CYANIDE TOTAL (MG/L AS CN) (00720)
OCT 16...	170	<.1	2	4	0	1	30	.00
DEC 17...	100	<.1	1	8	0	0	30	.00
FEB 12...	100	<.1	1	16	0	0	20	<.01
APR 08...	140	<.1	3	12	0	0	50	<.01
JUN 12...	170	<.1	1	8	1	0	30	<.01
SEP 08...	160	<.1	5	11	1	<1	70	<.01

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	BORON, DISSOLVED (UG/L AS B) (01020)
SEP 08...	1100	15700	463	8.1	20.0	6.8	76	.3	3	100	<10	20

DATE	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, HEXAVALENT, DIS. (UG/L AS CR) (01032)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
SEP 08...	<1	<1	4	30	6	10	<.1	3	1	<1	10

05344980 MISSISSIPPI RIVER AT LOCK AND DAM 3 NEAR RED WING, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	349	342	345	372	368	370	371	365	367	414	405	410
2	343	339	340	373	368	371	372	366	368	408	405	407
3	353	340	346	371	364	367	386	366	373	423	407	416
4	353	349	350	367	364	366	390	383	386	426	421	423
5	354	352	353	370	365	367	383	362	372	426	411	420
6	357	354	355	372	368	370	367	362	364	415	403	409
7	356	351	353	372	369	370	386	369	380	406	399	401
8	360	356	358	379	370	374	384	369	377	410	399	405
9	360	350	354	383	376	379	380	368	374	410	409	410
10	356	347	351	377	373	375	379	375	377	418	411	414
11	358	354	356	373	367	370	385	379	383	428	418	424
12	367	356	362	367	365	366	386	377	383	432	398	428
13	372	368	371	373	360	369	380	369	376	431	429	430
14	375	367	371	380	366	373	390	376	382	430	411	424
15	367	365	366	381	377	379	408	387	395	420	417	418
16	370	366	368	378	370	375	415	406	411	407	402	414
17	377	374	375	375	372	374	414	408	410	418	411	414
18	383	373	377	373	360	370	415	404	411	412	408	410
19	376	352	365	371	369	370	411	402	407	405	400	402
20	366	347	353	376	371	373	422	402	413	400	394	396
21	371	355	362	376	362	369	411	391	398	---	---	---
22	377	368	371	365	360	363	390	384	386	386	381	383
23	379	369	375	373	363	368	393	387	390	386	381	383
24	372	364	366	373	367	370	413	385	402	387	382	385
25	365	363	364	371	370	370	421	411	414	388	383	384
26	363	358	361	374	370	372	432	421	427	408	395	402
27	368	360	362	376	372	374	427	417	422	407	386	391
28	379	363	369	376	374	375	420	415	417	396	386	392
29	373	370	372	374	364	370	425	417	419	392	384	387
30	372	370	371	367	361	364	430	425	427	381	375	377
31	371	367	368	---	---	---	429	414	424	378	373	375
MONTH	383	339	362	383	360	371	432	362	395			

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	386	375	377	379	361	371	390	343	369	339	312	329
2	378	374	376	359	350	353	379	370	375	324	311	318
3	386	375	378	352	348	350	380	372	376	323	315	320
4	393	384	389	352	348	350	377	369	373	328	315	320
5	394	377	387	348	346	348	378	365	370	334	321	329
6	380	374	376	348	345	347	377	358	368	332	315	325
7	393	375	388	346	332	338	372	367	370	331	311	323
8	397	391	395	332	322	326	382	366	376	316	310	313
9	408	397	404	334	321	327	383	367	377	328	314	321
10	413	405	409	341	331	335	379	370	375	343	326	332
11	413	411	412	346	335	339	378	365	373	348	337	343
12	424	415	417	351	343	347	376	361	369	348	330	341
13	417	390	400	349	343	347	373	363	369	359	346	351
14	394	379	383	345	338	340	373	363	369	358	346	353
15	393	385	389	345	336	339	368	349	356	355	331	347
16	407	393	402	347	330	340	362	347	354	339	321	332
17	443	408	430	350	331	342	365	354	360	343	331	335
18	426	391	411	348	341	344	364	352	359	344	338	342
19	390	375	380	343	336	340	355	336	350	350	339	344
20	380	374	377	342	337	339	353	342	348	364	344	355
21	376	371	374	342	336	338	351	340	346	357	350	354
22	390	374	379	346	336	339	361	350	356	357	351	354
23	405	394	401	346	341	344	357	342	348	357	353	354
24	402	395	398	352	344	347	348	343	346	367	353	360
25	396	387	391	361	341	360	347	328	340	374	367	371
26	387	374	380	367	363	365	333	311	325	373	366	369
27	383	373	376	373	368	370	320	310	315	---	---	---
28	385	376	381	381	378	380	337	313	327	---	---	---
29	---	---	---	387	381	384	344	317	337	---	---	---
30	---	---	---	391	381	386	343	332	337	---	---	---
31	---	---	---	389	383	387	---	---	---	---	---	---
MONTH	443	371	391	391	321	350	390	310	357			

05344980 MISSISSIPPI RIVER AT LOCK AND DAM 3 NEAR RED WING, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	380	355	367	437	427	432	434	423	428
2	---	---	---	377	373	375	437	429	433	444	434	437
3	---	---	---	404	389	395	450	438	443	460	444	452
4	---	---	---	411	399	405	459	417	442	461	452	456
5	---	---	---	414	403	407	431	418	424	463	452	457
6	---	---	---	416	383	406	455	435	445	469	462	465
7	---	---	---	396	378	387	465	454	460	469	459	464
8	---	---	---	395	378	385	460	448	453	463	458	461
9	397	388	393	395	377	386	460	446	454	483	459	472
10	393	380	387	391	377	381	461	437	452	488	482	486
11	383	372	379	402	389	393	439	414	428	487	472	482
12	374	367	370	412	401	407	430	415	423	485	471	479
13	372	369	370	409	383	399	431	423	428	491	481	487
14	384	366	372	402	382	393	435	409	422	495	479	487
15	400	386	392	407	398	403	426	414	422	488	478	484
16	388	380	386	405	388	401	429	421	427	484	471	476
17	386	374	380	390	380	385	434	430	432	478	472	475
18	389	372	380	390	381	387	434	428	432	477	467	471
19	383	370	377	404	389	397	430	418	423	471	464	467
20	386	370	379	430	406	418	425	417	423	470	464	467
21	390	375	382	433	426	430	435	426	431	469	454	461
22	399	384	390	425	403	409	430	423	427	454	441	447
23	396	379	389	407	402	404	424	415	419	442	438	440
24	389	377	385	413	403	407	428	418	423	442	437	439
25	402	380	391	416	410	413	434	428	432	440	438	439
26	415	394	403	427	416	421	433	420	426	440	437	438
27	429	409	418	440	427	433	441	427	433	412	407	411
28	424	413	419	444	434	440	444	434	440	392	382	386
29	403	379	390	433	422	429	433	394	414	362	346	354
30	375	357	364	427	422	425	399	386	390	343	319	330
31	---	---	---	430	422	426	423	399	408	---	---	---
MONTH				444	355	404	465	386	430	495	319	450

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	7.7	7.6	7.7	7.9	7.8	7.8	7.9	7.8	7.8	7.9	7.9	7.9
2	7.8	7.7	7.8	7.8	7.8	7.8	7.9	7.8	7.8	7.9	7.8	7.9
3	7.9	7.7	7.8	7.9	7.8	7.8	8.0	7.8	7.9	7.9	7.8	7.8
4	7.8	7.7	7.8	7.9	7.8	7.9	8.1	8.0	8.0	7.8	7.8	7.8
5	7.8	7.7	7.7	7.9	7.8	7.9	8.0	7.9	8.0	7.8	7.8	7.8
6	7.8	7.7	7.7	7.9	7.8	7.8	7.9	7.9	7.9	7.8	7.8	7.8
7	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.9	7.9	7.9	7.8	7.8
8	7.9	7.6	7.8	7.8	7.7	7.8	7.9	7.9	7.9	7.8	7.8	7.8
9	7.8	7.7	7.8	7.8	7.7	7.7	7.9	7.8	7.8	7.8	7.8	7.8
10	7.9	7.8	7.8	7.9	7.8	7.8	8.0	7.8	7.9	7.8	7.8	7.8
11	7.9	7.8	7.8	7.8	7.7	7.8	8.1	8.0	8.0	7.8	7.8	7.8
12	8.0	7.8	7.9	7.8	7.7	7.7	8.1	8.0	8.0	7.8	7.7	7.8
13	7.9	7.8	7.8	7.9	7.8	7.8	8.1	8.0	8.0	7.8	7.8	7.8
14	7.8	7.8	7.8	7.9	7.8	7.8	8.1	8.0	8.0	7.8	7.7	7.7
15	7.7	7.7	7.7	7.8	7.8	7.8	8.0	7.9	8.0	7.8	7.7	7.7
16	7.9	7.7	7.8	7.8	7.8	7.8	8.0	7.9	8.0	7.8	7.7	7.7
17	7.8	7.7	7.8	7.8	7.7	7.8	7.9	7.8	7.9	7.8	7.7	7.7
18	7.8	7.7	7.8	7.8	7.8	7.8	8.0	7.9	8.0	7.8	7.7	7.7
19	7.7	7.7	7.7	7.8	7.7	7.7	8.0	7.9	8.0	7.7	7.7	7.7
20	7.7	7.6	7.7	7.8	7.8	7.8	8.0	7.9	8.0	7.7	7.6	7.7
21	7.8	7.7	7.7	7.8	7.8	7.8	8.0	8.0	8.0	---	---	---
22	7.8	7.7	7.8	7.8	7.7	7.8	8.0	7.9	8.0	7.9	7.9	7.9
23	7.8	7.7	7.7	7.9	7.8	7.8	8.0	7.9	7.9	7.9	7.9	7.9
24	7.7	7.6	7.7	8.0	7.8	7.9	8.0	7.8	7.9	7.9	7.9	7.9
25	7.7	7.6	7.7	7.9	7.8	7.8	8.0	7.9	8.0	7.9	7.9	7.9
26	7.7	7.7	7.7	7.9	7.8	7.8	7.9	7.9	7.9	8.0	7.9	7.9
27	7.7	7.7	7.7	7.9	7.8	7.8	7.9	7.8	7.8	8.0	7.5	7.9
28	7.8	7.7	7.7	7.9	7.8	7.8	7.8	7.8	7.8	8.0	7.9	7.9
29	7.8	7.7	7.7	7.8	7.7	7.8	7.9	7.8	7.8	7.9	7.9	7.9
30	7.8	7.7	7.7	7.8	7.7	7.8	7.9	7.9	7.9	7.9	7.8	7.9
31	7.8	7.7	7.8	---	---	---	7.9	7.8	7.9	7.9	7.9	7.9
MONTH	8.0	7.6	7.8	8.0	7.7	7.8	8.1	7.8	7.9			

05344980 MISSISSIPPI RIVER AT LOCK AND DAM 3 NEAR RED WING, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	8.0	7.9	7.9	8.0	8.0	8.0	8.4	8.2	8.3	8.2	7.8	8.0
2	8.0	7.9	8.0	8.1	8.0	8.1	8.2	8.1	8.2	8.1	7.8	8.0
3	8.0	7.9	8.0	8.1	8.0	8.1	8.2	8.1	8.1	8.0	7.8	7.9
4	8.0	7.9	7.9	8.0	7.9	8.0	8.1	7.9	8.0	7.8	7.6	7.6
5	7.9	7.9	7.9	8.1	8.0	8.0	8.1	7.9	8.0	7.7	7.4	7.5
6	7.9	7.9	7.9	8.1	8.0	8.0	8.1	8.0	8.1	8.1	7.3	7.7
7	8.0	7.8	7.9	8.1	8.0	8.0	8.0	7.9	8.0	8.0	7.7	7.8
8	7.9	7.8	7.9	8.1	8.0	8.1	8.2	7.9	8.0	7.8	7.6	7.7
9	7.9	7.8	7.9	8.2	8.0	8.1	8.3	8.0	8.2	7.8	7.6	7.7
10	7.9	7.8	7.9	8.3	8.1	8.2	8.2	8.1	8.2	8.0	7.6	7.8
11	7.9	7.9	7.9	8.2	8.1	8.2	8.3	8.1	8.2	8.0	7.7	7.9
12	7.9	7.8	7.9	8.2	8.0	8.1	8.2	8.1	8.2	7.9	7.7	7.8
13	7.9	7.8	7.9	8.2	8.0	8.1	8.1	8.0	8.1	8.2	7.7	7.9
14	7.9	7.8	7.9	8.3	8.1	8.2	8.1	7.9	8.0	8.2	7.9	8.0
15	7.9	7.8	7.9	8.2	8.1	8.2	8.2	8.0	8.1	8.2	7.9	8.1
16	7.9	7.9	7.9	8.4	8.1	8.2	8.1	8.0	8.1	8.2	8.0	8.1
17	7.9	7.9	7.9	8.4	8.2	8.3	8.1	7.9	8.0	8.2	8.0	8.1
18	7.9	7.9	7.9	8.4	8.2	8.3	8.0	7.8	8.0	8.3	8.1	8.2
19	8.0	7.9	7.9	8.3	8.1	8.2	8.0	7.8	7.9	8.5	8.1	8.3
20	8.0	8.0	8.0	8.2	8.1	8.1	8.1	7.9	8.0	8.5	8.1	8.3
21	8.0	8.0	8.0	8.3	8.2	8.2	8.0	7.8	7.9	8.3	8.2	8.3
22	8.0	8.0	8.0	8.4	8.2	8.3	8.1	7.8	7.9	8.3	8.1	8.1
23	8.0	8.0	8.0	8.4	8.3	8.3	7.9	7.8	7.9	8.1	7.8	7.9
24	8.0	7.9	8.0	8.5	8.3	8.4	8.0	7.8	7.9	7.8	7.7	7.7
25	8.0	7.9	8.0	8.5	8.2	8.3	8.0	7.8	7.9	7.7	7.5	7.6
26	8.0	8.0	8.0	8.4	8.2	8.3	8.1	7.8	7.9	7.5	7.4	7.5
27	8.1	8.0	8.0	8.4	8.3	8.4	8.0	7.8	7.9	---	---	---
28	8.0	8.0	8.0	8.4	8.3	8.4	8.0	7.8	7.9	---	---	---
29	---	---	---	8.5	8.3	8.4	8.1	7.8	7.9	---	---	---
30	---	---	---	8.5	8.4	8.4	8.1	7.8	8.0	---	---	---
31	---	---	---	8.5	8.4	8.4	---	---	---	---	---	---
MONTH	8.1	7.8	7.9	8.5	7.9	8.2	8.4	7.8	8.0			

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	7.8	7.7	7.8	8.0	7.9	8.0	8.0	7.9	7.9
2	---	---	---	7.8	7.7	7.8	8.0	7.9	7.9	8.0	7.9	8.0
3	---	---	---	7.9	7.7	7.8	8.0	7.9	7.9	8.0	7.9	8.0
4	---	---	---	7.8	7.7	7.8	8.0	7.9	7.9	8.0	7.9	8.0
5	---	---	---	7.9	7.8	7.8	8.1	7.8	8.0	8.0	7.9	8.0
6	---	---	---	7.9	7.8	7.8	8.2	8.1	8.2	8.1	8.0	8.0
7	---	---	---	7.9	7.8	7.8	8.2	8.1	8.2	8.2	8.0	8.1
8	---	---	---	7.9	7.8	7.9	8.3	8.1	8.2	8.2	8.0	8.1
9	8.1	7.8	7.9	8.0	7.8	7.9	8.2	8.1	8.1	8.1	8.1	8.1
10	8.2	7.9	8.0	8.0	7.8	7.9	8.2	8.1	8.1	8.2	8.1	8.1
11	8.1	8.0	8.0	8.0	7.9	7.9	8.2	8.0	8.1	8.3	8.0	8.1
12	8.0	7.9	7.9	8.0	7.9	7.9	8.3	7.9	8.1	8.3	8.0	8.1
13	7.9	7.8	7.9	7.9	7.9	7.9	8.3	8.1	8.2	8.3	8.1	8.2
14	7.9	7.8	7.8	7.9	7.8	7.9	8.4	8.1	8.2	8.2	8.0	8.1
15	8.0	7.8	7.9	7.9	7.9	7.9	8.3	8.1	8.2	8.2	8.0	8.1
16	7.9	7.7	7.8	7.9	7.8	7.9	8.2	8.0	8.1	8.1	7.9	8.0
17	8.1	7.9	8.0	8.0	7.8	7.8	8.2	8.1	8.2	7.9	7.8	7.9
18	8.1	7.8	8.0	8.2	7.8	8.0	8.2	8.1	8.1	7.9	7.8	7.8
19	8.0	7.8	7.9	8.2	7.9	8.0	8.2	8.0	8.1	7.9	7.8	7.8
20	7.9	7.7	7.8	8.1	7.8	8.0	8.1	8.0	8.0	7.9	7.8	7.8
21	7.8	7.7	7.7	8.0	7.9	8.0	8.1	8.0	8.0	7.8	7.8	7.8
22	7.8	7.7	7.7	8.0	7.8	7.9	8.1	8.0	8.0	7.8	7.7	7.8
23	7.8	7.7	7.7	8.0	7.9	7.9	8.1	8.0	8.0	7.9	7.7	7.8
24	8.0	7.7	7.8	8.0	8.0	8.0	8.0	7.9	7.9	7.9	7.8	7.8
25	8.0	7.8	7.9	8.0	7.9	8.0	8.1	7.9	7.9	7.9	7.8	7.8
26	8.0	7.9	7.9	7.9	7.9	7.9	8.1	7.9	8.0	7.8	7.7	7.7
27	8.1	7.9	8.0	8.0	7.9	7.9	8.1	8.0	8.0	7.8	7.7	7.7
28	8.0	7.9	7.9	8.1	8.0	8.0	8.0	7.9	8.0	7.7	7.7	7.7
29	7.8	7.8	7.8	8.0	7.9	8.0	7.9	7.8	7.9	7.7	7.6	7.7
30	7.8	7.7	7.7	8.0	7.9	8.0	7.8	7.7	7.8	7.9	7.6	7.7
31	---	---	---	8.0	7.9	8.0	7.9	7.8	7.9	---	---	---
MONTH				8.2	7.7	7.9	8.4	7.7	8.0	8.3	7.6	7.9

05344980 MISSISSIPPI RIVER AT LOCK AND DAM 3 NEAR RED WING, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	17.0	16.5	16.5	8.5	7.5	8.0	3.5	2.0	3.0	1.5	1.0	1.0
2	16.5	15.0	15.5	8.0	7.5	7.5	2.0	1.5	1.5	1.5	1.0	1.0
3	15.0	14.0	14.5	9.0	8.0	8.5	1.5	1.0	1.5	1.5	1.0	1.0
4	14.5	14.0	14.0	9.0	8.0	8.5	2.0	1.0	1.5	1.5	1.0	1.0
5	14.0	13.5	13.5	9.5	8.0	8.5	2.0	1.5	2.0	1.5	1.0	1.5
6	16.0	14.5	15.0	9.5	8.0	8.5	2.5	2.0	2.0	2.0	1.0	1.5
7	15.0	14.0	14.5	9.0	8.0	8.0	2.5	2.0	2.5	1.5	1.0	1.0
8	16.0	14.0	14.5	8.0	7.5	8.0	2.0	1.5	2.0	1.5	1.0	1.5
9	15.0	15.0	15.0	8.5	7.5	8.0	1.5	1.5	1.5	1.5	1.5	1.5
10	15.5	14.5	15.0	8.5	7.5	8.0	1.5	1.0	1.5	1.5	1.0	1.5
11	14.0	12.5	13.0	7.5	7.0	7.0	1.5	1.0	1.0	1.5	1.0	1.5
12	14.0	12.0	12.5	7.0	6.5	7.0	2.0	1.0	1.5	2.0	1.0	1.5
13	12.0	11.5	11.5	7.5	5.0	7.0	1.5	1.0	1.5	1.5	1.0	1.5
14	11.5	11.0	11.0	7.0	6.0	6.5	1.5	1.0	1.0	1.5	1.0	1.5
15	11.5	11.0	11.0	6.5	6.0	6.0	1.5	1.0	1.5	1.5	1.0	1.5
16	11.5	11.0	11.0	6.5	6.0	6.0	1.5	1.0	1.5	1.5	1.0	1.5
17	11.5	11.0	11.5	7.0	5.5	6.5	2.0	1.5	1.5	2.0	1.5	1.5
18	12.0	10.5	11.0	6.0	5.0	5.5	1.5	1.0	1.5	2.0	1.0	1.5
19	13.5	10.0	11.0	5.5	5.0	5.0	1.5	1.0	1.0	2.0	1.5	1.5
20	13.5	10.5	11.5	5.5	4.5	5.0	1.5	1.0	1.0	2.0	1.5	2.0
21	11.0	10.0	10.5	5.0	4.5	5.0	1.5	1.0	1.5	---	---	---
22	10.0	10.0	10.0	5.0	4.5	5.0	1.5	1.5	1.5	2.0	1.5	1.5
23	12.5	10.0	10.5	6.5	4.5	5.5	2.0	1.5	1.5	1.5	1.5	1.5
24	11.0	9.0	10.0	5.0	4.5	5.0	1.5	.5	1.5	2.0	1.5	1.5
25	9.0	8.0	8.5	4.5	4.0	4.0	1.5	1.0	1.0	2.0	1.5	1.5
26	8.5	7.5	8.0	4.5	3.5	4.0	2.0	1.5	1.5	2.0	1.5	1.5
27	8.0	7.5	8.0	5.0	4.0	4.0	1.5	1.0	1.0	3.5	1.0	1.5
28	8.0	7.0	7.5	4.0	3.5	3.5	2.0	1.0	1.5	1.5	1.0	1.0
29	8.5	7.0	7.5	3.5	3.5	3.5	1.5	1.0	1.0	1.5	1.0	1.0
30	8.5	7.5	8.0	4.5	3.5	4.0	1.0	1.0	1.0	1.5	1.0	1.0
31	8.5	8.0	8.0	---	---	---	1.5	1.0	1.0	1.5	1.0	1.0
MONTH	17.0	7.0	11.5	9.5	3.5	6.0	3.5	.5	1.5			

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2.0	1.0	1.0	2.5	2.0	2.5	8.5	7.5	8.0	14.5	12.5	13.5
2	1.0	.5	.5	2.5	2.0	2.0	8.5	7.5	8.0	15.0	13.0	14.0
3	1.0	1.0	1.0	2.0	2.0	2.0	9.0	8.0	8.5	14.5	14.0	14.5
4	1.5	1.0	1.0	2.0	2.0	2.0	9.0	7.0	8.0	15.0	14.5	14.5
5	1.5	1.0	1.0	2.0	2.0	2.0	8.0	6.5	7.5	15.5	14.0	14.5
6	1.5	1.0	1.0	2.5	1.5	2.0	8.5	7.0	8.0	15.5	13.5	14.5
7	1.5	1.0	1.0	2.5	2.0	2.5	9.0	8.5	8.5	15.5	14.0	15.0
8	1.0	1.0	1.0	2.5	2.0	2.5	9.5	8.5	9.0	15.5	14.5	15.0
9	1.5	1.0	1.0	4.0	2.0	3.0	9.5	8.5	9.0	15.0	14.0	14.5
10	1.0	1.0	1.0	4.0	3.0	3.5	11.5	9.5	10.0	15.0	13.0	14.0
11	1.0	1.0	1.0	4.0	3.0	3.5	11.0	10.0	10.5	15.5	13.0	14.5
12	1.5	.5	1.0	4.5	2.5	3.5	11.0	10.0	10.5	15.0	14.0	14.5
13	1.0	1.0	1.0	4.5	3.5	4.0	11.5	10.5	11.0	15.5	14.0	15.0
14	1.5	1.0	1.0	4.5	3.5	4.0	10.5	9.5	10.0	16.0	14.5	15.5
15	1.5	1.0	1.0	4.5	3.5	4.5	10.5	9.5	10.0	17.0	15.5	16.0
16	2.0	1.5	1.5	6.0	4.5	5.0	10.5	10.0	10.5	16.5	15.5	16.0
17	2.0	1.5	1.5	5.5	4.5	5.0	11.5	10.5	11.0	16.5	16.0	16.0
18	2.5	1.5	2.0	6.0	5.0	5.5	11.5	10.5	11.0	16.5	15.5	16.0
19	3.5	2.5	3.0	5.0	4.0	4.5	12.0	11.0	11.5	18.5	15.5	17.0
20	3.5	2.5	3.0	4.5	3.5	4.0	11.5	10.5	11.0	20.0	16.5	17.5
21	4.0	3.0	3.0	5.0	3.5	4.0	11.5	10.5	11.0	18.0	17.0	17.5
22	3.0	2.5	2.5	6.5	4.5	5.0	11.0	9.5	10.5	18.0	17.5	18.0
23	2.5	2.5	2.5	6.5	5.0	5.5	11.0	10.0	10.5	18.5	17.5	18.0
24	3.5	2.0	2.5	7.5	5.0	6.0	10.5	9.5	10.0	18.0	17.5	17.5
25	3.5	2.5	3.0	6.5	5.5	6.0	11.0	10.0	10.5	18.5	17.0	17.5
26	3.0	2.5	2.5	8.0	6.0	6.5	12.5	11.0	12.0	17.5	16.5	17.0
27	3.5	2.5	3.0	7.0	6.0	6.5	13.5	12.5	13.0	21.5	17.0	18.5
28	2.5	2.0	2.5	8.0	6.5	7.0	13.5	12.5	13.0	19.0	17.5	18.0
29	---	---	---	10.0	7.5	8.0	13.5	12.0	12.5	23.0	18.5	20.5
30	---	---	---	9.0	8.0	8.5	14.0	12.5	13.0	24.0	18.5	21.0
31	---	---	---	8.0	8.0	8.0	---	---	---	24.5	17.5	20.5
MONTH	4.0	.5	1.5	10.0	1.5	4.5	14.0	6.5	10.5	24.5	12.5	16.5

05344980 MISSISSIPPI RIVER AT LOCK AND DAM 3 NEAR RED WING, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	24.5	19.0	21.5	24.5	22.0	23.5	24.0	23.5	23.5	22.0	21.0	21.0
2	22.0	19.0	20.0	24.5	22.5	23.5	24.5	23.0	23.5	21.5	20.5	21.0
3	20.5	19.0	19.5	24.0	23.0	23.5	26.5	23.5	24.5	21.5	20.5	21.0
4	20.0	19.0	19.5	25.0	23.5	24.5	28.5	24.5	25.5	21.5	20.5	21.0
5	22.0	20.0	21.0	26.0	24.0	25.0	25.5	24.5	25.0	21.5	20.5	20.5
6	28.0	19.5	23.5	26.5	25.0	25.5	26.5	25.0	26.0	21.0	20.0	20.5
7	24.5	21.0	22.0	26.5	25.5	26.0	25.5	24.5	25.0	21.0	20.5	21.0
8	23.5	20.5	21.5	27.0	25.5	26.0	26.5	24.0	24.5	21.0	20.0	20.5
9	23.5	20.5	21.0	26.5	25.0	26.0	25.0	24.0	24.5	21.5	20.5	21.0
10	23.5	20.0	21.5	26.5	25.5	26.0	25.0	24.0	24.5	22.5	21.0	21.5
11	23.0	21.5	22.0	26.0	25.5	25.5	27.0	23.5	25.0	23.0	21.5	22.5
12	22.0	21.5	22.0	26.5	25.5	26.0	26.0	24.0	24.5	23.0	21.5	22.5
13	23.0	22.0	22.5	26.5	25.5	26.0	25.5	24.5	25.0	24.5	21.5	22.5
14	23.0	22.5	23.0	26.0	25.0	25.5	27.5	24.5	25.0	24.5	22.0	23.0
15	23.0	23.0	23.0	25.0	23.5	24.0	26.5	24.5	25.0	23.0	21.5	22.0
16	23.0	22.0	22.0	25.0	23.5	24.0	25.0	23.5	24.0	21.5	19.0	20.0
17	22.0	21.0	21.5	26.5	24.0	25.0	24.0	23.5	24.0	19.5	18.0	19.0
18	21.5	20.5	21.0	27.0	25.0	26.0	24.5	23.0	24.0	19.5	17.5	18.0
19	21.0	20.0	20.5	27.0	25.5	26.5	24.5	23.0	24.0	19.5	17.5	18.5
20	21.5	20.0	21.0	27.0	26.0	26.5	24.0	23.0	23.5	18.0	17.5	17.5
21	21.0	20.0	20.5	26.5	25.5	26.0	23.5	23.0	23.5	18.0	17.5	18.0
22	20.5	19.5	20.0	25.5	23.5	24.5	23.5	22.5	23.0	17.5	17.0	17.5
23	20.5	19.5	20.0	24.5	23.5	24.0	24.5	22.5	23.5	17.0	16.5	16.5
24	21.0	19.5	20.5	24.0	23.5	23.5	24.5	23.0	23.5	16.5	16.0	16.0
25	22.0	20.0	21.0	24.5	23.5	24.0	26.0	23.0	23.5	16.5	16.0	16.0
26	23.0	20.5	21.5	24.0	23.0	23.5	25.5	23.0	24.0	17.0	16.0	16.5
27	22.5	21.0	22.0	23.0	22.5	22.5	24.5	22.5	23.0	16.5	15.5	16.0
28	22.5	21.5	22.0	23.5	22.0	22.5	22.5	22.0	22.0	15.5	15.0	15.5
29	23.5	21.5	22.5	23.5	22.5	23.0	22.5	21.5	22.0	15.0	14.5	14.5
30	24.0	22.0	23.0	23.5	23.0	23.0	22.0	21.0	21.5	15.5	13.5	14.0
31	---	---	---	24.0	23.0	23.5	22.5	21.5	22.0	---	---	---
MONTH	28.0	19.0	21.5	27.0	22.0	24.5	28.5	21.0	24.0	24.5	13.5	19.0

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.0	8.5	8.7	10.3	10.0	10.1	9.1	8.9	9.0	10.1	9.6	9.8
2	8.6	8.2	8.4	10.3	10.0	10.1	9.6	9.0	9.3	11.1	10.0	10.4
3	8.8	7.9	8.3	10.3	9.9	10.1	12.0	9.0	10.9	10.9	10.3	10.5
4	8.4	7.7	8.1	10.0	9.7	9.8	12.2	11.3	11.6	10.8	9.7	10.4
5	8.2	7.4	7.8	10.0	9.5	9.7	12.4	11.8	12.0	11.2	9.7	10.0
6	8.2	7.1	7.6	10.3	9.4	9.8	12.0	11.2	11.5	10.2	9.7	9.9
7	7.6	7.1	7.4	10.1	9.8	10.0	11.3	10.9	11.0	10.7	9.9	10.2
8	9.1	6.5	8.1	10.1	9.7	9.9	11.5	10.9	11.1	10.9	9.9	10.2
9	8.8	8.3	8.6	9.8	9.6	9.7	11.0	10.5	10.8	11.5	8.8	9.9
10	8.9	8.5	8.7	9.8	9.4	9.6	11.0	9.4	9.8	11.7	10.1	10.8
11	9.0	8.5	8.7	9.6	9.4	9.5	9.8	9.3	9.5	11.5	10.2	10.8
12	9.6	8.5	8.9	9.7	9.4	9.5	9.7	9.1	9.4	11.1	9.3	10.6
13	9.0	8.7	8.8	9.8	9.5	9.7	10.0	9.2	9.6	11.2	10.7	11.0
14	8.7	8.3	8.5	10.0	9.6	9.8	10.3	9.2	9.6	12.7	10.1	11.7
15	8.4	8.0	8.2	10.0	9.6	9.8	9.8	9.4	9.5	12.6	12.0	12.2
16	10.0	8.0	9.7	10.1	9.7	9.9	9.9	9.5	9.6	12.5	11.6	11.9
17	9.8	9.4	9.6	10.0	9.7	9.8	10.9	9.6	10.3	12.8	11.8	12.2
18	9.6	9.2	9.5	10.2	9.8	9.9	12.2	10.8	11.6	12.9	11.8	12.1
19	9.5	8.9	9.3	10.0	9.7	9.8	11.9	9.1	11.3	12.7	11.7	12.1
20	9.6	8.9	9.3	10.4	9.9	10.2	11.9	11.2	11.5	12.6	11.7	12.0
21	10.2	9.5	9.8	10.4	9.9	10.1	12.2	11.7	12.0	---	---	---
22	9.9	9.1	9.6	10.1	9.7	9.9	12.3	10.9	11.7	11.2	10.8	11.0
23	9.5	9.0	9.4	10.0	9.4	9.6	11.0	10.5	10.6	11.5	10.9	11.2
24	9.6	9.0	9.3	10.0	9.7	9.8	11.4	10.4	10.7	12.0	11.0	11.3
25	10.1	9.5	9.7	10.0	9.9	10.0	11.5	10.6	11.0	11.6	11.2	11.4
26	10.0	9.7	9.9	10.5	9.4	9.9	11.4	10.2	10.7	11.7	11.2	11.4
27	9.7	9.4	9.6	9.4	9.2	9.2	11.5	11.2	11.3	12.0	11.5	11.7
28	9.8	9.5	9.6	9.7	9.2	9.4	11.4	9.9	10.6	12.4	11.3	11.9
29	10.1	9.4	9.7	9.3	9.1	9.2	11.6	9.4	9.7	13.2	11.9	12.6
30	10.0	9.6	9.7	9.3	9.0	9.1	9.7	9.5	9.6	13.5	12.1	12.6
31	10.2	9.7	9.7	---	---	---	10.9	9.6	9.9	12.2	11.8	11.9
MONTH	10.2	6.5	9.0	10.5	9.0	9.8	12.4	8.9	10.5			

05344980 MISSISSIPPI RIVER AT LOCK AND DAM 3 NEAR RED WING, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	12.4	11.7	12.0	12.6	12.2	12.4	12.4	11.1	11.8	12.0	9.7	10.6
2	12.4	11.9	12.1	13.6	12.4	12.8	13.0	11.8	12.3	11.0	10.0	10.5
3	12.3	11.7	12.0	14.3	12.3	12.8	12.7	11.9	12.2	10.0	9.5	9.8
4	12.6	11.8	12.2	14.2	12.4	13.1	11.8	11.2	11.4	9.7	9.0	9.3
5	12.4	11.8	12.0	13.2	12.1	12.7	12.4	11.0	11.7	10.2	8.3	9.2
6	12.6	11.6	11.9	12.7	12.0	12.3	12.6	11.6	12.1	10.4	8.2	9.3
7	12.1	11.3	11.7	12.8	12.1	12.4	12.3	11.7	12.0	10.8	9.3	10.0
8	12.1	11.4	11.7	13.9	12.7	13.4	12.5	11.6	12.1	9.9	9.0	9.5
9	11.7	11.0	11.4	14.1	12.9	13.4	12.8	11.3	12.1	9.5	8.9	9.2
10	11.7	11.3	11.5	13.2	12.7	13.0	13.2	11.7	12.4	10.6	8.7	9.6
11	11.5	11.1	11.3	13.7	13.0	13.3	12.9	12.0	12.4	10.9	8.9	9.8
12	11.9	10.8	11.3	13.3	12.2	12.7	13.3	12.1	12.6	9.8	9.0	9.4
13	12.4	10.7	11.4	12.8	12.1	12.4	12.6	11.6	12.2	10.4	8.4	10.1
14	11.4	10.7	11.1	12.8	12.1	12.5	12.3	11.1	11.7	10.4	8.9	9.6
15	11.8	10.8	11.1	12.8	12.0	12.4	12.3	11.3	12.4	10.8	9.0	9.8
16	11.4	10.8	11.1	12.8	12.2	12.4	11.5	11.1	11.3	10.2	9.2	9.8
17	12.0	10.7	11.1	12.6	12.0	12.3	12.0	10.9	11.3	9.8	9.1	9.4
18	12.4	10.8	11.7	13.2	11.9	12.4	11.8	10.3	11.1	10.2	8.8	9.4
19	12.6	11.9	12.2	12.6	11.7	12.1	11.4	10.7	11.0	12.0	9.0	10.2
20	12.8	11.9	12.3	13.1	11.8	12.3	11.6	10.3	10.9	12.3	9.8	11.0
21	12.6	12.1	12.3	13.1	12.0	12.5	10.8	10.2	10.4	11.6	9.9	10.7
22	12.3	12.0	12.1	14.1	12.3	13.1	10.1	9.5	9.9	10.7	9.9	10.3
23	12.7	11.9	12.2	14.3	12.7	13.6	9.6	9.3	9.4	9.8	8.9	9.4
24	12.5	11.8	12.1	14.3	13.1	13.6	10.5	9.3	9.8	8.9	8.2	8.5
25	12.6	11.7	12.1	14.2	12.8	13.0	10.7	9.7	10.2	8.1	7.1	7.7
26	12.4	11.9	12.1	13.6	12.4	12.9	12.1	10.2	11.0	9.2	6.6	8.0
27	13.7	11.7	12.5	13.4	12.6	13.0	10.8	9.9	10.4	9.5	8.2	8.7
28	12.8	11.8	12.4	13.1	12.6	12.8	9.6	9.3	9.4	8.5	8.0	8.1
29	---	---	---	12.6	12.1	12.3	11.0	8.8	10.0	9.2	5.7	7.7
30	---	---	---	13.3	11.6	12.0	11.3	10.0	10.6	9.2	7.0	8.3
31	---	---	---	12.7	11.7	12.2	---	---	---	10.2	7.3	8.4
MONTH	13.7	10.7	11.8	14.3	11.6	12.7	13.3	8.8	11.3	12.3	5.7	9.4

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	10.4	6.8	9.0	7.3	6.0	6.6	6.7	6.4	6.6	7.5	6.7	6.9
2	9.4	6.7	8.2	7.2	5.9	6.5	7.1	6.0	6.5	8.3	6.7	7.5
3	8.8	6.6	7.8	7.1	6.1	6.5	7.1	6.0	6.5	7.8	6.5	7.1
4	9.3	7.5	8.3	7.2	6.0	6.6	7.1	5.7	6.3	8.3	6.4	7.2
5	9.6	8.0	8.8	7.4	6.0	6.6	8.0	5.6	6.7	7.9	6.4	7.0
6	8.7	5.8	6.8	7.3	5.9	6.6	7.6	6.9	7.2	8.6	6.6	7.4
7	9.6	7.0	8.5	7.0	6.0	6.4	7.4	6.7	7.0	8.4	7.3	7.7
8	9.4	6.7	8.0	7.8	5.7	6.9	7.9	6.4	7.0	8.9	7.0	7.8
9	8.5	7.4	7.8	7.2	5.9	6.5	7.2	6.2	6.7	9.5	7.3	8.4
10	8.1	6.9	7.5	6.5	5.7	6.0	7.5	6.1	6.7	10.6	7.4	8.6
11	7.1	6.4	6.8	6.2	5.4	5.7	7.4	5.8	6.5	9.8	7.7	8.5
12	7.1	6.2	6.6	5.9	5.2	5.6	8.7	7.0	7.8	9.9	7.3	8.4
13	7.0	6.3	6.6	6.9	4.5	5.6	8.1	6.6	7.2	10.0	7.4	8.4
14	6.2	5.1	5.9	6.5	5.6	6.0	7.7	6.6	7.1	9.2	7.3	8.1
15	4.8	3.4	4.0	6.1	5.6	5.8	7.8	6.4	7.0	8.1	7.1	7.6
16	---	---	---	6.7	5.5	6.0	7.3	6.1	6.6	8.2	6.9	7.5
17	7.5	6.8	7.2	7.1	5.6	6.2	7.9	6.0	6.8	8.2	7.0	7.5
18	7.2	6.3	6.7	7.7	5.8	6.6	7.9	5.9	6.7	8.1	6.7	7.3
19	7.0	6.0	6.5	8.0	6.1	6.9	7.9	6.0	7.0	8.7	7.2	7.8
20	7.0	6.0	6.4	6.9	6.1	6.4	8.1	6.2	7.0	8.7	6.8	7.5
21	6.2	5.8	6.0	6.6	5.9	6.2	7.5	6.3	6.9	7.7	7.0	7.3
22	6.7	5.8	6.2	6.5	5.7	6.1	7.6	6.4	6.8	7.8	6.5	7.1
23	6.9	6.0	6.5	6.6	6.0	6.2	7.8	6.4	6.9	8.3	6.8	7.5
24	8.6	6.8	7.7	6.6	5.8	6.2	7.5	6.3	6.7	9.1	7.9	8.4
25	8.0	6.6	7.3	6.5	5.9	6.1	6.9	6.3	6.5	8.6	8.3	8.4
26	8.9	6.6	7.6	6.2	5.4	5.8	7.2	6.2	6.5	8.9	8.2	8.5
27	8.0	6.8	7.4	6.2	5.3	5.8	6.6	6.1	6.2	8.6	7.7	8.0
28	7.5	6.9	7.2	6.9	5.8	6.2	6.3	6.0	6.2	8.8	7.4	8.0
29	7.2	6.4	6.8	7.5	5.8	6.6	6.6	6.2	6.3	8.7	7.7	8.1
30	7.2	5.9	6.5	7.4	6.6	6.9	7.2	6.0	6.5	8.5	8.0	8.2
31	---	---	---	7.5	6.5	6.9	7.7	6.6	7.0	---	---	---
MONTH				8.0	4.5	6.3	8.7	5.6	6.8	10.6	6.4	7.8

05345000 VERMILLION RIVER NEAR EMPIRE, MN

LOCATION.--Lat 44°40'00", long 93°03'17", in SW¼NW¼ 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 (3.2 km) west of Empire and 4 mi (6.4 km) northeast of Farmington.

DRAINAGE AREA.--110 mi^2 (285 km^2).

WATER-DISCHARGE RECORDS

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 (259.687 m) National Geodetic Vertical Datum of 1929 (levels by 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 except those for winter period, which are fair.

AVERAGE DISCHARGE.--9 years (water years 1943, 1974-81), 43.3 ft^3/s (1.226 m^3/s), 5.35 in/yr (136 mm/yr), 31,370 acre-ft/yr (38.7 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,030 ft^3/s (57.5 m^3/s) Sept. 18, 1942; maximum gage height observed, 6.40 ft (1.951 m) Mar. 13, 1945 (backwater from ice); minimum daily discharge, 8.4 ft^3/s (0.24 m^3/s) Jan. 15, 1975; minimum gage height, 1.63 ft (0.497 m) Oct. 14, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1965, reached a stage of 7.5 ft (2.286 m) from information by local resident, discharge 6,200 ft^3/s (176 m^3/s) from rating extended above 2,100 ft^3/s (59.5 m^3/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 111 ft^3/s (3.14 m^3/s) Aug. 8, gage height, 4.46 ft (1.359 m); maximum gage height 4.49 ft (1.369 m) Feb. 28, no peak above base of 200 ft^3/s (5.66 m^3/s); minimum discharge, 19 ft^3/s (0.54 m^3/s) Jan. 15, gage height, 2.13 ft (0.649 m); minimum gage height, 2.13 ft (0.649 m) Jan. 15, 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	35	29	23	22	79	37	42	31	27	42	61
2	41	36	29	23	22	52	36	39	30	26	47	58
3	40	36	27	23	22	42	37	39	31	25	42	52
4	39	35	25	23	22	39	42	56	29	25	37	47
5	38	34	26	23	22	35	41	57	28	24	41	45
6	39	35	27	23	22	34	39	49	27	24	54	43
7	38	35	27	23	22	32	37	43	27	24	82	43
8	38	33	27	23	22	32	37	40	28	24	107	42
9	37	33	27	22	22	32	35	42	38	23	103	41
10	38	33	26	22	22	31	34	39	27	22	88	40
11	37	32	26	22	22	31	34	38	26	48	75	37
12	38	33	25	22	22	31	34	36	27	72	63	35
13	39	32	24	22	31	31	35	35	29	48	55	34
14	39	32	24	22	48	30	35	34	36	39	61	35
15	38	31	26	22	41	31	34	33	55	39	65	32
16	39	31	25	22	28	30	33	32	46	38	55	31
17	42	32	26	22	32	30	33	31	37	37	52	31
18	39	31	26	22	36	29	31	32	33	34	47	31
19	39	30	26	23	32	29	33	31	31	32	43	31
20	39	30	26	22	29	29	32	30	31	32	41	32
21	38	30	26	22	29	29	33	29	3	30	38	32
22	37	31	26	22	30	29	37	29	35	29	37	30
23	39	30	26	22	33	29	50	31	34	29	37	30
24	44	28	26	22	31	29	49	40	35	29	37	30
25	42	28	25	23	31	29	43	36	33	35	37	31
26	40	28	24	23	29	29	39	35	30	35	48	34
27	39	28	24	22	50	29	40	33	29	40	57	32
28	39	28	23	23	95	30	40	34	29	41	83	31
29	37	28	23	22	---	36	40	36	31	38	88	31
30	37	29	23	22	---	40	45	33	29	35	83	31
31	37	---	24	22	---	38	---	31	---	33	72	---
TOTAL	1208	947	794	694	869	1056	1125	1145	953	1037	1817	1113
MEAN	39.0	31.6	25.6	22.4	31.0	34.1	37.5	36.9	31.8	33.5	58.6	37.1
MAX	44	36	29	23	95	79	50	57	55	72	107	61
MIN	37	28	23	22	22	29	31	29	26	22	37	30
CFSM	.36	.29	.23	.20	.28	.31	.34	.34	.29	.31	.53	.34
IN.	.41	.32	.27	.23	.29	.36	.38	.39	.32	.35	.61	.38
AC-FT	2400	1880	1570	1380	1720	2090	2230	2270	1890	2060	3600	2210

CAL YR 1980 TOTAL 17215 MEAN 47.0 MAX 835 MIN 21 CFSM .43 IN 5.82 AC-FT 34150
WTR YR 1981 TOTAL 12758 MEAN 35.0 MAX 107 MIN 22 CFSM .32 IN 4.31 AC-FT 25310

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1973 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: February 1974 to current year.
pH: February 1974 to current year.
WATER TEMPERATURES: February 1974 to current year.
DISSOLVED OXYGEN: February 1974 to current year.

INSTRUMENTATION.--Water quality monitor since February 1974.

REMARKS.--Water is pumped to a monitor that is inside a heated shelter; water temperature during the winter may be affected. Extremes are for those years with 80 percent or more record.

COOPERATION.--Water-quality monitor is operated by the Metropolitan Waste Control Commission, St. Paul, MN.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1979-81): Maximum, 994 micromhos Mar. 10, 1980; minimum, 236 micromhos June 8, 1980.
pH (water years 1979-81): Maximum, 9.3 units Nov. 11, 1978; minimum, 6.7 units Mar. 20, 1980.
WATER TEMPERATURES (water years 1979-81): Maximum, 27.0°C Aug. 6, 1979; minimum 0.0°C many days during winter.
DISSOLVED OXYGEN (water years 1979-81): Maximum, 12.9 mg/L May 7, 8, 1980; minimum, 1.5 mg/L Nov. 14, 1979.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 947 micromhos Feb. 2; minimum, 268 micromhos Feb. 28.
pH: Maximum, 8.2 units several days in Apr., May, June, Sept.; minimum, 7.2 units June 29.
WATER TEMPERATURES: Maximum, 25.5°C July 8; minimum, 0.0°C Dec. 2, 3, 10, 11, 13, 18.
DISSOLVED OXYGEN: Maximum, 12.8 mg/L Dec. 2; minimum, 4.4 mg/L July 11.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	FLUORIDE, TOTAL (MG/L AS F) (00951)
NOV									
13...	1100	--	31	660	7.4	6.0	9.8	81	.2
FEB									
12...	1140	22	--	640	7.5	.0	11.2	79	.3
MAY									
11...	1205	--	36	835	7.4	10.5	10.4	95	.3
SEP									
08...	1240	--	41	720	8.0	17.0	9.0	95	.2

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)
NOV									
13...	1	<50	0	70	0	8	1	530	0
FEB									
12...	1	100	0	90	0	7	4	420	4
MAY									
11...	1	100	10	50	1	15	2	780	1
SEP									
08...	3	200	<10	60	<1	7	7	1700	4

DATE	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	CYANIDE TOTAL (MG/L AS CN) (00720)
NOV								
13...	30	<.1	0	4	0	0	10	<.01
FEB								
12...	180	<.1	1	4	0	0	30	<.01
MAY								
11...	230	<.1	1	5	0	0	30	<.01
SEP								
08...	270	<.1	5	6	1	<1	30	<.01

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	697	631	661	758	674	707	625	520	588	723	557	627
2	691	628	666	745	663	712	621	546	583	704	534	620
3	690	638	668	723	647	691	593	508	556	742	614	667
4	716	642	674	705	648	684	615	529	567	755	579	675
5	698	632	669	705	642	678	607	524	567	722	590	656
6	706	629	667	717	631	675	627	488	559	648	526	608
7	721	661	683	688	634	668	625	481	566	699	593	638
8	747	662	700	730	640	672	595	491	560	691	566	640
9	741	675	712	725	635	683	576	509	555	693	578	641
10	747	676	713	709	636	679	574	505	543	721	558	655
11	789	687	724	729	626	665	633	477	559	729	580	679
12	786	690	735	694	627	668	566	503	544	701	556	645
13	755	682	725	686	608	652	587	496	551	682	550	622
14	749	688	724	679	616	647	634	487	572	678	552	625
15	765	698	732	699	591	639	759	555	640	674	565	622
16	749	671	715	683	592	641	768	618	680	735	619	661
17	739	678	706	657	570	613	747	604	680	706	542	635
18	753	681	715	614	553	587	784	620	698	706	558	641
19	757	692	727	617	532	574	892	681	769	699	560	639
20	758	684	729	617	534	580	832	686	755	685	556	632
21	757	687	728	609	529	581	823	630	720	709	564	655
22	760	690	728	680	520	581	736	584	685	741	615	686
23	758	669	721	673	545	607	731	626	686	740	609	690
24	726	670	695	643	533	600	820	654	721	794	605	687
25	760	681	713	625	532	589	787	672	732	777	610	693
26	749	672	713	637	544	605	729	606	662	741	604	679
27	737	671	710	620	530	583	752	606	670	715	592	675
28	730	673	704	621	519	563	733	582	668	752	589	680
29	772	669	710	615	498	567	721	592	658	786	693	738
30	743	670	713	642	536	590	704	570	643	788	689	731
31	743	686	717	---	---	---	701	567	639	791	592	690
MONTH	789	628	706	758	498	633	892	477	631	794	526	659

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	801	598	701	401	283	342	741	660	711	900	817	865
2	947	691	796	530	385	460	776	700	733	935	826	885
3	810	663	745	594	489	535	776	704	746	901	734	825
4	779	625	728	626	520	568	855	709	770	849	791	817
5	780	626	711	640	548	593	857	772	822	853	784	828
6	757	586	671	665	549	606	873	822	847	838	785	818
7	742	554	639	712	579	625	872	793	839	845	774	814
8	784	548	649	675	563	625	879	781	839	848	734	796
9	690	555	623	701	606	650	886	803	849	872	782	827
10	644	550	604	687	594	655	907	788	851	857	784	823
11	655	574	613	711	595	658	922	791	851	863	784	826
12	671	537	621	722	616	669	905	791	862	870	770	825
13	680	527	634	728	620	676	883	763	829	853	722	797
14	699	540	622	768	614	677	851	772	819	824	747	798
15	815	558	635	732	618	685	877	763	822	841	741	793
16	877	592	671	739	614	691	885	796	846	847	743	799
17	696	507	585	725	623	680	894	795	850	867	749	811
18	549	473	517	736	619	684	938	793	867	854	749	809
19	604	504	540	737	632	688	915	804	869	848	762	804
20	634	522	569	742	629	689	922	861	892	864	745	809
21	714	536	592	776	608	674	911	818	872	856	770	808
22	673	568	625	752	626	697	904	799	850	812	612	750
23	712	554	624	735	634	696	850	814	831	785	670	741
24	706	537	617	731	616	674	867	803	843	833	714	775
25	640	558	604	723	620	680	921	818	866	816	724	779
26	653	560	608	721	627	683	915	828	866	845	727	795
27	649	423	526	746	628	686	894	810	856	824	724	771
28	419	268	313	739	613	678	897	820	868	839	739	790
29	---	---	---	742	595	666	887	802	842	868	739	809
30	---	---	---	696	599	652	875	774	843	853	746	816
31	---	---	---	721	640	680	---	---	---	922	818	871
MONTH	947	268	621	776	283	643	938	660	835	935	612	809

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	908	800	859	882	776	838	816	571	718	715	678	700
2	909	830	869	878	772	834	749	638	679	739	680	708
3	917	820	878	902	787	839	800	692	741	746	692	720
4	926	822	876	902	764	832	820	726	777	771	699	731
5	946	821	873	893	755	825	798	632	733	772	697	731
6	921	823	887	937	801	869	756	531	663	759	691	729
7	904	796	858	929	819	885	529	427	481	772	654	715
8	887	770	829	924	788	864	499	433	455	787	702	749
9	873	772	835	907	794	859	536	484	501	769	698	739
10	886	776	832	923	802	872	584	525	550	790	708	746
11	873	777	830	880	534	722	619	561	589	793	710	751
12	869	773	827	703	540	621	650	601	627	807	711	749
13	886	751	815	802	692	743	681	624	654	784	708	750
14	857	642	765	815	756	793	691	608	648	776	677	737
15	735	628	682	818	735	788	699	641	662	759	675	722
16	778	688	730	821	743	787	709	668	692	762	678	725
17	828	735	780	830	744	793	758	695	721	778	685	732
18	852	763	809	863	750	796	755	694	728	782	686	735
19	853	765	814	851	752	801	776	692	737	798	681	730
20	869	748	804	857	754	813	780	721	751	772	676	730
21	849	747	806	867	773	827	799	715	761	788	685	739
22	836	717	778	862	763	824	838	721	770	787	686	745
23	847	764	810	871	766	828	811	719	770	790	685	741
24	859	752	801	897	778	842	816	686	756	781	677	733
25	857	751	812	852	683	744	771	687	738	772	683	731
26	854	766	820	748	691	722	768	602	700	756	676	713
27	903	753	815	717	619	677	724	605	659	788	678	729
28	880	773	826	743	627	690	693	584	619	901	745	818
29	904	746	827	748	651	708	627	586	604	889	796	850
30	915	793	852	779	680	731	674	612	635	900	805	852
31	---	---	---	816	715	765	711	657	681	---	---	---
MONTH	946	628	820	937	534	791	838	427	671	901	654	743
YEAR	947	268	714									

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	7.8	7.7	7.7	7.9	7.8	7.9	8.1	7.9	8.0	8.0	7.9	7.9
2	7.8	7.8	7.8	7.9	7.8	7.8	8.0	8.0	8.0	8.0	8.0	8.0
3	7.8	7.8	7.8	7.9	7.7	7.8	8.0	7.9	8.0	8.0	7.9	8.0
4	7.8	7.8	7.8	8.0	7.9	7.9	8.0	7.9	7.9	7.9	7.9	7.9
5	7.8	7.8	7.8	8.0	7.9	8.0	7.9	7.8	7.9	7.9	7.9	7.9
6	7.8	7.7	7.8	8.0	7.9	7.9	7.9	7.8	7.8	8.0	7.9	7.9
7	7.8	7.7	7.7	7.9	7.8	7.9	7.9	7.8	7.9	8.0	7.9	8.0
8	7.8	7.7	7.8	7.9	7.9	7.9	8.0	7.9	7.9	8.0	7.9	8.0
9	7.8	7.7	7.8	8.0	7.9	7.9	8.0	7.9	7.9	8.0	7.9	8.0
10	7.9	7.8	7.8	8.0	7.9	8.0	8.0	7.9	8.0	8.0	7.9	8.0
11	7.9	7.8	7.9	8.0	7.9	8.0	8.0	7.9	8.0	8.0	7.9	7.9
12	7.9	7.8	7.9	8.0	7.8	7.9	8.0	7.9	7.9	8.0	7.9	7.9
13	7.9	7.8	7.9	8.0	7.7	7.9	8.0	7.9	8.0	8.0	7.9	8.0
14	7.9	7.8	7.8	8.0	7.9	8.0	8.0	7.9	7.9	8.0	7.9	8.0
15	7.8	7.8	7.8	8.0	7.9	8.0	7.9	7.9	7.9	8.1	8.0	8.0
16	7.8	7.7	7.8	8.0	7.9	7.9	7.9	7.9	7.9	8.1	8.0	8.0
17	7.9	7.7	7.8	8.0	7.8	7.9	8.0	7.9	7.9	8.0	8.0	8.0
18	7.9	7.8	7.8	8.0	7.9	7.9	8.1	8.0	8.0	8.0	8.0	8.0
19	7.9	7.8	7.9	7.9	7.9	7.9	8.1	7.9	7.9	8.0	8.0	8.0
20	7.8	7.8	7.8	7.9	7.9	7.9	7.9	7.8	7.9	8.0	8.0	8.0
21	7.8	7.8	7.8	8.0	7.9	7.9	7.9	7.8	7.8	8.0	8.0	8.0
22	7.9	7.8	7.9	8.0	7.9	7.9	7.9	7.9	7.9	8.0	8.0	8.0
23	7.9	7.8	7.8	8.0	7.9	7.9	7.9	7.8	7.8	8.0	8.0	8.0
24	7.9	7.7	7.8	8.0	7.9	8.0	8.0	7.9	8.0	8.0	8.0	8.0
25	7.9	7.8	7.9	8.0	8.0	8.0	8.0	7.9	7.9	8.0	8.0	8.0
26	7.9	7.9	7.9	8.0	7.9	7.9	7.9	7.9	7.9	8.1	8.0	8.0
27	7.9	7.8	7.9	8.0	7.9	7.9	8.0	7.9	7.9	8.1	8.0	8.0
28	7.9	7.8	7.8	8.0	7.9	7.9	7.9	7.9	7.9	8.1	8.1	8.1
29	7.9	7.8	7.9	8.0	7.9	7.9	7.9	7.9	7.9	8.1	8.0	8.0
30	7.8	7.8	7.8	8.0	7.9	7.9	7.9	7.9	7.9	8.0	8.0	8.0
31	7.9	7.8	7.8	---	---	---	7.9	7.9	7.9	8.1	8.0	8.0
MONTH	7.9	7.7	7.8	8.0	7.7	7.9	8.1	7.8	7.9	8.1	7.9	8.0

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	8.1	8.0	8.0	7.6	7.5	7.6	8.0	8.0	8.0	8.1	8.0	8.0
2	8.1	7.9	8.0	7.8	7.6	7.7	8.0	7.9	7.9	8.1	8.0	8.0
3	7.9	7.9	7.9	7.8	7.8	7.8	7.9	7.8	7.9	8.0	7.9	7.9
4	7.9	7.9	7.9	7.8	7.8	7.8	8.0	7.9	8.0	8.0	7.9	7.9
5	7.9	7.8	7.9	7.9	7.8	7.8	8.0	7.9	7.9	8.0	8.0	8.0
6	8.0	7.9	7.9	7.9	7.9	7.9	8.0	7.9	7.9	8.1	8.0	8.0
7	8.0	7.9	7.9	8.0	7.9	7.9	8.0	7.9	8.0	8.1	8.0	8.1
8	8.0	7.9	8.0	7.9	7.8	7.9	8.1	7.9	8.0	8.1	8.0	8.0
9	7.9	7.9	7.9	7.9	7.8	7.9	8.0	7.9	8.0	8.2	8.0	8.1
10	7.9	7.9	7.9	8.0	7.9	7.9	8.0	7.9	8.0	8.1	8.0	8.1
11	7.9	7.7	7.9	8.0	7.9	7.9	8.1	7.9	8.0	8.1	7.9	8.0
12	7.9	7.6	7.8	8.0	7.9	8.0	8.1	7.9	8.0	8.1	8.0	8.1
13	7.9	7.8	7.9	8.0	7.9	8.0	8.1	7.9	8.0	8.1	8.0	8.1
14	8.0	7.9	7.9	8.0	8.0	8.0	8.2	8.1	8.1	8.1	8.0	8.1
15	8.0	7.9	7.9	8.1	7.9	8.0	8.2	8.0	8.1	8.1	8.1	8.1
16	7.9	7.8	7.8	8.1	8.0	8.0	8.1	8.0	8.1	8.2	8.1	8.1
17	7.8	7.8	7.8	8.1	8.0	8.0	8.2	8.0	8.1	8.2	8.1	8.1
18	7.8	7.7	7.8	8.1	8.0	8.0	8.1	8.0	8.1	8.2	8.1	8.1
19	7.9	7.8	7.8	8.1	8.0	8.0	8.1	7.9	8.0	8.2	8.1	8.1
20	7.9	7.8	7.9	8.0	7.9	8.0	8.2	8.0	8.1	8.2	8.1	8.1
21	7.9	7.9	7.9	8.0	7.9	8.0	8.1	8.0	8.1	8.1	8.1	8.1
22	8.0	7.9	7.9	8.0	7.9	8.0	8.0	7.9	8.0	8.1	7.9	8.0
23	8.0	7.8	7.9	8.0	7.9	7.9	8.0	7.9	8.0	8.1	7.9	8.1
24	7.9	7.8	7.9	8.0	7.9	7.9	8.0	7.9	8.0	8.1	8.1	8.1
25	8.0	7.9	7.9	8.0	8.0	8.0	8.0	7.9	8.0	8.1	8.1	8.1
26	8.0	7.9	7.9	8.0	7.9	8.0	8.0	7.9	7.9	8.1	8.1	8.1
27	8.0	7.7	7.9	8.0	7.9	8.0	8.0	7.9	8.0	8.0	7.9	8.0
28	7.7	7.6	7.6	8.0	7.9	7.9	8.1	8.0	8.1	8.1	8.0	8.1
29	---	---	---	7.9	7.8	7.8	8.1	8.0	8.0	8.2	8.1	8.1
30	---	---	---	7.9	7.8	7.9	8.0	7.9	8.0	8.1	8.0	8.1
31	---	---	---	8.0	7.9	7.9	---	---	---	8.1	8.0	8.1
MONTH	8.1	7.6	7.9	8.1	7.5	7.9	8.2	7.8	8.0	8.2	7.9	8.1

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.1	8.0	8.1	7.5	7.4	7.4	8.0	7.7	7.9	8.0	7.9	8.0
2	8.1	8.0	8.1	7.5	7.4	7.4	7.8	7.7	7.8	8.0	8.0	8.0
3	8.1	8.0	8.1	7.4	7.4	7.4	7.9	7.8	7.9	8.0	8.0	8.0
4	8.1	8.1	8.1	7.5	7.4	7.4	7.9	7.9	7.9	8.0	8.0	8.0
5	8.1	8.1	8.1	7.5	7.4	7.4	8.0	7.7	7.9	8.1	8.0	8.0
6	8.1	8.0	8.1	7.9	7.4	7.7	7.9	7.7	7.8	8.1	8.0	8.0
7	8.1	8.0	8.1	7.9	7.8	7.9	7.7	7.5	7.6	8.1	7.9	8.0
8	8.1	8.1	8.1	8.0	7.8	7.9	7.6	7.5	7.5	8.1	8.0	8.0
9	8.1	8.1	8.1	8.0	7.9	7.9	7.7	7.6	7.6	8.1	8.0	8.1
10	8.2	8.1	8.1	7.9	7.8	7.9	7.8	7.7	7.7	8.1	8.0	8.0
11	8.1	8.1	8.1	7.9	7.4	7.6	7.8	7.7	7.8	8.1	8.0	8.0
12	8.1	8.1	8.1	7.6	7.3	7.5	7.9	7.8	7.8	8.1	8.1	8.1
13	8.1	8.0	8.0	7.8	7.6	7.7	8.0	7.8	7.9	8.1	8.0	8.1
14	8.0	7.9	8.0	7.9	7.8	7.9	7.9	7.7	7.8	8.1	8.1	8.1
15	7.9	7.8	7.9	7.9	7.8	7.9	7.9	7.8	7.8	8.2	8.1	8.1
16	8.0	7.9	8.0	8.0	7.9	7.9	8.0	7.9	7.9	8.2	8.1	8.2
17	8.1	8.0	8.1	7.9	7.8	7.9	8.0	7.9	8.0	8.2	8.1	8.1
18	8.2	8.1	8.1	8.0	7.9	7.9	8.0	7.9	8.0	8.2	8.1	8.1
19	8.2	8.1	8.2	8.0	7.9	7.9	8.0	7.9	8.0	8.2	8.1	8.1
20	8.1	8.1	8.1	8.0	8.0	8.0	8.0	7.9	8.0	8.1	8.1	8.1
21	8.2	8.1	8.1	8.1	8.0	8.0	8.0	8.0	8.0	8.2	8.0	8.1
22	8.1	8.1	8.1	8.1	8.0	8.0	8.0	8.0	8.0	8.2	8.1	8.1
23	8.1	8.1	8.1	8.1	8.0	8.0	8.0	7.9	8.0	8.2	8.1	8.1
24	8.1	8.0	8.0	8.0	8.0	8.0	8.0	7.9	8.0	8.1	8.1	8.1
25	8.2	8.1	8.1	8.0	7.9	7.9	8.0	8.0	8.0	8.1	8.0	8.1
26	8.2	8.1	8.2	8.0	7.9	8.0	8.0	7.8	7.9	8.1	8.0	8.1
27	8.2	8.1	8.2	8.0	7.9	8.0	7.9	7.8	7.9	8.2	8.1	8.1
28	8.2	8.1	8.1	8.0	7.9	7.9	7.8	7.8	7.8	8.2	8.1	8.2
29	8.1	7.2	7.7	8.0	7.9	7.9	7.8	7.8	7.8	8.2	8.1	8.1
30	7.4	7.3	7.4	8.0	7.9	7.9	7.9	7.8	7.8	8.1	8.1	8.1
31	---	---	---	8.0	8.0	8.0	7.9	7.9	7.9	---	---	---
MONTH	8.2	7.2	8.1	8.1	7.3	7.8	8.0	7.5	7.9	8.2	7.9	8.1
YEAR	8.2	7.2	7.9									

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	15.0	13.5	14.5	9.0	7.5	8.5	5.5	1.0	3.5	5.0	2.5	4.0
2	13.0	11.0	12.0	9.5	8.0	8.5	1.0	.0	.5	2.5	1.5	2.0
3	12.0	10.5	11.0	10.5	9.0	9.5	1.5	.0	1.0	1.5	1.0	1.0
4	12.0	10.5	11.0	9.5	8.0	8.5	3.0	1.5	2.5	1.0	1.0	1.0
5	12.5	9.0	11.0	9.0	6.5	7.5	4.5	3.5	4.0	1.0	1.0	1.0
6	14.0	11.0	12.5	9.5	7.5	8.0	5.5	5.0	5.0	1.5	1.0	1.0
7	15.5	11.5	13.5	9.5	7.5	8.5	5.5	4.0	4.5	1.0	1.0	1.0
8	15.5	12.5	13.5	9.5	8.5	9.0	4.0	1.5	2.5	1.0	1.0	1.0
9	15.0	11.5	13.0	9.0	7.5	8.0	2.0	1.0	1.5	1.0	1.0	1.0
10	14.0	11.5	13.0	7.5	6.5	7.0	1.5	.0	.5	1.0	1.0	1.0
11	11.5	9.5	10.5	7.0	6.0	6.5	1.0	.0	.5	1.0	1.0	1.0
12	11.5	8.5	10.0	8.0	6.5	7.0	3.5	.5	2.0	1.0	1.0	1.0
13	10.5	9.0	9.5	8.0	6.0	7.0	1.5	.0	.5	2.0	1.0	1.5
14	10.0	9.5	10.0	6.5	6.0	6.5	1.5	.5	1.0	4.0	2.0	3.0
15	11.5	9.5	10.5	7.0	5.5	6.5	2.5	1.5	2.0	3.0	1.0	2.0
16	12.0	10.5	11.0	7.5	6.0	6.5	3.0	2.5	3.0	1.0	1.0	1.0
17	12.0	9.5	10.5	6.5	5.5	6.5	4.5	3.0	3.5	2.0	1.0	1.0
18	9.5	9.0	9.0	6.0	4.5	5.0	3.0	.0	1.5	4.0	1.5	2.5
19	10.5	8.0	9.0	7.0	4.5	5.5	.5	.5	.5	5.0	3.0	4.0
20	12.5	10.0	11.0	5.5	5.0	5.5	.5	.5	.5	4.5	3.0	4.0
21	12.0	10.0	11.0	6.0	4.0	5.0	.5	.5	.5	5.0	3.5	4.0
22	10.5	9.0	9.5	7.0	5.0	6.0	2.0	.5	1.0	5.0	3.0	4.0
23	10.0	9.5	10.0	6.5	5.5	6.0	3.5	2.0	3.0	5.5	3.0	4.0
24	10.0	8.5	9.5	5.5	4.0	4.5	2.0	1.0	1.0	6.5	4.0	5.0
25	8.5	7.5	7.5	4.5	3.0	4.0	1.0	1.0	1.0	7.0	5.0	6.0
26	9.0	7.0	7.5	5.5	3.5	4.5	1.0	1.0	1.0	6.0	4.0	5.0
27	8.5	7.5	8.0	6.0	5.0	5.5	2.0	1.0	1.5	4.0	2.0	3.0
28	8.5	7.0	7.5	5.0	4.5	4.5	4.5	2.0	3.0	2.0	1.0	1.5
29	9.0	6.5	7.5	5.5	5.0	5.0	5.0	4.0	4.5	2.0	1.0	1.0
30	10.0	7.0	8.5	6.0	5.0	5.5	5.5	4.5	5.0	2.5	1.0	1.5
31	10.0	8.0	8.5	---	---	---	5.5	4.5	5.0	2.5	1.0	2.0
MONTH	15.5	6.5	10.5	10.5	3.0	6.5	5.5	.0	2.0	7.0	1.0	2.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2.5	1.0	2.0	4.0	1.5	2.5	10.5	6.5	8.5	15.5	10.0	12.5
2	1.0	1.0	1.0	4.5	1.5	3.0	13.0	7.0	9.5	16.0	12.5	14.0
3	1.0	1.0	1.0	3.5	2.0	3.0	11.0	9.0	10.0	14.5	13.0	13.5
4	1.0	1.0	1.0	4.0	3.0	3.5	8.5	6.0	7.0	13.0	11.0	12.0
5	1.0	1.0	1.0	6.0	2.5	4.0	10.0	5.0	7.0	14.5	10.5	12.5
6	1.0	1.0	1.0	5.5	3.0	4.0	11.5	6.0	8.5	15.5	10.5	13.0
7	1.0	1.0	1.0	6.5	2.5	4.5	10.5	8.5	9.5	15.5	11.0	12.5
8	1.0	1.0	1.0	7.5	3.5	5.5	12.0	9.0	10.0	14.0	10.5	11.5
9	1.0	1.0	1.0	7.0	5.5	6.0	12.5	7.5	10.0	13.5	7.5	10.0
10	1.0	1.0	1.0	7.0	5.0	5.5	14.5	9.0	11.5	15.0	9.0	11.5
11	1.0	1.0	1.0	8.5	3.5	6.0	11.0	9.0	10.0	13.5	10.0	11.5
12	1.0	1.0	1.0	9.0	4.5	6.5	14.5	8.0	11.0	16.0	9.5	12.5
13	1.0	1.0	1.0	8.5	5.0	6.5	13.5	10.0	12.0	17.0	10.5	13.5
14	1.0	1.0	1.0	8.5	4.0	6.5	12.0	6.5	9.0	17.0	11.5	14.0
15	5.5	1.0	3.5	9.5	5.5	7.5	13.0	7.0	10.0	16.0	12.0	14.0
16	8.0	5.0	6.5	9.0	4.5	6.5	10.5	9.0	10.0	13.5	11.5	13.0
17	7.0	5.5	6.5	8.5	5.0	6.5	13.5	8.5	11.0	16.0	10.0	13.0
18	9.0	6.0	7.0	6.5	3.5	5.0	13.5	8.5	11.0	17.5	10.5	14.0
19	8.5	5.5	7.0	7.0	3.5	5.0	12.5	10.0	11.0	18.5	11.5	15.0
20	8.5	5.0	7.0	8.5	3.5	6.0	13.0	7.5	10.0	19.0	12.5	15.5
21	7.5	6.0	6.5	10.0	4.5	7.0	9.5	8.0	8.5	18.0	14.0	16.0
22	5.5	4.5	7.0	10.0	4.5	7.0	10.5	8.5	9.5	17.0	14.0	15.5
23	6.5	3.5	7.5	10.0	5.5	7.5	9.0	7.0	8.0	14.0	12.0	13.5
24	7.5	4.0	8.0	11.0	5.5	8.0	12.0	7.0	9.5	13.5	12.0	13.0
25	7.0	4.0	7.5	9.5	6.5	7.5	12.5	9.0	10.5	14.5	13.0	13.5
26	6.0	3.5	5.0	9.0	6.5	7.5	15.5	9.5	13.0	17.5	13.5	15.0
27	5.0	3.0	4.0	11.0	6.5	8.5	15.5	12.0	14.0	17.0	14.0	15.0
28	3.0	2.0	2.0	13.5	8.0	10.5	12.0	10.0	11.0	19.5	14.0	16.5
29	---	---	---	12.0	10.5	11.0	13.0	10.0	11.5	19.0	13.0	15.5
30	---	---	---	10.5	8.5	9.0	14.0	10.0	12.0	18.5	14.0	16.5
31	---	---	---	10.0	7.0	8.5	---	---	---	18.0	14.5	16.0
MONTH	9.0	1.0	3.5	13.5	1.5	6.5	15.5	5.0	10.0	19.5	7.5	13.5

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	18.5	14.0	16.0	23.0	16.5	19.5	21.0	19.5	20.0	18.5	16.0	17.0
2	21.0	14.0	17.0	22.5	16.5	19.5	21.5	18.5	20.0	17.5	14.5	16.0
3	20.5	15.5	18.0	21.5	18.0	19.5	22.5	18.5	20.5	16.5	15.0	16.0
4	21.5	14.5	17.5	22.5	17.0	19.5	23.0	19.5	21.0	17.5	14.5	16.0
5	20.5	15.5	18.0	24.5	17.0	20.5	22.0	19.5	20.5	16.0	14.0	15.0
6	18.5	16.0	17.0	25.0	17.5	21.0	22.0	19.0	20.5	17.5	14.0	15.5
7	18.0	16.0	17.0	25.0	19.0	22.0	21.0	20.0	20.5	18.0	16.5	17.0
8	17.5	15.5	16.5	25.5	19.5	22.5	21.0	19.5	20.5	17.5	15.0	16.0
9	16.5	14.0	15.5	24.5	17.5	21.0	21.0	20.0	20.5	18.5	14.5	16.5
10	20.0	13.5	17.0	24.0	17.0	20.0	21.0	19.0	20.0	19.0	16.0	17.5
11	18.0	14.5	16.5	23.0	19.0	20.5	21.5	19.0	20.0	19.0	16.5	17.5
12	18.5	14.5	16.5	22.0	21.0	21.5	22.0	19.5	20.5	18.5	15.5	17.0
13	19.5	16.0	18.0	21.5	19.5	20.5	22.0	19.5	20.5	18.5	15.0	16.5
14	19.5	17.5	18.5	20.0	18.5	19.5	21.0	19.5	20.0	17.5	15.0	16.5
15	19.0	17.0	18.0	18.5	17.5	18.0	21.0	18.5	19.5	16.0	14.5	15.0
16	19.0	14.5	16.5	20.5	16.5	18.5	19.5	17.5	18.0	14.5	13.0	13.5
17	19.0	14.5	17.0	23.0	18.0	20.5	19.0	16.0	17.5	14.0	11.5	13.0
18	19.5	15.0	17.0	23.5	18.5	21.0	19.0	16.0	17.5	14.5	11.5	12.5
19	16.0	13.5	15.0	23.5	19.0	21.0	19.0	16.0	17.5	15.5	12.5	14.0
20	19.0	13.5	16.0	22.5	19.0	20.5	19.0	16.0	17.5	15.5	12.5	14.0
21	16.0	14.0	14.5	20.5	18.0	19.0	18.5	16.5	17.5	14.5	13.5	14.0
22	17.0	12.5	14.5	20.0	16.5	18.5	19.0	16.5	17.5	14.5	12.0	13.0
23	15.0	13.5	14.5	20.0	17.0	18.5	20.0	17.0	18.5	12.5	11.5	12.0
24	19.0	14.5	16.5	19.5	17.5	18.5	20.0	18.0	19.0	14.0	11.5	12.5
25	20.5	14.5	17.5	20.0	17.5	18.5	18.5	17.5	17.5	14.5	13.5	14.0
26	21.5	15.0	18.0	19.0	17.0	17.5	18.0	17.0	17.5	14.5	13.5	14.0
27	19.5	16.0	18.0	17.5	16.0	16.5	17.5	16.5	17.0	13.5	11.5	12.5
28	18.5	17.0	17.5	19.5	15.5	17.5	16.5	16.0	16.0	13.0	10.0	11.5
29	22.0	16.5	19.0	19.5	16.0	18.0	17.0	16.0	16.5	14.0	11.5	12.5
30	22.5	16.0	19.5	21.5	17.5	19.5	18.5	16.0	17.0	13.5	12.5	13.0
31	---	---	---	22.0	19.0	20.5	19.0	18.0	18.5	---	---	---
MONTH	22.5	12.5	17.0	25.5	15.5	19.5	23.0	16.0	19.0	19.0	10.0	14.5
YEAR	25.5	.0	10.5									

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.4	7.3	7.7	10.3	9.2	9.7	12.2	10.6	11.4	10.7	9.5	10.2
2	9.2	8.2	8.7	10.3	8.9	9.6	12.8	11.9	12.3	11.2	10.3	10.7
3	9.3	8.6	8.9	11.2	8.5	9.9	12.5	11.7	12.1	11.4	10.3	10.9
4	9.4	8.2	8.8	11.4	10.0	10.6	12.4	11.3	11.8	10.9	10.2	10.6
5	9.7	8.9	9.4	11.4	10.2	10.7	11.3	10.6	10.9	10.8	9.9	10.4
6	9.0	8.3	8.8	11.5	9.5	10.5	11.0	10.2	10.5	11.1	10.0	10.6
7	9.1	8.2	8.6	11.2	9.9	10.4	11.3	10.2	10.7	11.4	10.7	11.1
8	8.7	8.2	8.4	11.1	9.4	10.1	11.9	10.7	11.2	11.3	10.7	11.0
9	9.1	8.3	8.6	11.3	9.8	10.5	11.8	11.0	11.4	11.6	10.8	11.2
10	8.9	8.1	8.5	11.9	10.4	11.1	12.4	11.2	11.7	11.5	10.6	11.2
11	10.0	8.5	9.1	11.7	10.7	11.1	12.3	11.3	11.7	11.3	10.6	10.9
12	10.0	9.3	9.6	11.3	10.1	10.6	11.1	10.6	10.8	10.8	10.3	10.5
13	10.0	9.1	9.5	11.5	10.1	10.7	11.8	10.3	11.0	11.1	10.3	10.6
14	9.3	8.6	8.9	12.0	10.6	11.2	11.1	9.3	10.7	10.7	10.1	10.4
15	9.6	8.4	8.8	12.3	10.6	11.3	10.8	10.0	10.4	11.4	10.1	10.8
16	9.0	8.3	8.7	12.0	10.9	11.4	10.9	9.9	10.3	11.8	10.8	11.3
17	9.5	7.6	8.6	11.8	10.5	11.1	10.5	9.7	10.1	11.5	10.7	11.1
18	10.0	9.0	9.4	12.0	10.8	11.3	11.8	9.9	10.8	10.9	10.3	10.6
19	10.2	9.1	9.5	11.7	10.8	11.2	11.6	10.2	10.8	10.5	9.8	10.2
20	9.6	8.7	9.1	11.5	10.6	11.0	10.9	10.0	10.4	10.8	9.9	10.3
21	9.5	8.6	9.0	11.9	10.9	11.3	10.9	10.0	10.5	10.7	9.9	10.2
22	10.0	8.9	9.3	11.7	10.6	11.0	10.8	10.0	10.3	10.7	9.8	10.2
23	9.7	8.9	9.2	11.8	10.3	11.0	10.7	9.8	10.2	10.9	9.9	10.3
24	9.8	8.3	9.0	12.5	10.9	11.6	11.7	10.4	11.2	10.6	9.8	10.2
25	10.7	9.2	9.8	12.5	11.2	11.8	11.2	10.3	10.8	10.3	9.4	9.8
26	10.8	9.8	10.2	12.1	11.1	11.4	11.1	10.2	10.6	10.7	9.3	10.1
27	10.6	9.5	9.9	11.8	10.6	11.2	11.2	10.4	10.8	11.4	10.1	10.7
28	10.5	9.4	9.9	11.5	10.6	11.1	10.6	9.8	10.4	11.5	10.8	11.1
29	10.6	9.6	9.9	11.6	10.5	10.9	10.5	9.8	10.1	11.4	10.3	10.9
30	10.3	9.3	9.8	11.7	10.3	11.0	10.2	9.4	9.8	11.5	10.4	11.0
31	10.0	9.2	9.6	---	---	---	10.3	9.3	9.6	11.5	10.6	11.0
MONTH	10.8	7.3	9.1	12.5	8.5	10.9	12.8	9.3	10.8	11.8	9.3	10.7

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	11.9	10.5	11.0	11.1	10.5	10.8	10.7	9.7	10.2	9.6	7.8	8.7
2	11.6	9.9	11.0	11.0	10.5	10.7	10.9	9.0	9.9	9.1	7.5	8.2
3	10.8	10.2	10.5	11.0	10.6	10.8	9.5	8.0	8.8	8.3	7.0	7.7
4	10.9	10.3	10.6	11.0	10.5	10.7	11.5	8.8	10.2	8.8	7.8	8.1
5	11.1	9.9	10.6	11.1	10.6	10.8	11.5	10.1	10.7	9.0	8.0	8.4
6	11.2	10.5	10.8	11.4	10.5	10.9	11.3	9.9	10.5	8.4	7.5	7.9
7	11.8	10.4	11.0	11.2	10.5	10.9	11.0	9.5	10.2	8.1	7.3	7.7
8	11.6	9.7	11.0	11.1	9.9	10.6	10.9	9.1	9.8	8.6	7.5	8.0
9	11.5	10.8	11.1	11.4	9.5	10.6	10.7	8.9	9.7	9.2	8.4	8.8
10	11.4	10.4	10.9	11.7	10.9	11.3	9.9	8.5	9.3	8.8	8.0	8.4
11	11.5	10.3	10.7	11.7	11.1	11.4	10.3	7.9	9.1	8.9	8.0	8.5
12	10.7	10.3	10.4	11.5	11.1	11.3	11.0	8.6	9.6	9.0	7.9	8.5
13	10.9	10.2	10.6	11.5	10.9	11.2	9.2	8.0	8.6	9.8	8.0	8.9
14	11.1	10.4	10.8	11.9	10.8	11.4	10.7	8.3	9.7	9.9	8.1	9.0
15	10.8	10.2	10.6	11.3	10.6	10.9	10.3	8.6	9.6	8.9	8.1	8.5
16	10.0	9.4	9.7	11.6	10.8	11.4	9.5	8.3	8.8	9.4	8.0	8.7
17	10.2	9.3	9.8	11.8	11.0	11.4	9.6	8.1	8.9	9.3	8.1	8.6
18	9.9	9.3	9.6	12.2	11.1	11.7	10.1	7.8	8.8	9.3	8.0	8.6
19	9.9	9.4	9.7	12.3	11.5	12.0	9.4	7.3	8.4	8.8	7.8	8.2
20	10.0	9.4	9.8	12.1	11.1	11.6	9.4	8.2	8.8	8.5	7.5	8.1
21	10.1	9.2	9.6	11.7	10.9	11.3	9.2	7.6	8.4	7.9	7.0	7.5
22	10.7	9.8	10.1	11.9	10.9	11.4	8.5	7.1	7.9	7.7	6.2	7.2
23	10.6	10.1	10.3	11.5	10.3	10.9	8.9	7.3	8.3	8.3	6.9	7.9
24	10.4	9.9	10.1	11.4	10.3	10.9	9.1	7.2	8.3	8.7	7.7	8.2
25	10.6	10.0	10.3	11.0	9.9	10.4	9.4	7.4	8.4	8.4	7.3	7.8
26	11.0	10.3	10.6	10.8	9.4	10.0	9.4	7.7	8.6	8.2	7.4	7.8
27	11.0	10.2	10.6	10.5	9.3	9.9	8.9	8.2	8.6	8.3	7.1	7.6
28	11.2	10.7	11.0	10.0	8.9	9.6	9.5	8.0	9.0	7.9	7.1	7.5
29	---	---	---	9.0	7.7	8.4	9.7	8.0	8.9	8.6	7.5	7.9
30	---	---	---	10.2	8.3	9.2	9.3	7.8	8.6	8.5	7.4	7.8
31	---	---	---	10.4	9.4	9.9	---	---	---	8.0	7.3	7.7
MONTH	11.9	9.2	10.5	12.3	7.7	10.8	11.5	7.1	9.2	9.9	6.2	8.1

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	7.8	7.2	7.5	7.6	6.8	7.2	8.1	6.6	7.0	8.5	7.0	7.8
2	8.5	7.8	8.1	8.2	6.9	7.5	7.3	6.4	7.0	9.4	8.1	8.7
3	8.0	7.4	7.7	7.5	6.4	7.0	7.8	6.4	7.1	9.6	8.6	9.0
4	8.0	7.4	7.7	7.0	5.5	6.4	7.5	6.7	7.0	9.6	8.5	9.0
5	8.0	7.3	7.6	6.1	4.9	5.6	7.6	6.5	6.9	9.8	8.6	9.2
6	7.3	6.7	7.0	8.2	5.2	6.9	7.2	6.5	6.9	9.8	8.5	9.3
7	7.5	6.9	7.2	7.5	6.1	6.9	6.7	5.8	6.4	8.7	7.8	8.3
8	7.7	7.1	7.5	6.8	5.7	6.2	6.4	5.6	5.9	9.4	8.3	8.8
9	7.9	7.0	7.5	8.2	6.4	7.2	6.8	5.8	6.4	9.1	7.8	8.6
10	8.1	6.8	7.5	7.5	6.0	6.6	7.7	6.5	7.1	8.5	7.5	8.0
11	7.5	6.9	7.2	6.0	4.4	5.4	7.8	6.7	7.3	8.6	7.6	8.1
12	7.5	6.3	7.1	6.1	4.9	5.6	8.0	6.7	7.3	9.1	7.8	8.5
13	6.8	5.9	6.4	7.6	5.9	6.9	8.5	6.4	7.3	9.4	8.0	8.6
14	7.7	6.1	6.8	7.7	6.9	7.3	6.9	6.1	6.4	9.4	7.9	8.7
15	7.2	6.6	7.0	8.0	6.4	7.3	7.3	6.5	6.8	9.8	8.3	9.1
16	8.2	6.5	7.5	8.2	7.1	7.8	7.9	6.5	7.3	10.5	8.7	9.8
17	8.3	7.5	7.9	7.2	6.4	6.9	8.4	7.1	7.8	10.9	9.5	10.2
18	8.4	7.6	8.0	7.0	6.1	6.6	8.3	7.1	7.8	10.7	9.4	10.1
19	8.6	7.7	8.2	7.3	6.2	6.8	7.9	7.0	7.5	9.9	8.5	9.3
20	8.1	7.1	7.8	8.1	6.2	7.2	8.4	7.3	7.9	9.8	8.2	9.0
21	9.0	7.7	8.4	8.4	7.1	7.8	8.4	7.2	7.7	9.5	7.7	8.7
22	8.8	7.8	8.4	8.4	7.6	8.1	8.2	7.1	7.5	10.0	8.7	9.3
23	8.2	7.6	7.9	8.6	7.5	8.0	8.0	6.5	7.5	10.1	8.9	9.4
24	7.7	6.8	7.3	8.2	7.3	7.8	8.3	6.5	7.4	9.9	8.5	9.3
25	8.3	7.6	7.9	8.0	6.6	7.5	8.2	7.2	7.6	8.9	8.0	8.5
26	8.2	7.1	7.7	9.2	7.4	8.0	7.8	6.6	7.3	8.8	8.0	8.3
27	8.0	6.9	7.4	9.3	8.2	8.8	8.0	7.3	7.7	10.2	8.0	9.1
28	8.1	7.3	7.7	8.8	7.8	8.5	7.7	7.2	7.5	10.3	9.1	9.6
29	7.8	7.2	7.5	8.6	7.7	8.0	7.6	7.1	7.4	9.8	8.7	9.1
30	8.0	6.9	7.5	8.3	7.4	7.9	7.8	7.0	7.5	8.8	8.0	8.4
31	---	---	---	7.9	6.6	7.3	7.7	6.6	7.2	---	---	---
MONTH	9.0	5.9	7.6	9.3	4.4	7.2	8.5	5.6	7.2	10.9	7.0	8.9
YEAR	12.8	4.4	9.2									

05353800 STRAIGHT RIVER NEAR FARIBAULT, MN

LOCATION.--Lat 44°15'29", long 93°13'51", in W½SE¼ sec.9, T.109 N., R.20 W., Rice County, Hydrologic Unit 07040002, on right bank 15 ft (5 m) downstream from highway bridge, 2.8 mi (4.5 km) upstream from Falls Creek and 3.2 mi (5.1 km) southeast of Faribault.

DRAINAGE AREA.--442 mi^2 (1,145 km^2).

PERIOD OF RECORD.--October 1965 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,034.58 ft (315.340 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--16 years, 232 ft^3/s (6.570 m^3/s), 7.13 in/yr (181 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,990 ft^3/s (170 m^3/s) May 1, 1973, gage height, 11.20 ft (3.414 m); maximum gage height, 12.74 ft (3.883 m) Mar. 5, 1974 (backwater from ice); minimum discharge, 10 ft^3/s (0.28 m^3/s) Oct. 27, 1976; minimum gage height, 3.66 ft (1.116 m) Nov. 27, 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 1,500 ft^3/s (42.5 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
July 15	0915	*3590	102	*9.46	2.883	Aug. 14	1300	1710	48.4	7.29	2.222
July 22	2115	1610	45.6	7.12	2.170	Aug. 27	2215	2840	80.4	8.70	2.652

Minimum discharge, 20 ft^3/s (0.57 m^3/s) Dec. 2, gage height, 3.79 ft (1.155 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	159	113	62	33	28	158	137	197	170	349	291	1400
2	147	108	42	33	28	146	131	188	156	340	277	1190
3	139	104	51	33	28	138	168	220	149	264	318	1020
4	129	104	53	32	28	131	542	1040	133	187	247	882
5	122	99	52	32	28	127	547	1260	122	138	615	755
6	114	95	50	32	28	120	432	1100	110	114	690	647
7	111	93	49	31	28	117	348	815	101	96	525	580
8	106	90	48	31	28	109	305	626	97	84	430	510
9	102	90	47	30	28	119	270	539	98	69	354	454
10	95	85	47	30	28	105	254	451	98	59	318	399
11	90	80	46	30	28	91	236	402	93	525	266	352
12	86	78	45	30	28	87	228	358	90	902	220	308
13	84	79	44	30	28	86	220	325	97	866	185	275
14	84	79	43	30	28	79	205	294	97	700	1310	261
15	84	76	43	30	31	77	189	266	201	2900	1230	237
16	89	72	42	30	60	75	176	242	220	2710	898	218
17	99	71	41	30	120	71	172	219	195	2130	669	201
18	94	69	40	30	180	66	161	205	165	1720	500	187
19	93	68	40	30	160	61	174	178	141	1340	389	172
20	88	69	39	30	148	60	169	165	125	1030	319	163
21	84	66	39	29	140	58	177	154	117	920	268	151
22	83	69	38	29	134	56	192	142	123	980	225	140
23	84	69	37	29	130	55	229	155	109	956	203	128
24	120	66	37	29	128	56	235	287	129	746	214	126
25	139	52	36	29	127	60	220	287	160	665	203	125
26	156	58	36	29	127	66	206	257	147	610	826	145
27	143	65	35	29	129	63	192	230	114	530	2080	142
28	135	61	35	29	140	61	187	212	101	490	2550	129
29	124	65	34	29	---	84	183	249	154	425	2280	125
30	82	65	34	29	---	117	204	243	268	368	2020	123
31	114	---	34	29	---	131	---	207	---	322	1690	---
TOTAL	3379	2358	1319	936	2146	2830	7089	11513	4080	23535	22610	11545
MEAN	109	78.6	42.5	30.2	76.6	91.3	236	371	136	759	729	385
MAX	159	113	62	33	180	158	547	1260	268	2900	2550	1400
MIN	82	52	34	29	28	55	131	142	90	59	185	123
CFSM	.25	.18	.10	.07	.17	.21	.53	.84	.31	1.72	1.65	.87
IN.	.28	.20	.11	.08	.18	.24	.60	.97	.34	1.98	1.90	.97

CAL YR 1980 TOTAL 64684 MEAN 177 MAX 3090 MIN 30 CFSM .40 IN 5.44
WTR YR 1981 TOTAL 93340 MEAN 256 MAX 2900 MIN 28 CFSM .58 IN 7.86

05372800 SOUTH FORK ZUMBRO RIVER ON BELT LINE AT ROCHESTER, MN

LOCATION.--Lat 44°00'26", long 92°28'19", in SE¼SW¼ sec.2, T.106 N., R.14 W., Olmsted County, Hydrologic Unit 07040004, on downstream side of bridge on west-bound lane of U.S. Highway 14 at Roohester, and 1.5 mi (2.4 km) upstream from Bear Creek.

DRAINAGE AREA.--155 mi^2 (401 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Annual maximum discharge, water years 1969-80. March 1981 to October 1981.

GAGE.--Nonreoording gage and crest-stage gage. Datum of gage is 990.00 ft (301.752 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records good.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,500 ft^3/s (581 m^3/s) July 6, 1978, gage height, 15.97 ft (4.868 m).

EXTREMES FOR CURRENT PERIOD.--Water year 1981: Maximum discharge, 3,920 ft^3/s (111 m^3/s) July 11, gage height, 9.99 ft (3.045 m); minimum (March to September), 14 ft^3/s (0.40 m^3/s) June 14, gage height, 3.33 ft (1.015 m).

October 1981: Maximum discharge during period, 155 ft^3/s (4.39 m^3/s) Oct. 18, gage height, 3.97 ft (1.210 m); minimum, 24 ft^3/s (0.68 m^3/s) Oct. 12, gage height, 3.41 ft (1.039 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						---	69	55	47	129	115	198
2						---	66	58	41	92	126	143
3						---	69	55	37	76	450	124
4						---	92	92	35	62	342	110
5						---	113	179	32	53	264	95
6						---	90	146	27	45	613	88
7						---	78	113	27	35	251	90
8						---	73	100	25	30	179	85
9						---	69	88	27	27	143	80
10						---	66	80	27	24	126	73
11						---	62	69	25	1230	108	64
12						---	60	64	24	2960	90	58
13						---	60	60	33	695	78	49
14						---	58	55	22	391	152	41
15						---	55	51	17	676	342	33
16						90	55	47	27	506	198	28
17						71	51	45	19	339	143	25
18						60	53	41	28	237	121	32
19						51	55	37	27	195	108	37
20						47	51	37	27	811	97	43
21						45	51	35	43	487	78	41
22						43	49	33	41	247	66	39
23						43	53	37	44	211	62	35
24						41	55	45	43	189	66	35
25						39	51	51	49	164	64	30
26						41	51	51	37	138	66	51
27						39	51	49	32	126	297	53
28						39	51	45	42	124	426	49
29						45	49	45	101	110	254	43
30						62	51	88	268	113	198	37
31						73	---	62	---	105	221	---
TOTAL						---	1857	2013	1274	10627	5844	1909
MEAN						---	61.9	64.9	42.5	343	189	63.6
MAX						---	113	179	268	2960	613	198
MIN						---	49	33	17	24	62	25
CFSM						---	.40	.42	.27	2.21	1.22	.41
IN.						---	.45	.48	.31	2.55	1.40	.46
AC-FT						---	3680	3990	2530	21080	11590	3790

05372800 SOUTH FORK ZUMBRO RIVER ON BELT LINE AT ROCHESTER, MN--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32											
2	28											
3	43											
4	62											
5	71											
6	83											
7	71											
8	71											
9	69											
10	64											
11	58											
12	32											
13	100											
14	80											
15	71											
16	62											
17	100											
18	152											
19	140											
20	115											
21	90											
22	76											
23	80											
24	88											
25	90											
26	60											
27	62											
28	71											
29	69											
30	76											
31	71											
TOTAL	2337											
MEAN	75.4											
MAX	152											
MIN	28											
CFSM	.49											
IN.	.56											
AC-FT	4640											

05372800 SOUTH FORK ZUMBRO RIVER ON BELT LINE AT ROCHESTER, MN

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1981 to October 1981.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: March 1981 to October 1981.
SUSPENDED-SEDIMENT DISCHARGE: March 1981 to October 1981.

REMARKS.--During the low-flow periods, daily sediment concentrations were estimated on the basis of water records and once or twice weekly sediment samples. Water temperatures were obtained when sediment samples were collected.

EXTREMES FOR CURRENT PERIOD.--March to September 1981:
SEDIMENT CONCENTRATIONS: Maximum daily mean during period, 1,970 mg/L July 11; minimum daily mean, 17 mg/L Mar. 25-28.
SEDIMENT LOADS: Maximum daily mean during period, 9,410 tons (8,540 tonnes) July 12; minimum daily mean, 1.8 tons (1.6 tonnes) Mar. 25, 27, 28.

October 1981:
SEDIMENT CONCENTRATIONS: Maximum daily mean during period, 87 mg/L Oct. 13; minimum daily mean, 25 mg/L Oct. 11.
SEDIMENT LOADS: Maximum daily mean during period, 23 tons (21 tonnes) Oct. 13; minimum daily mean, 2.3 tons (2.1 tonnes) Oct. 2.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						---	---	---	17.0	22.0	---	19.0
2						---	---	---	18.5	21.0	20.0	21.0
3						---	12.0	---	16.5	---	---	21.0
4						---	---	15.5	16.5	---	19.0	21.0
5						---	6.0	12.5	---	26.0	22.0	---
6						---	---	11.0	---	---	22.0	20.0
7						---	---	---	---	---	21.0	---
8						---	---	---	---	---	20.0	---
9						---	---	---	---	---	19.0	---
10						---	10.0	---	---	---	18.0	---
11						---	---	---	---	22.0	---	---
12						---	---	---	19.0	23.0	---	---
13						---	---	10.5	20.5	23.5	25.0	20.0
14						---	---	---	23.0	22.0	23.0	---
15						---	---	---	---	20.0	22.0	---
16						---	---	---	---	20.0	19.0	---
17						---	10.0	---	---	19.0	17.0	---
18						---	---	---	---	21.0	---	---
19						2.0	---	---	---	22.0	---	---
20						---	---	12.5	17.0	20.0	---	15.0
21						---	---	---	19.0	20.0	---	---
22						---	---	---	---	18.5	---	---
23						---	---	---	---	17.0	21.0	---
24						---	13.0	---	---	---	---	15.0
25						6.0	---	14.0	---	---	---	---
26						---	---	---	---	17.0	---	---
27						---	---	---	---	---	20.0	15.0
28						---	---	---	22.5	---	19.0	---
29						---	---	16.5	22.0	---	20.0	---
30						9.5	12.0	17.0	21.0	---	23.0	---
31						---	---	16.0	---	---	22.0	---

05372800 SOUTH FORK ZUMBRO RIVER ON BELT LINE AT ROCHESTER, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---											
2	---											
3	---											
4	---											
5	12.0											
6	11.0											
7	12.0											
8	---											
9	---											
10	---											
11	12.0											
12	---											
13	12.0											
14	11.0											
15	11.0											
16	---											
17	---											
18	12.0											
19	---											
20	---											
21	---											
22	---											
23	---											
24	---											
25	9.0											
26	---											
27	---											
28	---											
29	---											
30	---											
31	10.0											

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1											---	---
2											---	---
3											---	---
4											---	---
5											---	---
6											---	---
7											---	---
8											---	---
9											---	---
10											---	---
11											---	---
12											---	---
13											---	---
14											---	---
15											---	---
16											43	10
17											33	6.3
18											28	4.5
19											26	3.6
20											24	3.0
21											23	2.8
22											22	2.6
23											20	2.3
24											18	2.0
25											17	1.8
26											17	1.9
27											17	1.8
28											17	1.8
29											19	2.3
30											24	4.0
31											27	5.3
TOTAL											---	

05372800 SOUTH FORK ZUMBRO RIVER ON BELT LINE AT ROCHESTER, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	24	4.5	42	6.2	61	7.7	125	44	61	19	84	45
2	23	4.1	35	5.5	63	7.0	70	17	44	15	53	20
3	25	4.7	31	4.6	67	6.7	62	13	165	263	47	16
4	37	9.2	31	7.7	46	4.3	58	9.7	136	133	44	13
5	31	9.5	44	21	44	3.8	56	8.0	98	82	43	11
6	27	6.6	46	18	44	3.2	55	6.7	151	264	55	13
7	29	6.1	46	14	43	3.1	54	5.1	78	53	63	15
8	35	6.9	46	12	43	2.9	53	4.3	109	53	54	12
9	41	7.6	46	11	42	3.1	52	3.8	107	41	48	10
10	44	7.8	45	9.7	42	3.1	51	3.3	72	24	45	8.9
11	40	6.7	45	8.4	41	2.8	1970	7350	53	15	41	7.1
12	35	5.7	47	8.1	41	2.7	1050	9410	46	11	37	5.8
13	33	5.3	47	7.6	58	5.2	173	366	41	8.6	33	4.4
14	32	5.0	47	7.0	43	2.6	134	155	87	44	32	3.5
15	29	4.3	46	6.3	55	2.5	356	680	109	103	31	2.8
16	27	4.0	46	5.8	75	5.5	260	368	64	34	30	2.3
17	23	3.2	45	5.5	62	3.2	118	108	54	21	29	2.0
18	22	3.1	44	4.9	67	5.1	93	60	53	17	28	2.4
19	22	3.3	43	4.3	62	4.5	99	52	50	15	27	2.7
20	22	3.0	42	4.2	59	4.3	846	1960	46	12	27	3.1
21	22	3.0	40	3.8	82	9.5	267	384	41	8.6	26	2.9
22	20	2.6	39	3.5	78	8.6	122	81	35	6.2	26	2.7
23	20	2.9	38	3.8	84	11	102	58	31	5.2	25	2.4
24	23	3.4	43	5.2	109	13	95	48	39	6.9	25	2.4
25	25	3.4	46	6.3	124	16	92	41	48	8.3	25	2.0
26	25	3.4	45	6.2	122	12	91	34	47	8.4	67	9.2
27	25	3.4	46	6.1	117	10	87	30	141	146	68	9.7
28	25	3.4	47	5.7	368	87	83	28	122	147	56	7.4
29	34	4.5	47	5.7	266	100	79	23	74	51	48	5.6
30	46	6.3	96	23	555	433	72	22	66	35	43	4.3
31	---	---	91	15	---	---	64	18	97	63	---	---
TOTAL	---	146.9	---	256.1	---	783.4	---	21390.9	---	1713.2	---	248.6

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	37	3.2										
2	31	2.3										
3	44	5.1										
4	60	10										
5	49	9.4										
6	76	17										
7	53	10										
8	37	7.1										
9	33	6.1										
10	29	5.0										
11	25	3.9										
12	41	3.5										
13	87	23										
14	83	18										
15	80	15										
16	70	12										
17	63	17										
18	45	18										
19	45	17										
20	38	12										
21	35	8.5										
22	34	7.0										
23	38	8.2										
24	46	11										
25	49	12										
26	47	7.6										
27	45	7.5										
28	43	8.2										
29	41	7.6										
30	38	7.8										
31	36	6.9										
TOTAL	---	306.9										

05372800 SOUTH FORK ZUMBRO RIVER ON BELT LINE AT ROCHESTER, MN--Continued

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
JUL									
11...	1820	1850	2710	13500	55	67	78	88	99
12...	1030	3270	1290	11400	56	70	81	89	99

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	NUMBER OF SAM-PLING POINTS (00063)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	BED MAT. FALL DIAM. % FINER THAN .004 MM (80157)	BED MAT. FALL DIAM. % FINER THAN .062 MM (80158)	BED MAT. FALL DIAM. % FINER THAN .125 MM (80159)	BED MAT. FALL DIAM. % FINER THAN .250 MM (80160)	BED MAT. FALL DIAM. % FINER THAN .500 MM (80161)	BED MAT. FALL DIAM. % FINER THAN 1.00 MM (80162)	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)
JUL												
13...	0825	3	680	22	66	73	81	91	92	94	96	100

05372930 BEAR CREEK AT ROCHESTER, MN

LOCATION.--Lat 44°00'29", long 92°26'44", in SW¼SE¼ sec.1, T.106 N., R.14 W., Olmsted County, Hydrologic Unit 07040004, at bridge on west-bound lane of U.S. Highway 14 at Rochester, and 1.2 mi (1.9 km) above mouth.

DRAINAGE AREA.--80.0 mi^2 (207.2 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Annual maximum, water years 1969-80. March 1981 to October 1981.

GAGE.--Nonrecording gage and crest-stage gage. Datum of gage is 990.00 ft (301.752 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records good.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,900 ft^3/s (705 m^3/s) July 6, 1978, gage height, 17.87 ft (5.447 m).

EXTREMES FOR CURRENT PERIOD.--Water year 1981: Maximum discharge, 3,240 ft^3/s (91.8 m^3/s) July 11, gage height, 11.96 ft (3.645 m); minimum (March to September), 13 ft^3/s (0.37 m^3/s) July 8, 9, 10, 11, gage height, 2.81 ft (0.856 m).

October 1981: Maximum discharge during period, 75 ft^3/s (2.12 m^3/s) Oct. 5, gage height, 3.68 ft (1.122 m); minimum, 36 ft^3/s (1.02 m^3/s) Oct. 3, gage height, 3.16 ft (0.963 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						---	27	25	20	17	56	184
2						---	25	23	19	18	58	114
3						---	29	24	19	16	53	96
4						---	45	68	18	16	46	92
5						---	38	72	18	16	61	88
6						---	32	56	17	14	58	76
7						---	30	52	16	13	47	81
8						---	29	49	18	13	44	69
9						---	29	47	18	13	41	65
10						---	27	44	18	13	40	61
11						---	27	41	16	1320	39	58
12						---	27	39	16	644	37	55
13						---	27	38	20	168	35	52
14						---	26	36	18	123	79	49
15						---	24	34	18	250	65	48
16						---	27	32	17	134	43	48
17						---	27	30	17	113	40	47
18						---	24	29	17	96	37	45
19						24	25	28	16	88	36	44
20						25	25	27	17	284	35	43
21						24	23	26	18	108	34	41
22						23	24	24	19	85	33	39
23						23	27	27	20	77	32	39
24						23	26	29	21	72	34	40
25						23	24	28	18	67	32	41
26						23	23	26	16	62	44	44
27						22	23	25	16	60	111	42
28						23	22	24	25	61	96	40
29						28	25	24	18	55	60	41
30						30	28	22	19	52	55	41
31						28	---	21	---	49	312	---
TOTAL						---	815	1070	543	4117	1793	1823
MEAN						---	27.2	34.5	18.1	133	57.8	60.8
MAX						---	45	72	25	1320	312	184
MIN						---	22	21	16	13	32	39
CFSM						---	.34	.43	.23	1.66	.72	.76
IN.						---	.38	.50	.25	1.91	.83	.85
AC-FT						---	1620	2120	1080	8170	3560	3620

05372930 BEAR CREEK AT ROCHESTER, MN--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41											
2	40											
3	42											
4	53											
5	52											
6	50											
7	44											
8	41											
9	39											
10	39											
11	39											
12	39											
13	41											
14	43											
15	48											
16	46											
17	50											
18	47											
19	44											
20	43											
21	41											
22	39											
23	41											
24	41											
25	48											
26	47											
27	43											
28	41											
29	40											
30	41											
31	41											
TOTAL	1344											
MEAN	43.4											
MAX	53											
MIN	39											
CFSM	.54											
IN.	.62											
AC-FT	2670											

05372930 BEAR CREEK AT ROCHESTER, MN--Continued

PERIOD OF RECORD.--March 1981 to October 1981.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: March 1981 to October 1981.
SUSPENDED-SEDIMENT DISCHARGE: March 1981 to October 1981.

