Water Resources Data Minnesota Water Year 1995

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT MN-95-1
Prepared in cooperation with the Minnesota Department of Natural Resources, Division of Waters; the Minnesota Department of Transportation; and with other State, municipal, and Federal agencies

CALENDAR FOR WATER YEAR 1995

1994

OCTOBER

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1995

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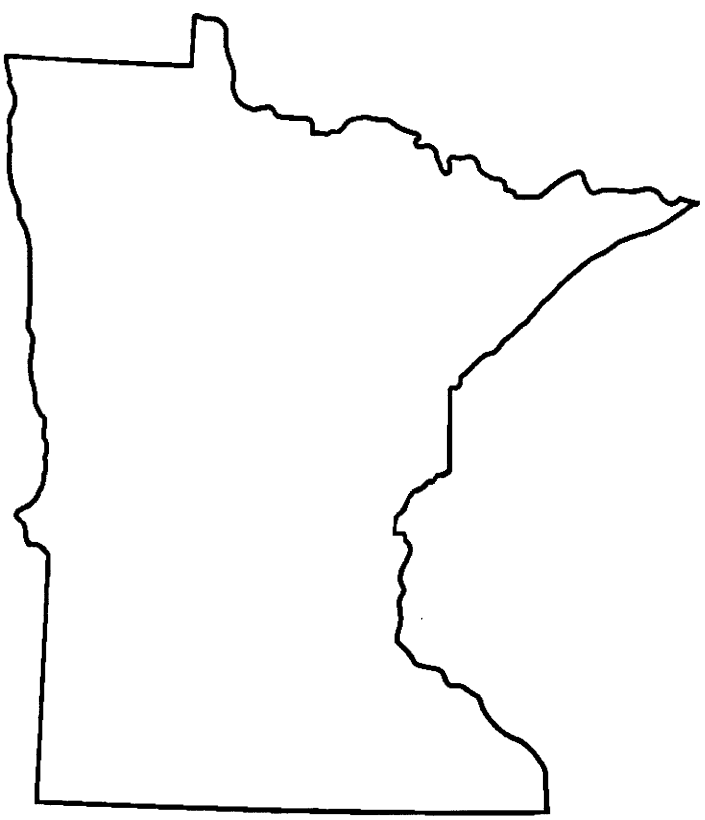
Water Resources Data Minnesota Water Year 1995

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



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT MN-95-1
Prepared in cooperation with the Minnesota Department of Natural Resources, Division of Waters; the Minnesota Department of Transportation; and with other State, municipal, and Federal agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

BRUCE BABBITT, Secretary

U. S. GEOLOGICAL SURVEY

Gordon Eaton, Director

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

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1996

PREFACE

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

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

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13. ABSTRACT *(Maximum 200 words)*

Water resources data for the 1995 water year for Minnesota consists of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels and water quality in wells and springs. This volume contains discharge records for 96 stream-gaging stations; stage and contents for 12 lakes and reservoirs; water quality for 23 stream-gaging stations; and water levels for 15 observation wells. Also included are 83 high-flow partial-record stations. Additional water data were collected at various sites that are not part of the systematic data collection program, and are published as miscellaneous measurements. These data represent that psrt of the National Water Data System operated by the U.S. Geological Survey and cooperating State and Federal agencies in Minnesota.

14. SUBJECT TERMS
*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

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GAGING STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED

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

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

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

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

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

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

GROUND-WATER LEVELS

QUALITY OF GROUND WATER RECORDS

PRECIPITATION SITES, FOR WHICH CHEMICAL QUALITY RECORDS ARE PUBLISHED

WATER RESOURCES DATA - MINNESOTA, 1995

DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

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

[Letters after station name designate type of data collected: (d) discharge, (e) elevation (stage only); -, not available]