REMARKS.--During the low-flow period, daily sediment concentrations were estimated on the basis of water records and once or twice weekly sediment samples. Water temperatures were obtained when sediment samples were collected.

EXTREMES FOR CURRENT PERIOD.--March to September 1981:
SEDIMENT CONCENTRATIONS: Maximum daily mean during period, 1,290 mg/L July 11; minimum daily mean, 21 mg/L Sept. 28-30.
SEDIMENT LOADS: Maximum mean during period, 5,850 tons (5,310 tonnes) July 11; minimum daily mean, 0.88 tons (0.80 tonnes) July 7-10.

October 1981:
SEDIMENT CONCENTRATIONS: Maximum daily mean during period, 77 mg/L Oct. 17; minimum daily mean, 21 mg/L Oct. 1, 2, 11.
SEDIMENT LOADS: Maximum daily mean during period, 10 tons (9.1 tonnes) Oct. 17; minimum daily mean, 2.2 tons (2.0 tonnes) Oct. 11.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					---	---	---	9.0	---	11.0	---	16.0
2					---	---	---	---	---	17.0	18.0	12.0
3					---	---	11.5	---	---	---	23.0	16.0
4					---	---	7.5	14.0	---	---	18.0	21.0
5					---	---	---	11.5	16.5	25.0	20.0	19.0
6					---	---	---	9.5	---	---	20.0	16.0
7					---	---	---	---	---	---	19.0	18.0
8					---	---	---	---	---	---	18.0	16.0
9					---	---	---	---	---	---	12.0	---
10					---	---	9.0	---	---	---	---	---
11					---	---	---	---	---	22.0	---	---
12					---	---	---	---	16.5	22.0	22.0	---
13					---	---	---	9.5	19.0	21.0	---	19.0
14					---	---	---	---	20.0	20.0	20.0	---
15					---	---	---	---	---	19.0	19.0	---
16					---	---	---	---	---	17.5	16.0	---
17					---	---	9.0	---	21.0	19.0	14.0	---
18					---	---	---	---	---	19.0	14.0	---
19					---	1.5	---	---	---	19.0	---	---
20					---	---	---	10.5	15.5	21.0	---	15.0
21					---	---	---	---	15.0	18.0	---	---
22					---	---	---	---	---	17.0	---	---
23					---	---	8.5	17.0	---	18.0	21.0	---
24					5.5	---	5.5	13.5	17.0	---	---	12.0
25					---	5.0	---	---	---	---	---	---
26					4.0	---	---	---	---	18.0	20.0	---
27					---	---	---	---	---	---	19.0	14.0
28					---	---	---	---	22.0	---	17.0	---
29					---	---	13.0	14.5	19.0	---	---	---
30					---	8.0	12.5	---	12.0	---	20.0	---
31					---	---	---	---	---	---	21.0	---
MEAN												

05372930 BEAR CREEK AT ROCHESTER, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---											
2	---											
3	---											
4	10.0											
5	12.0											
6	11.0											
7	---											
8	---											
9	---											
10	---											
11	11.0											
12	---											
13	---											
14	---											
15	---											
16	---											
17	---											
18	10.0											
19	---											
20	---											
21	---											
22	---											
23	---											
24	---											
25	9.0											
26	---											
27	---											
28	---											
29	---											
30	---											
31	9.0											

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1											---	---
2											---	---
3											---	---
4											---	---
5											---	---
6											---	---
7											---	---
8											---	---
9											---	---
10											---	---
11											---	---
12											---	---
13											---	---
14											---	---
15											---	---
16											---	---
17											---	---
18											---	---
19											37	2.4
20											37	2.5
21											38	2.5
22											38	2.4
23											39	2.4
24											40	2.5
25											41	2.5
26											40	2.5
27											39	2.3
28											39	2.4
29											59	4.5
30											61	4.9
31											49	3.7

05372930 BEAR CREEK AT ROCHESTER, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	43	3.1	44	3.0	59	3.2	93	4.3	134	22	352	183
2	41	2.8	39	2.4	57	2.9	39	1.9	148	23	181	56
3	49	3.8	45	2.9	54	2.8	30	1.3	97	14	123	32
4	89	11	159	33	54	2.6	27	1.2	72	8.9	107	27
5	64	6.6	128	25	69	3.4	26	1.1	120	23	110	26
6	58	5.0	106	16	56	2.6	25	.94	125	20	86	18
7	57	4.6	102	14	55	2.4	25	.88	95	12	83	18
8	55	4.3	99	13	66	3.2	25	.88	75	8.9	57	11
9	53	4.1	96	12	66	3.2	25	.88	59	6.5	49	8.6
10	51	3.7	93	11	59	2.9	25	.88	50	5.4	47	7.7
11	48	3.5	89	9.9	50	2.2	1290	5850	43	4.5	46	7.2
12	45	3.3	86	9.1	42	1.9	431	864	38	3.8	44	6.5
13	43	3.1	83	8.5	73	4.2	300	136	35	3.3	41	5.8
14	40	2.8	78	7.6	33	1.6	300	100	172	41	39	5.2
15	37	2.4	73	6.7	30	1.5	741	541	94	18	37	4.8
16	51	3.7	69	6.0	30	1.4	220	80	47	5.5	34	4.4
17	38	2.8	65	5.3	30	1.4	170	52	37	4.0	32	4.1
18	35	2.3	60	4.7	30	1.4	150	39	35	3.5	30	3.6
19	46	3.1	56	4.2	30	1.3	160	38	35	3.4	28	3.3
20	46	3.1	53	3.9	53	2.4	446	395	35	3.3	26	3.0
21	37	2.3	49	3.4	82	4.0	200	58	35	3.2	27	3.0
22	28	1.8	44	2.9	79	4.1	170	39	34	3.0	27	2.8
23	29	2.1	68	5.0	87	5.1	155	32	34	2.9	27	2.8
24	63	4.4	58	4.5	104	5.9	140	27	52	4.8	27	2.9
25	53	3.4	60	4.5	80	3.9	130	24	63	5.4	25	2.8
26	48	3.0	63	4.4	67	2.9	110	18	97	12	39	4.6
27	46	2.9	66	4.5	60	2.6	103	17	166	69	23	2.6
28	43	2.6	68	4.4	75	7.8	113	19	134	40	21	2.3
29	79	6.2	69	4.5	83	4.0	97	14	51	8.3	21	2.3
30	166	13	66	3.9	98	5.0	84	12	31	4.6	21	2.3
31	---	---	63	3.6	---	---	78	10	326	385	---	---
TOTAL	---	120.8	---	243.8	---	93.8	---	8379.26	---	772.2	---	463.6

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	21	2.3										
2	21	2.3										
3	32	3.6										
4	64	9.2										
5	67	9.4										
6	68	9.2										
7	47	5.6										
8	35	3.9										
9	28	2.9										
10	23	2.4										
11	21	2.2										
12	23	2.4										
13	26	2.9										
14	31	3.6										
15	41	5.3										
16	33	4.1										
17	77	10										
18	75	9.5										
19	64	7.6										
20	55	6.4										
21	50	5.5										
22	45	4.7										
23	38	4.2										
24	34	3.8										
25	33	4.3										
26	34	4.3										
27	35	4.1										
28	35	3.9										
29	35	3.8										
30	35	3.9										
31	35	3.9										
TOTAL	---	151.2										

05372930 BEAR CREEK AT ROCHESTER, MN--Continued

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)
JUL							
11...	2140	2420	802	5240	51	64	69
12...	1310	540	392	572	56	66	--

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)	SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM (70346)
JUL						
11	69	72	76	88	99	100
12	77	86	88	98	100	--

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	NUMBER OF SAM-PLING POINTS (00063)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	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)
JUL									
13...	0737	3	183	0	17	84	97	99	100

05372950 SILVER CREEK AT ROCHESTER, MN

LOCATION.--Lat 44°01'44", long 92°25'44", near center of sec.31, T.107 N., R.13 W., Olmsted County, Hydrologic Unit 07040004, on left bank at downstream side of bridge on county road at east edge of Rochester, and 1.7 mi (2.7 km) above mouth.

DRAINAGE AREA.--17.3 mi^2 (44.8 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Annual maximum discharge, water years 1969-80. March 1981 to October 1981.

GAGE.--Nonrecording gage and crest-stage gage. Datum of gage is 1,000.00 ft (304.800 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,290 ft^3/s (263 m^3/s) July 6, 1978, gage height, 16.18 ft (4.932 m).

EXTREMES FOR CURRENT PERIOD.--Water year 1981: Maximum discharge, 186 ft^3/s (5.27 m^3/s) July 11, gage height, 9.35 ft (2.850 m); minimum daily (March to September), 0.04 ft^3/s (0.001 m^3/s) Mar. 28, gage height, 5.74 ft (1.750 m).

October 1981: Maximum discharge during period, 6.2 ft^3/s (0.18 m^3/s) Oct. 4, gage height, 6.59 ft (2.009 m); minimum daily, 2.6 ft^3/s (0.074 m^3/s) Oct. 13, gage height, 6.32 ft (1.926 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						---	.65	1.6	.73	1.4	4.6	19
2						---	.51	1.4	.69	1.2	4.8	12
3						---	.69	3.3	.94	.99	3.8	11
4						---	5.2	13	.73	.88	3.7	11
5						---	2.2	13	.61	.65	4.2	13
6						---	1.3	8.8	.48	.48	4.0	9.1
7						---	1.1	7.3	.45	.69	3.1	8.9
8						---	1.0	6.4	.57	.57	3.0	7.6
9						---	.99	6.0	.83	.61	2.6	7.8
10						---	.88	5.6	.73	.45	2.6	7.8
11						---	.94	5.0	.54	68	2.5	8.6
12						---	1.0	4.5	.48	11	2.1	7.2
13						---	.94	4.2	.88	7.0	2.0	4.8
14						---	.77	3.7	.54	11	28	4.5
15						---	.61	3.2	.73	46	6.0	4.2
16						---	1.0	3.0	.48	15	3.6	4.2
17						---	.99	2.6	.48	11	2.8	4.1
18						---	.65	2.2	.39	8.8	2.5	4.1
19						1.3	.69	1.9	.36	7.7	2.1	4.2
20						1.0	.69	1.7	.45	28	1.7	4.1
21						.57	.61	1.5	.69	6.5	1.8	3.4
22						.39	.65	1.3	.65	5.6	1.8	3.7
23						.32	.94	1.7	.89	6.3	1.6	3.7
24						.24	1.1	1.9	1.5	6.2	1.2	3.6
25						.19	.77	1.7	.48	6.0	1.2	4.0
26						.15	.57	1.6	.24	6.0	12	4.1
27						.10	.48	1.4	.18	5.9	8.3	3.6
28						.04	.45	1.2	.32	5.3	7.6	3.6
29						.33	.65	1.4	5.6	4.4	6.0	3.4
30						1.0	3.0	1.0	2.9	4.0	4.9	3.7
31						.77	---	.83	---	3.7	55	---
TOTAL						---	32.02	113.93	25.54	281.32	191.1	194.0
MEAN						---	1.07	3.68	.85	9.07	6.16	6.47
MAX						---	5.2	13	5.6	68	55	19
MIN						---	.45	.83	.18	.45	1.2	3.4
CFSM						---	.06	.21	.05	.52	.36	.37
IN.						---	.07	.24	.05	.60	.41	.42
AC-FT						---	64	226	51	558	379	385

05372950 SILVER CREEK AT ROCHESTER, MN--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6											
2	3.7											
3	3.8											
4	5.2											
5	4.4											
6	4.6											
7	4.5											
8	4.0											
9	3.3											
10	3.0											
11	3.0											
12	2.7											
13	2.6											
14	3.2											
15	3.6											
16	3.3											
17	4.0											
18	4.5											
19	5.7											
20	5.3											
21	4.9											
22	5.6											
23	5.6											
24	5.0											
25	5.0											
26	5.6											
27	4.8											
28	4.1											
29	4.2											
30	3.8											
31	4.0											
TOTAL	130.6											
MEAN	4.21											
MAX	5.7											
MIN	2.6											
CFSM	.24											
IN.	.28											
AC-FT	259											

05372950 SILVER CREEK AT ROCHESTER, MN

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1981 to October 1981.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: March 1981 to October 1981.
SUSPENDED-SEDIMENT DISCHARGE: March 1981 to October 1981.

REMARKS.--During the low-flow periods, daily sediment concentrations were estimated on the basis of water records and once or twice weekly sediment samples. Water temperatures were obtained when sediment samples were collected.

EXTREMES FOR CURRENT PERIOD.--March to September 1981:
SEDIMENT CONCENTRATIONS: Maximum daily mean during period, 1,320 mg/L July 11; minimum daily mean, 13 mg/L Apr. 22.
SEDIMENT LOADS: Maximum daily during period, 347 tons (315 tonnes) July 11; minimum daily, 0.0 tons (0.0 tonnes) Mar. 28.

October 1981:
SEDIMENT CONCENTRATIONS: Maximum daily mean during period, 78 mg/L Oct. 4; minimum daily mean, 23 mg/L Oct. 18-21.
SEDIMENT LOADS: Maximum daily during period, 1.1 tons (1.0 tonnes) Oct. 4; minnimum daily, 0.17 ton (0.15 tonne) Oct. 13.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						---	---	10.5	---	20.0	---	18.0
2						---	---	---	---	---	21.0	17.0
3						---	12.0	---	---	---	---	18.0
4						---	8.0	14.0	---	---	---	---
5						---	---	11.5	19.5	27.0	---	---
6						---	---	9.5	---	---	---	19.0
7						---	---	---	---	---	---	---
8						---	---	---	---	---	---	---
9						---	---	---	---	---	20.0	---
10						---	9.5	---	---	---	---	---
11						---	---	---	---	22.5	---	---
12						---	---	---	19.0	23.0	25.0	---
13						---	---	10.5	20.5	23.5	---	21.0
14						---	---	---	23.0	24.0	22.5	---
15						---	---	---	---	19.0	23.0	---
16						---	---	---	---	19.0	20.0	---
17						---	9.0	---	21.0	20.0	---	---
18						---	---	---	---	---	---	---
19						1.0	---	---	---	22.0	---	---
20						---	---	13.0	18.5	21.0	---	16.0
21						---	---	---	19.0	20.5	---	---
22						---	---	---	16.0	19.0	---	---
23						---	9.5	18.0	15.5	---	25.0	---
24						---	6.0	---	18.0	---	---	12.0
25						2.0	---	---	19.0	---	---	---
26						---	---	---	---	16.0	21.0	---
27						---	---	---	---	---	20.0	15.0
28						---	---	---	23.5	---	17.0	---
29						---	13.5	17.0	22.0	---	---	---
30						8.5	12.0	---	20.0	---	23.0	---
31						---	---	---	---	---	20.0	---

05372950 SILVER CREEK AT ROCHESTER, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---											
2	---											
3	---											
4	11.0											
5	---											
6	---											
7	---											
8	---											
9	---											
10	---											
11	11.0											
12	---											
13	---											
14	---											
15	---											
16	---											
17	---											
18	10.0											
19	---											
20	---											
21	---											
22	---											
23	---											
24	---											
25	9.0											
26	---											
27	---											
28	---											
29	---											
30	---											
31	9.0											

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)
JUL 11...	1630	118	1200	382	50	59	73

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)	SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM (70346)
JUL 11...	85	96	97	98	99	100

05372950 SILVER CREEK AT ROCHESTER, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1											---	---
2											---	---
3											---	---
4											---	---
5											---	---
6											---	---
7											---	---
8											---	---
9											---	---
10											---	---
11											---	---
12											---	---
13											---	---
14											---	---
15											---	---
16											---	---
17											---	---
18											---	---
19											16	.06
20											18	.05
21											21	.03
22											23	.02
23											24	.02
24											26	.02
25											28	.01
26											27	.01
27											27	.01
28											26	.00
29											29	.03
30											24	.06
31											22	.05
TOTAL											---	0.37

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	22	.04	72	.31	51	.10	172	.65	90	1.1	168	12
2	21	.03	61	.23	55	.10	144	.47	101	1.3	78	2.5
3	23	.04	77	1.0	69	.18	117	.31	83	.85	71	2.1
4	34	.48	115	4.3	63	.12	90	.21	80	.80	63	1.9
5	30	.18	72	2.5	56	.09	62	.11	83	.94	68	2.4
6	30	.11	62	1.5	51	.07	53	.07	81	.87	37	.91
7	29	.09	60	1.2	47	.06	60	.11	75	.63	43	1.0
8	28	.08	58	1.0	50	.08	50	.08	68	.55	34	.70
9	27	.07	56	.91	58	.13	45	.07	57	.40	33	.69
10	26	.06	54	.82	57	.11	42	.05	46	.32	31	.65
11	26	.07	52	.70	50	.07	1320	347	35	.24	45	1.0
12	26	.07	57	.69	44	.06	250	7.7	24	.14	34	.66
13	25	.06	68	.77	59	.14	113	2.1	21	.11	17	.22
14	25	.05	66	.66	52	.08	193	12	203	17	16	.19
15	24	.04	62	.54	63	.12	788	128	62	1.1	17	.19
16	30	.08	58	.47	53	.07	138	5.6	47	.46	17	.19
17	23	.06	54	.38	60	.08	133	4.0	44	.33	18	.20
18	21	.04	49	.29	52	.05	121	2.9	43	.29	18	.20
19	19	.04	45	.23	47	.05	157	5.7	41	.23	19	.22
20	17	.03	39	.18	92	.11	541	48	38	.17	20	.22
21	15	.02	36	.15	74	.14	174	3.5	37	.18	21	.19
22	13	.02	35	.12	53	.09	88	1.3	35	.17	23	.23
23	14	.04	53	.24	62	.25	93	1.6	32	.14	26	.26
24	33	.10	48	.25	85	.34	96	1.6	32	.10	32	.31
25	22	.05	47	.22	90	.12	97	1.6	41	.13	36	.39
26	20	.03	47	.20	82	.05	95	1.5	223	8.2	39	.43
27	20	.03	46	.17	84	.04	91	1.4	56	1.3	43	.42
28	20	.02	46	.15	94	.09	86	1.2	42	.86	44	.43
29	33	.06	53	.20	539	12	82	.97	52	.84	43	.39
30	95	.77	54	.15	228	1.8	78	.84	56	.74	41	.41
31	---	---	52	.12	---	---	73	.73	704	135	---	---
TOTAL	---	2.86	---	20.65	---	16.79	---	581.37	---	175.49	---	31.60

05372950 SILVER CREEK AT ROCHESTER, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	37	.36										
2	33	.33										
3	37	.38										
4	78	1.1										
5	44	.52										
6	53	.66										
7	50	.61										
8	45	.49										
9	41	.37										
10	37	.30										
11	32	.26										
12	27	.20										
13	24	.17										
14	42	.36										
15	68	.66										
16	47	.42										
17	31	.33										
18	23	.28										
19	23	.35										
20	23	.33										
21	23	.30										
22	24	.36										
23	24	.36										
24	25	.34										
25	26	.35										
26	32	.48										
27	32	.41										
28	26	.29										
29	25	.28										
30	25	.26										
31	66	.71										
TOTAL	---	12.62										

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	NUMBER OF SAM-PLING POINTS (00063)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	BED MAT. FALL DIAM. % FINER THAN .004 MM (80157)	BED MAT. FALL DIAM. % FINER THAN .062 MM (80158)	BED MAT. FALL DIAM. % FINER THAN .125 MM (80159)	BED MAT. FALL DIAM. % FINER THAN .250 MM (80160)	BED MAT. FALL DIAM. % FINER THAN .500 MM (80161)	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)
JUL												
13...	0800	3	7.3	32	72	73	81	90	93	95	97	100

05372990 CASCADE CREEK AT ROCHESTER, MN

LOCATION.--Lat 44°01'41", long 92°29'03", in NW¼SE¼ sec.34, T.107 N., R.14 W., Olmsted County, Hydrologic Unit 07040004, on downstream side of bridge on 16th Street NW at Rochester, and 1.5 mi (2.4 km) upstream from mouth.

DRAINAGE AREA.--35.8 mi^2 (92.7 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Annual maximum discharge, water years 1969-80. March 1981 to October 1981.

GAGE.--Nonrecording gage and crest-stage gage. Datum of gage is 980.00 ft (298.704 m) National Geodetic Vertical Datum of 1929. Prior to March 1981, crest-stage gage at site 0.9 mi (1.4 km) downstream at datum 12.16 ft (3.706 m) lower.

REMARKS.--Records fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,050 ft^3/s (58.1 m^3/s) June 21, 1974, gage height, 17.84 ft (5.438 m).

EXTREMES FOR CURRENT PERIOD.--Water year 1981: Maximum discharge, 1,060 ft^3/s (30.0 m^3/s) July 11, gage height, 14.46 ft (4.407 m); minimum (March to September), 1.2 ft^3/s (0.034 m^3/s) June 6, 7, 12, gage height, 9.85 ft (3.002 m).

October 1981: Maximum discharge during period, 43 ft^3/s (1.22 m^3/s) Oct. 17, gage height, 10.74 ft (3.274 m); minimum, 36 ft^3/s (0.10 m^3/s) Oct. 2, gage height, 10.03 ft (3.057 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						---	3.4	4.8	2.1	17	6.3	38
2						---	2.9	5.5	1.7	12	5.5	23
3						---	4.8	6.3	1.6	8.8	11	18
4						---	7.2	14	1.5	7.5	6.0	16
5						---	7.2	22	1.4	6.3	7.2	13
6						---	5.2	14	1.2	5.0	9.6	12
7						---	4.8	10	1.2	4.3	5.5	12
8						---	4.8	8.8	1.5	3.6	5.0	11
9						---	4.3	7.8	1.6	2.7	4.5	9.6
10						---	4.1	6.9	1.5	2.6	3.8	8.1
11						---	3.8	6.3	1.3	446	3.2	7.8
12						---	4.1	5.2	1.2	237	2.9	6.9
13						---	4.5	5.0	1.7	48	4.3	6.0
14						---	4.1	4.8	2.7	38	20	5.5
15						---	3.6	4.3	3.8	75	22	5.0
16						---	4.3	3.6	3.8	42	11	4.1
17						---	4.1	3.4	2.9	30	8.1	3.4
18						---	3.6	3.2	2.6	24	6.6	3.2
19						3.2	5.2	3.1	2.6	19	5.2	3.1
20						3.1	3.8	3.1	2.9	30	4.8	3.1
21						3.1	3.8	2.9	2.7	16	3.8	2.9
22						3.4	4.3	2.6	2.9	14	3.6	2.7
23						2.9	4.3	6.7	3.2	12	3.6	2.4
24						2.4	4.3	5.5	5.2	12	4.1	2.4
25						2.2	4.1	5.7	11	12	3.1	1.9
26						2.1	3.8	4.3	5.7	12	9.0	2.6
27						1.7	3.6	3.4	4.1	11	35	4.5
28						1.7	3.4	3.1	15	7.8	32	4.1
29						1.9	6.2	3.1	28	7.2	25	4.1
30						3.1	3.4	2.7	47	7.5	19	3.8
31						3.6	---	2.4	---	7.2	46	---
TOTAL						---	131.0	184.5	165.6	1177.5	336.7	240.2
MEAN						---	4.37	5.95	5.52	38.0	10.9	8.01
MAX						---	7.2	22	47	446	46	38
MIN						---	2.9	2.4	1.2	2.6	2.9	1.9
CFSM						---	.12	.16	.15	1.03	.30	.22
IN.						---	.13	.19	.17	1.18	.34	.24
AC-FT						---	260	366	328	2340	668	476

05372990 CASCADE CREEK AT ROCHESTER, MN--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2											
2	3.1											
3	3.8											
4	6.0											
5	5.2											
6	4.8											
7	4.1											
8	3.8											
9	4.1											
10	4.5											
11	4.5											
12	4.3											
13	4.1											
14	5.0											
15	17											
16	14											
17	14											
18	12											
19	12											
20	11											
21	10											
22	7.5											
23	7.5											
24	8.1											
25	8.1											
26	5.5											
27	5.5											
28	6.6											
29	6.9											
30	7.2											
31	6.6											
TOTAL	220.0											
MEAN	7.10											
MAX	17											
MIN	3.1											
CFSM	.19											
IN.	.22											
AC-FT	436											

05372990 CASCADE CREEK AT ROCHESTER, MN

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1981 to October 1981.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: March 1981 to October 1981.
SUSPENDED-SEDIMENT DISCHARGE: March 1981 to October 1981.

REMARKS.--During low-flow periods, daily sediment concentrations were estimated on the basis of water records and once or twice weekly sediment samples. Water temperatures were obtained when sediment samples were collected.

EXTREMES FOR CURRENT PERIOD.--March to September 1981:
SEDIMENT CONCENTRATIONS: Maximum daily mean during period, 1,060 mg/L July 11; minimum daily mean, 14 mg/L Mar. 19, 20.
SEDIMENT LOADS: Maximum daily during period, 1,810 tons (1,640 tonnes) July 11; minimum daily, 0.12 ton (0.11 tonne) Mar. 19, 20, June 12.

October 1981:
SEDIMENT CONCENTRATIONS: Maximum daily mean during period, 96 mg/L Oct. 4; minimum daily mean, 23 mg/L Oct. 29-31.
SEDIMENT LOADS: Maximum daily during period, 3.1 tons (2.8 tonnes) Oct. 15, 17; minimum daily, 0.36 ton (0.33 tonne) Oct. 27.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1			---		---	---	---	10.5	---	21.0	---	20.0
2			---		---	---	---	---	---	21.5	21.0	21.0
3			---		---	---	12.0	---	---	---	---	21.0
4			---		---	---	---	15.0	---	---	---	---
5			---		---	---	---	12.5	20.0	28.0	---	---
6			---		---	---	---	11.5	---	---	---	21.0
7			---		---	---	---	---	---	---	---	---
8			---		---	---	---	---	---	---	---	---
9			---		---	---	---	---	---	---	21.0	---
10			---		---	---	10.5	---	---	---	---	---
11			---		---	---	---	---	---	22.0	---	---
12			---		---	---	---	---	19.0	24.0	---	---
13			---		---	---	---	11.0	20.5	24.0	27.0	22.0
14			---		---	---	---	---	23.0	22.0	23.0	---
15			---		---	---	---	---	---	21.0	23.0	---
16			---		---	---	---	---	---	19.0	18.0	---
17			---		---	---	11.0	---	---	19.0	17.0	---
18			---		---	---	---	---	21.0	---	18.0	---
19			---		---	3.5	11.0	---	---	22.0	---	---
20			---		---	---	---	13.0	17.0	21.0	---	17.0
21			---		---	---	---	---	18.0	---	---	---
22			---		---	---	---	---	---	---	---	---
23			---		---	---	11.0	18.0	---	---	25.0	---
24			---		6.0	---	10.5	15.0	15.0	---	---	15.0
25			---		---	6.0	---	14.0	18.0	---	---	---
26			---		4.5	---	---	---	18.0	16.0	---	---
27			---		---	---	---	---	24.0	---	13.0	15.0
28			---		---	---	---	---	23.0	---	18.0	---
29			---		---	---	12.0	16.5	21.5	---	20.0	---
30			---		---	8.5	12.5	---	21.0	---	24.0	---
31			5.0		---	---	---	---	---	---	22.0	---

05372990 CASCADE CREEK AT ROCHESTER, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1											---	---
2											---	---
3											---	---
4											---	---
5											---	---
6											---	---
7											---	---
8											---	---
9											---	---
10											---	---
11											---	---
12											---	---
13											---	---
14											---	---
15											---	---
16											---	---
17											---	---
18											---	---
19											14	.12
20											14	.12
21											22	.18
22											47	.43
23											45	.35
24											40	.26
25											33	.20
26											31	.18
27											30	.14
28											30	.14
29											32	.16
30											41	.34
31											42	.41
TOTAL											---	3.03

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	38	.35	103	1.3	88	.50	193	8.9	83	1.4	82	8.6
2	32	.25	97	1.4	86	.39	161	5.2	74	1.1	70	4.3
3	86	1.9	79	1.3	84	.36	131	3.1	88	2.9	85	4.1
4	100	1.9	57	2.2	83	.34	98	2.0	86	1.4	54	2.3
5	83	1.6	67	4.0	81	.31	72	1.2	92	1.8	48	1.7
6	71	1.0	70	2.6	75	.24	65	.88	107	2.8	44	1.4
7	66	.86	66	1.8	68	.22	62	.72	94	1.4	41	1.3
8	63	.82	63	1.5	63	.26	59	.57	90	1.2	39	1.2
9	59	.68	60	1.3	57	.25	56	.41	77	.94	36	.93
10	56	.62	62	1.2	49	.20	53	.37	58	.60	28	.61
11	55	.56	74	1.3	43	.15	1060	1810	45	.39	25	.53
12	53	.59	109	1.5	37	.12	336	306	41	.32	23	.43
13	51	.62	128	1.7	33	.15	115	15	45	.52	20	.32
14	49	.54	124	1.6	56	4.1	98	11	77	4.2	21	.31
15	47	.46	121	1.4	67	.69	215	47	43	2.6	22	.30
16	58	.67	117	1.1	70	.72	98	11	45	1.3	23	.25
17	41	.45	113	1.0	66	.52	105	8.5	49	1.1	23	.21
18	33	.32	109	.94	52	.37	97	6.3	46	.82	24	.21
19	39	.55	104	.87	45	.32	92	4.7	41	.58	26	.22
20	32	.33	100	.84	90	.76	107	8.7	36	.47	27	.23
21	32	.33	95	.74	72	.52	108	4.7	31	.32	26	.20
22	37	.43	90	.63	58	.45	95	3.6	25	.24	25	.18
23	40	.46	96	1.8	64	.55	90	2.9	19	.18	38	.25
24	72	.84	64	.95	72	1.0	94	3.0	40	.44	55	.36
25	69	.76	54	.83	97	2.9	110	3.6	43	.36	51	.26
26	62	.64	60	.70	83	1.3	113	3.7	90	2.5	48	.34
27	54	.52	72	.66	56	.62	107	3.2	78	7.4	68	.83
28	47	.43	87	.73	219	35	100	2.1	49	4.2	63	.70
29	127	3.2	92	.77	259	24	93	1.8	26	1.8	53	.59
30	93	.85	90	.66	298	40	93	1.9	38	1.9	50	.51
31	---	---	89	.58	---	---	91	1.8	108	15	---	---
TOTAL	---	23.53	---	39.90	---	117.31	---	2283.85	---	62.18	---	33.67

05372990 CASCADE CREEK AT ROCHESTER, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	50	.43										
2	50	.42										
3	58	.60										
4	96	1.6										
5	79	1.1										
6	72	.93										
7	62	.69										
8	58	.60										
9	59	.65										
10	72	.87										
11	75	.91										
12	70	.81										
13	58	.64										
14	46	.62										
15	67	3.1										
16	64	2.4										
17	82	3.1										
18	55	1.8										
19	52	1.7										
20	52	1.5										
21	52	1.4										
22	51	1.0										
23	51	1.0										
24	51	1.1										
25	49	1.1										
26	34	.50										
27	24	.36										
28	24	.43										
29	23	.43										
30	23	.45										
31	23	.41										
TOTAL	---	32.65										

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)
JUL												
11...	1530	739	2040	4070	62	73	83	87	94	95	96	100
11...	2040	977	1060	2800	63	73	82	86	95	95	97	100

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	NUMBER OF SAM-PLING POINTS (00063)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	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 16.0 MM (80172)
JUL											
13...	0900	3	50	0	4	40	78	92	97	99	100

05372995 SOUTH FORK ZUMBRO RIVER AT ROCHESTER, MN

LOCATION.--Lat 44°03'42", long 92°27'58", in NW¼NE¼ sec.23, T.107 N., R.14 W., Olmsted County, Hydrologic Unit 07040004, on left bank 50 ft (15 m) downstream from 37th Street bridge, 0.2 mi (0.3 km) upstream from sewer plant, and 2.0 mi (3.2 km) downstream from Silver Lake Dam.

DRAINAGE AREA.--303 mi^2 (785 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March to September 1981.

GAGE.--Water-stage recorder. Datum of gage is 950.00 ft (289.560 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. 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 (8.53 m), discharge 30,500 ft^3/s (864 m^3/s). This is the highest known stage since at least 1908.

EXTREMES FOR CURRENT PERIOD.--Peak discharges above base of 1,300 ft^3/s (36.8 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
July 11	2400	*6,610	187	*15.98	4.871	July 20	1800	1,380	39.1	8.16	2.487
July 15	1615	1,320	37.4	7.98	2.432						

Minimum discharge, 37 ft^3/s (1.05 m^3/s) July 10, 11, gage height, 3.45 ft (1.052 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						---	106	94	90	189	181	520
2						---	102	90	85	135	211	372
3						---	126	122	77	109	517	317
4						---	154	249	73	95	455	283
5						---	170	314	67	86	369	254
6						---	142	253	62	73	748	235
7						---	126	206	61	61	369	241
8						---	125	182	70	52	266	218
9						---	116	162	60	45	214	202
10						---	110	145	59	39	189	182
11						---	107	136	55	2560	165	167
12						---	109	125	53	4180	147	155
13						---	103	123	79	1020	134	144
14						---	97	118	75	616	356	136
15						---	92	110	79	1070	517	123
16						---	97	100	67	991	303	119
17						---	92	92	64	551	225	117
18						---	87	90	59	433	193	111
19						---	101	83	51	372	164	112
20						---	93	80	63	997	143	108
21						---	89	76	79	679	129	103
22						---	87	71	76	410	115	93
23						---	94	104	77	346	105	93
24						---	96	93	91	318	107	92
25						---	90	94	91	284	100	92
26						79	85	98	69	248	175	119
27						73	84	94	57	229	419	125
28						69	87	91	157	218	604	108
29						92	108	92	274	188	420	94
30						101	98	136	431	175	324	92
31						113	---	104	---	159	688	---
TOTAL						---	3173	3927	2751	16928	9052	5127
MEAN						---	106	127	91.7	546	292	171
MAX						---	170	314	431	4180	748	520
MIN						---	84	71	51	39	100	92
CFSM						---	.35	.42	.30	1.80	.96	.56
IN.						---	.39	.48	.34	2.08	1.11	.63
AC-FT						---	6290	7790	5460	33580	17950	10170

05372995 SOUTH FORK ZUMBRO RIVER AT ROCHESTER, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD OF RECORD.--March 1981 to September 1981.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: March 1981 to September 1981.
SUSPENDED-SEDIMENT DISCHARGE: March 1981 to September 1981.

REMARKS.--During the low-flow periods, daily sediment concentrations were estimated on the basis of water records and once or twice weekly sediment samples. Water temperatures were obtained when sediment samples were collected.

EXTREMES FOR CURRENT PERIOD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,430 mg/L July 11; minimum daily mean, 18 mg/L Sept. 20, 21.
SEDIMENT LOADS: Maximum daily, 13,200 tons (12,000 tonnes) July 12; minimum daily, 5.0 tons (4.5 tonnes) June 19, Sept 21.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						---	---	12.5	19.0	24.0	---	20.0
2						---	---	---	20.0	24.0	23.0	19.0
3						---	15.0	---	---	---	24.0	20.0
4						---	---	16.5	---	---	20.0	---
5						---	---	14.0	22.0	---	21.0	---
6						---	---	13.5	---	---	22.0	21.0
7						---	---	---	---	---	18.0	---
8						---	---	14.5	---	---	22.0	---
9						---	---	---	---	---	23.0	---
10						---	14.0	---	25.5	---	23.0	---
11						---	---	---	---	23.0	---	---
12						---	---	---	23.0	24.0	---	---
13						---	---	14.5	25.0	25.5	---	21.0
14						---	---	---	26.0	24.0	26.0	---
15						---	---	---	---	21.5	24.0	---
16						---	---	---	22.0	20.0	22.0	---
17						---	14.0	---	26.0	20.0	20.0	---
18						---	---	---	21.5	23.0	20.0	---
19						---	14.0	---	---	24.0	20.0	---
20						---	---	16.0	23.5	23.0	---	17.0
21						---	---	---	22.5	22.0	---	21.0
22						---	---	---	21.0	20.0	---	---
23						---	---	17.0	---	19.5	23.0	---
24						---	15.5	17.5	23.0	---	---	16.0
25						---	---	---	---	---	---	---
26						---	---	---	---	18.0	---	---
27						---	---	---	---	---	22.0	15.0
28						---	---	---	26.0	---	20.0	---
29						---	15.5	19.0	24.0	---	21.0	---
30						13.5	14.0	19.5	23.0	---	23.0	---
31						---	---	18.0	---	---	21.0	---

05372995 SOUTH FORK ZUMBRO RIVER AT ROCHESTER, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
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											42	9.0
27											41	8.1
28											41	7.6
29											57	14
30											51	14
31											54	16
TOTAL											---	68.7

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	53	15	50	13	64	16	216	110	71	39	155	224
2	47	13	47	11	72	17	70	26	61	35	110	110
3	63	26	78	35	73	15	63	19	254	480	88	75
4	71	30	95	65	72	14	63	16	151	207	77	59
5	75	34	81	69	71	13	63	15	137	190	70	48
6	60	23	57	39	64	11	62	12	251	546	67	43
7	49	17	55	31	56	9.2	61	10	98	98	98	64
8	43	15	55	27	59	11	58	8.1	78	56	73	43
9	40	13	54	24	53	8.6	55	6.7	75	43	56	31
10	39	12	54	21	49	7.8	52	5.5	74	38	47	23
11	39	11	54	20	43	6.4	1430	13100	64	29	40	18
12	38	11	54	18	38	5.4	1050	13200	52	21	37	15
13	37	10	54	18	56	12	265	730	44	16	36	14
14	36	9.4	52	17	46	9.3	264	498	95	98	33	12
15	34	8.4	49	15	76	16	842	2540	124	175	31	10
16	31	8.1	47	13	66	12	450	1200	78	64	28	9.0
17	27	6.7	44	11	61	11	190	283	61	37	26	8.2
18	26	6.1	42	10	44	7.0	121	141	57	30	23	6.9
19	46	13	39	8.7	36	5.0	113	118	59	26	21	6.4
20	44	11	37	8.0	76	14	568	1720	56	22	18	5.2
21	42	10	35	7.2	88	19	279	556	49	17	18	5.0
22	40	9.4	33	6.3	93	19	123	136	43	13	22	5.5
23	38	9.6	41	13	87	18	123	115	38	11	34	8.5
24	36	9.3	35	8.8	81	20	118	101	47	14	39	9.7
25	35	8.5	38	9.6	74	18	113	87	39	11	38	9.4
26	35	8.0	42	11	68	13	107	72	82	44	53	17
27	35	7.9	42	11	62	9.5	98	61	125	172	45	15
28	35	8.2	42	10	226	404	88	52	132	225	35	10
29	104	42	42	10	292	245	79	40	66	75	35	8.9
30	71	19	63	23	438	528	68	32	56	49	35	8.7
31	---	---	62	17	---	---	57	24	210	411	---	---
TOTAL	---	424.6	---	600.6	---	1514.2	---	35034.3	---	3292	---	922.4

05372995 SOUTH FORK ZUMBRO RIVER AT ROCHESTER, MN--Continued

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)
DEC											
01...	1700	54	137	20	--	--	--	--	--	--	--
JAN											
05...	1525	35	31	2.9	--	--	--	--	--	--	--
FEB											
27...	1650	235	75	48	--	--	--	--	--	--	--
APR											
24...	1500	96	35	9.1	--	--	--	--	--	--	--
JUN											
17...	1815	64	60	10	--	--	--	--	--	--	--
18...	1450	55	40	5.9	--	--	--	--	--	--	--
JUL											
12...	1635	3620	634	6200	57	68	85	89	90	97	100
AUG											
14...	1700	327	56	49	--	--	--	--	--	--	--
SEP											
24...	1920	93	39	9.8	--	--	--	--	--	--	--

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	NUMBER OF SAM-PLING POINTS (00063)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	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)
JUL							
13...	0930	3	1060	0	1	8	38

DATE	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 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)
JUL						
13...	73	85	91	95	97	100

05373000 SOUTH FORK ZUMBRO RIVER NEAR ROCHESTER, MN

LOCATION.--Lat 44°04'00", long 92°27'55", in SE¼ sec.14, T.107 N., R.14 W., Olmsted County, Hydrologic Unit 07040004, on left bank 0.2 mi (0.3 km) downstream from sewage plant, 1.6 mi (2.6 km) north of Rochester, 2 mi (3 km) downstream from Cascade Creek, and 2.5 mi (4.0 km) downstream from Silver Lake Dam.

DRAINAGE AREA.--304 mi^2 (787 km^2).

PERIOD OF RECORD.--January 1952 to September 1981 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 949.56 ft (289.426 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Slight regulation at times from Silver Lake and at very low flows from sewage-plant effluent.

AVERAGE DISCHARGE.--29 years, 153 ft^3/s (4.333 m^3/s), 6.83 in/yr (173 mm/yr); median of yearly mean discharges, 139 ft^3/s (3.94 m^3/s), 6.21 in/yr (158 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,500 ft^3/s (864 m^3/s) July 6, 1978, gage height, 23.36 ft (7.120 m) from floodmarks; minimum, 8.4 ft^3/s (0.24 m^3/s) Dec. 7, 1955.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 21, 1951, reached a stage of about 17.5 ft (5.33 m), discharge, 15,000 ft^3/s (425 m^3/s), from information by sewage plant superintendent. This is the highest known stage outside the period of record since at least 1908.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,300 ft^3/s (36.8 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
July 12	0030	*6,310	179	*13.59	4.142	July 20	1815	1,420	40.2	6.89	2.100
July 15	1700	1,390	39.4	6.82	2.079						

Minimum discharge, 32 ft^3/s (0.91 m^3/s) Jan. 21, 22, gage height, 2.40 ft (0.732 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	100	91	73	55	49	231	127	114	106	172	191	575
2	97	88	56	53	50	182	120	107	99	124	218	391
3	93	88	66	52	52	144	142	135	94	103	563	340
4	90	89	71	49	51	130	178	267	88	90	483	298
5	85	85	77	49	51	108	196	337	84	82	391	267
6	85	85	82	49	49	100	175	283	76	77	827	243
7	80	85	83	49	48	86	156	236	74	70	382	250
8	77	83	89	47	50	86	154	208	88	63	277	232
9	75	81	75	47	50	100	147	187	78	58	227	210
10	75	78	76	45	50	156	142	168	79	53	206	193
11	70	76	72	45	50	206	138	163	74	2340	185	181
12	67	75	82	45	51	339	141	152	72	4140	170	168
13	69	78	71	44	51	464	132	147	93	1030	157	157
14	74	78	76	44	50	246	128	140	86	614	376	152
15	74	74	78	44	66	229	119	132	94	1120	563	145
16	104	73	77	44	177	191	116	124	84	1040	317	140
17	88	73	78	45	269	147	110	118	80	536	241	135
18	90	74	90	43	214	122	105	114	77	391	208	129
19	85	72	47	81	138	110	120	108	72	317	183	126
20	83	72	53	38	106	103	112	106	80	1020	166	120
21	80	71	51	37	123	97	112	102	94	740	154	118
22	77	70	53	39	171	93	113	96	98	421	144	114
23	106	69	55	47	108	92	121	126	95	343	134	113
24	165	70	54	47	108	88	121	114	111	312	137	100
25	142	65	48	44	103	87	113	116	108	275	129	111
26	121	69	49	46	95	88	103	116	90	246	193	134
27	112	71	50	47	208	86	103	110	78	232	444	139
28	103	70	48	47	316	83	103	106	159	221	672	123
29	98	74	54	46	---	103	127	104	239	197	438	114
30	96	72	56	47	---	118	120	149	385	185	331	113
31	96	---	57	48	---	132	---	117	---	174	761	---
TOTAL	2857	2299	2047	1463	2904	4547	3894	4602	3135	16786	9868	5631
MEAN	92.2	76.6	66.0	47.2	104	147	130	148	105	541	318	188
MAX	165	91	90	81	316	464	196	337	385	4140	827	575
MIN	67	65	47	37	48	83	103	96	72	53	129	100
CFSM	.30	.25	.22	.16	.34	.48	.43	.49	.35	1.78	1.05	.62
IN.	.35	.28	.25	.18	.36	.56	.48	.56	.38	2.05	1.21	.69

CAL YR 1980 TOTAL 52816 MEAN 144 MAX 3140 MIN 47 CFSM .47 IN 6.46
WTR YR 1981 TOTAL 60033 MEAN 164 MAX 4140 MIN 37 CFSM .54 IN 7.35

05374900 ZUMBRO RIVER AT KELLOGG, MN

LOCATION.--Lat 44°18'43", long 92°00'14", in SW¼ sec.22, T.110 N., R.10 W., Wabasha County, Hydrologic Unit 07040004, on right bank at downstream side of bridge on U.S. Highway 61, and 4 mi (6.4 km) above mouth.

DRAINAGE AREA.--1,400 mi^2 (3,630 km^2).

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 669.47 ft (204.054 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for winter period, which are fair. Some regulation by powerplant upstream from station.

AVERAGE DISCHARGE.--6 years, 678 ft^3/s (19.20 m^3/s), 6.58 in/yr (167 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,800 ft^3/s (476 m^3/s) July 8, 1978, gage height, 13.70 ft (4.176 m); minimum daily, 140 ft^3/s (3.96 m^3/s) Dec. 3, 1980; minimum gage height, 1.69 ft (0.515 m) Dec. 2, 1980, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--A discharge of 33,000 ft^3/s (935 m^3/s) occurred on July 22, 1951, at station 05374500, 20 mi (32 km) upstream and this was the greatest since 1938.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,500 ft^3/s (99.1 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
July 14	0145	*7170	203	*9.43	2.874	Aug. 31	1900	5270	149	7.99	2.435
Aug. 16	1115	3560	101	6.47	1.972						

Minimum daily discharge, 140 ft^3/s (3.96 m^3/s) Dec. 3; minimum gage height, 1.69 ft (0.515 m) Dec. 2, result of freezeup.

PEAK DISCHARGE FOR WATER YEARS 1976 TO 1980.--Peak discharge above base of 3,500 ft^3/s (99.1 m^3/s) and maximum (*):

Water year	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Water year	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
1976	Mar. 13	2000	*9360	265	*10.00	3.048	1978	Sept. 13	0530	3540	100	6.61	2.015
1977	June 5	1515	*2920	82.7	*5.84	1.780		Sept. 14	1315	3860	109	6.92	2.109
1978	July 2	0100	14,400	408	12.70	3.871	1979	Mar. 24	1900	3890	110	6.93	2.112
	July 8	0600	*16,800	476	*13.70	4.176		Apr. 1	2000	6530	185	8.75	2.667
	July 19	1200	4210	119	6.98	2.128		Aug. 31	1500	*9500	269	*10.34	3.152
	July 24	2100	5180	147	7.74	2.359	1980	Mar. 20	1330	*14,400	408	*12.57	3.831

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	596	450	261	280	322	1540	576	556	649	698	682	2880
2	571	520	156	280	323	1380	569	528	566	922	682	2200
3	556	640	140	280	325	1170	647	573	546	912	634	1740
4	497	755	150	280	328	824	547	652	521	845	757	1460
5	482	780	165	280	330	800	629	921	506	726	1030	1330
6	482	789	185	283	331	765	653	1160	497	603	1020	1240
7	479	574	195	285	332	862	786	1270	497	605	1560	1170
8	476	477	210	288	334	868	804	1300	541	618	1510	1110
9	477	473	225	289	336	872	765	1170	487	568	1260	1090
10	448	455	240	290	338	731	651	1060	450	466	1070	1060
11	457	437	255	290	340	751	606	1020	464	1560	1010	1040
12	432	418	260	292	342	987	586	1000	450	4170	970	863
13	429	527	260	294	344	1210	559	896	441	6010	929	655
14	427	372	260	295	346	1030	545	777	511	5280	1280	685
15	429	545	260	296	350	958	555	771	676	2730	2160	751
16	444	413	260	297	530	778	503	709	720	2320	3270	565
17	451	369	260	299	880	720	499	692	654	2780	2260	600
18	458	363	260	300	1300	646	483	643	576	2210	1560	607
19	432	375	270	302	2000	694	521	606	478	1710	1330	601
20	430	469	280	303	1800	636	535	591	566	1400	1210	600
21	420	555	280	304	1550	597	534	576	511	1460	1010	591
22	423	370	280	306	1370	503	537	560	516	1660	941	513
23	419	317	280	309	1160	481	544	556	511	1450	1000	566
24	446	290	280	310	939	552	551	576	511	1220	770	565
25	512	282	280	311	812	514	550	591	560	1060	827	560
26	468	282	280	312	681	512	522	612	560	982	750	650
27	490	271	280	313	714	497	448	546	521	921	968	700
28	475	267	280	318	1610	503	492	612	516	905	1230	650
29	462	262	280	319	---	514	563	800	754	881	2360	600
30	459	257	280	320	---	516	555	748	742	746	2830	550
31	455	---	280	321	---	517	---	681	---	697	3890	---
TOTAL	14482	13354	7632	9246	20367	23928	17315	23753	16498	49115	42760	28192
MEAN	467	445	246	298	727	772	577	766	550	1584	1379	940
MAX	596	789	280	321	2000	1540	804	1300	754	6010	3890	2880
MIN	419	257	140	280	322	481	448	528	441	466	634	513
CFSM	.33	.32	.18	.21	.52	.55	.41	.55	.39	1.13	.99	.67
IN.	.38	.35	.20	.25	.54	.64	.46	.63	.44	1.31	1.14	.75

CAL YR 1980 TOTAL 235855 MEAN 644 MAX 13700 MIN 140 CFSM .46 IN 6.27
WTR YR 1981 TOTAL 266642 MEAN 731 MAX 6010 MIN 140 CFSM .52 IN 7.09

05374900 ZUMBRO RIVER AT KELLOGG, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--August 1975 to September 1981 (discontinued).

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: August 1975 to September 1981.
SUSPENDED-SEDIMENT DISCHARGE: August 1975 to September 1981.

REMARKS.--During the winter period, daily sediment concentrations were estimated on the basis of water records and weekly sediment samples. Water temperatures were obtained when sediment samples were collected.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum daily, 29.0°C July 10, 1976, July 5, 1977; minimum daily, 0.0°C on many days each year.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 6,670 mg/L May 31, 1979; minimum daily mean, 2 mg/L Nov. 29, 1976.
SEDIMENT LOADS: Maximum daily, 63,700 tons (57,800 tonnes) July 1, 1978; minimum daily, 1.7 tons (1.5 tonnes) Nov. 29, 30, 1976.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum daily, 27.5°C July 9; minimum daily, 0.0°C on many days.
SEDIMENT CONCENTRATIONS: Maximum daily mean 3,820 mg/L July 12; minimum daily mean, 11 mg/L Jan. 25.
SEDIMENT LOADS: Maximum daily, 41,300 tons (37,500 tonnes) July 12; minimum daily, 9.2 tons (8.3 tonnes) Jan. 25.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.5	5.5	2.0	---	.5	3.0	8.0	13.0	21.5	21.0	22.5	20.0
2	12.5	5.5	.0	---	---	3.5	9.0	13.0	22.0	24.0	21.0	18.5
3	11.0	6.0	---	---	---	1.5	---	15.0	18.0	23.5	25.0	19.0
4	12.5	7.0	1.5	.5	---	2.0	8.5	16.0	22.0	26.5	23.0	20.0
5	9.5	6.0	1.0	---	---	4.0	8.0	16.0	22.0	24.5	---	18.5
6	11.5	6.0	1.0	.0	---	2.0	11.0	14.0	22.5	25.5	25.0	17.0
7	---	8.0	1.0	---	---	4.0	9.0	16.0	19.5	24.0	23.0	18.5
8	16.0	7.0	.5	---	1.0	3.0	10.5	14.0	19.0	26.5	22.0	18.5
9	13.5	7.0	.5	---	---	5.5	9.5	13.5	---	27.5	24.0	18.5
10	13.5	6.5	1.0	.0	---	5.0	13.0	12.5	19.5	24.0	23.5	18.0
11	10.0	5.5	1.0	---	---	6.0	13.0	15.5	18.5	22.0	24.0	20.5
12	8.0	6.0	1.0	---	---	6.0	15.0	14.5	21.0	23.5	24.5	---
13	7.0	6.0	---	---	---	6.0	13.0	16.0	21.0	25.0	23.5	20.0
14	7.5	5.5	---	---	---	4.0	13.0	16.0	24.0	23.0	22.0	20.5
15	9.5	5.5	---	---	---	---	13.5	15.0	22.0	22.0	22.0	19.0
16	9.0	4.5	---	---	---	8.0	---	18.0	---	24.5	22.0	16.0
17	10.5	4.0	---	---	---	5.0	12.0	14.5	21.5	24.5	22.0	14.0
18	8.0	3.0	---	1.5	---	5.0	11.0	13.5	22.5	25.5	21.0	13.0
19	8.5	4.5	---	---	---	4.5	13.0	18.0	19.5	23.5	23.0	14.5
20	7.5	3.0	---	---	---	4.0	13.0	14.5	18.0	23.0	23.0	17.0
21	9.0	3.0	.0	---	---	5.5	10.0	17.5	18.0	23.5	19.5	16.0
22	6.5	3.5	---	---	3.0	10.0	11.0	19.5	17.5	---	20.0	---
23	8.0	4.0	---	---	3.0	10.0	8.5	19.0	19.0	22.0	21.0	14.0
24	8.0	3.0	---	---	5.0	8.0	8.0	17.0	22.0	21.0	22.0	13.0
25	6.0	1.5	---	---	5.5	7.5	10.0	15.5	21.0	21.0	21.0	15.5
26	4.5	1.0	---	---	5.5	8.0	15.0	16.0	20.5	19.5	20.5	16.5
27	4.0	2.5	1.0	---	4.0	6.5	19.0	17.0	21.0	18.0	19.0	14.0
28	3.5	1.5	---	---	2.0	13.0	14.0	18.0	22.0	21.0	19.0	13.0
29	5.0	2.5	---	---	---	13.0	13.0	20.5	23.0	22.0	21.5	14.0
30	4.5	3.0	---	---	---	11.0	13.0	19.5	22.0	22.0	20.5	14.0
31	6.0	---	---	---	---	9.0	---	16.5	---	21.0	21.0	---
MEAN		4.5						16.0				

05374900 ZUMBRO RIVER AT KELLOGG, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	90	145	29	35	23	16	25	19	33	29	520	2160
2	92	142	48	67	24	10	27	20	30	26	295	1100
3	57	86	54	93	30	11	31	23	24	21	220	695
4	53	71	84	171	72	29	33	25	23	20	127	283
5	49	64	61	128	52	23	32	24	22	20	130	281
6	44	57	50	107	27	13	42	32	20	18	112	231
7	47	61	37	57	60	32	40	31	19	17	152	354
8	50	64	45	58	87	49	36	28	18	16	143	335
9	45	58	43	57	34	21	32	25	20	18	136	320
10	37	45	25	31	77	50	27	21	20	18	125	247
11	34	42	27	32	68	47	26	20	20	18	145	311
12	34	40	29	33	57	40	25	20	20	18	624	1680
13	40	46	38	54	66	46	23	18	24	22	593	1960
14	46	53	26	26	64	45	21	17	37	35	458	1270
15	40	46	40	59	62	44	20	16	54	51	238	616
16	36	43	30	33	59	41	23	18	160	229	125	263
17	44	54	17	17	56	39	27	22	440	1050	122	237
18	38	47	17	17	53	37	30	24	560	1970	92	160
19	34	40	16	16	50	36	28	23	580	3130	122	229
20	42	49	23	29	46	35	30	25	470	2280	65	112
21	38	43	61	91	42	32	38	31	390	1630	52	84
22	28	32	31	31	39	29	36	30	460	1700	45	61
23	23	26	18	15	37	28	32	27	285	893	48	62
24	28	34	12	9.4	33	25	24	20	208	527	83	124
25	43	59	24	18	27	20	11	9.2	155	340	60	83
26	48	61	86	65	21	16	23	19	98	180	63	87
27	33	44	39	29	16	12	21	18	204	447	58	78
28	26	33	16	12	24	18	32	27	780	3390	66	90
29	37	46	20	14	25	19	25	22	---	---	83	115
30	24	30	21	15	25	19	19	16	---	---	68	95
31	50	61	---	---	25	19	28	24	---	---	52	73
TOTAL	---	1722	---	1419.4	---	901	---	694.2	---	18113	---	13796

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	65	101	77	116	440	771	1540	3400	192	354	550	4280
2	65	100	92	131	245	374	620	1540	230	424	250	1490
3	88	154	135	209	180	192	375	923	221	378	205	963
4	71	105	112	197	160	155	320	730	300	613	192	757
5	77	131	294	790	163	154	305	598	510	1420	185	664
6	103	182	266	833	148	199	265	431	440	1210	182	609
7	157	333	282	967	138	185	248	405	520	2190	182	575
8	153	332	245	860	163	238	260	434	315	1280	162	486
9	132	273	208	657	167	220	198	304	220	782	135	397
10	83	146	203	581	170	207	170	214	197	569	137	392
11	78	128	172	474	173	217	2590	24800	180	491	148	416
12	76	120	187	505	140	170	3820	41300	145	380	158	368
13	76	115	197	477	140	167	1120	18200	138	346	131	232
14	77	113	163	342	167	230	640	9120	631	2880	88	163
15	77	115	178	371	924	1950	620	4570	1370	9130	117	162
16	70	95	168	322	730	1420	520	3260	1030	9010	77	102
17	65	88	137	256	650	1150	760	5400	283	1730	90	139
18	95	124	115	200	480	746	420	2510	260	1100	92	151
19	97	136	138	226	245	316	376	1740	238	855	93	151
20	88	127	108	172	317	484	365	1380	218	712	93	151
21	78	112	87	135	247	341	338	1330	178	485	58	93
22	72	104	113	171	180	251	300	1320	160	407	47	65
23	90	132	172	183	210	290	235	920	150	405	50	76
24	50	74	147	151	240	331	215	708	137	285	42	64
25	67	99	110	176	210	318	208	595	125	279	57	86
26	57	80	106	175	190	287	202	536	119	241	50	88
27	52	63	103	152	188	264	197	477	197	515	60	113
28	82	109	127	210	195	272	191	467	232	770	38	67
29	97	147	2760	6300	2710	5980	188	447	418	2660	40	65
30	92	138	1500	3130	1450	3100	215	433	430	3290	33	49
31	---	---	820	1510	---	---	225	423	2850	33600	---	---
TOTAL	---	4076	---	20979	---	20979	---	128915	---	78791	---	13414

TOTAL LOAD FOR YEAR: 303799.6 TONS.

05374900 ZUMBRO RIVER AT KELLOGG, MN--Continued

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)
MAY						
30...	2100	771	2380	4950	63	73
JUL						
11...	2000	3960	8550	91400	48	51
14...	1000	6140	572	9480	34	39

DATE	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)
MAY						
30...	88	95	100	--	--	--
JUL						
11...	58	79	98	--	--	--
14...	47	53	80	84	95	100

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	NUMBER OF SAM-PLING POINTS (00063)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	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)
MAY										
05...	1520	5	1110	0	8	37	82	95	99	100

05376000 NORTH FORK WHITEWATER RIVER NEAR ELBA, MN
(Hydrologic bench-mark station)

LOCATION.--Lat 44°05'30", long 92°03'57", in sec.7, T.107 N., R.10 W., Winona County, Hydrologic Unit 07040003, on left bank 2.3 mi (3.7 km) upstream from Middle Fork, 2.4 mi (3.9 km) west of Elba, and 3.5 mi (5.6 km) upstream from confluence with South Fork.

DRAINAGE AREA.--101 mi^2 (262 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1939 to September 1941, July 1967 to current year.

REVISED RECORDS.--WRD MN-74: 1967(M), 1969(M), 1971(M), 1972(M), 1973(M). WRD MN-80-2: 1978.

GAGE.--Water-stage recorder. Datum of gage is 769.60 ft (234.574 m) National Geodetic Vertical Datum of 1929. Prior to Oct. 12, 1939, nonrecording gage at site 2 mi (3.2 km) downstream at different datum. Oct. 12, 1939, to Sept. 30, 1941, water-stage recorder at site 600 ft (183 m) downstream at present datum. Prior to July 6, 1978, water-stage recorder at same site and present datum (gage destroyed by flood of July 1978), July 6 to Oct. 30, 1978, nonrecording gage at same site and present datum.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--16 years (water years 1940-41, 1968-81), 44.7 ft^3/s (1.266 m^3/s), 6.01 in/yr (153 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,100 ft^3/s (456 m^3/s) June 21, 1974, gage height, 16.32 ft (4.974 m) from floodmark; minimum, 11 ft^3/s (0.31 m^3/s) Feb. 21, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 600 ft^3/s (17.0 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
July 11	1330	*986	27.9	*5.87	1.789	Aug. 31	0830	842	23.8	5.64	1.719
July 15	0015	854	24.2	5.65	1.722						

Minimum discharge, 22 ft^3/s (0.62 m^3/s) Jan. 4, 10, gage height, 3.77 ft (1.149 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	28	27	24	25	72	34	31	29	32	28	110
2	30	27	27	23	25	62	34	31	28	29	28	54
3	29	28	27	23	25	48	34	34	28	28	28	46
4	28	27	27	23	25	39	37	43	28	28	26	41
5	28	27	27	24	25	34	36	52	28	27	26	37
6	28	27	26	23	25	32	35	45	27	27	27	37
7	28	27	26	23	25	31	34	40	28	27	27	34
8	28	28	26	23	25	31	34	38	27	27	25	36
9	28	28	26	23	26	44	34	41	27	26	25	33
10	28	28	26	23	26	86	34	36	27	26	24	32
11	27	28	26	23	26	111	34	35	27	397	24	31
12	26	29	26	23	26	250	34	34	27	124	24	30
13	26	28	26	23	26	246	33	34	29	40	23	29
14	26	28	26	23	26	82	33	34	28	91	47	28
15	27	27	25	23	28	89	33	32	28	266	47	29
16	28	27	25	23	181	69	33	32	27	58	29	29
17	29	27	25	23	184	47	33	32	27	42	26	28
18	28	27	26	24	85	38	33	31	28	36	26	28
19	28	27	26	24	47	36	32	30	27	33	25	28
20	27	27	25	25	36	35	31	31	27	31	25	29
21	27	27	25	25	43	34	31	30	27	31	24	28
22	27	27	25	25	101	34	32	31	28	30	24	28
23	28	27	25	25	55	33	32	31	27	28	23	27
24	33	27	25	25	40	33	33	30	28	28	24	29
25	34	26	25	26	37	33	32	29	27	28	23	29
26	30	27	24	26	36	33	32	29	27	28	29	41
27	29	27	24	25	63	33	32	29	27	26	36	36
28	28	27	24	25	108	33	32	29	30	26	34	29
29	28	27	24	25	---	35	31	30	57	27	32	28
30	28	28	24	25	---	35	32	29	41	27	30	28
31	28	---	25	25	---	34	---	29	---	26	396	---
TOTAL	878	820	791	743	1400	1852	994	1042	871	1700	1235	1052
MEAN	28.3	27.3	25.5	24.0	50.0	59.7	33.1	33.6	29.0	54.8	39.8	35.1
MAX	34	29	27	26	184	250	37	52	57	397	396	110
MIN	26	26	24	23	25	31	31	29	27	26	23	27
CFSM	.28	.27	.25	.24	.50	.59	.33	.33	.29	.54	.39	.35
IN.	.32	.30	.29	.27	.52	.68	.37	.38	.32	.63	.45	.39

CAL YR 1980 TOTAL 19055 MEAN 52.1 MAX 1340 MIN 23 CFSM .52 IN 7.02
WTR YR 1981 TOTAL 13378 MEAN 36.7 MAX 397 MIN 23 CFSM .36 IN 4.93

05376000 NORTH FORK WHITEWATER RIVER NEAR ELBA, MN--Continued
(Hydrologic bench-mark station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967 to current year.

REMARKS.--Letter K indicates non-ideal colony count.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
OCT												
15...	1200	27	375	522	8.1	8.5	12.9	113	150	140	250	.00
DEC												
01...	1300	26	690	539	8.2	4.0	13.1	102	K10	K6	270	48
JAN												
06...	1245	23	580	541	8.2	1.0	13.4	98	K11	K13	280	.00
MAR												
02...	1115	55	455	443	8.0	1.0	12.8	92	420	>1000	200	--
MAY												
04...	1130	42	485	491	8.1	13.5	9.9	98	55	220	250	21
05...	1630	53	--	--	--	16.0	--	--	--	--	--	--
JUN												
29...	1300	62	530	484	8.3	17.0	9.4	96	K830	K1900	250	15
JUL												
13...	1805	37	--	--	--	21.5	--	--	--	--	--	--
AUG												
24...	1315	24	550	--	8.5	18.5	11.2	122	200	K2100	260	110

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)	ALKA-LINITY 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)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)
OCT												
15...	61	24	4.9	1.6	260	16	7.9	.1	14	304	295	22.2
DEC												
01...	66	25	7.0	1.5	220	16	12	.1	14	312	286	21.9
JAN												
06...	69	25	5.8	1.9	270	22	12	.2	10	380	321	23.6
MAR												
02...	53	16	4.9	10	170	18	18	.1	13	282	257	41.9
MAY												
04...	61	24	7.7	1.6	230	14	11	.2	9.1	287	274	32.5
05...	--	--	--	--	--	--	--	--	--	--	--	--
JUN												
29...	64	23	6.9	1.8	240	11	11	.1	15	303	284	50.7
JUL												
13...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
24...	66	23	6.4	1.9	150	15	12	.2	14	272	237	17.6

05376000 NORTH FORK WHITEWATER RIVER NEAR ELBA, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)
OCT												
15...	2.2	2.1	.020	.010	.22	.19	.110	.100	1.0	17	1.2	64
DEC												
01...	2.8	2.8	.030	.020	.22	.10	.190	.190	.9	10	.70	30
JAN												
06...	2.9	2.8	.070	.070	.22	.22	.160	.150	1.3	8	.50	41
MAR												
02...	4.9	4.9	.620	.550	1.50	1.4	.590	.520	12	20	3.0	86
MAY												
04...	1.5	1.5	.040	.040	.89	.82	.210	.120	2.8	53	6.2	93
05...	--	--	--	--	--	--	--	--	--	39	5.6	95
JUN												
29...	1.6	1.6	.060	.050	1.40	.43	.370	.180	--	183	31	97
JUL												
13...	--	--	--	--	--	--	--	--	--	99	9.9	99
AUG												
24...	1.8	1.8	.060	.060	.44	.35	.150	.120	--	33	2.1	34

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)
JUN												
29...	1300	2	2	100	60	<1	1	1	20	10	<3	4
AUG												
24...	1315	2	1	100	70	<1	2	<1	10	<1	<3	3

DATE	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)
JUN											
29...	<10	4000	3	42	<10	9	320	37	<.1	<.1	<10
AUG											
24...	<10	280	<3	8	<10	27	90	78	<.1	<.1	<10

DATE	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C) (00689)	CYANIDE TOTAL (MG/L AS CN) (00720)
JUN											
29...	<1	<1	<1	<1	66	<6.0	50	<4	2.4	1.1	<.01
AUG											
24...	<1	<1	<1	<1	77	<6.0	10	<4	2.4	--	<.01

05376000 NORTH FORK WHITEWATER RIVER NEAR ELBA, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	GROSS ALPHA, DIS-SOLVED (PCI/L AS U-NAT) (01515)	GROSS ALPHA, SUSP. TOTAL (PCI/L AS U-NAT) (01516)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L) (09511)	URANIUM DIS-SOLVED, EXTRAC-TION (UG/L) (80020)
JUN 29...	1300	<7.8	6.7	5.3	4.6	<3.5	7.7	<3.3	7.4	.05	1.1

DATE	TIME	PCB, TOTAL (UG/L) (39516)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L) (39250)	ALDRIN, TOTAL (UG/L) (39330)	CHLOR-DANE, TOTAL (UG/L) (39350)	DDD, TOTAL (UG/L) (39360)	DDE, TOTAL (UG/L) (39365)	DDT, TOTAL (UG/L) (39370)	DI-AZINON, TOTAL (UG/L) (39570)	DI-ELDRIN TOTAL (UG/L) (39380)
JUN 29...	1300	<.10	<.10	<.01	<.10	<.01	<.01	<.01	<.01	<.01

DATE	ENDO-SULFAN, TOTAL (UG/L) (39388)	ENDRIN, TOTAL (UG/L) (39390)	ETHION, TOTAL (UG/L) (39398)	HEPTA-CHLOR, TOTAL (UG/L) (39410)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L) (39420)	LINDANE TOTAL (UG/L) (39340)	MALA-THION, TOTAL (UG/L) (39530)	METH-OXY-CHLOR, TOTAL (UG/L) (39480)	METHYL PARA-THION, TOTAL (UG/L) (39600)	METHYL TRI-THION, TOTAL (UG/L) (39790)
JUN 29...	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01

DATE	MIREX, TOTAL (UG/L) (39755)	PARA-THION, TOTAL (UG/L) (39540)	PER-THANE TOTAL (UG/L) (39034)	TOX-APHENE, TOTAL (UG/L) (39400)	TOTAL TRI-THION (UG/L) (39786)	2,4-D, TOTAL (UG/L) (39730)	2, 4-DP TOTAL (UG/L) (82183)	2,4,5-T TOTAL (UG/L) (39740)	SILVEX, TOTAL (UG/L) (39760)
JUN 29...	<.01	<.01	<.01	<.10	<.01	.04	<.01	<.02	<.01

05376800 WHITEWATER RIVER NEAR BEAVER, MN

LOCATION.--Lat 44°09'03", long 92°00'19", in SW¼SE¼ 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 (0.8 km) above mouth of Beaver Creek, and 4.7 mi (7.6 km) miles north of Elba.

DRAINAGE.--271 mi^2 (702 km^2).

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 692.01 ft (210.925 m) National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1976, at datum 2.00 ft (0.610 m) higher.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--6 years (water years 1976-81), 153 ft^3/s (4.333 m^3/s), 7.67 in/yr (195 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,400 ft^3/s (436 m^3/s) July 6, 1978, gage height, 12.88 ft (3.926 m), present datum; minimum daily, 53 ft^3/s (1.50 m^3/s) Feb. 20 to Mar. 20, 1978; minimum gage height, 1.90 ft (0.579 m) Sept. 12, 1978.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1939, 19,200 ft^3/s (544 m^3/s) June 21, 1974, gage height, 13.00 ft (3.962 m), present datum, determined by contracted-opening measurement.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,170 ft^3/s (33.1 m^3/s) July 11, gage height, 8.16 ft (2.487 m), no peak above base of 2,000 ft^3/s (56.6 m^3/s); minimum discharge, 99 ft^3/s (2.80 m^3/s) July 10, 11; minimum gage height, 1.82 ft (0.55 m) June 5, 6, 7, 8, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	118	118	116	116	115	180	163	163	128	116	172	350
2	118	118	118	114	120	169	162	161	128	112	172	247
3	118	118	117	117	120	153	162	163	126	108	172	217
4	118	117	116	116	120	150	168	173	125	106	169	198
5	117	117	116	115	120	146	168	180	124	105	171	186
6	117	117	116	115	120	144	165	170	123	103	182	178
7	116	117	117	115	120	142	164	165	122	101	172	174
8	116	117	117	115	120	141	163	164	122	100	170	173
9	114	117	116	115	120	150	162	162	121	101	168	166
10	114	116	116	115	120	194	162	158	122	100	167	162
11	114	115	117	115	125	210	163	156	120	468	167	158
12	113	117	117	115	125	311	163	155	119	326	167	156
13	113	117	116	115	125	340	162	154	120	209	166	154
14	114	116	113	115	130	212	161	152	119	204	182	152
15	115	117	113	115	140	202	161	149	119	325	186	149
16	115	117	113	117	232	190	161	148	117	215	174	147
17	120	117	113	117	252	175	162	147	115	192	171	146
18	117	116	113	117	184	168	161	144	114	187	169	145
19	115	115	113	117	177	166	161	143	113	183	168	143
20	113	117	114	117	173	164	161	143	113	181	167	141
21	113	117	114	117	168	164	160	141	113	183	166	139
22	112	117	114	117	200	163	161	140	113	177	166	138
23	113	117	114	117	185	162	162	139	112	175	166	137
24	124	115	113	117	172	161	163	139	114	173	166	139
25	127	117	114	118	168	161	162	138	111	173	165	137
26	122	119	115	120	160	161	161	137	109	172	169	137
27	120	119	115	119	175	161	160	135	109	171	191	139
28	119	118	116	120	198	161	160	134	111	172	188	133
29	118	117	117	115	---	163	160	134	144	171	181	131
30	119	117	114	115	---	165	162	131	124	171	179	130
31	118	---	116	120	---	164	---	129	---	170	403	---
TOTAL	3620	3509	3569	3608	4284	5493	4866	4647	3570	5450	5572	4902
MEAN	117	117	115	116	153	177	162	150	119	176	180	163
MAX	127	119	118	120	252	340	168	180	144	468	403	350
MIN	112	115	113	114	115	141	160	129	109	100	165	130
CFSM	.43	.43	.42	.43	.57	.65	.60	.55	.44	.65	.66	.60
IN.	.50	.48	.49	.50	.59	.75	.67	.64	.49	.75	.76	.67

CAL YR 1980 TOTAL 60933 MEAN 166 MAX 2380 MIN 110 CFSM .61 IN 8.36
WTR YR 1981 TOTAL 53090 MEAN 145 MAX 468 MIN 100 CFSM .54 IN 7.29

05376800 WHITEWATER RIVER NEAR BEAVER, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years, May 1975 to current year (discontinued).

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: May 1975 to current year.
SUSPENDED-SEDIMENT DISCHARGE: May 1975 to current year.

REMARKS.--During the winter period, daily sediment concentrations were estimated on the basis of water records and monthly sediment samples. Water temperature was obtained when sediment samples were collected.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum daily, 27.0°C July 4, 1981; minimum daily, 0.0°C on many days each year.
SEDIMENT CONCENTRATIONS: Maximum daily mean (water years 1975-81), 7,690 mg/L May 31, 1979; minimum daily mean (water years 1975-81), 5 mg/L Sept. 17, 1976, Nov. 18, 1976.
SEDIMENT LOADS: Maximum daily, 64,700 tons (58,700 tonnes) July 6, 1978; minimum daily, 1.2 tons (1.1 tonnes) Sept. 17, 1976.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum daily, 27.0°C July 4; minimum daily, 0.0°C on many days.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,390 mg/L June 29; minimum daily mean, 8 mg/L Nov. 24.
SEDIMENT LOADS: Maximum daily, 2,900 tons (2,630 tonnes) July 11; minimum daily, 2.5 tons (2.3 tonnes) Nov. 24.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.0	6.0	4.0	---	---	4.0	---	15.0	14.0	23.0	---	18.0
2	10.0	8.0	---	---	---	.0	15.0	---	19.0	22.0	17.0	20.0
3	11.0	11.0	.0	---	---	2.0	---	13.0	20.0	22.0	23.0	20.0
4	9.0	9.0	---	---	---	5.0	8.0	16.0	13.0	27.0	---	18.0
5	---	7.0	---	.0	---	6.0	---	17.0	23.0	---	20.0	---
6	16.0	9.0	---	---	---	6.0	4.0	16.0	21.0	---	20.0	18.0
7	9.0	---	---	---	---	1.0	7.0	16.0	15.0	25.0	---	16.0
8	14.0	11.0	---	---	---	5.0	---	13.0	16.0	---	---	19.0
9	10.0	9.0	---	---	---	---	---	11.0	15.0	---	20.0	22.0
10	11.0	6.0	---	---	---	6.0	---	9.0	20.0	---	22.0	22.0
11	7.0	---	---	---	---	6.0	---	11.0	---	---	24.0	22.0
12	8.0	5.0	4.0	---	---	2.0	---	13.0	22.0	---	21.0	22.0
13	9.0	7.0	---	---	---	5.0	12.0	---	---	22.5	23.0	20.0
14	8.0	---	---	---	---	7.0	14.0	17.0	---	23.0	21.0	21.0
15	---	---	---	---	---	6.0	13.0	17.0	20.0	---	24.0	---
16	---	4.0	---	---	---	9.0	9.0	---	19.0	22.0	---	14.0
17	---	5.0	---	---	6.0	8.0	15.0	---	21.0	22.0	20.0	---
18	7.0	2.0	---	---	8.0	6.0	14.0	17.0	20.0	20.0	18.0	---
19	8.0	2.0	---	---	2.0	---	12.0	19.0	---	22.0	---	17.0
20	8.0	5.0	---	---	---	2.0	13.0	21.0	---	21.0	21.0	14.0
21	7.0	---	---	---	6.0	---	9.0	21.0	---	---	21.0	14.0
22	7.5	4.0	---	---	1.0	---	---	18.0	---	21.0	20.0	16.0
23	7.0	5.0	---	---	---	---	---	16.0	18.0	20.0	23.0	---
24	---	4.0	---	---	---	4.0	---	---	18.0	---	---	14.0
25	6.0	3.0	---	---	---	9.0	---	14.0	21.0	20.0	20.0	---
26	7.0	4.0	---	---	---	8.0	---	12.0	---	17.0	19.0	---
27	5.0	---	---	---	3.0	5.0	---	16.0	23.0	14.0	17.5	---
28	6.0	---	---	---	---	---	---	16.0	21.0	19.0	---	---
29	6.0	---	---	.0	---	13.0	---	19.0	21.0	---	---	17.0
30	---	---	4.0	---	---	9.0	14.0	19.0	24.0	20.0	---	13.0
31	4.0	---	---	---	---	13.0	---	14.0	---	21.0	17.0	---

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)
JUN								
29...	1630	134	1950	706	62	72	90	98

05376800 WHITEWATER RIVER NEAR BEAVER, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	56	18	32	10	17	5.3	34	11	35	11	106	52
2	45	14	35	11	28	8.9	34	10	35	11	93	42
3	31	9.9	40	13	80	25	34	11	35	11	58	24
4	50	16	18	5.7	36	11	35	11	35	11	36	15
5	46	15	23	7.3	23	7.2	35	11	35	11	46	18
6	34	11	40	13	20	6.3	35	11	35	11	67	26
7	37	12	38	12	20	6.3	35	11	35	11	77	30
8	30	9.4	30	9.5	20	6.3	35	11	35	11	63	24
9	27	8.3	32	10	20	6.3	35	11	35	11	194	93
10	28	8.6	22	6.9	22	6.9	35	11	35	11	436	245
11	18	5.5	20	6.2	27	8.5	35	11	35	12	384	267
12	19	5.8	24	7.6	34	11	35	11	35	12	998	953
13	21	6.4	27	8.5	36	11	35	11	35	12	1250	1270
14	27	8.3	26	8.1	36	11	35	11	35	12	223	128
15	25	7.8	24	7.6	36	11	35	11	35	13	147	80
16	27	8.4	22	6.9	36	11	35	11	418	262	106	54
17	48	16	19	6.0	35	11	35	11	798	543	67	32
18	38	12	21	6.6	35	11	35	11	380	189	46	21
19	29	9.0	19	5.9	35	11	35	11	122	58	44	20
20	34	10	21	6.6	35	11	35	11	55	26	43	19
21	23	7.0	22	6.9	34	10	35	11	120	54	42	19
22	22	6.7	21	6.6	34	10	35	11	1000	540	41	18
23	48	15	13	4.1	34	10	35	11	435	217	39	17
24	59	20	8	2.5	34	10	35	11	120	56	37	16
25	38	13	10	3.2	34	10	35	11	80	36	35	15
26	24	7.9	10	3.2	34	11	35	11	82	35	34	15
27	33	11	12	3.9	33	10	35	11	440	208	32	14
28	39	13	14	4.5	33	10	35	11	360	192	30	13
29	37	12	16	5.1	32	10	35	11	---	---	35	15
30	36	12	16	5.1	31	9.5	35	11	---	---	83	37
31	36	11	---	---	33	10	35	11	---	---	48	21
TOTAL	---	340.0	---	213.5	---	307.5	---	340	---	2587	---	3613

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	45	20	25	11	62	21	215	67	103	48	538	508
2	45	20	26	11	60	21	184	56	111	52	347	231
3	45	20	28	12	60	20	140	41	74	34	252	148
4	45	20	55	26	58	20	115	33	66	30	176	94
5	46	21	95	46	59	20	96	27	75	35	134	67
6	50	22	91	42	64	21	71	20	206	101	120	58
7	55	24	91	41	88	29	59	16	108	50	140	66
8	55	24	91	40	89	29	58	16	80	37	94	44
9	55	24	91	40	55	18	58	16	66	30	60	27
10	54	24	91	39	50	16	58	16	55	25	55	24
11	53	23	91	38	52	17	1170	2900	45	20	48	20
12	70	31	92	39	54	17	450	396	36	16	44	19
13	76	33	92	38	70	23	350	198	40	18	35	15
14	54	23	92	38	71	23	620	372	284	146	25	10
15	40	17	93	37	71	23	1010	992	621	315	23	9.3
16	35	15	94	38	86	27	480	279	75	35	20	7.9
17	34	15	94	37	58	18	287	149	50	23	20	7.9
18	31	13	95	37	32	9.8	211	107	40	18	22	8.6
19	29	13	100	39	34	10	173	85	35	16	23	8.9
20	27	12	102	39	36	11	160	78	34	15	18	6.9
21	27	12	100	38	40	12	200	99	34	15	14	5.3
22	28	12	96	36	42	13	153	73	33	15	11	4.1
23	29	13	93	35	44	13	113	53	29	13	12	4.4
24	29	13	92	35	45	14	93	43	25	11	53	20
25	29	13	91	34	46	14	87	41	23	10	13	4.8
26	29	13	90	33	46	14	83	39	33	15	46	18
27	27	12	89	32	46	14	64	30	125	64	29	11
28	25	11	86	31	84	27	54	25	92	47	20	7.2
29	25	11	81	29	1390	541	52	24	50	24	19	6.7
30	25	11	75	27	420	141	53	24	49	24	23	8.1
31	---	---	69	24	---	---	56	26	852	1310	---	---
TOTAL	---	535	---	1042	---	1196.8	---	6341	---	2612	---	1470.1

TOTAL LOAD FOR YEAR: 20597.9 TONS.

05378300 STRAIGHT VALLEY CREEK NEAR ROLLINGSTONE, MN

LOCATION.--Lat 44°05'09", long 91°50'34", in SE¼NE¼ sec.12, T.107 N., R.9 W., Winona County, Hydrologic Unit 07040003, at bridge on County Highway, 0.2 mi (0.3 km) above mouth, and 1.5 mi (2.4 km) southwest of Rollingstone.

DRAINAGE AREA.--5.16 mi^2 (13.36 km^2).

PERIOD OF RECORD.--Water years 1959-66 (annual maximums), 1967-70 (peaks above base), October 1970 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 723.85 ft (220.629 m) National Geodetic Vertical Datum of 1929. Nov. 6, 1958, to Oct. 20, 1966, crest-stage gage at present site and datum.

REMARKS.--Records good.

AVERAGE DISCHARGE.--11 years (water years 1971-81), 2.41 ft^3/s (0.068 m^3/s), 6.34 in/yr (161 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,500 ft^3/s (42.5 m^3/s) July 5, 1978, gage height, 18.10 ft (5.517 m) from high-water mark in well; minimum observed, 0.12 ft^3/s (0.003 m^3/s) Aug. 5, 1960.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft^3/s (2.83 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 16	1500	132	3.74	12.24	3.731	July 14	2230	193	5.47	12.81	3.904
July 11	1015	*470	13.3	*14.51	4.423						

Minimum discharge, 0.57 ft^3/s (0.016 m^3/s) Aug. 12; minimum gage height, 9.60 ft (2.926 m) Jan. 10, 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	1.6	1.5	1.6	1.4	4.0	1.9	1.4	.95	1.5	1.1	3.0
2	1.9	1.5	1.4	1.6	1.3	2.6	1.9	1.2	1.0	1.4	.92	2.8
3	1.8	1.6	1.4	1.6	1.3	2.1	2.5	1.7	1.1	1.3	.87	2.7
4	1.8	1.5	1.4	1.4	1.2	2.1	2.8	2.3	1.0	1.3	.83	2.6
5	1.8	1.5	1.5	1.4	1.2	1.9	2.1	1.8	.99	1.3	.97	2.5
6	1.8	1.6	1.7	1.5	1.2	1.9	1.9	1.7	.96	1.3	.82	2.5
7	1.8	1.6	1.8	1.4	1.2	1.8	1.9	1.6	.92	1.5	.81	2.7
8	1.8	1.7	1.7	1.3	1.2	1.8	1.9	1.6	1.1	1.7	.74	2.3
9	1.8	1.7	1.5	1.3	1.2	3.6	1.7	1.5	1.2	1.7	.68	2.3
10	1.8	1.6	1.4	1.1	1.2	4.6	1.8	1.5	1.1	1.6	.67	2.5
11	1.8	1.6	1.4	1.0	1.2	7.7	1.9	1.4	1.1	27	.67	2.2
12	1.7	1.7	1.5	1.2	1.1	18	1.8	1.3	1.1	2.1	.62	2.2
13	1.7	1.8	1.4	1.3	1.1	5.2	1.8	1.3	1.4	1.7	.62	2.3
14	1.7	1.7	1.4	1.2	1.1	4.0	1.6	1.3	1.4	18	2.4	2.3
15	1.7	1.7	1.5	1.2	1.6	4.4	1.5	1.2	1.6	7.0	.91	2.2
16	1.8	1.7	1.5	1.2	26	2.1	1.7	1.2	1.3	2.5	.82	2.2
17	1.9	1.7	1.6	1.2	9.3	2.0	1.6	1.2	1.2	2.1	.87	2.2
18	1.9	1.7	1.4	1.2	6.0	1.9	1.5	1.1	1.3	2.0	.94	2.2
19	1.8	1.7	1.3	1.2	3.0	1.8	1.6	1.1	1.3	1.7	.92	2.2
20	1.8	1.7	1.2	1.2	2.3	1.8	1.4	1.1	1.4	1.7	1.0	2.2
21	1.8	1.6	1.3	1.2	11	1.8	1.3	.99	1.5	1.6	1.3	2.2
22	1.6	1.6	1.3	1.2	24	1.7	1.6	1.1	1.6	1.5	1.3	2.2
23	1.7	1.5	1.3	1.3	6.7	1.7	1.8	1.2	1.6	1.3	1.4	2.1
24	3.7	1.5	1.3	1.3	5.2	1.7	1.7	1.3	1.7	1.2	1.5	4.4
25	2.1	1.5	1.3	1.5	3.1	1.8	1.5	1.2	1.5	1.2	1.6	2.0
26	1.9	1.5	1.3	1.5	2.3	1.8	1.4	1.2	1.4	1.1	2.1	2.0
27	1.8	1.5	1.2	1.4	16	1.8	1.3	1.1	1.5	1.1	4.4	1.8
28	1.8	1.5	1.3	1.4	9.8	1.8	1.3	1.1	1.7	1.1	2.5	1.8
29	1.7	1.5	1.4	1.4	---	2.2	1.5	1.2	3.9	.99	1.9	1.7
30	1.7	1.5	1.5	1.4	---	2.1	1.5	1.0	2.1	.96	2.1	1.7
31	1.7	---	1.6	1.4	---	2.0	---	.96	---	.93	5.3	---
TOTAL	57.6	48.1	44.3	41.1	143.2	95.7	51.7	40.85	41.92	93.38	43.58	70.0
MEAN	1.86	1.60	1.43	1.33	5.11	3.09	1.72	1.32	1.40	3.01	1.41	2.33
MAX	3.7	1.8	1.8	1.6	26	18	2.8	2.3	3.9	27	5.3	4.4
MIN	1.6	1.5	1.2	1.0	1.1	1.7	1.3	.96	.92	.93	.62	1.7
CFSM	.36	.31	.28	.26	.99	.60	.33	.26	.27	.58	.27	.45
IN.	.42	.35	.32	.30	1.03	.69	.37	.29	.30	.67	.31	.50

CAL YR 1980 TOTAL 1193.95 MEAN 3.26 MAX 99 MIN .97 CFSM .63 IN 8.61
WTR YR 1981 TOTAL 771.43 MEAN 2.11 MAX 27 MIN .62 CFSM .41 IN 5.56

05378500 MISSISSIPPI RIVER AT WINONA, MN

LOCATION.--Lat 44°03'20", long 91°38'15", 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 (15.3 km) upstream from Trempealeau River, and at mile 725.7 (1,167.7 km) upstream from the Ohio River.

DRAINAGE AREA.--59,200 mi^2 (153,300 km^2), approximately.

WATER-DISCHARGE RECORDS

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 (194.962 m) National Geodetic Vertical Datum of 1929. June 10, 1928, to Apr. 15, 1931, nonrecording gage at site 800 ft (244 m) upstream. Prior to Oct. 1, 1929, at datum 0.20 ft (0.06 m) higher and Oct. 1, 1929, to Apr. 15, 1931, at datum 0.12 ft (0.04 m) 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 (4.3 km) upstream at tailwater of navigation dam 5A.

REMARKS.--Records good. Some regulation by reservoirs, navigation dams, and powerplants at low and medium stages. Flood flow not materially affected by artificial storage.

AVERAGE DISCHARGE.--53 years, 26,380 ft^3/s (747.1 m^3/s), 6.05 in/yr (154 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 268,000 ft^3/s (7,590 m^3/s) Apr. 19, 1965, gage height, 20.77 ft (6.331 m) from floodmark; minimum, 1,940 ft^3/s (54.9 m^3/s) Dec. 12, 1980, gage height, 3.96 ft (1.207 m) result of ice jam; minimum gage height, -3.38 ft (-1.030 m) Aug. 31, 1934 (prior to dam construction in 1936); minimum gage height since 1938, after completion of dam, 1.95 ft (0.594 m) Jan. 27, 1944.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 18, 1880, reached an elevation of 657.14 ft (200.296 m), discharge, 172,000 ft^3/s (4,870 m^3/s), from information by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 69,800 ft^3/s (1,980 m^3/s) May 10, gage height 9.03 ft (2.752 m); minimum, 1,940 ft^3/s (54.9 m^3/s) Dec. 12; minimum gage height, 3.78 ft (1.152 m) Dec. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32200	26800	16500	12400	10400	26800	26600	43200	22700	55900	28100	40500
2	31200	24200	17400	13200	10400	28300	31600	42700	21200	55100	28800	40600
3	29400	22900	15300	13600	9430	26300	33700	43000	20200	54000	29200	37900
4	27900	22700	13000	13400	9100	23800	37400	45900	20400	53600	28400	36000
5	25400	21400	13200	13200	8630	22000	39700	48200	20500	51500	28200	35400
6	21600	21000	14200	13100	8330	21400	43200	51500	19800	48500	28700	33800
7	21300	22100	15200	13000	8400	20800	46400	57100	19800	44100	28800	31700
8	22000	22600	15400	12200	8430	18400	51100	64700	20400	41300	30700	29300
9	20500	21900	15200	11400	8970	15400	53300	67800	20800	40100	30100	28300
10	19700	22000	14100	11200	9930	15200	51000	69300	20600	35800	29500	27300
11	19800	21500	8400	11200	10100	17800	47700	62900	20300	35700	28300	26500
12	20300	20300	2350	10700	10200	20100	44300	56400	20100	40000	27200	25300
13	18700	19400	6600	10600	10700	21800	37600	53700	20500	36400	26400	23300
14	15000	18800	12500	10600	10800	22900	35700	49000	21300	34300	28400	19400
15	14300	18700	15400	10700	10800	22600	35500	42300	23200	33000	29900	15400
16	17000	20400	17700	11000	10900	21000	33700	39100	27100	31200	29500	14600
17	21600	21200	19400	11100	13500	19500	31800	35300	31600	28700	28900	16200
18	23000	21200	20900	11100	17600	19100	30300	30400	42600	27900	26700	16700
19	22500	21300	18700	11200	18900	19200	29700	28300	49400	29200	24400	17500
20	21800	21100	17900	11400	19900	19900	29000	27300	51600	30300	23600	17300
21	20400	21100	15800	11300	21700	20600	27700	26900	54800	30200	23800	15400
22	20200	21100	12700	11200	22700	20700	25700	24700	55600	28600	22500	14900
23	19500	21300	10900	11200	23700	19700	26100	21600	55800	27300	20700	14500
24	21800	20900	9770	11200	24900	18200	28200	22900	55700	27400	19100	14500
25	23900	19900	9300	11200	26500	16000	30300	22900	55100	28000	17000	14800
26	23800	18200	9400	11300	27700	15400	32200	21000	54100	28300	17500	14700
27	25000	17000	10000	11400	26700	16000	33300	18900	55100	28400	21300	13300
28	26900	16200	11000	11300	26100	16300	35900	19000	53800	28500	26700	15100
29	28200	15200	11300	11200	---	16700	40800	22800	55100	28400	31000	15600
30	28300	15000	11300	10700	---	19300	43000	25900	56000	28300	34400	14000
31	28300	---	11900	10400	---	24000	---	25200	---	28100	36200	---
TOTAL	711500	617400	412720	358700	425420	625200	1092500	1209900	1065200	1118100	834000	679800
MEAN	22950	20580	13310	11570	15190	20170	36420	39030	35510	36070	26900	22660
MAX	32200	26800	20900	13600	27700	28300	53300	69300	56000	55900	36200	40600
MIN	14300	15000	2350	10400	8330	15200	25700	18900	19800	27300	17000	13300
CFSM	.39	.35	.23	.20	.26	.34	.62	.66	.60	.61	.45	.38
IN.	.45	.39	.26	.23	.27	.39	.69	.76	.67	.70	.52	.43

CAL YR 1980 TOTAL 9117320 MEAN 24910 MAX 68800 MIN 2350 CFSM .42 IN 5.73
WTR YR 1981 TOTAL 9150440 MEAN 25070 MAX 69300 MIN 2350 CFSM .42 IN 5.75

05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1964 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: May 1980 to current year.
WATER TEMPERATURES: October 1975 to current year.
SUSPENDED-SEDIMENT DISCHARGE: September 1975 to current year.

REMARKS.--For the winter period, daily sediment loads were estimated on the basis of water records and weekly sediment samples. Water temperature and specific conductance were obtained once daily during most of the open water period and weekly during the winter period. Letter K indicates a non-ideal colony count.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 440 micromhos, June 23-15, June 28 to July 1, July 7-9, 1980; minimum daily, 180 micromhos Sept. 24, 1980, May 9, 1981.
WATER TEMPERATURES: Maximum daily, 29.0°C July 10, 1976; minimum daily, 0.0°C many days each year.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 393 mg/L July 2, 1978; minimum daily mean, 1 mg/L many days during several years.
SEDIMENT LOADS: Maximum daily 65,300 tons (59,200 tonnes) July 2, 1978; minimum daily, 19 tons (17 tonnes) Dec. 12, 1980.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 430 micromhos Sept. 17; minimum daily, 180 micromhos May 9.
WATER TEMPERATURES: Maximum daily, 27.0°C July 13; minimum daily, 0.0°C on many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 103 mg/L July 13; minimum daily mean, 1 mg/L Jan. 11-14, 24 to Feb. 17.
SEDIMENT LOADS: Maximum daily, 10,100 tons (9,160 tonnes) July 13; minimum daily, 19 tons (17 tonnes) Dec. 12.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE, AIR (DEG C) (00020)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)
OCT										
15...	1630	14300	270	282	7.9	11.0	10.0	1.1	10.2	93
DEC										
01...	1530	16500	405	312	8.1	-9.5	1.5	.60	12.0	88
JAN										
06...	1600	13100	380	348	8.5	-5.0	.0	.30	14.9	106
MAR										
02...	1500	28300	360	363	7.9	-10.0	1.0	.50	13.0	94
MAY										
04...	1545	45900	300	292	8.7	23.0	16.0	1.1	11.5	119
JUN										
29...	1515	55100	270	258	8.0	24.0	21.5	13	7.2	81
AUG										
24...	1645	19100	395	386	9.2	25.0	24.5	6.6	7.8	95

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	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)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
OCT										
15...	100	96	120	14	30	12	7.1	.3	2.1	110
DEC										
01...	50	K17	140	16	33	13	9.0	.3	2.0	120
JAN										
06...	450	K18	160	27	38	15	9.9	.3	.9	130
MAR										
02...	61	900	140	7.0	35	12	11	.4	4.9	130
MAY										
04...	44	560	130	17	31	12	8.9	.3	2.5	110
JUN										
29...	200	390	120	23	31	11	6.6	.3	2.0	100
AUG										
24...	70	61	190	32	49	17	8.5	.3	2.4	160

05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)
OCT										
15...	16	10	.1	10	178	156	6870	.70	.68	.040
DEC										
01...	18	12	.1	11	207	174	9220	.83	.78	.160
JAN										
06...	18	8.1	.1	17	206	190	7290	1.0	1.0	.140
MAR										
02...	20	16	.2	11	223	194	17000	1.3	1.3	.520
MAY										
04...	20	12	.2	2.5	174	157	21600	.42	.42	.060
JUN										
29...	13	9.4	.1	9.0	179	147	26600	1.1	1.1	.070
AUG										
24...	27	14	.2	12	254	234	13100	1.6	1.6	.040

DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	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)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT									
15...	.040	.62	.59	.150	.090	13	11	425	100
DEC									
01...	.140	.59	.57	.090	.080	--	7	312	97
JAN									
06...	.140	.54	.54	.100	.100	9.2	4	141	100
MAR									
02...	.510	1.10	1.1	.150	.150	--	12	917	--
MAY									
04...	.050	1.10	.47	.130	.020	--	22	2730	--
JUN									
29...	.070	.99	.88	.150	.100	14	37	5500	87
AUG									
24...	.040	.71	.68	.150	.100	--	19	980	89

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO) (01037)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)
DEC											
01...	1530	1	1	100	30	0	0	--	<10	0	0
MAR											
02...	1500	0	0	100	100	0	0	10	<10	0	0
MAY											
04...	1545	0	0	100	40	1	1	<10	<10	0	0
AUG											
24...	1645	3	2	100	100	2	1	10	10	4	3

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
DEC										
01...	16	4	450	120	3	0	50	20	<.1	<.1
MAR										
02...	5	5	670	150	1	1	90	50	.1	.1
MAY										
04...	26	7	520	40	50	2	50	9	.5	<.1
AUG										
24...	5	5	570	10	8	3	100	<10	<.1	<.1

05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)
DEC										
01...	3	2	0	0	0	0	30	0	6.8	.6
MAR										
02...	4	4	0	0	--	0	30	10	8.1	--
MAY										
04...	5	2	0	0	0	0	20	10	9.3	2.6
AUG										
24...	4	1	1	1	--	<1	20	10	8.5	--

05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO AUGUST 1981

DATE	OCT 15,80		DEC 1,80		MAY 4,81		JUN 29,81		AUG 24,81	
TIME	1630		1530		1545		1515		1645	
TOTAL CELLS/ML	29000		4100		28000		11000		25000	
DIVERSITY: DIVISION	1.1		0.8		1.2		1.7		1.1	
.CLASS	1.1		0.8		1.2		1.7		1.1	
..ORDER	1.8		1.3		1.7		2.2		1.2	
...FAMILY	1.8		1.4		1.9		2.4		1.3	
....GENUS	2.3		2.5		2.5		3.1		1.6	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)										
.CHLOROPHYCEAE										
..CHLOROCOCCALES										
...CHARACIACEAE										
....SCHROEDERIA	--	-	--	-	--	-	--	-	*	0
...COELASTRACEAE										
....COELASTRUM	--	-	--	-	--	-	--	-	500	2
...HYDRODICTYACEAE										
....PEDIASTRUM	--	-	--	-	--	-	--	-	140	1
...MICRACTINIACEAE										
....MICRACTINIUM	--	-	--	-	1200	4	--	-	--	-
...OOCYSTACEAE										
....ANKISTRODESMUS	150	1	75	2	740	3	210	2	*	0
....DICTYOSPHAERIUM	200	1	--	-	--	-	--	-	--	-
....OOCYSTIS	--	-	--	-	--	-	210	2	220	1
....SELENASTRUM	150	1	--	-	--	-	--	-	--	-
....TETRAEDRON	--	-	--	-	--	-	--	-	*	0
...SCENEDESMACEAE										
....ACTINASTRUM	--	-	--	-	1200	4	--	-	180	1
....CRUCIGENIA	--	-	--	-	--	-	170	2	--	-
....SCENEDESMUS	*	0	--	-	--	-	930	9	290	1
....TETRASTRUM	200	1	200	5	590	2	340	3	290	1
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	*	0	--	-	150	1	--	-	*	0
CHRYSOPHYTA										
.BACILLARIOPHYCEAE										
..CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	1600	5	450	11	1000	4	1600#	15	1800	7
....MELOSIRA	6400#	22	780#	19	1900	7	2300#	21	3900#	15
....STEPHANODISCUS	850	3	1800#	44	14000#	50	380	4	--	-
..PENNALES										
...ACHNANTHACEAE										
....COCCONEIS	--	-	--	-	--	-	84	1	--	-
...FRAGILARIACEAE										
....ASTERIONELLA	--	-	380	9	2100	7	--	-	--	-
....SYNEDRA	--	-	50	1	150	1	--	-	--	-
...NAVICULACEAE										
....NAVICULA	*	0	--	-	--	-	210	2	--	-
...NITZSCHIACEAE										
....NITZSCHIA	*	0	50	1	290	1	*	0	*	0
.CHRYSOPHYCEAE										
..CHRYSOMONADALES										
...OCHROMONADACEAE										
....OCHROMONAS	--	-	--	-	--	-	*	0	--	-
CRYPTOPHYTA (CRYPTOMONADS)										
.CRYPTOPHYCEAE										
..CRYPTOMONADALES										
...CRYPTOCHRYSIDACEAE										
....CHROOMONAS	*	0	--	-	150	1	84	1	--	-
...CRYPTOMONADACEAE										
....CRYPTOMONAS	--	-	--	-	150	1	170	2	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
.CYANOPHYCEAE										
..CHROOCOCCALES										
...CHROOCOCCACEAE										
....ANACYSTIS	9800#	34	300	7	4100	15	2600#	24	--	-
....COCCOCHLORIS	1100	4	--	-	--	-	--	-	--	-
..HORMOGONALES										
...NOSTOCACEAE										
....APHANIZOMENON	--	-	--	-	--	-	--	-	18000#	70
...OSCILLATORIACEAE										
....OSCILLATORIA	8500#	29	--	-	--	-	1400	13	--	-
EUGLENOPHYTA (EUGLENOIDS)										
.EUGLENOPHYCEAE										
..EUGLENALES										
...EUGLENACEAE										
....EUGLENA	--	-	25	1	--	-	*	0	--	-
....TRACHELOMONAS	--	-	25	1	--	-	*	0	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	290	260	330	---	---	---	320	280	285	280	360	420
2	280	280	320	---	360	340	300	290	290	290	360	420
3	280	300	320	---	---	380	270	290	290	290	360	420
4	280	300	320	340	---	370	240	285	290	290	370	420
5	290	300	320	---	---	380	250	270	290	290	380	410
6	290	300	300	---	---	400	225	255	290	300	360	420
7	300	300	300	---	---	380	220	225	290	310	340	420
8	300	320	300	---	---	380	200	215	290	310	340	420
9	300	320	320	---	400	380	200	180	290	300	340	420
10	300	300	340	---	---	380	240	200	295	310	370	420
11	280	300	340	---	---	380	265	225	320	310	380	410
12	290	300	340	350	---	400	270	240	320	310	380	400
13	280	320	340	---	---	400	285	240	320	310	380	400
14	290	320	340	---	---	400	280	250	320	330	370	420
15	290	320	340	---	---	380	280	250	320	330	360	420
16	300	320	280	---	---	360	280	250	320	320	360	420
17	280	300	320	---	380	360	270	250	320	310	380	430
18	270	280	340	---	---	350	290	250	245	320	400	420
19	280	280	340	370	---	360	290	250	250	330	410	420
20	280	280	350	---	---	350	290	250	290	330	400	420
21	290	280	360	---	---	340	290	250	310	330	400	410
22	290	290	360	---	---	340	290	250	330	330	400	410
23	300	300	360	---	320	330	280	250	330	330	400	410
24	280	300	---	---	330	340	290	250	320	330	400	420
25	280	300	---	380	---	340	290	260	290	340	400	420
26	290	310	---	---	330	360	290	270	280	340	400	420
27	270	310	---	---	---	350	250	270	280	350	400	420
28	270	320	---	---	---	340	240	280	280	330	380	420
29	240	320	---	---	---	340	260	280	280	360	380	420
30	220	320	330	---	---	320	285	260	280	370	370	420
31	240	---	---	---	---	320	---	260	---	360	400	---
MEAN	281	302				362	268	252	297	321	378	417

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.0	6.0	1.0	---	---	---	8.0	11.0	20.0	22.0	23.0	20.0
2	15.0	5.0	1.0	---	.0	1.0	8.0	11.0	20.0	22.0	23.0	19.0
3	13.0	6.0	1.0	---	---	1.0	9.0	12.0	19.0	23.0	24.0	19.0
4	13.0	7.0	2.0	.0	---	1.0	7.0	12.0	19.0	23.0	24.0	20.0
5	13.0	7.0	2.0	---	---	1.0	5.0	12.0	20.0	24.0	24.0	20.0
6	12.0	7.0	2.0	.0	---	1.0	6.0	12.0	20.0	25.0	24.0	21.0
7	13.0	7.0	1.0	---	---	2.0	7.0	13.0	21.0	25.0	23.0	20.0
8	15.0	7.0	1.0	---	---	2.0	7.0	13.0	22.0	26.0	22.0	19.0
9	15.0	6.0	1.0	---	.0	3.0	8.0	12.0	20.0	25.0	23.0	19.0
10	15.0	5.0	1.0	---	---	3.0	10.0	11.0	19.0	25.0	22.0	20.0
11	12.0	5.0	1.0	---	---	2.0	10.0	11.0	20.0	25.0	22.0	22.0
12	10.0	5.0	1.0	.0	---	3.0	11.0	12.0	21.0	25.0	23.0	21.0
13	10.0	5.0	1.0	---	---	3.0	9.0	13.0	21.0	27.0	25.0	20.0
14	10.0	4.0	.0	---	---	3.0	8.0	14.0	22.0	22.0	24.0	20.0
15	10.0	3.0	.0	---	---	4.0	8.0	15.0	22.0	22.0	23.0	19.0
16	10.0	3.0	.0	---	---	3.5	10.0	15.0	20.0	22.0	23.0	17.0
17	11.0	3.0	.0	---	2.0	3.0	11.0	16.0	20.0	23.0	22.0	15.0
18	10.0	3.0	.0	---	---	3.0	10.0	15.0	20.0	23.0	21.0	15.0
19	9.0	3.0	.0	.0	---	3.0	11.0	14.0	20.0	26.0	21.0	16.0
20	9.0	4.0	.0	---	---	2.0	10.0	16.0	20.0	22.0	22.0	16.0
21	9.0	4.0	.0	---	---	2.0	9.0	17.0	20.0	22.0	21.0	15.0
22	8.0	4.0	.0	---	---	3.0	10.0	17.0	19.0	22.0	21.0	15.0
23	9.0	4.0	.0	---	1.0	3.0	9.0	18.0	19.0	21.0	22.0	15.0
24	9.0	3.0	---	---	2.0	4.0	8.0	18.0	20.0	22.0	22.0	15.0
25	7.0	3.0	---	2.0	---	5.0	8.0	17.0	20.0	23.0	22.0	15.0
26	7.0	2.0	---	---	1.0	5.0	9.0	16.0	21.0	23.0	22.0	16.0
27	6.0	2.0	---	---	---	6.0	10.0	17.0	21.0	21.0	22.0	16.0
28	5.0	2.0	---	---	---	7.0	12.0	18.0	22.0	20.0	21.0	15.0
29	5.0	2.0	---	---	---	8.0	11.0	18.0	21.0	21.0	20.0	14.0
30	6.0	2.0	1.0	---	---	8.0	11.0	18.0	22.0	22.0	21.0	14.0
31	6.0	---	---	---	---	8.0	---	19.0	---	23.0	21.0	---
MEAN	10.5	4.5				3.5	9.0	14.5	20.5	23.0	22.5	17.5

05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	14	1220	8	579	7	312	4	134	1	28	9	651
2	14	1180	8	523	6	282	3	107	1	28	11	841
3	19	1510	8	495	5	207	3	110	1	25	8	568
4	16	1210	8	490	2	70	3	109	1	25	8	514
5	12	823	10	578	2	71	4	143	1	23	6	356
6	13	758	8	454	2	77	4	141	1	22	5	289
7	11	633	7	418	3	123	4	140	1	23	6	337
8	10	594	6	366	4	166	3	99	1	23	5	248
9	10	553	8	473	4	164	3	92	1	24	5	208
10	12	638	6	356	4	152	2	60	1	27	5	205
11	24	1280	5	290	3	68	1	30	1	27	6	288
12	20	1100	5	274	3	19	1	29	1	28	7	380
13	17	858	5	262	3	53	1	29	1	29	11	647
14	11	445	6	305	3	101	1	29	1	29	15	927
15	10	386	8	404	3	125	2	58	1	29	15	915
16	8	367	7	386	3	143	2	59	1	29	14	794
17	12	700	6	343	3	157	3	90	1	36	11	579
18	12	745	5	286	4	226	4	120	2	95	10	516
19	10	607	4	230	7	353	4	121	4	204	10	518
20	13	765	6	342	5	242	4	123	6	322	10	537
21	9	496	11	627	4	171	3	92	9	527	9	501
22	8	436	7	399	4	137	3	91	12	735	9	503
23	9	474	5	288	4	118	2	60	15	960	8	426
24	10	589	5	282	4	106	1	30	18	1210	8	393
25	14	903	6	322	4	100	1	30	17	1220	7	302
26	12	771	4	197	4	102	1	31	13	972	9	374
27	10	675	4	184	4	108	1	31	10	721	10	432
28	10	726	3	131	4	119	1	31	8	564	10	440
29	8	609	3	123	4	122	1	30	---	---	9	406
30	7	535	4	162	4	122	1	29	---	---	11	573
31	9	688	---	---	4	129	1	28	---	---	14	907
TOTAL	---	23274	---	10569	---	4445	---	2306	---	7985	---	15575

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	23	1650	23	2680	16	981	39	5890	22	1670	70	7650
2	28	2390	22	2540	17	973	36	5360	22	1710	44	4820
3	22	2000	22	2550	14	764	34	4960	19	1500	31	3170
4	19	1920	22	2730	15	826	30	4340	20	1530	30	2920
5	32	3430	24	3120	17	941	28	3890	23	1750	27	2580
6	51	5950	27	3750	13	695	23	3010	20	1550	27	2460
7	49	6140	38	5860	15	802	21	2500	22	1710	31	2650
8	43	5930	49	8560	18	991	21	2340	25	2070	23	1820
9	41	5900	44	8050	19	1070	23	2490	23	1870	24	1830
10	43	5920	45	8420	17	946	19	1840	20	1590	23	1700
11	32	4120	36	6110	17	932	20	1930	23	1760	22	1570
12	30	3590	30	4570	15	814	47	5080	24	1760	22	1500
13	27	2740	27	3910	13	720	103	10100	19	1350	21	1320
14	25	2410	25	3310	15	863	61	5650	20	1530	19	995
15	21	2010	23	2630	21	1320	52	4630	27	2180	18	748
16	16	1460	21	2220	27	1980	53	4460	23	1830	17	670
17	16	1370	18	1720	34	2900	37	2870	24	1870	19	831
18	23	1880	17	1400	41	4720	31	2340	24	1730	20	902
19	24	1920	14	1070	45	6000	34	2680	26	1710	21	992
20	27	2110	15	1110	41	5710	29	2370	32	2040	22	1030
21	16	1200	15	1090	41	6070	28	2280	26	1670	19	790
22	14	971	15	1000	37	5550	28	2160	21	1280	20	805
23	19	1340	14	816	38	5730	31	2290	18	1010	18	705
24	21	1600	13	804	36	5410	25	1850	17	877	18	705
25	13	1060	12	742	35	5210	22	1660	30	1380	20	799
26	15	1300	13	737	36	5260	24	1830	17	803	17	675
27	20	1800	13	663	35	5210	25	1920	22	1270	17	610
28	18	1740	9	462	38	5520	29	2230	22	1590	20	815
29	19	2090	9	554	41	6100	23	1760	24	2010	19	800
30	19	2210	15	1050	48	7260	23	1760	22	2040	20	756
31	---	---	21	1430	---	---	24	1820	39	3810	---	---
TOTAL	---	80151	---	85658	---	92268	---	100290	---	52450	---	49618

TOTAL LOAD FOR YEAR: 524589 TONS.

05384000 ROOT RIVER NEAR LANESBORO, MN

LOCATION.--Lat 43°44'58", long 91°58'43", in sec.1, T.103 N., R.10 W., Fillmore County, Hydrologic Unit 07040008, on left bank 0.5 mi (0.8 km) upstream from highway bridge, 1.2 mi (1.9 km) upstream from South Branch, and 2.5 mi (4.0 km) northeast of Lanesboro.

DRAINAGE AREA.--615 mi^2 (1,593 km^2).

PERIOD OF RECORD.--February to November 1910, February 1911 to September 1914, July 1915 to September 1917. August 1940 to current year. Published as North Branch Root River near Lanesboro, 1910-17.

REVISED RECORDS.--WSP 355: 1912. WSP 1308: 1911(M).

GAGE.--Water-stage recorder. Datum of gage is 791.32 ft (241.194 m) National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1917, nonrecording gage at site 0.5 mi (0.8 km) downstream at datum about 1.5 ft (0.5 m) higher.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--46 years (water years 1912-14, 1916-17, 1941-81), 339 ft^3/s (9.600 m^3/s), 7.49 in/yr (190 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,100 ft^3/s (626 m^3/s) Mar. 29, 1962, gage height, 16.11 ft (4.910 m); maximum gage height, 17.83 ft (5.435 m) Mar. 1, 1965, from floodmark (backwater from ice); minimum discharge, 29 ft^3/s (0.82 m^3/s) Aug. 27, 1949, gage height, 1.08 ft (0.329 m); minimum gage height, 0.42 ft (0.128 m) Dec. 3, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,500 ft^3/s (99.1 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
July 12	1900	*7,950	225	*10.99	3.350	Aug. 31	1215	7,670	217	10.75	3.277
July 16	0545	5,710	162	8.96	2.731						

Minimum discharge, 40 ft^3/s (1.13 m^3/s) Dec. 3, gage height, 0.42 ft (0.128 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	374	318	216	160	133	548	290	251	250	231	314	1220
2	352	310	118	155	135	424	288	233	244	225	319	789
3	338	302	123	150	135	337	288	225	225	208	662	633
4	324	294	246	145	135	301	309	231	216	198	568	542
5	307	286	243	140	135	274	370	307	210	190	737	479
6	297	281	233	140	136	252	426	390	204	181	2450	436
7	287	278	232	140	138	225	361	382	194	171	993	435
8	281	273	227	140	140	219	338	351	184	163	735	430
9	274	269	209	139	145	213	326	335	179	157	568	387
10	265	263	174	138	150	311	310	320	179	151	478	368
11	255	255	111	136	160	381	297	297	179	3500	427	346
12	249	252	216	135	170	468	291	279	178	6960	382	326
13	243	249	232	134	180	785	284	265	176	3510	350	311
14	246	249	193	134	190	685	267	253	176	1350	386	300
15	252	246	203	134	210	605	253	240	176	2910	472	284
16	258	243	212	134	700	611	242	234	179	4250	427	275
17	297	240	215	134	840	479	239	226	179	1500	385	270
18	291	234	202	134	650	362	235	211	177	996	345	265
19	271	231	98	134	551	307	234	203	173	772	322	261
20	274	231	182	132	421	278	234	195	325	1660	304	257
21	265	228	200	132	381	250	234	193	370	918	288	250
22	271	225	200	132	899	235	239	189	255	685	275	239
23	262	222	195	132	508	220	243	184	222	587	266	233
24	340	222	200	132	359	213	243	216	255	526	259	231
25	449	207	200	132	363	206	242	303	338	488	253	231
26	507	193	195	132	320	204	235	338	294	449	286	232
27	436	234	190	132	752	204	234	295	246	413	484	250
28	389	216	180	132	1090	201	233	264	228	395	479	250
29	360	216	175	132	---	202	232	254	237	371	565	234
30	342	222	170	132	---	223	259	256	265	348	456	228
31	330	---	165	132	---	249	---	279	---	327	3190	---
TOTAL	9686	7489	5955	4240	10126	10472	8276	8199	6713	34790	18425	10992
MEAN	312	250	192	137	362	338	276	264	224	1122	594	366
MAX	507	318	246	160	1090	785	426	390	370	6960	3190	1220
MIN	243	193	98	132	133	201	232	184	173	151	253	228
CFSM	.51	.41	.31	.22	.59	.55	.45	.43	.36	1.82	.97	.60
IN.	.59	.45	.36	.26	.61	.63	.50	.50	.41	2.10	1.11	.66

CAL YR 1980 TOTAL 146164 MEAN 399 MAX 4400 MIN 90 CFSM .65 IN 8.84
WTR YR 1981 TOTAL 135363 MEAN 371 MAX 6960 MIN 98 CFSM .60 IN 8.19

05385000 ROOT RIVER NEAR HOUSTON, MN

LOCATION.--43°46'07", long 91°34'11", in SW¼NW¼ sec.33, T.104 N., R.6 W., Houston County, Hydrologic Unit 07040008, on right bank 0.2 mi (0.3 km) north of Houston and 1.6 mi (2.6 km) upstream from South Fork and 18.2 mi (29.3 km) upstream from mouth.

DRAINAGE AREA.--1,270 mi^2 (3,290 km^2), approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1909 to September 1917, May to November 1929, March 1930 to current year. 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 (203.302 m) National Geodetic Vertical Datum of 1929. May 28, 1909, to Sept. 30, 1917, nonrecording gage at site 1.3 mi (2.1 km) 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 (1.4 km) upstream at datum 671.86 ft (204.783 m).

REMARKS.--Records good except those for winter periods, which are fair. Slight diurnal fluctuation at low flows caused by powerplants above station.

AVERAGE DISCHARGE.--59 years (water years 1910-17, 1931-81), 678 ft^3/s (19.20 m^3/s), 7.25 in/yr (184 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,000 ft^3/s (1,050 m^3/s) Apr. 1, 1952, gage height, 13.90 ft (4.237 m); maximum gage height, 18.32 ft (5.584 m) Mar. 2, 1965 (backwater from ice); minimum discharge, 65 ft^3/s (1.84 m^3/s) Dec. 26, 1933, Feb. 25, 1935.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 5,000 ft^3/s (142 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
July 13	0400	*12,600	357	*13.99	4.264	Aug. 31	2400	5,670	161	10.66	3.249
July 16	1500	7,020	199	11.72	3.572						

Minimum daily discharge, 405 ft^3/s (11.5 m^3/s) Jan. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1110	796	584	430	430	1810	623	618	547	533	801	3200
2	1050	780	579	425	430	1200	637	598	537	510	876	1760
3	994	770	492	420	440	950	628	589	510	505	819	1410
4	953	759	551	415	440	796	786	594	492	496	1100	1250
5	910	738	612	410	450	723	754	613	483	483	1970	1130
6	878	728	599	410	460	670	818	682	470	478	2420	1060
7	856	733	594	407	480	630	823	738	470	465	1990	1080
8	839	723	593	405	500	596	786	718	474	461	1430	1060
9	815	718	553	410	520	585	744	682	474	465	1200	984
10	798	708	521	410	560	701	719	652	465	448	1040	923
11	765	697	495	410	600	775	713	628	461	4040	938	880
12	742	687	511	415	660	949	710	613	452	11400	876	834
13	729	687	545	415	730	1230	700	603	478	10600	819	796
14	734	682	532	415	800	1230	687	589	487	3250	947	768
15	737	672	565	415	1000	1070	657	575	487	3450	1100	744
16	744	662	532	420	1500	1040	642	565	470	6170	928	724
17	791	657	519	420	3000	998	641	551	452	3410	855	710
18	807	647	510	420	2030	835	623	537	444	2270	794	700
19	770	632	500	420	1460	723	632	533	435	1750	754	696
20	744	633	490	420	1130	657	628	505	470	2600	725	690
21	733	628	485	420	984	613	598	501	809	2170	663	678
22	718	623	480	420	2800	584	613	492	618	1570	677	663
23	723	618	475	420	2030	561	632	501	533	1350	672	650
24	845	608	470	420	1190	547	632	598	561	1210	668	641
25	939	594	465	420	1050	547	632	584	575	1110	653	639
26	1050	575	460	420	950	542	628	672	598	1010	706	649
27	1010	579	455	425	1660	539	613	637	556	960	876	687
28	928	594	450	425	4000	533	603	594	528	933	976	675
29	872	589	445	425	---	547	594	575	528	876	960	665
30	839	589	440	425	---	593	613	551	528	829	917	653
31	823	---	435	425	---	598	---	547	---	789	2170	---
TOTAL	26246	20106	15937	12957	32284	24372	20109	18435	15392	66591	32320	27999
MEAN	847	670	514	418	1153	786	670	595	513	2148	1043	933
MAX	1110	796	612	430	4000	1810	823	738	809	11400	2420	3200
MIN	718	575	435	405	430	533	594	492	435	448	653	639
CFSM	.67	.53	.41	.33	.91	.62	.53	.47	.40	1.69	.82	.74
IN.	.77	.59	.47	.38	.95	.71	.59	.54	.45	1.95	.95	.82

CAL YR 1980 TOTAL 359216 MEAN 981 MAX 13100 MIN 295 CFSM .77 IN 10.52
WTR YR 1981 TOTAL 312748 MEAN 857 MAX 11400 MIN 405 CFSM .68 IN 9.16

05385000 ROOT RIVER NEAR HOUSTON, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1961-63, 1968 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: March 1975 to current year.
SUSPENDED-SEDIMENT DISCHARGE: March 1975 to current year.

REMARKS.--During the winter period suspended-sediment samples were collected weekly and daily sediment concentrations were estimated on the basis of water records and weekly sediment samples. Water temperature was obtained once daily for most of the open water period and weekly for winter period.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum daily, 31.0°C July 4, 5, 7, 14, 19, 1977; minimum daily, 0.0°C on many days each year.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 10,800 mg/L June 6, 1980; minimum daily mean, 5 mg/L Jan. 28-Feb. 7, 1977, Mar. 3, 1978.
SEDIMENT LOADS: Maximum daily, 215,000 tons (195,000 tonnes) June 6, 1980; minimum daily, 3.7 tons (3.4 tonnes) Mar. 3, 1978.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum daily, 29.0°C July 7, 8; minimum daily, 0.0°C on many days.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,260 mg/L July 11; minimum daily mean, 11 mg/L Nov. 18, Dec. 30 to Jan. 1, Jan 11.
SEDIMENT LOADS: Maximum daily, 108,000 tons (98,000 tonnes) July 12; minimum daily, 12 tons (11 tonnes) Jan.11.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.0	6.0	2.0	---	---	---	10.0	14.0	21.0	23.0	23.0	20.0
2	12.0	6.0	.0	---	---	2.0	13.0	15.0	20.0	23.0	22.0	20.0
3	10.0	8.0	.0	---	---	1.0	12.0	---	20.0	23.0	24.0	20.0
4	10.0	8.0	.0	---	---	3.0	8.0	15.0	20.0	---	25.0	21.0
5	11.0	7.0	---	---	---	3.0	9.0	16.0	22.0	25.0	23.0	20.0
6	13.0	8.0	---	.0	.0	4.0	10.0	15.0	23.0	28.0	23.0	---
7	14.0	7.0	---	.0	---	5.0	11.0	15.0	---	29.0	22.0	19.0
8	15.0	8.0	1.0	---	---	5.0	10.0	13.0	18.0	29.0	24.0	19.0
9	14.0	---	---	---	---	6.0	13.0	13.0	17.0	25.0	---	20.0
10	13.0	7.0	---	---	---	5.0	14.0	---	20.0	---	23.0	22.0
11	10.0	5.0	---	---	---	5.0	13.0	14.0	20.0	---	23.0	23.0
12	---	6.0	1.0	.0	---	7.0	15.0	13.0	23.0	---	24.0	22.0
13	9.0	6.0	---	---	.0	5.0	13.0	15.0	22.0	---	24.0	---
14	8.0	5.0	---	---	---	6.0	12.0	16.0	---	21.5	23.0	21.0
15	8.0	5.0	---	---	---	---	12.0	17.0	19.0	22.0	24.0	19.0
16	9.5	5.0	.0	---	---	7.0	10.0	18.0	18.0	22.0	---	17.0
17	9.0	4.0	---	---	.5	6.0	13.0	---	21.0	23.0	22.0	16.0
18	7.0	4.0	---	---	1.0	5.0	14.0	15.0	20.0	25.0	22.0	16.0
19	8.0	4.0	---	.0	1.0	4.0	---	18.0	20.0	25.0	22.0	18.0
20	9.0	4.0	---	---	4.0	6.0	12.0	18.0	20.0	23.0	23.0	---
21	9.0	4.0	---	---	5.0	7.0	10.0	20.0	---	22.0	22.0	15.0
22	8.0	---	.0	---	1.0	8.0	10.0	20.0	18.0	23.0	22.0	16.0
23	10.0	---	---	---	.5	9.0	8.0	18.0	19.0	21.0	---	15.0
24	7.0	3.0	---	---	3.0	10.0	9.0	16.0	19.0	22.0	23.0	15.0
25	5.0	2.0	---	---	4.0	9.0	11.0	15.0	21.0	---	22.0	15.0
26	---	2.0	---	.0	3.0	8.0	---	16.0	21.0	---	18.5	17.0
27	5.0	2.0	---	---	3.0	9.0	12.0	18.0	22.0	18.0	20.0	---
28	---	2.0	---	---	1.0	11.0	13.0	18.0	23.0	20.0	20.0	15.0
29	5.0	3.0	.0	---	---	---	13.0	20.0	22.0	21.0	21.0	15.0
30	6.0	---	---	---	---	10.0	14.0	20.0	23.0	23.0	22.0	15.0
31	6.0	---	---	---	---	11.0	---	---	---	24.0	---	---

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
JUL										
16...	1930	6440	2050	35600	45	52	--	64	--	95
AUG										
05...	2000	2060	4570	25400	40	46	52	69	--	98
SEP										
01...	0630	3750	2870	29100	44	50	57	69	96	--

05385000 ROOT RIVER NEAR HOUSTON, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	187	560	69	148	18	28	11	13	14	16	918	4790
2	171	485	62	131	45	70	12	14	14	16	385	1250
3	147	395	41	85	65	86	12	14	14	17	205	526
4	131	337	41	84	65	97	12	13	13	15	123	264
5	116	285	50	100	57	94	12	13	13	16	93	182
6	107	254	53	104	48	78	13	14	13	16	107	194
7	97	224	53	105	38	61	19	21	14	18	95	162
8	89	202	66	129	30	48	18	20	15	20	75	121
9	85	187	54	105	31	46	15	17	16	22	56	88
10	74	159	27	52	36	51	13	14	17	26	190	360
11	61	126	16	30	41	55	11	12	17	28	192	402
12	50	100	17	32	45	62	12	13	18	32	288	738
13	40	79	23	43	42	62	12	13	18	35	485	1610
14	43	85	21	39	38	55	13	15	23	50	605	2010
15	51	101	23	42	34	52	14	16	36	97	450	1300
16	65	130	21	38	27	39	15	17	480	1940	343	963
17	94	201	15	27	25	35	16	18	770	6240	242	652
18	51	111	11	19	25	34	17	19	810	4440	163	367
19	42	87	16	27	26	35	18	20	820	3230	108	211
20	70	141	18	31	26	34	18	20	480	1460	72	128
21	64	127	17	29	26	34	17	19	290	770	68	113
22	55	107	17	29	26	34	17	19	3700	30900	56	88
23	50	98	17	28	24	31	16	18	1730	10500	48	73
24	62	141	16	26	23	29	16	18	625	2010	52	77
25	68	172	18	29	21	26	16	18	320	907	70	103
26	92	260	14	22	19	24	16	18	230	590	66	97
27	61	166	13	20	17	21	16	18	1430	10100	77	112
28	66	175	22	35	14	17	16	18	2410	27000	118	170
29	89	210	25	40	12	14	15	17	---	---	143	211
30	65	147	22	35	11	13	15	17	---	---	160	256
31	60	133	---	---	11	13	15	17	---	---	163	263
TOTAL	---	5985	---	1664	---	1378	---	513	---	100511	---	17881

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	146	246	51	85	151	223	338	486	325	762	2090	16800
2	140	241	44	71	156	226	269	370	505	1190	808	3970
3	117	198	45	72	98	135	230	314	240	531	418	1590
4	283	601	48	77	93	124	205	275	860	3670	343	1160
5	196	399	70	116	107	140	172	224	4140	22900	328	1000
6	259	572	75	138	107	136	130	168	2480	16600	318	910
7	232	516	95	189	100	127	170	213	1130	6470	360	1050
8	166	352	105	204	164	210	211	263	595	2300	258	738
9	143	287	100	184	185	237	230	289	345	1120	320	850
10	142	276	92	162	143	180	218	264	263	739	264	658
11	136	262	82	139	144	179	4260	67600	220	557	262	623
12	122	234	77	127	150	183	3560	108000	260	615	200	450
13	104	197	98	160	184	237	2340	68700	197	436	165	355
14	96	178	73	116	174	229	1470	12900	406	1200	205	425
15	106	188	67	104	169	222	2130	22700	447	1330	144	289
16	99	172	69	105	174	221	2700	44100	214	536	128	250
17	102	177	70	104	172	210	1240	12200	152	351	138	265
18	72	121	74	107	157	188	700	4290	174	373	110	208
19	57	97	88	127	162	190	550	2600	161	328	83	156
20	52	88	79	108	176	223	3280	23600	233	456	80	149
21	49	79	63	85	1300	2890	2340	14900	249	446	81	148
22	46	76	76	101	940	1570	750	3180	194	355	72	129
23	59	101	82	111	460	662	480	1750	140	254	72	126
24	60	102	212	342	373	565	543	1770	99	179	71	123
25	45	77	149	235	366	568	517	1550	82	145	68	117
26	50	85	209	379	418	675	405	1100	140	267	65	114
27	62	103	128	220	354	531	298	772	260	615	60	111
28	62	101	137	220	283	403	198	499	286	754	60	109
29	53	85	112	174	240	342	230	544	276	715	65	117
30	52	86	113	168	293	418	210	470	247	612	68	120
31	---	---	141	208	---	---	202	430	2070	20000	---	---
TOTAL	---	6297	---	4738	---	12444	---	396521	---	86806	---	33110

05385500 SOUTH FORK ROOT RIVER NEAR HOUSTON, MN

LOCATION.--Lat 43°44'19", long 91°33'50", in NE¼SW¼ sec.9, T.103 N., R.6 W., Houston County, Hydrologic Unit 07040008, on left bank 50 ft (15 m) downstream from bridge on State Highway 76, 0.5 mi (0.8 km) upstream from Badger Creek and 1.5 mi (2.4 km) south of Houston.

DRAINAGE AREA.--275 mi^2 (712 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1953 to current year.

REVISED RECORDS.--WSP 1388: 1953. WSP 1914: 1956(M), 1959(P), 1960.

GAGE.--Water-stage recorder. Datum of gage is 680.41 ft (207.389 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--28 years, 136 ft^3/s (3.852 m^3/s), 6.72 in/yr (171 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,000 ft^3/s (312 m^3/s) June 21, 1974, gage height, 13.81 ft (4.209 m); minimum, 11 ft^3/s (0.31 m^3/s) Nov. 28, 1961, gage height, 1.47 ft (0.448 m); minimum gage height, 0.85 ft (0.259 m) Aug. 17, 1967.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 26, 1950, reached a stage of 12.81 ft (3.904 m), from floodmark, discharge, 7,040 ft^3/s (199 m^3/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 900 ft^3/s (25.5 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Feb. 16	2100	936	26.5	7.39	2.252	July 12	0300	*4,280	121	*12.01	3.661
Feb. 22	1600	1,400	39.6	9.73	2.966	July 15	1245	948	26.8	7.46	2.274
Feb. 28	0855	1,460	41.3	9.90	3.018	Aug. 26	2100	1,890	53.5	10.71	3.264
Apr. 4	0330	1,210	34.3	8.88	2.707						

Minimum daily discharge, 102 ft^3/s (2.89 m^3/s) Dec. 19; minimum gage height, 1.73 ft (0.527 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	188	154	137	131	120	357	144	165	131	130	291	498
2	185	153	141	126	120	242	140	161	131	128	308	318
3	181	153	135	122	120	196	194	159	132	128	188	282
4	176	150	130	120	120	174	854	162	131	129	175	261
5	172	149	140	120	120	167	297	165	129	126	300	243
6	170	148	138	120	120	162	228	157	129	126	351	231
7	172	149	138	123	120	156	208	153	128	124	202	236
8	166	148	138	123	120	153	203	152	131	125	189	233
9	162	147	137	125	120	155	196	152	135	134	182	217
10	160	144	135	125	120	202	182	150	132	126	174	211
11	157	142	130	125	115	205	182	150	129	1940	168	205
12	155	143	130	125	115	212	179	148	128	1690	164	200
13	155	143	130	125	115	206	173	149	134	360	162	191
14	153	148	134	125	120	166	194	149	132	264	220	190
15	155	144	132	125	130	154	175	147	135	685	256	186
16	157	143	130	125	500	152	171	143	132	362	194	180
17	163	142	130	120	586	149	172	141	128	248	177	178
18	158	141	130	120	311	147	163	141	125	222	171	176
19	152	141	115	120	204	143	170	138	123	205	164	176
20	150	140	125	120	168	142	172	138	136	489	164	175
21	148	140	125	120	157	141	167	137	167	253	160	172
22	147	140	125	120	1040	139	171	136	138	209	159	169
23	147	140	125	120	488	137	180	138	131	194	157	166
24	174	140	125	130	253	136	175	164	146	182	155	166
25	191	137	125	132	235	137	171	153	140	178	154	169
26	170	136	125	135	224	134	166	142	131	171	712	176
27	163	137	125	131	512	135	163	140	129	168	619	192
28	160	138	125	125	1120	135	164	138	128	173	287	169
29	159	138	130	120	---	141	166	138	132	167	238	166
30	158	138	134	120	---	148	170	136	132	160	227	166
31	155	---	132	120	---	146	---	134	---	157	397	---
TOTAL	5059	4306	4051	3838	7593	5169	6090	4576	3985	9753	7465	6298
MEAN	163	144	131	124	271	167	203	148	133	315	241	210
MAX	191	154	141	135	1120	357	854	165	167	1940	712	498
MIN	147	136	115	120	115	134	140	134	123	124	154	166
CFSM	.59	.52	.48	.45	.99	.61	.74	.54	.48	1.15	.88	.76
IN.	.68	.58	.55	.52	1.03	.70	.82	.62	.54	1.32	1.01	.85

CAL YR 1980 TOTAL 66225 MEAN 181 MAX 3700 MIN 107 CFSM .66 IN 8.96
WTR YR 1981 TOTAL 68183 MEAN 187 MAX 1940 MIN 115 CFSM .68 IN 9.22

05385500 SOUTH FORK ROOT RIVER NEAR HOUSTON, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1968-69, July 1975 to September 1981 (discontinued).

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: July 1975 to September 1981.
SUSPENDED SEDIMENT: July 1975 to September 1981.

REMARKS.--During the winter period, suspended-sediment samples were collected weekly and daily sediment concentrations were estimated on the basis of water records and weekly sediment samples. Water temperature was obtained once daily for most of the open water period and weekly for winter period.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum daily, 28.0°C July 5, 14, 1977; minimum daily, 0.0°C on many days each year.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 11,800 mg/L July 11, 1981; minimum daily mean, 20 mg/L Jan. 26, 1977, and Feb. 22, 1978.
SEDIMENT LOADS: Maximum daily, 84,100 tons (76,300 tonnes) July 11, 1981; minimum daily, 3.4 tons (3.1 tonnes) Feb. 22, 1978.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum daily, 27.0°C July 8; minimum daily, 0.0°C on many days.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 11,800 mg/L July 11; minimum daily mean, 23 mg/L Nov. 29.
SEDIMENT LOADS: Maximum daily, 84,100 tons (76,300 tonnes) July 11; minimum daily, 8.6 tons (7.8 tonnes) Nov. 29.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.0	6.0	3.0	---	---	---	9.0	12.0	19.0	21.0	20.0	19.0
2	10.0	6.0	.0	---	---	2.0	13.0	14.0	18.0	21.0	21.0	19.0
3	10.0	8.0	.0	---	.0	2.0	11.0	---	18.0	20.0	22.0	19.0
4	10.0	7.0	.0	---	---	3.0	8.0	14.0	18.0	---	23.0	19.0
5	10.0	7.0	---	---	---	2.0	8.0	14.0	20.0	23.0	21.0	19.0
6	13.0	8.0	---	.0	---	4.0	9.0	17.0	20.0	24.5	23.0	---
7	14.0	8.0	---	.0	---	5.0	11.0	14.0	---	26.0	21.0	18.0
8	15.0	8.0	3.0	---	---	5.0	9.0	12.0	16.0	27.0	22.0	18.0
9	13.0	---	---	---	---	6.0	12.0	12.0	15.0	22.0	---	19.0
10	13.0	6.0	---	---	---	5.0	13.0	---	18.0	---	21.0	20.0
11	9.0	5.0	---	---	---	5.0	12.0	13.0	18.0	---	21.0	21.0
12	---	7.0	3.0	.0	---	7.0	14.0	12.0	20.0	---	22.0	20.0
13	8.0	6.0	---	---	.0	5.0	13.0	14.0	20.0	---	22.0	---
14	13.0	5.0	---	---	---	7.0	11.0	15.0	---	23.0	22.0	19.0
15	8.0	5.0	---	---	---	---	12.0	16.0	17.0	21.0	23.0	17.0
16	9.0	5.0	2.0	---	2.0	7.0	10.0	17.0	17.0	20.5	---	15.0
17	9.0	4.0	---	---	2.5	6.0	12.0	---	19.0	22.0	20.0	15.0
18	8.0	4.0	---	---	5.0	5.0	13.0	14.0	19.0	24.0	20.0	15.0
19	8.0	4.0	---	.0	5.0	5.0	---	16.0	19.0	24.0	20.0	16.0
20	9.0	4.0	---	---	7.0	6.0	12.0	17.0	18.0	21.0	20.0	---
21	9.0	4.0	---	---	7.0	7.0	9.0	18.0	---	21.0	20.0	14.0
22	8.0	---	.0	---	2.0	8.0	10.0	18.0	16.0	21.0	20.0	15.0
23	10.0	---	---	---	1.0	9.0	8.0	17.0	17.0	20.0	---	14.0
24	7.0	3.0	---	---	4.0	10.0	8.0	14.0	18.0	21.0	21.0	14.0
25	---	2.0	---	---	5.0	9.0	10.0	14.0	19.0	---	19.0	19.0
26	---	2.0	---	3.0	4.0	8.0	---	15.0	20.0	---	20.0	17.0
27	5.0	2.0	---	---	2.5	9.0	11.0	17.0	20.0	17.0	19.5	---
28	5.0	2.0	---	---	1.0	11.0	12.0	17.0	22.0	19.0	18.0	14.0
29	5.0	4.0	1.0	---	---	---	12.0	18.0	20.0	20.0	19.0	14.0
30	6.0	---	---	---	---	9.0	13.0	18.0	22.0	21.0	---	14.0
31	6.0	---	---	---	---	11.0	---	---	---	23.0	20.0	---

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)
APR											
04...	0620	1070	11100	32100	41	48	55	66	96	97	100
JUL											
15...	1740	782	3130	6610	43	50	57	71	93	--	98
AUG											
26...	1925	1740	4970	23300	44	52	57	74	95	96	100

05385500 SOUTH FORK ROOT RIVER NEAR HOUSTON, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	194	98	55	23	30	11	98	35	50	16	953	1010
2	163	81	47	19	40	15	98	33	47	15	407	266
3	149	73	47	19	56	20	98	32	44	14	274	132
4	131	62	47	19	57	20	97	31	43	14	170	67
5	108	50	41	16	56	21	97	31	42	14	113	50
6	114	52	55	22	54	20	95	31	41	13	100	35
7	122	57	67	27	51	19	82	27	39	13	95	34
8	103	46	47	19	49	18	84	28	38	12	92	35
9	91	40	40	16	49	18	95	32	36	12	106	42
10	78	34	44	17	50	18	106	36	34	11	297	162
11	67	28	37	14	51	18	117	39	32	9.9	365	202
12	64	27	38	15	52	18	126	43	30	9.3	348	199
13	61	26	39	15	48	17	120	40	29	9.0	326	181
14	65	27	35	14	42	15	109	37	29	9.4	191	86
15	55	23	28	11	37	13	98	33	40	14	144	60
16	61	26	27	10	30	11	88	30	1300	2690	123	50
17	96	42	27	10	33	12	76	25	1850	3190	107	43
18	77	33	28	11	36	13	64	21	1130	949	97	38
19	77	32	34	13	40	12	53	17	425	234	85	33
20	89	36	40	15	42	14	52	17	270	122	77	30
21	97	39	41	15	44	15	54	17	165	70	88	34
22	67	27	38	14	46	16	56	18	3990	12100	89	33
23	75	30	37	14	51	17	57	18	1990	2950	83	31
24	99	47	34	13	56	19	59	21	560	383	67	25
25	108	56	37	14	62	21	60	21	430	273	68	25
26	98	45	33	12	67	23	61	22	510	308	54	20
27	90	40	32	12	74	25	60	21	2090	4450	86	31
28	78	34	29	11	86	29	58	20	2730	8780	94	34
29	86	37	23	8.6	98	34	56	18	---	---	101	38
30	74	32	25	9.3	98	35	53	17	---	---	145	58
31	70	29	---	---	98	35	52	17	---	---	127	50
TOTAL	---	1309	---	447.9	---	592	---	828	---	36684.6	---	3134

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	97	38	101	28	128	45	155	54	1520	2230	2120	3130
2	103	39	88	23	137	48	141	49	1810	1640	900	773
3	894	1200	84	21	99	35	125	43	560	284	570	434
4	9040	23000	95	24	101	36	109	38	397	188	415	292
5	2200	1890	98	25	139	48	96	33	1170	1340	408	268
6	820	505	68	25	176	61	96	33	979	1010	395	246
7	635	357	74	28	191	66	94	31	380	207	363	231
8	515	282	97	25	202	71	135	46	442	226	292	184
9	410	215	100	25	186	68	165	60	394	194	265	155
10	320	152	97	25	168	60	163	55	314	148	290	165
11	258	120	96	26	208	72	11800	84100	267	121	243	135
12	235	107	104	29	202	70	6010	38300	228	101	234	126
13	217	93	113	33	264	96	1180	1200	198	87	238	123
14	407	195	108	32	277	99	540	385	568	314	186	95
15	286	120	102	31	260	95	3650	7070	817	564	153	77
16	239	97	92	28	211	75	2040	2090	273	143	134	65
17	207	82	92	29	198	68	710	475	187	89	138	66
18	174	64	93	30	199	67	625	375	232	107	130	62
19	154	58	91	29	213	71	555	307	206	91	124	59
20	144	53	92	31	345	139	2510	4000	207	92	140	66
21	140	50	89	30	820	370	1220	833	153	66	145	67
22	125	44	117	41	366	136	640	361	150	64	125	57
23	122	45	158	57	215	76	468	245	135	57	112	50
24	142	50	697	319	205	81	526	258	115	48	105	47
25	181	60	259	107	190	72	522	251	91	38	98	45
26	199	62	121	46	191	68	457	211	2800	8730	108	51
27	170	51	128	48	158	55	394	179	2910	5730	136	71
28	123	36	139	52	155	54	305	142	650	504	103	47
29	95	28	122	45	142	51	255	115	380	244	100	45
30	108	31	122	45	155	55	262	113	310	190	85	38
31	---	---	126	46	---	---	237	100	1440	2410	---	---
TOTAL	---	29124	---	1383	---	2408	---	141552	---	27257	---	7270

TOTAL LOAD FOR YEAR: 251989.5 TONS.

05457000 CEDAR RIVER NEAR AUSTIN, MN

LOCATION.--Lat 43°38'10", long 92°58'20", in NE¼SE¼ sec.15, T.102 N., R.18 W., Mower County, Hydrologic Unit 07080201, on left bank 200 ft (61 m) upstream from abandoned powerhouse, 500 ft (152 m) downstream from highway bridge, 1.1 mi (1.8 km) downstream from Turtle Creek, and 1.1 mi (1.8 km) south of Austin.

DRAINAGE AREA.--425 mi^2 (1,100 km^2).

WATER-DISCHARGE RECORDS

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 (354.208 m) National Geodetic Vertical Datum of 1929. May 1909 to April 1912, nonrecording gage in tailwater of powerplant 200 ft (61 m) downstream at datum 3.1 ft (0.94 m) lower. May 1912 to September 1914, nonrecording gage on highway bridge 500 ft (152 m) downstream at datum 1.1 ft (0.34 m) lower.

REMARKS.--Records good except those for winter periods, which are fair.

AVERAGE DISCHARGE.--42 years (water years 1910-14, 1945-81), 191 ft^3/s (5.409 m^3/s), 6.10 in/yr (155 mm/yr); median of yearly mean discharges, 177 ft^3/s (5.01 m^3/s), 5.66 in/yr (144 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,400 ft^3/s (351 m^3/s) July 17, 1978, gage height, 20.35 ft (6.203 m) from floodmark in well; no flow for several days in 1911.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,400 ft^3/s (39.6 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
July 13	0030	2380	67.4	7.87	2.399	Aug. 28	2145	1540	43.6	6.15	1.875
July 16	0215	*4810	136	*11.62	3.452						

Minimum discharge, 44 ft^3/s (1.25 m^3/s) Jan. 22, gage height, 2.18 ft (0.664 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	217	168	106	76	58	178	173	151	180	904	245	556
2	203	159	81	72	58	143	158	133	173	488	246	448
3	189	161	95	70	58	133	171	152	155	332	272	378
4	178	160	98	68	58	133	225	324	139	265	245	329
5	167	151	102	67	58	105	238	503	128	228	304	290
6	162	147	109	65	58	103	208	471	115	199	381	261
7	157	149	111	64	56	91	193	352	103	176	532	272
8	155	142	109	63	56	94	181	282	116	157	429	243
9	147	142	103	61	56	96	171	248	122	142	313	222
10	144	135	98	60	56	96	164	218	124	126	248	209
11	135	127	95	60	56	98	157	197	117	607	220	198
12	128	128	96	60	56	109	150	189	121	2160	199	182
13	131	135	89	60	56	124	155	191	152	1730	181	167
14	140	131	92	60	57	136	152	176	154	745	219	161
15	136	126	91	60	72	142	135	163	189	2800	435	155
16	165	121	92	58	119	130	135	153	185	3680	504	145
17	188	121	94	57	192	122	137	143	160	1600	325	137
18	201	119	91	57	255	112	127	135	148	995	248	134
19	182	119	86	60	226	101	149	126	133	740	215	131
20	171	120	82	61	162	95	146	121	125	572	191	126
21	164	117	79	61	142	92	145	115	118	528	172	122
22	154	118	77	59	148	90	160	111	123	468	154	118
23	162	119	75	61	124	90	159	168	147	577	142	114
24	206	114	76	63	134	90	150	202	465	685	173	114
25	271	104	73	64	149	93	138	220	511	551	184	115
26	242	113	70	67	132	98	131	195	311	467	929	147
27	222	110	69	66	180	93	125	181	220	392	1250	129
28	206	107	69	62	232	93	187	169	183	349	1370	122
29	191	114	74	63	---	123	179	174	420	313	1340	121
30	183	109	76	61	---	151	168	339	1230	278	930	118
31	176	---	78	59	---	169	---	240	---	252	702	---
TOTAL	5473	3886	2736	1945	3064	3523	4867	6542	6567	23506	13298	5964
MEAN	177	130	88.3	62.7	109	114	162	211	219	758	429	199
MAX	271	168	111	76	255	178	238	503	1230	3680	1370	556
MIN	128	104	69	57	56	90	125	111	103	126	142	114
CFSM	.42	.31	.21	.15	.26	.27	.38	.50	.52	1.78	1.01	.47
IN.	.48	.34	.24	.17	.27	.31	.43	.57	.57	2.06	1.16	.52

CAL YR 1980 TOTAL 84331 MEAN 230 MAX 3010 MIN 55 CFSM .54 IN 7.38
WTR YR 1981 TOTAL 81371 MEAN 223 MAX 3680 MIN 56 CFSM .53 IN 7.12

05457000 CEDAR RIVER NEAR AUSTIN, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1961-62, 1968-69, 1971 to September 1981 (discontinued).

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: March 1973 to September 1975.
WATER TEMPERATURES: March 1973 TO September 1975, October 1978 to September 1981.
SUSPENDED-SEDIMENT DISCHARGE: March 1971 to September 1971, March 1973 to September 1975, October 1978 to September 1981.

REMARKS.--Sediment observer collects suspended-sediment samples daily when the stage is equal to or greater than 3.5 feet and several times daily during periods of rapidly changing stage. Water temperatures are obtained when sediment samples are collected.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---		---		---		---	21.5	---	19.0
2	---	---	---		---		---		---	22.0	---	18.0
3	---	---	---		---		---		---	---	---	18.0
4	---	---	---		---		---		---	---	---	---
5	---	---	---		---		---		---	---	---	---
6	---	---	---		---		---		---	---	---	---
7	---	---	---		---		---		---	---	---	---
8	---	---	---		---		---		---	---	---	---
9	---	---	---		---		---		---	---	---	---
10	---	---	---		---		---		---	---	---	---
11	---	---	---		---		---		---	26.0	22.0	---
12	---	---	---		---		---		---	25.0	---	---
13	---	---	---		---		---		---	24.5	---	---
14	---	---	---		---		---		---	25.0	---	---
15	---	---	---		---		---		---	24.0	---	---
16	---	---	---		---		---		19.5	22.5	22.0	---
17	---	---	---		---		---		---	23.5	20.0	---
18	---	---	---		---		---		---	23.5	---	---
19	---	---	---		---		---		---	25.0	---	---
20	---	---	---		---		---		---	24.5	---	---
21	11.5	---	---		---		11.5		---	23.0	---	---
22	---	---	---		---		---		---	23.0	---	---
23	---	---	---		---		---		---	22.0	---	9.0
24	---	---	---		8.0		---		---	21.5	---	---
25	---	4.0	---		---		---		19.5	22.0	---	---
26	---	---	---		---		---		21.0	20.5	21.0	---
27	---	---	---		---		---		21.0	---	21.0	---
28	---	---	---		---		---		22.0	21.0	20.0	---
29	---	---	---		---		---		---	19.5	20.0	---
30	---	---	5.0		---		---		23.0	22.0	20.0	---
31	---	---	---		---		---		---	---	20.0	---

05457000 CEDAR RIVER NEAR AUSTIN, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	---	---	---	---	---	---			---	---		
2	---	---	---	---	---	---			---	---		
3	---	---	---	---	---	---			---	---		
4	---	---	---	---	---	---			---	---		
5	---	---	---	---	---	---			---	---		
6	---	---	---	---	---	---			---	---		
7	---	---	---	---	---	---			---	---		
8	---	---	---	---	---	---			---	---		
9	---	---	---	---	---	---			---	---		
10	---	---	---	---	---	---			---	---		
11	---	---	---	---	---	---			---	---		
12	---	---	---	---	---	---			---	---		
13	---	---	---	---	---	---			---	---		
14	---	---	---	---	---	---			---	---		
15	---	---	---	---	---	---			---	---		
16	---	---	---	---	---	---			---	---		
17	---	---	---	---	---	---			---	---		
18	---	---	---	---	---	---			---	---		
19	---	---	---	---	---	---			---	---		
20	---	---	---	---	---	---			---	---		
21	18	8.0	---	---	---	---			---	---		
22	---	---	---	---	---	---			---	---		
23	---	---	---	---	---	---			---	---		
24	---	---	---	---	---	---			14	5.1		
25	---	---	7	2.0	---	---			---	---		
26	---	---	---	---	---	---			---	---		
27	---	---	---	---	---	---			---	---		
28	---	---	---	---	---	---			---	---		
29	---	---	---	---	---	---			---	---		
30	---	---	---	---	7	1.4			---	---		
31	---	---	---	---	---	---			---	---		

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	---	---			---	---	253	618	---	---	58	87
2	---	---			---	---	203	267	---	---	51	62
3	---	---			---	---	---	---	---	---	50	51
4	---	---			---	---	---	---	---	---	---	---
5	---	---			---	---	---	---	---	---	---	---
6	---	---			---	---	---	---	---	---	---	---
7	---	---			---	---	---	---	---	---	---	---
8	---	---			---	---	---	---	---	---	---	---
9	---	---			---	---	---	---	---	---	---	---
10	---	---			---	---	---	---	---	---	---	---
11	---	---			---	---	312	511	59	35	---	---
12	---	---			---	---	470	2740	---	---	---	---
13	---	---			---	---	197	920	---	---	---	---
14	---	---			---	---	102	205	---	---	---	---
15	---	---			---	---	528	3990	---	---	---	---
16	---	---			63	31	257	2550	60	82	---	---
17	---	---			---	---	113	488	43	38	---	---
18	---	---			---	---	84	226	---	---	---	---
19	---	---			---	---	88	176	---	---	---	---
20	---	---			---	---	100	154	---	---	---	---
21	14	5.5			---	---	87	124	---	---	---	---
22	---	---			---	---	80	101	---	---	---	---
23	---	---			---	---	172	268	---	---	24	7.4
24	---	---			---	---	137	253	---	---	---	---
25	---	---			283	390	91	135	---	---	---	---
26	---	---			232	195	89	112	392	983	---	---
27	---	---			188	112	84	89	118	398	---	---
28	---	---			150	74	77	73	62	229	---	---
29	---	---			224	254	65	55	62	224	---	---
30	---	---			318	1060	63	47	54	136	---	---
31	---	---			---	---	---	---	68	129	---	---

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 mi^2 (3,160 km^2), approximately.

WATER-DISCHARGE RECORDS

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 (392.506 m) National Geodetic Vertical Datum of 1929. May 31, 1909, to Dec. 20, 1913, nonrecording gage at site 0.6 mi (1.0 km) downstream at datum 0.99 ft (0.302 m) lower. Aug. 22, 1930, to Sept. 30, 1944, nonrecording gage at site 7 mi (11 km) upstream at datum 17.10 ft (5.212 m) higher. Oct. 1, 1944, to Oct. 26, 1949, nonrecording gage at site 600 ft (183 m) upstream at datum 10.64 ft (3.243 m) higher. Oct. 27, 1949, to Dec. 15, 1965, water-stage recorder 200 ft (61 m) downstream at present datum.

REMARKS.--Records good except those for winter period, which are fair. Regulation at times by Yankton, Long, Shetek, and Heron Lakes.

AVERAGE DISCHARGE.--46 years (water years 1936-81), 278 ft^3/s (7.873 m^3/s), 3.09 in/yr (78 mm/yr); median of yearly mean discharges, 207 ft^3/s (5.86 m^3/s), 2.30 in/yr (58 mm/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,700 ft^3/s (445 m^3/s) Apr. 11, 1969, gage height, 19.45 ft (5.928 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 992 ft^3/s (28.1 m^3/s) June 14, gage height, 6.55 ft (1.996 m), no other peak above base of 500 ft^3/s (14.2 m^3/s); minimum, 0.05 ft^3/s (0.001 m^3/s) Sept. 27, gage height, 2.75 ft (0.838 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	19	22	16	6.5	29	56	29	10	17	40	34
2	17	18	26	16	6.5	33	62	31	13	15	39	30
3	18	18	20	16	6.5	35	65	42	11	15	38	21
4	17	17	23	12	6.5	34	50	56	12	15	45	19
5	14	18	25	11	6.5	44	46	51	10	15	49	17
6	14	17	26	12	6.5	38	40	41	8.0	11	43	17
7	14	17	29	12	6.5	35	42	37	8.8	8.8	35	20
8	13	20	31	9.7	6.5	34	45	34	8.8	8.8	28	20
9	15	18	29	8.0	6.5	38	44	34	7.3	7.3	32	18
10	16	17	28	7.3	6.5	37	35	32	9.7	6.0	30	16
11	12	16	26	6.5	6.5	35	35	28	8.8	4.8	26	16
12	17	16	25	6.5	6.5	33	35	28	34	5.4	26	16
13	12	16	25	6.5	6.5	30	39	19	50	5.4	26	14
14	12	18	24	6.5	6.5	29	36	18	389	3.4	31	11
15	15	18	27	6.5	14	28	32	17	398	6.0	36	10
16	22	16	27	6.5	26	27	32	16	314	5.4	60	11
17	23	17	26	6.5	38	26	33	14	199	6.6	48	11
18	24	19	32	6.5	47	25	31	13	127	6.0	43	10
19	25	21	25	6.5	42	23	30	13	84	12	44	8.8
20	22	22	14	6.5	47	20	44	12	68	17	33	9.7
21	21	22	17	6.5	51	18	36	11	61	22	24	12
22	20	22	14	6.5	46	18	35	11	54	50	19	10
23	21	19	13	6.5	43	22	44	13	54	198	18	5.4
24	20	25	13	6.5	29	20	45	12	83	137	16	1.7
25	22	36	10	6.5	29	19	41	15	55	106	16	1.1
26	18	32	10	6.5	28	18	39	14	48	106	15	.77
27	18	36	11	6.5	30	17	34	13	40	62	25	.35
28	17	32	12	6.5	26	18	34	14	37	50	35	.44
29	18	25	12	6.5	---	38	31	12	29	42	37	.65
30	18	22	14	6.5	---	50	29	12	20	36	36	3.4
31	18	---	15	6.5	---	50	---	11	---	34	33	---
TOTAL	550	629	651	256.5	587.0	921	1200	703	2251.4	1033.9	1026	365.31
MEAN	17.7	21.0	21.0	8.27	21.0	29.7	40.0	22.7	75.0	33.4	33.1	12.2
MAX	25	36	32	16	51	50	65	56	398	198	60	34
MIN	12	16	10	6.5	6.5	17	29	11	7.3	3.4	15	.35
CFSM	.02	.02	.02	.007	.02	.02	.03	.02	.06	.03	.03	.01
IN.	.02	.02	.02	.01	.02	.03	.04	.02	.07	.03	.03	.01

CAL YR 1980 TOTAL 107604.00 MEAN 294 MAX 1970 MIN 10 CFSM .24 IN 3.28
WTR YR 1981 TOTAL 10174.11 MEAN 27.9 MAX 398 MIN .35 CFSM .02 IN .31

05476000 DES MOINES RIVER AT JACKSON, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1968 to September 1981 (discontinued).

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---		---		---	---	---	---	---
2	---	---	---	---		---		---	---	---	---	---
3	---	---	---	---		---		---	---	---	---	---
4	---	---	---	---		---		---	---	---	---	---
5	---	---	---	---		---		---	---	---	---	---
6	17.0	---	---	---		---		---	---	---	---	---
7	---	---	---	---		---		---	---	---	---	---
8	---	---	---	---		---		---	---	---	---	---
9	---	---	---	---		---		---	---	---	---	---
10	---	---	---	---		---		---	---	---	---	---
11	---	---	---	---		---		---	---	---	---	---
12	---	---	---	---		4.0		---	---	---	---	---
13	---	---	---	---		---		13.0	22.0	---	---	---
14	---	---	---	---		---		---	22.0	26.5	---	---
15	---	---	---	---		---		---	20.5	---	---	---
16	---	---	---	---		---		---	20.0	---	---	---
17	---	---	---	---		---		---	21.5	---	---	---
18	---	---	1.0	---		---		---	22.0	---	---	---
19	---	7.0	---	---		---		---	20.5	---	---	---
20	---	---	---	---		---		---	21.0	---	---	---
21	---	---	---	2.5		---		---	22.0	---	---	---
22	---	---	---	---		---		---	---	21.0	---	---
23	---	---	---	---		---		---	---	21.5	---	---
24	---	---	---	---		---		---	24.0	25.0	---	---
25	---	---	---	---		---		---	---	---	---	---
26	---	---	---	---		---		---	---	---	22.0	---
27	---	---	---	---		---		---	---	---	---	---
28	---	---	---	---		---		---	---	---	---	---
29	---	---	---	---		---		---	---	---	---	20.5
30	---	---	---	---		---		---	---	---	---	---
31	---	---	---	---		---		---	---	---	---	---

05476000 DES MOINES RIVER AT JACKSON, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	---	---	---	---	---	---	---	---			---	---
2	---	---	---	---	---	---	---	---			---	---
3	---	---	---	---	---	---	---	---			---	---
4	---	---	---	---	---	---	---	---			---	---
5	---	---	---	---	---	---	---	---			---	---
6	59	2.2	---	---	---	---	---	---			---	---
7	---	---	---	---	---	---	---	---			---	---
8	---	---	---	---	---	---	---	---			---	---
9	---	---	---	---	---	---	---	---			---	---
10	---	---	---	---	---	---	---	---			---	---
11	---	---	---	---	---	---	---	---			---	---
12	---	---	---	---	---	---	---	---			49	4.4
13	---	---	---	---	---	---	---	---			---	---
14	---	---	---	---	---	---	---	---			---	---
15	---	---	---	---	---	---	---	---			---	---
16	---	---	---	---	---	---	---	---			---	---
17	---	---	---	---	---	---	---	---			---	---
18	---	---	---	---	159	14	---	---			---	---
19	---	---	33	1.9	---	---	---	---			---	---
20	---	---	---	---	---	---	---	---			---	---
21	---	---	---	---	---	---	286	5.0			---	---
22	---	---	---	---	---	---	---	---			---	---
23	---	---	---	---	---	---	---	---			---	---
24	---	---	---	---	---	---	---	---			---	---
25	---	---	---	---	---	---	---	---			---	---
26	---	---	---	---	---	---	---	---			---	---
27	---	---	---	---	---	---	---	---			---	---
28	---	---	---	---	---	---	---	---			---	---
29	---	---	---	---	---	---	---	---			---	---
30	---	---	---	---	---	---	---	---			---	---
31	---	---	---	---	---	---	---	---			---	---

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1			---	---	---	---	---	---	---	---	---	---
2			---	---	---	---	---	---	---	---	---	---
3			---	---	---	---	---	---	---	---	---	---
4			---	---	---	---	---	---	---	---	---	---
5			---	---	---	---	---	---	---	---	---	---
6			---	---	---	---	---	---	---	---	---	---
7			---	---	---	---	---	---	---	---	---	---
8			---	---	---	---	---	---	---	---	---	---
9			---	---	---	---	---	---	---	---	---	---
10			---	---	---	---	---	---	---	---	---	---
11			---	---	---	---	---	---	---	---	---	---
12			---	---	97	13	---	---	---	---	---	---
13			49	5.2	87	12	---	---	---	---	---	---
14			---	---	292	473	26	.24	---	---	---	---
15			---	---	252	276	---	---	---	---	---	---
16			---	---	176	149	---	---	---	---	---	---
17			---	---	126	68	---	---	---	---	---	---
18			---	---	103	35	---	---	---	---	---	---
19			---	---	102	23	---	---	---	---	---	---
20			---	---	97	18	---	---	---	---	---	---
21			---	---	108	18	---	---	---	---	---	---
22			---	---	112	16	---	---	---	---	---	---
23			---	---	106	15	---	---	---	---	---	---
24			---	---	115	26	79	29	---	---	---	---
25			---	---	---	---	---	---	---	---	---	---
26			---	---	---	---	---	---	101	4.1	---	---
27			---	---	---	---	---	---	---	---	---	---
28			---	---	---	---	---	---	---	---	---	---
29			---	---	---	---	---	---	---	---	64	.11
30			---	---	---	---	---	---	---	---	---	---
31			---	---	---	---	---	---	---	---	---	---

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 partial-record 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. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

Low-flow partial-record stations

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 the 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.

Discharge measurements made at low-flow partial-record stations during water year 1981

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements: Date	Measurements: Discharge (ft^3/s)
		Minnesota River basin				
b05293370	Pomme de Terre River near Elbow Lake, MN	Lat 45°59'06", long 95°53'37", in NE¼SE¼ sec.13, T.129 N., R.42 W., Grant County, Hydrologic Unit 07020002, at bridge on county road, 1 mile downstream from Pomme de Terre Lake, and 4 miles east of Elbow Lake.	a334	1963-65, 1970, 1973-75, 1978, 1980-81	11- 6-80	19.4
b05293600	Mud Creek near Morris, MN	Lat 45°32'26", long 95°54'44", on line between secs.22 and 23, T.124 N., R.42 W., Stevens County, Hydrologic Unit 07020002, at culvert on U.S. Highway 59, 1 mile upstream from mouth, and 3 miles south of Morris.	a137	1963-65, 1970, 1973-75, 1978, 1980-81	11- 7-80	0.02
b05294000	Pomme de Terre River near Appleton, MN	Lat 45°14'22", long 95°59'06", in NW¼NE¼ sec.1, T.120 N., R.43 W., Swift County, Hydrologic Unit 07020002, at bridge on County Highway 54, 3 miles northeast of Appleton, and 12 miles upstream from mouth.	885	1931-53#, 1964, 1973, 1980-81	11- 7-80	37.9
05300500	Ten Mile Creek near Boyd, MN	Lat 44°56'10", long 95°53'20", on line between secs. 14 and 23, T.117 N., R.42 W., Lac qui Parle County, Hydro-Unit 07020003, at bridge on U.S. Highway 212, 5.8 miles north of Boyd and about 8 miles west of Montevideo.	82.8	1949-52#, 1980-81	10-27-80 9-29-81	1.22 0.42
b05302700	Little Chippewa River near Cyrus, MN	Lat 45°35'46", long 95°40'32", on line between secs.34 and 35, T.125 N., R.40 W., Pope County, Hydrologic Unit 07020005, at bridge on County Road 73, 4.3 miles southeast of Cyrus.	a12.6	1969-70, 1973-74, 1980-81	11- 6-80	2.50
b05302980	Lake Emily outlet near Hancock, MN	Lat 45°30'56", long 95°41'45", in SE¼SW¼ sec.28, T.124 N., R.40 W., Pope County, Hydrologic Unit 07020005, at culvert on county road, 4.0 miles east of Hancock.	260	1969-70, 1973-74, 1980-81	4- 6-80	1.11
05303350	East Branch Chippewa River near Swift Falls, MN	Lat 45°22'35", long 95°24'51", in W½ sec.14, T.122 N., R.38 W., Swift County, Hydrologic Unit 07020005, at bridge on County Highway 28, 1.7 miles southeast of Swift Falls.	200	1969-70, 1973-74, 1980-81	10-27-80	39.8
b05303470	East Branch Chippewa River near Benson, MN	Lat 45°20'53", long 95°35'37", in SE¼NW¼ sec.29, T.122 N., R.39 W., Swift County, Hydrologic Unit 07020005, at bridge on county road, 2.2 miles north of Benson.	a520	1964-66, 1969-70, 1973-74, 1980-81	11- 6-80	43.4
05311100	Palmer Creek near Granite Falls, MN	Lat 44°50'54", long 95°33'47", in SW¼SW¼ sec.16, T.116 N., R.39 W., Chippewa County, Hydrologic Unit 07020004, at bridge on county road, 2.5 miles north of Granite Falls.	34.2	1969-70, 1974-75, 1977-78, 1980-81	10-24-80 9-22-81	0.16 0.02

"See footnotes at end of table."

Discharge measurements made at low-flow partial-record stations during water year 1981--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements Date	Measurements Discharge (ft^3/s)
		Minnesota River basin--Continued				
05311500	Yellow Medicine River near Cottonwood, MN	Lat 44°38'45", long 95°48'35", in SE¼SE¼ sec.29, T.114 N., R.41 W., Yellow Medicine County, Hydrologic Unit 07020004, at bridge on U.S. Highway 59 at Normania, 5.4 miles southeast of Spring Creek, and 7 miles northwest of Cottonwood.	465	1945-46#, 1949, 1969, 1979-81	10-27-80 9-29-81	4.36 0.04
05312000	Spring Creek near Clarkfield, MN	Lat 44°42'25", long 95°47'15", on line between secs.3 and 4, T.114 N., R.41 W., Yellow Medicine County, Hydrologic Unit 07020004, at bridge on county road, 1000 ft downstream from unnamed right bank tributary, and 5.6 miles southeast of Clarkfield.	a89	1945-46#, 1951, 1980-81	10-27-80 9-29-81	0 0
05313670	Hawk Creek near Clara City, MN	Lat 44°58'41", long 95°21'40", on line between sec.31, T.118 N., R.37 W., and sec.6, T.117 N., R.37 W., Chippewa County, Hydrologic Unit 07020004, at bridge on county road, 1.5 miles north of Clara City.	197	1969, 1974-78, 1980-81	10-24-80 9-22-81	1.64 0.53
05314520	Spring Creek near Maynard, MN	Lat 44°51'16", long 95°26'30", in SW¼NW¼ sec. 16, T.116 N., R.38 W., Renville County, Hydrologic Unit 07020004, at culvert on farm road 75 ft upstream from mouth, and 3.5 miles southeast of Maynard.	162	1969-70, 1974-75, 1979-81	10-24-80 9-22-81	3.53 0.68
05314530	Hawk Creek near Granite Falls, MN	Lat 44°49'58", long 95°26'01", in SE¼SW¼ sec.21, T.116 N., R.38 W., Renville County, Hydrologic Unit 07020004, at bridge on county road, 1.5 miles downstream from Spring Creek, and 5 miles northeast of Granite Falls.	a486	1968-70, 1977, 1980-81	10-24-80 9-22-81	6.70 2.11
05314600	Boiling Spring Creek near Belview, MN	Lat 44°40'02", long 95°19'10", on line between secs.20 and 21, T.114 N. R.37 W., Redwood County, Hydrologic Unit 07020004, at bridge on county road, 1 mile upstream from mouth and 3.6 miles north of Belview.	29.1	1969, 1973-75, 1977-81	10-24-80 9-22-81	1.11 0.82
05314700	Sacred Heart Creek near Delhi, MN	Lat 44°40'41", long 95°14'43", in NW¼NE¼ sec.24, T.114 N., R.37 W., Renville County, Hydrologic Unit 07020004, at bridge on County Highway 15, 4.8 miles northwest of Delhi.	42.7	1969, 1974-75, 1977-81	10-28-80 9-22-81	0.45 0.22
05314750	Middle Creek near Delhi, MN	Lat 44°37'25", long 95°09'37", in SE¼NE¼ sec.3, T.113 N., R.36 W., Renville County, Hydrologic Unit 07020004, at bridge on County Highway 15, 0.3 mile upstream from mouth, and 2.8 miles northeast of Delhi.	13.1	1969, 1974-75, 1977-81	10-28-80 9-22-81	0.38 0.17
05314800	Smith Creek near North Redwood, MN	Lat 44°36'21", long 95°07'10", in NE¼SE¼ sec.12, T.113 N., R.36 W., Renville County, Hydrologic Unit 07020004, at bridge on County Highway 15, 0.7 mile upstream from mouth, and 3 miles northwest of North Redwood.	14.6	1969, 1947-81	10-28-80 9-22-81	0.53 0.54
05315300	Three Mile Creek near Ghent, MN	Lat 44°31'30", long 95°50'12", on line between sec.7, T.112 N., R.41 W., and sec.12, T.112 N., R.42 W., Lyon County, Hydrologic Unit 07020006, at bridge on County Highway 65, 2.9 miles northeast of Ghent.	73.4	1969, 1973-77, 1980-81	10-27-80 9-29-81	3.01 1.05
05316590	Birch Coulee Creek near Morton, MN	Lat 44°32'30", long 94°57'12", at common corner of secs.32 and 33, T.113 N., R.34 W., and sec.5, T.112 N., R.34 W., Renville County, Hydrologic Unit 07020007, at bridge on State Highway 19, 1.6 miles southeast of Morton.	68.4	1969, 1974-78, 1980-81	10-28-80 8-21-81	1.66 7.61

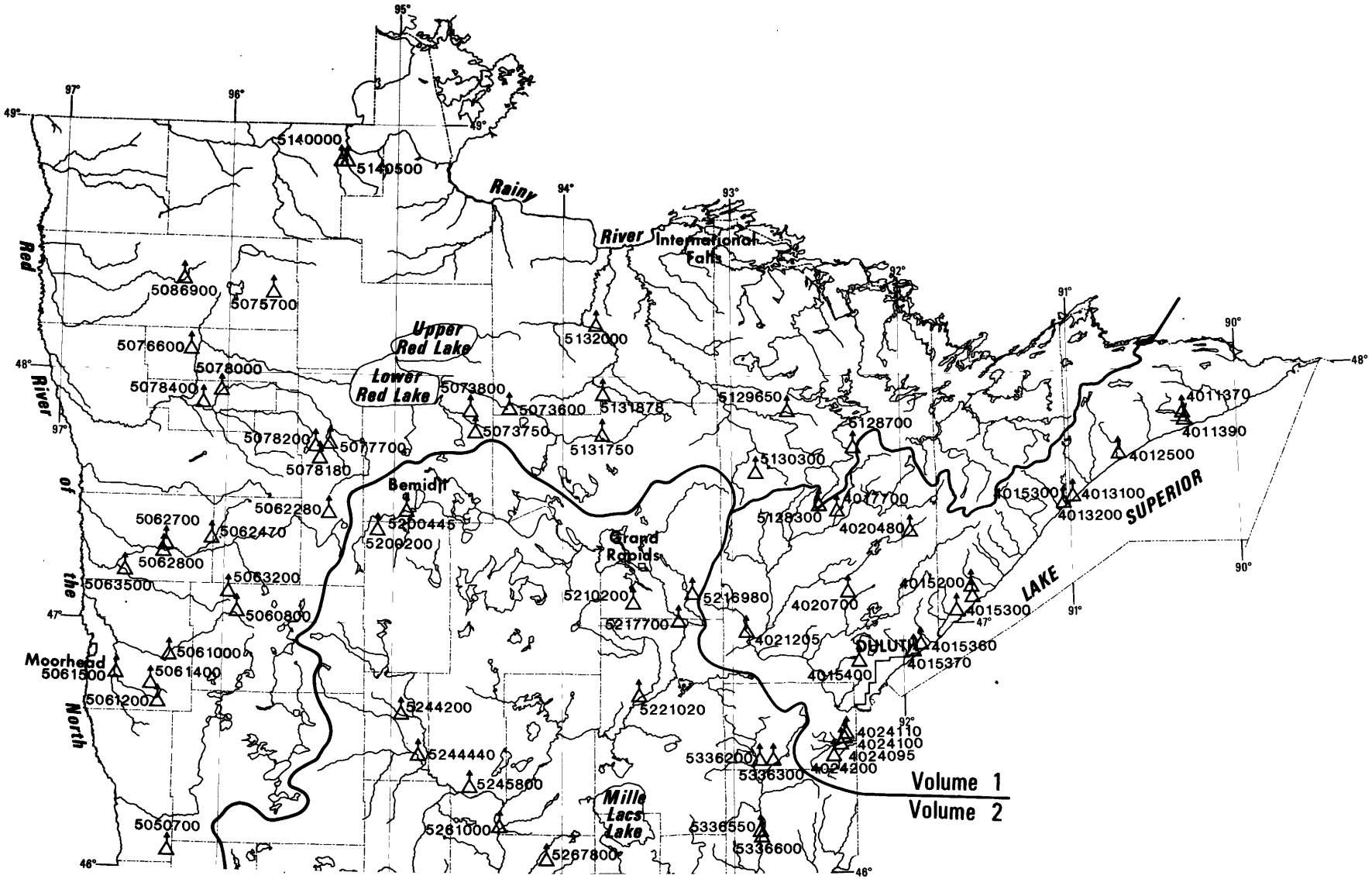
"See footnotes at end of table."

Discharge measurements made at low-flow partial-record stations during water year 1981--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements Date	Measurements Discharge (ft^3/s)
		Minnesota River basin--Continued				
05316630	Wabasha Creek near Morton, MN	Lat 44°29'45", long 94°54'23", in NE¼NE¼ sec.22, T.112 N., R.34 W., Redwood County. Hydrologic Unit 07020007, at bridge on county road, 5.4 miles southeast of Morton.	73.0	1969, 1973-78, 1980-81	10-28-80 8-21-81	0.89 4.22
05316840	Cottonwood River near Tracy, MN	Lat 44°20'41", long 95°36'50", on line between secs.11 and 12, T.110 N., R.40 W., Lyon County, Hydrologic Unit 07020008, at bridge on County Highway 11, 7.2 miles north of Tracy.	76.7	1968-69, 1973-75, 1980-81	10-28-80 8-21-81	2.96 0.99
05316870	Plum Creek near Walnut Grove, MN	Lat 44°16'09", long 95°25'39", on line between secs.4 and 9, T.109 N., R.38 W., Redwood County, Hydrologic Unit 07020008, at bridge on county road, 3.8 miles northeast of Walnut Grove.	82.6	1969, 1973-74, 1978, 1980-81	10-28-80 8-21-81	0.23 0.08
05316879	Pell Creek near Lamberton, MN	Lat 44°14'47", long 95°19'56", in SE¼NE¼ sec.18, T.109 N., R.37 W., Redwood County Hydrologic Unit 07020008, at bridge on county road, 3 miles west of Lamberton.	51.5	1969, 1973-74, 1978, 1980-81	10-28-80 8-21-81	0.36 0.02
05316890	Dutch Charley Creek near Lamberton, MN	Lat 44°12'58", long 95°16'12", on line between secs.26 and 27, T.109 N., R.37 W., Redwood County, Hydrologic Unit 07020008, at bridge on County Highway 6, 1.2 miles south of Lamberton.	88.2	1969, 1973-74, 1978, 1980-81	10-28-80 8-21-81	0.18 0
05316895	Highwater Creek near Lamberton, MN	Lat 44°12'36", long 95°14'45", on line between secs.25 and 36, T.109 N., R.37 W., Redwood County, Hydrologic Unit 07020008, at bridge on County Highway 15, 1.9 miles southeast of Lamberton.	108	1969, 1973-75, 1979-81	10-28-80 8-21-81	2.20 0.54
05316940	Mound Creek near Springfield, MN	Lat 44°11'40", long 95°03'34", in NW¼NW¼ sec.4, T.108 N., R.35 W., Brown County, Hydrologic Unit 07020008, at bridge on County Highway 2, 0.9 mile upstream from mouth, and 5 miles southwest of Springfield.	53.0	1968-69, 1973-76, 1978, 1980-81	10-28-80 8-21-81	1.77 2.02

Operated as continuous-record gaging station.
a Approximately.
b Also published under low-flow investigations in the Pomme de Terre and Chippewa River basins.

HIGH-FLOW PARTIAL-RECORD STATIONS


Rainy
River
International Falls
Upper Red Lake
Lower Red Lake
Bemidji
Grand Rapids
Mille Lacs Lake
Moorhead
DULUTH
LAKE SUPERIOR
Red River of the North
Volume 1
Volume 2
5140000
5140500
5086900
5075700
5076600
5078000
5078400
5078200
5077700
5078180
5073800
5073600
5073750
5132000
5131878
5131750
5129650
5128700
5130300
5128300
4077700
4020480
4011370
4011390
4012500
4015300
4013100
4013200
4015200
4015300
4015360
4015370
4015400
4020700
4021205
5062280
5062700
5062470
5062800
5063500
5063200
5060800
5061000
5061400
5061500
5061200
5200445
5200200
5210200
5217700
5216980
5221020
5244200
5244440
5245800
5261000
5267800
5050700
5336200
5336300
5336550
5336600
4024110
4024100
4024095
4024200

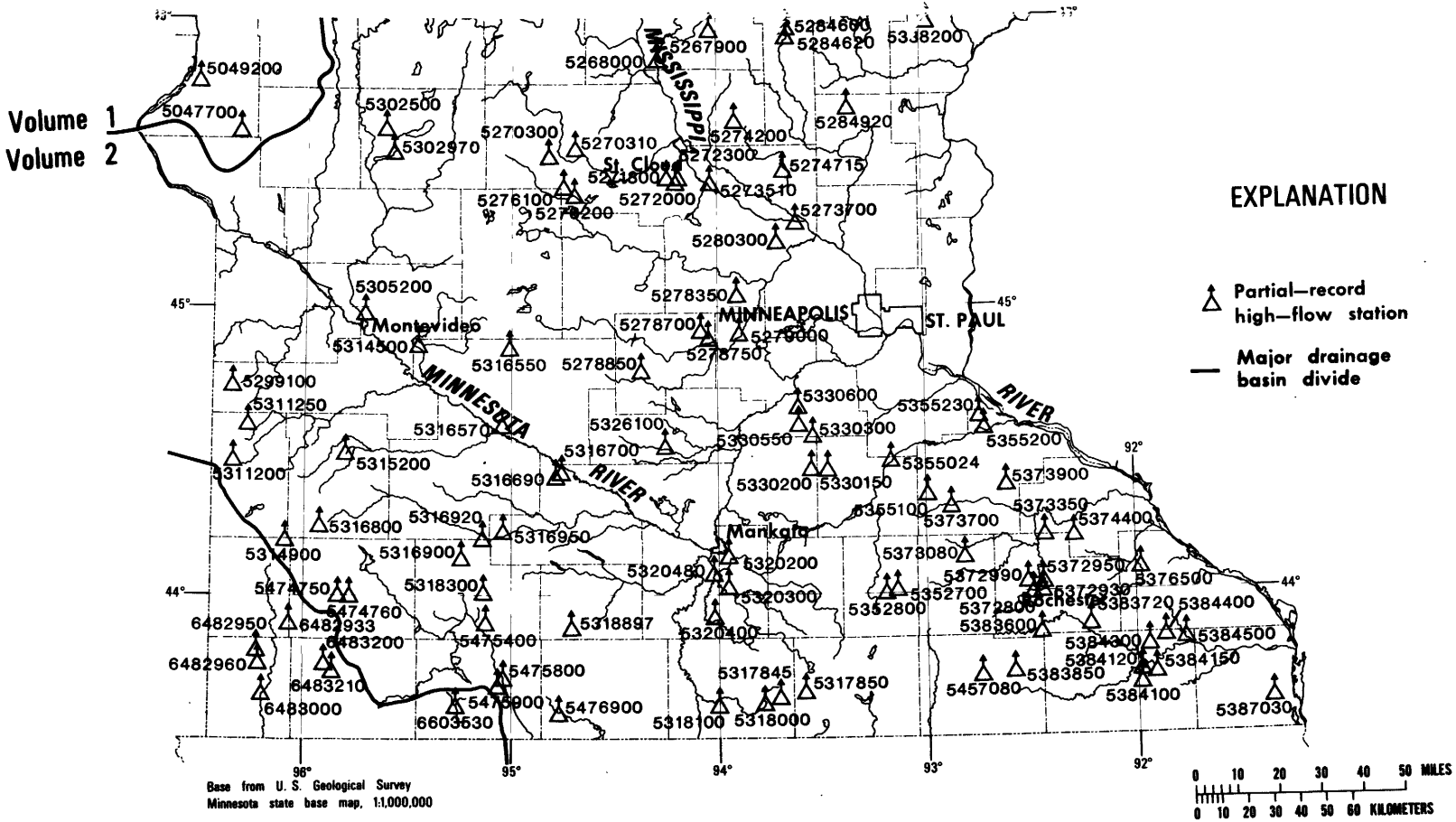


Figure 9.--Location of high-flow partial-record stations

High-flow partial-record stations

The following table contains annual maximum discharge for high-flow stations. A high-flow partial-record station is equipped with a crest-stage gage, 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. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained, and discharge measurements may have been made for purposes of establishing the stage-discharge relation, but these are not published herein. 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 partial-record stations during water year 1981

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Mississippi River main stem					
05200200	Hennepin Creek near Becida, MN	Lat 47°23'52", long 95°05'12", in NW¼NE¼ sec.11, T.145 N., R.35 W., Hubbard County, Hydrologic Unit 07010101, gages upstream and downstream from culvert on Stumphges Rapids Trail approximately 1/2 mile west of Hubbard County Road 3, 3 miles north of Becida, and 1.5 miles upstream from mouth.	41.4	1979-81	6-28-81	11.69	(†)
*05200445	Mississippi River at Bemidji, MN	Lat 47°27'04", long 94°54'23", in NW¼NW¼ sec.20, T.146 N., R.33 W., Beltrami County, Hydrologic Unit 07010101, at bridge on County Highway 11, 1.5 miles southwest of intersection of U.S. Highway 2 and County Highway 7 in Bemidji.	a400	1973-81	9- 7-81	10.88	254
		Smith Creek basin					
05210200	Smith Creek near Hill City, MN	Lat 47°04'58", long 93°34'59", in SE¼NW¼ 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	1961-81	8- 5-81	7.95	445
		Swan River basin					
05216980	Swan River tributary at Warba, MN	Lat 47°07'11", long 93°15'00", in SE¼NW¼ sec.34, T.54 N., R.23 W., Itasca County, Hydrologic Unit 07010103, at culvert on U.S. Highway 2, 0.9 mile upstream from mouth, and 1.1 miles southeast of Warba.	3.95	1961-81	8- 5-81	6.76	70
		Bluff Creek basin					
05217700	Bluff Creek near Jacobson, MN	Lat 47°00'19", long 93°17'30", in SW¼NW¼ sec.8, T.52 N., R.23 W., Aitkin County, Hydrologic Unit 07010103, at culvert on State Highway 200, 1.2 miles west of Jacobson.	1.50	1961-81	4-23-81	7.64	42
		Willow River basin					
*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.	a445	1972-81	4-24-81	9.83	718
		Crow Wing River basin					
05244200	Cat River near Nimrod, MN	Lat 46°37'49", long 94°55'51", in SW¼ SW¼ 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, and 3.0 miles upstream from mouth.	49.2	1961-81	8-25-81	4.48	69
*5244440	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, and 7.0 miles northeast of Aldrich.	860	1972-81	6-14-81	f	h400

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1981

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Crow Wing River basin--Continued					
05245800	Sevenmile Creek near Pillager, MN	Lat 46°20'32", long 94°32'56", in SW¼SE¼ sec.11, T.133 N., R.31 W., Cass County, Hydrologic Unit 07010106, at downstream wingwall of bridge on township road, 3.5 miles northwest of Pillager, 3.2 miles upstream from mouth.	18.3	1979-81	8-26-81	11.80	(†)
		Mississippi River main stem					
05261000	Mississippi River near Fort Ripley, MN	Lat 46°10'50", long 94°21'56", in SE¼NW¼ sec.27, T.43 N., R.32 W., Crow Wing County, Hydrologic Unit 07010104, on left bank 600 ft upstream from Nokasippi River, and 1.0 mile north of Fort Ripley.	11,010	1929#, 1972-81	h5- 1-81	f	h10,800
		Platte River basin					
05267800	Big Mink Creek tributary near Lastrup, MN	Lat 46°01'58", long 94°06'13", in NW¼SE¼ sec.14, T.41 N., R.30 W., Morrison County, Hydrologic Unit 07010201, at culvert on State Highway 25, 1.4 miles upstream from mouth, and 2.1 miles west of Lastrup.	1.53	1961-81	6-14-81	f	(†)
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, and 1.5 miles east of Pierz.	46.7	1964-81	6-14-81	12.82	(†)
05268000	Platte River above 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, and 6.6 miles upstream from mouth.	335	1929-36#, 1972-81	6-15-81	f	h750
		Sauk River basin					
05270300	Sauk River tributary at Spring Hill, MN	Lat 45°31'22", long 94°48'31", in SW¼NE¼ 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, and 2.7 miles upstream from mouth.	7.06	1960-81	8-26-81	10.37	123
05270310	Sauk River tributary No. 2 near St. Martin, MN	Lat 45°31'44", long 94°44'50", in SE¼SE¼ sec.19, T.124 N., R.32 W., Stearns County, Hydrologic Unit 07010202, at culvert on county highway, 4.2 miles northwest of St. Martin.	.26	1960, 1962-81	6-13-81	10.01	68
		Johnson Creek basin					
05271800	Johnson Creek tributary at Luxemburg, MN	Lat 45°26'30", long 94°14'46", in NW¼NE¼ sec.30, T.123 N., R.28 W., Stearns County, Hydrologic Unit 07010203, at culverts on State Highway 15, 0.8 mile south of Luxemburg.	3.82	1964-81	6-14-81	7.04	22
05272000	Johnson Creek tributary No. 2 near St. Augusta, MN	Lat 45°26'52", long 94°12'00", in NE¼SE¼ sec.21, T.123 N., R.28 W., Stearns County, Hydrologic Unit 07010203, at culverts on county highway, 0.7 mile upstream from mouth, and 3.1 miles southwest of St. Augusta.	13.4	1964-81	6-14-81	g8.70	(†)
05272300	Johnson Creek near St. Augusta, MN	Lat 45°27'49", long 94°09'19", in NW¼SW¼ 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, and 3.3 miles upstream from mouth.	46.7	1964-81	6-14-81	13.26	360

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1981

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Mississippi River main stem					
05273510	Mississippi River at Clearwater, MN	Lat 45°25'15", long 94°02'37", in NW¼SW¼ sec.23, T.34 N., R.30 W., Sherburne County, Hydrologic Unit 07010203, on left bank 700 ft upstream from bridge, on State Highway 24 at Clearwater.	-	1972-81	5- 3-81	f	h10,800
		Otsego Creek basin					
05273700	Otsego Creek near Otsego, MN	Lat 45°17'19", long 93°38'59", in SW¼NE¼ sec.13, T.131 N., R.24 W., Wright County, Hydrologic Unit 07010203, at culvert on County Highway 39, 1.3 miles upstream from mouth, and 1.9 miles west of Otsego.	3.11	1964-81	6-14-81	3.64	54
		Elk River basin					
05274200	Stony Brook tributary near Foley, MN	Lat 45°38'42", long 93°54'54", in NE¼NW¼ sec.2, T.36 N., R.29 W., Benton County, Hydrologic Unit 07010203, at culvert on State Highway 25, 0.3 mile upstream from mouth, and 1.5 miles south of Foley.	2.26	1960-81	6-14-81	i7.31	13
j05274715	St. Francis River near Orrock, MN	Lat 45°31'32", long 93°44'12", in SW¼NW¼ sec.17, T.35 N., R.27 W., Sherburne County, Hydrologic Unit 07010203, on downstream side of bridge on County Road 5, 5.6 miles north of Orrock, and 1.9 miles upstream from County Ditch No. 6.	-	1980-81	9-19-80 6-17-81	2.95 4.64	52 254
		Crow River basin					
05276100	North Fork Crow River tributary near Paynesville, MN	Lat 45°23'29", long 94°46'56", in SW¼NW¼ sec.12, T.122 N., R.33 W., Kandiyohi County, Hydrologic Unit 07010204, at culvert on county highway, 1.2 miles upstream from mouth, and 3.0 miles west of Paynesville.	.55	1960-81	6-13-81	18.07	36
05276200	North Fork Crow River at Paynesville, MN	Lat 45°23'09", long 94°42'41", in SW¼SE¼ 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	1973-81	6-13-81	3.94	570
05278350	Fountain Creek near Montrose, MN	Lat 45°01'20", long 93°56'29", in NE¼NW¼ sec.22, T.118 N., R.26 W., Wright County, Hydrologic Unit 07010204, at culvert on County Highway 30, 3.3 miles southwest of Montrose.	6.73	1962-81	6-14-81	5.23	28
05278700	Otter Creek near Lester Prairie, MN	Lat 44°54'23", long 94°04'24", in SE¼SE¼ sec.28, T.117 N., R.27 W., McLeod County, Hydrologic Unit 07010205, at culvert on State Highway 7, 2.1 miles northwest of Lester Prairie, and 4.4 miles upstream from mouth.	30.2	1961-81	6-14-81	6.59	52
05278750	Otter Creek tributary near Lester Prairie, MN	Lat 44°53'34", long 94°04'24", in SE¼SE¼ sec.33, T.117 N., R.27 W., McLeod County, Hydrologic Unit 07010205, at culvert on County Highway 63, 1.7 miles northwest of Lester Prairie, and 3.3 miles upstream from mouth.	1.54	1962-81	6-14-81	8.46	32
05278850	Buffalo Creek tributary near Brownton, MN	Lat 44°45'55", long 94°22'33", in NE¼SE¼ sec.13, T.115 N., R.30 W., McLeod County, Hydrologic Unit 07010205, at culvert on State Highway 15, 0.6 mile upstream from mouth, and 2.6 miles northwest of Brownton.	9.45	1961-81	7-23-81	13.96	42

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1981

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Crow River basin--Continued					
05279000	South Fork Crow River near Mayer, MN	Lat 44°54'20", long 93°53'05", in SW¼SW¼ sec.30, T.117 N., R. 25 W., Carver County, Hydrologic Unit 07010205, near center of span on downstream side of bridge on State Highway 7, 1.3 miles north of Mayer, 4.3 miles southwest of Watertown, and 16 miles upstream from confluence with North Fork.	1170	1934-79#, 1980-81	6-14-81	6.46	1050
05280300	School Lake Creek tributary near St. Michael, MN	Lat 45°12'09", long 93°41'31", in NW¼SE¼ sec.15, T.120 N., R.24 W., Wright County, Hydrologic Unit 07010204, at culvert on county highway, 0.2 mile upstream from mouth, and 1.5 miles southwest of St. Michael.	2.04	1964-81	6-14-81	7.30	17
		Rum River basin					
05284600	Robinson Brook near Onamia, MN	Lat 45°58'22", long 93°39'42", in NE¼SE¼ sec.11, T.40 N., R.27 W., Mille Lacs County, Hydrologic Unit 07010207, at culvert on U.S. Highway 169, 0.2 mile upstream from mouth, and 6.8 miles south of Onamia.	4.79	1960-81	4-23-81	14.38	74
05284620	Rum River tributary near Onamia, MN	Lat 45°57'29", long 93°39'43", in NE¼SE¼ sec.14, T.40 N., R.27 W., Mille Lacs County, Hydrologic Unit 07010207, at culvert on U.S. Highway 169, 0.3 mile upstream from mouth, and 7.8 miles south of Onamia.	2.37	1960-81	6-14-81	6.92	19
05284920	Stanchfield Creek tributary near Day, MN	Lat 45°41'29", long 93°23'45", in NW¼SE¼ sec.13, T.37 N., R.25 W., Isanti County, Hydrologic Unit 07010207, at culvert on County Highway 60, 0.5 mile upstream from mouth, and 1.5 miles southwest of Day.	1.26	1961-81	6-14-81	7.35	72
		Minnesota River basin					
05299100	Lazarus Creek tributary near Canby, MN	Lat 44°43'04", long 96°19'42", in NE¼NW¼ sec.6, T.114 N., R.45 W., Yellow Medicine County, Hydrologic Unit 07020003, at culvert on State Highway 68, 2.7 miles west of Canby, and 4.2 miles upstream from mouth.	2.97	1960-81	6-14-81	10.90	122
05302500	Little Chippewa River near Starbuck, MN	Lat 45°36'52", long 95°37'12", in NW¼NE¼ sec.30, T.125 N., R.39 W., Pope County,Hydrologic Unit 07020005, at downstream wingwall on triple box culvert on State Highway 28, 4.4 miles west of Starbuck.	69.6	1979-81	4- 1-80 6-13-81	12.09 11.30	b147 76
05302970	Outlet Creek tributary near Starbuck, MN	Lat 45°31'35", long 95°33'43", in NW¼NW¼ sec.27, T.124 N., R.39 W., Pope County, Hydrologic Unit 07020005, at culvert on State Highway 29, 0.2 mile upstream from mouth, and 6.6 miles south of Starbuck.	.47	1962-81	6-13-81	8.87	32
05305200	Spring Creek near Montevideo, MN	Lat 44°58'41", long 95°42'57", in NW¼NW¼ 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, and 2.0 miles north of Montevideo.	16.0	1959-81	6-13-81	14.51	116
05311200	North Branch Yellow Medicine River near Ivanhoe, MN	Lat 44°27'32", long 96°21'27", in NE¼NW¼ sec.2, T.111 N., R.46 W., Lincoln County, Hydrologic Unit 07020004, at culvert on State Highway 19, 5.3 miles west of Ivanhoe.	14.8	1960-81	7-23-81	11.63	(†)

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1981

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Minnesota River basin--Continued					
05311250	North Branch Yellow Medicine River tributary near Wilno, MN	Lat 44°33'12", long 96°16'33", in SE¼NE¼ sec.33, T.113 N., R.45 W., Lincoln County, Hydrologic Unit 07020004, at culvert on U.S. Highway 75, 2.1 miles upstream from mouth, and 4.3 miles northwest of Wilno.	.33	1960-81	3- 4-81	8.19	4.6
05314500	Hawk Creek near Maynard, MN	Lat 44°52'10", long 95°28'58", in SW¼NW¼ sec.7, T.116 N., R.38 W., at Renville and Chippewa County line, Hydrologic Unit 07020004, at right downstream side of bridge on State Highway 23, 3.0 miles southwest of Maynard.	474	1949-54#, 1981	7-12-81	15.34	(†)
05314900	Redwood River at Ruthton, MN	Lat 44°10'53", long 96°06'07", in NW¼NW¼ sec.11, T.108 N., R.44 W., Pipestone County, Hydrologic Unit 07020006, at culvert on State Highway 23, 0.3 mile north of Ruthton.	6.18	1959-81	7-21-81	f	h1
05315200	Prairie Ravine near Marshall, MN	Lat 44°29'44", long 95°47'48", in SE¼NE¼ sec.20, T.112 N., R.41 W., Lyon County, Hydrologic Unit 07020006, at culvert on U.S. Highway 59, 2.7 miles north of Marshall.	5.63	1959-64#, 1965-81	7-19-81	5.65	20
05316550	West Fork Beaver Creek near Olivia, MN	Lat 44°50'56", long 95°01'53", in SE¼SW¼ sec.14, T.116 N., R.35 W., Renville County, Hydrologic Unit 07020004, at culvert on field road, 0.25 mile upstream from U.S. Highway 71, and 5.5 miles northwest of Olivia.	12.2	1959-81	7-11-81	7.17	84
05316570	Beaver Creek at Beaver Falls, MN	Lat 44°35'03", long 95°02'49", in NE¼NW¼ 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, and 3.8 miles northwest of Morton.	194	1972-81	7-11-81	f	<450
05316690	Spring Creek tributary near Sleepy Eye, MN	Lat 44°23'54", long 94°45'35", in NW¼ sec.25, T.111 N., R.33 W., Brown County, Hydrologic Unit 07020007, at culvert on county highway, 0.1 mile upstream from mouth, and 7.5 miles north of Sleepy Eye.	3.69	1966-81	8-14-82	3.77	16
05316700	Spring Creek near Sleepy Eye, MN	Lat°44 24'12", long 94°44'41", in NE¼SE¼ sec.24, T.111 N., R.33 W., Brown County, Hydrologic Unit 07020007, at culvert on county highway, 4.3 miles upstream from mouth, and 7.5 miles north of Sleepy Eye.	31.3	1959-81	6-23-81	10.10	98
05316800	Cottonwood River tributary near Balaton, MN	Lat 44°14'24", long 95°57'22", in NW¼NW¼ sec.19, T.109 N., R.42 W., Lyon County, Hydrologic Unit 07020008, at culvert on U.S. Highway 14, 4.0 miles west of Balaton.	.91	1959-81	7-21-81	4.87	1.2
05316900	Dry Creek near Jeffers, MN	Lat 44°07'21", long 95°12'13", in NE¼NE¼ sec.31, T.108 N., R.36 W., Cottonwood County, Hydrologic Unit 07020008, at culvert on County Highway 10, 4.5 miles north of Jeffers.	3.13	1961-81	6-14-81	d5.27	52
05316920	Cottonwood River tributary No. 2 near Sanborn, MN	Lat 44°10'34", long 95°07'15", in SW¼NW¼ sec.12, T.108 N., R.36 W., Cottonwood County, Hydrologic Unit 07020008, at culvert on U.S. Highway 71, 2.4 miles south of Sanborn.	.42	1966-81	3- 4-81	e5.02	2.4
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, and 3.5 miles southwest of Springfield.	773	1973-81	6-24-81	f	h560

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1981

Station No.	Station name	Location	Drainage area (mi²)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Minnesota River basin--Continued					
05317845	East Branch Blue Earth River near Walters, MN	Lat 43°37'58", long 93°42'28", in SE¼SE¼ sec.16, T.102 N., R.24 W., Faribault County, Hydrologic Unit 07020009, at left downstream wing-wall of box culvert on State Highway 22, 2.5 miles northwest of Walters.	29.6	1979-81	4-28-81	18.17	(†)
05317850	Foster Creek near Alden, MN	Lat 43°39'31", long 93°35'30", in NE¼NE¼ sec.9, T.102 N., R.23 W., Freeborn County, Hydrologic Unit 07020009, at culvert on County Road 46 (old U.S. Highway 16), 1.2 miles southwest of Alden.	2.26	1959-81	7-15-81	8.19	223
05318000	East Branch Blue Earth River near Bricelyn, MN	Lat 43°37'50", long 93°47'25", in NE¼NE¼ sec.23, T.102 N., R.25 W., Faribault County, Hydrologic Unit 07020009, at bridge on county highway, 2.0 miles upstream from Brush Creek, 3.0 miles downstream from South Walnut Lake, and 5.0 miles northeast of Bricelyn.	132	1973-81	6-23-81	10.02	770
05318100	East Branch Blue Earth River tributary near Blue Earth, MN	Lat 43°37'09", long 94°01'03", in SW¼SE¼ sec.24, T.102 N., R.27 W., Faribault County, Hydrologic Unit 07020009, at culvert on County Highway 13, 0.5 mile upstream from mouth, and 4.3 miles east of Blue Earth.	9.20	1960-81	6-23-81	12.08	610
05318300	Watonwan River near Delft, MN	Lat 43°59'55", long 95°07'11", in NE¼SE¼ 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.	13.0	1960-81	7-24-81	d13.58	8.7
05318897	South Fork Watonwan River near Ormsby, MN	Lat 43°53'08", long 94°41'27", in SE¼NW¼ sec.21, T.105 N., R.32 W., Watonwan County, Hydrologic Unit 07020010, at right downstream wing-wall of bridge on township road, 2.6 miles north of Ormsby, 5.0 miles upstream from mouth at Willow Creek.	109	1979-81	6-14-81	10.60	117
05320200	Le Sueur River tributary near Mankato, MN	Lat 44°07'29", long 93°57'33", in SE¼SW¼ sec.28, T.108 N., R.26 W., Blue Earth County, Hydrologic Unit 07020011, at culvert on State Highway 22, 0.2 mile up stream from mouth, and 1.5 miles southeast of Mankato Airport.	.073	1959-81	6-23-81	24.91	320
05320300	Cobb River tributary near Mapleton, MN	Lat 44°01'05", long 93°57'30", in SW¼NE¼ sec.4, T.106 N., R.26 W., Blue Earth County, Hydrologic Unit 07020011, at culvert on State Highway 22, 1.0 mile upstream from mouth, and 6.3 miles north of Mapleton.	7.25	1959-81	6-23-81	15.40	112
05320400	Maple River tributary near Mapleton, MN	Lat 43°55'18", long 94°01'17", in SE¼SW¼ sec.1, T.105 N., R.27 W., Blue Earth County, Hydrologic Unit 07020011, at culvert on State Highway 30, 0.9 mile upstream from mouth, and 3.3 miles west of Mapleton.	6.22	1959-81	7-27-81	23.35	2000
05320480	Maple River near Rapidan, MN	Lat 44°03'54", long 94°01'32", in SW¼ 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, and 3.3 miles upstream from mouth.	c343	1972-81	6-26-81	11.13	(†)
05326100	Middle Branch Rush River near Gaylord, MN	Lat 44°30'27", long 94°15'00", in SW¼NW¼ sec.18, T.112 N., on line between R.28 W. and R.29 W., Sibley County, Hydrologic Unit 07020012, at downstream side of bridge on township road, 3.0 miles southwest of Gaylord, 10.5 miles upstream from the main branch of Rush River.	68.5	1979-81	8-14-81	15.16	353

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1981

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Minnesota River basin--Continued					
05330150	Sand Creek tributary near Montgomery, MN	Lat 44°25'41", long 93°30'31", in NE¼NE¼ sec.18, T.111 N., R.22 W., Rice County, Hydrologic Unit 07020012, at culvert on State Highway 21, 3.5 miles east of Montgomery.	.36	1961-81	8-27-81	8.58	23
05330200	Rice Lake tributary near Montgomery, MN	Lat 44°25'42", long 93°32'10", in NE¼NW¼ sec.13, T.111 N., R.23 W., Le Sueur County, Hydrologic Unit 07020012, at culvert on State Highway 21, 1.8 miles upstream from Rice Lake, and 2.5 miles east of Montgomery.	3.16	1960-81	8-27-81	7.98	78
05330300	Sand Creek near New Prague, MN	Lat 44°32'37", long 93°32'16", in NE¼NW¼ 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	1960-81	8-27-81	10.30	210
05330550	Raven Stream tributary near New Prague, MN	Lat 44°34'21", long 93°35'58", in NW¼ sec.28, T.113 N., R.23 W., Scott County, Hydrologic Unit 07020012, at culvert on county road, 1.6 miles upstream from mouth, and 2.3 miles northwest of New Prague.	22.1	1960-81	8-27-81	d10.30	82
05330600	Sand Creek tributary No. 2 near Jordan, MN	Lat 44°37'45", long 93°36'33", in NW¼NE¼ sec.5, T.113 N., R.23 W., Scott County, Hydrologic Unit 07020012, at culvert on State Highway 21, 0.8 mile upstream from mouth, and 2.8 miles south of Jordan.	2.62	1960-81	8-27-81	i12.75	29
		St. Croix River basin					
05336200	Glaisby Brook near Kettle River, MN	Lat 46°27'19", long 92°51'34", in SE¼NW¼ 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, and 2.4 miles south of Kettle River.	24.2	1960-70#, 1971-81	4-24-81	4.75	260
05336300	Moose River tributary at Moose Lake, MN	Lat 46°27'17", long 92°47'14", in SE¼NE¼ sec.19, T.46 N., R.19 W., Carlton County, Hydrologic Unit 07030003, at culvert on State Highway 27, 0.9 mile upstream from mouth, and 1.2 miles west of Moose Lake.	1.23	1960-81	7-16-81	8.55	70
05336550	Wolf Creek tributary near Sandstone, MN	Lat 46°09'45", long 92°51'58", in NE¼SE¼ sec.33, T.43 N., R.20 W., Pine County, Hydrologic Unit 07030003, at culvert on U.S. Highway 61, 0.2 mile upstream from mouth, and 2.2 miles north of Sandstone.	5.46	1960-81	6-14-81	16.72	74
05336600	Kettle River tributary at Sandstone, MN	Lat 46°08'46", long 92°51'57", in SE¼SE¼ sec.4, T.42 N., R.20 W., Pine County, Hydrologic Unit 07030003, at culvert on U.S. Highway 61 at Sandstone, and 0.2 mile upstream from mouth.	.65	1960-81	6-14-81	f	h2
05338200	Mission Creek near Hinckley, MN	Lat 45°59'52", long 92°56'44", in SW¼SW¼ sec.25, T.41 N., R.21 W., Pine County, Hydrologic Unit 07030004, at culvert on U.S. Highway 23, 1.2 miles south of Hinckley.	3.84	1960-81	8-26-81	14.04	74
		Cannon River basin					
05352700	Turtle Creek tributary No. 2 near Pratt, MN	Lat 44°00'02", long 93°08'30", in NW¼SW¼ sec.8, T.106 N., R.19 W., Steele County, Hydrologic Unit 07040002, at culvert on U.S. Highway 218, 1.0 mile upstream from mouth, and 1.7 miles southeast of Pratt.	1.26	1960-81	7-15-81	17.56	(†)

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1981

Station No.	Station name	Location	Drainage area (mi²)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Cannon River basin--Continued					
05352800	Turtle Creek tributary near Steele Center, MN	Lat 44°00'26", long 93°12'20", in NW¼NW¼ sec.11, T.106 N., R.20 W., Steele County, Hydrologic Unit 07040002, at culvert on township road, 1.3 miles upstream from mouth, and 1.6 miles northeast of Steele Center.	5.01	1960-81	7-15-81	8.97	198
05355024	Cannon River at Northfield, MN	Lat 44°27'19", long 93°09'46", in NE¼NE¼ sec.1, T.111 N., R.20 W., Rice County, Hydrologic Unit 07040002, on left bank at downstream side of Fifth Street bridge in Northfield.	934	1980-81	3-19-80 8-28-81	e904.28 903.35	4900 3550
05355100	Little Cannon River tributary near Kenyon, MN	Lat 44°20'45", long 92°58'47", in NE¼SE¼ sec.9, T.110 N., R.18 W., Goodhue County, Hydrologic Unit 07040002, at culvert on State Highway 56, 0.3 mile upstream from mouth, and 5.3 miles north of Kenyon.	2.20	1960-81	7-15-81	14.52	268
05355200	Cannon River at Welch, MN	Lat 44°33'50", long 92°43'55", in NW¼SW¼ sec.27, T.113 N., R.16 W., Goodhue County, Hydrologic Unit 07040002, on right bank 0.3 mile downstream from highway bridge at Welch, and 1.8 miles upstream from Belle Creek.	1,320	1909-14#, 1930-71#, 1973-81	8-29-81	7.08	4000
05355230	Cannon River tributary near Welch, MN	Lat 44°36'04", long 92°42'34", in SW¼SW¼ sec.11, T.113 N., R.16 W., Goodhue County, Hydrologic Unit 07040002, at culvert on U.S. Highway 61, 1.2 miles upstream from mouth, and 2.7 miles northeast of Welch.	.05	1960-81	5- 5-81	f	h3.5
		Zumbro River basin					
05373080	Milliken Creek near Concord, MN	Lat 44°07'13", long 92°49'08", in NW¼NW¼ 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	1979-81	7-11-81	13.85	(†)
05373350	Zumbro River tributary near South Troy, MN	Lat 44°11'16", long 92°25'22", in SE¼NE¼ sec.6, T.108 N., R.13 W., Olmsted County, Hydrologic Unit 07040004, at culvert on county road, 0.8 mile upstream from mouth, and 1.3 miles south of South Troy.	.16	1962-81	7-11-81	10.17	72
05373700	Spring Creek near Wanamingo, MN	Lat 44°17'13", long 92°52'17", in SE¼SE¼ sec.32, T.110 N., R.17 W., Goodhue County, Hydrologic Unit 07040004, at culvert on County Highway 1, 3.5 miles upstream from mouth, and 4.2 miles southwest of Wanamingo.	9.93	1960-81	8-14-81	12.71	930
05373900	Trout Brook tributary near Goodhue, MN	Lat 44°21'30", long 92°36'58", in NE¼SE¼ sec.4, T.110 N., R.15 W., Goodhue County, Hydrologic Unit 07040004, at culvert on State Highway 58, 0.8 mile upstream from mouth, and 3.0 miles south of Goodhue.	.40	1960-81	8-14-81	6.65	70
05374400	Long Creek near Potsdam, MN	Lat 44°10'48", long 92°17'23", at quarter corner on north line of sec.8, T.108 N., R.12 W., Wabasha County, Hydrologic Unit 07040004, at culvert on county highway, 2.6 miles northeast of Potsdam.	4.46	1966-81	7-11-81	16.03	163

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1981

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Whitewater River basin					
05376500	South Fork Whitewater River near Altura, MN	Lat 44°04'10", long 91°58'49", in SE¼ sec.14, T.107 N., R.10 W., Winona County, Hydrologic Unit 07040003, on left bank 500 ft upstream from highway bridge, 2.0 miles west of Altura, and 2.4 miles upstream from Keefer Creek.	76.8	1939-71#, 1973-81	7-11-81	d2.96	350
		Root River basin					
05383600	North Branch Root River tributary near Stewartville, MN	Lat 43°51'20", long 92°26'50", near center sec.36, T.105 N., R.14 W., Olmsted County, Hydrologic Unit 07040008, at culvert on State Highway 30, 2.0 miles east of Stewartville, and 2.3 miles upstream from mouth.	.73	1958, 1959-64#, 1965-81	7-14-81	13.17	318
05383720	Mill Creek near Chatfield, MN	Lat 43°53'01", long 92°13'46", in SE¼NW¼ sec.23, T.105 N., R.12 W., Olmsted County, Hydrologic Unit 07040008, at bridge on county highway, 3.4 miles northwest of Chatfield, and 4.8 miles upstream from mouth.	22.4	1962-81	7-11-81	16.77	5000
05383850	South Fork Bear Creek near Grand Meadow, MN	Lat 43°43'24", long 92°35'24", in NE¼SE¼ sec.14, T.103 N., R.15 W., Mower County, Hydrologic Unit 07040008, at bridge on county highway, 1.5 miles northwest of Grand Meadow, and 4.0 miles upstream from North Fork Bear Creek.	14.0	1962-81	7-15-81	20.34	1750
05384100	Duschee Creek near Lanesboro, MN	Lat 43°39'40", long 91°58'10", in SW¼SW¼ sec.6, T.102 N., R.9 W., Fillmore County, Hydrologic Unit 07040008, at culvert on county highway, 4 miles south of Lanesboro, and 7.4 miles upstream from mouth.	3.85	1959-81	7-11-81	20.45	1580
05384120	South Branch Root River at Lanesboro, MN	Lat 43°43'19", long 91°58'43", in NW¼SE¼ sec.13, T.103 N., R.10 W., Fillmore County, Hydrologic Unit 07040008, at bridge to ball park in Lanesboro, and 2.5 miles upstream from mouth.	a297	1973-81	6-21-74 3-12-76 3-11-77 7- 7-78 5-30-79 5-30-80 7-11-81	11.08 e13.42 5.85 10.45 12.05 11.95 13.48	5900 7000 1180 5100 5250 7100 9500
05384150	Root River tributary near Whalan, MN	Lat 43°43'03", long 91°56'39", in SE¼SW¼ sec.17, T.103 N., R.9 W., Fillmore County, Hydrologic Unit 07040008, at culvert on private road, 1.3 miles southwest of Whalan.	.08	1959-81	7-11-81	9.67	101
05384200	Gribben Creek near Whalan, MN	Lat 43°42'26", long 91°54'50", in NE¼SE¼ sec.21, T.103 N., R.9 W., Fillmore County, Hydrologic Unit 07040008, at bridge on county highway, 1.9 miles southeast of Whalan, and 2.4 miles upstream from mouth.	7.80	1959-81	7-11-81	21.98	4400
05384300	Big Springs Creek near Arendahl, MN	Lat 43°49'26", long 91°57'00", in NE¼SE¼ sec.7, T.104 N., R.9 W., Fillmore County, Hydrologic Unit 07040008, at culvert on State Highway 250, 2.0 miles west of Arendahl.	.14	1959-81	2-27-81	e8.20	6.2
05384400	Pine Creek near Arendahl, MN	Lat 43°50'27", long 91°53'39", in SE¼NE¼ sec.3, T.104 N., R.9 W., Fillmore County, Hydrologic Unit 07040008, at bridge on County Highway 25, 1.3 miles northeast of Arendahl, and 4.9 miles upstream from Hemingway Creek.	28.1	1959-81	2-27-81	12.74	610
05384500	Rush Creek near Rushford, MN	Lat 43°50'00", long 91°46'40", on line between secs.3 and 10, T.104 N., R.8 W., Fillmore County, Hydrologic Unit 07040008, on downstream side near center of span of highway bridge, 1.5 miles northwest of Rushford, 3.0 miles upstream from mouth.	129	1942-79#, 1980-81	7-11-81	f	<800

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1981

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Crooked Creek basin					
05387030	Crooked Creek at Freeburg, MN	Lat 43°36'37", long 91°21'39", in SW¼NE¼ sec.30, T.102 N., R.4 W., Houston County, Hydrologic Unit 07060001, on right downstream wingwall of bridge on State Highway 249 at Freeburg, 6.5 miles upstream from mouth.	44.2	1979-81	7-11-81	14.87	(†)
		Iowa River basin					
05457080	Rose Creek tributary near Dexter, MN	Lat 43°42'11", long 92°44'35", in SE¼SW¼ sec.22, T.103 N., R.16 W., Mower County, Hydrologic Unit 07080201, at culvert on county highway, 0.2 mile upstream from mouth, and 2.2 miles southwest of Dexter.	1.17	1962-81	7-15-81	10.18	190
		Des Moines River basin					
05474750	Beaver Creek tributary No. 2 near Slayton, MN	Lat 43°59'35", long 95°48'01", in NW¼NW¼ sec.17, T.106 N., R.41 W., Murray County, Hydrologic Unit 07100001, at culvert on State Highway 30, 2.4 miles west of Slayton, and 3.2 miles upstream from mouth.	3.53	1961-81	6-14-81	16.69	48
05474760	Beaver Creek tributary above Slayton, MN	Lat 43°59'35", long 95°47'12", in NE¼NE¼ sec.17, T.106 N., R.41 W., Murray County, Hydrologic Unit 07100001, at culvert on State Highway 30, 0.9 mile upstream from mouth, and 1.7 miles west of Slayton.	2.20	1961-81	6-14-81	18.07	55
05475400	Warren Lake tributary near Windom, MN	Lat 43°54'02", long 95°07'13", in SE¼NE¼ sec.14, T.105 N., R.36 W., Cottonwood County, Hydrologic Unit 07100001, at culvert on U.S. Highway 71, 0.2 mile up stream from Warren Lake, and 2.4 miles north of Windom.	1.39	1960-81	5-24-81	6.04	68
05475800	Des Moines River tributary near Jackson, MN	Lat 43°41'36", long 95°01'26", in NW¼SE¼ sec.27, T.103 N., R.35 W., Jackson County, Hydrologic Unit 07100001, at culvert on county highway, 0.8 mile upstream from mouth, and 5.3 miles north of Jackson.	1.52	1960-81	7-22-81	d13.07	5.9
05475900	Des Moines River tributary No. 2 near Lakefield, MN	Lat 43°40'28", long 95°03'15", in SE¼SE¼ sec.32, T.103 N., R.35 W., Jackson County, Hydrologic Unit 07100001, at culvert on County Highway 19, 1.9 miles upstream from mouth, and 5.8 miles east of Lakefield.	5.18	1960-81	6-12-81	d6.24	63
05476900	Fourmile Creek near Dunnell, MN	Lat 43°34'57", long 94°46'26", in SW¼NW¼ 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, and 1.6 miles north of Dunnell.	14.0	1960-81	6-24-81	d13.32	325
		Big Sioux River basin					
06482933	Chanarambi Creek near Edgerton, MN	Lat 43°53'59", long 96°03'39", in NW¼SW¼ sec.18, T.105 N., R.43 W., near Murray and Pipestone County line, Hydrologic Unit 10170204, at right downstream wingwall of bridge on township road, 3.8 miles northeast of Edgerton, 7.4 miles upstream from mouth.	56.1	1979-81	8-14-81	k11.61	19
06482950	Mound Creek near Hardwick, MN	Lat 43°48'18", long 96°12'47", in SE¼SE¼ sec.15, T.104 N., R.45 W., Rock County, Hydrologic Unit 10170204, at culvert on county highway, 2.2 miles northwest of Hardwick.	2.47	1959-81	6-12-81	6.46	7.0

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1981

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Big Sioux River basin--Continued					
06482960	Mound Creek tributary at Hardwick, MN	Lat 43°46'05", long 96°12'44", in NE¼ SE¼ sec. 34, T. 104 N., R. 45 W., Rock County, Hydrologic Unit 10170204, at culvert on U.S. Highway 75, 0.7 mile upstream from mouth, and 0.9 mile southwest of Hardwick.	.19	1959-81	8-13-81	6.54	28
06483000	Rock River at Luverne, MN	Lat 43°39'15", long 96°12'03", in SW¼ NE¼ sec. 11, T. 102 N., R. 45 W., Rock County, Hydrologic Unit 10170204, at bridge on Main Street (County Highway 4) in Luverne.	425	1911-14#, 1972-81	6-13-81	5.04	800
06483200	Kanaranzi Creek tributary near Lismore, MN	Lat 43°45'41", long 95°55'56", in SW¼SW¼ sec. 31, T. 104 N., R. 42 W., Nobles County, Hydrologic Unit 10170204, at culvert on county highway adjacent to State Highway 91, 60 ft upstream from mouth, and 1.2 miles northeast of Lismore.	.14	1959-81	6-12-81	18.81	126
06483210	Kanaranzi Creek tributary No. 2 near Wilmont, MN	Lat 43°43'32", long 95°52'20", in SW¼NW¼ sec. 15, T. 103 N., R. 42 W., Nobles County, Hydrologic Unit 10170204, at culvert on County Highway 15, 3.5 miles southwest of Wilmont, and 3.7 miles upstream from mouth.	2.14	1966-81	6-12-81	8.76	400
		Little Sioux River basin					
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, and 5.8 miles east of Spafford.	41.1	1962-81	6-14-81	7.92	148

< Less than.
* Also a low-flow partial-record station.
† Discharge not determined.
# Operated as a continuous-record gaging station.
a approximately.
b Not previously published.
c Revised.
d Affected by shifting control.
e Backwater from ice.
f Peak stage did not reach bottom of gage.
g Backwater from temporary rock dam.
h Estimated.
i Backwater from aquatic growth.
j Operated as a miscellaneous partial-record station.
k Affected by beaver dam.