Station name	Station number	Drainage area (mi^2)	Period of record
STREAMS TRIBUTARY TO LAKE SUPERIOR			
Pigeon River above mouth of Arrow River, MN (d)	04010000	256	1924-27
Poplar River at Lutsen, MN (d)	04012500	114	1911 (e), 1912-17, 1928-47, 1952-61
Cross River at Schroeder, MN (d)	04013000	91	1931-32
Baptism River near Beaver Bay, MN (d)	04014500	140	1928-93
Beaver Creek (Beaver Bay Run) at Beaver Bay, MN (d)	04015000	126	1911-14, 1928-31
South Branch Partridge River near Babbitt, MN (d)	04015455	18.5	1977-80
Partridge River above Colby Lake, at Hoyt Lakes, MN (d)	04015475	106	1979-88
Second Creek near Aurora, MN (d)	04015500	29	1955-80
Partridge River near Aurora, MN (d)	04016000	161	1942-82
St. Louis River near Aurora, MN (d)	04016500	290	1942-87
Embarrass River at Embarrass, MN (d)	04017000	93.8	1942-64
Embarrass River near McKinley, MN (d)	04018000	171	1953-62
St. Louis River at Forbes, MN (d)	04018750	713	1965-90
East Two Rivers near Iron Junction, MN (d)	04018900	40.0	1966-79
West Two Rivers near Iron Junction, MN (d)	04019000	65.3	1953-62, 1965-79
West Swan River near Silica, MN (d)	04019300	16.3	1963-79
East Swan River near Toivola, MN (d)	04019500	112	1953-62, 1964-71
Swan River near Toivola, MN (d)	04020000	254	1952-61
Whiteface River below (at) Meadowlands, MN (d)	04021000	453	1909-17
Cloquet River at Independence, MN (d)	04023000	750	1909-17
Elim Creek near Holyoke, MN (d)	04024090	1.06	1976-78
Skunk Creek below Elim Creek near Holyoke, MN (d)	04024093	8.83	1976-78
RED RIVER OF THE NORTH BASIN			
Otter Tail River near Detroit Lakes, MN (d)	05030000	270	1937-71
Pelican River at Detroit Lakes, MN (d)	05033900	-	1968-71, 1974-75
Pelican River at Detroit Lake outlet near Detroit Lakes, MN (d)	05034100	-	1968-71, 1972-75
Long Lake outlet near Detroit Lakes, MN (d)	05035100	-	1968-71
West Branch County Ditch No. 14 near Detroit Lakes, MN (d)	05035200	-	1968-71
East Branch County Ditch No. 14 near Detroit Lakes, MN (d)	05035300	-	1968-71
St. Clair Lake outlet near Detroit Lakes, MN (d)	05035500	-	1968-75
Pelican River at Muskrat Lake outlet near Detroit Lakes, MN (d)	05035600	-	1968-75
Pelican River at Sallie Lake outlet near Detroit Lakes, MN (d)	05037100	-	1968-75
Pelican River at Lake Melissa outlet near Detroit Lakes, MN (d)	05039100	-	1968-75
Pelican River near Detroit Lakes, MN (d)	05040000	123	1942-53
Pelican River near Fergus Falls, MN (d)	05040500	482	1909-12, 1942-80