Discharge measurements at miscellaneous sites

Measurements of streamflow at points other than gaging stations are given in the following table. The measurements of base flow are designated by an asterisk (*); measurements of peak flow by a dagger (†).

Discharge measurements made at miscellaneous sites during water year 1981

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Elk River basin				
cdSt. Francis River	Elk River	Lat 45°31'32", long 93°44'12", in SW¼NW¼ sec.17, T.35 N., R.27 W., Sherburne County, Hydrologic Unit 07010203, on downsteam side of bridge on County Road 5, 5.6 miles north of Orrock and 1.9 miles upstream from County ditch No. 6. (05274715)	-	-	10- 2-80 12- 2-80 2- 4-81 4- 8-81 5- 1-81 6-19-81 6-23-81 7-20-81 8-27-81 9-30-81	13.9 6.65 1.11 6.5 23.8 †178 78.0 7.89 8.26 33.5
		Rum River basin				
Lake George Inlet	County Ditch No. 19	Lat 45°21'06", long 93°19'35", seq. No. 01, in SW¼NW¼ sec.15, T.33 N., R.24 W., Anoka County, Hydrologic Unit 07010207, at culvert on Lake George Drive, southeast side of lake, near Oak Grove, MN.	-	-	8-28-81	*0.91
		Elm Creek basin				
Fish Lake Inlet above wetland	Elm Creek	Lat 45°04'50", long 93°27'23", seq. No. 01, SE¼SW¼ sec.27, T.119 N., R.22 W., Hennepin County, Hydrologic Unit 07010206, at culvert on Slope Drive, 0.4 mile above Fish Lake, near Maple Grove, MN.	-	-	8- 3-81 8-27-81	*0.02 1.02
Fish Lake Inlet below wetland	Elm Creek	Lat 45°05'01", long 93°27'32", seq. No. 01, in SW¼SW¼ sec.27, T.119 N., R.22 W., Hennepin County, Hydrologic Unit 07010206, at culvert on old road on southeast end, 0.1 mile above Fish Lake near Maple Grove, MN.	-	-	11-21-81	*0.07
Fish Lake Outlet (Weaver Lake Road)	Elm Creek	Lat 45°06'13", long 93°27'53", seq. No. 01, in E½ sec.21, T.119 N., R.22 W., Hennepin County, Hydrologic Unit 07010206, at culvert on 85th Ave. N. (Weaver Lake Road) near interstate 94 in Maple Grove, MN.	-	-	8- 3-81 8-26-81	*0.08 *0.06
		Bassett Creek basin				
Bassett Creek	Mississippi River	Lat 44°59'58", long 93°21'17", in W½ sec.28, T.118 N., R.21 W., Hennepin County, Hydrologic Unit 07010206, at bridge on County Highway 66, 0.2 mile west of underpass on State Highway 100 in Golden Valley, MN (05288800).	-	1963-80	10- 7-80 3-27-81 5-11-81	3.34 4.68 3.44
North Fork Bassett	Bassett Creek	Lat 45°01'06", long 93°21'32", in NW¼ sec.21, T.118 N., R.21 W., Hennepin County, Hydrologic Unit 07010206, at culvert on 34th Avenue North at Crystal, MN, and 0.8 mile upstream from mouth (05288810).	-	1963-80	3-27-81 5-11-81	0.16 0.66
South Fork Bassett Creek	Bassett Creek	Lat 44°59'04", long 93°20'40", near center of W½ sec.19, T.29 N., R.24 W., Hennepin County, Hydrologic Unit 07010206, at culvert on Olson Memorial Highway (State Highway 55), 0.2 mile east of State Highway 100 in Golden Valley, MN (05288850).	-	1963-69, 1971-80	10- 7-80 3-27-81 5-11-81	0.86 0.85 1.02
Bassett Creek	Mississippi River	Lat 44°58'45", long 93°18'48", in SE¼ sec.20, T.29 N., R.24 W., Hennepin County, Hydrologic Unit 07010206, at Fruen Mill, 700 ft downstream from Glenwood Avenue, at Minneapolis, MN (05288900).	41.6	1952-56, 1963-80	10- 7-80 3-27-81 5-11-81	5.32 5.28 7.68

"See footnotes at end of table."

Discharge measurements made at miscellaneous sites during water year 1981--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Mississippi River main stem				
Mississippi River	Gulf of Mexico	Lat 44°58'46", long 93°14'50", in SE¼SE¼ sec.23, T.29 N., R.24 W., Hennepin County, Hydrologic Unit 07010206, at lower St. Anthony Falls lock and dam in Minneapolis, MN, at River Mile 853.3 upstream from Ohio River. (Discharge measurements made between Hennepin Avenue and Franklin Avenue bridges over the Mississippi River are included). (05288920)	a19,700	1912, 1938-39, 1941, 1943, 1953-54, 1957, 1963-80	3-24-81 7-16-81 9-17-81	3,840 7,980 4,900
Mississippi River	Gulf of Mexico	Lat 44°54'57", long 93°11'59", in NE¼NW¼ sec.17, T.28 N., R.23 W., Ramsey County, Hydrologic Unit 07010206, at Ford Motor Company hydroelectric plant, 800 ft downstream from Ford Parkway bridge in St. Paul, MN, 3.5 miles upstream from Minnesota River, and at River mile 847.6 upstream from Ohio River. (05288950)	a19,700	1924, 1935, 1938-39, 1941, 1943, 1945-50, 1954, 1957, 1959, 1961-62, 1964-70, 1972-80	4- 7-81	6,640
		Minnesota River basin				
Chippewa River diversion	Minnesota River	Lat 45°01'30", long 95°48'00", in SE¼ sec.16, T.118 N., R.41 W., Chippewa County, Hydrologic Unit 07020001, 1 mile north of Watson, MN.	-	1945-80	12-11-80 4- 7-81 5-26-81 6-15-81 8-13-81	*37.5 104 394 †2,150 131
Chippewa River below diversion	Minnesota River	Lat 45°01'10", long 95°47'30", in NW¼ sec.22, T.118 N., R.41 W., Chippewa County, Hydrologic Unit 07020005, 1.4 miles northeast of Watson, MN.	-	1945-80	10- 2-80 12-11-80 1-16-81 3-12-81 4- 7-81 5-26-81 8-13-81	29.8 *29.6 30.1 78.7 78.0 14.0 39.1
Lake Susan Outlet	Riley Creek	Lat 44°51'07", long 93°32'32", seq. No. 01, in NE¼SW¼ sec.13, T.116 N., R.23 W., Carver County, Hydrologic Unit 07020012, at culvert on Highway 101, 0.7 mile south of intersection of State Highways 5 and 101, near Chanhassen, MN.	-	-	7-31-81 8-27-81	*0.55 4.03
Lake Riley Inlet	Riley Creek	Lat 44°50'23", long 93°30'52", seq. No. 01, in NE¼SW¼ sec.19, T.116 N., R.22 W., Hennepin County, Hydrologic Unit 07020012, at double culverts on Riley Lake Road, 1.7 miles southeast of intersection of State Highways 5 and 101, between Chanhassen and Shakopee, MN.	-	-	7-31-81 8-27-81	*0.47 1.56
Purgatory Creek	Mississippi River	Lat 44°49'27", long 93°25'34", in NW¼SE¼ sec.26, T.116 N., R.22 W., Hennepin County, Hydrologic Unit 07020012, on left bank in Eden Prairie, 0.4 mile downstream from culvert on County Road 1 (Pioneer Trail), and 2.4 miles upstream from Minnesota River. (05330800)	26.8	1968-72, 1975-80#	9-12-80 10- 7-80 11- 6-80 12-12-80 12-31-80	12.4 4.00 2.91 1.70 1.05
Spring Lake Inlet above pond	Prior Lake	Lat 44°41'21", long 93°29'38", seq. No. 01, in SE¼SW¼ sec.8, T.114 N., R.22 W., Scott County, Hydrologic Unit 07020012, inflow to pond, below culvert on State Highway 13, 0.4 mile above Spring Lake, 0.2 mile east of junction with State Highways 13 and 282, west of Prior Lake, MN.	-	-	8- 6-81 8-26-81 8-27-81	6.17 13.8 25.8
Spring Lake Inlet at pond outlet	Prior Lake	Lat 44°41'28", long 93°29'34", seq. No. 01, in SE¼SW¼ sec.8, T.114 N., R.22 W., Scott County, Hydrologic Unit 07020012, outflow from pond, 500 ft below culvert on State Highway 13, 0.4 mile east of junction with State Highways 13 and 282, west of Prior Lake, MN.	-	-	8- 6-81 8-26-81	2.81 10.3

"See footnotes at end of table."

Discharge measurements made at miscellaneous sites during water year 1981--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Minnesota River basin--Continued				
Spring Lake Outlet	Prior Lake	Lat 44°42'14", long 93°27'30", seq. No. 01, in SE¼SE¼ sec.4, T.114 N., R.22 W., Scott County, Hydrologic Unit 07020012, on northeast side of lake at culvert on County Road 12, west of Prior Lake, MN.	-	-	7-30-81 8- 6-81 8-26-81 9-21-81	1.05 3.67 11.8 7.82
South Fork Nine Mile Creek (Bryant Lake inlet)	Nine Mile Creek	Lat 45°53'14", long 93°26'03", seq. No. 01, in SW¼NW¼ sec.2, T.116 N., R.22 W., Hennepin County, Hydrologic Unit 07010206, at culvert on County Road 62, 0.5 mile upstream of Bryant Lake, near Eden Prairie, MN.	-	-	7-31-81 8-26-81	6.66 0.25
South Fork Nine Mile Creek (Bryant Lake	Nine Mile Creek	Lat 45°52'23", long 93°25'09", seq. No. 01, in NE¼NE¼, T.116 N., R.22 W., Hennepin County, Hydrologic Unit 07010206, at double culverts on Willow Creek Road, 0.1 mile downstream of Bryant Lake near Eden Prairie, MN.	-	-	7-31-81 8-26-81 8-27-81	0.25 0.24 1.24
		St. Croix River basin				
Square Lake Outlet	Unnamed tributary to St. Croix River	Lat 45°09'09", long 92°47'48", seq. No. 01, in SE¼SE¼ sec.23, T.31 N., R.20 W., Washington County, Hydrologic Unit 07030005, at culvert on southeast side of lake, in county park, 3.5 miles southwest of Marine on St. Croix, MN.	-	-	8- 3-81 8-26-81 8-27-81	9.54 3.87 3.71
Eagle Point Lake inlet	Eagle Point Lake	Lat 44°58'40", long 92°56'00", seq. No. 01, in N½ sec.28, T.29 N., R.22 W., Washington County, Hydrologic Unit 07010206, at culvert on County Road 138 (Inwood Ave. N.), 1 mile south of Stillwater Blvd., near Oakdale, MN.	-	-	8- 3-81 8-26-81 8-27-82 8-28-81	#0.06 1.93 6.07 0.53
Lake Elmo inlet (from Eagle Point Lake)	Lake Elmo	Lat 44°58'41", long 92°54'09", seq. No. 01, in SW¼SW¼ sec.23, T.29 N., R.22 W., Washington County, Hydrologic Unit 07010206, at culvert on Keats Ave., 1.3 miles south of State Highway 212, 212, near Oakdale, MN.	-	-	7-14-81 8- 3-81 8-26-81 8-27-81 8-27-81	#0 #0.03 #0.02 0.20 #0.07
Lake Elmo outlet on Creek 17	Horseshoe Lake	Lat 44°58'35", long 92°53'00", seq. No. 01, in NE¼NE¼ sec.26, T.29 N., R.22 W., Washington County, Hydrologic Unit 07010206, at culvert on southeast side side of Lake Elmo on Lake Elmo Ave., near Oakdale, MN.	-	-	8- 3-81 8-26-81 8-27-81 8-28-81	1.61 2.24 3.36 3.07
		Vermillion River basin				
Vermillion River	Mississippi River	Lat 44°42'07", long 92°54'44", in NW¼NW¼ sec.7, T.114 N., R.17 W., Dakota County, Hydrologic Unit 07040001, at bridge on 170th Street SE, 1 mile west of Highway 47.	-	-	9-15-80 11- 7-80 4-10-81 5-14-81 6-19-81 7-16-81 8-11-81 9-18-81	51.5 52.8 54.7 52.6 49.3 54.3 101 45.2
		Cedar River basin				
Mud Lake Creek	Woodbury Creek	Lat 43°34'18", long 93°06'50", in SW¼SE¼ sec.4, T.101 N., R.19 W., Freeborn County, Hydrologic Unit 07080201, at culvert on gravel road, 1.5 miles northeast of Myrtle, MN, and 4.2 miles northwest of London, MN.	-	-	2-24-81 4-21-81	b1 2.32

Operated as a continuous-record gaging station.
a Approximately.
b Estimated.
c Operated as a high-flow partial-record station.
d Operated as a miscellaneous water-quality station.

Low-flow investigations in the Chippewa-Pomme de Terre watersheds

Discharge measurements were made in the Chippewa-Pomme de Terre watersheds to determine base-flow variations that will facilitate modeling of ground water-surface water relationships. Conditions were excellent, and all measurements are considered base flow. Total precipitation in the area for the 10 days preceding the measurements was generally less than 0.01 inch.

Stream	Location	Drainage area (mi^2)	Measured previously (water years)	Date	Discharge (ft^3/s)	Specific conductance (micromhos)	Water Temperature °C
	Pomme de Terre River basin						
Pomme de Terre River at inlet to Pomme de Terre Lake	Lat 46°02'53", long 95°53'57", in NW¼NE¼ sec.25, T.130 N., R.42 W., Grant County, Hydrologic Unit 07020002, at bridge on County Road 52, 5.2 miles northeast of Elbow Lake, MN.	-	1980	11- 6-80	10.2	800	5.0
cPomme de Terre River at outlet from Pomme de Terre Lake	Lat 45°59'06", long 95°53'37", in NE¼SE¼ sec.13, T.129 N., R.42 W., Grant County, Hyrologic Unit 07020002, at culverts on county road, 4 miles east of Elbow Lake, MN. (05293370)	a334	1963-65, 1970, 1973-75, 1978, 1980	11- 6-80	19.4	700	6.0
Pomme de Terre River at inlet to Barrett Lake	Lat 45°56'02", long 95°52'31", in NE¼NW¼ sec.6, T.128 N., R.41 W., Grant County, Hydrologic Unit 07020002, at culverts on County Road 36, 1.8 miles northeast of Barrett, MN.	-	1980	11- 6-80	20.6	700	6.0
Pomme de Terre River at Barrett Lake outlet	Lat 45°54'43", long 95°52'57", in NE¼SE¼ sec.12, T.128 N., R.42 W., Grant County, Hydrologic Unit 07020002, at control structures on County Highway 2, in Barrett, MN.	-	1943-45, 1964, 1980	11- 6-80	13.5	680	6.0
Pomme de Terre River	Lat 45°49'56", long 95°51'38", in NW¼NW¼ sec.8, T.127 N., R.41 W., Grant County, Hydrologic Unit 07020002, at bridge on State Highway 27, 3 miles west of Hoffman, MN.	-	1980	11- 6-80	17.0	800	8.0
Pomme de Terre River at inlet to North Pomme de Terre Lake	Lat 45°44'43", long 95°51'24", in NW¼NW¼ sec.8, T.126 N., R.41 W., Stevens County, Hydrologic Unit 07020002, at culverts on County Road 76, 6.7 miles southwest of Hoffman, MN.	-	1980	11- 6-80	19.7	900	7.0
Pomme de Terre River at Perkins Lake outlet	Lat 45°41'14", long 95°51'35", in NW¼NW¼ sec.32, T.126 N., R.41 W., Stevens County, Hydrologic Unit 07020002, at culverts on County Road 74, 7.2 miles northeast of Morris, MN.	-	1980	11- 7-80	14.3	750	6.0
Pomme de Terre River	Lat 45°36'26", long 95°52'50", in NW¼SW¼ sec.30, T.125 N., R.41 W., Stevens County, Hydrologic Unit 07020002, at bridge on State Highway 28, 2 miles northeast of Morris, MN.	-	1980	11- 7-80	23.6	800	6.5
Pomme de Terre River	Lat 45°33'08", long 95°52'33", in SW¼NE¼ sec.13, T.124 N., R.42 W., Stevens County, Hydrologic Unit 07020002, at bridge on State Highway 9, 3 miles southeast of Morris, MN.	-	1980	11- 7-80	23.1	800	6.0
cMud Creek	Lat 45°32'26", long 95°54'44", in NE¼NE¼ sec.22, T.124 N., R.42 W., Stevens County, Hydrologic Unit 07020002, at culvert on U.S. Highway 59, 1 mile upstream from mouth, and 3 miles south of Morris, MN. (05293600)	a137	1963-65, 1970, 1973-75, 1978, 1980	11- 7-80	0.02	2,000	10.0
Pomme de Terre River	Lat 45°27'20", long 95°57'20", in NE¼NE¼ sec.20, T.123 N., R.42 W., Stevens County, Hydrologic Unit 07020002, at bridge on County Road 58, 9.5 miles southwest of Morris, MN.	-	1980	11- 7-80	28.4	900	6.0
Pomme de Terre River	Lat 45°23'02", long 95°56'43", in NE¼NW¼ sec.16, T.122 N., R.42 W., Swift County, Hydrologic Unit 07020002, at bridge on County Highway 22, 3 miles north of Fairfield, MN.	-	1964, 1973, 1980	11- 7-80	35.3	850	9.0

"See footnotes at end of table."

Low-flow investigations in the Chippewa-Pomme de Terre watersheds--Continued

Stream	Location	Drainage area (mi^2)	Measured previously (water years)	Date	Discharge (ft^3/s)	Specific conductance (micromhos)	Water Temperature °C
	Pomme de Terre River basin--Continued						
Pomme de Terre River	Lat 45°18'42", long 95°56'57", in SW¼SW¼ sec.4, T.121 N., R.42 W., Swift County, Hydrologic Unit 07020002, at bridge on County Road 56, 2 miles south of Fairfield, MN.	-	1964, 1973, 1980	11- 7-80	36.2	800	8.0
Pomme de Terre River	Lat 45°17'02", long 95°58'45", in SW¼SE¼ sec.18, T.121 N., R.42 W., Swift County, Hydrologic Unit 07020002, at spillway north of U.S. Highway 12, 4. miles northwest of Holloway, MN.	-	1964, 1973, 1980	11- 7-80	44.2	800	7.0
oPomme de Terre River	Lat 45°14'22", long 95°59'06", in NW¼NE¼ sec.1, T.120 N., R.43 W., Swift County, Hydrologic Unit 07020002, on County Road 54, 3.5 miles west of Holloway, MN. (05294000)	885	1931-53#d, 1964, 1980	11- 7-80	37.9	800	7.5
Pomme de Terre River	Lat 45°12'46", long 95°59'34", in SE¼SW¼ sec.12, T.120 N., R.43 W., Swift County, Hydrologic Unit 07020002, at bridge on county road, 1.5 miles east of Appleton, MN.	-	1973, 1980	11- 7-80	39.2	800	6.0
Pomme de Terre River	Lat 45°12'10", long 96°01'20", in SW¼NW¼ 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 miles upstream from mouth. (05294000)	905	1953-79#, 1980#	11- 6-80	38.7	800	8.0
Pomme de Terre River	Lat 45°11'18", long 96°04'18", in SW¼NE¼ sec.20, T.120 N., R.43 W., Swift County, Hydrologic Unit 07020002, at bridge on County Road 51, 2.5 miles southwest of Appleton, MN.	-	1980	11- 6-80	42.5	750	9.0
	Chippewa River basin						
Chippewa River	Lat 45°51'40", long 95°46'05", in NE¼NW¼ sec.36, T.128 N., R.41 W., Grant County, Hydrologic Unit 07020005, at culverts on county road, 2.5 miles northeast of Hoffman, MN.	-	1980	11- 6-80	17.5	700	4.0
Chippewa River at Reed Lake outlet	Lat 45°47'16", long 95°45'53", in NW¼NE¼ sec.25, T.127 N., R.41 W., Grant County, Hydrologic Unit 07020005, at culverts on County Road 37, 3 miles southeast of Hoffman, MN.	-	1980	11 -6-80	18.3	760	4.0
Chippewa River	Lat 45°42'59", long 95°46'33", in NW¼NW¼ sec.24, T.126 N., R.41 W., Stevens County, Hydrologic Unit 07020005, at culverts on County Highway 20, 7.2 miles northwest of Cyrus, MN.	-	1980	11- 6-80	23.5	645	5.0
Chippewa River	Lat 45°36'53", long 95°43'45", in NE¼NW¼ sec.29, T.125 N., R.40 W., Pope County, Hydrologic Unit 07020005, at bridge on State Highway 28, 0.5 mile east of Cyrus, MN.	-	1980	11- 6-80	25.0	645	5.0
oLittle Chippewa River	Lat 45°35'46", long 95°40'32", in SE¼NE¼ sec.34, T.125 N., R.40 W., Pope County, Hydrologic Unit 07020005, at culvert on County Road 73, 4.3 miles southeast of Cyrus, MN. (05302700)	a12.6	1969-70, 1973-74, 1980	11- 6-80	2.50	940	4.0
Chippewa River	Lat 45°32'08", long 95°41'54", in NE¼SW¼ sec.21, T.124 N., R.40 W., Pope County, Hydrologic Unit 07020005, at bridge on County Highway 1, 5.2 miles northeast of Hancock, MN.	-	1980	11- 6-80	35.2	680	7.0
oLake Emily outlet	Lat 45°30'56", long 95°41'45", in SE¼SW¼ sec.28, T.124 N., R.40 W., Pope County, Hydrologic Unit 07020005, at culverts on county road, 4.9 miles northeast of Hancock, MN. (05302980)	260	1969-70, 1973-74, 1980	11- 6-80	1.11	700	7.0

"See footnotes at end of table."

Low-flow investigations in the Chippewa-Pomme de Terre watersheds--Continued

Stream	Location	Drainage area (mi^2)	Measured previously (water years)	Date	Discharge (ft^3/s)	Specific conductance (micromhos)	Water Temperature °C
	Chippewa River basin--Continued						
Chippewa River tributary	Lat 45°28'22", long 95°41'08", in SE¼SE¼ sec.9, T.123 N., R.40 W., Pope County, Hydrologic Unit 07020005, at culvert on County Road 71, 5.6 miles southeast of Hancock, MN.	-	1980	11- 6-80	0.04	545	13.0
Chippewa River	Lat 45°28'13", long 95°42'13", in NW¼NW¼ sec.16, T.123 N., R.40 W., Pope County, Hydrologic Unit 07020005, at bridge on county road, 4.8 miles southeast of Hancock, MN.	-	1980	11- 6-80	55.4	700	6.0
Chippewa River	Lat 45°23'08", long 95°39'30", in SE¼SW¼ sec.11, T.122 N., R.40 W., Swift County, Hydrologic Unit 07020005, at bridge on County Highway 22, 1 mile northeast of Clontarf, MN.	-	1980	11- 6-80	60	685	7.0
cEast Branch of Chippewa River	Lat 45°20'53", long 95°35'37", in SE¼NW¼ sec.29, T.122 N., R.39 W., Swift County, Hydrologic Unit 07020005, at bridge on county road, 2.2 miles north of Benson, MN. (05303470)	-	1963-65, 1969-70, 1973-74, 1980	11- 6-80	43.4	590	6.0
Chippewa River	Lat 45°18'42", long 95°37'28", in SE¼SE¼ sec.1, T.121 N., R.40 W., Swift County, Hydrologic Unit 07020005, at bridge on U.S. Highway 12, 1.2 miles southwest of Benson, MN.	-	1980	11- 7-80	107	645	6.0
Chippewa River	Lat 45°16'01", long 95°40'28", in NW¼NE¼ sec.27, T.121 N., R.40 W., Swift County, Hydrologic Unit 07020005, at bridge on County Highway 14, 5.0 miles southwest of Benson, MN.	-	1980	11- 7-80	109	680	6.0
Chippewa River	Lat 45°12'30", long 95°40'00", in NE¼NW¼ sec.15, T.120 N., R.40 W., Swift County, Hydrologic Unit 07020005, at bridge on county road, 6.4 miles southeast of Danvers, MN.	-	1980	11- 7-80	110	645	7.0
Shakopee Creek	Lat 45°12'37", long 95°39'15", in SE¼SE¼ sec.10, T.120 N., R.40 W., Swift County, Hydrologic Unit 07020005, at bridge on county road, 7.7 miles southwest of Benson, MN.	-	1980	11- 7-80	3.06	780	8.0
Chippewa River	Lat 45°09'23", long 95°44'07", in NE¼SE¼ sec.36, T.120 N., R.41 W., Swift County, Hydrologic Unit 07020005, at bridge on county road, 2.0 miles northeast of Hagen, MN.	-	1980	11- 6-80	116	700	7.0
Cottonwood Creek	Lat 45°08'34", long 95°48'07", in NW¼SE¼ sec.4, T.119 N., R.41 W., Chippewa County, Hydrologic Unit 07020005, at bridge on county road, 1.2 miles west of Big Bend City, MN.	-	1980	11- 6-80	14.5	1,100	8.5
Chippewa River	Lat 45°06'39", long 95°47'57", in SE¼SE¼ 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 miles upstream from small tributary, and 5.5 miles east of Milan, MN. (05304500)	a1,870	1939-79#, 1980#	11- 6-80	142	750	6.0
cDry Weather Creek	Lat 45°03'00", long 95°46'00", in NE¼NW¼ sec.11, T.118 N., R.41 W., Chippewa County, Hydrologic Unit 07020005, at bridge on county road, 7.4 miles northeast of Montevideo, MN. (05304800)	105	1969-70, 1973-75, 1980	11- 6-80	0.29	1,500	5.0
Chippewa River tributary	Lat 45°02'12", long 95°47'14", in SE¼SW¼ sec.10, T.118 N., R.41 W., Chippewa County, Hydrologic Unit 07020005, at bridge on county road, 2 miles north of Watson, MN.	-	1980	11- 6-80	0.13	775	6.5

"See footnotes at end of table."

Low-flow investigations in the Chippewa-Pomme de Terre watersheds--Continued

Stream	Location	Drainage area (mi^2)	Measured previously (water years)	Date	Discharge (ft^3/s)	Specific conductance (micromhos)	Water Temperature °C
	Chippewa River basin--Continued						
Chippewa River	Lat 45°01'20", long 95°47'28", on line between secs.15 and 22, T.118 N., R.41 W., Chippewa County, Hydrologic Unit 07020005, at culvert on County Highway 13, 1.5 miles north of Watson, MN., 2.4 miles downstream from Dry Weather Creek, and 10 miles upstream from mouth. (05305000)	a2,050	1910-17#, 1931-36#, 1937, 1943-58, 1960-67, 1969-71, 1980	11- 6-80	127	700	6.0

Operated as a continuous-record gaging station.
a Approximately.
b Estimate.
c Also published under low-flow measurements.
d Site of gage prior to 1953.

Samples are collected at sites other than gaging stations and partial-record stations to give better areal coverage in a river basin. Such sites are referred to as miscellaneous sites.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

05274715 ST. FRANCIS RIVER NEAR ORROCK, MN

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT											
02...	1230	14	300	--	7.0	11.5	2.5	6.0	56	35	52
DEC											
02...	1130	6.7	360	409	7.1	1.0	6.3	4.6	34	25	K2
FEB											
04...	1424	1.1	393	398	6.9	.0	17	4.8	34	37	<1
APR											
08...	1215	6.5	275	333	6.9	10.0	36	5.3	48	41	K4

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	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, DIS-SOLVED (MG/L AS P) (00666)	SEDI-MENT SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)
OCT										
02...	64	200	--	--	.06	.030	.040	.020	2	.09
DEC										
02...	K31	252	--	--	.10	.040	.050	.010	--	--
FEB										
04...	K10	255	--	--	.03	.100	.120	.020	--	--
APR										
08...	K11	228	<.03	<.010	.02	.160	.100	.010	22	.39

440533091445200 GARVIN BROOK BELOW US 61 AT MINNESOTA CITY, MN

DATE	TIME	STREAM FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
JUN											
16...	1555	52	432	516	8.2	18.0	15	9.2	99	<10	2100

DATE	STREP-TOCOCCI FECAL KF AGAR (COLS. PER 100 ML) (31673)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
JUN								
16...	3300	13	4.6	283	44	1	2	1700

DATE	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)
JUN						
16...	8	<.1	6	20	3.31	.000

NOTE: K - NON-IDEAL COLONY COUNT

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

443636096095400 DILLON-SYLTE IMPOUNDMENT NEAR PORTER, MN

DATE	TIME	SAMP-LING DEPTH (FT) (00003)	RESER-VOIR DEPTH (FEET) (72025)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TRANS-PAR-ENCY (SECCHI DISK) (M) (00078)	OXYGEN, DIS-SOLVED (MG/L) (00300)
NOV								
03...	1615	.50	10	879	8.2	6.3	.76	12.1
FEB								
24...	1505	.50	10	927	8.0	4.4	1.34	14.5
APR								
24...	1418	.50	14	845	8.2	12.0	1.92	10.4
JUN								
24...	1340	2.00	12	1000	8.4	23.0	.70	--
JUL								
30...	1115	4.00	13	900	--	21.0	.82	--
SEP								
02...	1030	.50	12	910	8.4	19.5	.98	8.9

DATE	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)
NOV								
03...	103	.02	.070	1.40	1.4	.080	35.4	.000
FEB								
24...	118	.06	.060	1.10	1.2	.050	--	--
APR								
24...	100	.01	.040	.75	.76	.020	1.37	.220
JUN								
24...	--	<.01	.070	1.60	--	.060	1.94	.000
JUL								
30...	--	<.01	.100	.93	--	.070	58.4	.000
SEP								
02...	100	.02	.030	1.20	1.2	.120	16.8	1.80

DATE	TIME	SAMP-LING DEPTH (FT) (00003)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)
NOV						
03...	1615	.50	879	8.2	6.3	12.1
03...	1618	3.00	878	8.2	6.2	12.1
03...	1621	6.00	878	8.2	6.2	12.2
03...	1624	9.00	878	8.3	6.0	12.2
FEB						
24...	1505	.50	927	8.0	4.4	14.5
24...	1508	3.00	936	8.0	4.3	15.2
24...	1511	6.00	939	8.0	4.3	15.4
24...	1515	9.40	946	8.0	4.3	16.2
APR						
24...	1418	.50	845	8.2	12.0	10.4
24...	1421	3.00	--	--	10.1	10.3
24...	1424	6.00	--	--	10.5	10.2
24...	1427	9.00	--	--	10.0	10.5
24...	1430	12.0	--	--	10.0	10.6
24...	1433	13.0	--	--	10.0	10.9
JUN						
24...	1338	.50	--	--	23.0	--
24...	1340	2.00	1000	8.4	23.0	--
24...	1343	11.5	--	--	23.0	--
JUL						
30...	1115	4.00	900	--	21.0	--
AUG						
04...	0945	.50	880	8.5	24.0	8.2
04...	0948	3.00	890	--	24.0	8.0
04...	0951	6.00	890	--	24.0	7.7
04...	0954	9.00	890	--	23.5	3.1
04...	0957	12.0	880	--	22.0	.2
SEP						
02...	1030	.50	910	8.4	19.5	8.9
02...	1033	3.00	910	--	--	8.9
02...	1036	6.00	--	--	--	8.8
02...	1040	9.00	--	--	--	8.5
02...	1043	11.5	910	--	19.5	7.8

443636096095400 DILLON-SYLTE IMPOUNDMENT NEAR PORTER, MN--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	JUN 24,81	JUL 30,81	SEP 2,81
TIME	1430	1115	1030
TOTAL CELLS/ML	16000	6700	4200
DIVERSITY: DIVISION	0.7	2.3	1.8
.CLASS	0.7	2.3	1.8
..ORDER	1.6	2.5	2.5
...FAMILY	1.7	2.9	2.6
....GENUS	1.7	3.3	2.7

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)						
.BACILLARIOPHYCEAE						
..BACILLARIALES						
...NITZSCHIACEAE						
....NITZSCHIA	*	0	35	1	--	-
..EUPODISCALES						
...COSCINODISCACEAE						
....CYCLOTELLA	*	0	70	1	--	-
....MELOSIRA	--	-	70	1	--	-
CHLOROPHYTA (GREEN ALGAE)						
.CHLOROPHYCEAE						
..CHLOROCOCCALES						
...COCCOMYXACEAE						
....ELAKATOTHRIX	--	-	210	3	--	-
...OOCYSTACEAE						
....ANKISTRODESMUS	--	-	35	1	--	-
....OOCYSTIS	350	2	170	3	140	3
...PALMELLACEAE						
....SPHAEROCYSTIS	520	3	280	4	*	0
...SCENEDESMACEAE						
....COELASTRUM	280	2	--	-	--	-
....SCENEDESMUS	*	0	280	4	--	-
..VOLVOCALES						
...CHLAMYDOMONADACEAE						
....CHLAMYDOMONAS	210	1	35	1	--	-
...PHACOTACEAE						
....DYSMORPHOCOCCUS	--	-	700	10	--	-
....PHACOTUS	--	-	--	-	35	1
..ZYGNEMATALES						
...DESMIDIACEAE						
....CLOSTERIUM	--	-	--	-	170	4
CRYPTOPHYTA (CRYPTOMONADS)						
.CRYPTOPHYCEAE						
..CRYPTOMONADALES						
...CRYPTOCHRYSIDACEAE						
....CHROOMONAS	360	2	1200#	17	--	-
...CRYPTOMONADACEAE						
....CRYPTOMONAS	*	0	170	3	280	7
CYANOPHYTA (BLUE-GREEN ALGAE)						
.CYANOPHYCEAE						
..CHROOCOCCALES						
...CHROOCOCCACEAE						
....ANACYSTIS	7500#	48	--	-	69	2
..NOSTOCALES						
...NOSTOCACEAE						
....APHANIZOMENON	6100#	40	1600#	24	1600#	38
....NODULARIA	--	-	520	8	--	-
..OSCILLATORIALES						
...OSCILLATORIACEAE						
....OSCILLATORIA	--	-	--	-	780#	19
EUGLENOPHYTA (EUGLENOIDS)						
.EUGLENOPHYCEAE						
..EUGLENALES						
...EUGLENACEAE						
....EUGLENA	*	0	35	1	190	5
....TRACHELOMONAS	100	1	280	4	260	6
PYRRHOPHYTA (FIRE ALGAE)						
.DINOPHYCEAE						
..DINOKONTAE						
...CERATIACEAE						
....CERATIUM	*	0	--	-	69	2
...PERIDINIACEAE						
....PERIDINIUM	--	-	1000#	16	610	14

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

443636096095402 DILLON-SYLTE IMPOUNDMENT INLET NEAR PORTER, MN

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)
FEB								
24...	1415	.01	1059	--	7.7	4.4	10.5	84
APR								
23...	1545	.81	--	860	8.2	13.0	10.2	101
JUL								
24...	1340	1.3	700	--	--	--	--	--

DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)
FEB							
24...	--	--	--	--	--	--	--
APR							
23...	.02	.040	.35	.37	.010	33	.07
JUL							
24...	--	--	--	--	--	28	.09

443636096095404 DILLON-SYLTE IMPOUNDMENT OUTLET NEAR PORTER, MN

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)
APR								
24...	1420	.51	1000	790	8.3	15.0	25	.03

ANALYSIS OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

444900096240000 WEBBER IMPOUNDMENT NEAR GARY, SD

DATE	TIME	SAMPLING DEPTH (FT) (00003)	RESERVOIR DEPTH (FEET) (72025)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	TRANSPARENCY (SECCHI DISK) (M) (00078)	OXYGEN, DISSOLVED (MG/L) (00300)
NOV								
04...	1215	.50	14	602	7.9	5.8	1.55	11.8
FEB								
25...	1200	.50	12	650	7.7	2.6	--	11.8

DATE	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, TOTAL (MG/L AS N) (00600)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70954)
NOV								
04...	98	.04	.080	.95	.99	.060	4.93	.000
FEB								
25...	91	.05	.130	1.10	1.2	.030	--	--

DATE	TIME	SAMPLING DEPTH (FT) (00003)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)
NOV						
04...	1215	.50	602	7.9	5.8	11.8
04...	1218	3.00	602	7.9	5.8	11.8
04...	1221	6.00	602	7.9	5.8	11.8
04...	1224	9.00	603	8.0	5.7	11.9
04...	1227	12.0	602	8.0	5.7	11.8
08...	1230	13.5	602	8.0	5.7	11.8
FEB						
25...	1200	.50	650	7.7	2.6	11.8
25...	1201	3.00	655	7.8	2.9	11.8
25...	1203	6.00	655	7.8	3.0	12.0
25...	1206	9.00	657	7.8	3.2	11.9
25...	1209	12.0	657	7.9	3.3	11.9

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

450317096412100 LA BOLT IMPOUNDMENT AT LA BOLT, SD

DATE	TIME	SAMPLING DEPTH (FT) (00003)	RESERVOIR DEPTH (FEET) (72025)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	TRANSPARENCY (SECCHI DISK) (M) (00078)	OXYGEN, DISSOLVED (MG/L) (00300)
NOV								
04...	1010	.50	9	675	8.0	5.7	.58	10.9
FEB								
25...	1000	1.00	--	801	8.0	4.0	--	12.9

DATE	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, TOTAL (MG/L AS N) (00600)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70954)
NOV								
04...	90	.02	.840	2.40	2.4	.110	23.9	.000
FEB								
25...	102	.17	.910	1.70	1.9	.060	--	--

DATE	TIME	SAMPLING DEPTH (FT) (00003)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)
NOV						
04...	1010	.50	675	8.0	5.7	10.9
04...	1013	3.00	675	8.0	5.6	11.0
04...	1016	6.00	674	8.0	5.6	10.9
04...	1019	9.00	675	8.0	5.6	10.9
FEB						
25...	1000	1.00	801	8.0	4.0	12.9

450317096412102 LA BOLT IMPOUNDMENT INLET AT LA BOLT, SD

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
FEB							
25...	0930	E.14	1268	8.3	.5	12.5	100

DATE	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, TOTAL (MG/L AS N) (00600)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)
FEB							
25...	.23	.100	.44	.67	.080	95	.04

NOTE: E - ESTIMATED VALUE

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

451240092500001 BIG MARINE LAKE EAST BAY, NEAR FOREST LAKE, MN

DATE	TIME	SAMPLING DEPTH (FT) (00003)	RESERVOIR DEPTH (FEET) (72025)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	SPECIFIC CONDUCTANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	TRANSPARENCY (SECCHI DISK) (M) (00078)	OXYGEN, DISSOLVED (MG/L) (00300)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARBONATE (MG/L AS CACO3) (95902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)
NOV												
05...	1400	2.00	30	169	177	8.0	5.9	--	12.3	75	.00	18
MAR												
12...	1100	3.00	30	190	205	7.4	5.4	4.3	12.6	87	--	22
12...	1130	26.0	30	223	236	6.9	5.0	--	6.9	91	--	23
JUN												
11...	1200	3.30	30	192	184	7.6	19.0	--	--	87	--	22
11...	1230	13.1	30	--	183	--	13.2	--	--	87	--	22
AUG												
25...	1400	3.30	30	186	164	7.6	23.0	--	7.4	89	9.0	21
25...	1500	36.1	30	280	182	6.8	14.2	--	1.8	92	2.0	24

DATE	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)
NOV												
05...	7.4	2.3	2.0	77	2.1	4.1	.0	.0	107	.01	0	0
MAR												
12...	7.8	2.5	2.2	--	2.2	4.2	--	--	114	--	--	--
12...	8.2	2.8	2.5	--	1.9	4.6	--	--	136	--	--	--
JUN												
11...	7.9	2.6	1.9	--	3.5	4.3	--	--	110	--	--	--
11...	7.9	2.6	1.6	--	2.8	4.2	--	--	112	--	--	--
AUG												
25...	8.9	2.5	1.9	80	1.2	4.3	--	1.3	112	--	--	--
25...	7.9	2.5	2.2	90	.2	4.4	--	2.5	117	--	--	--

DATE	TIME	SAMPLING DEPTH (FT) (00003)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)
NOV						
05...	1358	.00	172	8.0	5.9	12.2
05...	1400	2.00	169	8.0	5.9	12.3
05...	1401	3.00	169	8.0	5.9	12.3
05...	1402	6.00	169	8.1	5.8	12.4
05...	1403	9.00	168	8.1	5.8	12.3
05...	1404	12.0	167	8.1	5.7	12.4
05...	1405	14.0	167	8.1	5.7	12.4
MAR						
12...	1059	.00	--	7.0	1.9	9.2
12...	1100	3.00	190	7.4	5.4	12.6
12...	1104	6.56	201	7.5	5.6	12.7
12...	1109	9.84	209	7.5	5.6	12.8
12...	1113	13.1	212	7.5	5.2	12.8
12...	1118	16.4	217	7.1	5.1	10.3
12...	1122	19.7	220	7.0	5.1	8.5
12...	1127	23.0	221	6.9	5.1	8.0
12...	1130	26.0	223	6.9	5.0	6.9
12...	1132	31.2	226	6.8	5.1	5.8
JUN						
11...	1200	3.30	192	7.6	19.0	--
11...	1230	13.1	--	--	13.2	--
AUG						
25...	1358	.00	--	7.6	22.9	7.5
25...	1400	3.30	186	7.6	23.0	7.4
25...	1405	6.00	--	7.6	22.9	7.4
25...	1410	9.00	--	7.6	22.9	7.3
25...	1415	12.0	--	7.6	22.9	7.0
25...	1420	15.0	--	7.6	22.9	7.0
25...	1425	18.0	--	7.4	22.8	6.7
25...	1430	21.0	--	7.2	22.5	4.7
25...	1435	24.0	--	6.8	20.9	1.6
25...	1440	27.0	--	6.7	18.4	1.5
25...	1445	30.0	--	6.7	16.0	1.6
25...	1450	33.0	--	6.7	14.7	1.7
25...	1500	36.1	280	6.8	14.2	1.8

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

451240092500002 BIG MARINE LAKE SOUTH BAY, NEAR FOREST LAKE, MN

DATE	TIME	SAMPLING DEPTH (FT) (00003)	RESERVOIR DEPTH (FEET) (72025)	SPECIFIC CONDUCTANCE (UMHOS) (00095)	SPECIFIC CONDUCTANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	TRANSPARENCY (SECCHI DISK) (M) (00078)	OXYGEN, DISSOLVED (MG/L) (00300)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARBONATE (MG/L AS CACO3) (95902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)
NOV												
05...	1430	2.00	53	165	176	7.7	6.5	--	11.6	75	.00	18
MAR												
12...	1300	3.00	53	185	204	7.3	5.4	5.8	11.3	79	--	19
12...	1325	43.0	53	221	234	6.8	5.1	--	4.5	93	--	23
JUN												
11...	1300	3.30	53	192	183	7.6	20.0	--	--	85	--	21
11...	1330	49.2	53	--	190	--	19.0	--	--	90	--	23
AUG												
25...	1100	3.30	53	190	166	7.7	22.7	--	7.3	87	3.0	21
25...	1105	49.2	53	229	188	6.9	14.4	--	1.7	110	9.0	27
25...	1110	.00	--	--	--	7.9	22.7	--	7.3	--	--	--

DATE	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)
NOV												
05...	7.4	2.4	1.8	76	2.6	4.1	.1	.0	106	.02	10	0
MAR												
12...	7.7	2.6	2.2	--	2.0	4.2	--	--	120	--	--	--
12...	8.7	2.8	2.4	--	3.2	4.8	--	--	130	--	--	--
JUN												
11...	7.9	2.7	1.9	--	3.3	4.3	--	--	103	--	--	--
11...	7.9	2.7	1.9	--	3.0	4.1	--	--	111	--	--	--
AUG												
25...	8.5	2.5	1.9	84	1.6	4.3	--	1.3	105	--	--	--
25...	9.2	2.5	2.2	96	.0	4.4	--	4.0	123	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

451240092500002 BIG MARINE LAKE SOUTH BAY, NEAR FOREST LAKE, MN--Continued

DATE	TIME	SAMP-LING DEPTH (FT) (00003)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)
NOV						
05...	1429	.00	168	7.6	6.2	11.5
05...	1430	2.00	165	7.7	6.5	11.6
05...	1431	3.00	168	7.6	6.2	11.6
05...	1432	6.00	166	7.6	6.2	11.8
05...	1433	9.00	166	7.7	6.1	11.9
05...	1434	12.0	166	7.7	6.1	11.9
05...	1435	15.0	165	7.7	6.1	11.9
05...	1436	18.0	165	7.7	6.1	12.0
05...	1437	21.0	165	7.7	6.1	11.9
05...	1438	24.0	165	7.7	6.0	11.9
05...	1439	27.0	165	7.7	6.0	11.9
05...	1440	30.0	165	7.7	5.9	11.9
05...	1441	33.0	165	7.7	6.0	11.9
05...	1442	36.0	164	7.7	6.0	11.8
05...	1443	39.0	164	7.7	6.0	11.8
05...	1444	42.0	164	7.1	6.0	11.1
MAR						
12...	1258	.00	--	7.4	1.9	8.2
12...	1300	3.00	185	7.3	5.4	11.3
12...	1302	6.56	192	7.4	5.4	12.1
12...	1305	9.84	197	7.4	5.4	12.3
12...	1307	13.1	196	7.3	5.1	12.2
12...	1309	16.4	197	7.3	4.9	12.2
12...	1312	19.7	198	7.3	4.8	11.9
12...	1314	23.0	200	7.2	4.8	10.9
12...	1316	26.2	202	7.1	4.8	10.0
12...	1318	29.5	203	7.0	4.7	9.8
12...	1320	32.8	207	7.0	4.8	8.8
12...	1322	36.1	210	7.0	4.8	9.0
12...	1324	39.4	214	6.9	4.8	7.9
12...	1325	43.0	221	6.8	5.1	4.5
JUN						
11...	1300	3.30	192	7.6	20.0	--
11...	1330	49.2	--	--	19.0	--
AUG						
25...	1110	.00	--	7.9	22.7	7.3
25...	1111	3.00	--	7.7	22.7	7.3
25...	1100	3.30	190	7.7	22.7	7.3
25...	1112	6.00	--	7.9	22.7	7.6
25...	1113	9.00	--	7.8	22.6	7.1
25...	1115	12.0	--	7.8	22.6	7.0
25...	1116	15.0	--	7.8	22.5	7.0
25...	1117	18.0	--	7.8	22.5	7.1
25...	1118	21.0	--	7.7	22.4	6.8
25...	1120	24.0	--	7.3	22.3	5.5
25...	1122	30.0	--	6.9	21.5	1.7
25...	1123	33.0	--	6.8	19.4	1.4
25...	1125	36.0	--	6.8	17.3	1.5
25...	1126	39.0	--	6.9	16.4	1.6
25...	1127	42.0	--	6.9	15.2	1.7
25...	1128	45.0	--	6.9	14.8	1.7
25...	1130	48.0	--	6.9	14.4	1.7
25...	1105	49.2	229	6.9	14.4	1.7

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

451240092500003 BIG MARINE LAKE NORTH BAY, NEAR FOREST LAKE, MN

DATE	TIME	SAMP-LING DEPTH (FT) (00003)	RESER-VOIR DEPTH (FEET) (72025)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
NOV											
05...	1500	2.00	20	164	177	7.7	5.8	75	.00	18	7.4

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY 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, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)
NOV											
05...	2.3	1.9	76	2.2	4.2	.0	.0	102	.03	0	0

DATE	TIME	SAMP-LING DEPTH (FT) (00003)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)
NOV						
05...	1459	.00	170	7.6	6.1	12.0
05...	1500	2.00	164	7.7	5.8	--
05...	1501	3.00	169	7.6	6.1	12.0
05...	1502	6.00	169	7.6	6.1	12.1
05...	1503	9.00	169	7.6	6.1	12.0
05...	1504	12.0	169	7.7	6.1	12.0
05...	1505	15.0	169	7.7	6.0	12.1
05...	1506	18.0	169	7.7	5.9	12.1

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

451240092500004 032N20W29AAD USGS PPT COLLECTOR AT BIG MARINE

DATE	TIME	PRE-CIPITA-TION TYPE	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
JUL									
07-15	1435	WET	9	11	6.2	0	.00	.1	.0
07-15	1445	DRY	9	9	6.6	1	.00	.4	.0
15-22	1400	BULK	25	14	4.4	1	.00	.3	.0
22-28	1300	BULK	34	12	6.3	1	.00	.3	.0
28-AUG -04	1320	WET	13	13	5.5	1	.00	.3	.0
JUL 28-AUG -04	1330	DRY	4	5	6.0	1	.00	.3	.0
04-18	1400	WET	10	12	5.3	1	--	.4	.1
04-18	1500	DRY	6	7	6.1	2	.00	.2	.3
18-26	1300	WET	17	14	4.9	1	.00	.2	.0
18-26	1400	DRY	--	7	--	1	.00	.3	.0
26-SEP -08	1300	BULK	46	5	4.5	1	.00	.2	.0
08-29	1300	BULK	8	13	6.0	2	.00	.6	.1

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
JUL							
07-15	.1	.1	2.0	.8	.2	.2	--
07-15	.3	.0	7.0	.0	.0	.4	--
15-22	.1	.1	3.0	1.7	.2	.3	--
22-28	.3	.1	3.0	1.0	.3	.1	--
28-AUG -04	.1	.1	2.0	1.3	.3	.1	--
JUL 28-AUG -04	.1	.1	2.0	.0	.1	.1	--
04-18	.6	.4	--	.9	.3	<.1	--
04-18	.3	.1	2.0	.0	.1	.3	--
18-26	.1	.1	2.0	1.0	.1	<.1	--
18-26	.3	.1	2.0	.1	.2	.2	--
26-SEP -08	.2	.1	<1.0	2.0	.1	.0	.460
08-29	.2	.5	2.0	3.2	.4	.1	.650

WATER QUALITY DATA AT STREAMFLOW STATIONS

Periodic field determinations of water temperature and specific conductance are made at many stream-gaging stations other than regular water-quality stations. These data are usually collected at monthly intervals during routine visits to the station. Additional data for each station are published in Volume 2 of this report.

WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
05211000 MISSISSIPPI RIVER AT GRAND RAPIDS, MN							
OCT. 28, 1980...	894	4.0	285	JUNE 30.....	1420	18.5	---
NOV. 24.....	882	1.0	305	JULY 31.....	1610	25.0	280
JAN. 15, 1981...	379	1.0	330	AUG. 07.....	2500	24.0	290
FEB. 18.....	287	2.5	390	AUG. 10.....	2280	23.0	260
APR. 07.....	609	6.0	260	AUG. 14.....	2090	22.0	282
MAY 08.....	737	---	---	AUG. 25.....	2100	20.5	285
JUNE 12.....	359	23.0	270	SEPT. 16.....	754	16.0	300
05212700 PRAIRIE RIVER NEAR TACONITE, MN							
OCT. 29, 1980...	148	3.0	127	APR. 30.....	955	8.0	82
NOV. 28.....	122	1.0	145	JUNE 11.....	257	20.0	110
JAN. 12, 1981...	48	.0	178	JUNE 30.....	348	21.0	---
FEB. 19.....	88	.0	180	AUG. 17.....	129	18.0	160
APR. 09.....	302	6.0	140				
05216860 SWAN RIVER NEAR CALUMET, MN							
OCT. 29, 1980...	70	3.0	275	APR. 09.....	49	9.5	200
NOV. 28.....	43	1.0	310	JUNE 11.....	58	20.0	275
JAN. 21, 1981...	20	.5	315	AUG. 14.....	46	24.0	290
FEB. 19.....	27	1.5	308				
05220500 MISSISSIPPI RIVER BELOW SANDY RIVER NEAR LIBBY, MN							
OCT. 27, 1980...	1500	4.0	242	APR. 06.....	1370	4.5	255
NOV. 25.....	1140	1.0	---	JUNE 10.....	1260	20.0	230
JAN. 13, 1981...	1000	.5	280	AUG. 11.....	3430	20.5	222
FEB. 17.....	537	.5	315				
05227500 MISSISSIPPI RIVER AT AITKIN, MN							
OCT. 28, 1980...	1570	3.5	262	APR. 07.....	1810	7.0	240
NOV. 26.....	1140	1.0	270	JUNE 08.....	2340	21.0	185
JAN. 14, 1981...	1090	.0	307	AUG. 10.....	3540	21.0	200
FEB. 18.....	618	.0	335				
05244000 CROW WING RIVER AT NIMROD, MN							
OCT. 20, 1980...	316	8.0	320	MAR. 19.....	289	.0	350
NOV. 19.....	351	.5	330	MAY 19.....	254	16.0	---
DEC. 16.....	244	.0	353	JULY 16.....	424	20.0	290
JAN. 22, 1981...	211	.0	370	SEPT. 16.....	427	17.0	185

WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

05245100 LONG PRAIRIE RIVER AT LONG PRAIRIE, MN

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
OCT. 14, 1980...	131	5.5	480	MAR. 26.....	88	7.0	610
NOV. 25.....	51	.0	600	MAY 11.....	132	13.0	500
DEC. 22.....	44	.0	630	JULY 10.....	106	18.0	540
FEB. 20, 1981...	43	.0	580	SEPT. 09.....	89	19.0	420
MAR. 12.....	104	1.0	340				

05247500 CROW WING RIVER NEAR PILLAGER, MN

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
OCT. 07, 1980...	814	13.0	380	APR. 14.....	1050	9.5	300
NOV. 13.....	850	3.0	420	JUNE 04.....	1400	19.0	310
DEC. 16.....	812	.5	450	JULY 07.....	1190	26.0	360
JAN. 21, 1981...	434	.5	470	SEPT. 01.....	1400	---	---
MAR. 10.....	768	.0	420				

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
NOV. 24, 1980...	3010	1.0	320	MAY 06.....	8600	15.0	207
JAN. 19, 1981...	1610	.5	370	JULY 17.....	3440	23.0	260
MAR. 18.....	2270	2.0	310	SEPT. 01.....	4950	21.5	300

05270500 SAUK RIVER NEAR ST. CLOUD, MN

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
OCT. 07, 1980...	311	12.5	430	APR. 10.....	268	12.0	340
NOV. 12.....	209	4.0	490	MAY 11.....	269	13.5	485
DEC. 15.....	135	.5	560	JUNE 17.....	703	20.5	390
JAN. 20, 1981...	86	.0	570	JULY 06.....	393	27.0	450
MAR. 11.....	168	1.5	510	SEPT. 02.....	234	18.5	450

05275000 ELK RIVER NEAR BIG LAKE, MN

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
OCT. 09, 1980...	184	12.0	260	APR. 03.....	214	11.5	340
NOV. 14.....	150	2.5	380	MAY 12.....	245	14.0	325
DEC. 17.....	112	.5	410	JULY 08.....	243	26.0	330
JAN. 22, 1981...	76	.0	410	SEPT. 02.....	126	19.5	330
MAR. 11.....	132	1.0	370				

05278000 MIDDLE FORK CROW RIVER NEAR SPICER, MN

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
OCT. 15, 1980...	21	7.0	450	MAY 19.....	27	18.0	380
NOV. 25.....	21	1.5	440	JUNE 17.....	132	20.0	340
DEC. 22.....	17	1.0	480	JULY 10.....	101	24.0	340
FEB. 03, 1981...	17	.0	530	AUG. 25.....	39	21.5	320
MAR. 16.....	19	5.0	380				

WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
05280000 CROW RIVER AT ROCKFORD, MN							
OCT. 21, 1980...	194	9.0	640	MAY. 22.....	175	21.0	---
NOV. 19.....	132	2.5	685	JUNE 24.....	1810	19.5	420
DEC. 16.....	108	.5	1000	JULY 27.....	899	21.0	610
JAN. 23, 1981...	74	.5	1100	AUG. 28.....	1250	18.0	---
FEB. 20.....	120	.5	655	SEPT. 04.....	1900	---	---
MAR. 23.....	196	7.0	660	SEPT. 09.....	1170	20.0	710
APR. 22.....	373	10.0	625	SEPT. 28.....	382	13.5	650
05286000 RUM RIVER NEAR ST. FRANCIS, MN							
OCT. 09, 1980...	354	12.5	300	APR. 14.....	577	11.5	305
NOV. 14.....	270	3.0	330	MAY 13.....	727	13.5	255
DEC. 17.....	163	.5	430	JULY 08.....	755	27.0	240
JAN. 23, 1981...	109	.0	440	SEPT. 02.....	332	20.0	280
MAR. 12.....	325	.5	350				
05287890 ELM CREEK NEAR CHAMPLIN, MN							
OCT. 10, 1980...	10.0	12.0	480	JUNE 09.....	4.7	16.5	590
NOV. 10.....	4.6	4.5	600	JUNE 16.....	42	16.5	400
DEC. 12.....	3.3	1.0	650	JUNE 25.....	30	---	---
JAN. 27, 1981...	2.5	1.5	---	JULY 16.....	12	20.0	500
JAN. 29.....	2.5	---	---	AUG. 17.....	3.0	16.0	630
MAR. 27.....	3.1	7.5	590	SEPT. 18.....	2.4	---	---
MAY 05.....	27	23.5	440				
05288500 MISSISSIPPI RIVER NEAR ANOKA, MN							
OCT. 23, 1980...	4090	9.0	360	APR. 29.....	14000	12.5	320
NOV. 26.....	3680	2.0	350	JULY 15.....	6600	23.5	330
FEB. 19, 1981...	2320	6.0	460	AUG. 19.....	6790	23.0	340
MAR. 25.....	3270	8.5	645				
05290000 LITTLE MINNESOTA RIVER NEAR PEEVER, SOUTH DAKOTA							
OCT. 10, 1980...	.16	11.0	1420	MAR. 30.....	5.7	9.0	1240
NOV. 20.....	.57	3.0	1470	MAY 08.....	.86	16.0	1550
DEC. 22.....	.53	.0	1850	JULY 24.....	3.4	28.0	1600
FEB. 03, 1981...	.05	.0	1690	AUG. 19.....	.13	24.0	1800
FEB. 27.....	1.9	.5	1180	SEPT. 30.....	.30	13.0	1550
05291000 WHETSTONE RIVER NEAR BIG STONE CITY, SOUTH DAKOTA							
OCT. 02, 1980...	1.3	13.0	900	MAR. 24	6.8	10.0	960
OCT. 07.....	2.4	13.0	975	APR. 08.....	12	13.0	1220
NOV. 10.....	4.1	.5	1090	JUNE 12.....	3.8	21.0	1200
DEC. 15.....	3.6	.5	1410	JUNE 16.....	89	21.0	---
JAN. 20, 1981...	3.2	.0	1550	AUG. 10.....	8.0	21.5	1020
FEB. 27.....	9.7	.5	900	SEPT. 23.....	1.1	13.0	1200

WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
05292000 MINNESOTA RIVER AT ORTONVILLE, MN							
OCT. 02, 1980...	2.9	13.5	1130	APR. 08.....	1.3	---	---
NOV. 03.....	1.2	9.0	1440	JUNE 12.....	1.4	19.5	1600
DEC. 15.....	2.5	---	1690	AUG. 10.....	3.2	23.0	---
JAN. 21, 1981...	2.0	1.5	1690	SEPT. 11.....	1.3	19.0	1800
FEB. 27.....	4.3	3.0	1300	SEPT. 23.....	.95	---	---
05293000 YELLOW BANK RIVER NEAR ODESSA, MN							
OCT. 02, 1980...	.33	13.0	900	MAR. 24.....	8.2	8.0	825
NOV. 10.....	3.0	.5	1060	APR. 15.....	7.3	12	1000
DEC. 15.....	2.8	---	1210	JUNE 12.....	1.2	19.5	1000
JAN. 20, 1981...	2.2	.5	1300	AUG. 11.....	1.4	21.0	900
FEB. 27.....	11	.5	750	SEPT. 14.....	.30	18.5	1000
05294000 POMME DE TERRE RIVER AT APPLETON, MN							
OCT. 02, 1980...	57	12.0	840	APR. 07.....	78	10.5	800
NOV. 06.....	39	8.0	800	JUNE 12.....	51	20.0	800
DEC. 11.....	19	.5	1000	JUNE 16.....	418	---	---
JAN. 15, 1981...	13	.0	970	AUG. 11.....	55	23.5	825
FEB. 27.....	68	.0	720	SEPT. 10.....	28	22.0	850
05300000 LAC QUI PARLE RIVER NEAR LAC QUI PARLE, MN							
OCT. 02, 1980...	1.0	11.5	1500	APR. 07.....	51	13.0	1300
OCT. 20.....	4.3	---	---	MAY 12.....	11	14.0	1450
NOV. 17.....	4.7	2.0	1020	JULY 13.....	3.7	---	1200
DEC. 12.....	6.1	.0	1280	JULY 29.....	32	21.0	1350
JAN. 15, 1981...	4.2	.0	---	SEPT. 18.....	.77	14.5	1280
FEB. 20.....	18	.0	1250	SEPT. 30.....	.79	---	---
MAR. 23.....	22	10	975				
05301000 MINNESOTA RIVER NEAR LAC QUI PARLE, MN							
OCT. 06, 1980...	152	12.0	730	MAY 12.....	79	14.0	975
NOV. 17.....	122	3.0	780	JUNE 26.....	1430	18.5	570
DEC. 15.....	130	1.0	1000	AUG. 25.....	12	---	---
JAN. 16, 1981...	90	1.0	940	AUG. 28.....	83	20.5	650
FEB. 20.....	58	2.0	950	SEPT. 03.....	23	---	---
MAR. 23.....	197	6.5	800	SEPT. 30.....	19	14.0	660
05304500 CHIPPEWA RIVER NEAR MILAN, MN							
OCT. 02, 1980...	121	12.0	640	APR. 07.....	212	10	650
NOV. 06.....	142	6.0	750	MAY 26.....	293	15.5	590
DEC. 11.....	64	.0	850	JUNE 15.....	2530	20.5	400
JAN. 16, 1981...	37	.0	1000	AUG. 13.....	171	24.5	710
MAR. 12.....	191	1.0	600				

WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

05311000 MINNESOTA RIVER AT MONTEVIDEO, MN

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
OCT. 03, 1980...	183	7.0	640	APR. 14.....	350	11.5	990
NOV. 17.....	154	3.0	790	APR. 16.....	322	---	---
DEC. 11.....	151	.0	950	MAY 01.....	268	---	820
JAN. 15, 1981...	115	----	---	JUNE 19.....	2090	---	---
FEB. 23.....	106	.5	825	AUG. 14.....	134	24.0	650
MAR. 03.....	542	3.5	900	SEPT. 03.....	83	19.0	720
MAR. 12.....	237	5.5	800				

05311400 SOUTH BRANCH YELLOW MEDICINE RIVER NEAR MINNEOTA, MN

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
OCT. 06, 1980...	.004	---	---	MAY 13.....	.92	12.0	1320
NOV. 17.....	1.1	3.0	1240	JULY 09.....	.003	20.0	1450
DEC. 15.....	.73	.5	1520	JULY 27.....	15.2	19.0	1050
FEB. 03, 1981...	0.0	---	---	AUG. 14.....	.17	23.0	---
MAR. 16.....	2.9	3.0	530	SEPT. 16.....	.01	14.5	1380

05313500 YELLOW MEDICINE RIVER NEAR GRANITE FALLS, MN

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
OCT. 03, 1980...	2.1	10.5	1250	MAY 13.....	11	16.0	1320
NOV. 17.....	6.6	3.0	1150	JUNE 16.....	86	19.0	630
DEC. 15.....	4.9	1.0	1480	JULY 22.....	7.2	24.0	1050
FEB. 03, 1981...	4.1	.5	1480	SEPT. 21.....	1.8	17.0	1100
MAR. 16.....	19	8.0	875				

05315000 REDWOOD RIVER AT MARSHALL, MN

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
OCT. 06, 1980...	3.1	---	---	JAN. 12, 1981....	3.3	.5	1600
OCT. 14.....	3.1	9.0	1700	FEB. 03.....	3.9	.0	1500
OCT. 20.....	5.9	---	---	MAR. 16.....	7.8	8.0	1280
OCT. 27.....	5.2	5.0	1300	MAR. 30.....	12	---	---
OCT. 27.....	5.5	---	---	APR. 09.....	7.2	14.0	1400
NOV. 03.....	5.5	7.5	900	MAY 13.....	4.1	15.0	1490
NOV. 03.....	5.4	7.5	900	MAY 18.....	3.4	---	---
NOV. 17.....	5.6	4.0	1330	MAY 26.....	3.5	16.5	1450
NOV. 26.....	6.1	1.5	810	JULY 09.....	.71	25.5	1350
DEC. 03.....	5.0	.0	---	JULY 20.....	9.8	24.5	1260
DEC. 18.....	7.0	.0	1480	SEPT. 16.....	2.6	16.0	1320

05316500 REDWOOD RIVER NEAR REDWOOD FALLS, MN

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
OCT. 07, 1980...	8.6	15.5	1540	MAR. 13.....	32	4.0	1150
OCT. 28.....	15	4.0	960	MAY 06.....	38	14.0	1600
DEC. 03.....	16	.0	1300	JULY 13.....	14	26.5	900
JAN. 12, 1981...	6.0	.0	2600	AUG. 26.....	165	21.0	900
FEB. 13.....	2.9	.5	750	SEPT. 29.....	9.2	14.0	1100

WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERA-TURE (°C)	SPECIFIC CONDUC-TANCE (MICRO-MHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERA-TURE (°C)	SPECIFIC CONDUC-TANCE (MICRO-MHOS)
05317000 COTTONWOOD RIVER NEAR NEW ULM, MN							
OCT. 09, 1980...	20	12.0	930	MAR. 23.....	50	7.0	920
NOV. 12.....	33	6.0	950	MAY 11.....	38	17.5	1030
DEC. 15.....	24	.0	1180	JULY 08.....	36	25.0	810
JAN. 27, 1981...	19	.5	810	SEPT. 01.....	95	18.0	940
05317200 LITTLE COTTONWOOD RIVER NEAR COURTLAND, MN							
OCT. 09, 1980...	1.9	14.0	1000	MAR. 23.....	6.7	3.0	870
NOV. 12.....	4.5	1.0	1000	MAY 13.....	5.2	10.5	955
DEC. 15.....	3.4	2.5	975	JULY 08.....	9.5	22.5	870
JAN. 27, 1981...	2.7	2.0	1250	SEPT. 01.....	56	17.0	890
05319500 WATONWAN RIVER NEAR GARDEN CITY, MN							
OCT. 09, 1980...	19	16.0	860	MAR. 23.....	33	10.0	770
NOV. 13.....	26	5.0	905	MAY 13.....	39	14.5	905
DEC. 15,.....	16	.0	1150	JULY 08.....	138	26.5	860
JAN. 26, 1981...	13	.0	950	SEPT. 01.....	332	20.0	850
05320000 BLUE EARTH RIVER NEAR RAPIDAN, MN							
OCT. 10, 1980...	309	14.0	830	MAR. 24.....	130	10.0	770
NOV. 14.....	250	4.0	905	MAY 13.....	1020	14.0	810
DEC. 16.....	150	.0	980	JULY 08.....	2190	25.5	720
JAN. 28, 1981...	84	.0	1050	SEPT. 02.....	3940	17.5	790
05320500 LE SUEUR RIVER NEAR RAPIDAN, MN							
OCT. 10, 1980...	104	14.0	905	MAR. 25.....	72	7.0	700
NOV. 14.....	105	3.5	860	MAY 14.....	871	11.5	830
DEC. 16.....	52	.0	1060	JULY 07.....	673	26.5	810
JAN. 28, 1981...	24	.0	825	SEPT. 02.....	1820	18.0	820
05325000 MINNESOTA RIVER AT MANKATO, MN							
OCT. 14, 1980...	662	9.0	870	MAR. 25.....	730	11.0	800
NOV. 14.....	687	4.5	905	MAY 14.....	2230	15.0	880
DEC. 17.....	501	.0	1060	JULY 09.....	3320	25.0	770
JAN. 28, 1981...	365	.5	---	SEPT. 02.....	6380	20.0	840
05327000 HIGH ISLAND CREEK NEAR HENDERSON, MN							
OCT. 02, 1980...	2.7	10.0	940	MAY 11.....	7.5	14.0	900
NOV. 10.....	2.8	6.0	975	JULY 06.....	10	25.0	920
DEC. 17.....	2.8	4.0	1060	JULY 15.....	28	---	---
JAN. 26, 1981...	1.7	2.0	1040	AUG. 31.....	420	20.5	555
MAR. 26.....	8.9	5.0	920				

WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

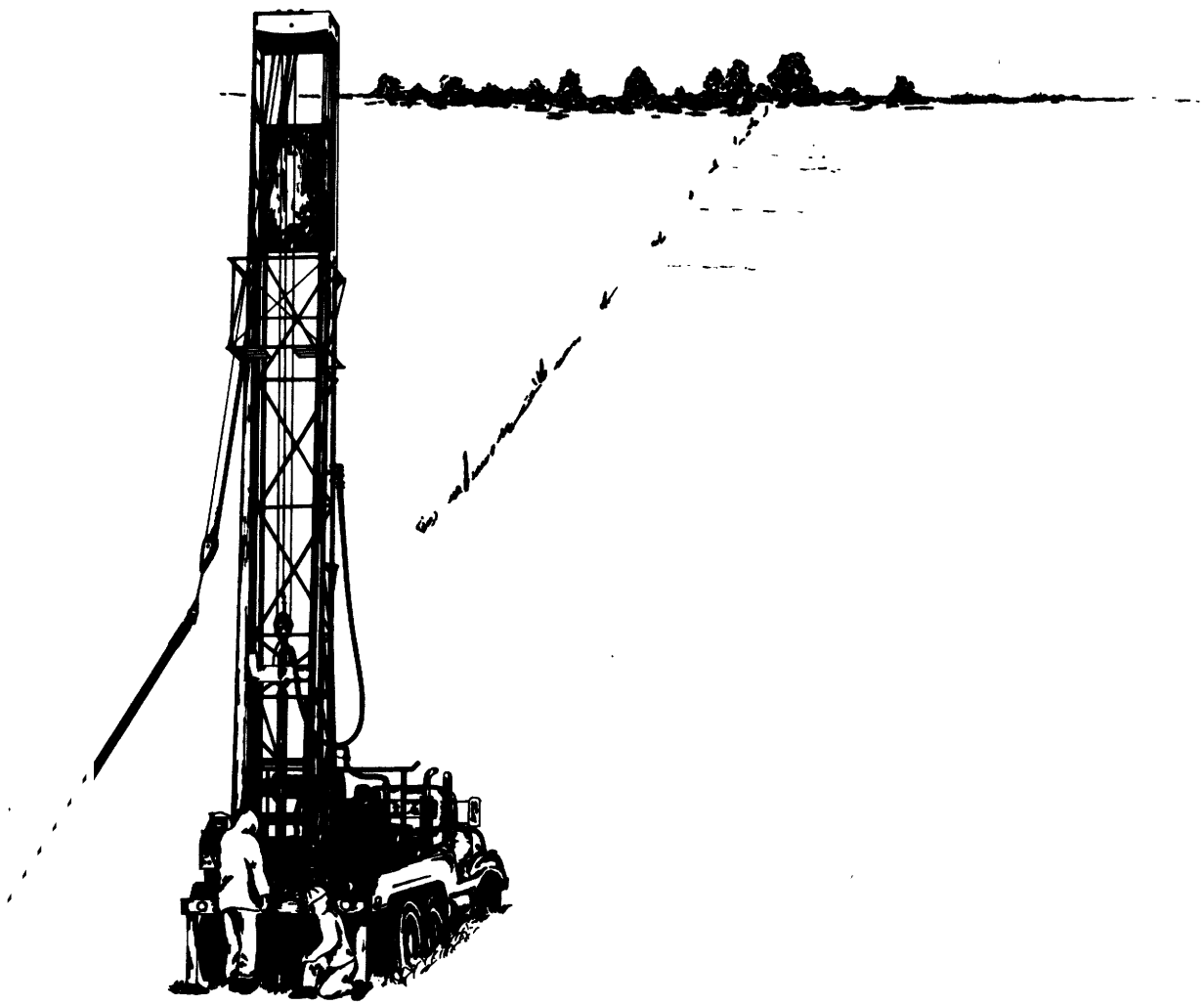
DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERA-TURE (°C)	SPECIFIC CONDUC-TANCE (MICRO-MHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERA-TURE (°C)	SPECIFIC CONDUC-TANCE (MICRO-MHOS)
05330000 MINNESOTA RIVER NEAR JORDAN, MN							
OCT. 23, 1980...	929	8.0	890	MAR. 24.....	921	9.5	930
NOV. 19.....	803	3.5	860	MAY 12.....	3190	15.0	1000
DEC. 17.....	622	.0	1100	JUNE 19.....	5850	19.0	770
JAN. 19, 1981...	397	.0	1350	JULY 27.....	10400	21.5	570
FEB. 17.....	442	.5	1200	SEPT. 01.....	10300	21.0	720
05330800 PURGATORY CREEK AT EDEN PRAIRIE, MN							
OCT. 07, 1980...	4.0	11.0	---	DEC. 12.....	1.7	1.0	700
NOV. 06.....	2.9	11.0	550	DEC. 31.....	1.0	3.0	735
05331000 MISSISSIPPI RIVER AT ST. PAUL, MN							
APR. 07, 1981...	8070	11.0	380	JULY 22.....	12700	25.0	---
05336700 KETTLE RIVER BELOW SANDSTONE, MN							
OCT. 07, 1980...	252	11.5	165	APR. 14.....	962	6.5	100
NOV. 06.....	207	4.5	165	MAY 06.....	2580	15.0	190
DEC. 11.....	127	.5	205	JUNE 30.....	1450	22.0	108
JAN. 14, 1981...	90	.5	245	AUG. 25.....	516	20.0	130
MAR. 11.....	136	1.5	205	SEPT. 30.....	205	10.0	180
05337400 KNIFE RIVER NEAR MORA, MN							
OCT. 10, 1980...	21	11.0	185	APR. 15.....	79	---	---
NOV. 07.....	23	5.5	185	MAY 08.....	139	12.5	110
DEC. 12.....	11	.5	235	JUNE 30.....	528	22.0	130
JAN. 15, 1981...	5.3	.0	260	AUG. 27.....	156	18.5	135
MAR. 13.....	12	4.0	215				
05338500 SNAKE RIVER NEAR PINE CITY, MN							
OCT. 07, 1980...	252	15.5	225	APR. 13.....	618	9.0	210
NOV. 05.....	184	7.5	225	MAY 06.....	1680	14.5	110
DEC. 10.....	117	.5	270	JUNE 29.....	1550	---	155
JAN. 13, 1981...	50	1.0	295	AUG. 25.....	334	21.5	180
MAR. 11.....	149	5.0	260				
05340050 SUNRISE RIVER NEAR LINDSTROM, MN							
OCT. 07, 1980...	97	12.0	280	MAR. 11.....	66	1.5	290
NOV. 05.....	88	4.0	285	APR. 13.....	242	11.5	210
DEC. 10.....	61	.0	330	MAY 06.....	277	15.0	215
JAN. 13, 1981...	36	.0	355	JUNE 29.....	255	22.0	280
FEB. 24.....	64	3.5	300	AUG. 25.....	51	20.5	280
05344500 MISSISSIPPI RIVER AT PRESCOTT, WISCONSIN							
APR. 02, 1981...	14900	9.5	475	JULY 30.....	20300	22.5	360

WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

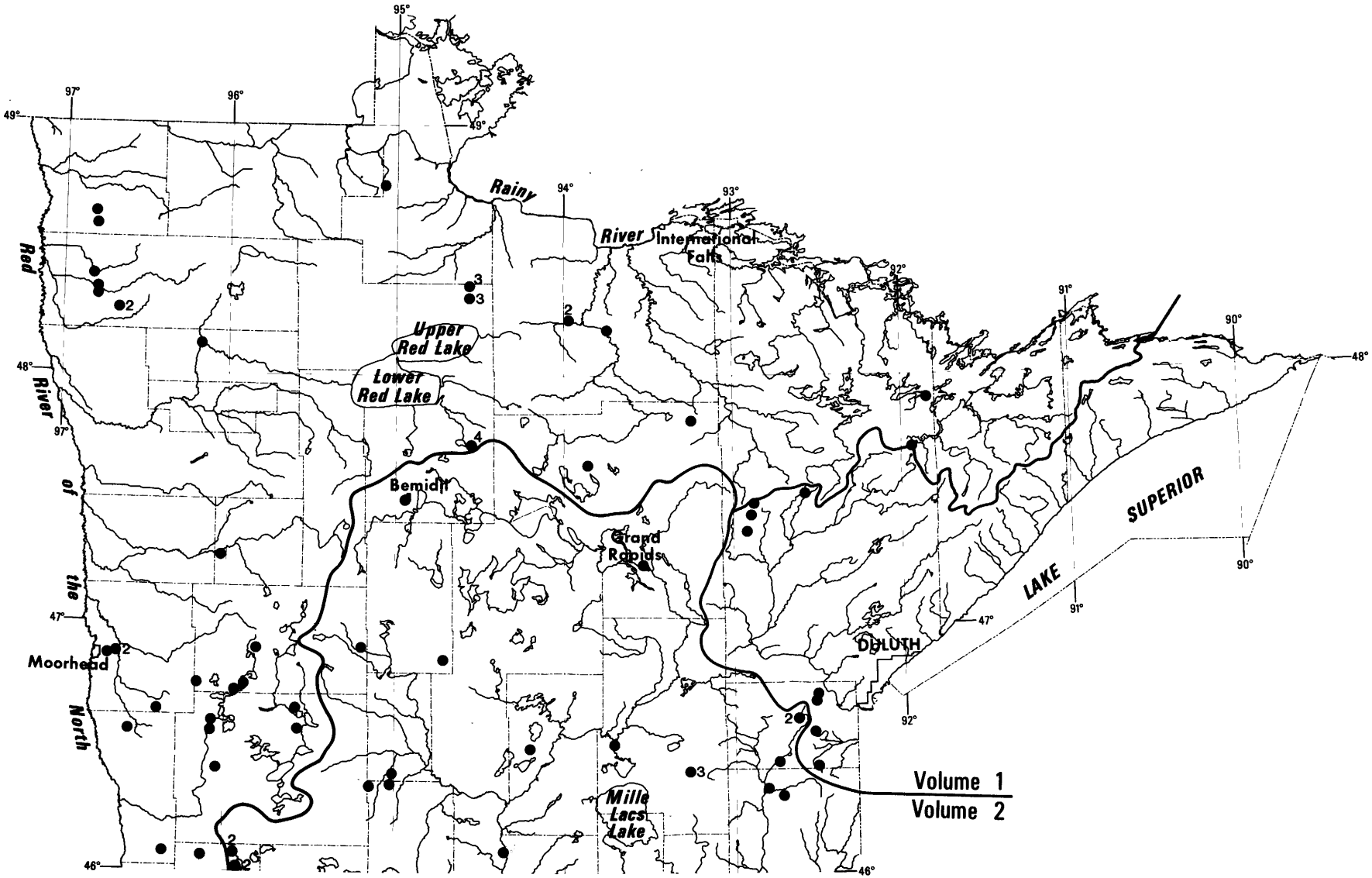
DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
05345000 VERMILLION RIVER NEAR EMPIRE, MN							
OCT. 02, 1980...	39	10.5	750	APR. 10.....	34	12.0	745
NOV. 07.....	34	3.0	925	APR. 22.....	34	10.0	725
DEC. 10.....	25	1.5	750	MAY 14.....	33	14.5	730
JAN. 14, 1981...	22	3.0	550	JUNE 19.....	30	15.5	800
FEB. 18.....	36	6.5	685	JULY 16.....	37	17.5	700
FEB. 26.....	27	4.5	800	AUG. 11.....	76	19.5	500
MAR. 03.....	39	2.0	---	SEPT. 18.....	31	12.0	750
05353800 STRAIGHT RIVER NEAR FARIBAULT, MN							
OCT. 20, 1980...	88	14.0	760	APR. 20.....	172	7.5	800
NOV. 25.....	100	4.0	600	JUNE 15.....	237	18.5	565
NOV. 26.....	73	4.0	600	AUG. 10.....	312	24.0	845
DEC. 29.....	35	5.0	940	SEPT. 22.....	129	7.0	910
FEB. 25, 1981...	127	2.5	680				
05372995 SOUTH FORK ZUMBRO RIVER AT ROCHESTER, MN							
DEC. 01, 1980...	54	4.0	675	JUNE 17.....	63	26.0	565
JAN. 05, 1981...	35	3.0	740	JULY 12.....	3790	24.5	240
FEB. 27.....	235	8.0	---	AUG. 14.....	327	26.0	475
APR. 04.....	95	---	640	SEPT. 24.....	93	16.0	---
05374900 ZUMBRO RIVER AT KELLOGG, MN							
OCT. 21, 1980...	376	9.0	610	MAY 05.....	1030	16.0	1550
DEC. 02.....	156	.0	---	JULY 02.....	934	24.0	625
JAN. 06, 1981...	283	.0	650	JULY 14.....	6580	23.0	300
MAR. 06.....	753	2.0	---	AUG. 27.....	1090	19.0	595
05376000 NORTH FORK WHITEWATER RIVER NEAR ELBA, MN							
OCT. 15, 1980...	27	8.5	375	MAY 05.....	53	16.0	555
DEC. 01.....	26	4.0	690	JUNE 29.....	54	17.0	530
JAN. 06, 1981...	23	1.0	580	JULY 13.....	37	21.5	410
MAR. 02.....	55	1.0	455	AUG. 24.....	24	18.5	550
05376800 WHITEWATER RIVER NEAR BEAVER, MN							
OCT. 22, 1980...	112	7.5	585	MAY 05.....	184	18.0	505
DEC. 03.....	117	.0	---	JULY 07.....	101	25.0	565
DEC. 05.....	116	---	---	JULY 13.....	192	22.5	480
JAN. 05, 1981...	115	.0	300	AUG. 27.....	186	17.5	530
MAR. 03.....	156	2.0	500				

WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (°C)	SPECIFIC CONDUCTANCE (MICROMHOS)
05378300 STRAIGHT VALLEY CREEK NEAR ROLLINGSTONE, MN							
OCT. 22, 1980...	1.8	7.0	580	MAY 07.....	1.6	---	---
DEC. 03.....	1.5	1.0	715	JULY 07.....	1.3	23.0	565
JAN. 05, 1981...	1.4	2.5	620	AUG. 27.....	1.9	18.0	510
MAR. 04.....	2.2	4.0	530				
05378500 MISSISSIPPI RIVER AT WINONA, MN							
MAY 05, 1981...	48300	---	---	JUNE 30.....	55300	---	---
05384000 ROOT RIVER NEAR LANESBORO, MN							
OCT. 23, 1980...	269	8.5	---	MAY 07.....	389	16.5	580
DEC. 05.....	247	.5	---	JULY 07.....	173	26.5	590
JAN. 08, 1981...	140	.0	---	AUG. 26.....	272	20.0	465
MAR. 04.....	314	2.0	490				
05385000 ROOT RIVER NEAR HOUSTON, MN							
OCT. 16, 1980...	740	9.5	540	MAY 06.....	706	15.0	---
DEC. 04.....	565	.0	---	JULY 06.....	480	28.0	565
JAN. 07, 1981...	408	.0	680	JULY 14.....	3170	21.5	380
MAR. 05.....	746	3.0	480	AUG. 26.....	711	18.5	510
05385500 SOUTH FORK ROOT RIVER NEAR HOUSTON, MN							
OCT. 16, 1980...	154	9.0	520	MAY 06.....	158	17.0	---
DEC. 04.....	123	.0	---	JULY 06.....	125	24.5	525
JAN. 07, 1981...	122	.0	650	AUG. 25.....	156	19.0	525
MAR. 05.....	169	2.0	520				
05457000 CEDAR RIVER NEAR AUSTIN, MN							
OCT. 21, 1980...	161	11.5	650	JUNE 16.....	189	19.5	820
NOV. 25.....	103	4.0	700	JULY 13.....	1290	24.5	---
DEC. 30.....	75	5.0	810	AUG. 11.....	222	22.0	665
FEB. 24, 1981...	113	8.0	550	SEPT. 23.....	114	9.0	760
APR. 21.....	138	11.5	750				
05476000 DES MOINES RIVER AT JACKSON, MN							
OCT. 06, 1980...	13	17.0	810	MAY 13.....	19	13.0	850
NOV. 19.....	22	7.0	900	JULY 14.....	3.0	26.5	740
DEC. 18.....	32	1.0	1500	JULY 24.....	88	25.0	700
JAN. 21, 1981...	6.5	2.5	2000	AUG. 26.....	13	22.0	780
MAR. 12.....	31	4.0	680	SEPT. 29.....	.42	21.0	810



GROUND-WATER RECORDS


Rainy
River
International Falls
Red
River
of
the
North
Upper Red Lake
Lower Red Lake
Bemidji
Grand Rapids
Moorhead
DULUTH
LAKE
SUPERIOR
Mille Lacs Lake
Volume 1
Volume 2
95°
97°
96°
94°
93°
92°
91°
90°
49°
48°
47°
46°

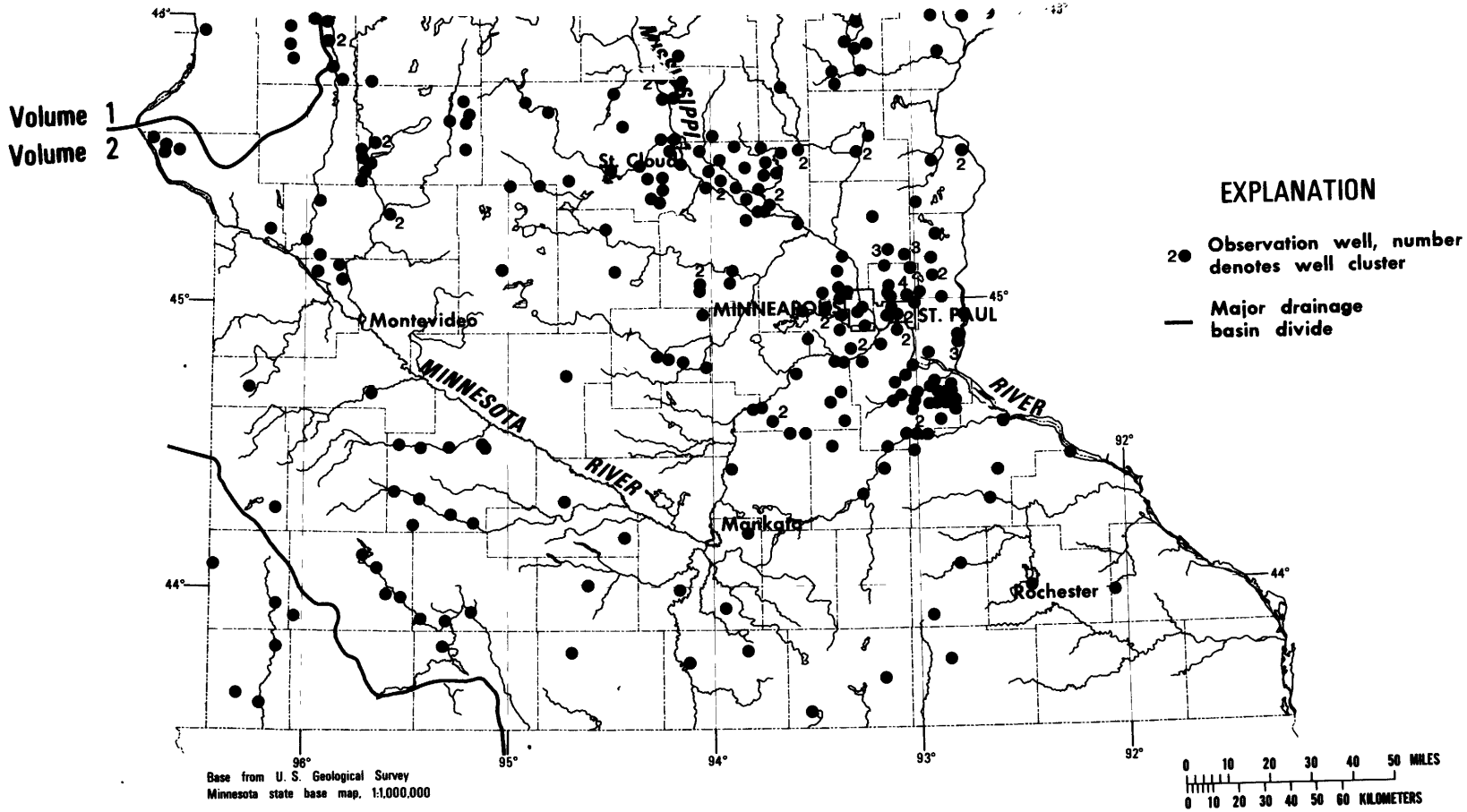


Figure 10.--Location of ground-water wells

AITKIN COUNTY

462447093154401. Local number, 045N23W05ADD01.
LOCATION.--Lat 46°24'47", long 93°15'44", in SE¼SE¼NE¼ sec.5, T.45 N., R.23 W., Hydrologic Unit 07010104, in Solana State Forest.
Owner: U.S. Geological Survey.
AQUIFER.--Shallow buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Hand augered and driven observation water-table well, diameter 1¼ in (0.03 m), depth 13 ft (4.0 m), screened 10 to 13 ft (3.0 to 4.0 m).
DATUM.--Altitude of land-surface datum is 1,265 ft (386 m). Measuring point: Top of platform, 0.80 ft (0.24 m) above land-surface datum.
REMARKS.--Water level subject to freezing during winter periods.
PERIOD OF RECORD.--October 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 0.50 ft (0.15 m) above land-surface datum, Mar. 22, 1976; lowest, 3.12 ft (0.95 m) below land-surface datum, Jan. 10, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	0.21	NOV 25	0.24	APR 6	0.79	JUN 9	0.28	AUG 11	0.40

462447093154402. Local number, 045N23W05ADD02.
LOCATION.--Lat 46°24'47", long 93°15'44", in SE¼SE¼NE¼ sec.5, T.45 N., R.23 W., Hydrologic Unit 07010104, in Solana State Forest.
Owner: U.S. Geological Survey.
AQUIFER.--Peat of Quaternary Age.
WELL CHARACTERISTICS.--Hand augered and driven observation water-table well, diameter 2 in (0.05 m), depth 3 ft (0.9 m), screened 0 to 3 ft (0.0 to 0.9 m).
DATUM.--Altitude of land-surface datum is 1,265 ft (386 m). Measuring point: Top of platform, 0.80 ft (0.24 m) above land-surface datum.
REMARKS.--Water-level subject to freezing during winter periods.
PERIOD OF RECORD.--November 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 0.22 ft (0.07 m) above land-surface datum, May 2, 1975; lowest, dry below land-surface datum, Sept. 10, 1976 to Feb. 14, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	0.37	APR 6	0.22	JUN 9	0.28	AUG 11	0.54

462447093154403. Local number, 045N23W05ADD03.
LOCATION.--Lat 46°24'47", long 93°15'44", in SE¼SE¼NE¼ sec.5, T.45 N., R.23 W., Hydrologic Unit 07010104, in Solana State Forest.
Owner: U.S. Geological Survey.
AQUIFER.--Peat and sand of Quaternary Age.
WELL CHARACTERISTICS.--Hand augered observation water-table well, diameter 8 in (0.20 m), depth 4 ft (1.2 m), open end stovepipe.
DATUM.--Altitude of land-surface datum is 1,265 ft (386 m). Measuring point: Top of platform, 0.80 ft (0.24 m) above land-surface datum.
REMARKS.--Water-level subject to freezing during winter periods.
PERIOD OF RECORD.--August 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 0.13 ft (0.04 m) above land-surface datum, May 19, 1979; lowest, dry below land-surface datum, Nov. 29, 1976 to Feb. 14, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	0.30	APR 6	0.65	JUN 15	0.14	JUL 10	0.46	AUG 15	0.61	SEP 10	0.61
10	0.34	MAY 10	0.15	20	0.18	15	0.45	20	0.75	15	0.74
15	0.35	15	0.21	25	0.16	20	0.47	25	0.68	20	0.88
20	0.32	20	0.28	30	0.20	25	0.44	31	0.48	25	0.96
25	0.33	JUN 9	0.22	JUL 5	0.30	AUG 10	0.49	SEP 5	0.54		

AITKIN COUNTY--Continued

463135093433901. Local number, 047N27W26BBC01.
LOCATION.--Lat 46°31'35", long 93°43'39", in SW¼NW¼NW¼ sec.26, T.47 N., R.27 W., Hydrologic Unit 07010104, in City of Aitkin.
Owner: Woodland Container Co.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 52 ft (15.8 m), screened 47 to 52 ft (14.3 to 15.8 m).
DATUM.--Altitude of land-surface datum is 1,213 ft (370 m). Measuring point: Top of casing, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--January 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.96 ft (2.12 m) below land-surface datum, June 9, 1965; lowest, 13.38 ft (4.08 m) below land-surface datum, Nov. 29, 1976.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

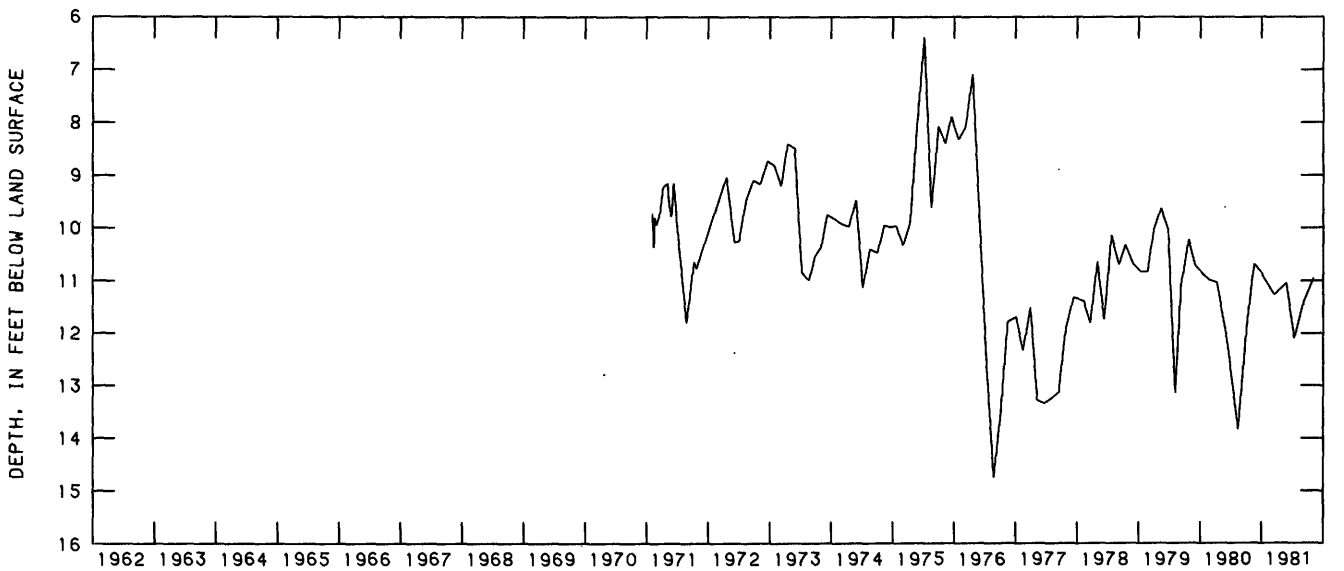
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	11.39	JAN 13	11.75	FEB 17	12.01	APR 6	11.52	JUN 8	10.82	AUG 10	11.20
NOV 25	11.72										

ANOKA COUNTY

451056093072201. Local number, 031N22W18AAA01.
LOCATION.--Lat 45°10'56", long 93°07'22", in NE¼NE¼NE¼ sec.18, T.31 N., R.22 W., Hydrologic Unit 07010206, at 4th Avenue and Lilac Street, Lino Lakes.
Owner: U.S. Geological Survey.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 6 in (0.15 m), depth 270 ft (82.3 m), screened 260 to 270 ft (79.2 to 82.3 m).
DATUM.--Land-surface datum is 895.8 ft (273.0 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of well cap, 0.80 ft (0.24 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--February 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.39 ft (1.95 m) below land-surface datum, July 7, 1975; lowest, 14.75 ft (4.50 m) below land-surface datum, Aug. 24, 1976.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	11.82	DEC 30	10.85	MAR 17	11.27	MAY 29	11.05	JUL 15	12.10	SEP 8	11.40
NOV 18	10.68										



031N22W18AAA01

451056093072202. Local number, 031N22W18AAA02.
LOCATION.--Lat 45°10'56", long 93°07'22", in NE¼NE¼NE¼ sec.18, T.31 N., R.22 W., Hydrologic Unit 07010206, at 4th Avenue and Lilac Street, Lino Lakes.
Owner: U.S. Geological Survey.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 4 in (0.10 m), depth 214 ft (65.2 m), screened 209 to 214 ft (63.7 to 65.2 m).
DATUM.--Land-surface datum is 896.1 ft (273.1 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of well cap, 2.20 ft (0.67 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--February 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.78 ft (2.07 m) below land-surface datum, July 7, 1975; lowest, 15.10 ft (4.60 m) below land-surface datum, Aug. 24, 1976.

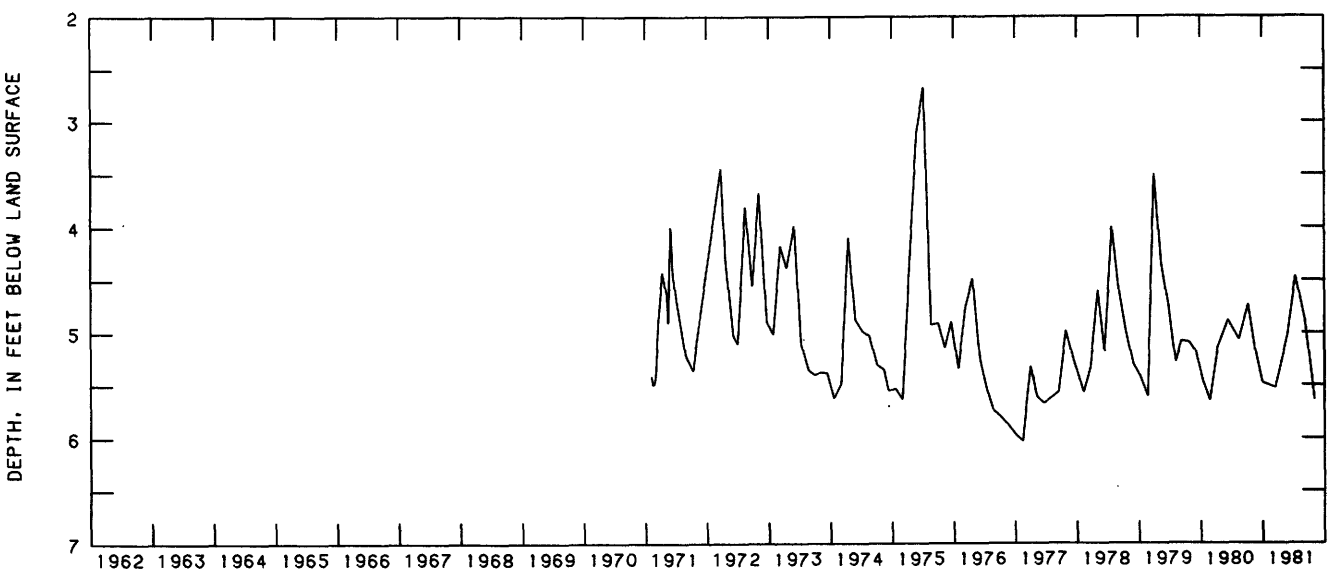
WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	11.22	DEC 30	11.22	MAR 17	11.65	MAY 29	11.42	JUL 15	12.48	SEP 8	11.80
NOV 18	11.06										

451056093072205. Local number, 031N22W18AAA05.
LOCATION.--Lat 45°10'56", long 93°07'22", in NE¼NE¼NE¼ sec.18, T.31 N., R.18 W., Hydrologic Unit 07010206, at 4th Avenue and Lilac Street, Lino Lakes.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 13 ft (3.96 m), screened 11 to 13 ft (3.35 to 3.96 m).
DATUM.--Land-surface datum is 895.6 ft (273.0 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 1.90 ft (0.60 m) above land-surface datum.
PERIOD OF RECORD.--February 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.67 ft (0.81 m) below land-surface datum, July 7, 1975; lowest, 6.03 ft (1.84 m) below land-surface datum, Feb. 14, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	4.73	DEC 30	5.48	MAR 17	5.53	MAY 29	5.02	JUL 15	4.46	SEP 8	4.88
NOV 18	5.17										



031N22W18AAA05

ANOKA COUNTY--Continued

450927093033801. Local number, 031N22W23CBC01.
LOCATION.--Lat 45°09'27", long 93°03'38", in SW¼NW¼SW¼ sec.23, T.31 N., R.22 W., Hydrologic Unit 07010206, at City of Centerville.
Owner: U.S. Geological Survey.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 4 in (0.10 m), depth 95 ft (29.0 m), screened 91 to 95 ft (27.7 to 29.0 m).
DATUM.--Land-surface datum is 901.6 ft (274.8 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of well cap, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--February 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.95 ft (2.12 m) below land-surface datum, Aug. 20, 1975; lowest, 9.78 ft (2.98 m) below land-surface datum, Feb. 14, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	7.94	DEC 30	8.28	MAR 10	8.63	MAY 6	8.32	JUL 15	8.02	SEP 1	7.75
NOV 18	8.09										

450927093033802. Local number, 031N22W23CBC02.
LOCATION.--Lat 45°09'27", long 93°03'38", in SW¼NW¼SW¼ sec.23, T.31 N., R.22 W., Hydrologic Unit 07010206, at City of Centerville.
Owner: U.S. Geological Survey.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 4 in (0.10 m), depth 277 ft (84.4 m), screened 272 to 277 ft (82.9 to 84.4 m).
DATUM.--Land-surface datum is 901.6 ft (274.8 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of recorder platform, 2.20 ft (0.67 m) 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, 8.10 ft (2.47 m) below land-surface datum, July 5, 1975; lowest, 16.20 ft (4.94 m) below land-surface datum, Sept. 15, 1976.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	10.96	DEC 30	11.14	MAR 10	11.35	MAY 6	10.93	JUL 15	11.18	SEP 1	11.16
NOV 18	11.26										

450927093033803. Local number, 031N22W23CBC03.
LOCATION.--Lat 45°09'27", long 93°03'38", in SW¼NW¼SW¼ sec.23, T.31 N., R.22 W., Hydrologic Unit 07010206, at City of Centerville.
Owner: U.S. Geological Survey.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 4 in (0.10 m), depth 221 ft (67.4 m), cased to 211 ft (64.3 m).
DATUM.--Land-surface datum is 901.8 ft (274.9 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of well cap, 3.30 ft (1.01 m) 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, 8.57 ft (2.61 m) below land-surface datum, July 7, 1975; lowest, 12.69 ft (3.87 m) below land-surface datum, Aug. 1, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	11.25	DEC 30	11.42	MAR 10	11.64	MAY 6	11.22	JUL 15	11.47	SEP 1	11.45
NOV 18	11.53										

ANOKA COUNTY--Continued

451210093170201. Local number, 031N24W01CBB01.
LOCATION.--Lat 45°12'10", long 93°17'02", in NW¼NW¼SW¼ sec.1, T.31 N., R.24 W., Hydrologic Unit 07010206, at Golf Course.
Owner: City of Coon Rapids.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 193 ft (58.8 m), screened 163 to 193 ft (49.7 to 58.8 m).
DATUM.--Altitude of land-surface datum is 897 ft (273 m). Measuring point: Top of breather pipe, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--December 1980 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 21.20 ft (6.46 m) below land-surface datum, Dec. 30, 1980; lowest, 23.20 ft (7.07 m) below land-surface datum, Sept. 1, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 30	21.20	MAR 10	21.74	MAY 6	21.50	SEP 1	23.20

451742093122102. Local number, 032N23W04AAD02.
LOCATION.--Lat 45°17'42", long 93°12'21", in SE¼NE¼NE¼ sec.4, T.32 N., R.23 W., Hydrologic Unit 07030005, 1.5 mi (2.4 km) east of Soderville.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 21 ft (6.4 m), screened 19 to 21 ft (5.8 to 6.4 m).
DATUM.--Altitude of land-surface datum is 916 ft (279 m). Measuring point: Top of casing, 3.50 ft (1.07 m) above land-surface datum.
PERIOD OF RECORD.--August 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.20 ft (1.89 m) below land-surface datum, July 30, 1975; lowest, 13.22 ft (4.03 m) below land-surface datum, Mar. 5-9, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	8.13	DEC 30	9.35	MAR 10	10.16	MAY 6	8.30	JUL 15	8.31	SEP 1	8.99
NOV 18	8.96										

452305093141501. Local number, 033N23W05BAB01.
LOCATION.--Lat 45°23'05", long 93°14'15", in NW¼NE¼NW¼ sec.5, T.33 N., R.23 W., Hydrologic Unit 07010207, at 1300 229th Ave. NE, Bethel.
Owner: Friendship Baptist Church.
AQUIFER.--Franconian Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 141 ft (43.0 m), cased to 126 ft (38.4 m).
DATUM.--Altitude of land-surface datum is 923 ft (281 m). Measuring point: Top of well cap, 0.80 ft (0.24 m) above land-surface datum.
PERIOD OF RECORD.--April 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 21.10 ft (6.43 m) below land-surface datum, Oct. 7, 1980; lowest, 22.12 ft (6.74 m) below land-surface datum, Mar. 10, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	21.10	DEC 30	21.62	MAR 10	22.12	MAY 6	21.95	JUL 15	21.66	SEP 1	21.48
NOV 18	21.37										

ANOKA COUNTY--Continued

451938093223101. Local number, 033N24W30ABB01.
LOCATION.--Lat 45°19'38", long 93°22'31", in NW¼NW¼NE¼ sec.30, T.33 N., R.24 W., Hydrologic Unit 07010207, at 4324 Viking Blvd.
Owner: Northwestern Bell Telephone Co.
AQUIFER.--Ironton-Galesville Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 280 ft (85.3 m), cased to 223 ft (68.0 m).
DATUM.--Altitude of land-surface datum is 900 ft (274 m). Measuring point: Top of casing, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--April 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 30.36 ft (9.25 m) below land-surface datum, July 15, 1981; lowest, 31.84 ft (9.70 m) below land-surface datum, July 11, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	30.48	DEC 30	30.93	MAR 10	31.34	MAY 6	30.60	JUL 15	30.36	SEP 1	30.76
NOV 18	30.72										

452416093160801. Local number, 034N24W25DAC01.
LOCATION.--Lat 45°24'16", long 93°16'08", in SW¼NE¼SE¼ sec.25, T.34 N., R.24 W., Hydrologic Unit 07010207, at City of Bethel.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 21 ft (6.4 m), screened 19 to 21 ft (5.8 to 6.4 m).
DATUM.--Altitude of land-surface datum is 930 ft (283 m). Measuring point: Top of casing, 2.30 ft (0.70 m) above land-surface datum.
PERIOD OF RECORD.--August 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.73 ft (2.36 m) below land-surface datum, May 1, 1975; lowest, 10.87 ft (3.31 m) below land-surface datum, Mar. 10, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	9.50	DEC 30	10.35	MAR 10	10.87	MAY 6	8.82	JUL 15	8.92	SEP 1	9.43
NOV 18	9.90										

BECKER COUNTY

465501095110101. Local number, 140N36W26AAD01.
LOCATION.--Lat 46°55'01', long 95°11'01", in SE¼NE¼NE¼ sec.26 T.140 N., R.36 W., Hydrologic Unit 07010106, on Pritchard farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 28 ft (8.5 m), screened 26 to 28 ft (7.9 to 8.5 m).
DATUM.--Altitude of land-surface datum is 1,469 ft (448 m): Measuring point: Top of platform, 0.50 ft (0.15 m) above land-surface datum.
PERIOD OF RECORD.--October 1974 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 17.80 ft (5.43 m) below land-surface datum, July 28, 1975; lowest, 22.40 ft (6.83 m) below land-surface datum, Aug. 7, 1980.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	21.38	OCT 15	21.40	NOV 19	21.50	JAN 22	21.77	MAY 18	22.17	SEP 7	22.07
10	21.37	20	21.42	DEC 15	21.55	MAR 19	21.98				

BELTRAMI COUNTY

473023094570901. Local number, 147N34W35ADC01.
LOCATION.--Lat 47°30'23", long 94°57'09", in SW¼SE¼NE¼ sec.35, T.147 N., R.34 W., Hydrologic Unit 07010101, on Clarence Hart farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Altitude of land-surface datum is 1,383 ft (421 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--October 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.17 ft (1.88 m) below land-surface datum, Aug. 1, 1975; lowest, 10.63 ft (3.22 m) below land-surface datum, Mar. 16, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	9.76	DEC 18	10.12	MAR 16	10.63	MAY 11	10.41	JUL 13	9.65	SEP 14	9.90
NOV 17	9.92	JAN 19	10.35								

BENTON COUNTY

453454094002402. Local number, 036N29W30BCC02.
LOCATION.--Lat 45°34'54", long 94°00'24", in SW¼SW¼NW¼ sec. 30, T.36 N., R.29 W., Hydrologic Unit 07010203, 3.7 mi (6.0 km) west of Duelm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 19 ft (5.8 m), screened 17 to 19 ft (5.2 to 5.8 m).
DATUM.--Altitude of land-surface datum is 1,049 ft (320 m). Measuring point: Top of casing, 4.00 ft (1.22 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.58 ft (1.70 m) below land-surface datum, June 30, 1979; lowest, 12.30 ft (3.75 m) below land-surface datum, Aug. 18, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	8.58	DEC 4	9.32	FEB 12	10.02	APR 7	10.57	JUN 2	10.52	AUG 11	10.04
NOV 4	8.96	JAN 13	9.81	MAR 10	10.43	MAY 6	10.46	JUL 1	9.95	SEP 9	10.35

454312094114402. Local number, 037N31W09AAA02.
LOCATION.--Lat 45°43'12",long 94°11'44", in NE¼NE¼NE¼ sec.9, T.37 N., R.31 W., Hydrologic Unit 07010201, 2.6 mi (4.2 km) south of flashing light in Rice.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in(0.03 m), depth 34 ft (10.4 m), screened 32 to 34 ft (9.8 to 10.4 m).
DATUM.--Altitude of land-surface datum is 1,058 ft (322 m). Measuring point: Top of casing, 2.50 ft (0.76 m) above land-surfaca datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 28.68 ft (8.74 m) below land-surface datum, Sept. 29, 1978; lowest, 33.52 ft (10.22 m) below land-surface datum, Sept. 5, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	31.12	DEC 4	30.89	FEB 12	31.22	APR 7	31.51	JUN 2	31.94	AUG 11	31.60
NOV 4	30.96	JAN 13	31.03	MAR 10	31.35	MAY 6	31.73	JUL 1	32.05	SEP 9	31.55

BENTON COUNTY--Continued

454657094143701. Local number, 038N31W18DCA01.
LOCATION.--Lat 45°46'57", long 94°14'37", in NE¼SW¼SE¼ sec.18, T.38 N., R.31 W., Hydrologic Unit 07010201, 0.25 mi (0.40 km) north of Highway 10.
Owner: Jerry Schlicting.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 130 ft (39.6 m), screened 101 to 106 ft (30.8 to 32.3 m) and 120 to 130 ft (36.6 to 39.6 m).
DATUM.--Altitude of land-surface datum is 1,070 ft (326 m): Measuring point: Hole in pump base, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--December 1979 to June 1980.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 20.91 ft (6.37 m) below land-surface datum, Dec. 6, 1979; lowest, 26.58 ft (8.10 m) below land-surface datum, Sept. 9, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	24.09	DEC 4	24.48	FEB 12	24.97	APR 7	25.47	JUN 2	26.08	SEP 9	26.58
NOV 4	24.21	JAN 13	24.62	MAR 10	25.38	MAY 6	25.78	JUL 1	26.01		

454648094144102. Local number, 038N31W18DCD02.
LOCATION.--Lat 45°46'48", long 94°14'41", in SE¼SW¼SE¼ sec.18, T.38 N., R.31 W., Hydrologic Unit 07010201, 2.4 mi (3.9 km) north of flashing light in Rice.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 36 ft (11.0 m), screened 34 to 36 ft (10.4 to 11.0 m).
DATUM.--Altitude of land-surface datum is 1,065 ft (325 m). Measuring point: Top of casing, 4.60 ft (1.40 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 23.65 ft (7.21 m) below land-surface datum, Dec. 6, 1979; lowest, 32.36 ft (9.86 m) below land-surface datum, Aug. 10, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	26.62	DEC 4	26.78	FEB 12	27.44	APR 7	27.97	JUN 2	28.54	AUG 11	29.27
NOV 4	26.58	JAN 13	27.11	MAR 10	27.74	MAY 6	28.30	JUL 1	28.60	SEP 9	29.25

454644094092902. Local number, 038N31W23AAB02.
LOCATION.--Lat 45°46'44", long 94°09'29", in NW¼NE¼NE¼ sec.23, T.38 N., R.31 W., Hydrologic Unit 07010201, 3.2 mi (5.2 km) northeast of flashing light in Rice.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 13 ft (4.0 m), screened 11 to 13 ft (3.4 to 4.0 m).
DATUM.--Altitude of land-surface datum is 1,082 ft (330 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.43 ft (0.74 m) below land-surface datum, July 14, 1978; lowest, 8.00 ft (2.44 m) below land-surface datum, Feb. 8, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

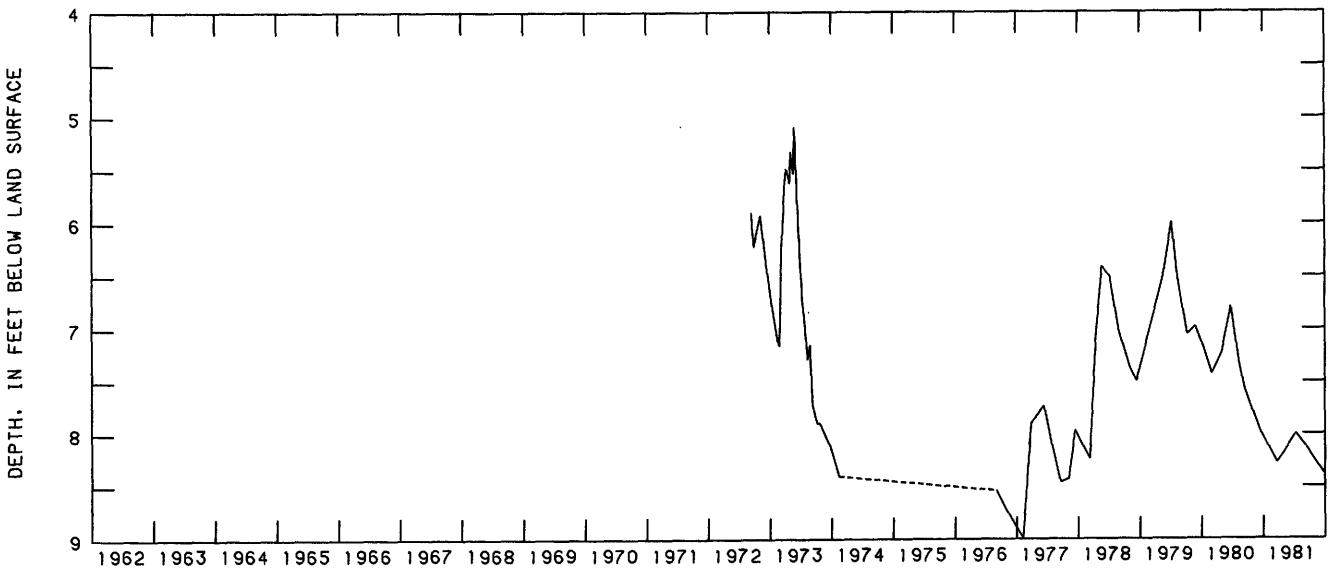
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	6.06	DEC 4	6.49	FEB 12	7.22	APR 7	7.12	JUN 2	6.48	AUG 11	5.72
NOV 4	6.14	JAN 13	6.90	MAR 10	7.40	MAY 6	6.52	JUL 1	5.65	SEP 9	6.37

BIG STONE COUNTY

451517096104501. Local number, 121N44W27CCC01.
LOCATION.--Lat 45°15'17", long 96°10'45", in SW¼SW¼SW¼ sec.27, T.121 N., R.44 W., Hydrologic Unit 07020001, north of Correll.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 16 ft (4.9 m), screened 14 to 16 ft (4.3 to 4.9 m).
DATUM.--Altitude of land-surface datum is 1,018 ft (310 m). Measuring point: Top of casing, 3.10 ft (0.94 m) above land-surface datum.
PERIOD OF RECORD.--September 1972 to February 1974, August 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.09 ft (1.55 m) below land-surface datum, May 28, 1973; lowest, 8.99 ft (2.74 m) below land-surface datum, Feb. 8, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 11	7.97	JAN 15	8.07	MAR 24	8.28	JUL 13	8.00	SEP 10	8.12



121N44W27CCC01

453330096420201. Local number, 124N48W17AAA01.
LOCATION.--Lat 45°33'30", long 96°42'02", in NE¼NE¼NE¼ sec.17, T.124 N., R.48 W., Hydrologic Unit 07020001, 0.5 mi (0.8 km) east of Beardsley.
Owner: U.S. Geological Survey.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 2 in (0.05 m), depth 282 ft (86.0 m), screened 242 to 282 ft (73.8 to 86.0 m).
DATUM.--Land-surface datum is 1,086.8 ft (331.3 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.70 ft (0.82 m) above land-surface datum.
PERIOD OF RECORD.--November 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.90 ft (3.32 m) below land-surface datum, Apr. 11, 1979; lowest, 17.14 ft (5.22 m) below land-surface datum, Sept. 4, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	13.54	DEC 22	13.76	FEB 3	14.03	MAR 30	14.09	JUN 25	14.99	SEP 4	17.14
NOV 20	13.69										

BIG STONE COUNTY--Continued

453237096381601. Local number, 124N48W23AAA04.
LOCATION.--Lat 45°32'37", long 96°38'16", in NE¼NE¼NE¼ sec.23, T.124 N., R.48 W., Hydrologic Unit 07020001, 3.5 mi (5.6 km) southeast of Beardsley.
Owner: U.S. Geological Survey.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 2 in (0.05 m), depth 240 ft (73.2 m), screened 200 to 240 ft (61.0 to 73.2 m).
DATUM.--Land-surface datum is 1,087.2 ft (331.4 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--November 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 39.25 ft (11.96 m) below land-surface datum, Jan. 28., 1979; lowest, 41.68 ft (12.70 m) below land-surface datum, Sept. 4, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	40.22	DEC 22	40.27	FEB 3	40.33	MAR 30	40.08	JUN 25	40.44	SEP 4	41.68
NOV 20	40.31										

453100096442202. Local number, 124N48W31BBB01.
LOCATION.--Lat 45°31'00", long 96°44'22", in NW¼NW¼NW¼ sec.31, T.124 N., R.48 W., Hydrologic Unit 07020001, 3.5 mi (5.6 km) southwest of Beardsley.
Owner: U.S. Geological Survey.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation artesian well, diameter 1½ in (0.04 m), depth 30 ft (9.1 m), screened 28 to 30 ft (8.5 to 9.1 m).
DATUM.--Altitude of land-surface datum is 1,083.0 ft (330.1 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 3.90 ft (1.19 m) above land-surface datum.
PERIOD OF RECORD.--September 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.65 ft (2.33 m) below land-surface datum, July 10, 1979; lowest, 16.88 ft (5.15 m) below land-surface datum, Sept. 30, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	13.18	DEC 22	14.43	FEB 3	15.33	MAR 30	15.53	JUN 25	15.15	SEP 4	15.52
NOV 20	14.14										

453430096454201. Local number, 124N49W02DDD01.
LOCATION.--Lat 45°34'30", long 96°45'42", in SE¼SE¼SE¼ sec.2, T.124 N., R.49 W., Hydrologic Unit 07020001, 5 mi (8 km) southeast of Browns Valley.
Owner: U.S. Geological Survey.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation artesian well, diameter 1½ in (0.04 m), depth 23.5 ft (7.16 m), screened 21.5 to 23.5 ft (6.55 to 7.16 m).
DATUM.--Altitude of land-surface datum is 1,088 ft (332 m). Measuring point: 3.20 ft (0.98 m) above land-surface datum.
PERIOD OF RECORD.--September 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.51 ft (2.29 m) below land-surface datum, Apr. 30, 1979; lowest, 12.30 ft (3.75 m) below land-surface datum, Sept. 27, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	10.85	DEC 22	11.03	FEB 3	11.33	MAR 30	11.40	JUN 25	10.10	SEP 4	11.46
NOV 20	10.98										

BLUE EARTH COUNTY

435544093573901. Local number, 105N26W04BDC01.
LOCATION.--Lat 43°55'44", long 93°57'39", in SW¼SE¼NW¼ sec.4, T.105 N., R.26 W., Hydrologic Unit 07020011, at Mapleton.
Owner: Mapleton Creamery.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 186 ft (56.7 m).
DATUM.--Altitude of land-surface datum is 1,036 ft (316 m). Measuring point: Hole in well cap, 1.70 ft (0.52 m) above land-surface datum.
PERIOD OF RECORD.--October 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 29.94 ft (9.13 m) below land-surface datum, May 11, 1978; lowest, 35.78 ft (10.91 m) below land-surface datum, Nov. 30, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

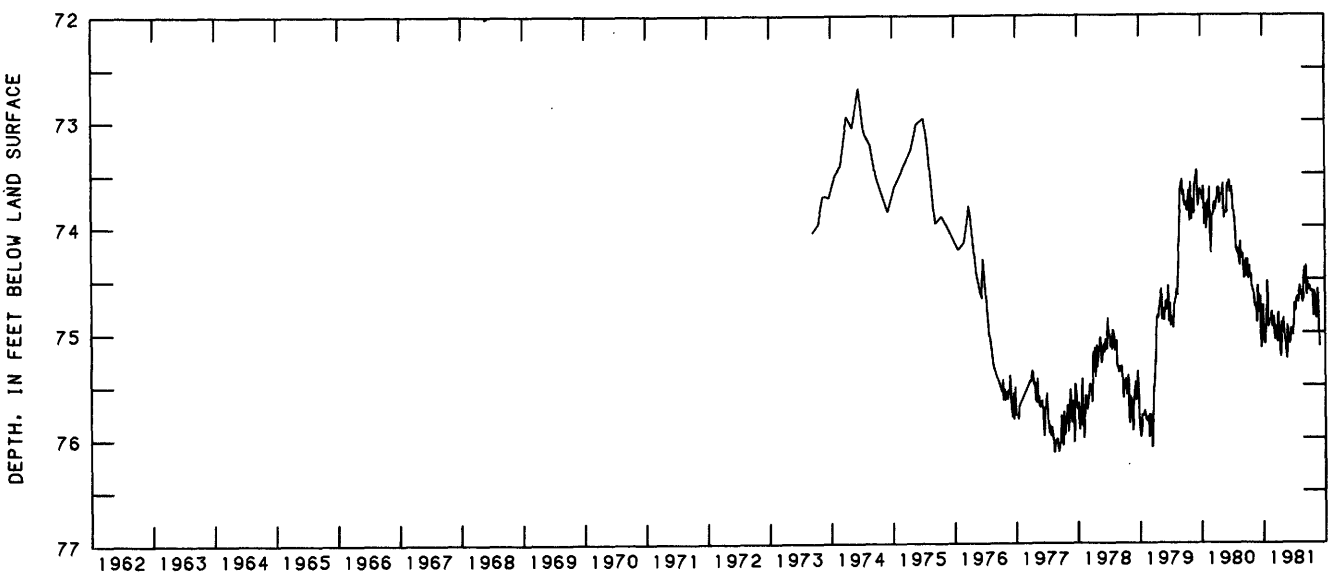
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	33.76	DEC 16	33.44	MAR 24	33.83	MAY 12	32.95	JUL 7	33.26	AUG 31	31.20
NOV 13	34.09	JAN 26	33.57								

440050094102801. Local number, 106N28W03DBA01.
LOCATION.--Lat 44°00'50", long 94°10'28", in NE¼NW¼SE¼ sec.3, T.106 N., R.28 W., Hydrologic Unit 07020010, at Farmland Industries Ammonia Plant, 3.2 mi (5.2 km) north of Vernon Center.
Owner: Farmland Industries.
AQUIFER.--Ironton-Galesville Sandstones of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 16 in (0.41 m), depth 390 ft (119 m), cased to 150 ft (45.7 m).
DATUM.--Altitude of land-surface datum is 1,005 ft (306 m). Measuring point: Top of recorder floor, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--October 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 72.37 ft (22.06 m) below land-surface datum, June 21, 1974; lowest, 76.17 ft (23.22 m) below land-surface datum, Aug. 17, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	74.50	74.62	74.68	75.04	74.92	74.85	74.97	75.02	75.11	74.72	74.56	74.55
10	74.37	74.73	74.82	75.11	74.88	75.07	75.13	.....	75.07	74.80	74.66	74.37
15	74.49	74.77	74.66	75.01	74.88	74.96	75.23	75.13	74.96	74.70	74.61	74.65
20	74.45	74.73	75.15	74.89	74.80	74.94	74.90	75.25	74.97	74.66	74.72	74.51
25	74.56	74.91	75.07	74.51	74.95	75.09	75.00	74.93	75.03	74.72	74.68	74.61
EOM	74.60	74.56	74.74	74.95	74.91	74.81	74.86	74.05	74.92	74.65	74.39	74.56

WTR YEAR 1981 HIGHEST 74.09 OCT 17, 1980 LOWEST 75.40 APR 11-12, 1981



106N28W03DBA01

BLUE EARTH COUNTY--Continued

441134093505301. Local number, 108N25W04BBC01.
LOCATION.--Lat 44°11'34", long 93°50'53", in SW¼NW¼NW¼ sec.4, T.108 N., R.25 W., Hydrologic Unit 07020011, 1.3 mi (2.1 km) west of Madison Lake at waste treatment plant.
Owner: City of Madison Lake.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 6 in (0.15 m), depth 313 ft (95.4 m), cased to 296 ft (90.2 m).
DATUM.--Altitude of land-surface datum is 1,036 ft (316 m). Measuring point: Top of casing, 1.60 ft (0.49 m) above land-surface datum.
PERIOD OF RECORD.--May 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 94.80 ft (28.90 m) below land-surface datum, Nov. 6, 1979; lowest, 95.42 ft (29.08 m) below land-surface datum, July 16, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 8	95.19	MAR 18	95.14	JUL 16	95.42

BROWN COUNTY

441030094254501. Local number, 108N30W09ADD01.
LOCATION.--Lat 44°10'30", long 94°25'45", in SE¼SE¼NE¼ sec.9, T.108 N., R.30 W., Hydrologic Unit 07020007, 3.7 mi (6.0 km) northeast of Hanska.
Owner: Erwin Kjelshus.
AQUIFER.--Deposits of Pleistocene Age.
WELL CHARACTERISTICS.--Bored unused water-table well, diameter 16 in (0.41 m), depth 32 ft (9.8 m), cased to 32 ft (9.8 m), open end.
DATUM.--Altitude of land-surface datum is 1,003 ft (306 m). Measuring point: Top of concrete cover, at land-surface datum.
REMARKS.--Measured by Erwin Kjelshus. Water level used in monthly Water Resources Review.
PERIOD OF RECORD.--July 1942 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.27 ft (0.79 m) below land-surface datum, Aug. 10, 1979; lowest, 22.00 ft (6.71 m) below land-surface datum, Mar. 2, 1977.

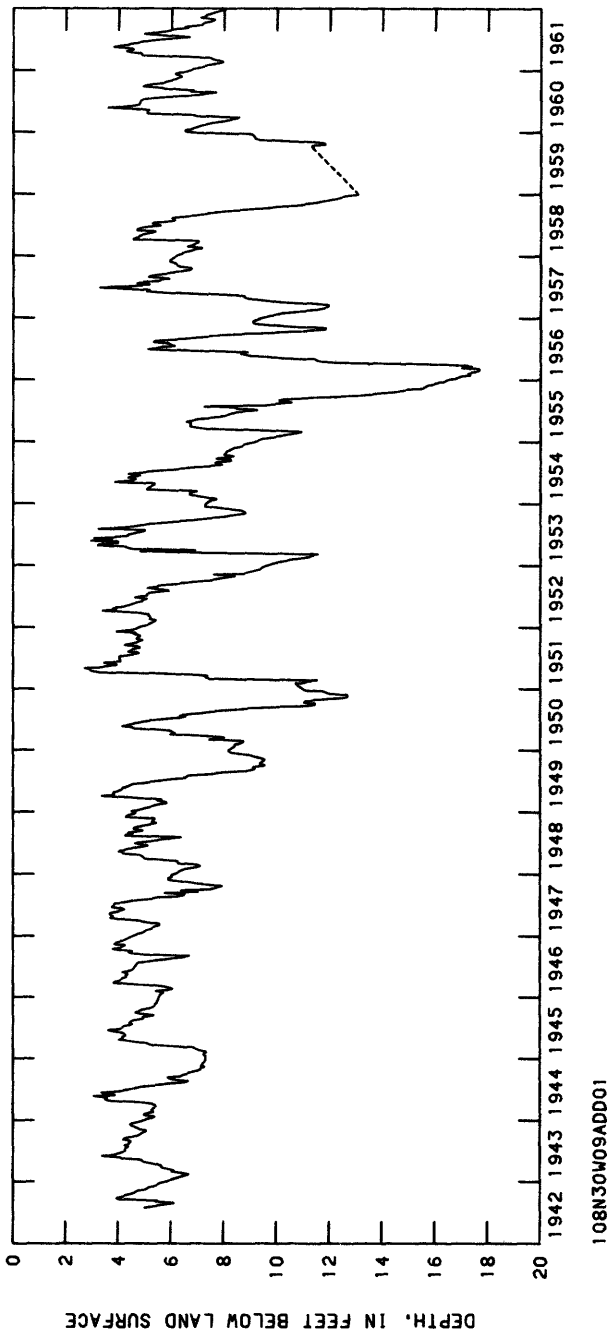
WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

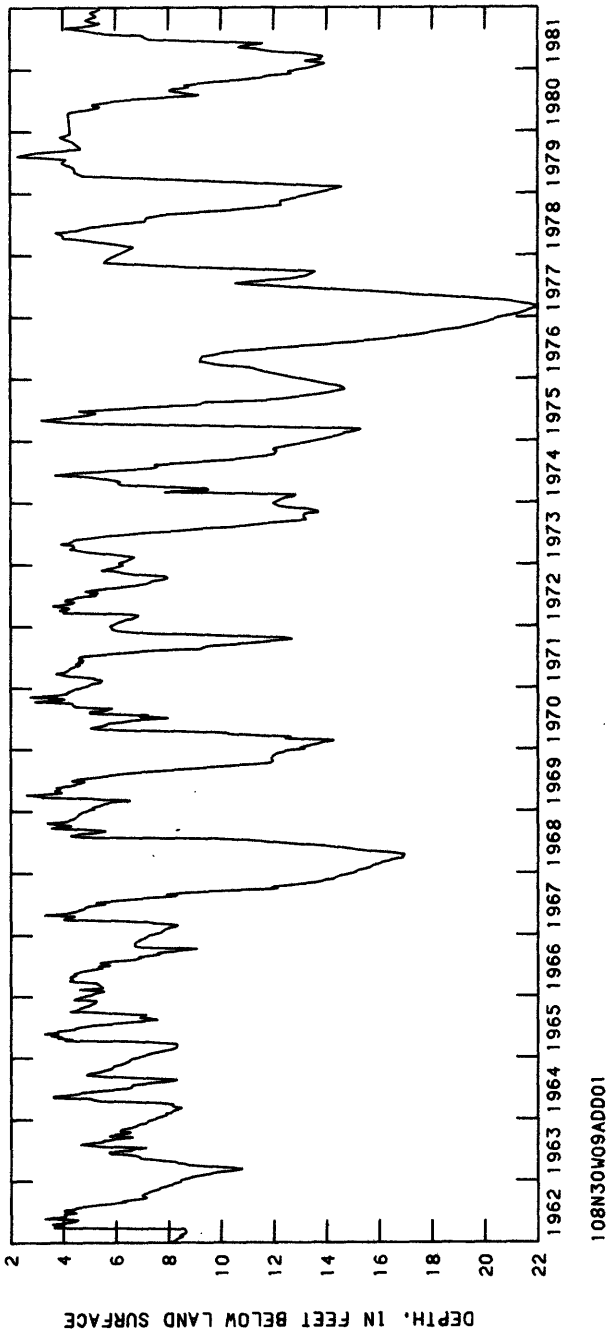
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	9.78	DEC 23	12.55	MAR 15	13.74	MAY 5	11.32	JUL 10	7.10	SEP 3	4.08
31	10.69	JAN 11	13.32	22	13.88	13	10.65	21	7.02	11	4.69
NOV 17	11.55	FEB 9	13.95	APR 8	13.02	26	11.00	29	5.61	21	5.10
27	11.85	20	13.18	18	11.88	JUN 6	11.61	AUG 20	4.85	30	5.43
DEC 10	12.68	MAR 5	13.80	27	11.52	28	7.27				

441800094434301. Local number, 110N32W30DDB01.
LOCATION.--Lat 44°18'00", long 94°43'43", in NW¼SE¼SE¼ sec. 30, T.110 N., R.32 W., Hydrologic Unit 07020008, in Sleepy Eye at hospital.
Owner: City of Sleepy Eye.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 2 in (0.05 m), depth 176 ft (53.6 m).
DATUM.--Altitude of land-surface datum is 1,030 ft (314 m). Measuring point: Top of casing, 1.30 ft (0.40 m) above land-surface datum.
REMARKS.--Water level affected by pumping from nearby wells.
PERIOD OF RECORD.--August 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 52.40 ft (15.97 m) below land-surface datum, June 3, 1980; lowest, 118.1 ft (36.00 m) below land-surface datum, Sept. 15, 1976.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 2	54.70	MAR 31	54.00	MAY 5	53.80	AUG 1	58.10	SEP 1	62.30


DEPTH, IN FEET BELOW LAND SURFACE
0
2
4
6
8
10
12
14
16
18
20
1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961
108N30W09ADD01


DEPTH, IN FEET BELOW LAND SURFACE
2
4
6
8
10
12
14
16
18
20
22
1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981
108N30W09ADD01

CARLTON COUNTY

462712092453401. Local number, 046N19W21CBB01.
LOCATION.--Lat 46°27'12", long 92°45'34", in NW¼NW¼SW¼ sec.21, T.46 N., R.19 W., Hydrologic Unit 07030003, in Moose Lake at water tower.
Owner: City of Moose Lake.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Dug unused water-table well, diameter 120 in (3.0 m), depth 43 ft (13.1 m), screened 33 to 43 ft (10.1 to 13.1 m).
DATUM.--Altitude of land-surface datum is 1,061 ft (323 m). Measuring point: Top of concrete cover, 1.10 ft (0.34 m) above land-surface datum.
PERIOD OF RECORD.--August 1967 to May 1969, July 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 20.35 ft (6.20 m) below land-surface datum, Oct. 25, 1968; lowest, 23.30 ft (7.10 m) below land-surface datum, Feb. 20, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	22.24	JAN 22	23.21	MAR 18	22.99	MAY 20	22.05	JUL 17	22.28	AUG 25	22.59
NOV 17	22.47	FEB 20	23.30	APR 29	21.79	JUN 23	21.57	22	22.30	SEP 22	22.81
DEC 11	22.15										

463747092372701. Local number, 048N18W21ACD01.
LOCATION.--Lat°46 37'47", long 92°37'27", in SE¼SW¼NE¼ sec.21, T.48 N., R.18 W., Hydrologic Unit 07030003, on Clarence Gustafson farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 52 ft (15.8 m), screened 50 to 52 ft (15.2 to 15.8 m).
DATUM.--Altitude of land-surface datum is 1,280 ft (390 m). Measuring point: Top of casing, 3.80 ft (1.16 m) above land-surface datum.
PERIOD OF RECORD.--December 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 20.36 ft (6.21 m) below land-surface datum, July 25, 1979; lowest, 22.53 ft (6.87 m) below land-surface datum, Mar. 6, 1979.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	21.43	JAN 22	21.76	MAR 18	21.70	MAY 20	21.56	JUL 16	21.43	AUG 25	21.50
NOV 17	21.54	FEB 20	21.85	APR 29	21.68	JUN 23	21.49	JUL 17	21.45	SEP 22	21.64
DEC 11	21.61										

463715092380001. Local number, 048N18W21CDC01.
LOCATION.--Lat 46°37'15", long 92°38'00", in SW¼SE¼SW¼ sec.21, T.48 N., R.18 W., Hydrologic Unit 07030003, on Marvin Benson farm:
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-tble well, diameter 1½ in (0.04 m), depth 44 ft (13.4 m), screened 42 to 44 ft (12.8 to 13.4 m).
DATUM.--Altitude of land-surface datum is 1,275 ft (389 m). Measuring point: Top of casing, 4.00 ft (1.22 m) above land-surface datum.
PERIOD OF RECORD.--December 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.24 ft (6.78 m) below land-surface datum, Mar. 12, 1980; lowest, 23.80 ft (7.25 m) below land-surface datum, Sept. 22, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	23.12	DEC 11	23.37	FEB 20	23.43	APR 29	23.14	JUN 23	23.09	AUG 25	23.54
NOV 17	23.20	JAN 22	23.64	MAR 18	23.23	MAY 20	23.21	JUL 17	22.82	SEP 22	23.80

CARVER COUNTY

445155093320101. Local number, 116N23W12CDB01.
LOCATION.--Lat 44°51'55", long 93°32'01", in NW¼SE¼SW¼ sec.12, T.116 N., R.23 W., Hydrologic Unit 07020012, at Chanhassen water tower.
Owner: City of Chanhassen, well 1.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled public supply artesian well, diameter 10 in (0.25 m), depth 518 ft (158 m), cased to 424 ft (129.2 m).
DATUM.--Altitude of land-surface datum is 990 ft (302 m). Measuring point: Edge of vent pipe, 2.40 ft (0.73 m) above land-surface datum.
REMARKS.--Water level affected by pumping from nearby wells.
PERIOD OF RECORD.--June 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 130.3 ft (39.72 m) below land-surface datum, Oct. 13, 1965; lowest, 149.8 ft (45.66 m) below land-surface datum, July 22, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	145.7	JAN 5	144.8	MAR 16	145.4	MAY 5	146.7	JUL 22	149.8	AUG 31	148.8
NOV 20	145.0										

CHIPPEWA COUNTY

450813095512701. Local number, 119N41W07BBB01.
LOCATION.--Lat 45°08'13", long 95°51'27", in NW¼NW¼NW¼ sec.7, T.119 N., R.41 W., Hydrologic Unit 07020005, northwest of Milan.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Altitude of land-surface datum is 1,040 ft (317 m). Measuring point: Top of casing, 1.40 ft (0.43 m) above land-surface datum.
PERIOD OF RECORD.--September 1972 to October 1973, January 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 14.96 ft (4.56 m) below land-surface datum, Sept. 14, 1972; lowest, 19.77 ft (6.03 m) below land-surface datum, Apr. 1, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 4	17.34	JAN 15	17.67	MAR 24	17.94	MAY 7	18.05	JUL 13	16.96	SEP 10	16.43
DEC 11	17.55										

450447095490101. Local number, 119N41W29DDD01.
LOCATION.--Lat 45°04'47", long 95°49'01", in SE¼SE¼SE¼ sec.29, T.119 N., R.41 W., Hydrologic Unit 07020005, 5 mi (8.1 km) north of Watson.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 19 ft (5.8 m), screened 17 to 19 ft (5.2 to 5.8 m).
DATUM.--Altitude of land-surface datum is 992 ft (302 m). Measuring point: Top of casing, 3.75 ft (1.14 m) above land-surface datum.
PERIOD OF RECORD.--September 1972 to February 1974, January 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.23 ft (1.29 m) below land-surface datum, May 7, 1973; lowest, 9.06 ft (2.76 m) below land-surface datum, Feb. 8, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 4	7.15	JAN 15	7.95	MAR 24	7.19	MAY 7	6.45	JUL 13	4.92	SEP 10	6.54
DEC 11	7.61										

CHIPPEWA COUNTY--Continued

450631095562201. Local number, 119N42W17DDD01.
LOCATION.--Lat 45°06'31", long 95°56'22", in SE¼SE¼SE¼ sec.17, T.119 N., R.42 W., Hydrologic Unit 07020001, west of Milan.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial silt of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m) depth 19 ft (5.8 m), screened 17 to 19 ft (5.2 to 5.8 m).
DATUM.--Altitude of land-surface datum is 1,027 ft (313 m). Measuring point: Top of casing, 4.50 ft (1.37 m) above land-surface datum.
PERIOD OF RECORD.--September 1972 to October 1973, April 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 1.50 ft (0.46 m) below land-surface datum, May 7, 1973; lowest, 17.46 ft (5.32 m) below land-surface datum, Apr. 1, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 4	10.37	JAN 15	11.78	MAR 24	10.90	MAY 7	9.12	JUL 13	5.77	SEP 10	9.08
DEC 11	10.75										

CHISAGO COUNTY

452014092595102. Local number, 033N21W20BBC02.
LOCATION.--Lat 45°20'14", long 92°59'51", in SW¼NW¼NW¼ sec.20, T.33 N., R.21 W., Hydrologic Unit 07030005, at City of Wyoming.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Altitude of land-surface datum is 905 ft (276 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--August 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.57 ft (2.00 m) below land-surface datum, July 11, 1975; lowest, 11.70 ft (3.57 m) below land-surface datum, Feb. 24, 1970.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	7.90	DEC 10	8.94	MAR 11	9.96	MAY 6	8.57	JUN 29	8.09	AUG 25	8.91
NOV 5	8.44	JAN 13	9.34	APR 13	9.35						

453138092445502. Local number, 035N19W17BAB02.
LOCATION.--Lat 45°31'38", long 92°44'55", in NW¼NE¼NW¼ sec.17, T.35 N., R.19 W., Hydrologic Unit 07030005, at Wild River State Park.
Owner: State of Minnesota.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 6 in (0.15 m), depth 110 ft (33.5 m), screened 104 to 110 ft (31.7 to 33.5 m).
DATUM.--Altitude of land-surface datum is 860 ft (262 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--October 1980 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 53.61 ft (16.34 m) below land-surface datum, Aug. 25, 1981; lowest, 54.38 ft (16.58 m) below land-surface datum, Mar. 11, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	53.70	MAR 11	54.38	APR 13	54.26	MAY 6	54.02	JUN 29	53.70	AUG 25	53.61
FEB 6	54.24										

CHISAGO COUNTY--Continued

453125092445401. Local number, 035N19W17BDB01.
LOCATION.--Lat 45°31'25", long 92°44'54", in NW¼SE¼NW¼ sec.17, T.35 N., R.19 W., Hydrologic Unit 07030005, at Wild River State Park.
Owner: State of Minnesota.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 6 in (0.15 m), depth 270 ft (82.3 m), cased to 230 ft (70.1 m).
DATUM.--Altitude of land-surface datum is 820 ft (250 m). Measuring point: Top of casing, 0.70 ft (0.21 m) above land-surface datum.
PERIOD OF RECORD.--October 1980 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 43.08 ft (13.13 m) below land-surface datum, June 29, 1981; lowest, 44.06 ft (13.43 m) below land-surface datum, Mar. 11, 1981.

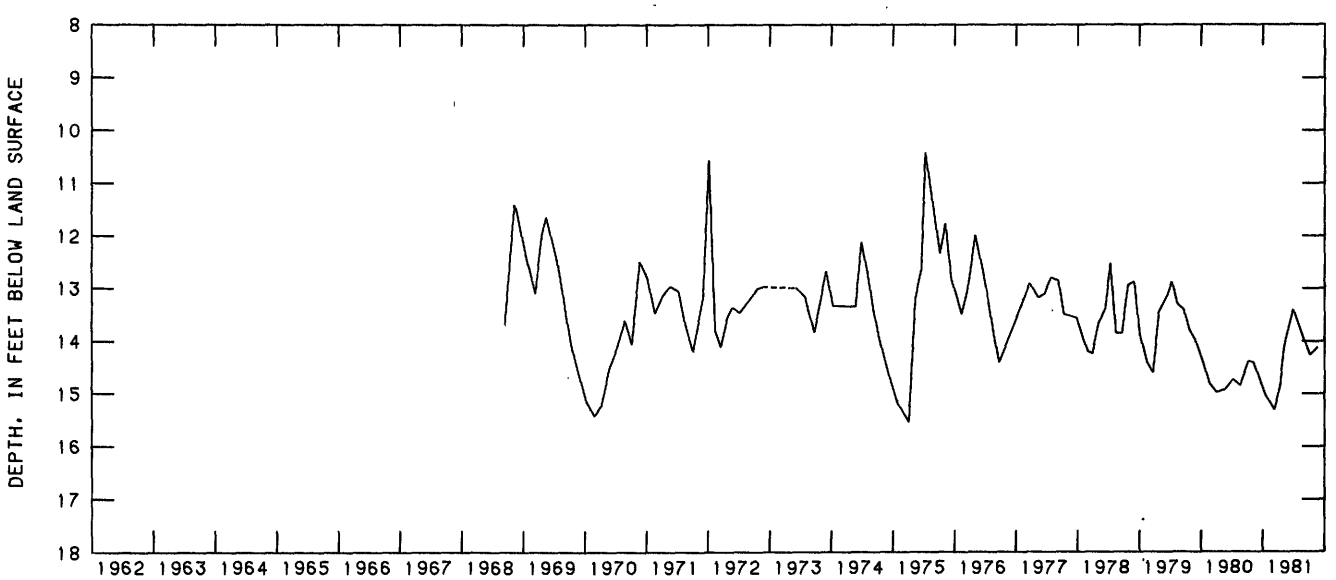
WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	43.37	MAR 11	44.06	APR 13	43.76	MAY 6	43.60	JUN 29	43.08	AUG 25	43.44
FEB 6	44.01										

452936092561901. Local number, 035N21W26BCC01.
LOCATION.--Lat 45°29'36", long 92°56'19", in SW¼SW¼NW¼ sec.26, T.35 N., R.21 W., Hydrologic Unit 07030005, southeast of North Branch.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 26 ft (7.9 m), screened 24 to 26 ft (7.3 to 7.9 m).
DATUM.--Altitude of land-surface datum is 894 ft (272 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--September 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.42 ft (3.18 m) below land-surface datum, July 11, 1975; lowest, 15.54 ft (4.74 m) below land-surface datum, Apr. 4, 1975.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	14.38	DEC 10	14.70	MAR 11	15.32	MAY 6	14.11	JUN 29	13.40	AUG 25	13.90
NOV 5	14.40	JAN 13	15.01	APR 13	14.85						



035N21W26BCC01

COTTONWOOD COUNTY

435458095110801. Local number, 105N36W08ACA01.
LOCATION.--Lat 43°54'58", long 95°11'08", in NE¼SW¼NE¼, sec.8, T.105 N., R.36 W., Hydrologic Unit 0710001, 4 mi (6.4 km) northwest of Windom.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 25 ft (7.6 m), screened 23 to 25 ft (7.0 to 7.6 m).
DATUM.--Altitude of land-surface datum is 1,370 ft (418 m): Measuring point: Top of casing, 3.20 ft (0.98 m) above land-surface datum.
PERIOD OF RECORD.--November 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 15.62 ft (4.76 m) below land-surface datum, June 7, 1979; lowest, 24.28 ft (7.40 m) below land-surface datum, JULY 25, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	22.13	DEC 20	23.05	FEB 28	23.58	APR 28	23.96	JUN 13	24.24	SEP 5	24.12
NOV 15	22.56	JAN 31	23.43	MAR 28	23.80	MAY 23	24.16	JUL 25	24.28	22	24.19

435237095180601. Local number, 105N37W29AAA01.
LOCATION.--Lat 43°52'37", long 95°18'06", in NE¼NE¼NE¼ sec.29, T.105 N., R.37 W., Hydrologic Unit 07100001, 9.6 mi (15.4 km) west of Windom.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 8 ft (2.4 m), screened 6 to 8 ft (1.8 to 2.4 m).
DATUM.--Altitude of land-surface datum is 1,375 ft (419 m): Measuring point: Top of casing, 0.70 ft (0.21 m) above land-surface datum.
PERIOD OF RECORD.--November 1977 to current year
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 0.90 ft (0.27 m) below land-surface datum, Apr. 18, 1979; lowest, dry below land-surface datum, July 25, Sept. 5, 30, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	7.03	DEC 20	7.09	FEB 28	6.55	APR 28	6.85	JUN 13	7.27	SEP 5	DRY
NOV 15	7.07	JAN 31	6.67	MAR 28	6.83	MAY 23	7.22	JUL 25	DRY	30	DRY

435258095255301. Local number, 105N38W20BAA01.
LOCATION.--Lat 43°52'58", long 95°25'53", in NE¼NE¼NW¼ sec.20, T.105 N., R.38 W., Hydrologic Unit 07100001, 4.5 mi (7.2 km) northeast of Dundee.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 12.5 ft (3.8 m), screened 10.5 to 12.5 ft (3.2 to 3.8 m).
DATUM.--Altitude of land-surface datum is 1,415 ft (431 m): Measuring point: Top of casing, 3.40 ft (1.04 m) above land-surface datum.
PERIOD OF RECORD.--November 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.21 ft (1.89 m) below land-surface datum, May 5, 1979; lowest, 10.68 ft (3.26 m) below land-surface datum, Dec. 20, 1980.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

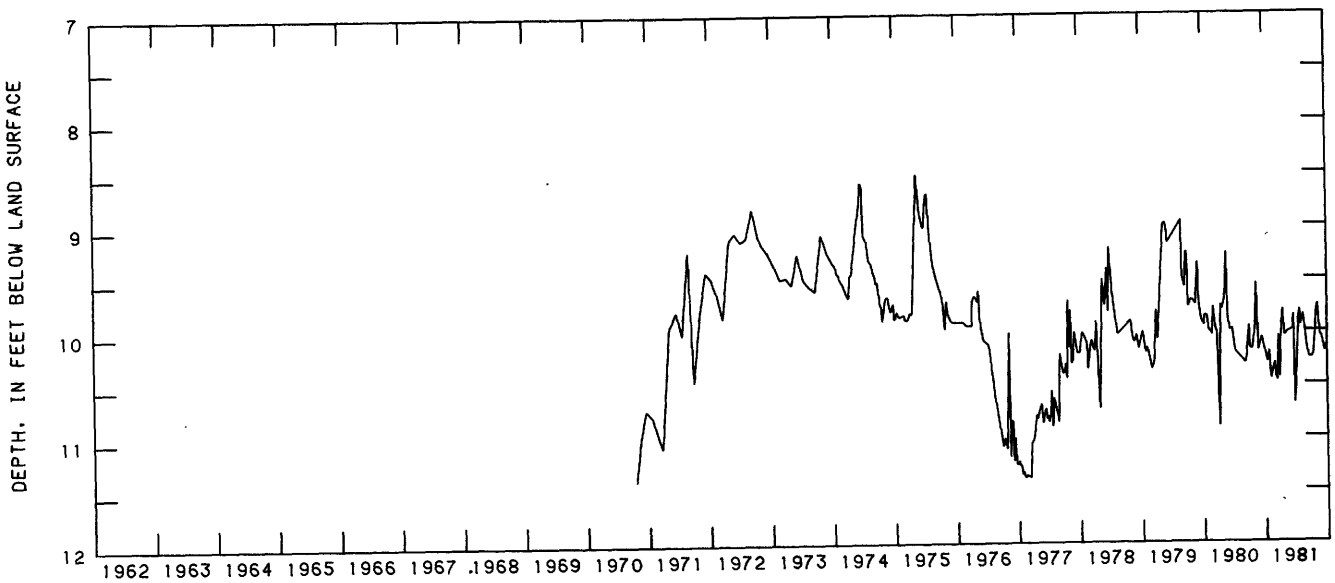
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	9.47	DEC 20	10.68	FEB 28	9.70	APR 28	9.47	JUN 13	9.72	SEP 5	9.83
NOV 15	9.61	JAN 31	9.71	MAR 28	9.65	MAY 15	9.53	JUL 25	9.80	22	9.95

CROW WING COUNTY

463006094131201. Local number, 135N28W16CCD01.
LOCATION.--Lat 46°30'06", long 94°13'12", in SE¼SW¼SW¼ sec.16, T.135 N., R.28 W., Hydrologic Unit 07010106, northwest of Merrifield.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 18 ft (5.5 m), screened 16 to 18 ft (4.9 to 5.5 m).
DATUM.--Altitude of land-surface datum is 1,212 ft (369 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--October 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 8.50 ft (2.59 m) below land-surface datum, May 12, 1975; lowest, 11.38 ft (3.47 m) below land-surface datum, Oct. 16, 1970, Feb. 11, Mar. 11, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 4	10.17	DEC 13	10.06	MAR 6	10.44	APR 17	9.80	JUN 20	9.85	JUL 31	9.95
18	10.18	JAN 15	10.30	13	10.48	25	10.05	27	10.69	AUG 15	9.85
NOV 3	9.94	24	10.19	21	10.05	MAY 2	10.05	JUL 18	9.90	SEP 4	10.15
10	9.55	FEB 6	10.46	28	10.45	8	10.02	25	9.80	17	10.26
22	10.19	28	10.30	APR 4	10.03	JUN 12	9.99				



135N28W16CCD01

DAKOTA COUNTY

445040093102201. Local number, 027N23W09ABD01.
LOCATION.--Lat 44°50'40", long 93°10'22", in SE¼NW¼NE¼ sec.9, T.27 N., R.23 W., Hydrologic Unit 07020012, at Eagan.
Owner: City of Eagan, Timberline Addition.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 10 in (0.25 m), depth 503 ft (153 m), cased to 401 ft (122 m).
DATUM.--Altitude of land-surface datum is 900 ft (274 m). Measuring point: Hole in well cap, 2.60 ft (0.79 m) above land-surface datum.
REMARKS.--Water-level affected by pumping.
PERIOD OF RECORD.--December 1965, April 1966, December 1966, March 1967, December 1970, August 1971, August 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 141.4 ft (43.10 m) below land-surface datum, Apr. 5, 1966; lowest, 155.5 ft (47.40 m) below land-surface datum, Sept. 7, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	148.7	JAN 5	146.0	MAR 16	147.2	MAY 5	149.3	JUL 20	151.9	AUG 31	150.7
NOV 19	145.5										

DAKOTA COUNTY--Continued

444702093170101. Local number, 027N24W34BDC01.
LOCATION.--Lat 44°47'02", long 93°17'01", in SW¼SE¼NW¼ sec.34, T.27 N., R.24 W., Hydrologic Unit 07020012, at Burnsville recycling center.
Owner: City of Burnsville.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 220 ft (67.1 m), cased to 180 ft (54.9 m).
DATUM.--Altitude of land-surface datum is 725 ft (221 m). Measuring point: Top of well cap, 2.70 ft (0.82 m) above land-surface datum.
REMARKS.--Water level affected by pumping from nearby city wells.
PERIOD OF RECORD.--July 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.50 ft (2.29 m) above land-surface datum, Sept. 12, 1975; lowest, 42.00 ft (12.80 m) below land-surface datum, July 22, 1975.

WATER LEVEL, IN FEET BELOW OR ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 16	12.13	MAY 13	+0.70	JUL 20	9.20	AUG 31	7.50

445330093054101. Local number, 028N22W19DCC01.
LOCATION.--Lat 44°53'30", long 93°05'41", in SW¼SW¼SE¼ sec.19, T.28 N., R.22 W., Hydrologic Unit 07010206, in West St. Paul.
Owner: U.S. Geological Survey, 1-N.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 6 in (0.15 m), depth 652 ft (199 m), cased to 561 ft (171 m).
DATUM.--Land-surface datum is 1,039.0 ft (316.7 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 3.40 ft (1.04 m) above land-surface datum.
REMARKS.--Water level affected by regional pumping.
PERIOD OF RECORD.--October 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 315.2 ft (96.07 m) below land-surface datum, Apr. 15, 1980; lowest, 332.9 ft (101.5 m) below land-surface datum, July 31, 1975.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	318.0	JAN 13	316.2	MAR 19	316.8	MAY 13	316.5	JUL 22	321.5	SEP 11	323.1
NOV 20	316.8										

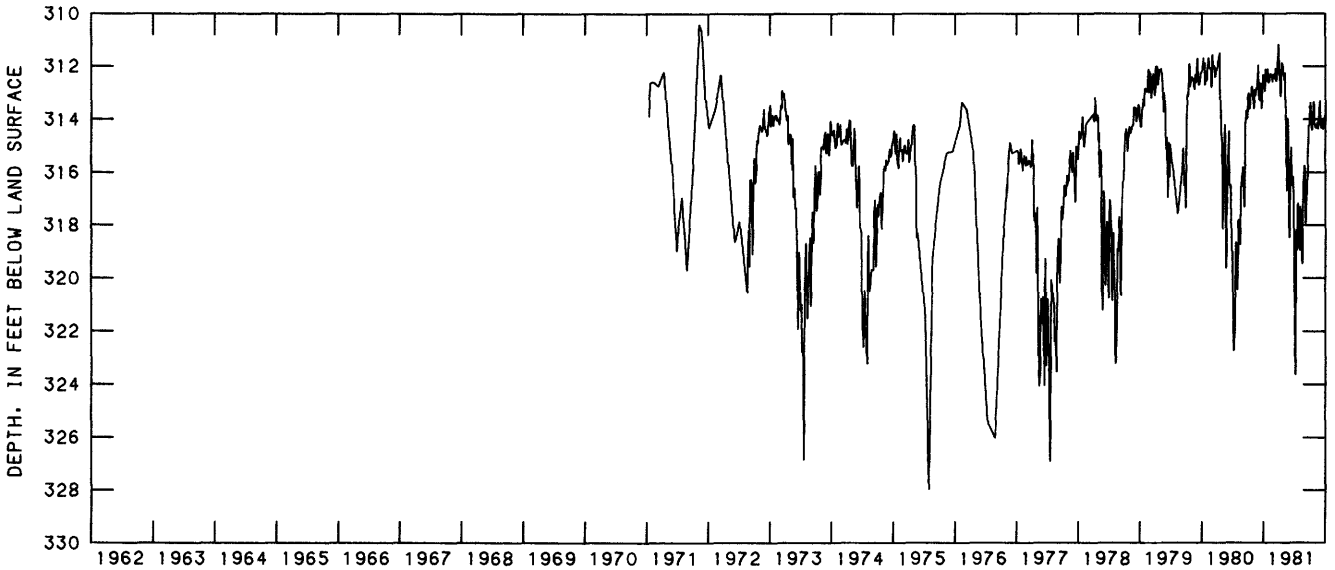
445330093054301. Local number, 028N22W19DCC02.
LOCATION.--Lat 44°53'30", long 93°05'43", in SW¼SW¼SE¼ sec.19, T.28 N., R.22 W., Hydrologic Unit 07010206, in West St. Paul.
Owner: U.S. Geological Survey, 2-N.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 6 in (0.15 m), depth 539 ft (164 m), cased to 407 ft (124 m).
DATUM.--Land-surface datum is 1,036.8 ft (316.0 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.60 ft (0.79 m) 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, 310.4 ft (94.61 m) below land-surface datum, Nov. 9, 1971; lowest, 328.0 ft (99.97 m) below land-surface datum, July 31, 1975.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	313.0	313.6	313.1	312.4	312.6	312.3	312.2	312.5	318.5	319.6	319.0	316.5
10	313.6	312.9	313.3	313.0	312.3	312.5	312.5	312.3	316.2	323.6	317.3	318.0
15	313.0	313.1	312.6	312.6	312.3	312.1	313.2	314.3	315.1	318.2	318.6	316.6
20	313.1	312.8	313.6	312.5	312.4	312.6	311.9	316.7	316.5	319.0	319.5	316.1
25	312.7	312.8	313.0	312.1	312.6	312.1	311.9	314.0	316.2	317.2	316.6	314.3
EOM	313.2	312.0	312.3	312.6	312.3	311.2	312.3	315.5	317.2	318.7	315.7	314.2

WTR YEAR 1981 HIGHEST 311.0 MAR 30, 1981 LOWEST 323.6 JUL 10, 1981

DAKOTA COUNTY--Continued



028N22W19DCC02

443149092582701. Local number, 112N18W03CDC01.
LOCATION.--Lat 44°31'49", long 92°58'27", in SW¼SE¼SW¼ sec.3, T.112 N., R.18 W., Hydrologic Unit 07040002, 0.25 mi (0.40 km) east of Felton Avenue.
Owner: Arnold Felton.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled irrigation water-table well, diameter 16 in (0.41 m), depth 32 ft (9.8 m), screened 17 to 32 ft (5.2 to 9.8 m).
DATUM.--Altitude of land-surface datum is 865 ft (264 m). Measuring point: Top of casing, 1.30 ft (0.49 m) above land-surface datum.
REMARKS.--Water level affected by Lake Byllesby.
PERIOD OF RECORD.--October 1979 to June 1980.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.76 ft (1.25 m) below land-surface datum, Sept. 3, 1981; lowest, 5.69 ft (1.73 m) below land-surface datum, Mar. 12, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	4.15	JAN 7	5.39	MAR 12	5.69	MAY 11	4.87	JUL 17	4.39	SEP 3	3.76
NOV 21	4.72										

443146093002201. Local number, 112N18W08ABA01.
LOCATION.--Lat 44°31'46", long 93°00'22", in NE¼NW¼NE¼ sec.8, T.112 N., R.18 W., Hydrologic Unit 07040002, northeast of Randolph.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 44 (13.4 m), screened 42 to 44 ft (12.8 to 13.4 m).
DATUM.--Altitude of land-surface datum is 880 ft (268 m). Measuring point: Top of casing, 3.40 ft (1.04 m) above land-surface datum.
PERIOD OF RECORD.--April 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 19.88 ft (6.06 m) below land-surface datum, Sept. 18, 1979; lowest, 23.80 ft (7.25 m) below land-surface datum, Feb. 21, 1979.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	20.96	JAN 7	22.05	MAR 12	22.20	MAY 11	21.99	JUL 17	20.68	SEP 3	20.24
NOV 21	21.62										

DAKOTA COUNTY--Continued

443134093010601. Local number, 112N18W08BBC01.
LOCATION.--Lat 44°31'34", long 93°01'06", in SW¼NW¼NW¼ sec.8, T.112 N., R.18 W., Hydrologic Unit 07040002, at Randolph Fire Station.
Owner: City of Randolph.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled fire protection artesian well, diameter 10 in (0.25 m), depth 150 ft (45.7 m), cased to 64 ft (19.5 m).
DATUM.--Altitude of land-surface datum is 883 ft (269 m). Measuring point: Top of 3/4-inch (0.02 m) breather pipe, 2.20 ft (0.67 m) above land-surface datum.
PERIOD OF RECORD.--July 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 11.97 ft (3.65 m) below land-surface datum, Apr. 3, 1979; lowest, 19.70 ft (6.00 m) below land-surface datum, Aug. 11, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	15.32	JAN 7	15.77	MAR 12	15.15	MAY 11	15.10	JUL 17	14.57	SEP 3	13.89
NOV 21	15.73										

443136093042901. Local number, 112N19W11BBD01.
LOCATION.--Lat 44°31'36", long 93°04'29", in SE¼NW¼NW¼ sec.11, T.112 N., R.19 W., Hydrologic Unit 07040002, Northfield Boulevard, 0.3 mi (0.1 km) southwest of 290th Street.
Owner: Willmer Volkert.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 16 in (0.41 m), depth 364 ft (111 m), cased to 40 ft (12.2 m).
DATUM.--Altitude of land-surface datum is 894 ft (273 m). Measuring point: Hole in pump base, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--September 1977, February 1978, June 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 9.25 ft (2.82 m) below land-surface datum, June 11, 1979; lowest, 12.65 ft (3.86 m) below land-surface datum, Sept. 14, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	11.24	JAN 7	11.30	MAR 12	12.00	MAY 11	10.52	JUL 16	10.39	SEP 2	9.62
NOV 21	11.20										

442830093085201. Local number, 112N19W30DBD01.
LOCATION.--Lat 44°28'30", long 93°08'52", in SE¼NW¼SE¼ sec.30, T.112 N., R.19 W., Hydrologic Unit 07040002, at Northfield waste treatment plant.
Owner: City of Northfield.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 6 in (0.15 m), depth 275 ft (83.8 m), cased to 212 ft (64.6 m).
DATUM.--Altitude of land-surface datum is 890 ft (271 m). Measuring point: Center of pressure guage, 2.05 ft (0.62 m) above land-surface datum.
PERIOD OF RECORD.--May 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 13.83 ft (4.22 m) above land-surface datum, Nov. 5, 1979; lowest, 9.44 ft (2.88 m) above land-surface datum, July 10, 1981.

WATER LEVEL, IN FEET ABOVE LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	10.71	JAN 7	9.90	MAR 12	9.67	MAY 11	10.02	JUL 10	9.44	SEP 2	11.06
NOV 21	10.37										

DAKOTA COUNTY--Continued

443747092483501. Local number, 113N17W01BBA01.
LOCATION.--Lat 44°37'47", long 92°48'35", in NE¼NW¼NW¼ sec.1, T.113 N., R.17 W., Hydrologic Unit 07040001, north of Miesville.
Owner: Alvin Bauer.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation water-table well, diameter 16 in (0.41 m), depth 424 ft (129 m), cased to 50 ft (15.2 m).
DATUM.--Altitude of land-surface datum is 994 ft (288 m). Measuring point: Hole in pump base, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--August 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 144.5 ft (44.04 m) below land-surface datum, Mar. 3, 1980; lowest, 151.7 ft (46.24 m) below land-surface datum, Sept. 3, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	148.7	DEC 31	148.4	MAR 11	149.0	MAY 7	149.7	JUL 16	150.9	SEP 3	151.7
NOV 17	148.6										

443459092531901. Local number, 113N17W20BCA01.
LOCATION.--Lat 44°34'59", long 92°53'19", in NE¼SW¼NW¼ sec.20, T.113 N., R.17 W., Hydrologic Unit 07040002, southeast of New Trier.
Owner: Leander Kimmes.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 16 in (0.41 m), depth 451 ft (137 m), cased to 64 ft (19.5 m).
DATUM.--Altitude of land-surface datum is 920 ft (280 m). Measuring point: Edge of vent pipe, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--September 1977, February 1978, June 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 55.25 ft (16.84 m) below land-surface datum, Dec. 10, 1979; lowest, 63.05 ft (19.22 m) below land-surface datum, Aug. 8, 1979.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	56.88	DEC 31	56.60	MAR 12	56.84	MAY 7	57.37	JUL 16	59.64	SEP 3	58.58
NOV 17	56.73										

443645093014701. Local number, 113N18W07BAC01.
LOCATION.--Lat 44°36'45", long 93°01'47", in SW¼NE¼NW¼ sec.7, T.113 N., R.18 W., Hydrologic Unit 07040001, west of Hampton.
Owner: Eugene Dohmen.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 16 in (0.41 m), depth 325 ft (99.1 m), cased to 65 ft (19.8 m).
DATUM.--Altitude of land-surface datum is 915 ft (217 m). Measuring point: Hole in pump base, 1.60 ft (0.49 m) above land-surface datum.
PERIOD OF RECORD.--April 1977 to August 1977, January 1978, June 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 29.75 ft (9.07 m) below land-surface datum, Dec. 10, 1979; lowest, 33.19 ft (10.12 m) below land-surface datum, Aug. 12, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	30.98	DEC 31	31.38	MAR 13	31.77	MAY 7	31.77	JUL 16	32.06	SEP 2	31.94
NOV 17	31.14										

DAKOTA COUNTY--Continued

444205925000 01. Local number, 114N17W10AAA01.
LOCATION.--Lat 44°42'05", long 92°50'00", in NE¼NE¼NE¼ 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 (0.10 m), depth 151 ft (46.0 m), depth of casing unknown.
DATUM.--Altitude of land-surface datum is 827 ft (252 m). Measuring point: Top of platform, 2.50 ft (0.76 m) above land-surface datum.
PERIOD OF RECORD.--April 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 98.82 ft (30.12 m) below land-surface datum, July 26, 1978; lowest, 107.4 ft (32.74 m) below land-surface datum, Mar. 12, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	102.2	.....	102.5	102.6	102.8	102.9	103.2	103.2	103.2	103.3	103.8	104.0
10	.....	.....	102.6	102.9	102.9	102.9	103.0	103.2	103.2	103.5	103.8	103.8
15	.....	.....	102.4	102.8	102.7	103.0	103.2	103.1	103.2	103.5	103.9	104.0
20	.....	102.5	102.9	102.8	102.9	102.9	103.2	103.1	103.2	103.6	103.8	103.9
25	.....	102.6	102.7	102.4	103.1	103.0	103.0	103.1	103.3	103.7	103.9	104.0
EOM	.....	102.5	102.5	102.8	102.9	102.9	103.1	103.2	103.4	103.7	103.8	104.0

WTR YEAR 1981 HIGHEST 101.9 OCT 5, 1980 LOWEST 104.1 SEP 27-28, 1981

444101092500001. Local number, 114N17W15ADA01.
LOCATION.--Lat 44°41'01", long 92°50'00", in NE¼SE¼NE¼ sec.15, T.114 N., R.17 W., Hydrologic Unit 07040001, 1.5 mi (2.4 km) south of State Highway 316.
Owner: Schultz and Swanson.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 5 in (0.13 m), depth 119 ft (36.3 m), screen information not available.
DATUM.--Altitude of land-surface datum is 820 ft (250 m). Measuring point: Top of pump flange, 0.50 ft (0.15 m) above land-surface datum.
PERIOD OF RECORD.--April 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 93.85 ft (28.61 m) below land-surface datum, Apr. 7, 1980; lowest, 100.0 ft (30.48 m) below land-surface datum, June 27, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	94.90	DEC 31	94.96	MAR 11	95.13	MAY 7	95.25	JUL 16	95.67	SEP 3	96.22
NOV 17	94.99										

444047092521901. Local number, 114N17W16CBB01.
LOCATION.--Lat 44°40'47", long 92°52'19", in NW¼NW¼SW¼ sec.16, T.114 N., R.17 W., Hydrologic Unit 07040001, Kirby Avenue, 0.5 mi (0.8 km) north of 190th Street.
Owner: Jim Huneke Construction Company.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 4 in (0.10 m), depth 170 ft (51.8 m), screened 164 to 170 ft (50.0 to 51.8 m).
DATUM.--Altitude of land-surface datum is 823 ft (251 m). Measuring point: Top of casing, 1.10 ft (0.34 m) above land-surface datum.
PERIOD OF RECORD.--March 1976, March 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 80.98 ft (24.68 m) below land-surface datum, Apr. 7, 1980; lowest, 87.75 ft (26.75 m) below land-surface datum, June 27, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	82.17	DEC 31	81.76	MAR 11	81.84	MAY 11	82.15	JUL 17	82.92	SEP 3	83.49
NOV 17	81.95										

DAKOTA COUNTY--Continued

444116092541301. Local number, 114N17W18ABB01.
LOCATION.--Lat 44°41'16", long 92°54'13", in NW¼NW¼NE¼ sec.18, T.114 N., R.17 W., Hydrologic Unit 07040001, 0.3 mi (0.5 km) east of Northfield Boulevard.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 94 ft (28.6 m), screened 92 to 94 ft (28.0 to 28.6 m).
DATUM.--Altitude of land-surface datum is 830 ft (253 m). Measuring point: Top of casing, 3.90 ft (1.19 m) above land-surface datum.
PERIOD OF RECORD.--April 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 78.93 ft (24.06 m) below land-surface datum, Apr. 7, 1980; lowest, 86.32 ft (26.31 m) below land-surface datum, June 27, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	80.63	DEC 31	80.52	MAR 11	80.55	MAY 11	80.69	JUL 17	81.15	SEP 3	81.59
NOV 17	80.63										

443850092495501. Local number, 114N17W26CCB01.
LOCATION.--Lat 44°38'50", long 92°49'55", in NW¼SW¼SW¼ sec.26, T.114 N., R.17 W., Hydrologic Unit 07040001, Michael Avenue, 1.8 mi (2.9 km) south of 190th Street).
Owner: State of Minnesota.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 5 in (0.13 m), depth 195 ft (59.4 m), cased to 25 ft (7.6 m).
DATUM.--Altitude of land-surface datum is 900 ft (274 m). Measuring point: Hole in well cap, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--June 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 118.9 ft (36.24 m) below land-surface datum, Mar. 3, 1980; lowest, 124.2 ft (37.86 m) below land-surface datum, June 7, 1979.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	122.2	NOV 17	122.0	DEC 31	121.9	MAR 11	122.4	MAY 7	123.2	JUL 14	123.9

443754092544701. Local number, 114N17W31CCC01.
LOCATION.--Lat 44°37'54", long 92°54'47", in SW¼SW¼SW¼ sec.31, T.114 N., R.17 W., Hydrologic Unit 07040001, Inga Avenue, 0.1 mi (0.2 km) north of 220th Street.
Owner: Jim Carnell.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 16 in (0.41 m), depth 406 ft (124 m), cased to 29 ft (8.8 m).
DATUM.--Altitude of land-surface datum is 890 ft (271 m). Measuring point: Hole in pump base, 1.30 ft (0.40 m) above land-surface datum.
PERIOD OF RECORD.--June 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 35.95 ft (10.96 m) below land-surface datum, Apr. 11, 1980; lowest, 40.52 ft (12.35 m) below land-surface datum, Aug. 8, 1979.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	37.08	DEC 31	36.49	MAR 11	36.41	MAY 7	36.75	JUL 16	38.93	SEP 3	38.42
NOV 17	36.70										

DAKOTA COUNTY--Continued

443827092521801. Local number, 114N17W33BBC01.
LOCATION.--Lat 44°38'27", long 92°52'18", in SW¼NW¼NW¼ sec.33, T.114 N., R.17 W., Hydrologic Unit 07040001, 39 ft (11.9 m) south of irrigation well.
Owner: Rainer Kimmes.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 16 in (0.41 m), depth 290 ft (88.4 m), cased to 25 ft (7.6 m).
DATUM.--Altitude of land-surface datum is 862 ft (263 m). Measuring point: Hole in plate over well, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--August 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 64.08 ft (19.53 m) below land-surface datum, Jan. 16, 1980; lowest, 78.52 ft (23.02 m) below land-surface datum, Aug. 10, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	68.18	DEC 31	67.20	MAR 11	67.75	MAY 7	68.52	JUL 16	70.76	SEP 3	70.28
NOV 17	67.56										

444248092550601. Local number, 114N18W01ADB01.
LOCATION.--Lat 44°42'48", long 92°55'06", in NW¼SE¼NE¼ sec.1, T.114 N., R.18 W., Hydrologic Unit 07040001, 1.75 mi (2.82 km) west of Hastings.
Owner: Greg Bauer.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation water-table well, diameter 16 in (0.41 m), depth 400 ft (122 m), cased to 300 ft (91.4 m).
DATUM.--Altitude of land-surface datum is 830 ft (253 m). Measuring point: Hole in pump base, 0.40 ft (0.12 m) above land-surface datum.
PERIOD OF RECORD.--June 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 97.92 ft (29.85 m) below land-surface datum, June 11, 1980; lowest, 99.14 ft (30.22 m) below land-surface datum, Sept. 3, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	98.33	JAN 7	98.62	MAR 12	98.62	MAY 11	98.76	JUL 17	98.90	SEP 3	99.14
NOV 17	98.53										

444117092560201. Local number, 114N18W11DDD01.
LOCATION.--Lat 44°41'17", long 92°56'02", in SE¼SE¼SE¼ sec.11, T.114 N., R.18 W., Hydrologic Unit 07040001, Hogan Avenue and 180th Street.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 58 ft (17.7 m), screened 56 to 58 ft (17.1 to 17.7 m).
DATUM.--Altitude of land-surface datum is 838 ft (255 m). Measuring point: Top of casing 3.30 ft (1.01 m) above land-surface datum.
PERIOD OF RECORD.--April 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 40.27 ft (12.27 m) below land-surface datum, Apr. 3, 1979; lowest, 45.23 ft (13.79 m) below land-surface datum, Dec. 14, 1977, Jan. 18, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	42.79	DEC 31	42.90	MAR 11	43.30	MAY 11	43.72	JUL 17	43.93	SEP 3	43.90
NOV 17	42.80										

DAKOTA COUNTY--Continued

444117092595701. Local number, 114N18W17AAB01.
LOCATION.--Lat 44°41'17", long 92°59'57", in NW¼NE¼NE¼ sec.17, T.114 N., R.18 W., Hydrologic Unit 07040001, 180th Street, 0.25 mi (0.40 km) west of Emery Avenue.
Owner: Joe Ries.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 16 in (0.41 m), depth 280 ft (85.3 m), cased to 39 ft (11.9 m).
DATUM.--Altitude of land-surface datum is 905 ft (276 m). Measuring point: Edge of vent pipe, 1.40 ft (0.43 m) above land-surface datum.
PERIOD OF RECORD.--June 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 65.81 ft (20.06 m) below land-surface datum, June 11, 1979; lowest, 71.60 ft (21.82 m) below land-surface datum, July 17, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	70.76	DEC 31	68.37	MAR 12	68.42	MAY 7	68.94	JUL 17	71.60	SEP 3	71.18
NOV 17	68.73										

443933092595401. Local number, 114N18W29AAB01.
LOCATION.--Lat 44°39'33", long 92°59'54", in NW¼NE¼NE¼ sec.29, T.114 N., R.18 W., Hydrologic Unit 07040001, east of Empire.
Owner: U.S. Geological Survey
AQUIFER.--Surficial outwash sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 30 ft (0.91 m), screened 28 to 30 ft (8.5 to 9.1 m).
DATUM.--Altitude of land-surface datum is 850 ft (259 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--April 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 13.53 ft (4.12 m) below land-surface datum, Apr. 3, 1979; lowest, 16.93 ft (5.16 m) below land-surface datum, Sept. 12, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	15.04	DEC 31	15.60	MAR 12	15.67	MAY 7	15.59	JUL 17	15.76	SEP 3	15.58
NOV 17	15.38										

443801092571301. Local number, 114N18W35CCB01.
LOCATION.--Lat 44°38'01", long 92°57'13", in NW¼SW¼SW¼ sec.35, T.114 N., R.18 W., Hydrologic Unit 07040001, Goodwin Avenue, 1.1 mi (1.8 km) south of Northfield Boulevard.
Owner: Al Wagner, Jr.
AQUIFER.--Buried gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 203 ft (61.9 m), screened 173 to 203 ft (52.7 to 61.9 m).
DATUM.--Altitude of land-surface datum is 898 ft (274 m). Measuring point: Hole in pump base, 1.25 ft (0.38 m) above land-surface datum.
PERIOD OF RECORD.--June 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 31.11 ft (9.48 m) below land-surface datum, June 12, 1979; lowest, 35.80 ft (10.91 m) below land-surface datum, Sept. 3, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

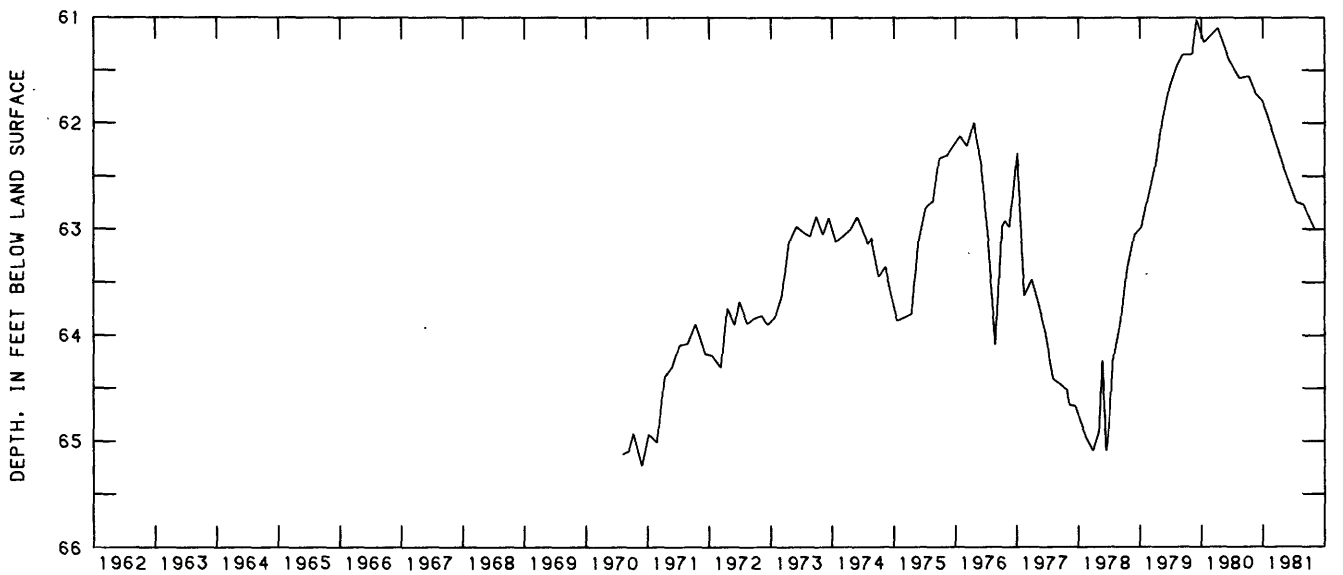
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	34.39	DEC 31	33.47	MAR 11	33.75	MAY 7	34.34	JUL 16	35.78	SEP 3	35.80
NOV 17	33.68										

DAKOTA COUNTY--Continued

444220093055001. Local number, 114N19W04DAC01.
LOCATION.--Lat 44°42'20", long 93°05'50", in NE¼SE¼SE¼ sec.4, T.114 N., R.19 W., Hydrologic Unit 07040001, 2.1 mi (3.4 km) southeast of Rosemount.
Owner: University of Minnesota Agricultural Experiment Station (Plant Pathology).
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 6 in (0.15 m), depth 415 ft (126 m), cased to 355 ft (108 m).
DATUM.--Altitude of land-surface datum is 947 ft (289 m). Measuring point: Top of 1-inch breather pipe, 2.10 ft (0.64 m) above land-surface datum.
PERIOD OF RECORD.--August 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 61.02 ft (18.60 m) below land-surface datum, Dec. 4, 1979; lowest, 65.23 ft (19.88 m) below land-surface datum, Nov. 27, 1970.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	61.56	DEC 31	61.80	MAR 13	62.15	MAY 7	62.43	JUL 17	62.75	SEP 2	62.78
NOV 17	61.72										



114N19W04DAC01

443934093043201. Local number, 114N19W22DDD01.
LOCATION.--Lat 44°39'34", long 93°04'32", in SE¼SE¼SE¼ sec.22, T.114 N., R.19 W., Hydrologic Unit 07040001, west of Empire.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 24 ft (7.3 m), screened 22 to 64 ft (6.7 to 7.3 m).
DATUM.--Altitude of land-surface datum is 875 ft (267 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--April 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.90 ft (1.80 m) below land-surface datum, Apr. 3, 1979; lowest, 9.08 ft (2.77 m) below land-surface datum, Sept. 12, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	7.30	DEC 31	8.28	MAR 13	8.45	MAY 7	7.94	JUL 16	8.12	SEP 2	8.03
NOV 17	7.95										

DAKOTA COUNTY--Continued

443831093074201. Local number, 114N19W32BAD01.
LOCATION.--Lat 44°38'31", long 93°07'42", in SE¼NE¼NW¼ sec.32, T.114 N., R.19 W., Hydrologic Unit 07040001, at City of Farmington.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 23 ft (7.0 m), screened 21 to 23 ft (6.4 to 7.0 m).
DATUM.--Altitude of land-surface datum is 895 ft (273 m). Measuring point: Top of casing, 3.75 ft (1.14 m) above land-surface datum.
PERIOD OF RECORD.--August 1974 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.51 ft (1.07 m) below land-surface datum, May 2, 1975; lowest, 8.60 ft (2.62 m) below land-surface datum, Oct. 26, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	4.77	DEC 31	5.37	MAR 13	5.95	MAY 7	5.95	JUL 17	5.93	SEP 2	5.72
NOV 17	5.13										

443832093133801. Local number, 114N20W33ABC01.
LOCATION.--Lat 44°38'32", long 93°13'38", in SE¼NW¼NE¼ sec.33, T.114 N., R.20 W., Hydrologic Unit 07040001, at old waste treatment plant.
Owner: City of Lakeville.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 150 ft (45.7 m), cased to 131 ft (39.9 m).
DATUM.--Altitude of land-surface datum is 950 ft (290 m). Measuring point: Top of well cap, at land-surface datum.
PERIOD OF RECORD.--June 1981 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.30 ft (3.14 m) below land-surface datum, Sept. 2, 1981; lowest, 10.92 ft (3.33 m) below land-surface datum, June 11, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

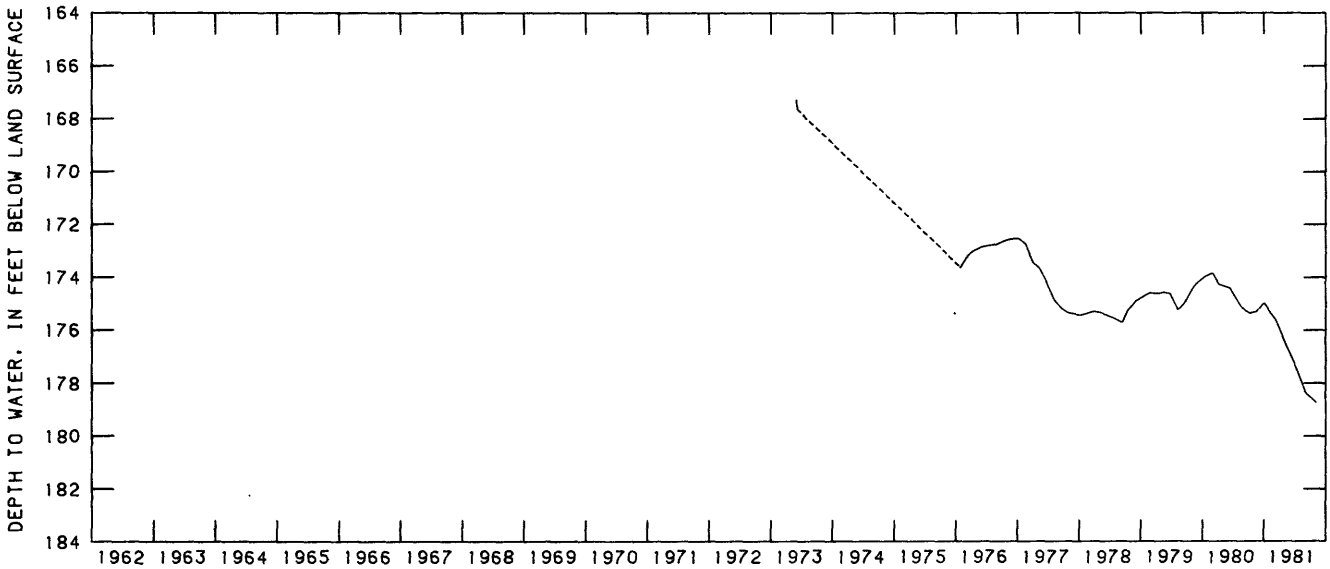
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JUN 11	10.92	JUL 16	10.62	SEP 2	10.30

444616093020101. Local number, 115N18W18BCB01.
LOCATION.--Lat 44°46'16", long 93°02'01", in NW¼SW¼NW¼ sec.18, T.115 N., R.18 W., Hydrologic Unit 07010206, southwest corner of Pine Bend Cemetery.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 189 ft (57.6 m), screened 187 to 189 ft (57.0 to 57.6 m).
DATUM.--Altitude of land-surface datum is 930 ft (283 m). Measuring point: Top of casing, 3.80 ft (1.16 m) above land-surface datum.
PERIOD OF RECORD.--May and June 1973, January 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 167.3 ft (50.99 m) below land-surface datum, Mar. 31, 1973; lowest, 178.4 ft (54.38 m) below land-surface datum, Sept. 12, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	175.4	DEC 31	175.0	MAR 13	175.6	MAY 7	176.5	JUL 17	177.5	SEP 2	178.4
NOV 17	175.3										

DAKOTA COUNTY--Continued



115N18W18BCB01

444358093034001. Local number, 115N19W26DCD01.
LOCATION.--Lat 44°43'58", long 93°03'40", in SE¼SW¼SE¼ sec.26, T.115 N., R.19 W., Hydrologic Unit 07040001, at Rosemount Research Center.
Owner: University of Minnesota.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 5 in (0.13 m), depth 156 ft (47.5 m), cased to 140 ft (42.7 m).
DATUM.--Altitude of land-surface datum is 930 ft (283 m). Measuring point: Top of well cap, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--August 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 85.38 ft (26.02 m) below land-surface datum, Dec. 4, 1979; lowest, 90.73 ft (27.65 m) below land-surface datum, Nov. 27, 1970.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	85.98	NOV 17	86.24	DEC 31	86.12	MAR 13	86.52	MAY 7	Well destroyed

444631093150901. Local number, 115N20W08CDC01.
LOCATION.--Lat 44°46'31", long 93°15'09", in SW¼SE¼SW¼ sec.8, T.115 N., R.20 W., Hydrologic Unit 07020012, 0.05 mi (0.08 km) east of Burnsville Boulevard.
Owner: City of Burnsville.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 6 in (0.15 m), depth 504 ft (154 m), cased to 420 ft (128 m).
DATUM.--Altitude of land-surface datum is 980 ft (299 m). Measuring point: Top of coupling, 2.50 ft (0.76 m) above land-surface datum.
PERIOD OF RECORD.--September 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 183.4 ft (55.90 m) below land-surface datum, Nov. 24, 1980; lowest, 189.0 ft (57.61 m) below land-surface datum, July. 20, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

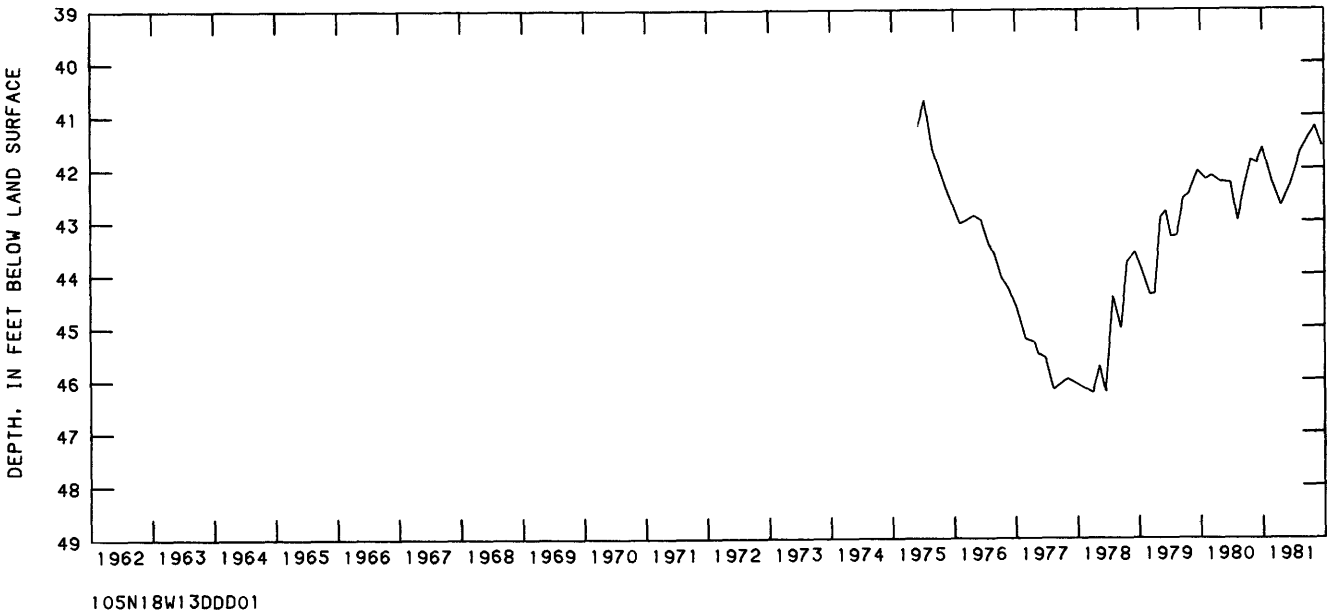
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	185.2	JAN 8	185.5	MAR 16	186.4	MAY 13	187.3	JUL 20	189.0	AUG 31	186.5
NOV 24	183.4										

DODGE COUNTY

435336092553201. Local number, 105N18W13DDD01.
LOCATION.--Lat 43°53'36", long 92°55'32", in SE¼SE¼SE¼ sec.13, T.105 N., R.18 W., Hydrologic Unit 07080201, 3 mi (4.8 km) west of Hayfield.
Owner: James Barry.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 5 in (0.13 m), depth 82 ft (25.0 m), screen information not available.
DATUM.--Altitude of land-surface datum is 1,288 ft (393 m). Measuring point: Top of casing, 1.80 ft (0.55 m) above land-surface datum.
PERIOD OF RECORD.--June 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 40.70 ft (12.41 m) below land-surface datum, July 11, 1975; lowest, 46.25 ft (14.10 m) below land-surface datum, Mar. 30, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	41.84	DEC 30	41.61	APR 20	42.71	JUN 15	42.30	AUG 11	41.70	SEP 22	41.44
NOV 26	41.90	FEB 24	42.24								



440448092485501. Local number, 107N17W13BBA01.
LOCATION.--Lat 44°04'48", long 92°48'55", in NE¼NW¼NW¼ sec.13, T.107 N., R.17 W., Hydrologic Unit 07040004, in City of Wasioja.
Owner: Wasioja Township Garage.
AQUIFER.--Galena Formation of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled maintenance artesian well, diameter 6 in (0.15 m), depth 100 ft (30.5 m), cased to 52 ft (15.8 m).
DATUM.--Altitude of land-surface datum is 1,185 ft (361 m). Measuring point: Top of casing, 1.60 ft (0.49 m) above land-surface datum.
PERIOD OF RECORD.--January 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 17.97 ft (5.48 m) below land-surface datum, July 11, 1975; lowest, 26.88 ft (8.19 m) below land-surface datum, Jan. 5, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

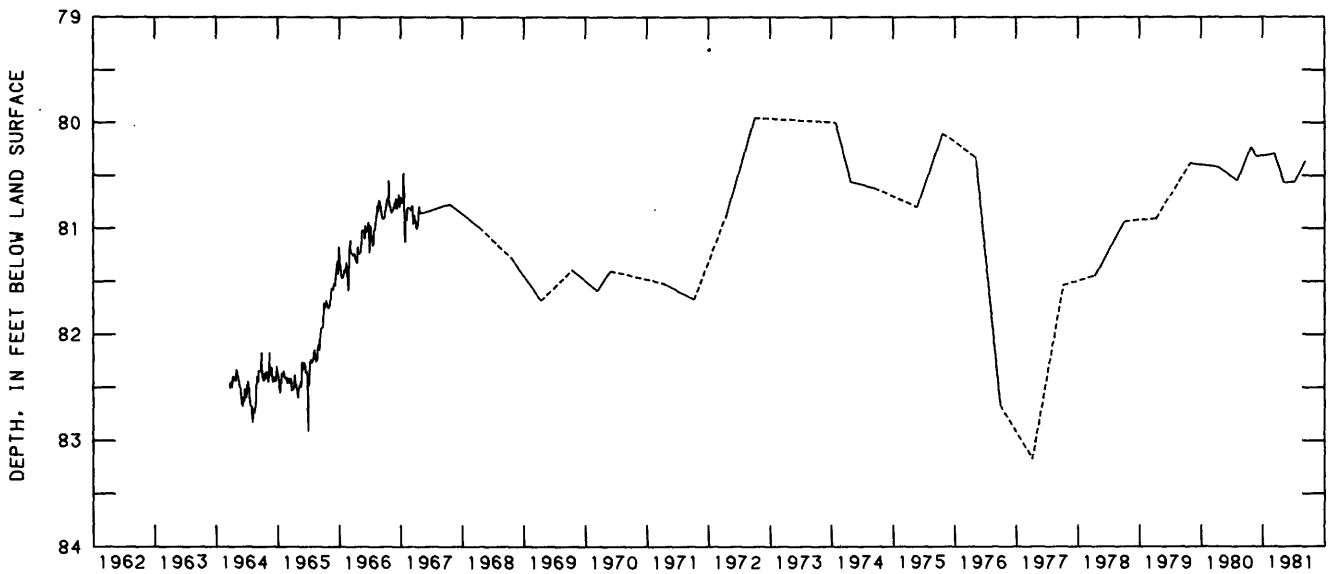
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	23.68	DEC 30	24.21	APR 22	24.18	JUN 18	24.20	AUG 13	23.33	SEP 23	22.87
NOV 26	23.99	FEB 26	25.18								

DOUGLAS COUNTY

454643095413201. Local number, 127N40W27CBB01.
LOCATION.--Lat 45°46'43", long 95°41'32", in NW¼NW¼SW¼ sec.27, T.127 N., R.40 W., Hydrologic Unit 07020005, at Kensington.
Owner: City of Kensington.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 10 in (0.25 m), depth 259 ft (78.9 m), screened 251 to 261 ft (76.5 to 79.6 m).
DATUM.--Altitude of land-surface datum is 1,332 ft (406 m). Measuring point: Top of casing, 2.10 ft (0.64 m) above land-surface datum.
PERIOD OF RECORD.--March 1964 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 79.95 ft (24.37 m) below land-surface datum, Oct. 2, 1972; lowest, 83.17 ft (25.35 m) below land-surface datum, Apr. 5, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	80.23	NOV 24	80.32	MAR 12	80.29	MAY 7	80.57	JUL 10	80.56	SEP 9	80.37



127N40W27CBB01

FARIBAULT COUNTY

434237094082901. Local number, 103N28W24BDC01.
LOCATION.--Lat 43°42'37", long 94°08'29", in SW¼SE¼NW¼ sec.24, T.103 N., R.28 W., Hydrologic Unit 07020009, 4.5 mi (7.2 km) south of Winnebago.
Owner: Riverside Town and Country Club.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 8 in (0.20 m), depth 352 ft (107 m), cased to 291 ft (88.7 m).
DATUM.--Altitude of land-surface datum is 1,085 ft (331 m). Measuring point: Top of coupling, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--July 1979, April 1980, May 1981 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 37.59 ft (11.46 m) below land-surface datum, Apr. 18, 1980; lowest, 39.20 ft (11.95 m) below land-surface datum, July 31, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL
MAY 28	38.05	SEP 15	38.02

FARIBAULT COUNTY--Continued

434558093540001. Local number, 104N26W36CAC01.
LOCATION.--Lat 43°45'58", long 93°54'00", in SW¼NE¼SW¼ sec.36, T.104 N., R.26 W., Hydrologic Unit 07020011, at Easton Creamery.
Owner: City of Easton.
AQUIFER.--Platteville Formation of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled public supply artesian well, diameter 6 in (0.15 m), depth 145 ft (44.2 m), cased to 120 ft (36.6 m).
DATUM.--Altitude of land-surface datum is 1,060 ft (323 m). Measuring point: Top of well cap, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--August 1979, April 1980, May 1981 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 32.47 ft (9.90 m) below land-surface datum, Sept. 15, 1981; lowest, 35.25 ft (10.74 m) below land-surface datum, Aug. 1, 1979.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL
MAY 28	33.50	SEP 15	32.47

FREEBORN COUNTY

433434093331201. Local number, 101N23W02DAC01.
LOCATION.--Lat 43°34'34", long 93°33'12", in SW¼NE¼SE¼ sec.2, T.101 N., R.23 W., Hydrologic Unit 07080203, 3 mi (4.8 km) southwest of Conger.
Owner: Richard Steele.
AQUIFER.--Upper Carbonates of Devonian and Ordovician Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 16 in (0.41 m), depth 373 ft (114 m), cased to 156 ft (47.6 m).
DATUM.--Altitude of land-surface datum is 1,280 ft (390 m). Measuring point: Vent pipe, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--July 1981 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 68.50 ft (20.88 m) below land-surface datum, Sept. 15, 1981; lowest, 68.90 ft (21.00 m) below land-surface datum, July 8, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL
JUL 8	68.90	SEP 15	68.50

434032093111801. Local number, 103N20W36CCB01.
LOCATION.--Lat 43°40'32", long 93°11'18", in NW¼SW¼SW¼ sec.36, T.103 N., R.20 W., Hydrologic Unit 07080201, at Pillsbury Grain Station.
Owner: Pillsbury Co.
AQUIFER.--Cedar Valley Formation of Middle Devonian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 5 in (0.13 m), depth 231 ft (70.4 m), cased to 136 ft (41.4 m).
DATUM.--Altitude of land-surface datum is 1,255 ft (383 m). Measuring point: Top of casing, 1.80 ft (0.55 m) above land-surface datum.
PERIOD OF RECORD.--July 1981 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 50.76 ft (15.47 m) below land-surface datum, Sept. 15, 1981; lowest, 51.40 ft (15.67 m) below land-surface datum, July 8, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL
JUL 8	51.40	SEP 15	50.76

GOODHUE COUNTY

441737092400501. Local number, 110N15W31BBD01.
LOCATION.--Lat 44°17'37", long 92°40'05", in SE¼NW¼NW¼ sec.31, T.110 N., R.15 W., Hydrologic Unit 07040004, at Zumbrota Fire Station.
Owner: City of Zumbrota, well 3.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in (0.30 m), depth 210 ft (64.0 m), cased to 50 ft (15.2 m).
DATUM.--Altitude of land-surface datum is 1,000 ft (305 m). Measuring point: Hole in pump base, 2.20 ft (0.67 m) above land-surface datum.
PERIOD OF RECORD.--June 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 20.07 ft (6.12 m) below land-surface datum, July 11, 1975; lowest, 27.07 ft (8.23 m) below land-surfaoe datum, Jan. 5, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 24	25.46	FEB 23	25.43	APR 14	26.42	JUN 15	25.08	AUG 10	24.50	SEP 22	25.81
DEC 29	25.88										

442401092372501. Local number, 111N15W21CDA01.
LOCATION.--Lat 44°24'01", long 92°37'25", in NE¼SE¼SW¼ sec.21, T.111 N., R.15 W., Hydrologic Unit 07040004, in Goodhue clerk's office.
Owner: City of Goodhue, creamery well.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 12 in (0.30 m), depth 310 ft (94.5 m), cased to 175 ft (53.3 m).
DATUM.--Altitude of land-surface datum is 1,125 ft (343 m). Measuring point: Top of 1¼ in (0.03 m) elbow, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--June 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 124.4 ft (37.92 m) below land-surface datum, Aug. 23, 1974; lowest, 143.8 ft (43.83 m) below land-surface datum, Jan. 29, 1980.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	134.5	JAN 7	p142.1	FEB 27	135.5	JUN 15	136.5	AUG 10	136.9	SEP 22	137.1
NOV 28	136.7										

p Well pumping.

442844093001601. Local number, 112N18W29DBA01.
LOCATION.--Lat 44°28'44", long 93°00'16", in NE¼NW¼SE¼ sec.28, T.112 N., R.18 W., Hydrologic Unit 07040001, northeast of Stanton.
Owner: David McKeag.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in (0.30 m), depth 355 ft (108 m), cased to 43 ft (13.1 m).
DATUM.--Altitude of land-surface datum is 912 ft (278 m). Measuring point: Hole in cover, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--May 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 15.69 ft (4.78 m) below land-surface datum, Sept. 8, 1979; lowest, 17.72 ft (5.40 m) below land-surface datum, May 11, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	17.20	JAN 7	17.57	MAR 12	17.61	MAY 11	17.72	JUL 17	17.47	SEP 3	17.08
NOV 21	17.47										

GOODHUE COUNTY--Continued

443012092362201. Local number, 113N15W27BAB01.
LOCATION.--Lat 44°30'12", long 92°36'22", in NW¼NE¼NW¼ sec.27, T.113 N., R.15 W., Hydrologic Unit 07040002, at Red Wing.
Owner: City of Red Wing, Anderson Park.
AQUIFER.--Eau Claire-Mount Simon Sandstones of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in (0.30 m), depth 684 ft (208 m), cased to 243 ft (74.1 m).
DATUM.--Altitude of land-surface datum is 800 ft (244 m). Measuring point: Edge of casing, 2.70 ft (0.82 m) above land-surface datum.
PERIOD OF RECORD.--April 1976, June 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 104.1 ft (31.73 m) below land-surface datum, Jan. 7, 1981; lowest, 108.2 ft (32.98 m) below land-surface datum, Sept. 14, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	105.1	JAN 7	104.1	APR 13	104.7	JUN 15	104.5	AUG 10	104.8	SEP 22	104.8
NOV 28	104.6										

GRANT COUNTY

455010095523701. Local number, 127N41W06CAC01.
LOCATION.--Lat 45°50'10", long 95°52'37", in SW¼NE¼SW¼ sec.6, T.127 N., R.41 W., Hydrologic Unit 07020002.
Owner: Lee Hedstrom.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 70 ft (21.3 m), screened 50 to 70 ft (15.2 to 21.3 m).
DATUM.--Altitude of land-surface datum is 1,175 ft (358 m). Measuring point: Top of casing, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--May 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 35.30 ft (10.76 m) below land-surface datum, May 31, 1978; lowest, 39.80 ft (12.13 m) below land-surface datum, May 26, June 22, July 6, 19, Aug. 19, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	36.80	DEC 4	36.41	APR 15	36.36	JUN 30	36.33	AUG 20	36.44	SEP 21	36.40
NOV 4	36.80	FEB 24	36.42	MAY 26	36.59	JUL 29	38.60				

454624095513201. Local number, 127N41W32BBA01.
LOCATION.--Lat 45°46'24", long 95°51'32", in NE¼NW¼NW¼ sec.32, T.127 N., R.41 W., Hydrologic Unit 07020002.
Owner: Charles Musser.
AQUIFER.--Surficial gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored irrigation water-table well, diameter 16 in (0.41 m), depth 44 ft (13.4 m), screened 12 to 44 ft (3.7 to 13.4 m).
DATUM.--Altitude of land-surface datum is 1,129 ft (344 m). Measuring point: Top of casing, 0.90 ft (0.27 m) above land-surface datum.
PERIOD OF RECORD.--May 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.10 ft (0.94 m) below land-surface datum, May 31, 1978; lowest, 8.10 ft (2.47 m) below land-surface datum, Sept. 6, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	6.10	DEC 4	6.04	APR 15	5.98	JUN 30	5.73	AUG 20	6.24	SEP 21	6.33
NOV 4	7.10	FEB 23	5.99	MAY 26	6.40	JUL 29	p17.99				

p Well pumping.