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

Station name	Station number	Drainage area (mi^2)	Period of record
RED RIVER OF THE NORTH BASIN - Continued			
Otter Tail River near Breckenridge, MN (d)	05046500	2,040	1931-32, 1939-46
Mustinka River (head of Bois de Sioux River) near Norcross, MN(d)	05047000	-	1940-47
Mustinka ditch above West Branch Mustinka River (Twelve Mile Creek) near Charlesville, MN (d)	05047500	-	1943-55
Mustinka Ditch ditch below West Branch Mustinka River (Twelve Mile Creek) near Charlesville, MN (d)	05048000	-	1943-55
West Branch Mustinka River (Twelve Mile Creek) below Mustinka ditch near Charlesville, MN (d)	05048500	-	1943-55
Mustinka River above (near) Wheaton, MN (d)	05049000	834	1915-24, 1930-58
Bois de Sioux River below Fairmont, ND (d)	05050500	1,540	1919-44
Rabbit River at Cambell, MN (d)	05051000	266	1942-52
Red River of the North below Fargo, ND (d)	05054020	-	1969-78
Whiskey Creek at Barnesville, MN (d)	05061200*	25.3	1964-66
Wild Rice River near Ada, MN (d)	05063000	1,100	1948-54
South Branch Wild Rice River near Borup, MN (d)	05063500	254	1944-49
Marsh River below Ada, MN (d)	05067000	-	1948-52
Sand Hill River at Beltrami, MN (d)	05068000	324	1943-58
Sand Hill ditch at Beltrami, MN (d)	05068500	-	1943-58
Thief River near Gatske, MN (d)	05075500	-	1953-56
Red Lake River at Thief River Falls, MN (d)	05076500	3,450	1909-18, 1920-30
Clearwater River near Pinewood, MN (d)	05077000	132	1940-45
Clearwater River near Leonard, MN (d)	05077500	153	1934-47
Ruffy Brook near Gonvick, MN (d)	05077700*	45.2	1960-78
Red River of the North at Oslo, MN (d)	05083500	331,200	1936-37, 1941-43, 1945-60, 1973-78
Snake River at Warren, MN (d)	05085500	175	1945, 1953-56
Snake River at Alvarado, MN (d)	05086000	220	1945, 1953-56
Middle River near Strandquist, MN (d)	05087000	-	1953-56
Tamarac River near Strandquist, MN (d)	05090500	-	1953-56
Tamarac River near Stephen, MN (d)	05091500	320	1945,
Two Rivers (Middle Fork Two Rivers) near Hallock, MN (d)	05092500	131	1931-38
South Branch (South Fork) Two Rivers near Pelan, MN (d)	05093000	281	1928-38, 1953-56
South Branch Two Rivers (Two Rivers) at Hallock, MN (d)	05094500	-	1940-47
Two Rivers (South Branch Two Rivers) at Hallock, MN (d)	05095000	-	1911-14, 1929-30, 1938-39, 1941-43
Two Rivers below Hallock, MN (d)	05095500	644	1945-55
North Branch (North Fork) Two Rivers near Lancaster, MN (d)	05096000	32	1929-38, 1941-55 1953-55
State Ditch 85 near Lancaster, MN (d)	05096500	95	1929-38, 1942-55
North Branch Two Rivers at Lancaster, MN (d)	05097000	209	1941-42, 1953-56

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

Station name	Station number	Drainage area (mi^2)	Period of record
RED RIVER OF THE NORTH BASIN - Continued			
North Branch Two Rivers near Northcote, MN (d)	05097500	386	1941-42, 1945-51
Two Rivers below North Branch near Hallock, MN (d)	05098000	1,060	1941-43
Roseau River (at) near Malung, MN (d)	05103000	252	1928-46
South Fork (West Branch) Roseau River near Malung, MN (d)	05104000	312	1911-14, 1928-46
Roseau River at Roseau, MN (d)	05105000	-	1940-47
Roseau River near Roseau, MN (d)	05105500	-	1930-60
Sprague Creek near Sprague, Manitoba (d)	05106000	176	1928-81
Pine Creek near Pine Creek, MN (d)	05107000	74.6	1928-53
Roseau River at Roseau Lake, MN (e)	05106500	-	1939-91
Roseau River near Badger, MN (d)	05108000	-	1928-69
Roseau River near Duxby, MN (d)	05108500	-	1929-51, 1952-56
Badger Creek near Badger, MN (d)	05109000	2.2	1929-30, 1931-38
Roseau River near Haug, MN (d)	05109500	-	1932-66
Roseau River at outlet of State Ditch 69 near Oak Point, MN (d)	05110000	-	1939-42
Roseau River at head of State Ditch 51 near Oak Point, MN (d)	05110500	-	1933-42
Roseau River at Oak Point, MN (d)	05111000	-	1933-39, 1941-60
Roseau River at international boundary, near Caribou, MN (d)	05112500	1,590	1933-69
LAKE OF THE WOODS BASIN			
Shagawa Lake tributary at Ely, MN (d)	05127219	1.84	1971-78
Burgo Creek near Ely, MN (d)	05127220	3.04	1967-78
Shagawa River near Ely, MN (d)	05127230	99	1967-78
Vermilion Lake near Soudan, MN (e)	05128200	-	1913-15 1941-42 1946-87
Pike River near Biwabik, MN (d)	05128340	-	1977-79
Pike River near Embarrass, MN (d)	05128500	115	1953-64 1976-79
Vermilion River below Vermilion Lake near Tower, MN (d)	05129000	483	1911-17, 1928-81
Gold Portage Outlet from Kabetogama Lake near Ray, MN (d)	05129290	-	1982-93
Rainy River at International Falls, MN (d)	05129500	14,900	1905-60
Sturgeon River (Lake) at Side Lake, MN (d)	05130000	-	1938-47
Dark River near Chisholm, MN (d)	05131000	50.6	1942-61, 1965-79
Deer Lake outlet (Deer Lake) near Effie, MN (d)	05131800	-	1937-39, 1940-46
Big Fork River at Big Falls, MN (d)	05132000	1,460	1909-10, 1928-79, 1982-93
Rapid River near Baudette, MN (d)	05134200	543	1956-85
Warroad River near Warroad, MN (d)	05139500	162	1946-80
Bulldog Run near Warroad, MN (d)	05140000	14.2	1946-51, 1966-77
East Branch Warroad River near Warroad, MN (d)	05140500	102	1946-54, 1966-77
Lake of the Woods at Warroad, MN (e)	05140520	27,200	1979-94