GRANT COUNTY--Continued

455918095525201. Local number, 129N41W18ACB01.
LOCATION.--Lat 45°59'18", long 95°52'52", in NW¼SW¼NE¼ sec.18, T.129 N., R.41 W., Hydrologic Unit 07020002.
Owner: Paul Sanford.
AQUIFER.--Surficial gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored irrigation water-table well, diameter 16 in (0.41 m), depth 50 ft (15.2 m), screened 18 to 50 ft (5.5 to 15.2 m).
DATUM.--Altitude of land-surface datum is 1,177 ft (359 m). Measuring point: Top of casing, 1.40 ft (0.43 m) above land-surface datum.
PERIOD OF RECORD.--May 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.60 ft (3.23 m) below land-surface datum, May 31, 1978; lowest, 14.60 ft (4.45 m) below land-surface datum, Nov. 4, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	13.60	DEC 4	11.32	APR 15	11.12	JUL 29	11.14	AUG 20	11.29	SEP 21	11.27
NOV 4	14.60	FEB 23	11.46	MAY 26	11.17						

455731095532201. Local number, 129N41W30BCA01.
LOCATION.--Lat 45°57'31", long 95°53'22", in NE¼SW¼NW¼ sec.30, T.129 N., R.41 W., Hydrologic Unit 07020002.
Owner: Rick Mittag.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 5 in (0.13 m), depth 85 ft (25.9 m).
DATUM.--Altitude of land-surface datum is 1,198 ft (365 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--June 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 33.00 ft (10.06 m) below land-surface datum, May 30, June 21, 1978; lowest, 37.33 ft (11.38 m) below land-surface datum, July 7, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	36.00	DEC 4	34.28	MAY 26	34.24	JUL 29	34.09	AUG 20	33.94	SEP 21	34.16
NOV 4	35.00	APR 15	34.27	JUN 30	33.20						

455641095524001. Local number, 129N41W31ACA01.
LOCATION.--Lat 45°56'41", long 95°52'40", in NE¼SW¼NE¼ sec.31, T.129 N., R.41 W., Hydrologic Unit 07020002.
Owner: Paul Sanford.
AQUIFER.--Surficial gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored irrigation water-table well, diameter 16 in (0.41 m), depth 51 ft (15.5 m), screened 15 to 51 ft (4.6 to 15.5 m).
DATUM.--Altitude of land-surface datum is 1,165 ft (355 m). Measuring point: Top of casing, 0.80 ft (0.24 m) above land-surface datum.
PERIOD OF RECORD.--July 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 13.11 ft (4.00 m) below land-surface datum, June 30, 1981; lowest, 14.20 ft (4.33 m) below land-surface datum, Sept. 25, 1979 to Nov. 4, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	14.20	DEC 4	14.07	APR 15	13.92	JUN 30	13.11	AUG 20	13.35	SEP 21	13.50
NOV 4	14.20	FEB 23	13.42	MAY 26	13.98	JUL 29	13.18				

460316095551301. Local number, 130N42W23DBD01.
LOCATION.--Lat 46°03'16", long 95°55'13", in SE¼NW¼SE¼ sec.23, T.130 N., R.42 W., Hydrologic Unit 07020002.
Owner: George Haberer.
AQUIFER.--Buried gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 52 ft (15.8 m), screened 32 to 52 ft (9.8 to 15.8 m).
DATUM.--Altitude of land-surface datum is 1,189 ft (362 m). Measuring point: Top of plastic pipe, 0.65 ft (0.20 m) above land-surface datum.
PERIOD OF RECORD.--May 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 11.35 ft (3.46 m) below land-surface datum, July 31, 1979; lowest, 31.84 ft (9.70 m) below land-surface datum, Aug. 23, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	14.77	DEC 4	12.04	APR 15	12.48	JUN 30	11.87	AUG 20	12.25	SEP 21	12.41
NOV 4	14.35	FEB 23	12.48	MAY 26	12.82	JUL 29	12.12				

460235095545401. Local number, 130N42W26DAA01.
LOCATION.--Lat 46°02'35", long 95°54'54", in NE¼NE¼SE¼ sec.26, T.130 N., R.42 W., Hydrologic Unit 07020002.
Owner: Neil Ehlers.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 143 ft (43.6 m), screened 103 to 143 ft (31.4 to 43.6 m).
DATUM.--Altitude of land-surface datum is 1,199 ft (365 m). Measuring point: Hole in casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--June 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 23.00 ft (7.01 m) below land-surface datum, June 16, July 16, 1980; lowest, 28.50 ft (8.69 m) below land-surface datum, Aug. 1, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 4	24.20	APR 15	25.25	JUN 30	25.19	JUL 29	25.17	AUG 20	25.09	SEP 21	25.12
FEB 23	25.07	MAY 26	25.28								

460122095544901. Local number, 130N42W36CCC01.
LOCATION.--Lat 46°01'22", long 95°54'49", in SW¼SW¼SW¼ sec.36, T.130 N., R.42 W., Hydrologic Unit 07020002.
Owner: William Nelson.
AQUIFER.--Surficial gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled irrigation water-table well, diameter 16 in (0.41 m), depth 36 ft (11.0 m), screened 20 to 36 ft (6.1 to 11.0 m).
DATUM.--Altitude of land-surface datum is 1,189 ft (362 m). Measuring point: Top of casing, 0.20 ft (0.06 m) above land-surface datum.
PERIOD OF RECORD.--July 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.80 ft (1.46 m) below land-surface datum, July 11, 1978, July 10, 1979; lowest, 10.30 ft (3.14 m) below land-surface datum, July 6, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	6.80	FEB 23	8.10	MAY 26	8.44	JUL 29	7.95	AUG 20	8.18	SEP 21	8.06
NOV 4	6.80	APR 15	8.31	JUN 30	6.70						

GRANT COUNTY--Continued

460123095545102. Local number, 130N42W36CCC02.
LOCATION.--Lat 46°01'23", long 95°54'51", in SW¼SW¼SW¼ sec.36, T.130 N., R.42 W., Hydrologic Unit 07020002.
Owner: William Nelson
AQUIFER.--Surficial gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Driven observation water-table well, diameter 1¼ in (0.03 m), depth 15 ft (4.6 m), screened 13 to 15 ft (4.0 to 4.6 m).
DATUM.--Altitude of land-surface datum is 1,186 ft (361 m). Measuring point: Top of casing, 1.05 ft (0.32 m) above land-surface datum.
PERIOD OF RECORD.--August 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.00 ft (0.61 m) below land-surface datum, July 31, 1979; lowest, 8.50 ft (2.59 m) below land-surface datum, Aug. 2, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	6.00	FEB 23	6.27	MAY 26	6.26	JUL 29	6.25	AUG 20	6.13	SEP 21	6.27
NOV 4	6.00	APR 15	6.15								

HENNEPIN COUNTY

444815093194901. Local number, 027N24W30AAA01.
LOCATION.--Lat 44°48'15", long 93°19'49", in NE¼NE¼NE¼ sec.30, T.27 N., R.24 W., Hydrologic Unit 07020012, at 4001 West 110th Street, Bloomington.
Owner: Transfiguration Church
AQUIFER.--Buried Sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 139 ft (42.4 m), screened 135 to 139 ft (41.2 to 42.4 m).
DATUM.--Altitude of land-surface datum is 832 ft (254 m). Measuring point: Top of casing, 0.50 ft (0.15 m) above land-surface datum.
PERIOD OF RECORD.--March 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 63.97 ft (19.50 m) below land-surface datum, Mar. 2, 1979; lowest, 68.64 ft (20.92 m) below land-surface datum, Aug. 31, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	66.80	JAN 5	66.98	MAR 16	67.32	MAY 5	67.72	JUL 20	68.55	AUG 31	68.64
NOV 19	66.93										

444801093202801. Local number, 027N24W30BDA01.
LOCATION.--Lat 44°48'01", long 93°20'28", in NE¼SE¼NW¼ sec.30, T.27 N., R.24 W., Hydrologic Unit 07020012, in Bloomington.
Owner: City of Bloomington, at Southwood Terrace.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in (0.30 m), depth 330 ft (101 m), cased to 269 ft (82.0 m).
DATUM.--Altitude of land-surface datum is 815 ft (248 m). Measuring point: Top of recorder platform, 2.20 ft (0.67 m) above land-surface datum.
PERIOD OF RECORD.--March 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 63.05 ft (19.22 m) below land-surface datum, Apr. 15, 1969; lowest, 82.85 ft (25.25 m) below land-surface datum, July 10, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	75.83	75.31	75.38	75.49	75.56	75.71	76.31	76.46	78.85	79.64	80.78	80.30
10	77.33	75.59	75.54	75.66	75.64	75.70	78.12	76.40	78.44	82.85	78.29	81.00
15	78.03	75.33	75.32	75.62	75.49	75.86	78.55	80.00	76.28	77.44	78.27	79.61
20	76.21	75.41	75.73	75.59	75.69	75.76	76.54	82.17	79.56	80.39	80.03	79.08
25	75.35	75.47	75.61	75.38	75.84	77.13	76.92	76.94	77.02	77.20	77.59	77.48
EOM	75.20	75.37	75.53	75.59	75.67	75.77	76.10	76.81	80.96	80.42	76.83	77.40

WTR YEAR 1981 HIGHEST 74.96 NOV 8, 1980 LOWEST 82.85 JUL 10, 1981

HENNEPIN COUNTY--Continued

445356093145301. Local number, 028N24W23ADD01.
LOCATION.--Lat 44°53'56", long 93°14'53", in SE¼SE¼NE¼ sec.23, T.28 N., R.24 W., Hydrologic Unit 07010206, at 5728 Cedar Avenue, Minneapolis.
Owner: Hope Lutheran Church.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 6 in (0.15 m), depth 245 ft (74.7 m), cased to 172 ft (52.4 m).
DATUM.--Altitude of land-surface datum is 835 ft (254 m). Measuring point: Top of casing, 0.30 ft (0.09 m) above land-surface datum.
PERIOD OF RECORD.--April 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 37.42 ft (11.41 m) below land-surface datum, Jan. 23, 1980; lowest, 47.30 ft (14.42 m) below land-surface datum, July 20, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

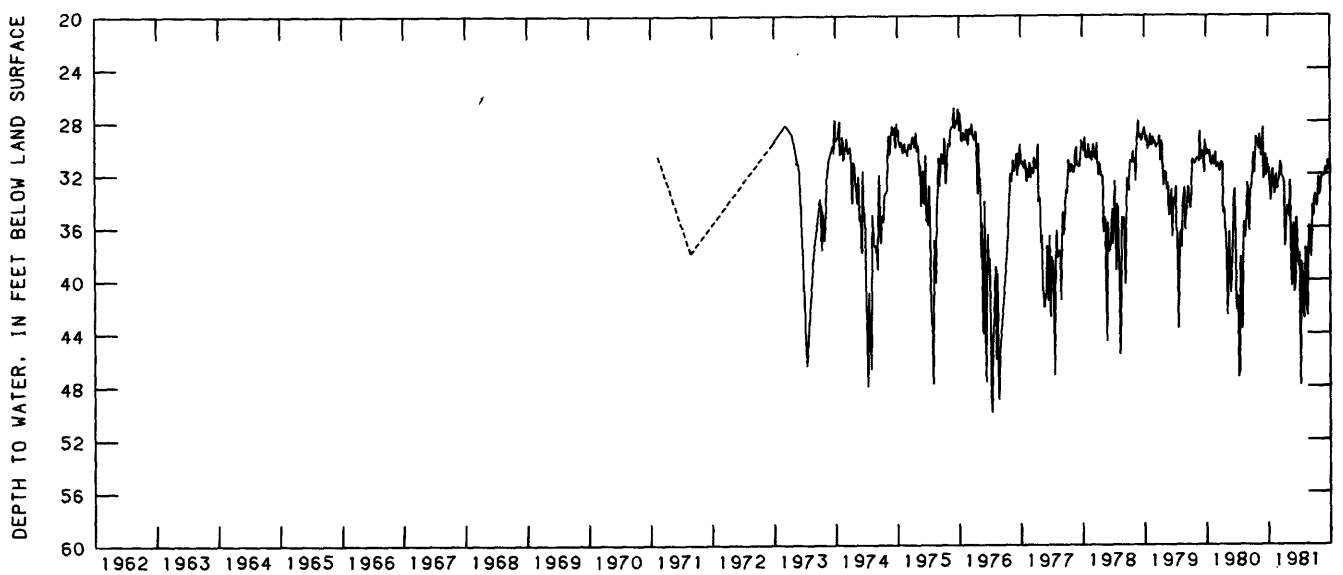
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	41.15	JAN 6	38.62	MAR 16	39.68	MAY 5	40.80	JUL 20	47.30	AUG 31	44.28
NOV 20	39.29										

450116093205301. Local number, 029N24W06CCC01.
LOCATION.--Lat 45°01'16", long 93°20'53", in SW¼SW¼SW¼ sec.6, T.29 N., R.24 W., Hydrologic Unit 07010206, at 3610 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 (0.13 m), depth 200 ft (61.0 m), cased to 152 ft (46.3 m).
DATUM.--Altitude of land-surface datum is 870 ft (265 m). Measuring point: Top of casing, 3.50 ft (1.07 m) 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 (7.48 m) below land-surface datum, Dec. 28-29, 1975; lowest, 50.11 ft (15.27 m) below land-surface datum, July 14, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	30.36	30.13	32.38	31.51	33.51	32.39	32.64	35.27	40.91	37.93	40.07	36.09
10	31.93	28.98	31.24	33.10	32.94	31.41	37.45	32.46	40.30	47.89	37.52	38.28
15	30.56	29.84	30.47	34.02	32.00	31.05	35.87	37.49	35.23	38.62	41.66	36.88
20	29.16	30.68	32.14	32.41	33.14	32.15	34.80	40.46	35.93	39.00	42.70	34.30
25	29.45	29.85	30.80	31.59	33.11	32.19	34.39	36.79	38.48	40.13	38.42	35.14
EOM	29.58	28.44	31.99	32.54	32.56	32.39	34.73	35.67	38.98	42.92	35.86	33.77

WTR YEAR 1981 HIGHEST 27.52 OCT 27, 1980 LOWEST 47.89 JUL 10, 1981



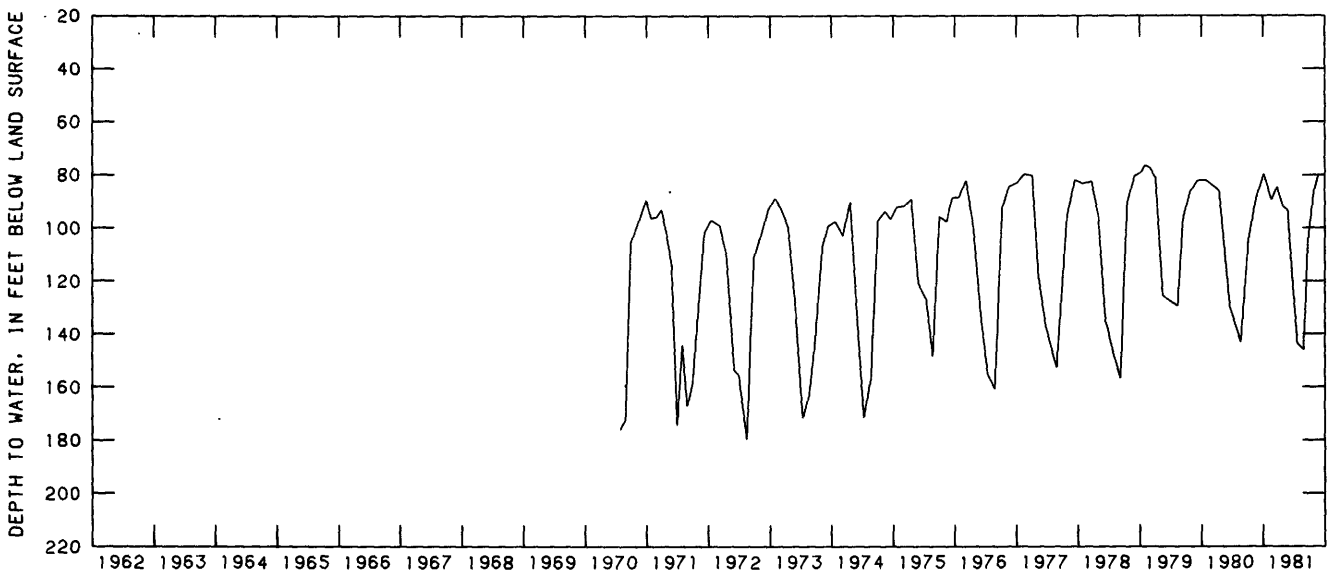
029N24W06CCC01

HENNEPIN COUNTY--Continued

445849093155802. Local number, 029N24W23CCB02.
LOCATION.--Lat 44°58'49", long 93°15'58", in NW¼SW¼SW¼ sec.23, T.29 N., R.24 W., Hydrologic Unit 07010206, at 245 Marquette Avenue, Minneapolis.
Owner: IBM Corporation.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 10 in (0.25 m), depth 430 ft (131 m), cased to 250 ft (76.2 m).
DATUM.--Altitude of land-surface datum is 840 ft (256 m). Measuring point: Edge of 2 in (0.05 m) vent pipe, 9.60 ft (2.93 m) below land-surface datum.
REMARKS.--Water level affected by pumping of nearby wells.
PERIOD OF RECORD.--July 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 76.30 ft (23.26 m) below land-surface datum, Jan. 31, 1979; lowest, 179.6 ft (54.74 m) below land-surface datum, Aug. 16, 1972.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	104.2	JAN 5	79.70	MAR 24	84.60	MAY 26	93.40	JUL 21	143.5	SEP 24	104.7
NOV 19	88.80	FEB 19	89.40	APR 24	91.50	JUN 19	115.2	AUG 27	146.2		



029N24W23CCB02

445833093154301. Local number, 029N24W26BAB01.
LOCATION.--Lat 44°58'33", long 93°15'43", in NW¼NE¼NW¼ sec.26, T.29 N., R.24 W., Hydrologic Unit 07010206, at 425 Portland Ave.
Owner: Minneapolis Star and Tribune.
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 (0.41 m), depth 445 ft (136 m), cased to 252 ft (76.8 m).
DATUM.--Altitude of land-surface datum is 835 ft (254 m). Measuring point: Top of steel cover, 7.60 ft (7.90 m) below land-surface datum.
REMARKS.--Water-level affected by pumping.
PERIOD OF RECORD.--June 1981 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 92.90 ft (28.32 m) below land-surface datum, Sept. 16, 1981; lowest, 128.9 ft (39.29 m) below land-surface datum, July 21, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

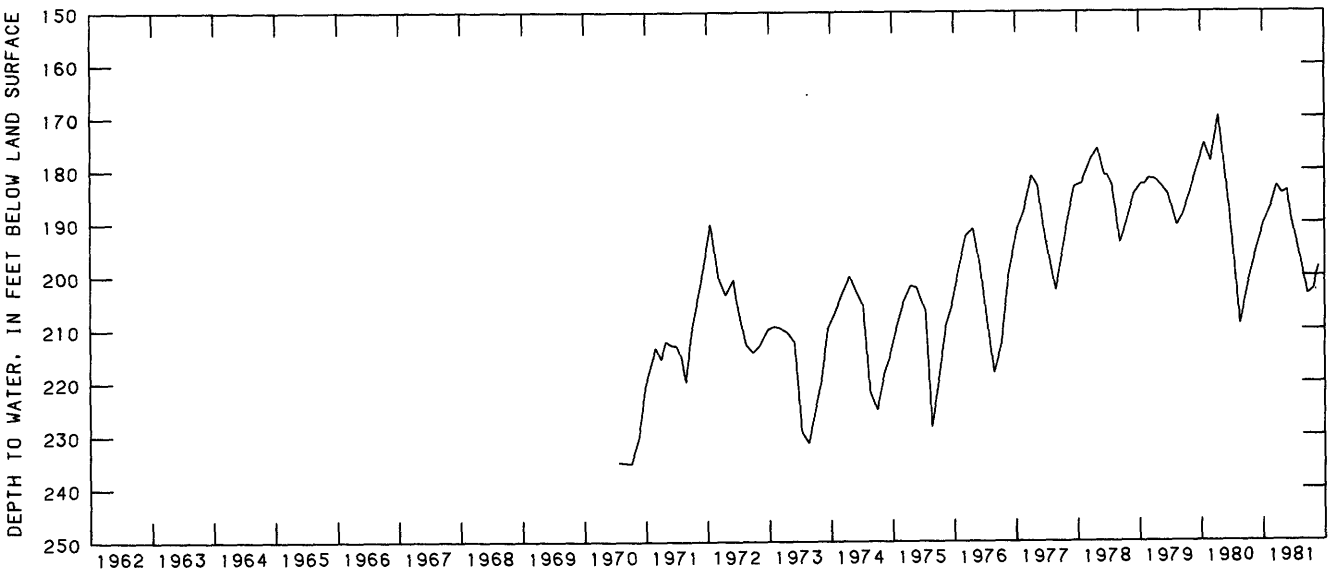
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JUN 23	117.2	JUN 24	122.7	JUL 21	128.9	SEP 16	92.90	SEP 30	109.4

HENNEPIN COUNTY--Continued

445829093162901. Local number, 029N24W27ABD01.
LOCATION.--Lat 44°58'29", long 93°16'29", in SE¼NW¼NE¼ sec.27, T.29 N., R.24 W., Hydrologic Unit 07010206, at 911 LaSalle Avenue, Minneapolis.
Owner: American Linen Supply Co.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age and Hinckley Sandstone of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 16 in (0.41 m), depth 1,094 ft (333 m), cased to 812 ft (248 m).
DATUM.--Altitude of land-surface datum is 850 ft (259 m). Measuring point: Hole in pump base, 22.00 ft (6.71 m) below land-surface datum.
REMARKS.--Water level affected by regional pumping.
PERIOD OF RECORD.--July 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 169.8 ft (51.76 m) below land-surface datum, Apr. 15, 1980; lowest, 235.1 ft (71.66 m) below land-surface datum, Oct. 6, 1970.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	201.2	JAN 5	190.2	MAR 24	183.0	MAY 26	183.8	JUL 21	193.6	SEP 24	203.6
NOV 19	195.5	FEB 19	186.8	APR 24	184.5	JUN 19	189.1	AUG 27	199.2		



029N24W27ABD01

445158093225101. Local number, 116N21W07DAD01.
LOCATION.--Lat 44°51'58", long 93°22'51", in SE¼NE¼SE¼ sec.7, T.116 N., R.21 W., Hydrologic Unit 07020012, at Braemer Golf Course.
Owner: City of Edina, well 14.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 16 in (0.41 m), depth 420 ft (1283 m), cased to 325 ft (99.1 m).
DATUM.--Altitude of land-surface datum is 848 ft (258 m). Measuring point: Vent pipe at land-surface datum.
PERIOD OF RECORD.--April 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 31.26 ft (9.53 m) below land-surface datum, Apr. 4, 1966; lowest, 63.20 ft (19.26 m) below land-surface datum, July 21, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	48.10	JAN 5	48.25	MAR 16	47.35	MAY 12	52.06	JUL 21	63.20	AUG 31	60.02

445615093212301. Local number, 117N21W16CCA01.
LOCATION.--Lat 44°56'15", long 93°21'23", in NE¼SW¼SW¼ sec.16, T.117 N., R.21 W., Hydrologic Unit 07010206, at 6021 36th Street West by water tower.
Owner: City of St. Louis Park, old well 1.
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 (0.41 m), depth 421 ft (128 m), cased to 280 ft (85.3 m).
DATUM.--Land-surface datum is 916.8 ft (279.4 m), revised, National Geodetic Vertical Datum of 1929. Measuring point: Top of well cover, 0.70 ft (0.21 m) above land-surface datum.
REMARKS.--Water level affected by pumping of nearby wells.
PERIOD OF RECORD.--February 1953 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 66.0 ft (20.11 m) below land-surface datum, Mar. 23, 1953; lowest, 110.5 ft (33.68 m) below land-surface datum, July 31, 1959.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	79.62	80.80	80.40	80.93	82.64	81.98	82.17	86.07	93.36	.....	95.01	88.18
10	85.92	81.14	81.16	82.49	82.69	81.07	86.00	84.12	92.82	.....	91.36	90.61
15	82.57	81.72	80.00	83.51	82.18	80.11	84.28	91.20	89.42	.....	94.93	90.47
20	79.63	82.52	81.62	82.10	.....	81.71	80.55	95.43	90.73	.....	97.13	86.63
25	79.97	81.66	79.56	80.99	83.81	82.74	81.14	89.00	91.18	92.47	92.60	86.65
EOM	80.69	78.45	81.48	82.57	82.85	82.60	83.43	87.15	.....	94.59	88.67	85.33

WTR YEAR 1981 HIGHEST 75.32 OCT 26, 1980 LOWEST 97.86 AUG 21, 1981

445618093211801. Local number, 117N21W16CDB01.
LOCATION.--Lat 44°56'18", long 93°21'18", in NW¼SE¼SE¼ sec.16, T.117 N., R.21 W., Hydrologic Unit 07010206, at 2565 Wooddale Avenue South, St. Louis Park.
Owner: D-A Lubricant Co.
AQUIFER.--Ironton-Galesville Sandstones of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 4 in (0.10 m), depth 691 ft (211 m), screened 651 to 661 ft (198 to 202 m).
DATUM.--Altitude of land-surface datum is 917.2 ft (279.6 m), National Geodetic Vertical Datum of 1929. Measuring point: Hole in well seal, 3.60 ft (1.10 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--April 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 133.0 ft (40.54 m) below land-surface datum, Apr. 25, 1980; lowest, 146.2 ft (44.56 m) below land-surface datum, Aug. 13, 1980.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	144.5	DEC 10	138.6	FEB 4	135.7	MAR 31	134.1	JUN 9	136.2	AUG 7	143.4
29	142.6	19	138.3	10	135.3	APR 16	134.5	19	136.7	17	144.0
NOV 4	141.6	24	137.9	19	134.8	28	134.3	25	138.1	20	144.1
7	141.0	31	136.8	24	134.7	MAY 13	134.6	29	138.4	24	144.2
14	140.8	JAN 5	136.7	MAR 3	135.2	19	134.9	JUL 8	138.9	31	144.2
19	140.3	14	136.1	11	135.0	26	135.3	17	140.7	SEP 10	143.8
20	139.2	21	136.0	20	134.6	29	135.4	22	141.7	16	144.2
DEC 3	139.1	28	135.6	27	134.6	JUN 4	136.0	30	142.6	23	143.7

445347093213901. Local number, 117N21W32DAD01.
LOCATION.--Lat 44°53'47", long 93°21'39", in SE¼NE¼SE¼ sec.32, T.117 N., R.21 W., Hydrologic Unit 07010206, at Hanson Road and Benton Avenue.
Owner: City of Edina, well 9.
AQUIFER.--Hinckley Sandstone of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 16 in (0.41 m), depth 1,130 ft (344 m), cased to 1,010 ft (308 m).
DATUM.--Land-surface datum is 933.3 ft (284.5 m) National Geodetic Vertical Datum of 1929. Measuring point: Hole in east side of pump base, 2.00 ft (0.61 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--August 1961 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 230.8 ft (70.35 m) below land-surface datum, Apr. 20, 1962; lowest, 369.6 ft (112.6 m) below land-surface datum, Aug. 28, 1970.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	321.4	NOV 19	316.6	JAN 5	291.1	MAR 16	282.3	MAY 12	297.8	SEP 17	331.5

HENNEPIN COUNTY--Continued

445818093264101. Local number, 117N22W03ADC01.
LOCATION.--Lat 44°58'18", long 93°26'41", in SW¼SE¼NE¼ sec.3, T.117 N., R.22 W., Hydrologic Unit 07010206, at 13106 Wayzata Boulevard.
Owner: Standard Oil Co.
AQUIFER.--Platteville Formation of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 4 in (0.10 m), depth 143 ft (43.6 m), cased to 120 ft (36.6 m).
DATUM.--Altitude of land-surface datum is 970 ft (296 m). Measuring point: Top of casing, 1.80 ft (0.55 m) above land-surface datum.
PERIOD OF RECORD.--April 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 59.94 ft (18.27 m) below land-surface datum, Dec. 5, 1979; lowest, 61.32 ft (18.69 m) below land-surface datum, May 5, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	60.56	JAN 6	60.35	MAR 17	60.80	MAY 5	61.32	JUL 22	61.25	SEP 11	61.18
NOV 20	60.30										

445740093333001. Local number, 117N23W11BBD01.
LOCATION.--Lat 44°57'40", long 93°33'30", in SE¼NW¼NW¼ sec.11, T.117 N., R.23 W., Hydrologic Unit 07010206, 2 mi (3.2 km) 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 observation artesian well, diameter 6 in (0.15 m), depth 437 ft (133 m), cased to 270 ft (82.3 m).
DATUM.--Altitude of land-surface datum is 930.8 ft (283.7 m) National Geodetic Vertical Datum of 1929. Measuring point: Wood floor of instrument shelter, 3.30 ft (1.01 m) 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 (4.33 m) below land-surface datum, Apr. 30, 1954; lowest, 34.89 ft (10.63 m) below land-surface datum, July 12, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	.....	27.01	25.83	25.86	26.55	.....	27.01	27.12	29.71	31.27	31.09	29.97
10	27.50	26.60	25.82	26.47	26.31	.....	27.18	27.21	29.65	34.48	30.53	30.45
15	26.39	26.34	25.70	26.43	26.30	.....	27.36	30.09	28.69	31.04	31.88	31.82
20	26.68	25.95	26.60	26.15	26.59	26.88	27.32	31.20	28.20	32.54	32.55	30.18
25	26.81	26.04	26.49	25.84	.....	27.00	27.35	30.52	28.18	31.30	31.16	29.40
EOM	26.59	25.78	25.80	26.60	.....	26.57	27.41	28.58	28.72	31.44	29.22	28.71

WTR YEAR 1981 HIGHEST 25.52 DEC 12, 1980 LOWEST 34.54 JUL 11, 1981

450223093231801. Local number, 118N21W07DCB01.
LOCATION.--Lat 45°02'23", long 93°23'18", in NW¼SW¼SE¼ sec.7, T.118 N., R.21 W., Hydrologic Unit 07010206, 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 (0.41 m), depth 422 ft (129 m), cased to 339 ft (103 m).
DATUM.--Altitude of land-surface datum is 933 ft (284 m). Measuring point: Top of wood platform, 3.00 ft (0.91 m) 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 (18.43 m) below land-surface datum, Dec. 17, 1967; lowest, 71.35 ft (21.75 m) below land-surface datum, July 11, 1970.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	64.74	64.31	64.44	64.15	.....	.....	65.23	65.27	66.48	66.60	67.71	66.84
10	65.15	64.35	64.35	.....	.....	.....	65.54	65.33	66.71	69.45	66.90	66.56
15	64.91	64.54	63.88	.....	.....	.....	65.71	65.95	65.69	67.68	68.23	67.26
20	64.33	64.57	65.07	.....	.....	64.79	64.92	66.33	66.16	67.15	68.45	66.42
25	64.72	64.32	64.63	.....	.....	64.70	65.07	66.54	66.09	67.41	67.59	66.30
EOM	64.32	63.62	64.32	.....	.....	64.84	65.16	65.92	66.20	67.68	65.97	65.87

WTR YEAR 1981 HIGHEST 63.45 NOV 30, 1980 LOWEST 69.51 JUL 11, 1981

HENNEPIN COUNTY--Continued

445905093224401. Local number, 118N21W32CBB01.
LOCATION.--Lat 44°59'05", long 93°22'44", in NW¼NW¼SW¼ sec.32, T.118 N., R.21 W., Hydrologic Unit 07010206, at Winnetka Avenue and Highway 55, Golden Valley.
Owner: Red Owl Store.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 6 in (0.16 m), depth 95 ft (29.0 m), screened 87 to 95 ft (26.5 to 29.0 m).
DATUM.--Altitude of land-surface datum is 895 ft (273 m). Measuring point: Top of well cap, 0.80 ft (0.24 m) above land-surface datum.
PERIOD OF RECORD.--May 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 19.77 ft (6.03 m) below land-surface datum, Oct. 26, 1979; lowest, 21.05 ft (6.42 m) below land-surface datum, May 5, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	20.35	JAN 6	20.67	MAR 17	20.89	MAY 5	21.05	JUL 22	20.67	SEP 11	20.76
NOV 20	20.45										

445857093223101. Local number, 118N21W32CBD01.
LOCATION.--Lat 44°58'57", long 93°22'31", in SE¼NW¼SW¼ sec.32, T.118 N., R.21 W., Hydrologic Unit 07010206, at 760 Harold Avenue, Golden Valley.
Owner: Golden Valley Methodist Church.
AQUIFER.--St. Peter Sandstone of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 265 ft (80.8 m), cased to 200 ft (61.0 m).
DATUM.--Altitude of land-surface datum is 890 ft (271 m). Measuring point: Top of well cap, 0.70 ft (0.21 m) above land-surface datum.
PERIOD OF RECORD.--February 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 31.44 ft (9.58 m) below land-surface datum, Mar. 9, 1976; lowest, 37.51 ft (11.43 m) below land-surface datum, Aug. 24, 1971.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	33.21	JAN 6	32.94	MAR 17	33.08	MAY 5	33.42	JUL 22	34.17	SEP 11	34.30
NOV 20	33.10										

450854093212801. Local number, 119N21W04BBA01.
LOCATION.--Lat 45°08'54", long 93°21'28", in NE¼NW¼NW¼ sec.4, T.119 N., R.21 W., Hydrologic Unit 07010206, 109th Avenue North, 0.15 mi (0.24 km) east of Zane Avenue North, Brooklyn Park.
Owner: Walter Tessman.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled irrigation water-table well, diameter 12 in (0.30 m), depth 80 ft (24.4 m), screened 62 to 80 ft (18.9 to 24.4 m).
DATUM.--Altitude of land-surface datum is 876 ft (267 m). Measuring point: Hole in pump base, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--September 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 15.66 ft (4.77 m) below land-surface datum, July 26, 1978; lowest, 19.15 ft (5.84 m) below land-surface datum, Sept. 6, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	17.46	JAN 13	18.38	MAR 17	18.89	MAY 27	18.43	JUL 22	18.19	SEP 11	18.58
NOV 20	17.86										

HENNEPIN COUNTY--Continued

450541093225601. Local number, 119N21W19DDD01.
LOCATION.--Lat 45°05'41", long 93°22'56", in SE¼SE¼SE¼ sec.19, T.119 N., R.21 W., Hydrologic Unit 07010206, at 77th Avenue North and Highway 52.
Owner: City of Brooklyn Park, Fire Station.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 4 in (0.10 m), depth 47 ft (14.3 m), screen information not available.
DATUM.--Altitude of land-surface datum is 880 ft (268 m). Measuring point: Top of well cap, 1.60 ft (0.49 m) above land-surface datum.
PERIOD OF RECORD.--March 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 11.98 ft (3.65 m) below land-surface datum, July 26, 1978; lowest, 15.83 ft (4.82 m) below land-surface datum, Jan. 13, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	15.06	JAN 13	15.83	MAR 17	15.81	MAY 27	15.56	JUL 22	15.25	SEP 11	15.58
NOV 20	15.42										

450519093281401. Local number, 119N22W28ACC01.
LOCATION.--Lat 45°05'19", long 93°28'14", in SW¼SW¼NE¼ sec.28, T.119 N., R.22 W., Hydrologic Unit 07010206, at 7349 Mariner Driver, Maple Grove
Owner: Cliff Lake.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 4 in (0.10 m), depth 192 ft (58.5 m), cased to 187 ft (57.0 m).
DATUM.--Altitude of land-surface datum is 925 ft (288 m). Measuring point: Top of well cap, 1.80 ft (0.55 m) above land-surface datum.
PERIOD OF RECORD.--October 1980 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 29.13 ft (8.88 m) below land-surface datum, Oct. 9, Nov. 20, 1980; lowest, 29.73 ft (9.06 m) below land-surface datum, Sept. 11, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

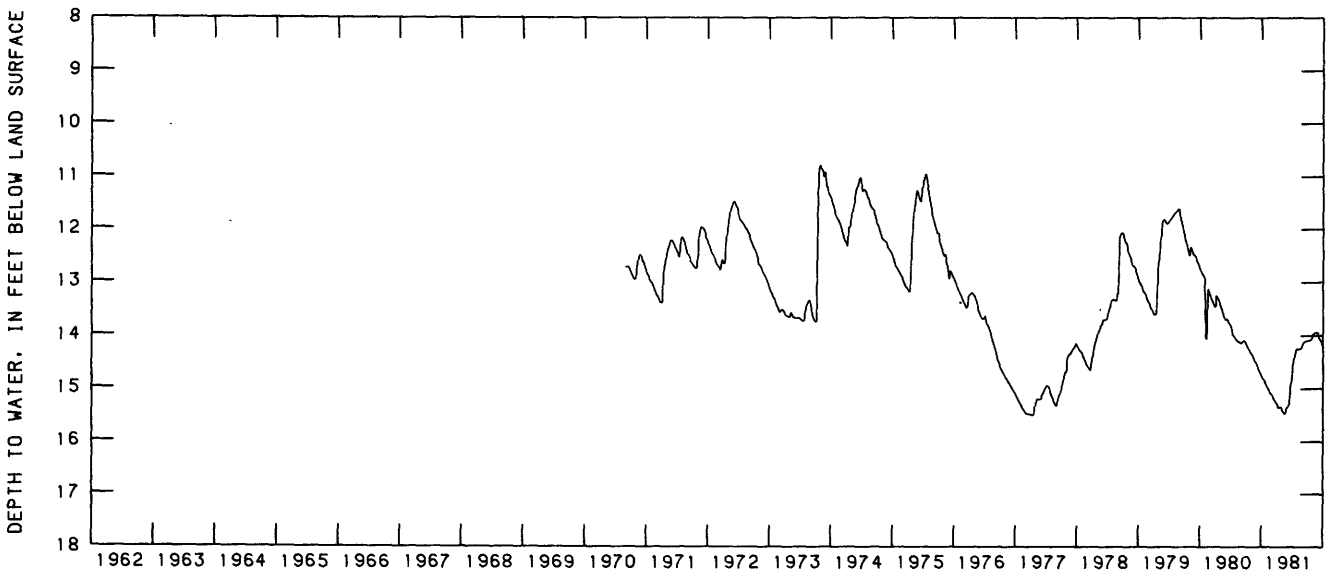
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	29.13	JAN 13	29.25	MAR 17	29.47	MAY 27	29.52	JUL 22	29.65	SEP 11	29.73
NOV 20	29.13										

HUBBARD COUNTY

465142094433201. Local number, 139N32W16AAA01.
LOCATION.--Lat 46°51'42", long 94°43'32", in NE¼NE¼NE¼ sec.16, T.139 N., R.32 W., Hydrologic Unit 07010106, at Badoura Nursery.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 21 ft (6.4 m), screened 19 to 21 ft (5.8 to 6.4 m).
DATUM.--Altitude of land-surface datum is 1,419 ft (433 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
REMARKS.--Measured weekly by Archie Hakala.
PERIOD OF RECORD.--September 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.78 ft (3.29 m) below land-surface datum, Oct. 30, 1973; lowest, 15.51 ft (4.73 m) below land-surface datum, Apr. 12, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	14.20	DEC 9	14.57	FEB 10	15.00	APR 7	15.32	JUN 9	15.33	AUG 4	14.25
14	14.24	16	14.63	17	15.03	14	15.36	16	15.25	20	14.24
21	14.28	30	14.74	24	15.10	21	15.37	23	15.00	25	14.24
28	14.33	JAN 7	14.80	MAR 3	15.10	28	15.33	30	14.80	SEP 1	14.17
NOV 4	14.36	13	14.82	11	15.16	MAY 5	15.41	JUL 7	14.56	9	14.13
11	14.40	20	14.86	17	15.20	19	15.48	14	14.43	17	14.11
18	14.44	28	14.91	24	15.24	26	15.44	21	14.33	23	14.10
25	14.49	FEB 2	14.94	31	15.27	JUN 1	15.37	28	14.26	29	14.09
30	14.50										



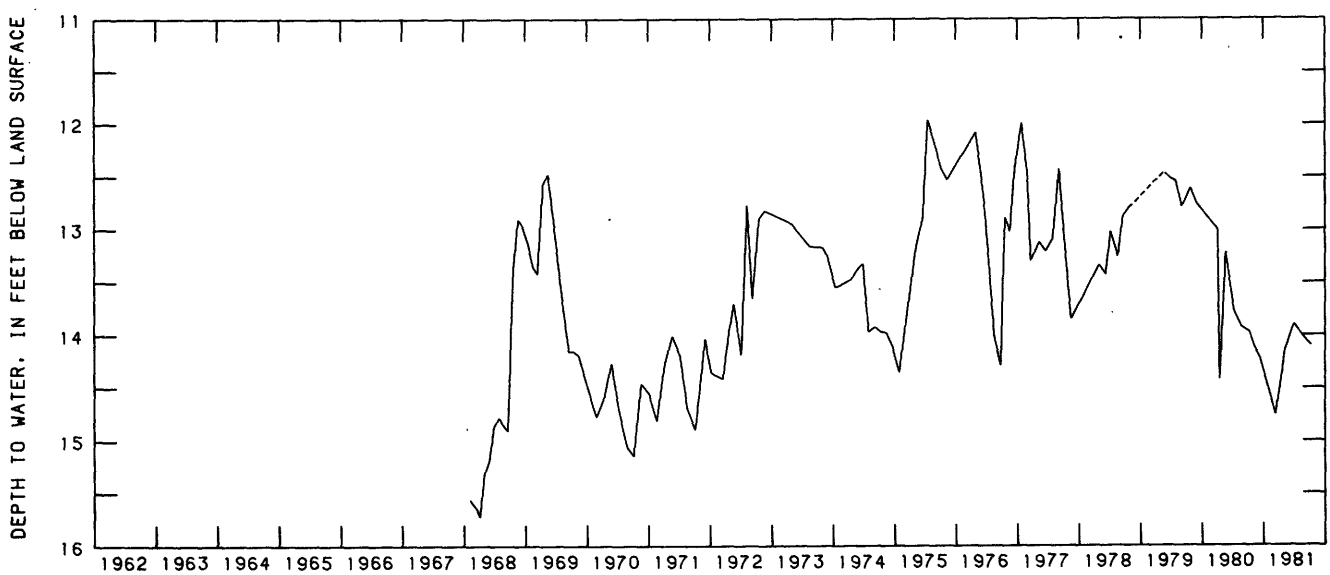
139N32W16AAA01

ISANTI COUNTY

453125093181101. Local number, 035N24W14BCD01.
LOCATION.--Lat 45°31'25", long 93°18'11", in SE¼NW¼NW¼ sec.14, T.35 N., R.24 W., Hydrologic Unit 07010207, northwest of Isanti.
Owner: Allen Kluck.
AQUIFER.--Eau Claire - Mount Simon Formations of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 300 ft (91.4 m), cased to 105 ft (32.0 m).
DATUM.--Altitude of land-surface datum is 940 ft (287 m). Measuring point: Hole in pump base, 0.10 ft (0.03 m) above land-surface datum.
PERIOD OF RECORD.--February 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 11.96 ft (3.65 m) below land-surface datum, July 17, 1975; lowest, 15.72 ft (4.79 m) below land-surface datum, Apr. 4, 1968.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	13.98	DEC 12	14.22	APR 15	14.42	MAY 8	14.14	JUN 30	13.90	AUG 26	14.02
NOV 7	14.11	MAR 13	14.76								



035N24W14BCD01

ISANTI COUNTY--Continued

453058093175901. Local number, 035N24W14CDC01.
LOCATION.--Lat 45°30'58", long 93°17'59", in SW¼SE¼SW¼ sec.14, T.35 N., R.24 W., Hydrologic Unit 07010207, northwest of Isanti.
Owner: Ernest Kluck.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Driven unused water-table well, diameter 1¼ in (0.03 m), depth 3.00 ft (0.91 m), screen information not available.
DATUM.--Altitude of land-surface datum is 930 ft (283 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--March 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.49 ft (1.67 m) below land-surface datum, May 21, 1979; lowest, 10.60 ft (3.23 m) below land-surface datum, Apr. 4, 1968.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	8.95	DEC 12	9.44	MAR 13	9.96	MAY 8	8.81	JUN 30	8.35	AUG 27	8.29
NOV 7	9.25	JAN 15	9.76	APR 15	9.31						

453410093140001. Local number, 036N23W32ACB01.
LOCATION.--Lat 45°34'10", long 93°14'00", in NW¼SE¼NE¼ sec.32, T.36 N., R.23 W., Hydrologic Unit 07010207, in Cambridge.
Owner: City of Cambridge, well 4.
AQUIFER.--Hinckley Sandstone of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 20 in (0.51 m), depth 630 ft (192 m), cased to 352 ft (107 m).
DATUM.--Altitude of land-surface datum is 960 ft (293 m). Measuring point: Edge of vent pipe, 3.00 ft (0.91 m) above land-surface datum.
REMARKS.--Measured weekly by Thomas Minar. Water level affected by pumping.
PERIOD OF RECORD.--July 1972 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.50 ft (0.76 m) below land-surface datum, Jan. 17, 1974; lowest, 16.95 ft (5.17 m) below land-surface datum, July 11, 1974.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	5.58	DEC 11	6.45	FEB 5	7.01	APR 3	6.53	MAY 21	7.88	JUL 30	4.95
16	6.60	19	6.58	12	6.86	10	7.13	28	7.03	AUG 6	4.66
23	6.62	26	6.17	19	7.12	16	4.68	JUN 5	6.23	13	4.03
30	6.55	JAN 2	7.20	26	7.37	23	6.84	11	7.36	28	6.65
NOV 14	6.50	8	7.12	MAR 6	7.09	MAY 1	5.40	25	5.86	SEP 3	6.62
21	5.46	15	7.21	13	6.60	7	6.54	JUL 1	6.34	10	6.06
26	6.87	22	6.59	19	7.17	14	4.35	16	6.17	17	4.36
DEC 4	6.00	29	7.39	26	7.36						

ITASCA COUNTY

471450093322001. Local number, 055N25W17ACD01.
LOCATION.--Lat 47°14'50", long 93°32'20", in SE¼SW¼NE¼ sec.17, T.55 N., R.25 W., Hydrologic Unit 07010103, at west end of 13th Street NW, Grand Rapids.
Owner: U.S. Geological Survey.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 4 in (0.10 m), depth 147 ft (44.8 m), screened 143 to 147 ft (43.6 to 44.8 m).
DATUM.--Altitude of land-surface datum is 1,318 ft (402 m). Measuring point: Top of platform, 1.60 ft (0.49 m) above land-surface datum.
PERIOD OF RECORD.--April 1962 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 29.04 ft (8.85 m) below land-surface datum, June 1, 1966; lowest, 33.92 ft (10.34 m) below land-surface datum, May 17, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	32.60	32.70	.....	.....	.....	.....	33.00	32.85	32.64	32.37	32.28	32.11
10	32.73	32.74	.....	.....	.....	.....	33.00	32.78	32.61	32.37	32.22	32.09
15	32.66	.....	.....	.....	.....	33.01	32.97	32.74	32.56	32.34	32.23	32.09
20	32.62	.....	32.80	.....	.....	33.03	32.93	32.72	32.54	32.34	32.21	32.07
25	32.65	.....	.....	.....	.....	33.04	32.89	32.67	32.52	32.37	32.15	32.05
EOM	32.67	.....	.....	32.90	.....	33.01	32.89	32.65	32.45	32.35	32.12	32.01

WTR YEAR 1981 HIGHEST 32.01 SEPT 30, 1981 LOWEST 33.04 MAR 25, 1981

JACKSON COUNTY

434742095191501. Local number, 104N37W19DBD01.
LOCATION.--Lat 43°47'42", long 95°19'15", in SE¼NE¼SE¼ sec.19, T.104 N., R.37 W., Hydrologic Unit 07100001, at Heron Lake.
Owner: City of Heron Lake, old railroad well.
AQUIFER.--Sioux Quartzite of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 16 in (0.41 m), depth 323 ft (98.4 m), screened 205 to 225 ft (62.5 to 68.6 m).
DATUM.--Altitude of land-surface datum is 1,420 ft (433 m). Measuring point: Edge of breather pipe, 2.60 ft (0.79 m) above land-surface datum.
PERIOD OF RECORD.--August 1972, July 1973, September 1976, July 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 59.16 ft (18.03 m) below land-surface datum, Aug. 11, 1972; lowest, 65.50 ft (19.96 m) below land-surface datum, Sept. 24, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	65.24	DEC 18	64.16	JAN 21	64.27	MAR 21	64.03	JUL 14	66.10	SEP 29	65.92
NOV 19	64.62										

KANABEC COUNTY

454744093151601. Local number, 038N23W07DBB01.
LOCATON.--Lat 45°47'44", long 93°15'16", in NW¼NW¼SE¼ sec.7, T.38 N., R.23 W., Hydrologic Unit 07030004, on Chester Belkholm farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 21 ft (6.4 m), screened 19 to 21 ft (5.8 to 6.4 m).
DATUM.--Altitude of land-surface datum is 963 ft (294 m). Measuring point: Top of casing, 1.60 ft (0.49 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 12.81 ft (3.90 m) below land-surface datum, Aug. 1, 1979; lowest, 15.11 ft (4.61 m) below land-surface datum, Feb. 25, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	14.55	DEC 7	14.69	FEB 25	15.11	APR 28	14.60	JUN 22	14.39	AUG 28	14.39
NOV 5	14.59	JAN 17	14.92	MAR 22	15.01	MAY 19	14.47	JUL 21	14.26	SEP 23	14.53

454759093243301. Local number, 038N25W12BCB01.
LOCATION.--Lat 45°47'59", long 93°24'33", in NW¼SW¼NW¼ sec.12, T.38 N., R.25 W., Hydrologic Unit 07030004, on Duane Pearson farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 33 ft (10.1 m), screened 31 to 33 ft (9.4 to 10.1 m).
DATUM.--Altitude of land-surface datum is 1,015 ft (309 m). Measuring point: Top of casing, 4.00 ft (1.22 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 11.71 ft (3.57 m) below land-surface datum, Aug. 1, 1979; lowest, 15.72 ft (4.79 m) below land-surface datum, Apr. 28, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	14.70	DEC 17	15.01	FEB 25	15.58	APR 28	15.72	JUN 22	15.71	AUG 28	15.58
NOV 5	14.78	JAN 17	15.29	MAR 22	15.67			JUL 21	15.50	SEP 23	15.70

KANABEC COUNTY--Continued

454523093232401. Local number, 038N25W25AAD02.
LOCATION.--Lat 45°45'23", long 93°23'24", in SE¼NE¼NE¼ sec.25, T.38 N., R.25 W., Hydrologic Unit 07030004, on Ralph Wahlstrom farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 51 ft (15.5 m), screened 49 to 51 ft (14.9 to 15.5 m).
DATUM.--Altitude of land-surface datum is 1,018 ft (310 m). Measuring point: Top of casing, at land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 20.23 ft (6.17 m) below land-surface datum, Oct. 18, 1977; lowest, 27.40 ft (8.35 m) below land-surface datum, Sept. 23, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	25.44	DEC 7	25.96	FEB 25	26.43	MAY 19	27.10	JUN 22	27.15	AUG 28	27.30
NOV 5	25.67	JAN 17	25.43	MAR 22	26.32	21	27.05	JUL 21	27.17	SEP 23	27.40

455342093134001. Local number, 039N23W05DAC01.
LOCATION.--Lat 45°53'42", long 93°13'40", in SW¼NE¼SE¼ sec.5, T.39 N., R.23 W., Hydrologic Unit 07030004, on Roman Miller property.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 47 ft (14.3 m), screened 45 to 47 ft (13.7 to 14.3 m).
DATUM.--Altitude of land-surface datum is 1,030 ft (314 m). Measuring point: Top of casing, 4.00 ft (1.22 m) above land-surface datum.
PERIOD OF RECORD.--December 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 14.28 ft (4.35 m) below land-surface datum, July 31, 1979; lowest, 18.28 ft (5.57 m) below land-surface datum, Mar. 22, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	17.18	DEC 17	17.55	FEB 25	18.26	JUL 21	17.42	AUG 28	17.64	SEP 23	17.80
NOV 4	17.32	JAN 17	17.92	MAR 22	18.28						

455400093194401. Local number, 039N24W04ADA01.
LOCATION.--Lat 45°54'00", long 93°19'44", in NE¼SE¼NE¼ sec.4, T.39 N., R.24 W., Hydrologic Unit 07030004, on Wes Cashman farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 22 ft (6.7 m), screened 20 to 22 ft (6.1 to 6.7 m).
DATUM.--Altitude of land-surface datum is 1,023 ft (312 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.87 ft (0.87 m) below land-surface datum, Dec. 21, 1977; lowest, 6.22 ft (1.90 m) below land-surface datum, Feb. 25, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	4.58	JAN 17	5.73	MAR 22	5.87	MAY 19	4.10	JUN 22	3.37	AUG 28	4.43
NOV 5	4.70	FEB 25	6.22	APR 28	3.60	21	3.00	JUL 21	4.33	SEP 23	5.37
DEC 17	5.07										

KANABEC COUNTY--Continued

455236093172301. Local number, 039N24W11DDC01.
LOCATION.--Lat 45°52'36", long 93°17'23", in SW¼SE¼SE¼ sec.11, T.39 N., R.24 W., Hydrologic Unit 07030004, intersection of Forest Avenue and U.S. Highway 65.
Owner: City of Mora, well 3.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 12 in (0.30 m), depth 170 ft (51.8 m), screened 150 to 170 ft (45.7 to 51.8 m).
DATUM.--Altitude of land-surface datum is 1,011 ft (308 m). Measuring point: Edge of vent pipe, 2.40 ft (0.73 m) above land-surface datum.
REMARKS.--Measured weekly by Donald Dahl.
PERIOD OF RECORD.--March 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 32.28 ft (9.84 m) below land-surface datum, Apr. 6, 1973; lowest, 44.36 ft (13.52 m) below land-surface datum, Apr. 22, 1968.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	42.10	APR 10	43.75	MAY 1	43.70	MAY 18	43.43	JUN 3	43.50	JUN 16	43.45
DEC 22	42.84	18	43.83	11	43.41	26	44.01	8	43.43	22	43.32
29	43.05	24	43.80								

455815093171101. Local number, 040N24W12BCC01.
LOCATION.--Lat 45°58'15", long 93°17'11", in SW¼SW¼NW¼ sec.12, T.40 N., R.24 W., Hydrologic Unit 07030004, on Neill Heitke farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 51 ft (15.2 m), screened 49 to 51 ft (14.9 to 15.2 m).
DATUM.--Altitude of land-surface datum is 1,070 ft (326 m). Measuring point: Top of casing, 3.10 ft (0.94 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 25.28 ft (7.71 m) below land-surface datum, July 31, 1979; lowest, 27.64 ft (8.42 m) below land-surface datum, Mar. 22, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	26.94	JAN 17	27.38	MAR 22	27.64	MAY 19	27.44	JUN 22	27.44	AUG 28	27.27
NOV 5	27.03	FEB 25	27.58	APR 28	27.52	21	27.34	JUL 21	27.35	SEP 23	27.27
DEC 17	27.16										

KANDIYOHI COUNTY

450730095014801. Local number, 119N35W14ABB01.
LOCATION.--Lat 45°07'30", long 95°01'48", in NW¼NW¼NE¼ sec.14, T.119 N., R.35 W., Hydrologic Unit 07020004, at Willmar.
Owner: Burlington Northern, Inc.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 10 in (0.25 m), depth 320 ft (97.5 m), screened 297 to 320 ft (89.9 to 97.5 m).
DATUM.--Altitude of land-surface datum is 1,140 ft (347 m). Measuring point: Wood floor of recorder shelter, 1.00 ft (0.30 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--December 1967 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 12.78 ft (3.90 m) below land-surface datum, May 12, 1969; lowest, 32.50 ft (9.91 m) below land-surface datum, Aug. 27, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	.....	25.43	25.41	24.57	25.00	.....	25.06	25.62	27.81	27.02	27.72	28.56
10	.....	25.30	25.77	24.77	25.90	.....	25.10	25.60	27.78	30.05	28.74	28.49
15	26.70	26.40	25.79	24.98	24.90	.....	25.18	26.40	27.40	28.77	29.38	28.37
20	25.39	25.03	25.55	25.01	.....	24.96	24.98	28.00	27.58	28.10	.....	27.92
25	25.61	24.30	25.03	24.85	.....	24.82	25.01	27.38	27.52	27.91	29.28	28.35
EOM	25.90	23.65	24.82	25.10	.....	24.77	25.11	27.52	27.13	27.18	.....	28.37

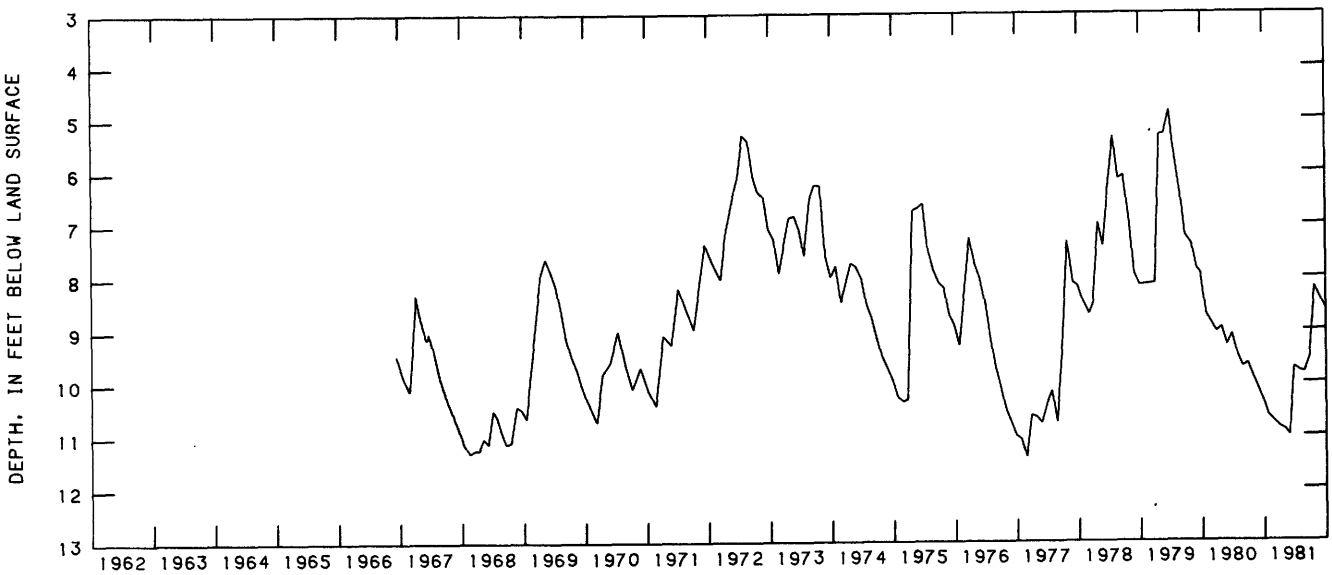
WTR YEAR 1981 HIGHEST 23.10 NOV 30, 1980 LOWEST 30.09 JUL 11, 1981

KANDIYOHI COUNTY--Continued

452415094503001. Local number, 122N33W04BCD01.
LOCATION.--Lat 45°24'15", long 94°50'30", in SE¼SW¼NW¼ sec.4, T.122 N., R.33 W., Hydrologic Unit 07010204, at Regal.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 17 ft (5.2 m), screened 14 to 17 ft (4.3 to 5.2 m).
DATUM.--Altitude of land-surface datum is 1,220 ft (372 m). Measuring point: Top of casing, 4.40 ft (1.34 m) above land-surface datum.
PERIOD OF RECORD.--December 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.86 ft (1.48 m) below land-surface datum, June 26, 1979; lowest, 11.40 ft (3.47 m) below land-surface datum, Feb. 26, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	9.86	DEC 26	10.34	MAR 30	10.84	MAY 30	11.01	JUL 31	9.79	SEP 26	9.52
NOV 28	10.12	JAN 24	10.63	MAY 5	10.91	JUN 26	9.71	AUG 26	9.81		



122N33W04BCD01

452400095004001. Local number, 122N34W06CBC01.
LOCATION.--Lat 45°24'00", long 95°00'40", in SW¼NW¼SW¼ sec.6, T.122 N., R.34 W., Hydrologic Unit 07010204, 3.4 mi (5.5 km) south of Belgrade.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 23 ft (7.0 m), screened 20 to 23 ft (6.1 to 7.0 m).
DATUM.--Altitude of land-surface datum is 1,237 ft (377 m). Measuring point: Top of platform, 0.80 ft (0.24 m) above land-surface datum.
PERIOD OF RECORD.--October 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.71 ft (1.44 m) below land-surface datum, Apr. 28, 1979; lowest, 11.61 ft (3.54 m) below land-surface datum, Feb. 26, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	10.01	DEC 26	10.26	MAR 30	10.18	MAY 30	9.84	JUL 31	8.69	SEP 26	7.69
NOV 28	9.95	JAN 24	10.41	MAY 5	9.86	JUN 26	8.58	AUG 26	8.53		

LE SUEUR COUNTY

442522093543901. Local number, 111N26W14ADA01.
LOCATION.--Lat 44°25'22", long 93°54'39", in NE¼SE¼NE¼ sec.14, T.111 N., R.26 W., Hydrologic Unit 07020012, 0.85 mi (1.37 km) south of Le Sueur.
Owner: Merle Moser.
AQUIFER.--Buried gravel of Pleistocene Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 16 in (0.41 m), depth 242 ft (73.8 m), screened 212 to 242 ft (64.6 to 73.8 m).
DATUM.--Altitude of land-surface datum is 855 ft (261 m). Measuring point: Edge of vent pipe, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--January 1980 to August 1980.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 82.32 ft (25.09 m) below land-surface datum, Mar. 3, 1980; lowest, 84.27 ft (25.69 m) below land-surface datum, July 23, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	83.24	NOV 24	83.56	JAN 8	83.45	MAY 13	83.92	JUL 23	84.27	SEP 11	84.05

443234093333501. Local number, 112N23W02BAB01.
LOCATION.--Lat 44°32'34", long 93°33'35", in NW¼NE¼NW¼ sec.2, T.112 N., R.23 W., Hydrologic Unit 07020012, just east of New Prague.
Owner: Holy Trinity Lutheran Church.
AQUIFER.--St. Lawrence Formation of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 180 ft (54.9 m), cased to 155 ft (47.2 m).
DATUM.--Altitude of land-surface datum is 1,005 ft (306 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--April 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 96.20 ft (29.32 m) below land-surface datum, Mar. 3, 1980; lowest, 99.42 ft (30.30 m) below land-surface datum, July 26, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	97.58	JAN 7	97.03	MAR 18	96.90	MAY 11	97.08	JUL 16	97.92	SEP 2	97.00
NOV 21	97.36										

443147093374501. Local number, 112N23W06DDD01.
LOCATION.--Lat 44°31'47",long 93°37'45", in SE¼SE¼SE¼ sec.6, T.112 N., R.23 W., Hydrologic Unit 07020012, 3 mi (4.8 km) southwest of New Prague.
Owner: Friedens Lutheran Church.
AQUIFER.--St. Lawrence Formation of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 5 in (0.13 m), depth 265 ft (80.8 m), cased to 209 ft (63.7 m).
DATUM.--Altitude of land-surface datum is 1,019 ft (311 m). Measuring point: Top of casing, 1.70 ft (0.52 m) above land-surface datum.
PERIOD OF RECORD.--April 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 150.8 ft (45.96 m) below land-surface datum, Mar. 18, 1981; lowest, 151.9 ft (46.30 m) below land-surface datum, July 26, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	151.3	JAN 7	151.0	MAR 18	150.8	MAY 11	150.9	JUL 16	151.5	SEP 2	151.4
NOV 21	151.2										

LINCOLN COUNTY

441705096084501. Local number, 110N44W33DCD01.
LOCATION.--Lat 44°17'05", long 96°08'45", in SE¼SW¼SE¼ sec.33, T.110 N., R.44 W., Hydrologic Unit 07020006, at Tyler.
Owner: U.S. Geological Survey.
AQUIFER.--Dakota Sandstone of Lower Cretaceous Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 8 in (0.20 m), depth 967 ft (295 m), screened 890 to 900 ft (271 to 274 m).
DATUM.--Altitude of land-surface datum is 1,738 ft (530 m). Measuring point: Top of recorder platform, 3.50 ft (1.07 m) above land-surface datum.
PERIOD OF RECORD.--November 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 248.4 ft (75.71 m) below land-surface datum, Apr. 20, 1970; lowest, 250.8 ft (76.44 m) below land-surface datum, Nov. 12, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	250.1	JAN 9	250.2	APR 22	249.8	MAY 5	249.7	JUL 9	250.0	SEP 2	249.5
DEC 3	250.1	MAR 12	250.0								

MARTIN COUNTY

434359094422201. Local number, 103N32W08CCD01.
LOCATION.--Lat 43°43'59", long 94°42'22", in SE¼SW¼SW¼ sec.8, T.103 N., R.32 W., Hydrologic Unit 07020009, 1.5 mi (2.4 km) south of Triumph.
Owner: Robert Olson.
AQUIFER.--Sandstone of Cretaceous Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 16 in (0.41 m), depth 412 ft (126 m), screened 372 to 412 ft (113 to 126 m).
DATUM.--Altitude of land-surface datum is 1,242 ft (379 m). Measuring point: Vent pipe, 0.50 ft (0.15 m) above land-surface datum.
PERIOD OF RECORD.--July 1981 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 92.30 ft (28.13 m) below land-surface datum, Sept 14, 1981; lowest, 92.39 ft (28.16 m) below land-surface datum, July 9, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL
JUL 9	92.39	SEP 14	92.30

MC LEOD COUNTY

444630094021601. Local number, 115N27W14ABA01.
LOCATION.--Lat 44°46'30", long 94°02'16", in NE¼NW¼NE¼ sec.14, T.115 N., R. 27 W., Hydrologic Unit 07010205, in City of Plato.
Owner: Kenny's Garage. Formerly Plato Creamery.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 67 ft (20.4 m).
DATUM.--Altitude of land-surface datum is 990 ft (302 m). Measuring point: Edge of pump base, 0.70 ft (0.21 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--September 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 24.97 ft (7.61 m) below land-surface datum, May 10, 1979; lowest, 32.22 ft (9.82 m) below land-surface datum, Apr. 23, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	28.48	MAR 24	31.60	APR 23	32.22	JUL 20	32.18	AUG 24	30.74	SEP 28	27.22
JAN 14	30.66										

MC LEOD COUNTY--Continued

447758094132101. Local number, 115N28W05ACC01.
LOCATION.--Lat 44°47'58", long 94°13'21", in SW¼SW¼NE¼ sec.5, T.115 N., R.28 W., Hydrologic Unit 07010205, northwest of Glencoe.
Owner: Graupmann Farms, Inc.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 472 ft (144 m), screened 432 to 472 ft (132 to 144 m).
DATUM.--Altitude of land-surface datum is 1,036 ft (316 m). Measuring point: Edge of vent pipe, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--September 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 80.50 ft (24.54 m) below land-surface datum, Aug. 20, 1979; lowest, 109.6 ft (33.41 m) below land-surface datum, Oct. 1, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	82.16	JAN 14	90.13	APR 23	89.95	JUL 20	88.02	AUG 24	87.39	SEP 28	87.00
NOV 5	90.36	MAR 24	87.40	JUN 8	90.09						

447040094090801. Local number, 115N28W11ADD01.
LOCATION.--Lat 44°47'04", long 94°09'08", in SE¼SE¼NE¼ sec.11, T.115 N., R.28 W., Hydrologic Unit 07010205, 0.4 mi (0.6 km) north of Glencoe.
Owner: McLeod County Highway Department.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 5 in (0.13 m), depth 500 ft (152 m), cased to 446 ft (136 m).
DATUM.--Altitude of land-surface datum is 1,020 ft (311 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--November 1972 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 137.6 ft (41.94 m) below land-surface datum, Sept. 28, 1977; lowest, 148.0 ft (45.10 m) below land-surface datum, July 18, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	144.0	JAN 14	145.3	APR 23	141.0	JUL 20	141.4	AUG 24	140.5	SEP 28	140.0
NOV 5	143.3	MAR 23	140.2	JUN 8	141.3						

448819094164701. Local number, 116N29W35DDC01.
LOCATION.--Lat 44°48'19", long 94°16'47", in SW¼SE¼SE¼ sec.35, T.116 N., R.29 W., Hydrologic Unit 07010205, 1.3 mi (2.1 km) south of Biscay.
Owner: Charles Johnson.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 269 ft (82.0 m), screened 229 to 269 ft (69.8 to 82.0 m).
DATUM.--Altitude of land-surface datum is 1,050 ft (320 m). Measuring point: Edge of vent pipe, 1.00 ft 0.30 m) above land-surface datum.
PERIOD OF RECORD.--September 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 25.37 ft (7.73 m) below land-surface datum, Feb. 5, 1980; lowest, 29.93 ft (9.12 m) below land-surface datum, Sept. 9, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	29.89	JAN 14	28.99	APR 23	28.18	JUL 20	28.00	AUG 24	27.58	SEP 28	27.97
NOV 5	28.85	MAR 24	26.32	JUN 8	28.19						

MC LEOD COUNTY--Continued

445721094031201. Local number 117N27W10DAA01.
LOCATION.--Lat 44°57'21", long 94°03'12", in NE¼NE¼SE¼ sec.10, T.117 N., R.27 W., Hydrologic Unit 07010205, 0.1 mi (0.2 km) south of Winsted.
Owner: Winsted Farmers Coop.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled industrial artesian well, diameter 4 in (0.10 m), depth 129 ft (39.3 m), screened 125 to 129 ft (38.1 to 39.3 m).
DATUM.--Altitude of land-surface datum is 1,015 ft (309 m). Measuring point: Top of casing, 1.40 ft (0.43 m) above land-surface datum.
PERIOD OF RECORD.--November 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 32.55 ft (9.92 m) below land-surface datum, June 20, 1979; lowest, 41.52 (12.66 m) below land-surface datum, Nov. 3, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	35.74	JAN 14	37.79	APR 24	37.84	JUL 20	37.71	AUG 24	37.38	SEP 28	36.61
NOV 6	37.70	MAR 24	37.49	JUN 8	37.79						

MEEKER COUNTY

450632094290801. Local number, 119N30W19AAB01.
LOCATION.--Lat 45°06'32", long 94°29'08", in NW¼NE¼NE¼ sec.19, T.119 N., R.30 W., Hydrologic Unit 07010204, on Ted Carlson farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 26 ft (7.9 m), screened 24 to 26 ft (7.3 to 7.9 m).
DATUM.--Altitude of land-surface datum is 1,130 ft (344 m). Measuring point: Top of casing, 3.30 ft (1.01 m) above land-surface datum.
PERIOD OF RECORD.--November 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.94 ft (1.20 m) below land-surface datum, July 1, 1981; lowest 6.74 ft (2.05 m) below land-surface datum, Feb. 3, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	6.07	DEC 22	6.31	MAR 16	6.55	APR 20	5.56	JUL 1	3.94	AUG 25	5.89
NOV 25	6.24	FEB 3	6.74								

451542094322301. Local number, 121N31W26BDC01.
LOCATION.--Lat 45°15'42", long 94°32'23", in SW¼SE¼NW¼ sec.26, T.121 N., R.31 W., Hydrologic Unit 07010204, on Keith Langmo farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 16 ft (4.9 m), screened 14 to 16 ft (4.3 to 4.9 m).
DATUM.--Altitude of land-surface datum is 1,112 ft (339 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--November 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.20 ft (1.28 m) below land-surface datum, Aug. 1, 1979; lowest, 6.59 ft (2.01 m) below land-surface datum, Mar. 12, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	4.93	DEC 22	5.72	MAR 16	6.27	APR 20	5.37	JUL 1	4.79	AUG 25	5.48
NOV 25	5.19	FEB 3	6.48								

MILLE LACS COUNTY

454450093395701. Local number, 038N27W35ABC01.
LOCATION.--Lat 45°44'50", long 93°39'57", in SW¼NW¼NE¼ sec.35, T.38 N., R.27 W., Hydrologic Unit 07010207, in Milaca.
Owner: City of Milaca, creamery well.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in (0.30 m), depth 82 ft (25.0 m), screened 67 to 82 ft (20.4 to 25.0 m).
DATUM.--Land-surface datum is 1,082.2 ft (329.8 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of platform, 3.00 ft (0.91 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--September 1967 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 36.74 ft (11.20 m) below land-surface datum, July 26, 1972; lowest, 42.81 ft (13.05 m) below land-surface datum, Aug. 27, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	40.71	40.93	.....	41.70	41.94	41.81	41.67	41.17	41.24	.....	41.19	41.45
10	40.79	41.06	.....	41.73	41.97	41.79	41.63	41.16	41.31	40.92	41.20	.....
15	40.82	41.08	.....	41.81	42.02	41.84	41.61	41.11	41.38	41.02	41.13	.....
20	40.83	41.10	41.49	41.83	41.98	41.77	41.55	41.09	.....	41.02	41.19	.....
25	40.85	41.18	41.59	41.81	41.94	41.81	41.47	41.21	.....	41.08	41.27	.....
EOM	40.92	41.15	41.67	41.93	41.83	41.77	41.31	41.25	.....	41.14	41.39	.....

WTR YEAR 1981 HIGHEST 40.59 OCT 1, 1980 LOWEST 42.03 FEB 17, 1981

MORRISON COUNTY

455135094092801. Local number, 039N31W23DAA01.
LOCATION.--Lat 45°51'35", long 94°09'28", in NE¼NE¼SE¼ sec.23, T.39 N., R. 31 W., Hydrologic Unit 07010201, on Kelzenberg farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Driven observation water-table well, diameter 1¼ in (0.03 m), depth 12 ft (3.7 m), screened 10 to 12 ft (3.0 to 3.7 m).
DATUM.--Altitude of land-surface datum is 1,104 ft (336 m). Measuring point: Top of casing, 0.50 ft (0.15 m) above land-surface datum.
PERIOD OF RECORD.--October 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.72 ft (1.13 m) below land-surface datum, July 14, 1978; lowest, dry below land-surface datum, July and Aug. 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	6.91	DEC 16	6.94	FEB 17	8.65	APR 9	8.70	JUN 5	6.12	JUL 14	6.10
15	7.28	17	6.88	MAR 10	8.89	13	7.79	16	6.70	AUG 12	6.25
NOV 13	6.30	JAN 17	7.72	16	8.80	MAY 27	6.30	JUL 7	5.31	SEP 15	6.67
18	6.82	21	8.16								

460444094212501. Local number, 130N29W08DCC01.
LOCATION.--Lat 46°04'44", long 94°21'25", in SW¼SW¼SE¼ sec.8, T.130 N., R.29 W., Hydrologic Unit 07010104, at Camp Ripley.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in (0.05 m), depth 59 ft (18.0 m), screened 56 to 59 ft (17.1 to 18.0 m).
DATUM--Land-surface datum is 1,149.0 ft (350.2 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.10 ft (0.64 m) above land-surface datum.
REMARKS.--Measured weekly by Theodore Wilczek. Water levels used in monthly Water Resources Review.
PERIOD OF RECORD.--April 1949 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.35 ft (2.24 m) below land-surface datum, July 28, 1972; lowest, 19.75 ft (6.02 m) below land-surface datum, Aug. 4, 1961.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

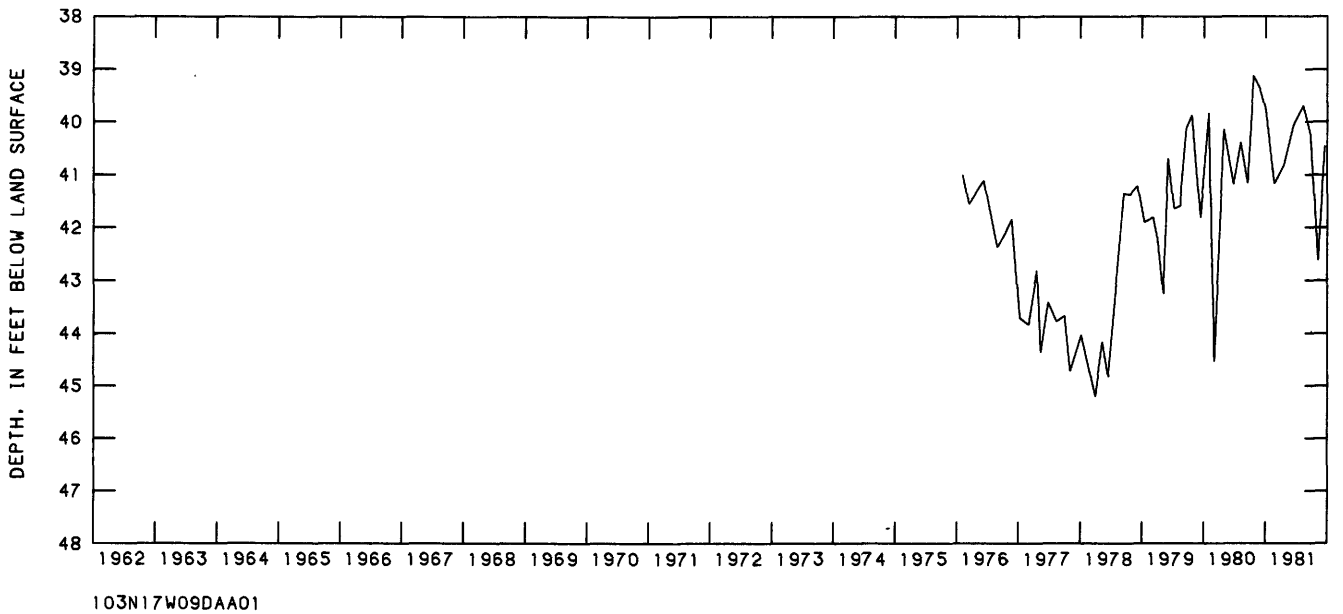
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	14.56	DEC 5	14.65	FEB 6	15.39	APR 10	15.75	JUN 12	16.23	AUG 7	15.34
10	14.65	12	14.57	13	15.47	17	15.76	19	16.56	14	15.20
17	14.45	19	14.85	20	15.41	24	15.88	26	16.54	21	15.46
24	14.61	24	14.87	27	15.27	MAY 1	15.87	JUL 2	16.01	28	15.07
31	14.31	JAN 2	14.89	MAR 6	15.63	8	15.87	10	16.94	SEP 4	14.92
NOV 7	14.57	9	15.03	13	15.62	15	15.91	17	16.78	11	14.73
14	13.97	16	15.24	20	15.62	22	16.04	24	15.75	18	14.72
21	14.60	23	15.29	27	15.64	29	15.87	31	15.49	25	14.65
26	14.65	30	15.34	APR 3	15.57	JUN 5	16.01				

MOWER COUNTY

434417093521001. Local number, 103N17W09DAA01.
LOCATION.--Lat 43°44'17", long 93°52'10", in NE¼NE¼SE¼ sec.9, T.103 N., R.17 W., Hydrologic Unit 07080201, in Brownsdale.
Owner: Land O'Lakes, creamery well.
AQUIFER.--Cedar Valley Formation of Middle Devonian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 4 in (0.10 m), depth 130 ft (39.6 m), casing information not available.
DATUM.--Altitude of land-surface datum is 1,280 ft (390 m). Measuring point: Top of well cap, 0.40 ft (0.12 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--February 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 39.12 ft (11.92 m) below land-surface datum, Oct. 21, 1980; lowest, 45.20 ft (13.78 m) below land-surface datum, Mar. 30, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	39.12	DEC 30	39.75	APR 20	40.81	JUN 15	40.05	AUG 11	39.69	SEP 23	40.25
NOV 26	39.35	FEB 24	41.17								



MURRAY COUNTY

435357096034701. Local number, 105N43W18BCC01.
LOCATION.--Lat 43°53'57", long 96°03'47", in SW¼SW¼NW¼ sec.18, T.105 N., R.43 W., Hydrologic Unit 10170204, 6 mi (9.6 km) southwest of Chandler.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 12 ft (3.7 m), screened 10 to 12 ft (3.0 to 3.7 m).
DATUM.--Altitude of land-surface datum is 1,600 ft (488 m). Measuring point: Top of casing, 4.25 ft (1.30 m) above land-surface datum.
PERIOD OF RECORD.--May 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.25 ft (1.60 m) below land-surface datum, July 21, 1979; lowest, 8.61 ft (2.62 m) below land-surface datum, Oct. 31, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	8.61	DEC 13	8.19	FEB 14	8.32	APR 18	8.15	JUN 6	8.37	AUG 22	8.13
NOV 13	8.16	JAN 31	8.31	MAR 30	8.09	MAY 15	8.29	JUL 18	8.37	SEP 30	8.17

MURRAY COUNTY--Continued

435757095314501. Local number, 106N39W21DCD01.
LOCATION.--Lat 43°57'57", long 95°31'45", in SE¼SW¼SE¼ sec.21, T.106 N., R.39 W., Hydrologic Unit 07100001, 6.7 mi (10.8 km) south of Dovray.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 8 ft (2.4 m), screened 6 to 8 ft (1.8 to 2.4 m).
DATUM.--Altitude of land-surface datum is 1,430 ft (436 m). Measuring point: Top of casing, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 0.76 ft (0.23 m) above land-surface datum, Apr. 21, 1979; lowest, 5.50 ft (1.68 m) below land-surface datum, Sept. 16, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	3.97	DEC 20	3.70	FEB 28	3.98	APR 28	3.84	JUN 13	4.80	SEP 5	5.03
NOV 15	3.88	JAN 31	4.32	MAR 28	4.05	MAY 15	3.85	JUL 25	5.05	30	4.93

440028095352401. Local number, 106N40W12ABB01.
LOCATION.--Lat 44°00'28", long 95°35'24", in NE¼NE¼NE¼ sec.12, T.106 N., R.40 W., Hydrologic Unit 07100012, 5.5 mi (8.8 km) southwest of Dovray.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 12.5 ft (3.8 m), screeened 10.5 to 12.5 ft (3.2 to 3.8 m).
DATUM.--Altitude of land-surface datum is 1,450 ft (442 m). Measuring point: Top of casing, 3.40 ft (1.04 m) above land-surface datum.
PERIOD OF RECORD.--December 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 0.09 ft (0.03 m) below land-surface datum, Apr. 21, 1979; lowest, 6.23 ft (1.90 m) below land-surface datum, Feb. 2, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	4.40	DEC 20	4.45	FEB 28	5.78	APR 29	5.78	JUN 13	6.04	SEP 5	5.92
NOV 15	4.80	JAN 31	5.93	MAR 28	6.05	MAY 15	5.59	JUL 25	5.60	30	5.89

440355095381701. Local number, 107N40W21AAB01.
LOCATION.--Lat 44°03'55", long 95°38'17", in NW¼NE¼NE¼ sec.21, T.107 N., R.40 W., Hydrologic Unit 07100001, 0.65 mi (1.05 km) east of Currie.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 11.5 ft (3.57 m), screened 9.5 to 11.5 ft (2.9 to 3.5 m).
DATUM.--Altitude of land-surface datum is 1,485 ft (453 m). Measuring point: Top of casing, 2.80 ft (0.85 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 0.82 ft (0.25 m) below land-surface datum, Mar. 24, 1979; lowest, 6.71 ft (2.05 m) below land-surface datum, Sept. 30, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	6.10	DEC 16	5.94	FEB 25	5.75	APR 29	5.68	JUN 26	5.89	SEP 30	6.71
NOV 11	6.11	JAN 31	5.85	MAR 28	5.73	MAY 15	5.89	AUG 29	6.58		

MURRAY COUNTY--Continued

444254095071201. Local number, 108N41W36BBC01.
LOCATION.--Lat 44°42'54", long 95°07'12", in SW¼NW¼NW¼ sec.36, T.108 N., R.41 W., Hydrologic Unit 07100001, 3.8 mi (6.1 km) northeast of Slayton.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 7 ft (2.1 m), screened 5 to 7 ft (1.5 to 2.1 m).
DATUM.--Altitude of land-surface datum is 1,490 ft (454 m). Measuring point: Top of casing, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 1.51 ft (0.46 m) above land-surface datum, Mar. 24, 1979; lowest, 6.09 ft (1.86 m) below land-surface datum, Sept. 30, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

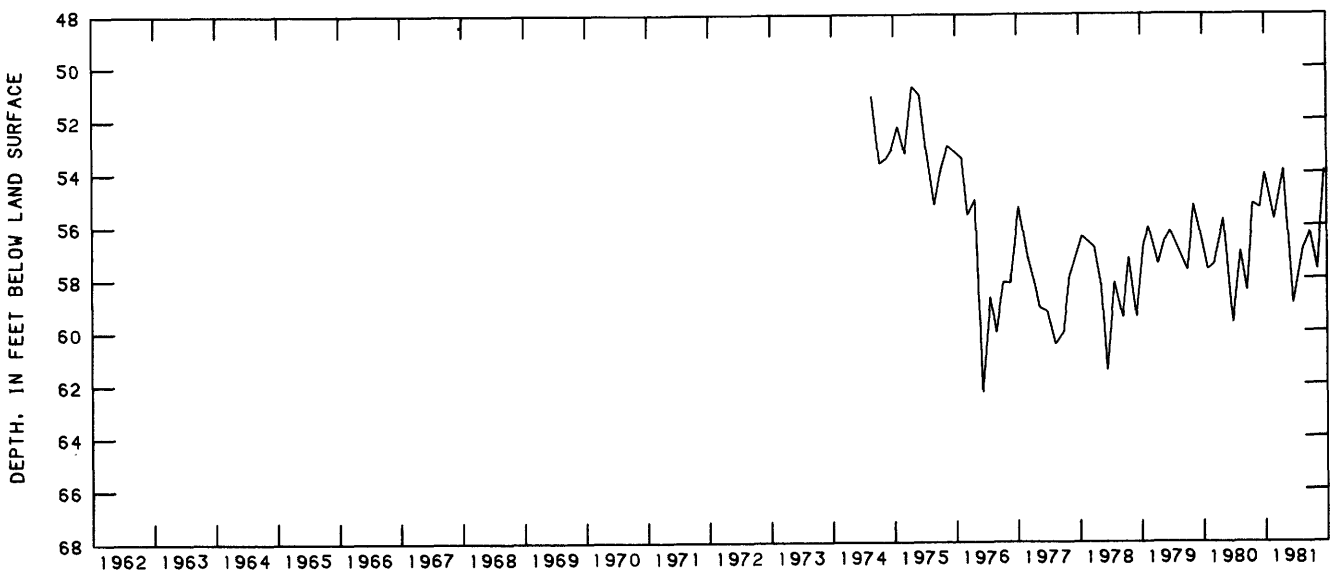
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	4.43	DEC 20	4.36	FEB 25	3.47	APR 29	2.22	JUN 11	4.53	AUG 29	4.97
NOV 11	4.30	JAN 30	4.92	MAR 28	2.84	MAY 15	2.89	JUL 25	4.85	SEP 30	6.09

OLMSTED COUNTY

435920092273801. Local number, 106N14W14ADB01.
LOCATION.--Lat 43°59'20", long 92°27'38", in NW¼SE¼NE¼ sec.14, T.106 N., R.14 W., Hydrologic Unit 07040004, in Rochester.
Owner: Golden Hill School Dist. #1371.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 478 ft (146 m), cased to 397 ft (121 m).
DATUM.--Altitude of land-surface datum is 1,065 ft (325 m). Measuring point: Edge of well cap, 1.80 ft (0.55 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--August 1974 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 50.73 ft (15.46 m) below land-surface datum, Apr. 18, 1975; lowest, 62.30 ft (18.99 m) below land-surface datum, June 8, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	55.16	DEC 31	54.03	APR 22	53.89	JUN 18	58.96	AUG 12	56.91	SEP 24	56.24
DEC 2	55.34	FEB 26	55.78								



106N14W14ADB01

PINE COUNTY

455139092524401. Local number, 039N20W18DDD01.
LOCATION.--Lat 45°51'39", long 92°52'44", in SE¼SE¼SE¼ sec.18, T.39 N., R.20 W., Hydrologic Unit 07030004, on Robert Lindahl farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 24 ft (7.3 m), screened 22 to 24 ft (6.7 to 7.3 m).
DATUM.--Altitude of land-surface datum is 945 ft (288 m). Measuring point: Top of casing, 2.70 ft (0.82 m) above land-surface datum.
PERIOD OF RECORD.--December 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 8.69 ft (2.65 m) below land-surface datum, July 31, 1979; lowest, 10.95 ft (3.34 m) below land-surface datum, Jan. 19, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	10.44	DEC 17	10.77	FEB 25	10.94	APR 28	10.12	JUN 22	9.80	AUG 28	9.42
NOV 5	10.52	JAN 19	10.95	MAR 20	10.83	MAY 19	9.95	JUL 21	9.97	SEP 23	9.64

455939092365801. Local number, 041N18W33AAD01.
LOCATION.--Lat 45°59'39", long 92°36'58", in SE¼NE¼NE¼ sec.33, T.41 N., R.18 W., Hydrologic Unit 07030001, in St. Croix State Park.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 24 ft (7.3 m), screened 22 to 24 ft (6.7 to 7.3 m).
DATUM.--Altitude of land-surface datum is 975 ft (297 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--November 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.29 ft (2.22 m) below land-surface datum, July 31, 1979; lowest, 11.27 ft (3.44 m) below land-surface datum, Mar. 20, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	10.63	DEC 17	10.82	FEB 25	11.25	APR 28	10.31	JUN 22	9.08	AUG 31	9.33
NOV 5	10.64	JAN 19	11.07	MAR 20	11.27	MAY 19	9.58	JUL 22	8.99	SEP 23	9.70

455859092454201. Local number, 041N19W33CCC01.
LOCATION.--Lat 45°58'59", long 92°45'42", in SW¼SW¼SW¼ sec.33, T.41 N., R.19 W., Hydrologic Unit 07030001, on Philip Myer farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 51 ft (15.5 m), screened 49 to 51 ft (14.9 to 15.5 m).
DATUM.--Altitude of land-surface datum is 990 ft (302 m). Measuring point: Top of casing, 3.80 ft (1.16 m) above land-surface datum.
PERIOD OF RECORD.--December 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 24.36 ft (7.42 m) below land-surface datum, July 31, 1979; lowest, 26.43 ft (8.06 m) below land-surface datum, Mar. 20, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	25.93	DEC 17	26.10	FEB 25	26.42	APR 28	26.07	JUN 22	25.64	AUG 31	25.29
NOV 5	25.92	JAN 19	26.25	MAR 20	26.43	MAY 19	25.85	JUL 21	25.43	SEP 23	25.42

PINE COUNTY--Continued

455947092542301. Local number, 041N20W32BBB01.
LOCATION.--Lat 45°59'47", long 92°54'23", in NW¼NW¼NW¼ sec.32, T.41 N., R.20 W., Hydrologic Unit 07030004, on Howard Sikkink farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m) , depth 44 ft (13.4 m), screened 42 to 44 ft (12.8 to 13.4 m).
DATUM.--Altitude of land-surface datum is 1,014 ft (309 m). Measuring point: Top of casing, 2.30 ft (0.70 m) above land-surface datum.
PERIOD OF RECORD.--December 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 17.49 ft (5.33 m) below land-surface datum, July 31, 1979; lowest, 20.71 ft (6.31 m) below land-surface datum, Sept. 23, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	19.57	DEC 17	19.90	FEB 25	20.33	APR 28	20.53	JUN 22	20.69	AUG 28	20.68
NOV 5	19.69	JAN 19	20.09	MAR 20	20.37	MAY 19	20.60	JUL 21	20.64	SEP 23	20.71

461901092440301. Local number, 044N19W10BAB01.
LOCATION.--Lat 46°19'01", long 92°44'03", in NW¼NE¼NW¼ sec. 10, T.44 N., R. 19 W., Hydrologic Unit 07030003, on Victor Waletzko farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 28 ft (8.5 m), screened 26 to 28 ft (7.9 to 8.5 m).
DATUM.--Altitude of land-surface datum is 1,105 ft (337 m). Measuring point: Top of casing, 4.20 ft (1.28 m) above land-surface datum.
PERIOD OF RECORD.--December 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 9.63 ft (2.94 m) below land-surface datum, July 26, 1979; lowest, 12.22 ft (3.72 m) below land-surface datum, Feb. 25, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

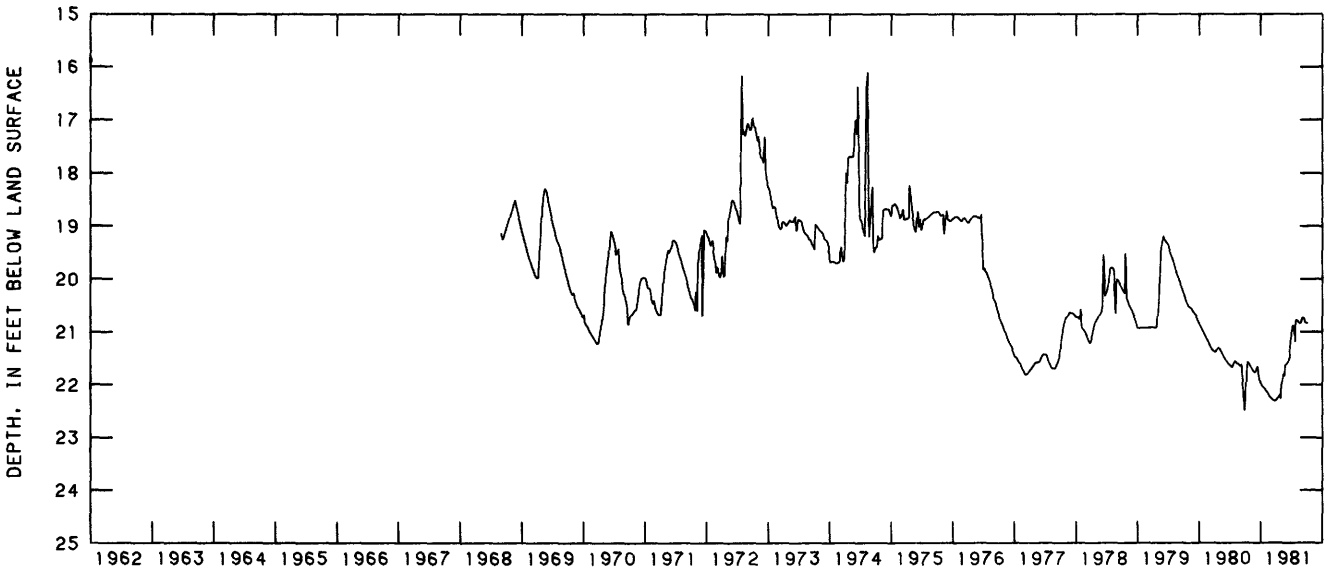
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	11.05	DEC 23	11.62	FEB 25	12.22	APR 29	11.41	JUN 23	10.58	AUG 28	10.03
NOV 4	11.27	JAN 22	12.02	MAR 18	12.08	MAY 20	11.25	JUL 22	10.32	SEP 24	10.30

462112092495801. Local number, 045N20W26DBB01.
LOCATION.--Lat 46°21'12", long 92°49'58", in NW¼NW¼SE¼ sec.26, T.45 N., R.20 W., Hydrologic Unit 07030003, at General Andrews Nursery.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Driven observation water-table well, diameter 1¼ in (0.03 m), depth 28 ft (8.5 m), screened 26 to 28 ft (7.9 to 8.5 m).
DATUM.--Altitude of land-surface datum is 1,060 ft (323 m). Measuring point: Top of casing, 0.50 ft (0.15 m) above land-surface datum.
REMARKS.--Measured weekly by Ralph Nelson.
PERIOD OF RECORD.--August 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 16.10 ft (4.91 m) below land-surface datum, Aug. 12, 1974; lowest, 22.49 ft (6.85 m) below land-surface datum, Sept. 26, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	21.57	JAN 1	21.95	MAR 13	22.29	APR 29	22.27	JUN 22	21.50	AUG 9	20.79
19	21.57	10	22.03	18	22.31	MAY 6	21.98	23	21.27	16	20.84
26	21.62	22	22.06	22	22.31	15	21.80	JUL 6	20.94	28	20.84
NOV 2	21.66	31	22.11	APR 1	22.30	20	21.85	11	20.87	31	20.77
16	21.73	FEB 8	22.14	6	22.27	25	21.64	22	21.09	SEP 8	20.72
17	21.75	18	22.19	12	22.25	31	21.62	23	21.19	17	20.76
28	21.77	21	22.21	19	22.23	JUN 7	21.60	28	20.78	22	20.83
DEC 13	21.65	26	22.24	26	22.18	14	21.55	AUG 2	20.77	28	20.84
23	21.91										

PINE COUNTY--Continued



045N20W26DBB01

PIPESTONE COUNTY

435610096082601. Local number, 106N44W33CCD01.
LOCATION.--Lat 43°56'10", long 96°08'26", in SE¼SW¼SW¼ sec.33, T.106 N., R.44 W., Hydrologic Unit 10170204, 4 mi (6.4 km) north of Edgerton.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 16 ft (4.9 m), screened 14 to 16 ft (4.3 to 4.9 m).
DATUM.--Altitude of land-surface datum is 1,610 ft (491 m). Measuring point: Top of casing 2.40 ft (0.73 m) above land-surface datum.
PERIOD OF RECORD.--May 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 1.78 ft (0.54 m) below land-surface datum, Apr. 19, 1979; lowest, 6.80 ft (2.07 m) below land-surface datum, July 18, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 13	6.57	DEC 31	6.35	FEB 14	6.06	APR 18	6.32	JUN 6	6.69	AUG 22	6.38
DEC 13	6.53	JAN 31	6.17	MAR 30	6.28	MAY 15	6.55	JUL 18	6.80	SEP 30	6.71

440456096263201. Local number, 107N47W12CDC01.
LOCATION.--Lat 44°04'56", long 96°26'32", in SW¼SE¼SW¼ sec.12, T.107 N., R.47 W., Hydrologic Unit 10170203, 4.2 mi (6.8 km) northwest of Cazenovia.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 16 ft (4.9 m), screened 14 to 16 ft (4.3 to 4.9 m).
DATUM.--Altitude of land-surface datum is 1,600 ft (488 m). Measuring point: Top of casing, 3.90 ft (1.19 m) above land-surface datum.
PERIOD OF RECORD.--May 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.76 ft (2.37 m) below land-surface datum, May 8, 1979; lowest, 10.85 ft (3.31 m) below land-surface datum, July 18, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	10.34	DEC 13	10.39	FEB 14	10.59	APR 28	10.25	JUN 6	10.61	AUG 22	10.70
NOV 13	10.39	JAN 31	10.60	MAR 30	10.30	MAY 15	10.43	JUL 18	10.85	SEP 30	10.67

POPE COUNTY

452940095414501. Local number, 123N40W04BDA01.
LOCATION.--Lat 45°29'40", long 95°41'45", in NE¼SE¼NW¼ sec.4, T.123 N., R.40 W., Hydrologic Unit 07020005, east of Hancock.
Owner: U.S. Geological Survey.
AQUIFER.--Shallow buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation artesian well, diameter 1¼ in (0.03 m), depth 20 ft (6.1 m), screened 17 to 20 ft (5.2 to 6.1 m).
DATUM.--Altitude of land-surface datum is 1,080 ft (329 m). Measuring point: Top of casing, 0.50 ft (0.15 m) above land-surface datum
PERIOD OF RECORD.--December 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.13 ft (0.65 m) below land-surface datum, July 27, 1972; lowest, 8.77 ft (2.67 m) below land-surface datum, Feb. 2, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	6.32	DEC 31	6.85	FEB 27	7.08	MAY 5	7.08	JUN 30	4.01	AUG 31	5.15
NOV 28	6.24	JAN 30	7.18	APR 2	7.10	29	6.53	JUL 31	4.67	SEP 30	5.85

452804095424001. Local number, 123N40W17AAC01.
LOCATION.--Lat 45°28'04", long 95°42'40", in SW¼NE¼NE¼ sec.17, T.123 N., R.40 W., Hydrologic Unit 07020005, on Morton farm.
Owner: Norman Morton.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled stock water-table well, diameter 4 in (0.10 m), depth 340 ft (10.4 m), screened 29 to 34 ft (8.8 to 10.4 m).
DATUM.--Altitude of land-surface datum is 1,071 ft (326 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--August 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 9.83 ft (3.00 m) below land-surface datum, Aug. 24, 1979; lowest, 14.28 ft (4.35 m) below land-surface datum, June 30, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	10.75	DEC 31	11.01	FEB 27	12.25	MAY 5	10.75	JUN 30	14.28	AUG 31	10.52
NOV 28	10.80	JAN 30	11.09	APR 2	10.74	29	10.55	JUL 31	10.32	SEP 30	10.77

452554095433801. Local number, 123N40W30DAD01.
LOCATION.--Lat 45°25'54", long 95°43'38", in SE¼NE¼SE¼ sec.30, T.123 N., R.40 W., Hydrologic Unit 07020005, 5.7 mi (9.2 km) southeast of Hancock.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.04 m), depth 13 ft (4.0 m), screened 11 to 13 ft (3.4 to 4.0 m).
DATUM.--Altitude of land-surface datum is 1,059 ft (323 m). Measuring point: Top of casing, 3.25 ft (0.99 m) above land-surface datum.
PERIOD OF RECORD.--August 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.77 ft (0.84 m) below land-surface datum, June 30, 1981; lowest, 5.38 ft (1.64 m) below land-surface datum, Jan. 30, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	4.87	DEC 31	5.20	FEB 27	5.31	MAY 5	4.70	JUN 30	2.77	AUG 31	3.62
NOV 28	4.94	JAN 30	5.38	APR 2	5.06	29	3.97	JUL 31	3.08	SEP 30	4.26

POPE COUNTY--Continued

453150095130001. Local number, 124N36W20DDD01.
LOCATION.--Lat 45°31'50", long 95°13'00", in SE¼SE¼SE¼ sec.20, T.124 N., R.36 W., Hydrologic Unit 07010204, southeast of Sedan.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 18 ft (5.5 m), screened 15 to 18 ft (4.6 to 5.5 m).
DATUM.--Altitude of land-surface datum is 1,332 ft (406 m). Measuring point: Top of casing, 3.75 ft (1.14 m) above land-surface datum.
PERIOD OF RECORD.--November 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.42 ft (1.65 m) below land-surface datum, June 27, 1972; lowest, 10.33 ft (3.15 m) below land-surface datum, Feb. 22, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	8.25	DEC 31	8.74	FEB 27	9.13	MAY 5	8.84	JUN 30	8.63	AUG 31	9.20
NOV 28	8.36	JAN 30	9.04	APR 2	9.06	29	8.90	JUL 31	9.03	SEP 30	9.26

453444095433701. Local number, 124N40W05BCC01.
LOCATION.--Lat 45°34'44", long 95°43'37", in SW¼SW¼NW¼ sec.5, T.124 N., R.40 W., Hydrologic Unit 07020005, on Wrolson farm.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Altitude of land-surface datum is 1,115 ft (340 m). Measuring point: Top of casing, 3.20 ft (0.98 m) above land-surface datum.
PERIOD OF RECORD.--August 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.73 ft (2.05 m) below land-surface datum, Aug. 29, 1979; lowest, 9.34 ft (2.85 m) below land-surface datum, Sept. 30, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	8.12	DEC 31	8.40	FEB 27	8.66	MAY 5	8.66	JUN 30	8.30	AUG 31	9.23
NOV 28	8.15	JAN 30	8.61	APR 2	8.66	29	8.81	JUL 31	8.62	SEP 30	9.34

453428095432801. Local number, 124N40W05CCA01.
LOCATION.--Lat 45°34'28", long 95°43'28", in NE¼SW¼SW¼ sec.5, T.124 N., R.40 W., Hydrologic Unit 07020005, on Solvie farm.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Altitude of land-surface datum is 1,112 ft (339 m). Measuring point: Top of casing, 2.50 ft (0.76 m) above land-surface datum.
REMARKS.--Water level affected by pumping from nearby irrigation well.
PERIOD OF RECORD.--August 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.91 ft (1.19 m) below land-surface datum, Oct. 30, Nov. 28, 1980; lowest, 7.44 ft (2.27 m) below land-surface datum, July 31, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	3.91	DEC 31	4.20	FEB 27	4.29	MAY 5	4.32	JUN 30	4.05	AUG 31	5.06
NOV 28	3.91	JAN 30	4.41	APR 2	4.29	29	4.45	JUL 31	s7.44	SEP 30	5.12

s Nearby well being pumped.

POPE COUNTY--Continued

453250095434501. Local number, 124N40W18DAD01.
LOCATION.--Lat 45°32'50", long 95°43'45", in SE¼NE¼SE¼ sec.18, T.124 N., R.40 W., Hydrologic Unit 07020005, south of Cyrus.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 23 ft (7.0 m), screened 20 to 23 ft (6.1 to 7.0 m).
DATUM.--Altutude of land-surface datum is 1,097 ft (334 m). Measuring point: Top of casing, 5.60 ft (1.71 m) above land-surface datum.
REMARKS.--Water level affected by pumping from nearby irrigation well.
PERIOD OF RECORD.--December 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.78 ft (1.76 m) below land-surface datum, July 27, 1972; lowest, 13.80 ft (4.21 m) below land-surface datum, July 27, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	9.98	DEC 31	10.10	FEB 27	10.12	MAY 5	9.93	JUN 30	9.25	AUG 31	10.22
NOV 28	9.94	JAN 30	10.21	APR 2	10.07	29	10.19	JUL 31	s11.34	SEP 30	10.15

s Nearby well being pumped.

453117095444201. Local number, 124N40W30BCC01.
LOCATION.--Lat 45°31'17", long 95°44'42", in SW¼SW¼NW¼ sec.30, T.124 N., R.40 W., Hydrologic Unit 07020005, on Schaefer farm.
Owner: U.S. Geological Survey
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 40.5 ft (12.3 m), screened 38.5 to 40.5 ft (11.7 to 12.3 m).
DATUM.--Altitude of land-surface datum is 1,105 ft (337 m). Measuring point: Top of casing, 3.50 ft (1.08 m) above land-surface datum.
PERIOD OF RECORD.--August 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.80 ft (6.95 m) below land-surface datum, Aug. 28, 1979; lowest, 25.36 ft (7.73 m) below land-surface datum, May 29, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	25.01	DEC 31	25.09	FEB 27	25.22	MAY 5	25.30	JUN 30	24.44	AUG 31	24.79
NOV 28	25.02	JAN 30	25.11	APR 2	25.25	29	25.36	JUL 31	24.32	SEP 30	24.84

454003095120401. Local number, 125N36W04ADA01.
LOCATION.--Lat 45°40'03", long 95°12'04", in NE¼SE¼NE¼ sec.4, T.125 N., R.36 W., Hydrologic Unit 07010202, on McKigney farm.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Altitude of land-surface datum is 1,445 ft (440 m). Measuring point: Top of casing, 3.10 ft (0.94 m) above land-surface datum.
PERIOD OF RECORD.--August 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.07 ft (2.15 m) below land-surface datum, May 30, 1980; lowest, 9.50 ft (2.90 m) below land-surface datum, Aug. 29, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	7.80	DEC 31	8.05	FEB 27	8.39	MAY 5	8.42	JUN 30	8.02	AUG 31	9.00
NOV 28	7.80	JAN 30	8.25	APR 2	8.49	29	8.44	JUL 31	8.33	SEP 30	8.93

POPE COUNTY--Continued

453833095131801. Local number, 125N36W16BBB01.
LOCATION.--Lat 45°38'33", long 95°13'18", in NW¼NW¼NW¼ sec.16, T.125 N., R.36 W., Hydrologic Unit 07010202, on Cinderland farm.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Altitude of land-surface datum is 1,350 ft (411 m). Measuring point: Top of casing, 2.70 ft (0.82 m) above land-surface datum.
PERIOD OF RECORD.--August 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 15.79 ft (4.81 m) below land-surface datum, Mar. 31, 1980; lowest, 17.84 ft (5.44 m) below land-surface datum, Aug. 31, 1981.

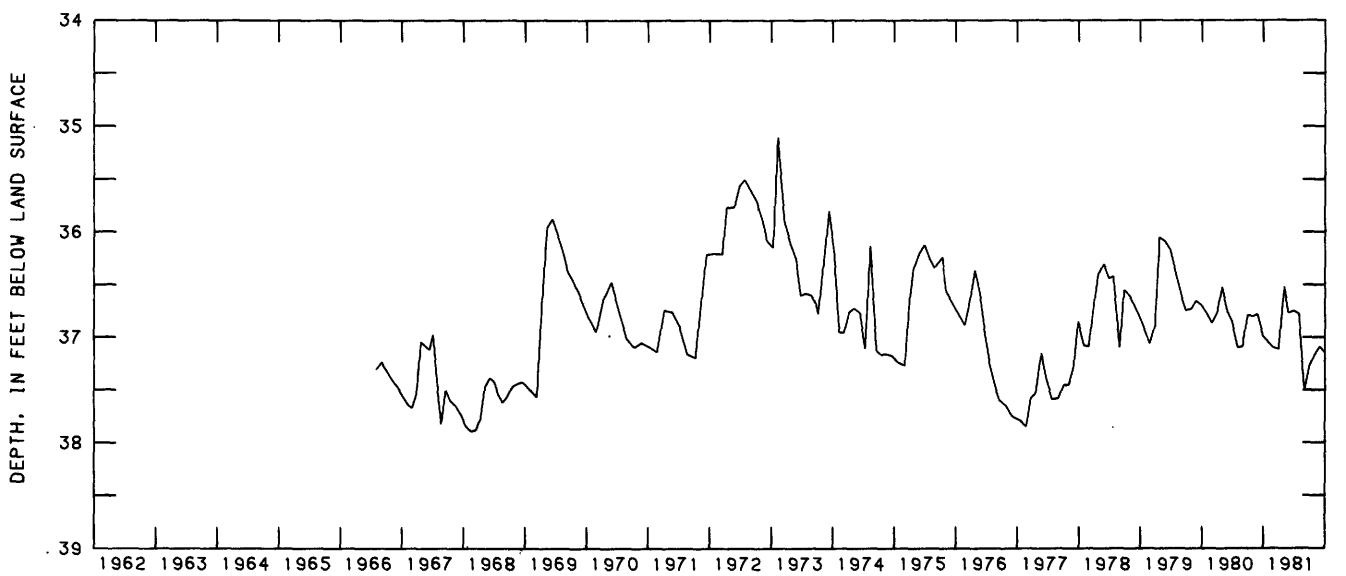
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	16.26	DEC 31	16.46	FEB 27	16.67	MAY 5	16.93	JUN 30	17.07	AUG 31	17.84
NOV 28	16.30	JAN 30	16.60	APR 2	16.88	29	16.99	JUL 31	17.40	SEP 30	17.71

453810095174501. Local number, 125N37W14DBB01.
LOCATION.--Lat 45°38'10", long 95°17'45", in NW¼NW¼SE¼ sec.14, T.125 N., R.37 W., Hydrologic Unit 07020005, 4 mi (6.4 km) east of Glenwood.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 64 ft (19.5 m), screened 62 to 64 ft (18.9 to 19.5 m).
DATUM.--Altitude of land-surface datum is 1,368 ft (417 m). Measuring point: Top of platform, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--August 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 35.10 ft (10.70 m) below land-surface datum, Feb. 9, 1973; lowest, 37.89 ft (11.55 m) below land-surface datum, Feb. 14, 1968.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	36.80	DEC 31	36.99	FEB 27	37.10	MAY 5	36.52	JUN 30	36.75	AUG 31	37.51
NOV 28	36.78	JAN 30	37.05	APR 2	37.12	29	36.77	JUL 31	36.78	SEP 30	37.28



125N37W14DBB01

POPE COUNTY--Continued

454230095143001. Local number, 126N36W20BCC01.
LOCATION.--Lat 45°42'30", long 95°14'30", in SW¼SW¼NW¼ sec.20, T.126 N., R.36 W., Hydrologic Unit 07010202, east of Villard.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 17 ft (5.2 m), screened 14 to 17 ft (4.3 to 5.2 m).
DATUM.--Altitude of land-surface datum is 1,354 ft (413 m). Measuring point: Top of platform, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--November 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.84 ft (1.17 m) below land-surface datum, July 27, 1972; lowest, 10.10 ft (3.08 m) below land-surface datum, Oct 4, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

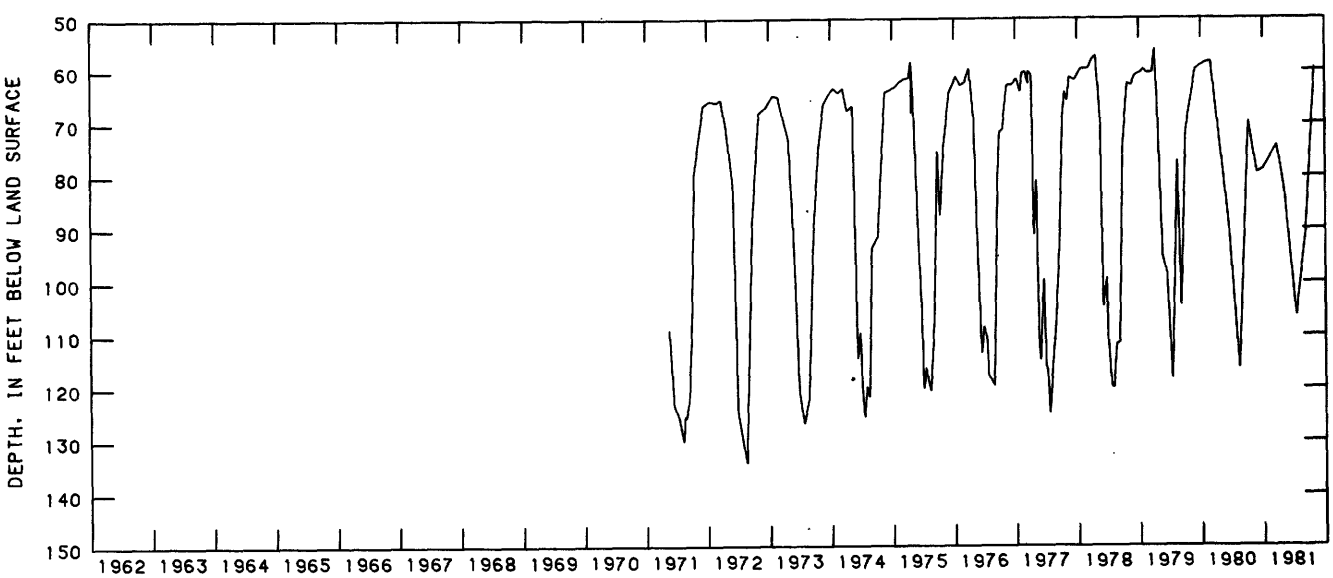
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	6.90	DEC 31	7.44	FEB 27	8.02	MAY 5	8.28	JUN 30	7.95	AUG 31	8.59
NOV 28	7.09	JAN 30	7.78	APR 2	8.28	29	8.30	JUL 31	8.09	SEP 30	8.75

RAMSEY COUNTY

445648093053402. Local number, 028N22W06ABD02.
LOCATION.--Lat 44°56'48", long 93°05'34", in SE¼NW¼NE¼ sec.6, T.28 N., R.22 W., Hydrologic Unit 07010206, at 55 East 5th Street, St. Paul.
Owner: Northwestern National Bank.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled air conditioning artesian well, diameter 16 in (0.41 m), depth 355 ft (108 m), cased to 212 ft (64.6 m).
DATUM.--Altitude of land-surface datum is 770 ft (235 m). Measuring point: Edge of vent pipe, 7.50 ft (2.29 m) below land-surface datum.
REMARKS.--Water level affected by pumping of nearby wells.
PERIOD OF RECORD.--May 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 56.00 ft (17.07 m) below land-surface datum, Apr. 5, 1979; lowest, 134.0 ft (40.84 m) below land-surface datum, Aug. 16, 1972.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	69.70	DEC 29	78.85	MAR 23	74.30	MAY 4	82.40	JUL 14	106.4	SEP 8	90.30
NOV 25	79.50										



028N22W06ABD02

RAMSEY COUNTY--Continued

445632093084901. Local number, 028N23W03ADD01.
LOCATION.--Lat 44°56'32", long 93°08'49", in SE¼SE¼NE¼ sec.3, T.28 N., R.23 W., Hydrologic Unit 07010206, at northwest corner of Lexington and Summit Avenues, St. Paul.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 96 ft (29.3 m), screened 94 to 96 ft (28.6 to 29.3 m).
DATUM.--Altitude of land-surface datum is 920 ft (280 m). Measuring point: Top of casing, 4.00 ft (1.22 m) above land-surface datum.
PERIOD OF RECORD.--August 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 84.44 ft (25.74 m) below land-surface datum, Oct. 26, 1979, Jan. 22, 1980; lowest, 87.88 ft (26.79 m) below land-surface datum, Oct. 25, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	84.75	JAN 5	84.82	MAR 17	84.98	MAY 5	85.14	JUL 21	85.43	SEP 8	85.60
NOV 19	84.78										

445955093011001. Local number, 029N22W14CAB01.
LOCATION.--Lat 44°59'55", long 93°01'10", in NW¼NE¼SW¼ sec.14, T.29 N., R.22 W., Hydrologic Unit 07010206, at Goodrich Golf Course.
Owner: Ramsey County.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 523 ft (159 m), cased to 303 ft (92.4 m).
DATUM.--Altitude of land-surface datum is 969 ft (295 m). Measuring point: Edge of vent pipe, 2.50 ft (0.76 m) above land-surface datum.
PERIOD OF RECORD.--May 1965, April 1966 to August 1966, August 1971, May 1980 to September 1980.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 127.8 ft (39.56 m) below land-surface datum, Mar. 23, 1981; lowest, 140.6 ft (42.85 m) below land-surface datum, Apr. 6, 1966.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	128.7	FEB 6	127.9	MAR 23	127.8	SEP 16	131.6

445955093011002. Local number, 029N22W14CAB02.
LOCATION.--Lat 44°59'55", long 93°01'10", in NW¼NE¼SW¼ sec.14, T.29 N., R.22 W., Hydrologic Unit 07010206, at Goodrich Golf Course.
Owner: U.S. Geological Survey
AQUIFER.--Buried gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation artesian well, diameter 2 in (0.05 m), depth 81 ft (24.7 m), screened 78 to 81 ft (23.8 to 24.7 m).
DATUM.--Altitude of land-surface datum is 970 ft (296 m). Measuring point: Top of casing, 1.30 ft (0.40 m) above land-surface datum.
PERIOD OF RECORD.--October 1966 to August 1971, August 1977, June 1980 to September 1980.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 34.98 ft (10.66 m) below land-surface datum, Oct. 31, 1980; lowest, 45.36 ft (13.83 m) below land-surface datum, June 3, 1968.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	34.98	JAN 12	36.35	FEB 6	37.06	MAR 23	37.86	MAY 29	38.25	SEP 16	37.82

RAMSEY COUNTY--Continued

445955093011003. Local number, 029N22W14CAB03.
LOCATION.--Lat 44°59'55", long 93°01'10", in NW¼NE¼SW¼ sec.14, T.29 N., R.22 W., Hydrologic Unit 07010206, at Goodrich Golf Course.
Owner: U.S. Geological Survey
AQUIFER.--Buried gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 52 ft (15.8 m), screened 49 to 52 ft (14.9 to 15.8 m).
DATUM.--Altitude of land-surface datum is 970 ft (296 m). Measuring point: Top of casing, 1.80 ft (0.55 m) above land-surface datum.
PERIOD OF RECORD.--October 1966 to August 1971, June 1980 to September 1980.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 15.36 ft (4.68 m) below land-surface datum, Oct. 31, 1980; lowest, 25.43 ft (7.75 m) below land-surface datum, June 3, 1968.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	15.36	JAN 12	17.33	FEB 6	18.26	MAR 23	19.21	MAY 29	20.18	SEP 16	19.69

450001093024701. Local number, 029N22W16ADD01.
LOCATION.--Lat 45°00'01", long 93°02'47", in SE¼SE¼NE¼ sec.16, T.29 N., R.22 W., Hydrologic Unit 07010206, at 1955 English St.
Owner: Maplewood Bowl.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 4 in (0.10 m), depth 163 ft (49.7 m), screened 158 to 163 ft (48.2 to 49.7 m).
DATUM.--Altitude of land-surface datum is 900 ft (274 m). Measuring point: Top of well cap, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--January 1981 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 70.70 ft (21.55 m) below land-surface datum, Jan. 12, 1981; lowest, 71.82 ft (21.89 m) below land-surface datum, Sept. 11, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 12	70.70	MAY 14	71.18	JUL 22	71.78	SEP 11	71.82

445918092590901. Local number, 029N22W24ADA01.
LOCATION.--Lat 44°59'18", long 92°59'09", in NE¼SE¼NE¼ sec.24, T.29 N., R.22 W., Hydrologic Unit 07010206, at 1555 Century Avenue.
Owner: Northern States Power Co., Maplewood Gas Plant.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled fire protection artesian well, diameter 12 in (0.30 m), depth 523 ft (159 m), cased to 420 ft (128 m).
DATUM--Land-surface datum is 996.5 ft (303.7 m) National Geodetic Vertical Datum of 1929. Measuring point: Edge of 2 in (0.05 m) breather pipe, 2.40 ft (0.73 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--August 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 134.7 ft (41.10 m) below land-surface datum, Nov. 15, 1976; lowest, 151.0 ft (46.02 m) below land-surface datum, May 14, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	140.2	JAN 13	134.7	MAR 9	135.9	MAY 14	151.0	JUL 15	139.2	SEP 4	137.5
NOV 18	136.8										

RAMSEY COUNTY--Continued

445700093051001. Local number, 029N22W31DDD01.
LOCATION.--Lat 44°57'00", long 93°05'10", in SE¼SE¼SE¼ sec.31, T.29 N., R.22 W., Hydrologic Unit 07010206, at 261 East 5th Street, St. Paul.
Owner: Control Data Corp.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in (0.30 m), depth 298 ft (91 m), cased to 151 ft (46.0 m).
DATUM.--Altitude of land-surface datum is 750 ft (229 m). Measuring point: Top of recorder platform, 9.00 ft (2.74 m) below land-surface datum.
REMARKS.--Water level affected by pumping of nearby wells.
PERIOD OF RECORD.--December 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 29.07 ft (8.86 m) below land-surface datum, Apr. 15-16, 1979; lowest, 83.06 ft (25.32 m) below land-surface datum, Aug. 16, 1972.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	36.90	47.29	40.69	49.43	47.78	46.36	39.97	47.06	60.60	50.22	70.74	51.86
10	49.22	47.84	50.14	47.30	47.76	47.55	49.31	35.79	59.26	67.87	65.71	68.11
15	44.60	48.28	49.42	47.72	45.21	41.85	42.53	53.51	59.51	66.16	60.78	60.94
20	45.94	48.20	49.52	47.11	47.01	46.86	42.57	55.80	50.49	66.02	66.98	45.18
25	44.90	48.52	48.16	46.11	45.52	45.88	41.44	41.02	61.26	60.52	69.98	60.44
EOM	48.95	47.46	48.11	47.61	44.45	44.37	44.99	44.26	63.85	71.86	68.77	45.65

WTR YEAR 1981 HIGHEST 33.88 APR 19, 1981 LOWEST 71.88 AUG 6, 1981

450136093433901. Local number, 029N23W03CBA01.
LOCATION.--Lat 45°01'36", long 93°43'39", in NE¼NW¼SW¼ sec.3, T.29 N., R.23 W., Hydrologic Unit 07010206, Reeder School in Roseville.
Owner: Mounds View School District #621.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 8 in (0.20 m), depth 506 ft (154 m), cased to 421 ft (128 m).
DATUM.--Altitude of land-surface datum is 920 ft (280 m). Measuring point: Hole in well cover, 0.50 ft (0.15 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--December 1970, August 1971, August 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 101.1 ft (30.82 m) below land-surface datum, Dec. 30, 1980; lowest, 116.5 ft (35.5 m) below land-surface datum, Aug. 19, 1971.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	103.3	DEC 30	101.1	MAR 10	101.5	MAY 6	103.2	JUL 15	107.6	SEP 1	107.0
NOV 18	102.7										

450026093084201. Local number, 029N23W11CCC01.
LOCATION.--Lat 45°00'26", long 93°08'42", in SW¼SW¼SW¼ sec.11, T.29 N., R.23 W., Hydrologic Unit 07010206, at 2204 North Lexington Avenue, Roseville.
Owner: Lexington Court Apartments.
AQUIFER.--St. Peter Sandstone of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 325 ft (99.1 m), cased to 192 ft (58.5 m).
DATUM.--Altutude of land-surface datum is 945 ft (288 m). Measuring point: Top of well cap, 1.40 ft (0.43 m) above land-surface datum.
PERIOD OF RECORD.--January 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 107.5 ft (32.77 m) below land-surface datum, Mar. 4, 1974; lowest, 111.2 ft (33.89 m) below land-surface datum, Aug. 18, 1975.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	109.7	DEC 30	108.9	MAR 10	109.5	MAY 6	110.2	JUL 15	110.8	SEP 1	110.9
NOV 18	109.5										

RAMSEY COUNTY--Continued

445751093072301. Local number, 029N23W25CCD01.
LOCATION.--Lat 44°57'51", long 93°07'23", SE¼SW¼SW¼ sec.25, T.29 N., R.23 W., Hydrologic Unit 07010206, at 760 North Dale Street, St. Paul.
Owner: Burlington Northern, Inc., Dale Street Shops.
AQUIFER.--Hinckley Sandstone of Precambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 8 in (0.20 m), depth 999 ft (304 m), cased to 955 ft (291 m).
DATUM.--Land-surface datum is 859.5 ft (262.0 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of recorder floor, 4.60 ft (1.40 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--December 1970, November 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 161.0 ft (49.07 m) below land-surface datum, May 10, 1980; lowest, 205.0 ft (62.48 m) below land-surface datum, Dec. 15, 1970.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	174.7	174.4	173.3	171.2	171.3	170.2	169.5	168.2	167.2	167.9	169.5	.....
10	174.5	174.3	173.2	172.2	171.0	170.0	169.1	168.2	167.1	167.8	169.9	171.2
15	174.4	174.7	172.7	172.1	171.0	169.8	169.5	167.8	167.1	167.4	.....	171.5
20	174.1	174.2	173.5	171.5	170.7	169.6	168.6	167.6	167.6	167.9	.....	171.4
25	174.8	173.9	173.0	171.2	170.8	169.6	168.4	166.9	167.7	168.6	.....	171.7
EOM	174.7	172.8	171.8	171.7	170.6	169.0	168.2	167.2	167.9	169.1	.....	171.5

WTR YEAR 1981 HIGHEST 166.9 MAY 26, 28, 1981 LOWEST 174.9 OCT 2-3, 1980

445739093081201. Local number, 029N23W35BAD01.
LOCATION.--Lat 44°57'39", long 93°08'12", in SE¼NE¼NW¼ sec.35, T.29 N., R.23 W., Hydrologic Unit 07010206, Victoria St., 0.35 mi (0.56 km) north of University Ave.
Owner: City of St. Paul.
AQUIFER.--St. Peter Sandstone of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 16 in (0.41 m), depth 234 ft (71.3 m), screened 174 to 234 ft (53.0 to 71.3 m).
DATUM.--Altitude of land-surface datum is 888 ft (261 m). Measuring point: Top of coupling, 0.50 ft (0.15 m) above land-surface datum.
PERIOD OF RECORD.--May 1981 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 130.1 ft (39.65 m) below land-surface datum, July 21, 1981; lowest, 133.0 ft (40.54 m) below land-surface datum, May 5, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAY 5	133.0	JUN 19	130.7	JUL 21	130.1	SEP 8	131.6	SEP 16	131.5

450414093012701. Local number, 030N22W23CBB01.
LOCATION.--Lat 45°04'14", long 93°01'27", in NW¼NW¼SW¼ sec.23, T.30 N., R.22 W., Hydrologic Unit 07010206, Hoffman Road, 0.85 mi (1.4 km) southwest of Highway 61.
Owner: White Bear Town Hall.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 96 ft (29.3 m), screened 91 to 96 ft (27.7 to 29.3 m).
DATUM.--Altitude of land-surface datum is 928 ft (283 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--April 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 20.73 ft (6.32 m) below land-surface datum, Apr. 10, 1980; lowest, 22.23 ft (6.78 m) below land-surface datum, July 15, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	21.60	DEC 30	21.30	MAR 10	21.82	MAY 6	21.77	JUL 15	22.23	SEP 1	21.90
NOV 18	21.36										

RAMSEY COUNTY--Continued

450723093071801. Local number, 030N23W01BAB01.
LOCATION.--Lat 45°07'23", long 93°07'18", in NW¼NE¼NW¼ sec.1, T.30 N., R.23 W., Hydrologic Unit 07010206, at Bucher Playground.
Owner: City of Shoreview.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled recreation artesian well, diameter 8 in (0.20 m), depth 155 ft (47.2 m), cased to 101 ft (30.8 m).
DATUM.--Altitude of land-surface datum is 900 ft (274 m). Measuring point: Top of breather pipe, 2.40 ft (0.73 m) above land-surface datum.
PERIOD OF RECORD.--August 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.47 ft (6.85 m) below land-surface datum, Apr. 19, 1976; lowest, 29.73 ft (9.06 m) below land-surface datum, Sept. 8, 1970.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	26.60	DEC 30	26.02	MAR 17	26.05	MAY 29	28.04	JUL 15	27.63	SEP 8	27.30
NOV 18	26.26										

450238093082501. Local number, 030N23W35BDC01.
LOCATION.--Lat 45°02'38", long 93°08'25", in SW¼SE¼NW¼ 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 12 in (0.30 m), depth 510 ft (155 m), cased to 465 ft (142 m).
DATUM.--Altitude of land-surface datum is 960 ft (293 m). Measuring point: Hole in shelter floor, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--April 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 134.7 ft (41.06 m) below land-surface datum, Apr. 9, 1980; lowest, 141.0 ft (42.98 m) below land-surface datum, July 10, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	136.7	136.2	135.8	136.2	136.7	135.4	135.8	135.9	137.2	138.9	139.9	138.5
10	136.9	136.4	135.8	136.9	136.7	135.3	135.7	137.3	137.2	141.0	139.7	138.0
15	136.4	136.3	135.3	136.9	135.4	135.4	136.0	138.6	136.6	138.3	140.4	138.6
20	136.0	136.0	137.2	136.6	135.7	135.9	135.2	140.2	138.2	137.9	140.6	139.2
25	136.2	136.0	136.8	136.3	136.2	137.4	137.3	139.7	138.0	138.1	140.0	139.2
EOM	136.2	135.3	136.3	136.9	135.5	135.3	136.0	138.0	137.3	138.1	138.0	138.9

WTR YEAR 1981 HIGHEST 134.8 APR 21, 1981 LOWEST 141.0 JUL 10, 1981

REDWOOD COUNTY

441327095110701. Local number, 109N36W21DCC01.
LOCATION.--Lat 44°13'27", long 95°11'07", in SW¼SW¼SE¼ sec.21, T.109 N., R.36 W., Hydrologic Unit 07020008, 2 mi (3.2 km) west of Sanborn.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 15 ft (4.6 m), screened 13 to 15 ft (4.0 to 4.6 m).
DATUM.--Altitude of land-surface datum is 1,040 ft (317 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.46 ft (1.36 m) below land-surface datum, Sept. 8, 1979; lowest, dry below land-surface datum, Nov. 15, Dec. 20, 1980, Jan 31, May 23 to Sept. 30, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	11.84	DEC 20	DRY	FEB 26	11.50	APR 28	11.46	JUN 26	DRY	SEP 5	DRY
NOV 15	DRY	JAN 31	DRY	MAR 30	11.58	MAY 23	DRY	JUL 25	DRY	30	DRY

REDWOOD COUNTY--Continued

441513095183001. Local number, 109N37W09CCC01.
LOCATION.--Lat 44°15'13", long 95°18'30", in SW¼SW¼SW¼ sec.9, T.109 N., R.37 W., Hydrologic Unit 07020008, 3 mi (4.8 km) northwest of Lamberton.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 19 ft (5.8 m), screened 17 to 19 ft (5.2 to 5.8 m).
DATUM.--Altitude of land-surface datum is 1,065 ft (325 m). Measuring point: Top of casing, 3.70 ft (1.13 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 8.37 ft (2.55 m) below land-surface datum, Mar. 24, 1979; lowest, 17.03 ft (5.19 m) below land-surface datum, Oct. 20, 1978.

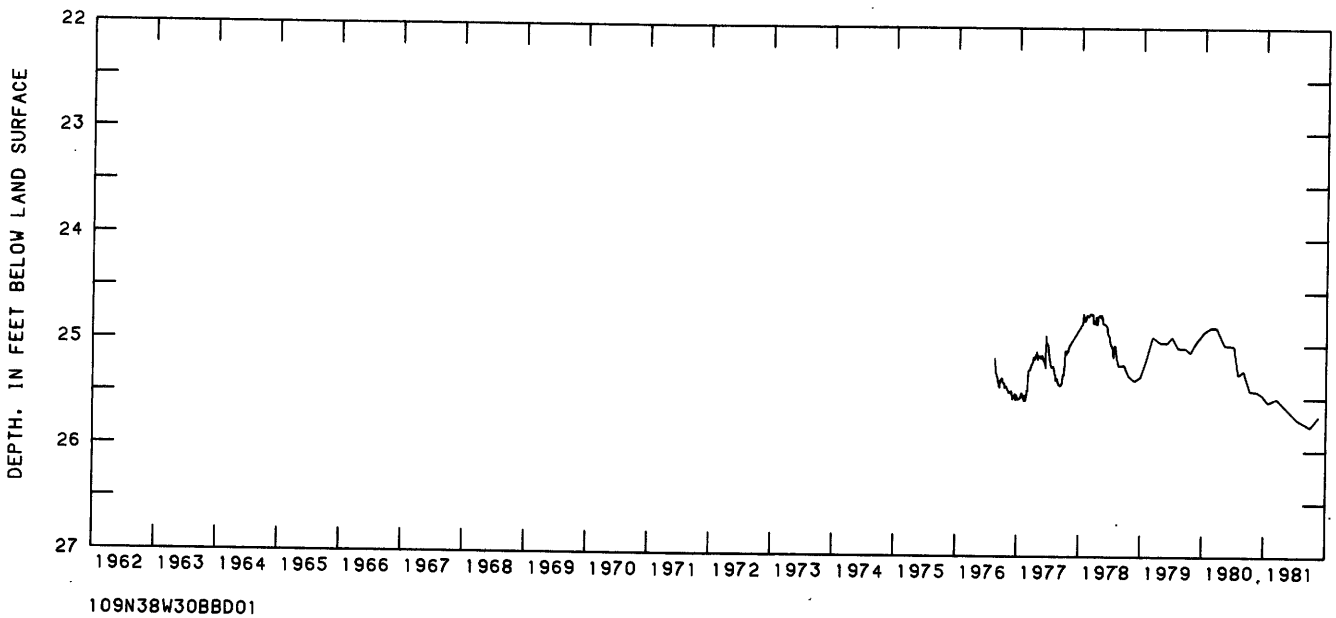
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	15.49	DEC 20	15.45	FEB 26	15.30	APR 28	15.14	JUN 26	16.09	AUG 29	15.67
NOV 11	15.44	JAN 31	15.50	MAR 30	15.03	MAY 23	16.24	JUL 25	15.64	SEP 30	16.41

441323095280701. Local number, 109N38W30BBD01.
LOCATION.--Lat 44°13'23", long 95°28'07", in SE¼NW¼NW¼ sec.30, T.109 N., R.38 W., Hydrologic Unit 07020008, at City of Walnut Grove.
Owner: Plum Creek Cheese Co.
AQUIFER.--Sandstone of Cretaceous Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 5 in (0.13 m), depth 240 ft (73.2 m), casing depth not available.
DATUM.--Altitude of land-surface datum is 1,218 ft (371 m). Measuring point: Top of recorder floor, 1.80 ft (0.55 m) above land-surfaoe datum.
PERIOD OF RECORD.--August 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 24.65 ft (7.51 m) below land-surface datum, Mar. 13, 14, Apr. 23, May 8, 9, 1978; lowest, 25.77 ft (7.85 m) below land-surface datum, Sept. 29, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	25.43	DEC 18	25.47	JAN 21	25.54	MAR 13	25.50	JUL 13	25.70	SEP 29	25.77
NOV 19	25.44										



REDWOOD COUNTY--Continued

441844095265301. Local number, 110N38W20CCD01.
LOCATION.--Lat 44°18'44", long 95°26'53", in SE¼SW¼SW¼ sec.20, T.110 N., R.38 W., Hydrologic Unit 07020008, 6.7 mi (10.8 km) north of Walnut Grove.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 18 ft (5.5 m), screened 16 to 18 ft (4.9 to 5.5 m).
DATUM.--Altitude of land-surface datum is 1,090 ft (332 m). Measuring point: Top of casing, 2.50 ft (0.76 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.57 ft (0.78 m) below land-surface datum, Apr. 21, 1979; lowest, dry below land-surface datum, July 25, Aug. 29, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	7.59	DEC 12	7.17	FEB 25	7.28	APR 29	8.14	JUN 26	11.52	AUG 29	DRY
NOV 11	7.31	JAN 30	7.44	MAR 30	6.99	MAY 23	8.25	JUL 25	DRY	SEP 30	10.30

442027095341401. Local number, 110N39W17AAA01.
LOCATION.--Lat 44°20'27", long 95°34'14", in NE¼NE¼NE¼ sec.17, T.110 N., R.39 W., Hydrologic Unit 07020008, 5 mi (8.1 km) south of Milroy.
Owner: U.S. Geological Survey
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 15 ft (4.6 m), screened 13 to 15 ft (4.0 to 4.6 m).
DATUM.--Altitude of land-surface datum is 1,110 ft (338 m). Measuring point: Top of casing, 0.10 ft (0.03 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.51 ft (0.77 m) below land-surface datum, Mar. 24, 1979; lowest, 8.96 ft (2.73 m) below land-surface datum, Sept. 30, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	8.63	DEC 12	8.62	FEB 25	8.15	APR 28	8.17	JUN 26	8.61	AUG 29	8.67
NOV 11	8.65	JAN 30	8.37	MAR 30	8.15	MAY 23	8.48	JUL 25	8.69	SEP 30	8.96

443051095074201. Local number, 112N36W14AAA01.
LOCATION.--Lat 44°30'51", long 95°07'42", in NE¼NE¼NE¼ sec.14, T.112 N., R.36 W., Hydrologic Unit 07020007, 2 mi (3.2 km) south of Redwood Falls.
Owner: Frank Boots.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 4 in (0.10 m), measured depth 214 ft (65.2 m), reported screened 213 to 218 ft (64.9 to 66.4 m).
DATUM.--Land-surface datum is 1,038.9 ft (316.7 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
REMARKS.--Measured weekly by Kenneth Daby. Water level affected by regional pumping.
PERIOD OF RECORD.--July 1952 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 30.72 ft (9.36 m) below land-surface datum, Sept. 10, 1953; lowest, 44.68 ft (13.62 m) below land-surface datum, July 16, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

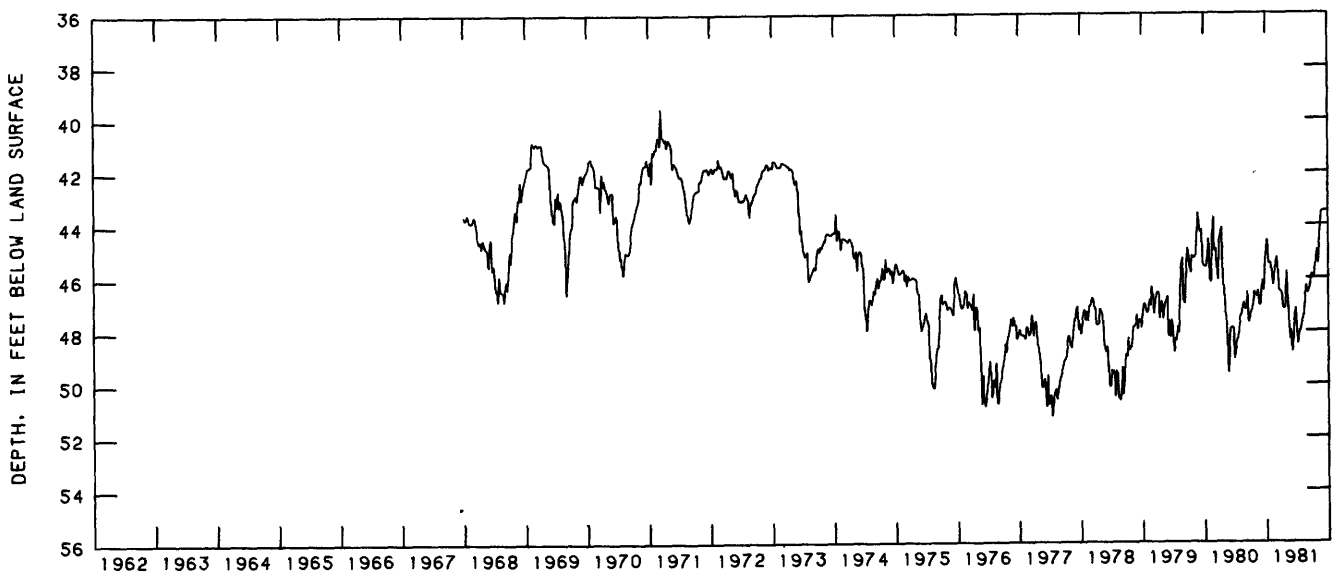
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	41.45	DEC 3	40.85	FEB 4	40.35	APR 8	41.32	JUN 10	42.59	AUG 5	41.92
8	41.39	10	40.74	11	40.69	15	41.39	17	42.33	12	41.88
15	41.12	17	40.89	18	40.75	22	41.51	24	42.02	19	41.71
22	41.04	24	40.81	25	40.62	30	41.19	JUL 1	42.04	26	41.24
29	40.99	31	40.52	MAR 4	40.20	MAY 6	41.26	8	42.43	SEP 2	41.36
NOV 5	40.97	JAN 7	40.13	11	40.54	13	41.55	15	42.30	9	41.35
12	41.08	14	40.55	18	40.94	20	41.08	22	42.19	16	41.33
19	41.03	21	40.48	25	41.05	27	41.21	29	42.05	23	41.02
26	40.98	28	40.54	APR 1	41.11	JUN 3	42.70				

REDWOOD COUNTY--Continued

442906095064101. Local number, 112N36W24DDC01.
LOCATION.--Lat 44°29'06", long 95°06'41", in SW¼SE¼SE¼ sec.24, T.112 N., R.36 W., Hydrologic Unit 07020007, 3.6 mi (5.8 km) south of Redwood Falls.
Owner: City of Redwood Falls.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 2 in (0.05 m), depth 144 ft (43.9 m), screened 141 to 144 ft (43.0 to 43.9 m).
DATUM.--Altitude of land-surface datum is 1,041 ft (317 m). Measuring point: Top of casing, 2.50 ft (0.76 m) above land-surface datum.
REMARKS.--Water level affected by pumping from nearby well field.
PERIOD OF RECORD.--December 1967 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 39.52 ft (12.05 m) below land-surface datum, Mar. 13, 1971; lowest, 52.21 ft (15.61 m) below land-surface datum, July 16, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	47.30	DEC 3	46.47	FEB 4	45.88	APR 8	47.10	JUN 10	48.35	AUG 5	47.55
8	47.21	10	46.08	11	46.30	15	47.18	17	47.48	12	47.35
15	46.96	17	46.49	18	45.79	22	47.12	24	47.15	19	46.66
22	46.52	24	45.46	25	45.53	30	45.75	JUL 1	47.96	26	46.29
29	46.66	31	44.88	MAR 4	45.21	MAY 6	46.48	8	48.50	SEP 2	46.60
NOV 5	46.72	JAN 7	44.57	11	45.74	13	47.37	15	48.09	9	46.51
12	46.48	14	45.49	18	46.50	20	48.31	22	47.94	16	46.29
19	47.03	21	45.43	25	46.53	27	47.99	29	47.69	23	45.85
26	47.05	28	45.50	APR 1	46.54	JUN 3	48.80				



112N36W24DDC01

442917095183701. Local number, 112N37W21CCC01.
LOCATION.--Lat 44°29'17", long 95°18'37", in SW¼SW¼SW¼ sec.21, T.112 N., R.37 W., Hydrologic Unit 07020006, 1 mi (1.6 km) northeast of Seaforth.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 17 ft (5.2 m), screened 15 to 17 ft (4.6 to 5.2 m).
DATUM.--Altitude of land-surface datum is 1,020 ft (311 m). Measuring point: Top of casing, 3.40 ft (1.04 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 9.73 ft (2.97 m) below land-surface datum, June 2, 1979; lowest, 14.11 ft (4.30 m) below land-surface datum, Mar. 11, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	12.79	DEC 31	13.28	FEB 25	13.35	APR 29	12.61	JUN 26	13.06	AUG 29	12.13
NOV 11	12.71	JAN 30	13.38	MAR 30	13.08	MAY 23	12.59	JUL 25	12.92	SEP 30	11.94

REDWOOD COUNTY--Continued

442950095255301. Local number, 112N38W21BBC01.
LOCATION.--Lat 44°29'50", long 95°25'53", in SW¼NW¼NW¼ sec.21, T.112 N., R.37 W., Hydrologic Unit 07020006, 0.2 mi (0.3 km) southwest of Vesta.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 21 ft (6.4 m), screened 19 to 21 ft (5.8 to 6.4 m).
DATUM.--Altitude of land-surface datum is 1,040 ft (317 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 1.66 ft (0.51 m) below land-surface datum, May 5, 1979; lowest, 7.09 ft (2.16 m) below land-surface datum, Sept. 16, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	6.93	DEC 12	6.60	FEB 25	6.94	APR 29	6.64	JUN 26	6.97	AUG 29	6.66
NOV 11	6.78	JAN 30	6.90	MAR 30	6.98	MAY 23	6.94	JUL 25	6.80	SEP 30	6.80

442959095315901. Local number, 112N39W22BBB01.
LOCATION.--Lat 44°29'59", long 95°31'59", in NW¼NW¼NW¼ sec.22, T.112 N., R.39 W., Hydrologic Unit 07020006, 5.7 mi (9.2 km) west of Vesta.
Owner: U.S. Geological Survey
AQUIFER.--Surficial gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 12 ft (3.7 m), screened 10 to 12 ft (3.0 to 3.7 m).
DATUM.--Altitude of land-surface datum is 1,055 ft (322 m). Measuring point: Top of casing, 3.90 ft (1.19 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 0.91 ft (0.28 m) below land-surface datum, Apr. 21, 1979; lowest, 7.75 ft (2.36 m) below land-surface datum, Sept. 30, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	7.49	DEC 12	7.52	FEB 25	7.00	APR 29	7.21	JUN 26	7.27	AUG 29	7.46
NOV 11	7.47	JAN 30	7.38	MAR 30	7.11	MAY 23	7.39	JUL 25	6.98	SEP 30	7.75

RENVILLE COUNTY

444437094425001. Local number, 115N32W29AAC01.
LOCATION.--Lat 44°44'37", long 94°42'50", in SW¼NE¼NE¼ sec.29, T.115 N., R.32 W., Hydrologic Unit 07010205, in Hector.
Owner: Hector Creamery.
AQUIFER.--Sandstone of Cretaceous Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 8 in (0.20 m), depth 370 ft (109 m), screened 360 to 370 ft (110 to 113 m).
DATUM.--Altitude of land-surface datum is 1,080 ft (329 m). Measuring point: Top of casing, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--March 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 33.16 ft (10.11 m) below land-surface datum, July 29, 1980; lowest, 38.48 ft (11.73 m) below land-surface datum, Oct. 24, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	33.71	MAR 13	34.04	MAY 14	33.65	JUN 12	33.56	JUL 13	33.56	SEP 29	33.62
JAN 12	34.18										

RICE COUNTY

441912093162901. Local number, 110N20W19BDC01.
LOCATION.--Lat 44°19'12", long 93°16'29", in SW¼SE¼NW¼ sec.19, T.110 N., R.20 W., Hydrologic Unit 07040002, just north of Faribault.
Owner: St. Lawrence Cemetery Assn.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 400 ft (122 m), cased to 357 ft (110 m).
DATUM.--Altitude of land-surface datum is 985 ft (300 m). Measuring point: Top of casing, 1.60 ft (0.49 m) above land-surface datum.
PERIOD OF RECORD.--June 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.60 ft (2.32 m) below land-surface datum, Dec. 10, 1979; lowest, 10.94 ft (3.33 m) below land-surface datum, July 10, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	9.23	JAN 7	9.32	MAR 12	9.04	MAY 11	9.12	JUL 10	10.94	SEP 2	9.15
NOV 21	9.27										

442543093113701. Local number, 111N20W11CDC01.
LOCATION.--Lat 44°25'43", long 93°11'37", in SW¼SE¼SW¼ sec.11, T.111 N., R.20 W., Hydrologic Unit 07040002, Highway 218 at Dundas.
Owner: Rollie Green.
AQUIFER.--Prairie du Chien Group of Lower Ordovician Age.
WELL CHARACTERISTICS.--Drilled commercial artesian well, diameter 4 in (0.10 m), depth 158 ft (48.2 m), cased to 101 ft (30.8 m).
DATUM.--Altitude of land-surface datum is 950 ft (290 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--October 1980 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 26.18 ft (7.98 m) below land-surface datum, Oct. 7, 1980; lowest, 26.92 ft (8.21 m) below land-surface datum, Mar. 12, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	26.18	JAN 7	26.83	MAR 12	26.92	MAY 11	26.49	JUL 10	26.77	SEP 2	26.34
NOV 21	26.59										

442751093240701. Local number, 112N21W31CBB01.
LOCATION.--Lat 44°27'51", long 93°24'07", in NW¼NW¼SW¼ sec.31, T.112 N., R.21 W., Hydrologic Unit 07040002, 1.0 mi (1.6 km) south of Highway 19.
Owner: Trondhjem Church.
AQUIFER.--Prairie du Chien Group of Lower Ordovician Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 276 ft (84.1 m), cased to 232 ft (70.7 m).
DATUM.--Altitude of land-surface datum is 1,130 ft (344 m). Measuring point: Top of casing, 1.10 ft (0.34 m) above land-surface datum.
PERIOD OF RECORD.--June 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 140.9 ft (42.95 m) below land-surface datum, June 16, 1980; lowest, 147.6 ft (43.16 m) below land-surface datum, May 11, July 16, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	141.3	JAN 7	141.2	MAY 11	141.6	JUL 16	141.6	SEP 2	141.3

ROCK COUNTY

433515096114901. Local number, 102N45W35DDC01.
LOCATION.--Lat 43°35'15", long 96°11'49", in SW¼SE¼SE¼ sec.35, T.102 N., R.45 W., Hydrologic Unit 10170204, 4 mi (6.4 km) south of Luverne.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 14 ft (4.3 m), screened 12 to 14 ft (3.7 to 4.3 m).
DATUM.--Altitude of land-surface datum is 1,400 ft (427 m). Measuring point: Top of casing, 3.40 ft (1.04 m) above land-surface datum.
PERIOD OF RECORD.--May 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 1.90 ft (0.58 m) below land-surface datum, Apr. 19, 1979; lowest, 7.01 ft (2.14 m) below land-surface datum, June 6, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	6.56	DEC 13	6.38	FEB 14	6.57	APR 18	6.19	JUN 6	7.01	AUG 31	6.55
NOV 13	6.73	JAN 30	5.82	MAR 30	6.45	MAY 15	6.90	JUL 18	6.76	SEP 29	7.00

433843096184701. Local number, 102N46W14AAA01.
LOCATION.--Lat 43°38'43", long 96°18'47", in NE¼NE¼NE¼ sec.14, T.102 N., R.46 W., Hydrologic Unit 10170203, 4.5 mi (7.2 km) west of Luverne.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 14 ft (4.3 m), screened 12 to 14 ft (3.7 to 4.3 m).
DATUM.--Altitude of land-surface datum is 1,450 ft (442 m). Measuring point: Top of casing, 1.65 ft (0.50 m) above land-surface datum.
PERIOD OF RECORD.--May 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.20 ft (0.98 m) below land-surface datum, Apr. 19, 1979; lowest, 8.81 ft (2.69 m) below land-surface datum, Dec. 13, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	8.62	DEC 13	8.81	FEB 14	8.50	APR 18	8.55	JUN 6	8.74	AUG 31	8.49
NOV 13	8.69	JAN 31	8.67	MAR 30	8.77	MAY 15	8.65	JUL 18	8.51	SEP 29	8.80

434726096073201. Local number, 104N44W21CDC01.
LOCATION.--Lat 43°47'26", long 96°07'32", in SW¼SE¼SW¼ sec.21, T.104 N., R.44 W., Hydrologic Unit 10170204, 3.8 mi (6.1 km) northeast of Hardwick.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1½ in (0.04 m), depth 16 ft (4.9 m), screened 14 to 16 ft (4.3 to 4.9 m).
DATUM.--Altitude of land-surface datum is 1,510 ft (460 m). Measuring point: Top of casing, 3.70 ft (1.13 m) above land-surface datum.
PERIOD OF RECORD.--May 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.90 ft (1.49 m) below land-surface datum, Apr. 19, 1979; lowest, 9.96 ft (3.04 m) below land-surface datum, June 15, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	7.32	DEC 13	7.37	FEB 14	7.51	APR 18	7.59	JUN 6	7.79	AUG 31	7.99
NOV 13	7.34	JAN 31	7.51	MAR 30	7.47	MAY 15	7.77	JUL 18	7.88	SEP 30	7.90

SCOTT COUNTY

443344093211301. Local number, 113N21W28CAC01.
LOCATION.--Lat 44°33'44", long 93°21'13", in SW¼NE¼SW¼ sec.28, T.113 N., R.21 W., Hydrologic Unit 07020012, 0.5 mi (0.8 km) south of New Market.
Owner: A and C Pullets.
AQUIFER.--Prairie du Chien Group of Lower Ordovician Age.
WELL CHARACTERISTICS.--Drilled stock artesian well, diameter 4 in (0.10 m), depth 310 ft (94.5 m), cased to 229 ft (91.1 m).
DATUM.--Altitude of land-surface datum is 1,140 ft (347 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--August 1977, February 1978, March 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 174.8 ft (53.28 m) below land-surface datum, Aug. 5, 1980; lowest, 178.8 ft (54.50 m) below land-surface datum, Feb. 9, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	176.8	JAN 7	176.9	MAR 13	177.2	MAY 11	177.2	JUL 16	177.4	SEP 2	176.5

443732093460301. Local number, 113N24W06BCB01.
LOCATION.--Lat 44°37'32", long 93°46'03", in NW¼SW¼NW¼ sec.6, T.113 N., R.24 W., Hydrologic Unit 07020012, in Belle Plaine.
Owner: Creative Tool and Engineering. Formerly Belle Plaine Coop Creamery.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 12 in (0.30 m), depth 272 ft (82.9 m), screen information not available.
DATUM.--Altitude of land-surface datum is 840 ft (256 m). Measuring point: Top of well cap, 2.30 ft (0.70 m) above land-surface datum.
PERIOD OF RECORD.--July 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 118.1 ft (36.00 m) below land-surface datum, Aug. 27, 1979; lowest, 144.0 ft (43.89 m) below land-surface datum, July 9, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	125.4	DEC 17	125.9	JAN 29	140.0	MAR 26	130.4	JUL 9	144.0	SEP 3	136.5
NOV 10	126.4	JAN 26	135.9	FEB 17	137.3	MAY 11	137.2				

443352093423001. Local number, 113N24W28DAA01.
LOCATION.--Lat 44°33'52", long 93°42'30", in NE¼NE¼SE¼ sec.28, T.113 N., R.24 W., Hydrologic Unit 07020012, at Michelle Wildlife Area.
Owner: U.S. Geological Survey
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 2 in (0.05 m), depth 655 ft (200 m), screened 650 to 655 ft (198 to 200 m).
DATUM.--Altitude of land-surface datum is 990 ft (302 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--August 1981 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 221.5 ft (67.51 m) below land-surface datum, Sept. 8, 1981; lowest, 221.7 ft (67.56 m) below land-surface datum, Aug. 19, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL
AUG 19	221.7	SEP 2	221.5

SCOTT COUNTY--Continued

443352093423002. Local number, 113N24W28DAA02.
LOCATION.--Lat 44°33'52", long 93°42'30", in NE¼NE¼SE¼ sec.28, T.113 N., R.24 W., Hydrologic Unit 07020012, at Michelle Wildlife Area.
Owner: U.S. Geological Survey
AQUIFER.--Ironton-Galesville Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 6 in (0.15 m), depth 450 ft (137 m), cased to 219 ft (66.8 m).
DATUM.--Altitude of land-surface datum is 990 ft (302 m). Measuring point: Top of well seal, 2.30 ft (0.70 m) above land-surface datum.
PERIOD OF RECORD.--August 1981 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 132.5 ft (40.39 m) below land-surface datum, Sept. 2, 1981; lowest, 132.7 ft (40.45 m) below land-surface datum, Aug. 19, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL
AUG 19	132.7	SEP 2	132.5

443715093480801. Local number, 113N25W02CAC01.
LOCATION.--Lat 44°37'15", long 93°48'08", in SW¼NE¼SW¼ sec.2, T.113 N., R.25 W., Hydrologic Unit 07020012, 0.75 mi (1.21 km) west of Belle Plaine at Shep's Gravel Pit.
Owner: U.S. Geological Survey
AQUIFER.--Ironton-Galesville Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 4 in (0.04 m), depth 323 ft (98.4 m), cased to 193 ft (58.8 m).
DATUM.--Altitude of land-surface datum is 750 ft (229 m). Measuring point: Top of casing, 0.25 ft (0.08 m) above land-surface datum.
PERIOD OF RECORD.--October 1979 to August 1980.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 8.07 ft (2.46 m) below land-surface datum, June 18, 1980; lowest, 10.35 ft (3.15 m) below land-surface datum, Jan. 8, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	9.78	JAN 8	10.35	MAY 13	10.04	JUL 23	9.34	AUG 19	9.20	SEP 14	9.02
NOV 24	10.28	MAR 18	10.17								

444025093220801. Local number, 114N21W20BAA01.
LOCATION.--Lat 44°40'25", long 93°22'08", in NE¼NE¼NW¼ sec.20, T.114 N., R.21 W., Hydrologic Unit 07020012, 0.5 mi (0.8 km) east of Credit River.
Owner: Credit River Town Hall
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 98 ft (29.9 m), screened 93 to 98 ft (28.4 to 29.9 m).
DATUM.--Altitude of land-surface datum is 946 ft (288 m). Measuring point: Top of casing, 1.10 ft (0.34 m) above land-surface datum.
PERIOD OF RECORD.--September 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 39.02 ft (11.89 m) below land-surface datum, Mar. 3, 1980; lowest, 40.72 ft (12.41 m) below land-surface datum, July 16, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	39.45	JAN 7	39.45	MAR 13	39.56	MAY 11	40.00	JUL 16	40.72	SEP 2	40.05
NOV 21	39.52										

SCOTT COUNTY--Continued

443752093254401. Local number, 114N22W35DCC01.
LOCATION.--Lat 44°37'52", long 93°25'44", in SW¼SW¼SE¼ sec.35, T.114 N., R.22 W., Hydrologic Unit 07020012, southwest of Credit River.
Owner: St. Catherine's Church
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 235 ft (71.6 m), cased to 194 ft (59.1 m).
DATUM.--Altitude of land-surface datum is 1,015 ft (309 m). Measuring point: Top of casing, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--September 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 89.28 ft (27.21 m) below land-surface datum, Mar. 3, 1980; lowest, 90.30 ft (27.52 m) below land-surface datum, Sept. 6, 1979.

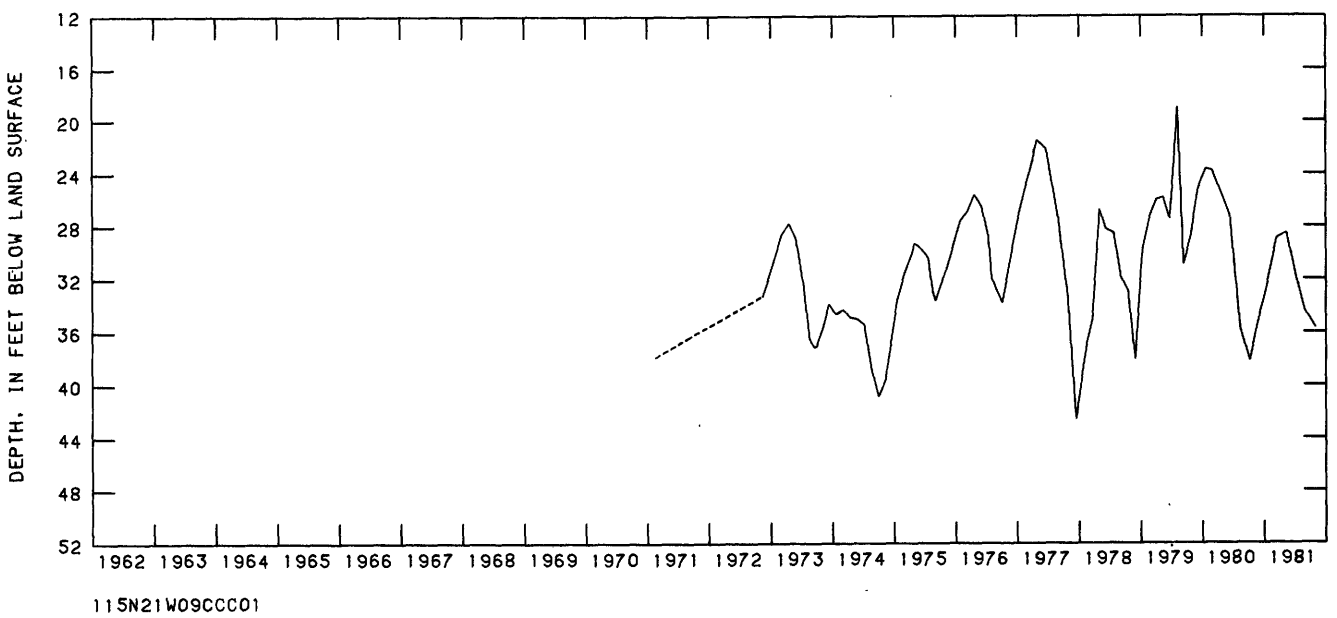
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	89.35	JAN 7	89.53	MAR 13	89.70	MAY 11	89.77	JUL 16	89.92	SEP 2	90.00
NOV 21	89.45										

444633093212901. Local number, 115N21W09CCC01.
LOCATION.--Lat 44°46'33", long 93°21'29", in SW¼SW¼SW¼ sec.9, T.115 N., R.21 W., Hydrologic Unit 07020012,at Savage waste treatment plant.
Owner: City of Savage, well 2.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age and Hinckley Sandstone of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, depth 846 ft (258 m), 16 in (0.41 m) casing 0 ft to 280 ft (85.3 m), 10 in (0.25 m) oasing 250 ft to 660 ft (85.3 m to 201 m).
DATUM.--Land-surface datum is 730 ft (222.5 m). Measuring point: Edge of vent pipe 0.75 ft (0.23 m) above land-surface datum.
PERIOD OF RECORD.--February 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 18.98 ft (5.79 m) below land-surface datum, Aug. 9, 1979; lowest, 42.59 ft (12.98 m) below land-surface datum, Dec. 14, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	38.19	JAN 8	33.05	MAR 16	28.92	MAY 13	28.50	JUL 20	32.45	AUG 31	34.43
NOV 24	35.25										



SCOTT COUNTY--Continued

444720093241801. Local number, 115N22W12ABA01.
LOCATION.--Lat 44°47'20", long 93°24'18", in NE¼NW¼NE¼ sec.12, T.115 N., R.22 W., Hydrologic Unit 07020012, west of Savage at Wilkie State Park.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 21 ft (6.4 m), screened 19 to 21 ft (5.8 to 6.4 m).
DATUM.--Altitude of land-surface datum is 725 ft (221 m). Measuring point: Top of casing, 2.40 ft (0.73 m) above land-surface datum.
PERIOD OF RECORD.--August 1974 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 8.05 ft (2.45 m) below land-surface datum, Sept. 13, 1979; lowest, 11.10 ft (3.38 m) below land-surface datum, Mar. 4, 1975.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	10.28	JAN 8	10.96	MAR 16	8.87	MAY 13	10.16	JUL 20	9.45	AUG 31	9.05
NOV 24	10.60										

444442093351001. Local number, 115N23W28AAC01.
LOCATION.--Lat 44°44'42", long 93°35'10", in SW¼NE¼NE¼ sec.28, T.115 N., R.23 W., Hydrologic Unit 07020012, 2.75 mi (6.03 km) south of Shakopee.
Owner: Leonard Granzow.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 8 in (0.20 m), depth 150 ft (45.7 m), cased to 116 ft (35.4 m).
DATUM.--Altitude of land-surface datum is 801 ft (244 m). Measuring point: Top of casing, 0.40 ft (0.12 m) above land-surface datum.
PERIOD OF RECORD.--April 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 84.76 ft (25.83 m) below land-surface datum, Apr. 16, 1980; lowest, 87.60 ft (26.70 m) below land-surface datum, July 23, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	85.84	JAN 8	86.55	MAR 18	86.98	MAY 13	87.36	JUL 23	87.60	SEP 17	87.35
NOV 24	86.30										

SHERBURNE COUNTY

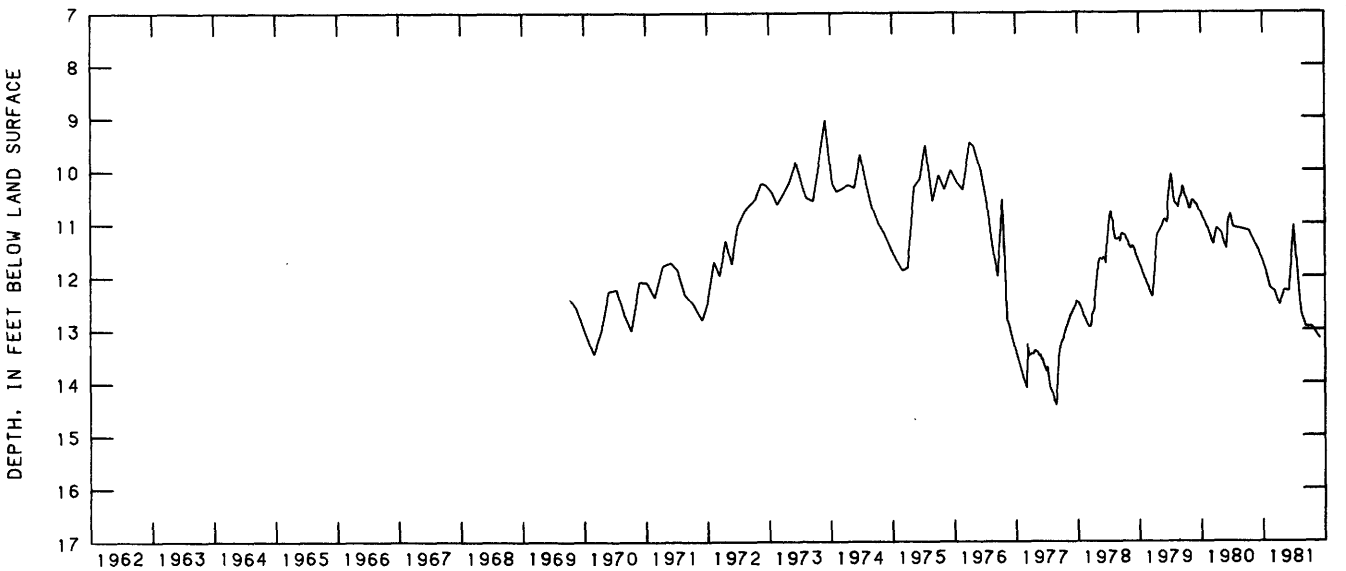
451954093424801. Local number, 033N27W21CCA01.
LOCATION.--Lat 45°19'54", long 93°42'48", in NE¼SW¼SW¼ sec.21, T.33 N., R.27 W., Hydrologic Unit 07010203, on Bromeling farm, 0.9 mi (1.4 km) east of Big Lake.
Owner: U.S. Geological Survey
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Altitude of land-surface datum is 933.8 ft (284.6 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 3.60 ft (1.10 m) above land-surface datum.
PERIOD OF RECORD.--October 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 9.03 ft (2.75 m) below land-surface datum, Nov. 27, 1973; lowest, 14.43 ft (4.40 m) below land-surface datum, Aug. 25, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	e11.14	DEC 4	e11.50	FEB 12	e12.22	APR 8	12.54	JUN 3	12.28	AUG 13	12.68
NOV 4	e11.31	JAN 14	e11.88	MAR 9	12.27	MAY 7	12.25	JUL 1	11.03	SEP 10	12.95

e Water level estimated.

SHERBURNE COUNTY--Continued



033N27W21CCA01

451954093424802. Local number, 033N27W21CCA02.
LOCATION.--Lat 45°19'54", long 93°42'48", in NE¼SW¼SW¼ sec.21, T.33 N., R.27 W., Hydrologic Unit 07010203, on Bromeling farm.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 52 ft (15.8 m), screened 50 to 52 ft (15.2 to 15.8 m).
DATUM.--Altitude of land-surface datum is 934 ft (285 m). Measuring point: Top of casing, 2.80 ft (0.85 m) above land-surface datum.
PERIOD OF RECORD.--October 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 9.76 ft (1.09 m) below land-surface datum, Apr. 1, 1976; lowest, 14.49 ft (4.42 m) below land-surface datum, Aug. 17, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	11.38	DEC 4	11.74	FEB 12	12.46	APR 8	12.55	JUN 3	12.30	AUG 13	12.72
NOV 4	11.55	JAN 14	12.12	MAR 9	12.60	MAY 7	12.29	JUL 1	12.06	SEP 10	12.80

451943093425001. Local number, 033N27W21CCC01.
LOCATION.--Lat 45°19'43", long 93°42'50", in SW¼SW¼SW¼ sec.21, T.33 N., R.27 W., Hydrologic Unit 07010203, 3 mi (3.2) km) east of stoplight in Big Lake.
Owner: Remmelle Engineering.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age and Hinckley Sandstone of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 250 ft (76.2 m), cased to 102 ft (31.1 m).
DATUM.--Altitude of land-surface datum is 935 ft (285 m). Measuring point: Hole in pump base, 0.90 ft (0.27 m) above land-surface datum.
PERIOD OF RECORD.--March 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 11.87 ft (3.62 m) below land-surface datum, Nov. 7, 1979; lowest, 14.89 ft (4.54 m) below land-surface datum, June 14, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	12.98	DEC 4	13.30	FEB 12	14.20	APR 8	14.32	JUN 3	14.01	AUG 13	r17.77
NOV 4	13.21	JAN 14	14.00	MAR 9	14.30	MAY 7	13.95	JUL 1	13.98	SEP 10	14.85

r Well recently pumped.

SHERBURNE COUNTY--Continued

451852093435301. Local number, 033N27W29CDC01.
LOCATION.--Lat 45°18'52", long 93°43'53", in SW¼SE¼SW¼ sec.29, T.33 N., R.27 W., Hydrologic Unit 07010203, southeast of Big Lake.
Owner: Truman (Pete) Sanford.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age and Hinckley Sandstone of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 218 ft (66.4 m), cased to 92 ft (28.0 m).
DATUM.--Altitude of land-surface datum is 931 ft (284 m). Measuring point: Top of casing, 0.50 ft (0.15 m) above land-surface datum.
REMARKS.--Water level affected by pumping of nearby wells.
PERIOD OF RECORD.--September, November 1973, October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 9.48 ft (2.89 m) below land-surface datum, June 29, 1979; lowest, 18.69 ft (5.70 m) below land-surface datum, Aug. 10, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	11.39	DEC 4	11.89	FEB 12	13.00	APR 8	13.17	JUN 3	12.67	AUG 13	r17.45
NOV 4	11.55	JAN 14	12.54	MAR 9	13.12	MAY 7	12.67	JUL 1	12.75	SEP 10	14.42

r Well recently pumped.

452040093491202. Local number, 033N28W16DDD02.
LOCATION.--Lat 45°20'40", long 93°49'12", in SE¼SE¼SE¼ sec.16, T.33 N., R.28 W., Hydrologic Unit 07010203, 0.8 mi (1.3 km) south of Salida.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 48 ft (14.6 m), screened 46 to 48 ft (14.0 to 14.6 m).
DATUM.--Altitude of land-surface datum is 952 ft (290 m). Measuring point: Top of casing, 3.50 ft (1.07 m) above land-surface datum.
PERIOD OF RECORD.--May 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 27.70 ft (8.44 m) below land-surface datum, Apr. 28, 1979; lowest, 35.66 ft (10.87 m) below land-surface datum, Aug. 18, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	31.79	DEC 4	31.19	FEB 12	31.92	APR 7	32.52	JUN 3	32.92	AUG 13	34.46
NOV 4	32.17	JAN 14	31.55	MAR 10	32.22	MAY 6	32.64	JUL 1	32.87	SEP 10	33.84

452638093402802. Local number, 034N27W10DDD02.
LOCATION.--Lat 45°26'38", long 93°40'28", in SE¼SE¼SE¼ sec.10, T.34 N., R.27 W., Hydrologic Unit 07010203, 3 mi (4.8 km) east of Orrock.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 35 ft (10.7 m), screened 33 to 35 ft (10.1 to 10.7 m).
DATUM.--Altitude of land-surface datum is 980.1 ft (298.7 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--December 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 24.10 ft (7.35 m) below land-surface datum, June 30, Nov. 27, Dec. 27, 1979; lowest, 27.16 ft (8.28 m) below land-surface datum, Aug. 1, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	25.38	DEC 3	25.22	JAN 23	25.12	MAR 9	25.54	APR 15	25.50	JUL 1	25.74
31	25.06	22	25.05	FEB 12	25.40	12	25.36	MAY 6	25.73	AUG 11	25.57
NOV 4	25.24	JAN 13	25.29	19	25.26	APR 7	25.65	JUN 2	25.73	SEP 9	25.50
26	24.75										

SHERBURNE COUNTY--Continued

452638093442001. Local number, 034N27W18AAB01.
LOCATION.--Lat 45°26'38", long 93°44'20", in NW¼NE¼NE¼ sec.18, T.34 N., R.27 W., Hydrologic Unit 07010203, in Orrock, 0.15 mi (0.24 km) west of County Road 5.
Owner: Morton Arneson.
AQUIFER.--Buried gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 115 ft (35.0 m), screened 95 to 115 ft (29.0 to 35.0 m).
DATUM.--Altitude of land-surface datum is 985 ft (300 m). Measuring point: 3/4-in (0.02 m) pipe inside of pump base, 1.40 ft (0.43 m) above land-surface datum.
PERIOD OF RECORD.--December 1979 to June 1980.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 11.95 ft (3.64 m) below land-surface datum, Dec. 6, 1979; lowest, 13.71 ft (4.18 m) below land-surface datum, Mar. 9, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 4	12.62	FEB 12	13.39	APR 7	13.62	JUN 2	12.70	AUG 11	12.53	SEP 9	12.71
JAN 13	13.29	MAR 9	13.71	MAY 6	13.01	JUL 1	12.15				

452804093491302. Local number, 034N28W04ADA02.
LOCATION.--Lat 45°28'04", long 93°49'13", in NE¼SE¼NE¼ sec.4, T.34 N., R.28 W., Hydrologic Unit 07010203, 7.5 mi (12.1 km) north of Salida.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 13 ft (4.0 m), screened 11 to 13 ft (3.4 to 4.0 m).
DATUM.--Altitude of land-surface datum is 998 ft (304 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.82 ft (0.86 m) below land-surface datum, June 30, 1979; lowest, 8.78 ft (2.68 m) below land-surface datum, Feb. 8, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	5.03	NOV 18	5.91	JAN 13	6.29	MAR 9	7.00	APR 15	6.17	JUL 1	4.35
27	5.87	26	5.48	23	6.30	12	6.92	MAY 6	5.21	AUG 11	5.61
31	5.21	DEC 3	5.58	FEB 12	6.92	APR 7	6.60	JUN 2	5.10	SEP 9	6.11
NOV 4	5.29	22	5.80	19	6.82						

452339093521402. Local number, 034N28W31BDD02.
LOCATION.--Lat 45°23'39", long 93°52'14", in SE¼SE¼NW¼ sec.31, T.34 N., R.28 W., Hydrologic Unit 07010203, 0.4 mi (0.6 km) north of U.S. Highway 10 in Becker.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 27 ft (8.2 m), screened 25 to 27 ft (7.6 to 8.2 m).
DATUM.--Altitude of land-surface datum is 970 ft (296 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--December 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 18.37 ft (5.60 m) below land-surface datum, June 29, 1979; lowest, 22.51 ft (6.86 m) below land-surface datum, Feb. 8, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	18.88	DEC 4	19.68	FEB 12	20.49	APR 7	20.99	JUN 2	21.05	AUG 11	19.90
NOV 4	19.36	JAN 13	20.14	MAR 10	20.72	MAY 6	21.12	JUL 1	20.15	SEP 9	20.15

SHERBURNE COUNTY--Continued

452312093463802. Local number, 034N28W36CCC02.
LOCATION.--Lat 45°23'12", long 93°46'38", in SW¼SW¼SW¼ sec.36, T.34 N., R.28 W., Hydrologic Unit 07010203, 5 mi (8.0 km) north of Highway 10 in Big Lake.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 20.5 ft (6.2 m), screened 18.5 to 20.5 ft (5.6 to 6.2 m).
DATUM.--Altitude of land-surface datum is 940 ft (286 m). Measuring point: Top of casing, 2.50 ft (0.76 m) above land-surface datum.
PERIOD OF RECORD.--December 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.53 ft (3.21 m) below land-surface datum, July 14, 1978; lowest, 14.12 ft (4.30 m) below land-surface datum, Feb. 7, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	12.06	DEC 4	12.71	FEB 12	13.08	APR 7	12.40	JUN 3	12.10	AUG 13	12.46
NOV 4	11.89	JAN 13	13.06	MAR 9	12.99	MAY 6	11.42	JUL 1	11.05	SEP 10	12.94

452545093571002. Local number, 034N29W21ABB02.
LOCATION.--Lat 45°25'45", long 93°57'10", in NW¼NW¼NE¼ sec.21, T.34 N., R.29 W., Hydrologic Unit 07010203, 2.5 mi (4.0 km) east of Clear Lake on Mel Goenner farm.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 36 ft (11.0 m), screened 34 to 36 ft (10.4 to 11.0 m).
DATUM.--Altitude of land-surface datum is 985 ft (300 m). Measuring point: Top of casing, 4.00 ft (1.22 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 20.00 ft (6.10 m) below land-surface datum, June 30, July 1, 1979; lowest, 25.12 ft (7.66 m) below land-surface datum, July 11, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	20.46	DEC 4	20.75	FEB 12	21.22	APR 7	21.43	JUN 2	21.82	AUG 11	22.37
NOV 4	20.52	JAN 13	20.98	MAR 10	21.31	MAY 6	21.55	JUL 1	21.40	SEP 9	22.24

452545093571003. Local number, 034N29W21ABB03.
LOCATION.--Lat 45°25'45", long 93°57'10", in NW¼NW¼NE¼ sec.21, T.34 N., R.29 W., Hydrologic Unit 07010203, on Mel Goenner farm.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 112 ft (34.1 m), screened 109 to 112 ft (33.2 to 34.1 m).
DATUM.--Altitude of land-surface datum is 985 ft (300.2 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--September 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 20.01 ft (6.10 m) below land-surface datum, Dec. 4, 1979; lowest, 24.13 ft (7.35 m) below land-surface datum, Sept. 22, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	20.70	DEC 5	21.05	FEB 12	21.51	APR 7	21.69	JUN 2	22.09	AUG 11	23.03
NOV 4	20.87	JAN 13	21.29	MAR 10	21.60	MAY 6	21.85	JUL 1	22.20	SEP 9	22.46

SHERBURNE COUNTY--Continued

452708094015601. Local number, 034N30W11ACD02.
LOCATION.--Lat 45°27'08", long 94°01'56", in SE¼SE¼NE¼ sec.11, T.34 N., R.30 W., Hydrologic Unit 07010203, 2.8 mi (4.5 km) west of Clear Lake.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 26 ft (7.9 m), screened 24 to 26 ft (7.3 to 7.9 m).
DATUM.--Altitude of land-surface datum is 982.0 ft (299.3 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 4.00 ft (1.22 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 15.69 ft (4.78 m) below land-surface datum, June 29, 1979; lowest, 20.27 ft (6.18 m) below land-surface datum, Aug. 20, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	16.53	DEC 4	16.65	FEB 12	17.05	APR 7	17.10	JUN 2	17.31	AUG 11	17.46
NOV 4	16.52	JAN 13	16.86	MAR 10	17.09	MAY 6	17.20	JUL 1	17.04	SEP 9	17.79

453121093334401. Local number, 035N26W15DBB01.
LOCATION.--Lat 45°31'21", long 93°33'44", in NW¼NW¼SE¼ sec.15, T.35 N., R.26 W., Hydrologic Unit 07010207, on Sanborn farm, 2.5 mi (4.0 km) south of Princeton.
Owner: U.S. Geological Survey
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 56 ft (17.1 m), screened 54 to 56 ft 16.5 to 17.1 m).
DATUM.--Altitude of land-surface datum is 965 ft (294 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--October 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.42 ft (1.04 m) below land-surface datum, Aug. 9, 1972; lowest, 9.19 ft (2.80 m) below land-surface datum, Aug. 17, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	7.36	DEC 3	7.79	FEB 12	8.66	APR 7	7.73	JUN 2	7.04	AUG 11	7.10
NOV 4	7.54	JAN 13	8.42	MAR 9	8.53	MAY 6	6.65	JUL 1	5.68	SEP 9	7.43

453121093334402. Local number, 035N26W15DBB02.
LOCATION.--Lat 45°31'21", long 93°33'44", in NW¼NW¼SE¼ sec.15, T.35 N., R.26 W., Hydrologic Unit 07010207, on Sanborn farm, 2.5 mi (4.0 km) south of Princeton.
Owner: U.S. Geological Survey
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 15 ft (4.6 m), screened 13 to 15 ft 4.04 to 4.6 m).
DATUM.--Altitude of land-surface datum is 965 ft (294 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--October 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.37 ft (1.03 m) below land-surface datum, Aug. 9, 1972; lowest, 8.90 ft (2.71 m) below land-surface datum, Aug. 17, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	7.13	DEC 3	7.60	FEB 12	8.45	APR 7	7.50	JUN 2	6.79	AUG 11	5.81
NOV 4	7.36	JAN 13	8.17	MAR 9	8.32	MAY 6	6.43	JUL 1	5.42	SEP 9	7.20

SHERBURNE COUNTY--Continued

453157093451402. Local number, 035N27W07CCA02.
LOCATION.--Lat 45°31'57", long 93°45'14", in NE¼SW¼SW¼ sec.7, T.35 N., R.27 W., Hydrologic Unit 07010203, 4 mi (6.4 km) east of Santiago.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 13 ft (4.0 m), screened 11 to 13 ft (3.4 to 4.0 m).
DATUM.--Altitude of land-surface datum is 991 ft (302 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--May 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.45 ft (1.36 m) below land-surface datum, June 6, 1980; lowest, 8.66 ft (2.64 m) below land-surface datum, Aug. 18, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	4.88	JAN 6	6.46	FEB 26	6.31	APR 8	4.76	JUN 2	4.86	JUL 21	4.77
31	4.81	13	7.08	MAR 5	6.14	15	4.41	4	5.73	AUG 5	5.14
NOV 4	5.04	15	6.70	9	6.37	21	5.16	9	5.08	11	5.17
26	4.95	23	7.15	12	6.13	30	5.15	17	5.11	12	5.22
27	4.88	28	7.23	19	6.00	MAY 6	4.35	24	4.33	19	6.45
DEC 3	5.27	FEB 5	6.83	25	5.85	13	5.40	JUL 1	4.49	SEP 1	5.00
22	5.65	12	6.82	31	5.15	21	5.49	8	4.85	9	5.43
27	5.55	19	7.26	APR 7	4.96	29	5.59	14	4.54	29	6.32
30	5.96										

453058093393501. Local number, 035N27W14DCD01.
LOCATION.--Lat 45°30'58", long 93°39'35", in SE¼SW¼SE¼ sec.14, T.35 N., R.27 W., Hydrologic Unit 07010203, 5.5 mi (8.8 km) southwest of Princeton.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 21 ft (6.4 m), screened 19 to 21 ft (5.8 to 6.4 m).
DATUM.--Altitude of land-surface datum is 975 ft (297 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 15.25 ft (4.65 m) below land-surface datum, June 30, 1979; lowest, 18.52 ft (5.64 m) below land-surface datum, Feb. 7, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	16.79	JAN 6	17.25	FEB 19	17.60	APR 15	17.30	JUN 7	17.95	AUG 5	16.51
31	16.77	13	17.41	MAR 9	17.72	21	17.22	9	16.85	11	16.72
NOV 4	16.77	15	16.33	12	17.63	30	17.05	17	16.63	12	16.64
26	16.91	16	17.33	19	17.69	MAY 6	17.06	24	16.30	19	16.77
DEC 3	16.31	23	17.39	25	17.62	13	16.78	JUL 1	16.22	SEP 3	16.81
22	17.07	28	17.49	31	17.54	21	16.80	8	16.21	9	16.97
27	16.19	FEB 5	17.54	APR 7	17.52	29	16.81	14	16.05	29	17.07
30	17.15	12	17.69	8	17.40	JUN 4	17.78	21	16.30		

452938093432701. Local number, 035N27W29DBB02.
LOCATION.--Lat 45°29'38", long 93°43'27", in NW¼NW¼SE¼ sec.29, T.35 N., R.27 W., Hydrologic Unit 07010203, 3.2 mi (5.2 km) north of Orrock in Sherburne National Wildlife Refuge.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 15 ft (4.6 m), screened 13 to 15 ft (4.0 to 4.6 m).
DATUM.--Altitude of land-surface datum is 985 ft (300 m). Measuring point: Top of casing, 4.20 ft (1.28 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.00 ft (1.22 m) below land-surface datum, May 14, 1979; lowest, 8.48 ft (2.58 m) below land-surface datum, Nov. 30, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	6.73	NOV 26	6.37	JAN 23	7.28	FEB 19	7.49	MAR 12	7.26	APR 15	5.51
31	6.21										

SHERBURNE COUNTY--Continued

453230093530002. Local number, 035N29W12AAD02.
LOCATION.--Lat 45°32'30", long 93°53'00", in SE¼NE¼NE¼ sec.12, T.35 N., R.29 W., Hydrologic Unit 07010203, 3.5 mi (5.6 km) west of Santiago.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 12 ft (3.7 m), screened 10 to 12 ft (3.1 to 3.7 m).
DATUM.--Altitude of land-surface datum is 1,012 ft (308 m). Measuring point: Top of casing, 4.00 ft (1.22 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 0.30 ft (0.09 m) below land-surface datum, June 30, 1979; lowest, 6.12 ft (1.87 m) below land-surface datum, Feb. 8, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	1.48	DEC 3	2.04	FEB 12	3.34	APR 7	2.74	JUN 2	2.09	AUG 11	2.44
NOV 4	1.34	JAN 13	2.77	MAR 9	3.20	MAY 6	1.95	JUL 1	1.81	SEP 9	2.92

452952093570801. Local number, 035N29W28ABC01.
LOCATION.--Lat 45°29'52", long 93°57'08", in SW¼NW¼NE¼ sec.28, T.35 N., R.29 W., Hydrologic Unit 07010203, on Gilyard farm, north of Clear Lake.
Owner: U.S. Geological Survey
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 31 ft (9.4 m), screened 29 to 31 ft (8.8 to 9.4 m).
DATUM.--Altitude of land-surface datum is 998 ft (304 m). Measuring point: Top of casing, 2.30 ft (0.70 m) above land-surface datum.
PERIOD OF RECORD.--August 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 17.00 ft (5.18 m) below land-surface datum, Aug. 3, 1979; lowest, 22.32 ft (6.80 m) below land-surface datum, Aug. 18, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	20.39	DEC 3	20.00	FEB 12	20.79	APR 7	21.30	JUN 2	21.43	AUG 11	20.52
NOV 4	20.67	JAN 13	20.40	MAR 9	21.03	MAY 6	21.50	JUL 1	20.89	SEP 9	20.81

453156094040501. Local number, 035N30W10CCB01.
LOCATION.--Lat 45°31'56", long 94°04'05", in NW¼SW¼SW¼ sec.10, T.35 N., R.30 W., Hydrologic Unit 07010203, 1.7 mi (2.7 km) north of Cable.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel to 12 ft, sandy till to 32 ft of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 32 ft (9.8 m), screened 30 to 32 ft (9.1 to 9.8 m).
DATUM.--Altitude of land-surface datum is 1,015 ft (309 m). Measuring point: Top of casing, 5.20 ft (1.58 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 9.42 ft (2.87 m) below land-surface datum, June 30, 1979; lowest, 15.59 ft (4.75 m) below land-surface datum, Feb. 8, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	10.50	DEC 3	12.08	FEB 12	13.34	APR 7	13.09	JUN 2	11.79	AUG 11	12.30
NOV 4	11.69	JAN 13	12.82	MAR 9	13.45	MAY 6	10.61	JUL 1	10.09	SEP 9	13.05

STEARNS COUNTY

452357094145302. Local number, 122N28W07ABA02.
LOCATION.--Lat 45°23'57" in 94°14'53", in NE¼NW¼NE¼ sec.7, T.122 N., R.28 W., Hydrologic Unit 07010203, on Mark John farm.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 22 ft (6.7 m), screened 20 to 22 ft (6.1 to 6.7 m).
DATUM.--Land-surface datum is 1,132.3 ft (345.1 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 4.70 ft (1.43 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 11.75 ft (3.58 m) below land-surface datum, June 30, 1979; lowest, 15.67 ft (4.78 m) below land-surface datum, Mar. 10, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	13.30	DEC 11	13.72	FEB 19	14.17	APR 22	14.23	JUN 18	13.88	AUG 19	14.16
NOV 18	13.58	JAN 13	13.97	MAR 18	14.26	MAY 21	14.32	JUL 23	13.78	SEP 17	14.41

452100094154002. Local number, 122N28W30BCC02.
LOCATION.--Lat 45°21'00", long 94°15'40", in SW¼SW¼NW¼ sec.30, T.122 N., R.28 W., Hydrologic Unit 07010203, on Stein farm, 2 mi (3.2 km) north of Kimball.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 41 ft (12.5 m), screened 39 to 41 ft (11.9 to 12.5 m).
DATUM.--Land-surface datum is 1,160.5 ft (353.7 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--December 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 30.90 ft (9.42 m) below land-surface datum, June 29, 1979; lowest, 34.75 ft (10.59 m) below land-surface datum, Aug. 19, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	32.46	DEC 11	32.89	FEB 19	33.32	APR 22	33.65	JUN 18	33.73	AUG 19	33.35
NOV 18	32.76	JAN 13	33.09	MAR 18	33.46	MAY 21	33.84	JUL 23	33.42	SEP 17	33.68

452147094173102. Local number, 122N29W23CAA02.
LOCATION.--Lat 45°21'47", long 94°17'31", in NE¼NE¼SE¼ sec.23, T.122 N., R.29 W., Hydrologio Unit 07010202, 3.2 mi (5.2 km) north of Kimball.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 34 ft (10.4 m), screened 32 to 34 ft (9.8 to 10.4 m).
DATUM.--Land-surface datum is 1,157.9 ft (352.9 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--May 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 26.97 ft (8.22 m) below land-surface datum, June 29, 1979; lowest, 31.00 ft (9.45 m) below land-surface datum, Aug. 19, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	29.06	JAN 13	29.62	MAR 18	29.93	MAY 21	30.19	JUL 23	29.76	SEP 17	30.16
NOV 18	29.25	FEB 19	29.83	APR 22	30.04	JUN 18	30.00	AUG 19	30.04		

STEARNS COUNTY--Continued

452903094090402. Local number, 123N28W12BAB02.
LOCATION.--Lat 45°29'03", long 94°09'04", in NW¼NE¼NW¼ sec.12, T.123 N., R.28 W., Hydrologic Unit 07010203, 0.2 mi (0.5 km) north of St. Augusta at Cedar Point Ballroom.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 20.5 ft (6.2 m), screened 18.5 to 20.5 ft (5.6 to 6.2 m).
DATUM.--Altitude of land-surface datum is 1,015 ft (309 m). Measuring point: Top of casing, 2.50 ft (0.76 m) above land-surface datum.
PERIOD OF RECORD.--November 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 14.23 ft (4.34 m) below land-surface datum, June 29, 1979; lowest, 19.22 ft (5.86 m) below land-surface datum, May 7, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	16.17	DEC 11	16.53	FEB 19	17.08	APR 22	17.56	JUN 18	17.59	AUG 19	17.29
NOV 18	16.36	JAN 13	16.76	MAR 18	17.30	MAY 21	17.65	JUL 23	17.26	SEP 17	17.48

452632094145102. Local number, 123N28W30ABA02.
LOCATION.--Lat 45°26'32", long 94°14'51", in NE¼NW¼ sec.30, T.123 N., R.28 W., Hydrologic Unit 07010203, 0.7 mi (1.1 km) south of Luxemburg at Alber's Feed Mill.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Land-surface datum is 1,112.6 ft (339.1 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--September 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.69 ft (3.26 m) below land-surface datum, June 29, 1979; lowest, 14.45 ft (4.40 m) below land-surface datum, Feb. 10, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	11.85	JAN 13	12.73	MAR 18	13.18	MAY 21	12.73	JUL 23	12.23	SEP 17	12.79
DEC 11	12.33	FEB 19	13.06	APR 22	12.94	JUN 18	12.34	AUG 19	12.56		

452834094222102. Local number, 123N29W07DBC02.
LOCATION.--Lat 45°28'34", long 94°22'21", in SW¼NW¼SE¼ sec.7, T.123 N., R.29 W., Hydrologic Unit 07010202, 2 mi (3.2 km) west of Rockville.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand, gravel, and cobbles of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Altitude of land-surface datum is 1,107 ft (337 m). Measuring point: Top of casing, 3.50 ft (1.07 m) above land-surface datum.
PERIOD OF RECORD.--December 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.18 ft (1.88 m) below land-surface datum, Sept. 8, 1977; lowest, 10.99 ft (3.35 m) below land-surface datum, Feb. 10, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	9.73	DEC 11	10.30	FEB 19	10.74	APR 22	10.24	JUN 18	9.66	AUG 19	10.45
NOV 18	10.10	JAN 13	10.57	MAR 18	10.67	MAY 21	10.37	JUL 23	9.96	SEP 17	10.78

STEARNS COUNTY--Continued

452543094191902. Local number, 123N29W27CCC02.
LOCATION.--Lat 45°25'43", long 94°19'19", in SW¼SW¼SW¼ sec.27, T.123 N., R.29 W., Hydrologic Unit 07010202, 3 mi (4.8 km) south of Rockville.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Altitude of land-surface datum is 1,121 ft (342 m). Measuring point: Top of casing, 2.60 ft (0.79 m) above land-surface datum.
PERIOD OF RECORD.--June 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.70 ft (3.26 m) below land-surface datum, June 29, 1979; lowest, 12.77 ft (3.89 m) below land-surface datum, July 18, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	11.65	DEC 11	11.96	FEB 19	12.18	APR 22	11.56	JUN 18	11.42	AUG 19	12.18
NOV 18	11.82	JAN 13	12.20	MAR 18	12.07	MAY 21	11.91	JUL 23	11.84	SEP 17	12.27

452751094301802. Local number, 123N30W18BCC02.
LOCATION.--Lat 45°27'51", long 94°30'18", in SW¼SW¼NW¼ sec.18, T.123 N., R.30 W., Hydrologic Unit 07010202, 1.3 mi (2.1 km) north of Richmond.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 13 ft (4.0 m), screened 11 to 13 ft (3.4 to 4.0 m).
DATUM.--Altitude of land-surface datum is 1,111 ft (339 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.40 ft (1.65 m) below land-surface datum, June 26, 1978; lowest, 8.11 ft (2.47 m) below land-surface datum, Sept. 17, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	7.42	DEC 11	7.67	FEB 19	7.79	APR 22	7.67	JUN 18	7.28	AUG 19	7.98
NOV 18	7.55	JAN 13	7.86	MAR 18	7.97	MAY 21	7.89	JUL 23	7.50	SEP 17	8.11

452527094420702. Local number, 123N32W33AAD02.
LOCATION.--Lat 45°25'27", long 94°42'07", in SE¼NE¼NE¼ sec.33, T.123 N., R.32 W., Hydrologic Unit 07010202, 2.8 mi (4.5 km) north of Paynesville.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 14 ft (4.3 m), screened 12 to 14 ft (3.7 to 4.3 m).
DATUM.--Altitude of land-surface datum is 1,187 ft (362 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.58 ft (1.09 m) below land-surface datum, July 13, 1978; lowest, 12.03 ft (3.67 m) below land-surface datum, May 21, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	10.31	JAN 13	11.10	MAR 18	11.65	MAY 21	12.03	JUL 23	10.23	SEP 17	10.75
DEC 11	10.82	FEB 19	11.43	APR 22	11.90	JUN 18	10.64	AUG 19	10.60		

STEARNS COUNTY--Continued

453434094113002. Local number, 124N28W03CDB02.
LOCATION.--Lat 45°34'34", long 94°11'30", in NW¼SE¼SW¼ sec.3, T.124 N., R.29 W., Hydrologic Unit 07010203, 0.25 mi (0.40 km) north of intersection of 29th Avenue North and 12th Street North in St. Cloud.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Altitude of land-surface datum is 1,036 ft (316 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.10 ft (3.08 m) below land-surface datum, June 30, 1979; lowest, 13.20 ft (4.02 m) below land-surface datum, Mar. 24, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	10.87	DEC 11	12.29	FEB 19	13.10	APR 22	13.02	JUN 18	12.20	AUG 20	12.13
NOV 18	11.35	JAN 13	12.79	MAR 18	13.17	MAY 21	12.59	JUL 23	11.98	SEP 17	12.15

453428094150201. Local number, 124N28W06CDD01.
LOCATION.--Lat 45°34'28", long 94°15'02", in SE¼SE¼SW¼ sec.6, T.124 N., R.28 W., Hydrologic Unit 07010202, on Robert Murreim farm.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Altitude of land-surface datum is 1,065 ft (323 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--December 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.16 ft (1.57 m) below land-surface datum, May 30, June 30, 1979; lowest, 10.93 ft (3.33 m) below land-surface datum, Dec. 15, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

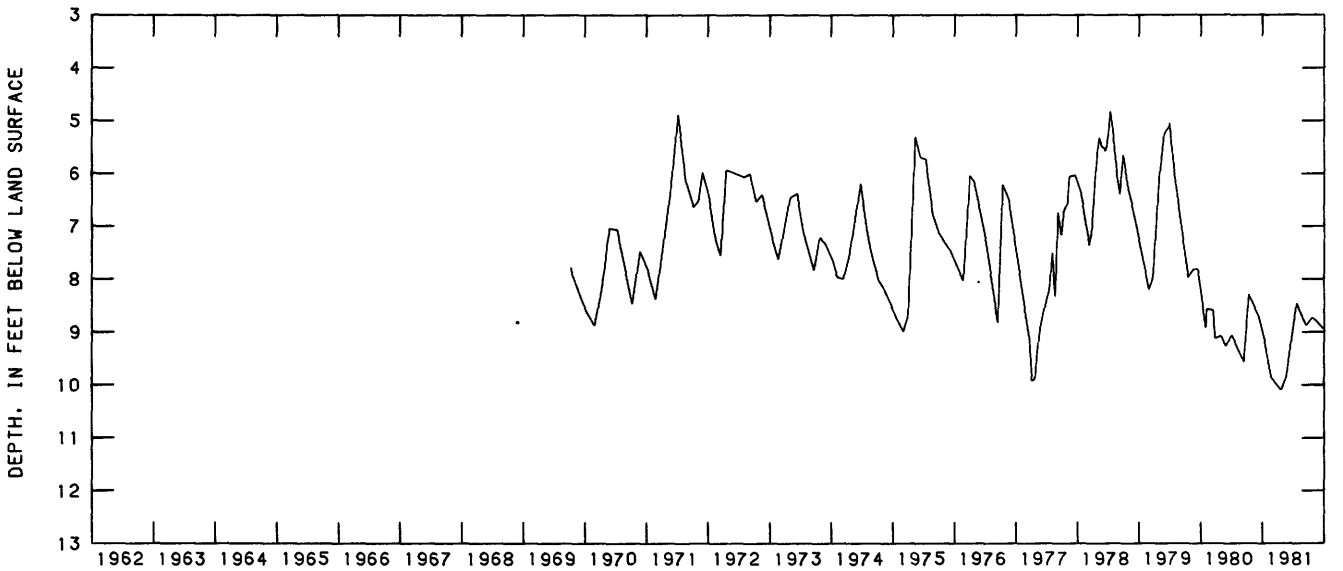
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	7.25	DEC 11	8.08	FEB 19	9.28	APR 22	8.99	JUN 18	8.13	AUG 20	8.92
NOV 18	7.63	JAN 13	8.70	MAR 18	9.58	MAY 21	8.88	JUL 23	8.30	SEP 17	9.39

453158094123701. Local number, 124N28W21CDA01.
LOCATION.--Lat 45°31'58", long 94°12'37", in NE¼SE¼SW¼ sec.21, T.124 N., R.28 W., Hydrologic Unit 07010203, on Reinert farm, south of St. Cloud.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 11 ft (3.4 m), screened 9 to 11 ft (2.7 to 3.4 m).
DATUM.--Altitude of land-surface datum is 1,078 ft (329 m). Measuring point: Top of casing, 0.50 ft (0.15 m) above land-surface datum.
PERIOD OF RECORD.--October 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.82 ft (1.47 m) below land-surface datum, July 13, 1978; lowest, 10.10 ft (3.08 m) below land-surface datum, Apr. 22, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	8.29	DEC 11	8.72	FEB 19	9.83	APR 22	10.10	JUN 18	9.22	AUG 19	8.66
NOV 18	8.56	JAN 13	9.16	MAR 18	9.96	MAY 21	9.87	JUL 23	8.46	SEP 17	8.88

STEARNS COUNTY--Continued



124N28W21CDA01

453700094262801. Local number, 125N30W22CDD01.
LOCATION.--Lat 45°37'00", long 94°26'28", in SE¼SE¼SW¼ sec.22, T.125 N., R.30 W., Hydrologic Unit 07010201, on Alcott farm, 0.5 mi (0.8 km) north of Avon.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 13 ft (4.0 m), screened 11 to 13 ft (3.4 to 4.0 m).
DATUM.--Altitude of land-surface datum is 1,128 ft (344 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--September 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.39 ft (0.73 m) below land-surface datum, July 13, 1978; lowest, 7.41 ft (2.26 m) below land-surface datum, Dec. 15, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	4.62	DEC 11	5.11	FEB 19	6.00	APR 22	5.18	JUN 18	4.61	AUG 20	5.31
NOV 18	4.83	JAN 13	5.59	MAR 18	5.86	MAY 21	5.13	JUL 23	4.75	SEP 17	5.57

453937094491102. Local number, 125N33W03CDA02.
LOCATION.--Lat 45°39'37", long 94°49'11", in NE¼SE¼SW¼ sec.3, T.125 N., R.33 W., Hydrologic Unit 07010202, on Melrose Golf Course.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 13 ft (4.0 m), screened 11 to 13 ft (3.4 to 4.0 m).
DATUM.--Altitude of land-surface datum is 1,209 ft (368 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--December 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.63 ft (1.11 m) below land-surface datum, Apr. 30, 1979; lowest, 7.88 ft (2.40 m) below land-surface datum, Feb. 9, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	6.73	JAN 13	6.20	MAR 18	5.96	MAY 21	6.52	JUL 23	5.37	SEP 17	5.95
DEC 11	5.94	FEB 19	6.22	APR 22	5.66	JUN 18	5.32	AUG 20	5.97		

STEARNS COUNTY--Continued

454328094135901. Local number, 126N28W17CAA01.
LOCATION.--Lat 45°43'28", long 94°13'59", in NE¼NE¼SW¼ sec.17, T.126 N., R.28 W., Hydrologic Unit 07010201, 7.7 mi (12.4 km) north of bridge across Mississippi River in Sartell.
Owner: Gordon Hiscock.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 4 in (0.10 m), depth 41 ft (12.5 m).
DATUM.--Altitude of land-surface datum is 1,047 ft (319 m). Measuring point: Top of casing, 0.50 ft (0.15 m) above land-surface datum.
PERIOD OF RECORD.--September 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 14.03 ft (4.28 m) below land-surface datum, July 13, 1978; lowest, 21.04 ft (6.41 m) below land-surface datum, Feb. 9, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	18.67	DEC 11	19.22	FEB 19	19.80	APR 22	19.84	JUN 18	17.51	AUG 20	17.33
NOV 18	19.01	JAN 13	19.54	MAR 18	19.95	MAY 21	18.19	JUL 23	16.71	SEP 17	17.93

454346094284602. Local number, 126N30W17ABC02.
LOCATION.--Lat 45°43'46", long 94°28'46", in SW¼NW¼NE¼ sec.17, T.126 N., R.30 W., Hydrologic Unit 07010201, 0.2 mi (0.3 km) west of bridge in Holdingford.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 21 ft (6.4 m), screened 19 to 21 ft (5.8 to 6.4 m).
DATUM.--Altitude of land-surface datum is 1,142 ft (348 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--September 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 8.83 ft (2.69 m) below land-surface datum, July 13, 1978; lowest, 13.26 ft (4.04 m) below land-surface datum, Feb. 9, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	10.69	DEC 11	11.51	FEB 19	12.04	APR 22	11.36	JUN 18	10.55	AUG 20	11.18
NOV 18	11.27	JAN 13	11.92	MAR 18	11.86	MAY 21	11.48	JUL 23	10.55	SEP 17	11.39

454216094552801. Local number, 126N34W23CDA01.
LOCATION.--Lat 45°42'16", long 94°55'28", in NE¼SE¼SW¼ sec.23, T.126 N., R.34 W., Hydrologic Unit 07010202, 2.2 mi (3.5 km) southeast of Sauk Centre.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 27 ft (8.2 m), screened 25 to 27 ft (7.6 to 8.2 m).
DATUM.--Altitude of land-surface datum is 1,243 ft (379 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--December 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 19.22 ft (5.86 m) below land-surface datum, Apr. 30, 1979; lowest, 22.23 ft (6.78 m) below land-surface datum, Nov. 13, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	20.46	DEC 11	20.66	FEB 19	20.96	APR 22	21.21	JUN 18	21.48	AUG 20	21.40
NOV 18	20.56	JAN 13	20.81	MAR 18	21.00	MAY 21	21.35	JUL 23	21.48	SEP 17	21.43

SWIFT COUNTY

450959095550801. Local number, 120N42W28DDD01.
LOCATION.--Lat 45°09'59", long 95°55'08", in SE¼SE¼SE¼ sec.28, T.120 N., R.42 W., Hydrologic Unit 07020005, southeast of Appleton.
Owner: U.S. Geological Survey
AQUIFER.--Surficial silt of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 11 ft (3.4 m), screened 9 to 11 ft (2.7 to 3.4 m).
DATUM.--Altitude of land-surface datum is 1,023 ft (312 m). Measuring point: Top of casing, 5.00 ft (1.52 m) above land-surface datum.
PERIOD OF RECORD.--September 1972 to October 1973, January 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 0.25 ft (0.08 m) below land-surface datum, Apr. 16, 1973; lowest, 9.77 ft (2.98 m) below land-surface datum, Feb. 8, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 4	7.87	JAN 15	8.27	MAR 24	7.62	MAY 7	7.12	JUL 13	2.74	SEP 10	6.08
DEC 11	8.03										

451329096000101. Local number, 120N43W02DDD01.
LOCATION.--Lat 45°13'29", long 96°00'01", in SE¼SE¼SE¼ sec.2, T.120 N., R.43 W., Hydrologic Unit 07020002, at Appleton Airport.
Owner: U.S. Geological Survey
AQUIFER.--Surficial outwash sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 34 ft (10.4 m), screened 32 to 34 ft (9.8 to 10.4 m).
DATUM.--Altitude of land-surface datum is 1,020 ft (311 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--September 1972 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 18.44 ft (5.62 m) below land-surface datum, Sept. 14, 1972; lowest, 24.99 ft (7.62 m) below land-surface datum, Dec. 15, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 4	23.77	JAN 15	24.08	MAR 24	24.22	MAY 7	24.25	JUL 13	24.21	SEP 10	24.37
DEC 11	23.96										

451913095370201. Local number, 121N39W06BDB01.
LOCATION.--Lat 45°19'13", long 95°37'02", in NW¼SE¼NW¼ sec.6, T.121 N., R.39 W., Hydrologic Unit 07020005, in Ambush Park.
Owner: City of Benson
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 3 in (0.08 m), depth 143 ft (43.6 m), screened 123 to 143 ft (37.5 to 43.6 m).
DATUM.--Altitude of land-surface datum is 1,030 ft (314 m). Measuring point: Top of shelter floor, 3.10 ft (0.94 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--May 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.48 ft (1.98 m) below land-surface datum, June 29, 1979; lowest, 19.90 ft (6.07 m) below land-surface datum, July 24, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 30	10.73	JAN 4	11.95	MAR 12	11.41	MAY 7	13.85	JUL 10	17.00	SEP 9	10.04
DEC 8	10.40	15	11.35								

SWIFT COUNTY--Continued

451832095362101. Local number, 121N39W07AAC01.
LOCATION.--Lat 45°18'32", long 95°36'21", in SW¼NE¼NE¼ sec.7, T.121 N., R.39 W., Hydrologic Unit 07020005, southwest corner of 15th Street and Clark Avenue. mi (9.2 km) southeast of Hancock.
Owner: City of Benson.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 3 in (0.08 m), depth 164 ft (50.0 m), screened 154 to 164 ft (46.9 to 50.0 m).
DATUM.--Altitude of land-surface datum is 1,038 ft (316 m). Measuring point: Top of valve box at land-surface datum.
PERIOD OF RECORD.--April 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.50 ft (1.98 m) below land-surface datum, June 23, 1980; lowest, 11.40 ft (3.47 m) below land-surface datum, Apr. 16, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 8	8.25	JAN 15	8.37	MAR 12	8.33	MAY 7	8.32	JUL 10	7.48	SEP 9	7.72

452211095570701. Local number, 122N42W21BBB01.
LOCATION.--Lat 45°22'11", long 95°57'07", in NW¼NW¼NW¼ sec.21, T.122 N., R.42 W., Hydrologic Unit 07020002, north of Holloway.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 27 ft (8.2 m), screened 25 to 27 ft (7.6 to 8.2 m).
DATUM.--Altitude of land-surface datum 1,048 ft (319 m). Measuring point: Top of casing, 2.80 ft (0.85 m) above land-surface datum.
PERIOD OF RECORD.--September 1972 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 14.81 ft (4.51 m) below land-surface datum, July 9, 1979; lowest, 22.01 ft (6.71 m) below land-surface datum, Dec. 11, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 4	17.81	JAN 15	20.28	MAR 24	18.68	MAY 7	18.27	JUL 13	17.75	SEP 10	17.33
DEC 11	22.01										

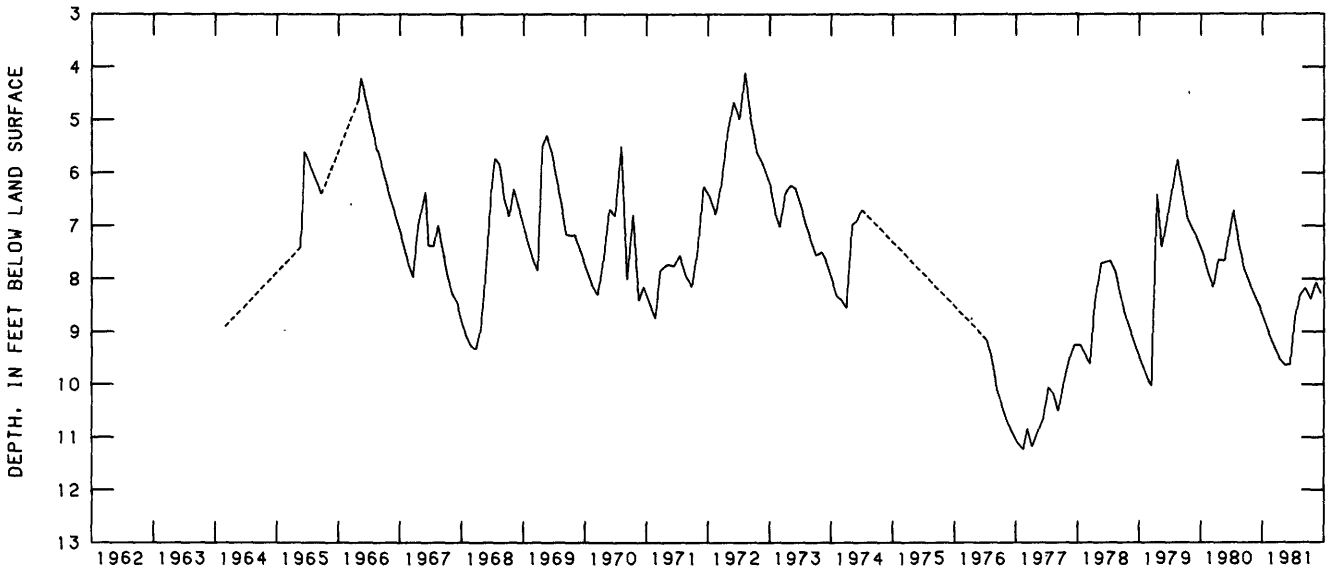
TODD COUNTY

462130095035201. Local number, 133N35W02CAC01.
LOCATION.--Lat 46°21'30", long 95°03'52", in SE¼NE¼SW¼ sec.2, T.133 N., R.35 W., Hydrologic Unit 07010107, northeast of Hewitt.
Owner: Walt Peterson.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 18 in (0.46 m), depth 28 ft (8.5 m), slotted pipe 10 to 28 ft (3.1 to 8.5 m).
DATUM.--Altitude of land-surface datum 1,356 ft (413 m). Measuring point: Top of casing, 0.60 ft (0.18 m) above land-surface datum.
PERIOD OF RECORD.--August 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.10 ft (1.25 m) below land-surface datum, Aug. 8, 1972; lowest, 11.23 ft (3.42 m) below land-surface datum, Feb. 12, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	8.05	DEC 15	8.52	FEB 13	9.05	APR 15	9.51	JUN 16	9.61	AUG 14	8.30
NOV 17	8.31	JAN 13	8.78	MAR 16	9.29	MAY 18	9.64	JUL 15	8.74	SEP 14	8.17

TODD COUNTY--Continued



133N35W02CAC01

462024095091401. Local number, 133N35W07CCC01.
LOCATION.--Lat 46°20'24", long 95°09'14", in SW¼SW¼SW¼ sec.7, T.133 N., R.35 W., Hydrologic Unit 07010107, east of Kramer farm.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 15 ft (4.6 m), screened 13 to 15 ft (4.0 to 4.6 m).
DATUM.--Altitude of land-surface datum is 1,384 ft (422 m). Measuring point: Top of casing, 3.20 ft (0.98 m) above land-surface datum.
REMARKS.--Water level subject to freezing during winter.
PERIOD OF RECORD.--November 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 0.10 ft (0.03 m) above land-surface datum, Aug. 8, 1972; lowest, 6.13 ft (1.87 m) below land-surface datum, Aug. 10, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	2.89	DEC 15	3.24	FEB 13	4.01	APR 15	3.02	JUN 16	2.30	AUG 14	2.26
NOV 17	2.83	JAN 13	3.69	MAR 16	3.76	MAY 18	2.87	JUL 15	2.95	SEP 14	2.92

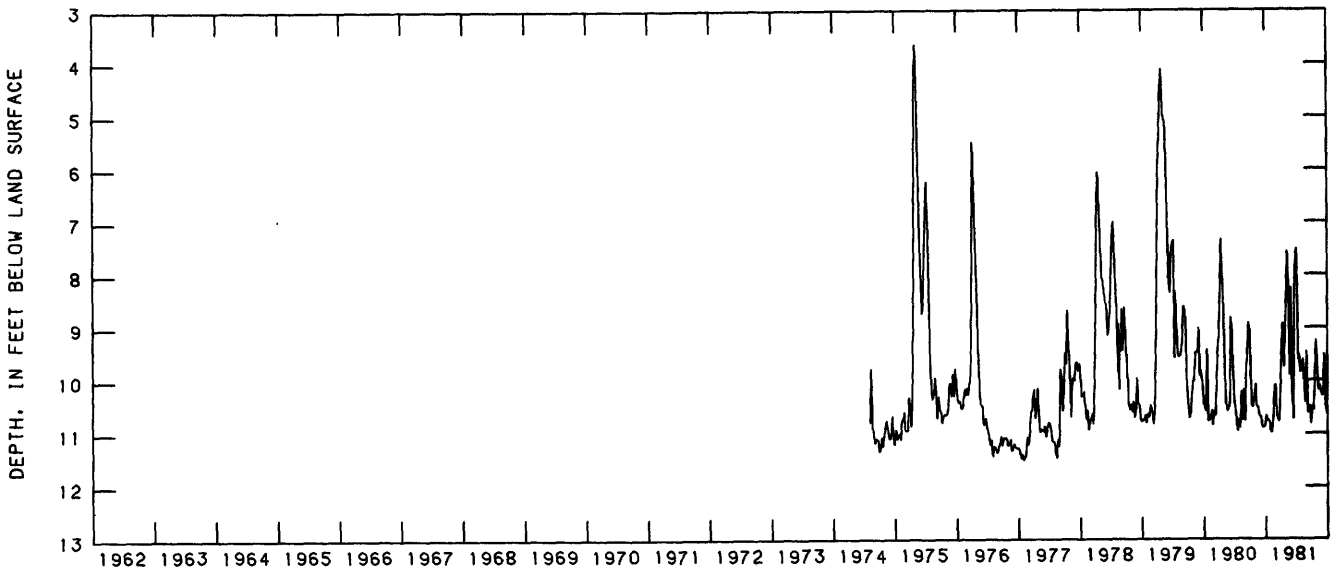
WABASHA COUNTY

442708092155401. Local number, 111N12W04BBD01.
LOCATION.--Lat 44°27'08", long 92°15'54", in SE¼NW¼NW¼ sec.14, T.111 N., R.12 W., Hydrologic Unit 07040001, at Lake City.
Owner: City of Lake City, well 3.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 16 in (0.41 m), depth 430 ft (131 m), cased to 258 ft (78.6 m).
DATUM.--Altitude of land-surface datum is 685 ft (209 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
REMARKS.--Measured weekly by David Finley.
PERIOD OF RECORD.--August 1974 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.63 ft (1.11 m) below land-surface datum, May 5, 1975; lowest, 11.50 ft (3.51 m) below land-surface datum, Jan. 31, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	10.03	DEC 8	10.77	FEB 8	10.98	APR 13	8.92	JUN 8	10.07	AUG 3	9.70
14	10.51	15	10.90	17	10.72	20	9.75	15	10.74	10	9.60
20	10.48	29	10.88	23	10.11	26	9.25	22	8.25	17	10.00
27	10.30	JAN 5	10.66	MAR 2	10.08	MAY 4	8.44	29	7.61	24	10.42
NOV 3	10.06	12	10.75	9	10.66	11	7.56	JUL 6	7.50	SEP 1	9.45
10	10.50	19	10.77	23	10.78	18	8.06	14	9.62	8	10.62
17	10.50	26	10.77	30	10.35	25	9.91	19	9.50	21	10.47
24	10.66	FEB 2	10.99	APR 6	9.38	31	8.25	27	9.86	28	10.82
DEC 1	10.66										

WABASHA COUNTY--Continued



111N12W04BBD01

WADENA COUNTY

462421095003601. Local number, 134N34W19ADD01.
LOCATION.--Lat 46°24'21", long 95°00'36", in SE¼SE¼NE¼ sec.19, T.134 N., R.34 W., Hydrologic Unit 07010107, 0.05 mi (0.08 km) north of Verndale.
Owner: U.S. Geological Survey
AQUIFER.--Surficial outwash sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 37 ft (11.3 m), screened 34 to 37 ft (10.4 to 11.3 m).
DATUM.--Altitude of land-surface datum is 1,342 ft (409 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--September 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 9.48 ft (2.89 m) below land-surface datum, June 2, 1972; lowest, 15.33 ft (4.41 m) below land-surface datum, Mar. 10-11, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	12.22	.....	12.56	12.90	13.22	13.41	.....	.....	13.58	13.28	.....	.....
10	12.28	.....	12.62	12.98	13.27	.....	.....	.....	13.60	.....	.....	.....
15	12.21	.....	12.67	13.02	13.31	.....	.....	.....	13.52	13.26	.....	12.90
20	12.26	12.44	12.76	13.07	13.34	.....	.....	13.56	13.46	13.32	.....	.....
25	.....	12.48	12.80	13.13	13.38	.....	.....	13.54	13.36	13.14	.....	.....
EOM	.....	12.52	12.86	13.16	13.40	.....	.....	13.56	13.30	13.06	.....	.....