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

Station name	Station number	Drainage area (mi^2)	Period of record
	UPPER MISSISSIPPI RIVER BASIN		
Mississippi River near Deer River, MN (d)	05210000	3,190	1945-50
Prairie River near Taconite, MN (d)	05212700	360	1967-83
Prairie River near Grand Rapids, MN (d)	05213000	485	1909 (e), 1925-49
O'Brien Creek near Pengilly, MN (d)	05216800	-	1963-68
Initial tailings basin outflow near Keewatin, MN (d)	05216820	2.5	1982-85
Swan River near Calumet, MN (d)	05216850	114	1964-90
Swan River near Warba, MN (d)	05217000	254	1954-69
Mississippi River above Sandy River near Libby, MN (d)	05218000	4,560	1895-1915, 1925-29
Mississippi River below Sandy River near Libby, MN (d)	05220500	5,060	1930-90
Pelican Brook (Long Lake) near Pequot Lakes, MN (d)	05232000	-	1938-42, 1943-47
Rabbit River near Crosby, MN (d)	05241500	8.38	1945-63
Little Sand Lake outlet (Sand Lake outlet) near Dorset, MN (d)	05242700	74	1930-41
Straight River at County Highway 125 near Osage, MN (d)	05243721	-	1986-91
Straight River at County Highway 115 near Park Rapids, MN (d)	05243723	-	1986-89
Crow Wing River at Motley, MN (d)	05244500	2,140	1909 (e), 1913-17, 1930-31
Diversion from Long Prairie River near Osakis, MN (d)	05244980	-	1939-47
Long Prairie River near Osakis, MN (d)	05245000	-	1949-54
Long Prairie River near Motley, MN (d)	05245500	973	1909-17, 1930-31
Crow Wing River at Pillager, MN (d)	05246000	3,230	1903 (e), 1909-13, 1925-50
Platte (Platt) River at Royalton, MN (d)	05268000*	338	1929-36
Mississippi River near Sauk Rapids, MN (d)	05269000	12,400	1903-06
Mississippi River at Sartell, MN (d)	05270000	12,450	1929, 1943-47 (e)
Clearwater River at Clearwater, MN (d)	05273500	-	1937, 1940-42
St. Francis River at Santiago, MN (d)	05274700	-	1965-70, 1980-81
St. Francis River above Zimmerman, MN (d)	05274750	-	1980-84
St. Francis River near Big Lake, MN (d)	05274900	-	1965-70
Mississippi River at Elk River, MN (d)	05275500	14,500	1915-56
North Fork Crow River near Regal, MN (d)	05276000	215	1943-54
Middle Fork Crow River at New London, MN (e)	05277000	-	1939-42, 1943-47
Middle Fork Crow River (Calhoun Lake Diversion) near(e) Spicer, MN	05277500	-	1939, 1940-46
Middle Fork Crow River near Spicer, MN (d)	05278000	179	1949-87
South Fork Crow River at Cosmos, MN (d)	05278500	221	1945-64
Buffalo Creek near Glencoe, MN (d)	05278930*	374	1972-80
South Fork Crow River near Mayer, MN (d)	05279000	1,170	1934-79
South Fork Crow River near Rockford, MN (d)	05279500	1,250	1909-12
Mississippi River at Anoka, MN (d)	05283500	17,100	1897, 1905-13