WTR YEAR 1981 HIGHEST 12.21 OCT 15, 1980 LOWEST 13.60 JUN 10, 1981

WASHINGTON COUNTY

445125092464001. Local number, 027N20W02BCC01.
LOCATION.--Lat 44°51'25", long 92°46'40", in SW¼SW¼NW¼ sec.2, T.27 N., R.20 W., Hydrologic Unit 07030005, in Afton State Park by Afton Alps.
Owner: U.S. Geological Survey
AQUIFER.--St. Lawrence Formation and Franconian Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 6 in (0.15 m), depth 285 ft (86.9 m), cased to 105 ft (32.0 m).
DATUM.--Altitude of land-surface datum is 695 ft (212 m). Measuring point: Center of pressure guage, 4.50 ft (1.37 m) above land-surface datum.
PERIOD OF RECORD.--March 1980 to August 1980.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 33.94 ft (10.38 m) above land-surface datum, May 2, 1980; lowest, 28.65 ft (8.73 m) above land-surface datum, Sept. 22, 1981.

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	29.57	NOV 18	30.72	JAN 13	29.80	SEP 22	28.65

WASHINGTON COUNTY--Continued

445125092464002. Local number, 027N20W02BCC02.
LOCATION.--Lat 44°51'25", long 92°46'40", in SW¼SW¼NW¼ sec.2, T.27 N., R.20 W., Hydrologic Unit 07030005, in Afton State Park by Afton Alps.
Owner: U.S. Geological Survey
AQUIFER.--Ironton-Galesville Sandstones of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 4 in (0.10 m), depth 385 ft (117 m), cased to 365 ft (111 m).
DATUM.--Altitude of land-surface datum is 695 ft (212 m). Measuring point: Center of pressure guage, 4.50 ft (1.37 m) above land-surface datum.
PERIOD OF RECORD.--March 1980 to August 1980.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 42.35 ft (12.91 m) above land-surface datum, May 2, 1980; lowest, 33.83 ft (10.31 m) above land-surface datum, Sept. 22, 1981.

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	34.27	SEP 22	33.83

445125092464003. Local number, 027N20W02BCC03.
LOCATION.--Lat 44°51'25", long 92°46'40", in SW¼SW¼NW¼ sec.2, T.27 N., R.20 W., Hydrologic Unit 07030005, in Afton State Park by Afton Alps.
Owner: U.S. Geological Survey
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 1½ in (0.04 m), depth 535 ft (163 m), screened 530 to 535 ft (162 to 163 m).
DATUM.--Altitude of land-surface datum is 695 ft (212 m). Measuring point: Center of pressure guage, 4.70 ft (1.43 m) above land-surface datum.
PERIOD OF RECORD.--March 1980 to August 1980.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.05 ft (6.72 m) above land-surface datum, May 2, 1980; lowest, 14.48 ft (4.41 m) above land-surface datum, Sept. 22, 1981.

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	17.93	NOV 18	17.93	JAN 13	15.05	SEP 22	14.48

444751092563101. Local number, 027N21W28BCC01.
LOCATION.--Lat 44°47'51", 92°56'31", in SW¼SW¼NW¼ sec.28, T.27 N., R.21 W., Hydrologic Unit 07010206, 0.1 mi (0.2 km) east of Ideal Avenue South.
Owner: Eugene Smallidge.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation water-table well, diameter 16 in (0.41 m), depth 345 ft (105 m), cased to 60 ft (18.3 m).
DATUM.--Altitude of land-surface datum is 807 ft (246 m). Measuring point: Hole in pump base, 2.10 ft (0.64 m) above land-surface datum.
PERIOD OF RECORD.--August 1977, January 1978, December 1979 to September 1980.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 62.34 ft (19.00 m) below land-surface datum, Dec. 10, 1979; lowest, 81.87 ft (24.95 m) below land-surface datum, Aug. 3, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	66.90	DEC 31	68.34	MAR 9	69.82	MAY 7	72.92	JUL 16	72.68	SEP 3	72.25
NOV 17	67.59										

WASHINGTON COUNTY--Continued

445536092462401. Local number, 028N20W11CAA01.
LOCATION.--Lat 44°55'36", long 92°46'24", in NE¼NE¼SW¼ sec.11, T.28 N., R.20 W., Hydrologic Unit 07030005, at Lake St. Croix Beach.
Owner: Lower St. Croix Valley Fire Department.
AQUIFER.--Franconian Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 4 in (0.10 m), depth 94 ft (28.6 m), cased to 78 ft (23.8 m).
DATUM.--Altitude of land-surface datum is 720 ft (220 m). Measuring point: Top of electrical housing, 1.70 ft (0.52 m) above land-surface datum.
PERIOD OF RECORD.--June 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 31.78 ft (9.69 m) below land-surface datum, May 14, 1979; lowest, 38.54 ft (11.75 m) below land-surface datum, Mar. 9, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	37.75	JAN 13	38.38	MAR 9	38.54	MAY 14	37.10	JUL 14	36.37	SEP 3	37.40
NOV 18	37.95										

445220092465901. Local number, 028N20W34ADA01.
LOCATION.--Lat 44°52'20", long 92°46'59", in NE¼SE¼NE¼ sec.34, T.28 N., R.20 W., Hydrologic Unit 07030005, in Afton State Park.
Owner: State of Minnesota.
AQUIFER.--Franconia Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 4 in (0.10 m), depth 306 ft (93.2 m), cased to 276 ft (84.1 m).
DATUM.--Altitude of land-surface datum is 970 ft (296 m). Measuring point: Top of casing, 0.90 ft (0.27 m) above land-surface datum.
PERIOD OF RECORD.--August 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 242.0 ft (73.76 m) below land-surface datum, June 9, 1980; lowest, 244.5 ft (74.52 m) below land-surface datum, Aug. 15, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	243.9	JAN 13	244.4	MAR 11	243.8	MAY 14	243.2	JUL 14	243.2	SEP 3	243.4
NOV 18	244.0										

450134092583101. Local number, 029N21W06CAD01.
LOCATION.--Lat 45°01'34", long 92°58'31", in SE¼NE¼SW¼ sec.6, T.29 N., R.21 W., Hydrologic Unit 07010206, at 6488 North Highway 36 Boulevard.
Owner: Twenty Nine Pines Trailer Park.
AQUIFER.--St. Peter Sandstone of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 210 ft (64.0 m), cased to 141 ft (43.0 m).
DATUM.--Altitude of land-surface datum is 980 ft (299 m). Measuring point: Hole in pump base, 2.20 ft (0.67 m) above land-surface datum.
PERIOD OF RECORD.--April 1974 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 74.03 ft (22.56 m) below land-surface datum, Apr. 10, 1980; lowest, 77.47 ft (23.61 m) below land-surface datum, Sept. 13, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	74.95	DEC 30	74.06	MAR 9	74.65	MAY 14	74.45	JUL 15	75.29	SEP 4	75.59
NOV 18	74.97										

WASHINGTON COUNTY--Continued

450027092552101. Local number, 029N21W10CCC01.
LOCATION.--Lat 45°00'27", long 95°55'21", in SW¼SW¼SW¼ sec.10, T.29 N., R.21 W., Hydrologic Unit 07010206, Lake Jane Road, 0.7 mi (1.1 km) north of Highway 212.
Owner: City of Lake Elmo.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 348 ft (106 m), cased to 280 ft (85.3 m).
DATUM.--Altitude of land-surface datum is 935 ft (285 m). Measuring point: Top of well cap, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--September 1977, February 1978, February 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 39.58 ft (12.06 m) below land-surface datum, Nov. 18, 1980; lowest, 45.65 ft (13.91 m) below land-surface datum, Sept. 28, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	39.58	MAR 9	40.73	MAY 14	41.08	JUN 15	41.22	JUL 15	41.46	SEP 4	41.63
JAN 13	39.87										

445958092523901. Local number, 029N21W13CAB01.
LOCATION.--Lat 44°59'58", long 92°52'39", in NW¼NE¼SW¼ sec.13, T.29 N., R.21 W., Hydrologic Unit 07010206, in City of Lake Elmo.
Owner: Elmo Lumber and Plywood. Formerly Lake Elmo Creamery.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in (0.30 m), depth 122 ft (37.2 m), screened 106 to 122 ft (32.3 to 37.2 m).
DATUM.--Altitude of land-surface datum is 938 ft (286 m). Measuring point: Hole in pump base, 1.30 ft (0.40 m) above land-surface datum.
PERIOD OF RECORD.--August 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 46.85 ft (14.28 m) below land-surface datum, Nov. 18, 1980; lowest, 51.37 ft (15.66 m) below land-surface datum, June 12, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	46.95	JAN 13	46.92	MAR 9	47.33	MAY 14	47.42	JUL 15	47.60	SEP 4	47.73
NOV 18	46.85										

450505092552501. Local number, 030N21W15CBB01.
LOCATION.--Lat 45°05'05", long 92°55'25", in NW¼NW¼SW¼ sec.15, T.30 N., R.21 W., Hydrologic Unit 07010206, 1.1 mi (1.8 km) east of Dellwood.
Owner: Victoria Station.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 4 in (0.10 m), depth 132 ft (40.2 m), cased to 125 ft (38.1 m).
DATUM.--Altitude of land-surface datum is 995 ft (303 m). Measuring point: Top of well cap, 2.80 ft (0.85 m) above land-surface datum.
PERIOD OF RECORD.--October 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 66.00 ft (20.12 m) below land-surface datum, Jan. 13, 1981; lowest, 69.27 ft (21.11 m) below land-surface datum, Feb. 2, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	66.43	JAN 13	66.00	MAR 19	66.30	MAY 14	WELL DESTROYED

WASHINGTON COUNTY--Continued

450858092575001. Local number, 031N21W28ABD01.
LOCATION.--Lat 45°08'58", long 92°57'50", in SE¼NW¼NE¼ sec.28, T.31 N., R.21 W., Hydrologic Unit 07010206, County Road 8A, 1.65 mi (2.6 km) east of Highway 61.
Owner: White Bear Gun Club.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 142 ft (43.3 m), cased to 94 ft (28.6 m).
DATUM.--Altitude of land-surface datum is 939 ft (28.6 m). Measuring point: Top of well cap, 1.30 ft (0.40 m) above land-surface datum.
PERIOD OF RECORD.--September 1977, February 1978, February 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.63 ft (3.24 m) below land-surface datum, Nov. 3, 1981; lowest, 13.17 ft (4.01 m) below land-surface datum, Sept. 30, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	10.84	DEC 30	11.06	MAR 10	11.45	MAY 6	10.75	JUL 15	10.95	SEP 1	10.75
NOV 18	10.97										

451355092532601. Local number, 032N20W30BCD01.
LOCATION.--Lat 45°13'55", long 92°53'26", in SE¼SW¼NW¼ sec.30, T.32 N., R.20 W., Hydrologic Unit 07030005, 0.25 mi (0.4 km) north of 192nd Street.
Owner: Arno Birr.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 260 ft (79.2 m), cased to 141 ft (43.0 m).
DATUM.--Altitude of land-surface datum is 990 ft (302 m). Measuring point: Vent pipe, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--March 1981 to September 1981.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 53.18 ft (16.21 m) below land-surface datum, Sept. 1, 1981; lowest, 53.89 ft (16.43 m) below land-surface datum, May 6, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 19	53.61	MAY 6	53.89	JUL 15	53.22	SEP 1	53.18

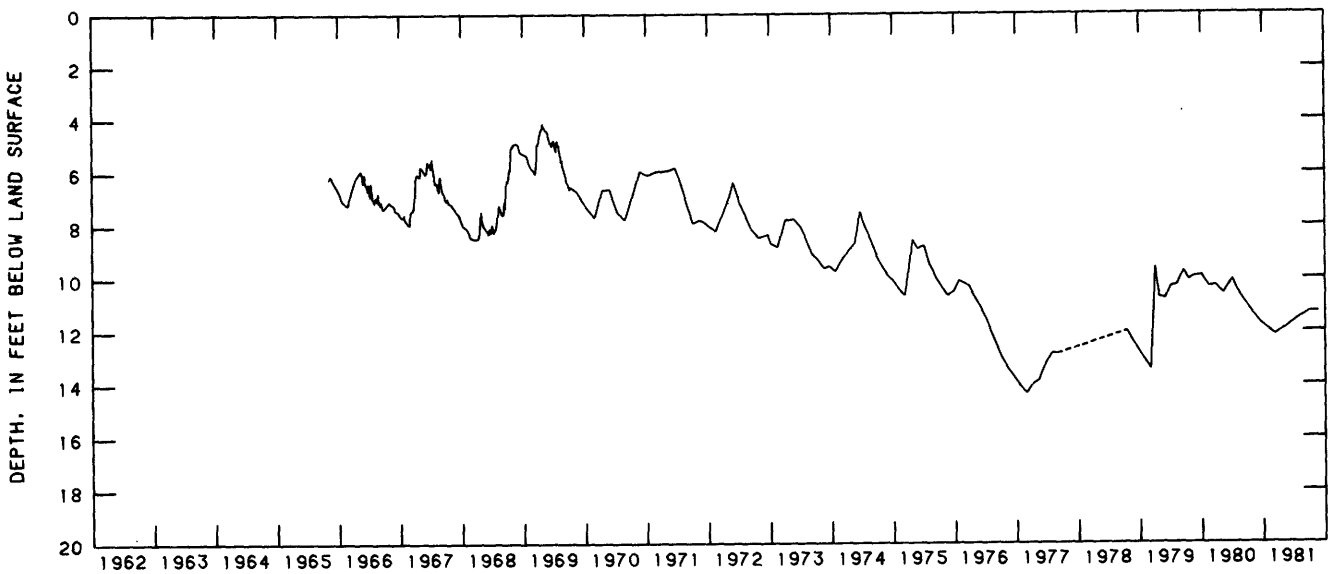
WATONWAN COUNTY

440037094372601. Local number, 106N32W01DDB01.
LOCATION.--Lat 44°00'37", long 94°37'26", in NW¼SE¼SE¼ 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.--Bored observation water-table well, diameter 2 in (0.05 m), depth 22 ft (6.7 m), screened 19 to 22 ft (5.8 to 6.7 m).
DATUM.--Altitude of land-surface datum is 1,056.2 ft (321.9 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of wood platform, 0.80 ft (0.24 m) above land-surface datum.
PERIOD OF RECORD.--November 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.11 ft (1.25 m) below land-surface datum, Apr. 27, 1969; lowest, 14.34 ft (4.37 m) below land-surface datum, Mar. 1, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	11.15	DEC 18	11.75	JAN 21	11.92	MAR 12	12.17	JUL 14	11.60	SEP 29	11.29

WATONWAN COUNTY--Continued



106N32W01DDB01

WINONA COUNTY

435756092034201. Local number, 106N10W19DDA01.
LOCATION.--Lat 43°57'56", long 92°03'42", in NE¼SE¼SE¼ sec.19, T.106 N., R.10 W., Hydrologic Unit 07040003, at St. Charles.
Owner: City of St. Charles, well 1.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 10 in (0.25 m), depth 175 ft (53.3 m), cased to 30 ft (9.1 m).
DATUM.--Altitude of land-surface datum is 1,160 ft (354 m). Measuring point: Hole in pump base, 2.25 ft (0.69 m) above land-surface datum.
REMARKS.--Measured weekly by Jim Braun. Water level affected by pumping.
PERIOD OF RECORD.--October 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 32.72 ft (9.97 m) below land-surface datum, July 19, 1974; lowest, 55.04 ft (16.78 m) below land-surface datum, Mar. 23, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	43.95	DEC 1	43.97	JAN 16	45.75	MAR 10	46.55	APR 24	46.47	JUL 3	47.63
9	43.95	5	44.05	23	45.65	13	46.15	MAY 4	46.47	10	48.27
17	44.25	12	44.05	30	46.25	23	46.35	11	46.52	17	47.37
24	44.45	19	44.95	FEB 6	46.17	27	46.55	29	47.10	AUG 10	46.95
31	44.65	24	44.85	13	46.55	APR 3	46.15	JUN 5	47.55	14	46.85
NOV 7	44.70	JAN 5	45.15	20	46.35	10	46.55	19	47.25	28	46.35
14	45.05	9	45.45	27	46.15	17	46.65	26	47.65	SEP 4	45.75
21	45.05										

WRIGHT COUNTY

450318094040602. Local number, 118N27W03CAC01.
LOCATION.--Lat 45°03'18", long 94°04'06", in SW¼NE¼SW¼ sec.3, T.118 N., R.27 W., Hydrologic Unit 07010204, at Howard Lake, well 1
Owner: City of Howard Lake.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age and Hinckley Sandstone of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 8 in (0.20 m), depth 510 ft (155 m), originally drilled to 900 ft (274 m), cased to 483 ft (147 m).
DATUM.--Altitude of land-surface datum is 1,045 ft (318 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
REMARKS.--Water level affeoted by pumping from well 115 ft (35.05 m) away.
PERIOD OF RECORD.--September 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 144.7 ft (44.10 m) below land-surface datum, Oct. 15, 1979; lowest, 154.7 ft (47.15 m) below land-surface datum, Apr. 6, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	147.0	JAN 14	145.6	APR 24	146.6	JUL 20	147.0	AUG 24	146.7	SEP 28	145.7
NOV 6	147.4	MAR 24	146.0	JUN 8	146.9						

WRIGHT COUNTY--Continued

450318094040603. Local number, 118N27W03CAC03.
LOCATION.--Lat 45°03'18", long 94°04'06", in SW¼NE¼SW¼ sec.3, T.118 N., R.27 W., Hydrologic Unit 07010204, at Howard Lake water tower.
Owner: City of Howard Lake, well 3.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 12 in (0.30 m), depth 148 ft (45.1 m), screened 138 to 148 ft (42.1 to 45.1 m).
DATUM.--Altitude of land-surface datum is 1,045 ft (319 m). Measuring point: Top of breather pipe, 1.80 ft (0.55 m) above land-surface datum.
PERIOD OF RECORD.--September 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 62.78 ft (19.14 m) below land-surface datum, May 29, 1979; lowest, 72.19 ft (22.00 m) below land-surface datum, June 24, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	68.59	JAN 14	66.98	APR 24	69.54	JUL 20	69.31	AUG 24	68.98	SEP 28	67.73
NOV 6	68.84	MAR 24	66.04	JUN 8	69.22						

450121094040401. Local number, 118N27W15CDC01.
LOCATION.--Lat 45°01'21", long 94°04'04", in SW¼SE¼SW¼ sec.15, T.118 N., R.27 W., Hydrologic Unit 07010204, 2 mi (3.2 km) south of Howard Lake.
Owner: Victor Town Hall.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 128 ft (39.0 m), screened 124 to 128 ft (37.8 to 39.0 m).
DATUM.--Altitude of land-surface datum is 998 ft (304 m). Measuring point: Top of casing, 1.60 ft (0.49 m) above land-surface datum.
PERIOD OF RECORD.--March 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 11.31 ft (3.45 m) below land-surface datum, May 29, 1979; lowest, 17.18 ft (5.24 m) below land-surface datum, June 24, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	13.77	NOV 6	13.75	MAR 24	13.24	JUN 8	14.14	AUG 24	12.96	SEP 28	11.39
14	13.18	JAN 14	13.29	APR 24	14.52	JUL 20	14.38				

450628093542102. Local number, 119N26W24BAB02.
LOCATION.--Lat 45°06'28", long 93°54'21", in NW¼NE¼NW¼ sec.24, T.119 N., R.26 W., Hydrologic Unit 07010204, 5.4 mi (1.65 km) south of Buffalo.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 13 ft (4.0 m), screened 11 to 13 ft (3.4 to 4.0 m).
DATUM.--Altitude of land-surface datum is 936 ft (285 m). Measuring point: Top of casing, 3.50 ft (1.07 m) above land-surface datum.
PERIOD OF RECORD.--December 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.63 ft (1.11 m) below land-surface datum, July 14, 1978; lowest, 8.03 ft (2.45 m) below land-surface datum, Aug. 17, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	5.47	DEC 4	5.99	FEB 6	6.64	APR 3	5.92	JUN 8	6.55	AUG 6	6.79
NOV 7	5.33	JAN 2	6.30	MAR 4	7.08	MAY 6	5.64	JUL 2	6.29	SEP 3	6.50

WRIGHT COUNTY--Continued

450403093544501. Local number, 119N26W35DDA01.
LOCATION.--Lat 45°04'03", long 93°54'45", in NE¼SE¼SE¼ sec.35, T.119 N., R.26 W., Hydrologic Unit 07010204, at Montrose.
Owner: City of Montrose, well 1.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age and Hinckley Sandstone of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 10 in (0.25 m), depth 693 ft (211 m), cased to 526 ft (160 m).
DATUM.--Altitude of land-surface datum is 1,000 ft (305 m). Measuring point: Edge of breather pipe, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--September 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 73.54 ft (22.41 m) below land-surface datum, Sept. 28, 1981; lowest, 78.38 ft (23.89 m) below land-surface datum, Nov. 3, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	76.51	JAN 14	75.15	APR 24	76.72	JUL 20	75.73	AUG 24	74.85	SEP 28	73.54
NOV 6	76.20	MAR 24	76.62	JUN 8	75.94						

451632093341301. Local number, 121N23W22ACC01.
LOCATION.--Lat 45°16'32", long 93°34'13", in SW¼SW¼NE¼ sec.22, T.121 N., R.23 W., Hydrologic Unit 07010203, 2.2 mi (3.5 km) south of old bridge across Mississippi River at Elk River.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Altitude of land-surface datum is 871 ft (266 m). Measuring point: Top of casing, 3.30 ft (1.01 m) above land-surface datum.
PERIOD OF RECORD.--December 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.35 ft (1.63 m) below land-surface datum, June 30, 1979; lowest, 8.75 ft (2.67 m) below land-surfaoe datum, July 16, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	7.25	DEC 4	7.68	FEB 4	8.21	APR 3	8.58	JUN 8	8.29	AUG 6	7.81
NOV 7	7.45	JAN 2	7.89	MAR 3	8.39	MAY 6	8.41	JUL 2	7.72	SEP 3	7.98

451738093492402. Local number, 121N25W15BBA02.
LOCATION.--Lat 45°17'38", long 93°49'24", in NE¼NW¼NW¼ sec.15, T.121 N., R.25 W., Hydrologic Unit 07010203, 1.4 mi (2.2 km) south of I-94.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 40 ft (12.2 m), screened 38 to 40 ft (11.6 to 12.2 m).
DATUM.--Altitude of land-surface datum is 966 ft (294 m). Measuring point: Top of casing, 4.00 ft (1.22 m) above land-surface datum.
PERIOD OF RECORD.--November 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 33.00 ft (10.06 m) below land-surface datum, July 29, 1978; lowest, 35.34 ft (10.77 m) below land-surface datum, Aug. 17, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	33.91	DEC 4	34.08	FEB 4	34.45	APR 3	34.74	JUN 8	34.81	AUG 6	34.78
NOV 7	33.92	JAN 7	34.26	MAR 3	34.59	MAY 6	34.66	JUL 2	34.52	SEP 3	33.53

WRIGHT COUNTY--Continued

452344094022202. Local number, 122N27W11AAC02.
LOCATION.--Lat 45°23'44", long 94°02'22", in SW¼NE¼NE¼ sec.11, T.122 N., R.27 W., Hydrologic Unit 07010203, 0.5 mi (0.80 km) south of I-94 Clearwater Exit.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 46 ft (14.0 m), screened 44 to 46 ft (13.4 to 14.0 m).
DATUM.--Altitude of land-surface datum is 1,010 ft (308 m). Measuring point: Top of casing, 4.50 ft (1.37 m) above land-surface datum.
PERIOD OF RECORD.--November 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 36.83 ft (11.23 m) below land-surface datum, June 29, 1979; lowest, 40.65 ft (12.39 m) below land-surface datum, Aug. 3, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	37.85	DEC 4	38.64	FEB 6	39.19	APR 3	39.38	JUN 8	39.71	AUG 6	39.85
NOV 7	38.52	JAN 7	38.86	MAR 3	39.23	MAY 6	39.53	JUL 2	39.74	SEP 3	39.89

YELLOW MEDICINE COUNTY

444111095404701. Local number, 114N40W16BAC01.
LOCATION.--Lat 44°41'11", long 95°40'47", in SW¼NE¼NW¼ sec.16, T.114 N., R.40 W., Hydrologic Unit 07020004, 3.3 mi (5.2 km) west of Hanley Falls.
Owner: Gilbert Orwoll.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 5 in (0.13 m), depth 135 ft (41.1 m).
DATUM.--Altitude of land-surface datum is 1,055 ft (322 m). Measuring point: Top of casing, 1.30 ft (0.40 m) above land-surface datum.
REMARKS.--Water level affected by pumping from nearby irrigation well.
PERIOD OF RECORD.--June 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.62 ft (6.89 m) below land-surface datum, Nov. 29, 1979; lowest, 31.63 ft (9.64 m) below land-surface datum, Aug. 14, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

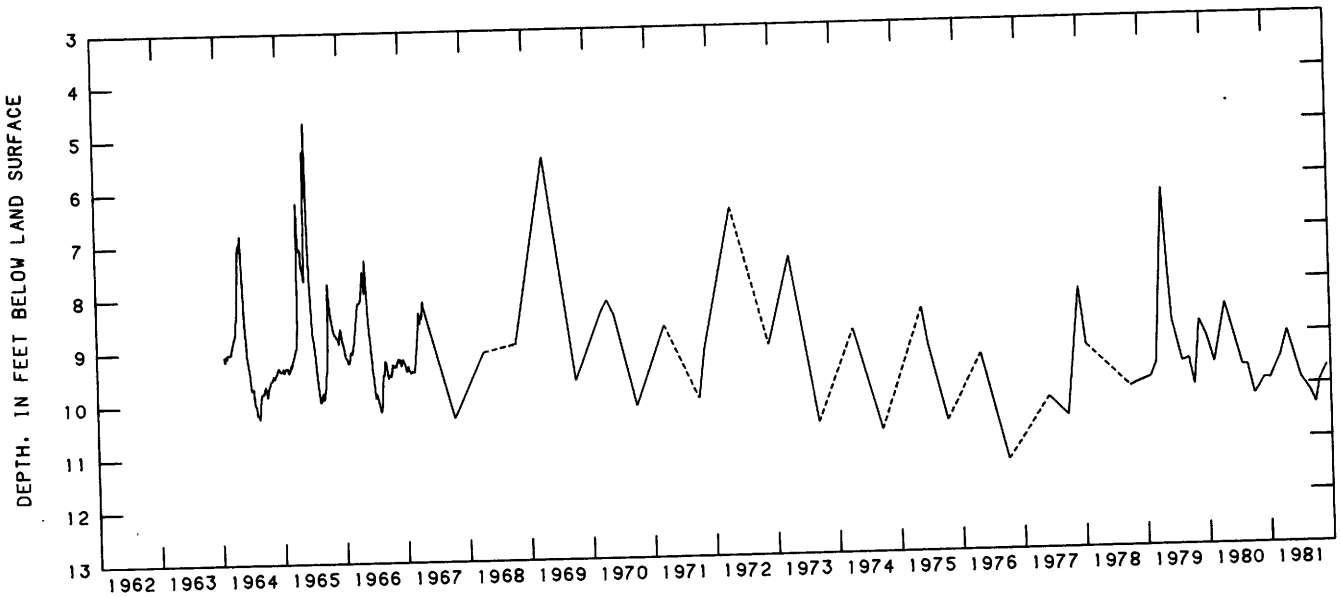
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 3	24.11	DEC 15	24.23	FEB 3	24.49	MAR 17	24.75	MAY 13	25.21	JUL 14	25.81

444219096165501. Local number, 114N45W04DCD01.
LOCATION.--Lat 44°42'19", long 96°16'55", in SE¼SW¼SE¼ sec.4, T.114 N., R.45 W., Hydrologic Unit 07020003, at Canby City Park.
Owner: City of Canby, well 6.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 12 in (0.30 m), depth 62 ft (18.9 m), screened 44 to 68 ft (13.4 to 20.7 m).
DATUM.--Altitude of land-surface datum is 1,255 ft (382 m). Measuring point: Top of casing, 2.90 ft (0.88 m) above land-surface datum.
PERIOD OF RECORD.--January 1964 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.67 ft (1.42 m) below land-surface datum, June 5, 1965; lowest, 11.32 ft (3.45 m) below land-surface datum, Oct. 7, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	10.19	JAN 9	9.90	MAR 12	9.47	APR 22	9.00	JUL 9	9.90	SEP 2	10.16
DEC 3	9.89										

YELLOW MEDICINE COUNTY--Continued



114N45W04DCD01

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

STATION NUMBER	LOCAL IDENT-I-FIER	GEO-LOGIC UNIT	DATE OF SAMPLE	TIME	SAMP-LING DEPTH (FT) (00003)	DEPTH OF WELL, TOTAL (FEET) (72008)	PUMP OR FLOW PERIOD PRIOR TO SAM-PLING (MIN) (72004)	FLOW RATE (GPM) (00058)	FLOW RATE, INSTAN-TANEOUS (GPM) (00059)
			BIG STONE						
451524096194501	121W45W29DCD01 ODESSA CI	400GRNT	81-07-06	1515	120	120	--	--	--
452208096290501	122N46W19BAB01 SCHNASER	400GRNT	81-07-06	1700	175	175	--	--	--
452724096335401	123N47W21BAA01 SHANNON G	210CRCS	81-07-07	0900	330	330	--	--	--
452942096403501	123N48W03BCC01 EASTMAN A	210CRCS	81-07-07	1000	153	153	--	--	--
			BLUE EARTH						
435605093512501	105N25W05ADD01 CAREY	364STPR	81-07-24	1400	--	180	--	--	--
			CARLTON						
463203092442401	047N19W22CCC C05 CORNER	112OTSH	81-07-16	1355	11.2	--	--	--	--
463228092404201	047N19W24ADD C03	112OTSH	81-06-29	1402	9.00	--	--	--	--
463437092313300	047N17W07AAB OLSON 3 FIE	112OTSH	81-07-17	0840	14.4	--	--	--	--
463635092345501	048N18W26DAD C01	112OTSH	81-06-29	1305	9.00	--	--	--	--
463715092413801	048N19W25BAA C04 DAIRY	112OTSH	81-07-16	1220	3.56	--	--	--	--
464036092380001	048N18W04BAC C07 SAWYER	112OTSH	81-07-13	1400	8.80	--	--	--	--
			CASS						
462357094283801	134N30W20ACB W RICHMOND	400MDMR	81-07-23	0930	--	120	--	--	--
			COTTONWOOD						
435312095055501	105N35W19BCB01 CALDWELL	210CRCS	81-07-09	1300	--	278	--	--	--
			CROW WING						
462622094081201	134N27W07BBD C R FELLMAN	210CRCS	81-07-23	1100	--	240	--	--	--
			FARIBAULT						
433212093434601	101N24W20ADD01 PARKS FLO	364GLEN	81-07-08	1500	--	120	--	200	--

DATE OF SAMPLE	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	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)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)
					BIG STONE							
81-07-06	750	960	7.0	13.0	--	440	130	110	40	25	11	.5
81-07-06	1780	2100	7.2	13.0	--	700	380	160	73	220	40	3.6
81-07-07	2260	2600	--	12.0	--	50	.00	5.1	9.0	600	96	37
81-07-07	1430	1640	--	12.0	--	880	530	220	80	17	4	.3
					BLUE EARTH							
81-07-24	1140	1220	7.5	10.0	--	470	100	130	36	92	30	1.8
					CARLTON							
81-07-16	245	220	6.8	7.0	--	98	.00	24	9.3	3.6	7	.2
81-06-29	260	200	7.3	10.0	--	92	8.0	23	8.3	2.8	6	.1
81-07-17	280	250	6.7	8.0	--	120	50	31	9.5	3.6	6	.1
81-06-29	100	82	7.7	10.0	--	35	4.0	5.9	4.8	1.8	10	.1
81-07-16	120	101	7.8	12.0	--	46	7.0	12	3.9	2.9	12	.2
81-07-13	245	206	7.4	13.0	--	100	11	33	4.5	2.6	5	.1
					CASS							
81-07-23	322	340	7.0	9.0	--	180	.00	50	13	5.4	6	.2
					COTTONWOOD							
81-07-09	1400	1380	7.4	10.5	--	710	310	190	56	76	19	1.2
					CROW WING							
81-07-23	285	296	7.0	9.5	--	160	.00	43	12	3.5	5	.1
					FARIBAULT							
81-07-08	725	758	7.3	9.5	--	290	.00	74	25	65	33	1.7

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE OF SAMPLE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)
BIG STONE												
81-07-06	4.9	310	160	15	.5	28	643	574	.35	--	--	<.010
81-07-06	12	320	730	65	1.9	18	1690	1480	<.01	--	--	<.010
81-07-07	7.6	400	430	320	1.5	8.4	1630	1630	.02	--	--	.020
81-07-07	6.4	350	620	3.9	.2	28	1400	1190	.11	--	--	<.010
BLUE EARTH												
81-07-24	4.0	370	260	2.5	.2	13	--	782	.01	--	--	.020
CARLTON												
81-07-16	.7	98	7.3	4.1	.2	22	145	137	1.6	--	<.010	--
81-06-29	.7	84	9.4	.9	.1	23	115	120	.02	--	<.010	--
81-07-17	.7	67	9.0	13	<.1	21	186	163	7.8	--	<.010	--
81-06-29	.5	31	5.8	.5	<.1	18	61	58	.02	--	<.010	--
81-07-16	.7	39	8.5	.9	<.1	.5	62	57	.07	--	<.010	--
81-07-13	.5	90	10	1.3	<.1	22	136	135	1.4	--	<.010	--
CASS												
81-07-23	1.5	180	7.8	.5	.1	14	208	201	.01	--	--	.060
COTTONWOOD												
81-07-09	5.4	400	470	2.4	.3	33	--	1080	<.01	--	--	.060
CROW WING												
81-07-23	1.2	170	.6	.6	.2	14	183	179	.01	--	--	.020
FARIBAULT												
81-07-08	3.0	390	37	1.4	.4	22	--	464	<.01	--	--	<.010

DATE OF SAMPLE	PHOSPHATE, ORTHO, DISSOLVED (MG/L AS PO4) (00660)	BORON, DISSOLVED (UG/L AS B) (01020)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	RA-226, DISSOLVED, PLANCHET COUNT (PCI/L) (09510)	RADON 222 DISSOLV (PC/L) (82305)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C) (00689)
BIG STONE										
81-07-06	--	270	2100	60	--	--	--	--	--	--
81-07-06	--	1900	6200	240	--	--	--	--	--	--
81-07-07	.06	3600	270	0	--	--	--	--	--	--
81-07-07	--	150	580	640	--	--	--	--	--	--
BLUE EARTH										
81-07-24	.06	170	21000	400	--	--	--	--	--	--
CARLTON										
81-07-16	--	10	190	20	--	--	--	--	--	--
81-06-29	--	30	960	20	--	<.1	340	--	--	--
81-07-17	--	20	180	20	--	--	--	--	--	--
81-06-29	--	20	1400	120	--	<.1	430	--	--	--
81-07-16	--	30	3500	190	--	--	--	--	--	--
81-07-13	--	10	640	540	--	--	--	--	--	--
CASS										
81-07-23	.18	20	70	80	--	--	--	--	--	--
COTTONWOOD										
81-07-09	.18	370	2200	310	--	--	--	--	--	--
CROW WING										
81-07-23	.06	60	1200	50	--	--	--	--	--	--
FARIBAULT										
81-07-08	--	200	1500	120	--	--	--	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

STATION NUMBER	LOCAL IDENT-I-FIER	GEO-LOGIC UNIT	DATE OF SAMPLE	TIME	SAMP-LING DEPTH (FT) (00003)	DEPTH OF WELL, TOTAL (FEET) (72008)	PUMP OR FLOW PERIOD PRIOR TO SAM-PLING (MIN) (72004)	FLOW RATE (GPM) (00058)	FLOW RATE, INSTAN-TANEOUS (GPM) (00059)
			FREEBORN						
433314093342601	101N23W15ACA01 HELLAND I	340CVMQ	81-07-08	1330	--	332	120	1000	--
434710093165101	104N20W29BBD01 DEHAAN SO	364GLEN	81-07-09	0800	--	410	1440	700	--
			GOODHUE						
441213092562901	109N18W35DAA01 SIBLEY	364GLEN	81-07-17	1000	--	175	--	--	--
			GRANT						
454952095462201	127N41W12BAB C-85 OBS. W	112DSMO	80-11-13	1500	35.0	--	--	--	--
		112DSMO	81-04-23	1100	35.0	--	--	--	--
455748095525201	129N41W19DCC C-82 OBS. W	112DSMO	80-11-13	1700	35.0	--	--	--	--
		112DSMO	81-04-24	0930	35.0	--	--	--	--
			HENNEPIN						
445523093211401	117N21W21DCA 01 SLP MUNI	371JRDN	81-02-05	1310	--	480	--	--	--
445548093202201	028N24W07BDA SLP MUNIC	371JRDN	81-03-12	0915	--	503	--	--	--
445604093223801	117N21W20BAA0Z SLP W29 M	367PRDC	81-03-12	1315	--	--	--	--	--
445613093214001	117N21W17DDA1 SLP W12	112DSMO	81-02-06	1100	--	47	--	--	10
445614093215305	117N21W17DDB05 SLP P119	112DSMO	81-02-06	1245	--	45	--	--	--
445614093220305	117N21W17DCA05 SLP P14	112DSMO	81-02-09	1300	--	42	--	--	--
		112DSMO	81-03-11	1545	--	--	--	--	--
445614093220604	117N21W17DCA SLP P124	112DSMO	81-02-06	1530	--	60	--	--	--
445615093212301	117N21W16CCA SLP W112	378PDCJ	81-02-18	1345	540	340	--	--	--
445615093220901	117N21W17DCB1 SLP W13	112DSMO	81-03-12	1530	--	50	--	--	--
445617093202602	028N24W06CAD SLP W124	364PLVL	81-02-03	1530	--	84	--	--	--
445617093202604	028N24W06CAD 04 SLP P117	112DSMO	81-02-03	1430	--	33	--	--	--
445617093211501	117N21W16CDB2 SLP W101	364PLVL	81-02-05	1500	--	106	--	--	--
445617093211502	117N21W16CDB3 SLP W117	112DSMO	81-02-04	1545	--	72	--	--	--
		112DSMO	81-03-11	1300	--	72	--	--	--
445617093212002	117N21W16CCA02 SLP W133	364STPR	81-02-05	1100	--	122	--	--	--
445625093221602	117N21W17CAD02 SLP W23A	367PRDC	81-02-19	1400	--	595	--	--	16
445634093205903	117N21W16DCB3 SLP W116	112DSMO	81-02-04	1015	--	67	--	--	--
445651093222901	117N21W17BCD1 SLP W2	112DSMO	81-02-03	1215	--	36	--	--	--
445654093215501	117N21W17BAC1 SLP W1	364PLVL	81-02-02	1600	--	107	--	--	--
445703093220202	117N21W08DCD06 SLP MUNIC	371JRDN	81-03-12	1045	--	--	--	--	--

DATE OF SAMPLE	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	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)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)
						FREEBORN						
81-07-08	610	656	7.7	11.0	--	290	.00	74	25	32	19	.8
81-07-09	690	722	7.3	11.0	--	350	.00	86	32	37	19	.9
						GOODHUE						
81-07-17	470	508	7.3	10.0	--	250	.00	67	20	7.9	6	.2
						GRANT						
80-11-13	650	--	7.7	9.0	--	300	--	65	34	5.5	4	.1
81-04-23	680	727	7.7	8.0	--	370	120	80	41	5.5	3	.1
80-11-13	840	--	7.5	9.0	--	370	--	90	36	22	11	.5
81-04-24	750	806	7.6	9.5	--	410	100	100	40	22	10	.5
						HENNEPIN						
81-02-05	--	--	--	--	--	--	--	--	--	--	--	--
81-03-12	625	637	--	10.0	.9	310	--	76	28	14	9	.3
81-03-12	520	516	--	12.0	.9	220	--	56	19	6.1	6	.2
81-02-06	970	--	--	10.5	--	--	--	--	--	--	--	--
81-02-06	1040	--	--	10.5	--	--	--	--	--	--	--	--
81-02-09	1750	--	--	11.0	--	--	--	--	--	--	--	--
81-03-11	1600	1780	7.3	11.0	--	360	--	100	26	250	60	5.8
81-02-06	1590	--	--	11.0	--	--	--	--	--	--	--	--
81-02-18	--	746	--	--	--	330	--	76	34	15	--	.4
81-03-12	--	--	--	--	--	--	--	--	--	--	--	--
81-02-03	1445	--	--	11.0	--	--	--	--	--	--	--	--
81-02-03	1630	--	--	10.0	--	--	--	--	--	--	--	--
81-02-05	1090	--	--	11.0	--	--	--	--	--	--	--	--
81-02-04	1490	--	--	11.0	--	--	--	--	--	--	--	--
81-03-11	1330	1550	7.2	12.0	.1	570	--	160	42	86	24	1.6
81-02-05	3100	--	--	--	--	--	--	--	--	--	--	--
81-02-19	540	553	--	10.5	--	250	--	60	25	4.8	--	.1
81-02-04	1010	--	--	10.5	--	--	--	--	--	--	--	--
81-02-03	1210	--	--	10.5	--	--	--	--	--	--	--	--
81-02-02	800	--	--	10.0	--	--	--	--	--	--	--	--
81-03-12	600	603	--	10.5	.7	280	--	72	25	9.4	7	.2

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE OF SAMPLE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)
						FREEBORN						
81-07-08	2.2	350	1.1	1.5	.4	19	--	367	.02	--	--	<.010
81-07-09	1.8	380	38	1.3	.3	20	--	446	<.01	--	--	.020
						GOODHUE						
81-07-17	.7	280	.0	1.1	.3	21	--	290	<.01	--	--	.010
						GRANT						
80-11-13	2.8	--	37	--	.3	25	--	--	12	--	.040	--
81-04-23	2.4	250	40	36	.2	26	458	444	14	--	.040	--
80-11-13	4.5	--	160	--	.2	27	--	--	.01	--	.040	--
81-04-24	4.1	310	150	2.1	.2	27	543	535	.02	--	.030	--
						HENNEPIN						
81-02-05	--	--	--	--	--	--	--	--	--	--	--	--
81-03-12	2.7	300	30	7.3	.5	16	362	356	.02	--	--	.000
81-03-12	1.2	280	4.5	2.7	.3	15	285	275	.01	--	--	.010
81-02-06	--	--	--	--	--	--	--	--	--	--	--	--
81-02-06	--	--	--	--	--	--	--	--	--	--	--	--
81-02-09	--	--	--	--	--	--	--	--	--	--	--	--
81-03-11	7.8	670	3.0	230	.2	25	1080	1050	.02	--	--	.010
81-02-06	--	--	--	--	--	--	--	--	--	--	--	--
81-02-18	--	260	50	30	--	21	--	--	<.01	--	--	--
81-03-12	--	--	--	--	--	--	--	--	--	--	--	--
81-02-03	--	--	--	--	--	--	--	--	--	--	--	--
81-02-03	--	--	--	--	--	--	--	--	--	--	--	--
81-02-05	--	--	--	--	--	--	--	--	--	--	--	--
81-02-04	--	--	--	--	--	--	--	--	--	--	--	--
81-03-11	5.2	450	26	260	.1	18	928	877	<.00	--	--	<.010
81-02-05	--	--	--	--	--	--	--	--	--	--	--	--
81-02-19	--	290	8.6	7.0	--	23	--	--	.06	--	--	--
81-02-04	--	--	--	--	--	--	--	--	--	--	--	--
81-02-03	--	--	--	--	--	--	--	--	--	--	--	--
81-02-02	--	--	--	--	--	--	--	--	--	--	--	--
81-03-12	1.8	310	13	11	.2	18	342	339	<.00	--	--	.030

DATE OF SAMPLE	PHOSPHATE, ORTHO, DISSOLVED (MG/L AS PO4) (00660)	BORON, DISSOLVED (UG/L AS B) (01020)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	RA-226, DISSOLVED, PLANCHET COUNT (PCI/L) (09510)	RADON 222 DISSOLV (PC/L) (82305)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C) (00689)
					FREEBORN					
81-07-08	--	170	830	40	--	--	--	--	--	--
81-07-09	.06	130	1200	20	--	--	--	--	--	--
					GOODHUE					
81-07-17	.03	20	3200	120	--	--	--	--	--	--
					GRANT					
80-11-13	--	30	120	10	--	--	--	--	--	--
81-04-23	--	20	150	10	--	--	--	--	--	--
80-11-13	--	150	1500	190	--	--	--	--	--	--
81-04-24	--	130	2600	180	--	--	--	--	--	--
					HENNEPIN					
81-02-05	--	--	--	--	--	--	--	--	6.9	.8
81-03-12	.00	0	230	40	--	--	--	--	--	--
81-03-12	.03	20	1600	100	--	--	--	--	--	--
81-02-06	--	--	--	--	--	--	--	--	4.8	.1
81-02-06	--	--	--	--	--	--	--	--	10	.2
81-02-09	--	--	--	--	--	--	--	--	22	.3
81-03-11	.03	190	5500	440	--	--	--	--	--	--
81-02-06	--	--	--	--	--	--	--	--	20	.2
81-02-18	--	--	3000	120	--	--	--	--	1.1	.1
81-03-12	--	--	--	--	--	--	--	140	--	--
81-02-03	--	--	--	--	--	--	--	--	9.9	.2
81-02-03	--	--	--	--	--	--	--	--	17	.4
81-02-05	--	--	--	--	--	--	--	--	11	.2
81-02-04	--	--	--	--	--	--	--	--	18	.2
81-03-11	--	130	7900	690	--	--	--	--	--	--
81-02-05	--	--	--	--	--	--	--	--	9.0	.6
81-02-19	--	--	2800	100	--	--	--	--	.7	.2
81-02-04	--	--	--	--	--	--	--	--	12	.1
81-02-03	--	--	--	--	--	--	--	--	15	.2
81-02-02	--	--	--	--	--	--	--	--	15	.2
81-03-12	.09	30	830	80	--	--	--	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

STATION NUMBER	LOCAL IDENT-I-FIER	GEO-LOGIC UNIT	DATE OF SAMPLE	TIME	SAMP-LING DEPTH (FT) (00003)	DEPTH OF WELL, TOTAL (FEET) (72008)	PUMP OR FLOW PERIOD PRIOR TO SAM-PLING (MIN) (72004)	FLOW RATE (GPM) (00058)	FLOW RATE, INSTAN-TANEOUS (GPM) (00059)
			HUBBARD						
465650094393401	140N32W13AAA WELL 2 WILL	112PLSC	81-07-13	1515	--	--	--	--	--
465705094400701	140N32W12CAD2 ERICKSON S	112PLSC	81-08-14	1100	--	--	--	--	--
465705094400702	140N32W12CAD3 WELL 5 ERI	112PLSC	81-08-14	1030	--	--	--	--	--
465705094400703	140N32W12CAD4 WELL 10 ER	112PLSC	81-08-14	0945	--	--	--	--	--
465705094400704	140N32W12CAD5 OBS WELL U	112PLSC	81-08-14	1015	--	10	--	--	--
465705094400705	140N32W12CAD6 OBS WELL U	112PLSC	81-08-14	1045	--	6	--	--	--
465707094400701	140N32W12CAD1 WELL 4 WIL	112PLSC	81-07-10	1130	--	--	--	--	--
		112PLSC	81-08-14	1000	--	--	--	--	--
465708094403201	140N32W12CBD WELL 6 WILL	112PLSC	81-08-14	0900	--	--	--	--	--
465710094395101	140N32W12DBD1 WELL 8 WIL	112PLSC	81-07-10	1350	--	--	--	--	--
		112PLSC	81-08-14	0915	--	--	--	--	--
465710094395102	140N32W12DBD2 ADELMANS D	112PLSC	81-08-14	0930	--	--	--	--	--
465726094402701	140N32W12BCD2 WLN 40	112PLSC	81-08-13	0930	--	--	--	--	--
465727094402402	140N32W12BDC OBS WELL W	112PLSC	81-08-14	1115	--	25	--	--	--
465727094402409	140N32W12BCD6 OBS WELL	112PLSC	81-08-13	0900	--	10	--	--	--
465727094402411	140N32W12BCD07 OBS WELL	112PLSC	81-08-13	0915	--	10	--	--	--
			ITASCA						
472639093200501	057N24W01CDD RAY MANNES	400GRNT	81-07-24	1300	--	160	--	--	--
473233093110101	058N22W06BAA DEL APEL LO	400PCMB	81-07-24	1130	--	185	--	--	--
			KANABEC						
454909093152001	038N23W06ABB K01	112OTSH	81-05-21	0830	14.0	--	--	--	--
455045093210001	039N24W20DDD K03	112OTSH	81-05-20	1130	8.00	--	--	--	--
		112OTSH	81-06-29	1825	8.00	--	--	--	--
455145093270901	039N25W15CCC K05	112OTSH	81-05-20	1500	15.0	--	--	--	--
455400093155101	039N23W06BCB K02	112OTSH	81-05-20	1000	22.0	--	--	--	--
455400093194401	039N24W04ADA CASHMAN	112OTSH	81-05-21	1230	5.00	--	--	--	--
			LE SUEUR						
441657093451401	109N24W06ABA01 BROWN	364STPR	81-07-24	1000	--	213	--	--	--

DATE OF SAMPLE	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	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)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)
						HUBBARD						
81-07-13	310	--	7.9	10.0	--	--	--	--	--	--	--	--
81-08-14	--	232	--	--	--	120	2.0	33	9.5	1.8	3	.1
81-08-14	--	258	--	--	--	140	.00	39	9.2	1.9	3	.1
81-08-14	--	340	--	--	--	180	4.0	57	10	1.5	2	.0
81-08-14	--	312	--	--	--	170	.00	51	9.5	1.8	2	.1
81-08-14	--	258	--	--	--	130	.00	36	10	2.1	3	.1
81-07-10	500	--	7.3	11.0	--	--	--	--	--	--	--	--
81-08-14	--	434	--	--	--	230	.00	68	14	3.4	3	.1
81-08-14	--	404	--	--	--	220	6.0	60	16	3.6	3	.1
81-07-10	480	--	7.5	9.0	--	--	--	--	--	--	--	--
81-08-14	--	408	--	--	--	230	12	65	17	2.4	2	.1
81-08-14	--	450	--	--	--	260	19	69	21	2.8	2	.1
81-08-13	--	382	--	--	--	200	.00	63	10	2.5	3	.1
81-08-14	--	503	--	--	--	260	.00	85	12	2.7	2	.1
81-08-13	--	436	--	--	--	230	.00	67	15	2.7	2	.1
81-08-13	--	284	--	--	--	140	.00	38	12	3.1	4	.1
						ITASCA						
81-07-24	392	422	6.5	9.0	--	220	.00	60	16	7.1	7	.2
81-07-24	343	364	7.8	11.0	--	140	.00	37	12	25	27	.9
						KANABEC						
81-05-21	265	245	7.2	7.0	--	110	25	26	12	6.7	11	.3
81-05-20	840	841	6.3	8.0	--	420	63	130	24	12	6	.3
81-06-29	1050	--	6.4	11.0	--	--	--	--	--	--	--	--
81-05-20	140	145	6.6	8.0	--	60	4.0	15	5.4	4.9	15	.3
81-05-20	235	232	8.2	8.0	--	100	24	26	8.6	3.3	7	.1
81-05-21	390	280	7.3	7.0	--	120	.00	28	13	7.7	12	.3
						LE SUEUR						
81-07-24	469	528	7.5	12.0	--	210	.00	51	20	6.1	6	.2

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE OF SAMPLE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)
HUBBARD												
81-07-13	--	--	--	--	--	--	--	--	--	.270	--	--
81-08-14	1.5	120	.0	.8	<.1	1.7	125	121	--	.016	--	--
81-08-14	1.4	140	1.6	1.1	.1	7.9	140	151	--	.002	--	--
81-08-14	1.2	180	3.0	.6	.1	9.4	198	192	--	<.001	--	--
81-08-14	1.2	170	.0	.6	.1	9.3	179	177	--	.038	--	--
81-08-14	1.5	140	1.4	1.1	<.1	2.6	147	141	--	.032	--	--
81-07-10	--	--	--	--	--	--	--	--	--	.183	--	--
81-08-14	2.9	240	.4	1.5	<.1	12	250	247	--	.233	--	--
81-08-14	2.1	210	16	1.8	.1	13	253	239	--	.095	--	--
81-07-10	--	--	--	--	--	--	--	--	--	.130	--	--
81-08-14	1.0	220	9.1	.7	<.1	17	240	245	--	.003	--	--
81-08-14	.7	240	9.8	.8	.1	20	260	269	--	<.001	--	--
81-08-13	1.4	210	.0	1.1	<.1	25	224	233	--	.085	--	--
81-08-14	1.8	290	.0	1.0	<.1	22	297	303	--	.039	--	--
81-08-13	1.3	250	.0	1.1	<.1	16	259	256	--	.009	--	--
81-08-13	2.0	150	.9	.6	<.1	3.5	192	151	--	--	--	--
ITASCA												
81-07-24	3.3	220	16	.9	.2	26	269	262	.04	--	--	<.010
81-07-24	5.6	190	2.5	5.7	.3	14	228	217	.02	--	--	<.010
KANABEC												
81-05-21	.5	89	11	9.2	.2	37	178	178	4.9	--	.010	--
81-05-20	1.6	360	2.3	62	.1	49	609	543	.02	--	1.80	--
81-06-29	--	--	--	--	--	--	--	--	--	--	--	--
81-05-20	.8	56	4.2	4.7	<.1	26	105	103	1.8	--	<.010	--
81-05-20	1.3	76	4.7	7.9	<.1	25	153	143	4.7	--	.080	--
81-05-21	.9	130	6.8	16	.2	19	172	173	.07	--	<.010	--
LE SUEUR												
81-07-24	6.8	240	1.9	1.7	.2	31	--	271	<.01	--	--	<.010

DATE OF SAMPLE	PHOSPHATE, ORTHO, DISSOLVED (MG/L AS PO4) (00660)	BORON, DISSOLVED (UG/L AS B) (01020)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	RA-226, DISSOLVED, PLANCHET COUNT (PCI/L) (09510)	RADON 222 DISSOLV (PC/L) (82305)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C) (00689)
HUBBARD										
81-07-13	--	--	--	--	--	--	--	--	--	--
81-08-14	--	--	200	70	40	--	--	--	--	--
81-08-14	--	--	4200	340	50	--	--	--	--	--
81-08-14	--	--	30	1100	60	--	--	--	--	--
81-08-14	--	--	560	410	50	--	--	--	--	--
81-08-14	--	--	1900	120	50	--	--	--	--	--
81-07-10	--	--	--	--	--	--	--	--	--	--
81-08-14	--	--	530	240	80	--	--	--	--	--
81-08-14	--	--	30	160	60	--	--	--	--	--
81-07-10	--	--	--	--	--	--	--	--	--	--
81-08-14	--	--	<10	2	60	--	--	--	--	--
81-08-14	--	--	20	3	60	--	--	--	--	--
81-08-13	--	--	3400	240	70	--	--	--	--	--
81-08-14	--	--	3800	320	80	--	--	--	--	--
81-08-13	--	--	2200	460	80	--	--	--	--	--
81-08-13	--	--	1000	110	60	--	--	--	--	--
ITASCA										
81-07-24	--	40	30	300	--	--	--	--	--	--
81-07-24	--	280	610	30	--	--	--	--	--	--
KANABEC										
81-05-21	--	10	70	40	--	--	--	--	--	--
81-05-20	--	20	44000	1200	--	--	--	--	--	--
81-06-29	--	--	--	--	--	.3	570	--	--	--
81-05-20	--	10	560	40	--	--	--	--	--	--
81-05-20	--	10	60	50	--	--	--	--	--	--
81-05-21	--	10	2100	710	--	--	--	--	--	--
LE SUEUR										
81-07-24	--	70	8000	390	--	--	--	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

STATION NUMBER	LOCAL IDENT-I-FIER	GEO-LOGIC UNIT	DATE OF SAMPLE	TIME	SAMP-LING DEPTH (FT) (00003)	DEPTH OF WELL, TOTAL (FEET) (72008)	PUMP OR FLOW PERIOD PRIOR TO SAM-PLING (MIN) (72004)	FLOW RATE (GPM) (00058)	FLOW RATE, INSTAN-TANEOUS (GPM) (00059)
			MOWER						
434500093003501	103N18W05DDA01 ALEXANDER	340DVNN	81-07-10	1300	--	218	--	1000	--
			PINE						
453824092570000	040N18W18DBC PO-12	112OTSH	81-07-20	1225	4.82	--	--	--	--
455139092524401	039N20W18DDD LINDAHL	112OTSH	81-07-21	1120	1.27	--	--	--	--
455636092362501	040N18W21BBD HEADQUATER	112OTSH	81-07-22	0925	3.60	--	--	--	--
455833092440801	040N19W08AAA PO-9	112OTSH	81-07-21	0955	15.5	--	--	--	--
455939092365801	041N18W33AAD ST CROIX	--	81-07-23	1115	--	--	--	--	--
455947092542301	041N20W32BBB SIKKINK	112OTSH	81-07-21	1505	22.8	--	--	--	--
460007092395801	041N18W30ABB PO-11	112OTSH	81-07-21	0910	11.2	--	--	--	--
460512092194801	042N16W26BDD MARKSVILLE	112OTSH	81-07-14	1415	9.14	--	--	--	--
460945093000401	043N21W33CAD PO-8	112OTSH	81-07-21	1615	12.2	--	--	--	--
461215092550301	043N20W18DCC FINIAYSON T	400HCKL	81-09-24	1200	170	--	--	--	--
461536092521501	044N20W28DCD PO-1	112OTSH	81-07-23	0745	16.9	--	--	--	--
461809092481201	044N20W13AAA PO5	112OTSH	81-06-29	1650	8.00	--	--	--	--
462348092483601	045N20W12ACD PO2	112OTSH	81-06-29	1550	49.0	--	--	--	--
			POPE						
452726095444601	123N40W18CCC R DUNCAN IR	112DSMO	80-10-14	1500	30.0	--	1320	--	--
		112DSMO	81-04-23	1400	30.0	--	--	--	--
453942095451201	125N40W06CCA C-87 OBS. W	112DSMO	80-11-13	1400	35.0	35	--	--	--
		112DSMO	81-04-23	1200	35.0	35	--	--	--
			RICE						
441327093105701	109N20W26AAA01 ST MARTIN	364STPR	81-07-17	1130	--	250	--	--	--
			STEELE						
435722093150201	106N20W29DAB01 MAIXNER F	364GLEN	81-07-31	1000	--	--	--	4.0	--
440926093314801	108N21W18BBB01 MORK	364STPR	81-07-17	1300	--	211	--	--	--

DATE OF SAMPLE	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	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)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)
						MOWER						
81-07-10	530	502	7.5	9.5	--	270	.00	72	22	7.4	6	.2
						PINE						
81-07-20	145	73	6.3	16.0	--	29	6.0	7.4	2.5	2.3	15	.2
81-07-21	140	104	6.7	13.0	--	36	.00	8.2	3.8	4.7	21	.3
81-07-22	60	39	6.3	9.0	--	16	.00	3.9	1.4	1.6	18	.2
81-07-21	115	88	6.0	11.0	--	35	6.0	9.3	2.8	1.6	9	.1
81-07-23	--	112	--	--	--	54	.00	14	4.6	2.8	10	.2
81-07-21	185	164	7.9	10.0	--	72	.00	16	7.9	3.9	10	.2
81-07-21	500	410	6.4	13.0	--	130	28	23	17	18	21	.7
81-07-14	250	210	6.3	15.0	--	31	.00	10	1.5	30	64	2.3
81-07-21	105	29	6.2	11.0	--	5	.00	1.0	.7	1.3	30	.2
81-09-24	170	136	6.3	8.0	--	52	7.0	13	4.8	4.0	14	.2
81-07-23	175	--	6.7	9.0	--	42	--	10	4.1	1.8	8	.1
81-06-29	105	67	6.4	11.0	--	23	.00	5.8	2.0	1.7	14	.2
81-06-29	190	142	8.4	12.0	--	60	7.0	16	4.8	2.0	7	.1
						POPE						
80-10-14	1000	958	7.7	10.0	--	460	190	110	45	12	5	.2
81-04-23	960	1030	7.6	8.0	--	550	300	130	54	15	6	.3
80-11-13	800	--	7.8	9.0	--	360	--	79	39	7.7	4	.2
81-04-23	725	744	7.8	8.0	--	410	120	93	43	7.8	4	.2
						RICE						
81-07-17	630	644	7.3	10.0	--	300	33	80	25	18	11	.5
						STEELE						
81-07-31	610	594	7.1	9.5	--	330	.00	86	28	9.3	6	.2
81-07-17	710	766	7.3	13.0	--	360	.00	96	30	19	10	.4

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE OF SAMPLE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)
						MOWER						
81-07-10	1.8	270	9.4	.9	.3	22	--	300	.03	--	--	.010
						PINE						
81-07-20	.6	23	9.1	.7	<.1	21	65	59	.29	--	<.010	--
81-07-21	2.0	38	.1	8.2	<.1	.5	56	51	.01	--	<.010	--
81-07-22	.4	19	5.6	1.1	<.1	12	39	40	.17	--	<.010	--
81-07-21	.5	29	7.6	3.1	<.1	13	64	63	1.0	--	<.010	--
81-07-23	1.1	55	18	7.2	.3	10	76	95	.01	--	<.010	--
81-07-21	.9	76	8.3	4.7	.1	.9	95	90	.10	--	<.010	--
81-07-21	15	99	49	30	<.1	1.1	249	223	1.8	--	<.010	--
81-07-14	3.9	50	11	19	<.1	18	134	135	2.2	--	<.010	--
81-07-21	.9	7.0	5.6	1.2	<.1	16	49	43	.01	--	.060	--
81-09-24	1.3	45	8.0	7.0	.1	17	96	96	1.1	--	<.010	.000
81-07-23	1.6	--	--	--	--	1.1	--	--	.04	--	<.010	--
81-06-29	.7	26	3.8	1.7	<.1	25	60	66	.24	--	.010	--
81-06-29	.7	53	7.1	3.1	<.1	15	100	84	.02	--	<.010	--
						POPE						
80-10-14	4.1	270	150	43	.3	28	--	558	.23	--	.040	--
81-04-23	4.9	250	180	46	.3	28	581	615	.03	--	.010	--
80-11-13	5.5	290	120	--	.2	21	--	--	.04	--	.020	--
81-04-23	4.8	290	120	14	.2	23	508	485	.79	--	.020	--
						RICE						
81-07-17	2.1	270	83	1.4	.2	13	--	386	<.01	--	--	.040
						STEELE						
81-07-31	1.4	350	3.6	.9	.3	19	--	360	.04	--	--	.050
81-07-17	4.1	430	2.0	1.0	.3	22	--	434	.07	--	--	<.010

DATE OF SAMPLE	PHOSPHATE, ORTHO, DISSOLVED (MG/L AS PO4) (00660)	BORON, DISSOLVED (UG/L AS B) (01020)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	RA-226, DISSOLVED, PLANCHET COUNT (PCI/L) (09510)	RADON 222 DISSOLV (PC/L) (82305)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C) (00689)
					MOWER					
81-07-10	.03	40	1300	70	--	--	--	--	--	--
					PINE					
81-07-20	--	10	700	20	--	--	--	--	--	--
81-07-21	--	10	720	200	--	--	--	--	--	--
81-07-22	--	10	10	80	--	--	--	--	--	--
81-07-21	--	0	3100	60	--	--	--	--	--	--
81-07-23	--	10	3800	120	--	--	--	--	--	--
81-07-21	--	10	710	70	--	--	--	--	--	--
81-07-21	--	50	2300	190	--	--	--	--	--	--
81-07-14	--	30	1900	110	--	--	--	--	--	--
81-07-21	--	0	12000	70	--	--	--	--	--	--
81-09-24	.00	110	7800	470	--	--	--	--	--	--
81-07-23	--	30	7400	410	--	--	--	--	--	--
81-06-29	--	9	7000	1100	--	<.1	610	--	--	--
81-06-29	--	20	50	160	--	<.1	4.0	--	--	--
					POPE					
80-10-14	--	100	2000	400	--	--	--	--	--	--
81-04-23	--	110	6400	310	--	--	--	--	--	--
80-11-13	--	0	630	960	--	--	--	--	--	--
81-04-23	--	50	260	1000	--	--	--	--	--	--
					RICE					
81-07-17	.12	80	1000	60	--	--	--	--	--	--
					STEELE					
81-07-31	.15	80	830	30	--	--	--	--	--	--
81-07-17	--	130	500	380	--	--	--	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

STATION NUMBER	LOCAL IDENT-I-FIER	GEO-LOGIC UNIT	DATE OF SAMPLE	TIME	SAMP-LING DEPTH (FT) (00003)	DEPTH OF WELL, TOTAL (FEET) (72008)	PUMP OR FLOW PERIOD PRIOR TO SAM-PLING (MIN) (72004)	FLOW RATE (GPM) (00058)	FLOW RATE, INSTAN-TANEOUS (GPM) (00059)
			STEVENS						
453045095544501	124N42W35BBB HAROLD LUTH	112DSMO	80-11-14	0930	20.0	--	--	--	--
		112DSMO	81-04-22	--	--	--	--	--	--
454103095513901	126N41W32BBC C-9 OBS. WE	112DSMO	80-11-12	1700	35.0	--	--	--	--
		112DSMO	81-04-23	0915	35.0	--	--	--	--
			SWIFT						
450959095491901	120N41W28CCD C-114 OBS.	112DSMO	80-11-13	1100	25.0	25	--	--	--
450959095491901	120N41W28CCD C-114 OBS.	112DSMO	81-04-23	1645	25.0	25	--	--	--
451215096010001	120N43W14BCC APPLETON MU	112DSMO	80-11-13	0830	--	--	--	--	--
451811095473601	121N40W08AAA C-117 OBS.	112DSMO	80-11-13	1200	20.0	--	--	--	--
		112DSMO	81-04-23	1530	20.0	--	--	--	--
			WADENA						
462709094500401	134N33W03BAC D W CARROL	210CRCS	81-07-22	1830	--	43	--	--	--
			WASECA						
435833093412501	106N24N22AAC01 MARQUARDT	364STPR	81-07-24	1100	--	242	--	--	--
			WASHINGTON						
451027092511801	031N20W16BCC USGS OBS WE	112PLSC	81-09-04	1300	--	28	--	--	--
451127092513303	031N20W05AAC USGS OBS PZ	112PLSC	81-09-03	1130	--	9	--	--	--
451145092515501	031N20W05CDD USGS OBS WE	112PLSC	81-09-02	1500	--	8	--	--	--
451302092524001	032N20W31DAA LANGLY SPRI	112PLSC	81-09-03	1400	--	1	--	--	--
451305092524101	032N20W31ADD SCH-16 J SC	378PDCJ	81-09-03	1000	--	120	--	--	--
451333092523501	032N20W30DDD KOM-17 KOMI	378PDCJ	81-09-04	1000	--	120	--	--	--
451409092512401	032N20W29AAD USGS OBS WE	112PLSC	81-09-01	1440	--	4	--	--	--
451409092512402	032N20W29AAD USGS OBS WE	112PLSC	81-09-01	1430	--	7	--	--	--
451444092514801	032N20W20DBB USGS OBS WE	112PLSC	81-09-03	1600	--	9	--	--	--
			WATONWAN						
440133094312501	107N31W35CAC AL GUYER	371MSMN	81-07-09	1500	--	350	480	700	--

DATE OF SAMPLE	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	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)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)
					STEVENS							
80-11-14	900	--	7.5	9.0	--	380	--	91	36	20	10	.5
81-04-22	800	831	7.2	9.0	--	380	120	53	59	40	19	.9
80-11-12	660	--	8.7	9.5	--	350	--	75	39	15	8	.4
81-04-23	740	763	7.8	7.0	--	380	98	87	39	12	6	.3
					SWIFT							
80-11-13	650	--	7.9	9.0	--	290	--	64	32	11	8	.3
81-04-23	580	623	7.8	10.0	--	320	100	74	33	9.5	6	.2
80-11-13	880	--	8.0	13.0	--	400	--	81	48	23	11	.5
80-11-13	660	--	7.6	9.0	--	290	--	75	25	9.3	6	.2
81-04-23	625	649	8.2	10.0	--	340	89	88	29	10	6	.2
					WADENA							
81-07-22	450	464	6.4	9.0	--	250	15	69	20	4.3	4	.1
					WASECA							
81-07-24	806	--	7.6	10.0	--	320	.00	86	26	58	28	1.4
					WASHINGTON							
81-09-04	--	556	--	--	--	200	160	52	18	18	16	.5
81-09-03	--	160	--	--	--	72	4.0	18	6.5	2.7	8	.1
81-09-02	--	426	--	--	--	210	.00	56	16	7.4	7	.2
81-09-03	--	338	--	--	--	140	52	36	12	7.5	10	.3
81-09-03	--	394	--	--	--	210	2.0	52	20	5.3	5	.2
81-09-04	--	340	--	--	--	170	.00	40	17	3.6	4	.1
81-09-01	--	154	--	--	--	54	.00	13	5.2	2.5	9	.1
81-09-01	--	45	--	--	--	10	.00	1.7	1.3	1.1	17	.2
81-09-03	--	260	--	--	--	110	.00	24	11	3.4	6	.1
					WATONWAN							
81-07-09	2200	2300	7.0	10.0	--	1300	1100	330	120	75	11	.9

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE OF SAMPLE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED MG/L) (70301)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)
STEVENS												
80-11-14	5.2	--	210	--	.2	25	--	--	.10	--	.020	--
81-04-22	5.7	260	190	10	.2	29	569	545	.02	--	.010	--
80-11-12	4.5	--	140	--	.2	22	--	--	.11	--	.000	--
81-04-23	4.1	280	140	4.6	.2	22	512	480	.19	--	<.010	--
SWIFT												
80-11-13	3.2	--	110	--	.3	27	--	--	.00	--	.020	--
81-04-23	2.8	220	110	7.2	.3	28	405	400	.02	--	.030	--
80-11-13	7.3	--	120	--	.2	27	--	--	.03	--	.010	--
80-11-13	3.7	--	100	--	.3	25	--	--	.00	--	.050	--
81-04-23	3.4	250	110	2.6	.3	28	435	426	.03	--	.030	--
WADENA												
81-07-22	1.3	240	17	4.8	.1	21	299	284	<.01	--	--	.050
WASECA												
81-07-24	4.1	410	56	2.1	.6	17	--	500	.01	--	--	<.010
WASHINGTON												
81-09-04	5.0	41	11	130	--	15	402	274	--	--	--	--
81-09-03	.4	68	9.8	1.2	--	21	119	100	--	--	--	--
81-09-02	2.1	220	.0	11	--	24	265	249	--	--	--	--
81-09-03	.9	87	8.5	33	--	25	238	175	--	--	--	--
81-09-03	1.0	210	6.0	1.2	--	16	220	228	--	--	--	--
81-09-04	1.0	180	.0	2.9	--	16	198	189	--	--	--	--
81-09-01	3.6	61	1.9	5.0	--	9.7	93	78	--	--	--	--
81-09-01	1.6	14	4.7	1.2	--	17	73	37	--	--	--	--
81-09-03	4.1	120	.0	6.8	--	18	169	139	--	--	--	--
WATONWAN												
81-07-09	6.8	240	960	2.6	.2	19	--	2520	<.01	--	--	.020

DATE OF SAMPLE	PHOSPHATE, ORTHO, DISSOLVED (MG/L AS PO4) (00660)	BORON, DISSOLVED (UG/L AS B) (01020)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	RA-226, DISSOLVED, PLANCHET COUNT (PCI/L) (09510)	RADON 222 DISSOLV (PC/L) (82305)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C) (00689)
STEVENS										
80-11-14	--	140	690	210	--	--	--	--	--	--
81-04-22	--	130	1100	320	--	--	--	--	--	--
80-11-12	--	100	370	190	--	--	--	--	--	--
81-04-23	--	80	1900	210	--	--	--	--	--	--
SWIFT										
80-11-13	--	60	1100	220	--	--	--	--	--	--
81-04-23	--	40	2700	230	--	--	--	--	--	--
80-11-13	--	130	230	670	--	--	--	--	--	--
80-11-13	--	110	2500	480	--	--	--	--	--	--
81-04-23	--	100	3400	510	--	--	--	--	--	--
WADENA										
81-07-22	.15	20	2300	320	--	--	--	--	--	--
WASECA										
81-07-24	--	540	3000	160	--	--	--	--	--	--
WASHINGTON										
81-09-04	--	--	--	--	--	--	--	--	--	--
81-09-03	--	--	--	--	--	--	--	--	--	--
81-09-02	--	--	--	--	--	--	--	--	--	--
81-09-03	--	--	--	--	--	--	--	--	--	--
81-09-03	--	--	--	--	--	--	--	--	--	--
81-09-04	--	--	--	--	--	--	--	--	--	--
81-09-01	--	--	--	--	--	--	--	--	--	--
81-09-01	--	--	--	--	--	--	--	--	--	--
81-09-03	--	--	--	--	--	--	--	--	--	--
WATONWAN										
81-07-09	.06	410	3900	220	--	--	--	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

STATION NUMBER	DATE OF SAMPLE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)
COTTONWOOD											
435312095055501	81-07-09	1300	1	--	1	10	2	2200	10	310	<.1
FARIBAULT											
433212093434601	81-07-08	1500	6	--	1	120	1	1500	9	120	<.1
MOWER											
434500093003501	81-07-10	1300	3	--	1	10	8	1300	11	70	<.1
STEELE											
435722093150201	81-07-31	1000	2	200	1	<10	4	1200	2	30	<.1
WATONWAN											
440133094312501	81-07-09	1500	1	--	1	50	2	3900	10	230	<.1

DATE OF SAMPLE	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	CYANIDE TOTAL (MG/L AS CN) (00720)
COTTONWOOD				
81-07-09	0	0	110	<.01
FARIBAULT				
81-07-08	0	0	10	<.01
MOWER				
81-07-10	0	0	20	<.01
STEELE				
81-07-31	<1	<1	30	<.01
WATONWAN				
81-07-09	0	0	60	<.01

STATION NUMBER	DATE OF SAMPLE	TIME	ATRA-ZINE, TOTAL (UG/L) (39630)	PROME-TONE TOTAL (UG/L) (39056)	PROME-TRYNE TOTAL (UG/L) (39057)	PRO-PAZINE TOTAL (UG/L) (39024)	2,4-D, TOTAL (UG/L) (39730)	2,4,5-T TOTAL (UG/L) (39740)	SILVEX, TOTAL (UG/L) (39760)	SIMA-ZINE TOTAL (UG/L) (39055)	SIME-TRYNE TOTAL (UG/L) (39054)
POPE											
452726095444601	80-10-14	1500	.00	.0	.0	.00	.00	.00	.00	.00	.0

INDEX

Page

Accuracy of field data and computed results... 19
Acknowledgment..... 2
Acre-foot, definition of..... 10
Adenosine triphosphate, definition of..... 10
Afton, St. Croix River at..... 230-236
Aitkin, Mississippi River at..... 56,351
Akeley, Williams Lake near..... 32-46
Alden, Foster Creek near..... 327
Aldrich, Leaf River near..... 322
Algae, definition of..... 10
Algal growth, definition of..... 10
Altura, South Fork Whitewater River near..... 330
Analyses of water-quality samples collected
at miscellaneous sites..... 340-350
Anoka, Mississippi River at..... 91-92
Mississippi River near..... 96-98,353
Appleton, Pomme de Terre River at..... 121,354
Aquifer, definition of..... 10
Arendahl, Big Springs Creek near..... 330
Pine Creek near..... 330
Artesian, definition of..... 10
Artificial substrate, definition of..... 14
Ash mass, definition of..... 10
Austin, Cedar River near.....310-312,359

Bacteria, definition of..... 10
Balatan, Cottonwood River tributary near..... 326
Bassett Creek basin, measurements at
miscellaneous sites in..... 333
Bassett Creek in Golden Valley..... 106
Bear Creek at Rochester..... 262-267
South Fork, near Grand Meadow..... 330
Beaver Creek at Beaver Falls..... 326
tributary above Slayton..... 331
tributary No. 2 near Slayton..... 331
West Fork, near Olivia..... 326
Beaver, Whitewater River near.....293-294,358
Beaver Falls, Beaver Creek at..... 326
Becida, Hennepin Creek near..... 322
Bed material, definition of..... 10
Bemidji, Mississippi River at..... 322
Big Lake, Elk River near.....84-86,352
Big Mink Creek tributary near Lastrup..... 323
Big Sioux river basin, high-flow partial-
record stations in..... 331-332
Big Springs Creek near Arendahl..... 330
Big Stone City, SD, Whetstone River near....115-117,353
Big Stone Lake at Ortonville..... 118
Biochemical oxygen demand, definition of..... 10
Biomass, definition of..... 10
Blue Earth, East Branch Blue Earth River
tributary near..... 327
Blue Earth River, East Branch, near Bricelyn.. 327
East Branch, tributary near Blue Earth..... 327
East Branch, near Walters..... 327
Blue Earth River near Rapidan..... 140,356
Blue-green algae, definition of..... 13
Bluff Creek near Jacobson..... 322
Bottom material, definition of..... 11
Brainerd, Gull Lake near..... 61
Gull River at Gull Lake Dam near..... 62
Bricelyn, East branch Blue Earth River near... 327
Brownton, Buffalo Creek tributary near..... 324
Buffalo Creek tributary near Brownton..... 324
Burnsville, Minnesota River at..... 158-164

Calumet, Swan River (tributary to Mississippi
River), near..... 52,351
Canby, Canby Creek near..... 122-123
Lazarus Creek tributary near..... 325
Canby Creek near Canby..... 122-123
Cannon River at Northfield..... 329
at Welch..... 329
tributary near Welch..... 329
Cannon River basin, gaging stations in..... 255
high-flow partial-record stations in..... 328-329
Cascade Creek at Rochester..... 274-278
Cat River near Nimrod..... 322
Cedar River near Austin.....310-312,359
Cells/volume, definition of..... 11
Cfs/day, definition of..... 11
Champlin, Elm Creek near..... 95,353
Chanarambie Creek near Edgerton..... 331
Chatfield, Mill Creek near..... 330

Page

Chemical oxygen demand, definition of..... 11
Chippewa-Pomme de Terre watersheds,
discharge measurements in..... 336-339
Chippewa River near Milan.....126-128,354
Chlorophyll, definition of..... 11
Clearwater, Mississippi River at..... 324
Cloverdale, Kettle River near..... 216
Cobb River tributary near Mapleton..... 327
Collection and computations of data,
surface-water records..... 17
Collection and examination of data,
water-quality records..... 19
Collection of the data, ground-water-level
records..... 20
Color unit, definition of..... 11
Concord, Milliken Creek near..... 329
Contents, definition of..... 11
Control, definition of..... 11
Cooperation..... 1
Cottage Grove, Mississippi River at Grey
Cloud Island near..... 194-201
Cottonwood River near New Ulm..... 136,356
near Springfield..... 326
tributary near Balatan..... 326
tributary No. 2 near Sanborn..... 326
Courtland, Little Cottonwood River near..... 137,356
Crooked Creek at Freeburg..... 331
Cross Lake, Pine River at Cross Lake Dam, at.. 58
Pine River Reservoir at..... 57
Crow River at Rockford.....88-90,353
Middle Fork near Spicer..... 87,352
North Fork, at Paynesville..... 324
tributary near Paynesville..... 324
South Fork, near Mayer..... 325
Crow River basin, gaging station records in... 87-90
high-flow partial-record stations in..... 324-325
Crow Wing River at Nimrod..... 59,351
near Pillager..... 63,352
Crow Wing River basin, gaging station records
in..... 59-63
high-flow partial-record stations in..... 322-323
Cubic feet per second per square mile,
definition of..... 11
Cubic foot per second, definition of..... 11

Data, accuracy of..... 19
ground-water level records, collection of... 20
other available..... 19
surface-water, collection and
computation of..... 17
water-quality records, collection and
examination of..... 19
Day, Stanchfield Creek tributary near..... 325
Deer River, Mississippi River at
Winnibigoshish Dam near..... 31
Winnibigoshish Lake near..... 30
Definition of terms..... 3
Delft, Watonwan River near..... 327
Des Moines River at Jackson.....313-315,359
tributary near Jackson..... 331
tributary No. 2 near Lakefield..... 331
Des Moines River basin, gaging station
records in..... 313-315
high-flow partial-record stations in..... 331
Dexter, Rose Creek tributary near..... 331
Diatoms, definition of..... 13
Discharge at partial-record stations and
miscellaneous sites..... 316-339
High-flow partial-record stations..... 322-332
Low-flow partial-record stations..... 316-318
Low-flow sites in the Chippewa-Pomme de
Terre watershed..... 336-339
Miscellaneous sites..... 333-335
Discharge, definition of..... 11
Discontinued gaging stations..... 27-29
Dissolved, definition of..... 11
Diversity index, definition of..... 11
Downstream order and station number,
definition of..... 16
Drainage area, definition of..... 11
Drainage basin, definition of..... 11
Dry Creek near Jeffers..... 326
Dry mass, definition of..... 10

Page
Dunnel, Fourmile Creek near..... 331
Duschee Creek near Lanesboro..... 330

East Branch Blue Earth River tributary
near blue Earth..... 327
Eden Prairie, Purgatory Creek at..... 357
Edgerton, Chanarambie Creek near..... 331
Elba, North Fork Whitewater River near.....288-291,358
Elk River basin, gaging station records in.... 77-86
high-flow partial-record stations in..... 324
Elk River near Big Lake.....84-86,352
Elm Creek near Champlin..... 95,353
Empire, Vermillion River near.....247-254,358
Explanation of ground-water level records..... 20
of stage and water-discharge records..... 17
of water-quality records..... 19

Factors for converting Inch-Pound Units
to International System (SI)
Units.....Inside back cover
Faribault, Straight River near..... 255,358
Fecal coliform bacteria, definition of..... 10
Fecal streptacoccal bacteria, definition of... 10
Federal Dam, Leech Lake at..... 47
Leech Lake River at..... 48
Foley, Stony Brook tributary near..... 324
Fort Ripley, Mississippi River near..... 323
Foster Creek near Alden..... 327
Fountain Creek near Montrose..... 324
Fourmile Creek near Dunnell..... 331
Freeburg, Crooked Creek at..... 331
Fridley, Mississippi River at..... 99-105

Gage height, definition of..... 11
Gaging station, definition of..... 11
Gaging stations, discontinued..... 27-29
records..... 30-315
Garden City, Watonwan River near.....138-139,356
Garrison, Mille Lacs Lake at..... 93
Garvin Brook basin, gaging-station records
in..... 295
Gaylord, Rush River, Middle Branch near..... 327
Glaisby Brook near Kettle River..... 328
Golden Valley, Bassett Creek in..... 106
Goodhue, Trout Brook tributary near..... 329
Grand Meadow, South Fork Bear Creek near..... 330
Grand Rapids, Mississippi River at..... 50,351
Pokegama Lake near..... 49
Granite Falls, Yellow Medicine River near...131-133,355
Green algae, definition of..... 13
Gribben Creek near Whalan..... 330
Ground water, chemical analyses of..... 472-482
Ground-water-level records, by county..... 364-471
Ground-water levels, collection of data..... 20
in hydrologic conditions..... 3
Gull Lake near Brainerd..... 61
Gull River at Gull Lake Dam, near Brainerd.... 62

Hardness of water, definition of..... 12
Hardwick, Mound Creek near..... 331
Mound Creek tributary at..... 332
Hastings, Mississippi River at Lock and
Dam 2..... 207-214
Hawk Creek near Maynard..... 326
Henderson, High Island Creek near..... 146,356
Hennepin Creek near Becida..... 322
High-flow partial-record stations..... 322-332
High Island Creek near Henderson..... 146,356
Hill City, Smith Creek near..... 322
Hillman Creek near Pierz..... 323
Hinckley, Mission Creek near..... 328
Houston, Root River near.....304-306,359
South Fork Root River near.....307-309,359
Hydrologic bench-mark station, definition of.. 16
Hydrologic conditions..... 2
graphs of..... 4-9
ground-water levels in..... 3
precipitation and streamflow in..... 2
water quality in..... 2
Hydrologic unit, definition of..... 12

Introduction..... 1
Instantaneous discharge, definition of..... 11
Iowa River basin, gaging station records in... 310-312
high-flow partial-record stations in..... 331
Ivanhoe, North Branch Yellow Medicine
River near..... 325

Jackson, Des Moines River at.....313-315,359
tributary near..... 331
Jacobson, Bluff Creek near..... 322

Page
Jeffers, Dry Creek near..... 326
Johnson Creek near St. Augusta..... 323
tributary at Luxemburg..... 323
tributary No. 2 near St. Augusta..... 323
Jordan, Minnesota River near.....147-157,357
Sand Creek tributary No. 2 near..... 328

Kanaranzi Creek tributary near Lismore..... 332
tributary No. 2 near Wilmont..... 332
Kellogg, Zumbro River at.....284-287,358
Kenyon, Little Cannon River tributary near.... 329
Kettle River. Glaisby Brook near..... 328
Kettle River below Sandstone..... 215,357
near Cloverdale..... 216
tributary at Sandstone..... 328
Knife River near Mora..... 217,357

Lac qui Parle, Lac qui Parle River near..... 124,354
Minnesota River near..... 125,354
Lac qui Parle River near Lac qui Parle..... 124,354
Lakes and Reservoirs:
Big Stone Lake at Ortonville..... 118
Gull Lake near Brainerd..... 61
Leech Lake at Federal Dam..... 47
Mille Lacs Lake at Garrison..... 93
Pokegama Lake near Grand Rapids..... 49
Pine River Reservoir at Cross Lake..... 57
Sandy Lake at Libby..... 53
Williams Lake near Akeley..... 32-46
Winnibigoshish Lake near Deer River..... 30
Lakefield, Des Moines River tributary No. 2
near..... 331
Lanesboro, Duschee Creek near..... 330
Root River near..... 303,359
South Branch Root River at..... 330
Lastrup, Big Mink Creek tributary near..... 323
Lazarus Creek tributary near Canby..... 325
Leaf River near Aldrich..... 322
Leech Lake at Federal Dam..... 47
Leech Lake River at Federal Dam..... 48
Le Sueur River near Rapidan..... 141,356
tributary near Mankato..... 327
Lester Prairie, Otter Creek near..... 324
Otter Creek tributary near..... 324
Libby, Mississippi River below Sandy River
near..... 55,351
Sandy Lake at..... 53
Sandy River at Sandy Lake Dam at..... 54
Lindstrom, Sunrise River near..... 220,357
Lismore, Kanaranzi Creek tributary near..... 332
List of counties for which water-level
records are published..... VII-XII
List of gaging stations, in downstream order,
for which records are published..... VI-VII
Little Cannon River tributary near Kenyon..... 329
Little Chippewa River near Starbuck..... 325
Little Cottonwood River near Courtland..... 137,356
Little Minnesota River near Peever, SD..... 114,353
Little Sioux River near Spafford..... 332
Long Creek near Potsdam..... 329
Long Prairie, Long Prairie River at..... 60,352
Long Prairie River at Long Prairie..... 60,352
Low-flow investigations in Chippewa-Pomme
de Terre watersheds..... 336-339
Low-flow partial-record stations..... 316-318
Luverne, Rock River at..... 332
Luxemburg, Johnson Creek tributary at..... 323

Mankato, Le Sueur River tributary near..... 327
Minnesota River at.....142-145,356
Map of Minnesota ground-water observation
wells..... 362-363
high-flow partial-record stations..... 320-321
water-discharge stations..... 22-23
water-quality stations..... 24-25
Maple River near Rapidan..... 327
tributary near Mapleton..... 327
Mapleton, Cobb River tributary near..... 327
Maple River tributary near..... 327
Marshall, Prairie Ravine near..... 326
Redwood River near..... 134,355
Mayer, South Fork Crow River near..... 325
Maynard, Hawk Creek near..... 326
Mean concentration, definition of..... 14
Mean discharge, definition of..... 11
Methylene blue active substance,
definition of..... 12
Metamorphic stage, definition of..... 12
Micrograms per gram, definition of..... 12
Micrograms per liter, definition of..... 12

Page
Middle Fork Crow River near Spicer..... 87,352
Milan, Chippewa River near.....126-128,354
Mill Creek near Chatfield..... 330
Mille Lacs Lake at Garrison..... 93
Milligrams per liter, definition of..... 12
Milligrams of carbon per area or volume per unit time for periphyton and macrophytes and mg for phytoplankton..... 13
Milligrams of oxygen per area or volume per unit time for periphyton and macrophytes and mg for phytoplankton..... 13
Milliken Creek near Concord..... 329
Minneota, South Branch Yellow Medicine River at..... 130,355
Minnesota River at Burnsville..... 158-164
at Mankato.....142-145,356
at Montevideo..... 129,355
at Ortonville..... 119,354
at Fort Snelling State Park, at St. Paul.... 165-172
near Lac qui Parle..... 175,354
near Jordan.....147-157,357
Minnesota River basin, gaging station records in..... 114-172
high-flow partial-record stations in..... 325-328
low-flow partial-record stations in..... 316-318
measurements at miscellaneous sites in..... 334-335
Miscellaneous analysis of streams in Minnesota, water-quality data at streamflow stations..... 351-359
Miscellaneous sites, dicharge measurements at..... 333-335
Mission Creek near Hinckley..... 328
Mississippi River at Aitkin..... 56,351
at Anoka..... 91-92
at Bemidji..... 322
at Clearwater..... 324
at Fifth Street at Newport..... 187-193
at Ford Plant at St. Paul..... 107-113
at Fridley..... 99-105
at Grand Rapids..... 50,351
at Grey Cloud Island near Cottage Grove..... 194-201
at Highway 494 Bridge, at Newport..... 184-186
at Industrial Molasses, at St. Paul..... 177-183
at lock and dam 2, at Hastings..... 207-214
at lock and dam 3, near Red Wing..... 239-246
at Ninninger..... 202-206
at Prescott, WI..... 238,357
at St. Paul.....173-176,357
at Winona.....296-302,359
at Winnibigoshish Dam, near Deer River..... 31
below Sandy River near Libby..... 55,351
near Anoka.....96-98,353
near Fort Ripley..... 323
near Royalton.....64-75,352
Montevideo, Minnesota River at..... 129,355
Spring Creek near..... 325
Montgomery, Rice Lake tributary near..... 328
Sand Creek tributary near..... 328
Montrose, Fountain Creek near..... 324
Moose Lake, Moose River tributary at..... 328
Moose River tributary at Moose Lake..... 328
Mora, Knife River near..... 215,357
Mound Creek near Hardwick..... 331
tributary at Hardwick..... 332

National Geodetic Vertical Datum of 1929 (NGVD), definition of..... 12
National stream-quality accounting network (NASQAN), definition of..... 17
Natural substrate, definition of..... 14
Newport, Mississippi River at Fifth Street at..... 187-193
Mississippi River at 494 Bridge at..... 184-186
New Prague, Ravine Stream tributary near..... 328
Sand Creek near..... 328
New Ulm, Cottonwood River near..... 136,356
Nimrod, Cat River near..... 322
Crow Wing river at..... 59,351
Ninninger, Mississippi River at..... 202-206
Northfield, Cannon River at..... 329
Numbering system for wells and miscellaneous sites..... 16

Odessa, Yellow Bank River near..... 120,354
Olivia, West Fork Beaver Creek near..... 326
Onamia, Robinson Brook near..... 325
Rum River tributary near..... 325
Organic mass, definition of..... 10
Organism, definition of..... 12
count/area, definition of..... 12
count/volume, definition of..... 12

Page
Ormsby, Watonwan River South Fork near..... 327
Orrock, St. Francis River near..... 324
Ortonville, Big Stone Lake at..... 118
Minnesota River at..... 119,354
Other data available..... 19
Otsego Creek near Otsego..... 324
Otsego, Otsego Creek near..... 324
Otter Creek near Lester Prairie..... 324
tributary near Lester Prairie..... 324
Outlet Creek tributary near Starbuck..... 325

Palisade, Willow River below..... 322
Parameter code numbers..... 12
Partial-record station, definition of..... 12
Particle size, definition of..... 12
Particle-size classification, definition of... 12
Paynesville, North Fork Crow River at..... 324
North Fork Crow River tributary near..... 324
Peaks of record occurring during water year 1981 at high-flow partial-record sites.. 3
Peever, SD, Little Minnesota River near..... 114,353
Percent composition, definition of..... 13
Periphyton, definition of..... 13
Pesticides, definition of..... 13
Pesticide program, definition of..... 17
Phytoplankton, definition of..... 13
Picocurie, definition of..... 13
Pierz, Hillman Creek near..... 323
Pillager, Crow Wing River near..... 63,352
Sevenmile Creek near..... 323
Pine City, Snake River near.....218-219,357
Pine Creek near Arendahl..... 330
Pine River at Cross Lake Dam, at Cross Lake... 58
Pine River Reservoir at Cross Lake..... 57
Plankton, definition of..... 13
Platte River above Royalton..... 323
Platte River basin, high-flow partial-record stations in..... 323
Pokegama Lake near Grand Rapids..... 49
Polychlorinated biphenyls, definition of..... 13
Pomme de Terre River at Appleton..... 121,354
Potsdam, Long Creek near..... 329
Prairie Ravine near Marshall..... 326
Prairie River near Taconite..... 51,351
Pratt, Turtle Creek tributary No. 2 near..... 328
Prescott, WI, Mississippi River at..... 238,357
St. Croix River at..... 237
Primary productivity, definition of..... 13
Publications on techniques of water-resources investigations..... 26
Purgatory Creek at Eden Prairie..... 357

Radiochemical program, definition of..... 17
Rapidan, Blue Earth River near..... 140,356
Le Sueur River near..... 141,356
Maple River near..... 327
Raven Stream tributary near New Prague..... 328
Records of discharge collected by agencies other than the Geological Survey..... 19
Recoverable from bottom material, definition of..... 13
Red Wing, Mississippi River at lock and dam 3 near..... 239-246
Redwood Falls, Redwood River near..... 135,355
Redwood River near Marshall..... 134,355
at Ruthton..... 326
Redwood River near Redwood Falls..... 135,353
Reservoirs (see lakes and reservoirs)
Rice Lake tributary near Montgomery..... 328
Robinson Brook near Onamia..... 325
Rochester, Bear Creek at..... 262-267
Cascade Creek at..... 274-278
Silver Creek at..... 268-273
South Fork Zumbro River at.....279-282,358
South Fork Zumbro River near..... 283
South Fork Zumbro River on Belt Line at..... 256-261
Rock River at Luverne..... 332
Rockford, Crow River at.....88-90,353
Rollingstone, Straight Valley Creek near..... 295,359
Root River near Houston.....304-306,359
near Lanesboro..... 303,359
North Branch, tributary near Stewartville... 330
South Branch, at Lanesboro..... 330
South Fork, near Houston.....307-309,359
tributary near Whalan..... 330
Root River basin, gaging-station records in... 303-309
high-flow partial-record stations in..... 330
Rose Creek tributary near Dexter..... 331
Royalton, Mississippi River near.....64-75,352
Platte River above..... 323

Page
Rum River near St. Francis..... 94,353
tributary near Onamia..... 325
Rum River basin, gaging-station records in.... 93-94
high-flow partial-record stations in..... 325
miscellaneous sites in..... 333
Runoff in inches, definition of..... 13
Rush Creek near Rushford..... 330
Rushford, Rush Creek near..... 330
Rush River, Middle Branch near Gaylord..... 327
Ruthton, Redwood River at..... 326

St. Augusta, Johnson Creek near..... 323
Johnson Creek tributary No. 2 near..... 323
St. Cloud, Sauk River near..... 76,352
St. Croix Falls, WI, St. Croix River at..... 221-228
St. Croix River at Afton..... 230-236
at Prescott, WI..... 237
at St. Croix Falls, WI..... 221-228
at Stillwater..... 229
St. Croix River basin, gaging-station records in..... 215-237
high-flow partial-record stations in..... 328
miscellaneous sites in..... 335
St. Francis River above Zimmerman..... 81-83
at Santiago..... 77-80
near Orrock..... 324
St. Francis, Rum River near..... 94,353
St. Martin, Sauk River tributary No. 2 near... 323
St. Michael, School Lake Creek tributary near..... 325
St. Paul, Minnesota River at Fort Snelling State Park at..... 165-172
Mississippi River at.....173-176,357
Mississippi River at Ford Plant at..... 107-113
Mississippi River at Industrial Molasses at..... 177-183
Sanborn, Cottonwood tributary No. 2 near..... 326
Sand Creek near New Prague..... 328
tributary near Montgomery..... 328
tributary No. 2 near Jordan..... 328
Sandstone, Kettle River below..... 215,357
Sandstone, Kettle River tributary at..... 328
Wolf Creek tributary near..... 328
Sandy Lake at Libby..... 53
Sandy River at Sandy Lake Dam, at Libby..... 54
Santiago, St. Francis River near..... 77-80
Sauk River near St. Cloud..... 76,352
tributary at Spring Hill..... 323
tributary No. 2 near St. Martin..... 323
Sauk River basin, gaging-station records in... 76
high-flow partial-record stations in..... 323
School Lake Creek tributary near St. Michael.. 325
Sediment, definition of..... 14
Sevenmile Creek near Pillager..... 323
Silver Creek at Rochester..... 268-273
Slayton, Beaver Creek tributary above..... 331
Beaver Creek tributary No. 2 near..... 331
Sleepy Eye, Spring Creek near..... 326
Spring Creek tributary near..... 326
Smith Creek near Hill City..... 322
Snake River near Pine City.....218-219,357
Solute, definition of..... 14
South Fork Bear Creek near Grand Meadow..... 330
South Fork Crow River near Mayer..... 325
South Troy, Zumbro River tributary near..... 329
Spafford, Little Sioux River near..... 332
Special networks and programs..... 16
Specific conductance, definition of..... 14
Specific conductance and temperature at streamflow stations..... 351-359
Spicer, Middle Fork Crow River near..... 87,352
Spring Creek near Montevideo..... 325
near Sleepy Eye..... 326
tributary near Sleepy Eye..... 326
near Wanamingo..... 329
Springfield, Cottonwood River near..... 326
Springhill, Sauk River tributary at..... 323
Stage-discharge relation, definition of..... 14
Stanchfield Creek tributary near Day..... 325
Starbuck, Little Chippewa River near..... 325
Outlet Creek tributary near..... 325
Steele Center, Turtle Creek tributary near.... 329
Stewartville, North Branch Root River tributary near..... 330
Stillwater, St. Croix River at..... 229
Stony Brook tributary near Foley..... 324
Straight River near Faribault..... 255,358
Straight Valley Creek near Rollingstone..... 295,359
Streamflow, definition of..... 14
Substrate, definition of..... 14
Sunrise River near Lindstrom..... 220,357

Page
Surface area, definition of..... 14
Surface-water data, accuracy of..... 19
collection and computation of..... 17
Surface-water data, other available..... 19
Surficial bed material, definition of..... 14
Suspended, definition of..... 14
Suspended recoverable, definition of..... 15
Suspended sediment, definition of..... 14
Suspended-sediment concentration, definition of..... 14
Suspended-sediment discharge, definition of... 14
Suspended-sediment load, definition of..... 14
Suspended total, definition of..... 15
Swan River near Calumet..... 52,351
tributary at Warba..... 322

Taconite, Prairie River near..... 51,351
Taxonomy, definition of..... 15
Time-weighted average, definition of..... 15
Tons per acre-foot, definition of..... 15
Tons per day, definition of..... 15
Total, definition of..... 15
Total bottom material, definition of..... 15
Total coliform bacteria, definition of..... 10
Total load, definition of..... 15
Total organism count, definition of..... 12
Total recoverable, definition of..... 15
Total sediment discharge, definition of..... 14
Tritium network, definition of..... 17
Trout Brook tributary near Goodhue..... 329
Turtle Creek tributary near Steele Center..... 329
tributary No. 2 near Pratt..... 328

Vermillion River near Empire.....247-254,358
Vermillion River basin, gaging-station records in..... 247-254

Walters, Blue Earth River East Branch near.... 327
Wanamingo, Spring Creek near..... 329
Warba, Swan River tributary at..... 322
Warren Lake tributary near Windom..... 331
Water-quality records, analyses of samples collected at ground-water wells..... 472-482
at miscellaneous sites..... 340-350
at miscellaneous streamflow stations..... 351-359
sediment..... 20
water analysis..... 20
water temperature..... 20
Watonwan River, near Delft..... 327
near Garden City.....138-139,356
South Fork near Ormsby..... 327
Weighted average, definition of..... 16
Welch, Cannon River at..... 329
Cannon River tributary near..... 329
Wet mass, definition of..... 10
Whalan, Gribben Creek near..... 330
Root River tributary near..... 330
Whetstone River near Big Stone City, SD.....115-117,353
Whitewater River near Beaver.....293-294,358
North Fork, near Elba.....288-291,358
South Fork, near Altura..... 330
Whitewater River basin, gaging station records in..... 288-294
high-flow partial-record stations in..... 330
Williams Lake near Akeley..... 32-46
Willow River below Palisade..... 322
Wilmont, Kanaranzi Creek tributary No. 2 near. 332
Wilno, North Branch Yellow Medicine River tributary near..... 326
Windom, Warren Lake tributary near..... 331
Winnibigoshish Lake near Deer River..... 30
Winona, Mississippi River at.....296-302,359
Wolf Creek tributary near Sandstone..... 328
WRD, definition of..... 16
WSP, definition of..... 16

Yellow Bank River near Odessa..... 120,354
Yellow Medicine River near Granite Falls...131-133,355
North Branch, near Ivanhoe..... 325
tributary near Wilno..... 326
South Branch, at Minneota..... 130,355

Zimmerman, St. Francis River above..... 81-83
Zooplankton, definition of..... 13
Zumbro River at Kellogg.....284-287,358
South Fork, on Belt Line at Rochester..... 256-261
South Fork, at Rochester.....279-282,358
South Fork, near Rochester..... 283
tributary near South Troy..... 329
Zumbro River basin, gaging-station records in..... 256-287
high-flow partial-record stations in..... 329

October 1, 1978

FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI). This report contains both the inch-pound and SI unit equivalents in the station manuscript descriptions.

Multiply inch-pound units	By	To obtain SI units
	Length	
inches (in)	2.54×10^{1}	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^{0}	kilometers (km)
	Area	
acres	4.047×10^{3}	square meters (m^2)
	4.047×10^{-1}	square hectometers (hm^2)
	4.047×10^{-3}	square kilometers (km^2)
square miles (mi^2)	2.590×10^{0}	square kilometers (km^2)
	Volume	
gallons (gal)	3.785×10^{0}	liters (L)
	3.785×10^{0}	cubic decimeters (dm^3)
	3.785×10^{-3}	cubic meters (m^3)
million gallons	3.785×10^{3}	cubic meters (m^3)
	3.785×10^{-3}	cubic hectometers (hm^3)
cubic feet (ft^3)	2.832×10^{1}	cubic decimeters (dm^3)
	2.832×10^{-2}	cubic meters (m^3)
cfs-days	2.447×10^{3}	cubic meters (m^3)
	2.447×10^{-3}	cubic hectometers (hm^3)
acre-feet (acre-ft)	1.233×10^{3}	cubic meters (m^3)
	1.233×10^{-3}	cubic hectometers (hm^3)
	1.233×10^{-6}	cubic kilometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	2.832×10^{1}	liters per second (L/s)
	2.832×10^{1}	cubic decimeters per second (dm^3/s)
	2.832×10^{-2}	cubic meters per second (m^3/s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (L/s)
	6.309×10^{-2}	cubic decimeters per second (dm^3/s)
	6.309×10^{-5}	cubic meters per second (m^3/s)
million gallons per day	4.381×10^{1}	cubic decimeters per second (dm^3/s)
	4.381×10^{-2}	cubic meters per second (m^3/s)
	Mass	
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF THE INTERIOR
INT 413

U.S. MAIL

U.S. DEPARTMENT OF THE INTERIOR
Geological Survey
702 Post Office Building
St. Paul, MN 55101

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

SPECIAL 4TH CLASS BOOK RATE