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

Station name	Station number	Drainage area (mi^2)	Period of record
UPPER MISSISSIPPI RIVER BASIN -- Continued			
Rum River at Onamia, MN (d)	05284500	414	1910-12
Rum River at Spencer Brook MN (d)	05284750	-	1960-64
Rum River at Cambridge, MN (d)	05285000	1,160	1909-14
Rum River near Anoka, MN (d)	05286500	1,430	1905-06, 1909
Minnetonka Lake (head of Minnehaha Creek) near Wayzata (d) (at Excelsior), MN	05289000	-	1938-64
Minnehaha Creek at Minnetonka Mills, MN (d)	05289500	130	1953-64
MINNESOTA RIVER BASIN			
Big Stone Lake near Big Stone City, SD (e) (formerly Big Stone Lake at Ortonville, MN)	05291500	-	1937-93
Minnesota River near Odessa, MN (d)	05292500	1,340	1909-12, 1944-63
Pomme de Terre River near Morris, MN (d)	05293500	-	1937-39, 1940-47
Canby Creek at Canby, MN (d)	05299500	-	1938-39, 1940-46
Mississippi River near Lac Qui Parle, MN (d)	05301000	4,050	1942--94
Chippewa River at diversion dam near Hancock, MN (d)	05303000	-	1930-39, 1940-46
Chippewa River at Benson, MN (d)	05303500	1,270	1949-51
Shakopee Creek near Benson, MN (d)	05304000	352	1949-54
Chippewa River near Watson, MN (d)	05305000	2,050	1910-17, 1931-36
South Branch Yellow Medicine River at Minneota, MN (d)	05311400	111	1960-81, 1983-87
Spring Creek near Hazel Run, MN (d)	05312500	101	1945-48
Chetomba Creek near Maynard, MN (d)	05314000	200	1949-51
Hawk Creek near Maynard, MN (d)	05314500*	474	1949-54
Prairie Ravine near Marshall, MN (d)	05315200	5.63	1959-64
Redwood River near Green Valley, MN (d)	05315500	436	1945-57
Minnesota River at New Ulm, MN (d)	05316770	9,536	1968-76
Dry Creek near Jeffers, MN (d)	05316900	3.13	1982-85
Minnesota River at Judson, MN (d)	05317500	11,200	1938-50
East Branch (East Fork) Blue Earth River near Bricelyn, MN (d)	05318000	132	1951-70
South Fork Watonwan River at diversion dam near St. James, MN (d)	05319000	-	1939, 1940-46
Blue Earth River at Mankato, MN (d)	05321000	3,550	1938-39, 1940-42
Sand Creek at diversion dam near Jordan, MN (d)	05330400	-	1938-39, 1940-46
Purgatory Creek at Eden Prairie, MN (d)	05330800	-	1975-80
Nine Mile Creek at Bloomington, MN (d)	05330900	-	1963-73

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

Station name	Station number	Drainage area (mi^2)	Period of record
	ST. CROIX RIVER BASIN		
Glaisby Brook near Kettle River, MN (d)	05336200*	24.2	1959-70
Kettle River near Sandstone, MN (d)	05336500	825	1908-16
Grindstone River at Hinckley, MN (d)	05337000	-	1940-47
Snake River at Mora, MN (d)	05337500	422	1909-13
St. Croix River near Rush City, MN (d)	05339500	5,120	1923-61
Sunrise River near Stacy, MN (d)	05340000	167	1949-65
Sunrise River near Lindstrom, MN (d)	05340050	231	1965-85
	LOWER MISSISSIPPI RIVER BASIN		
Vermillion River at Hastings, MN (d)	05346000	195	1942-47,1990
South Fork Zumbro River near Rochester, MN (d)	05373000	304	1952-81
Zumbro River (South Branch) near Zumbro Falls, MN (d)	05373500	821	1911-17
Zumbro River at Zumbro Falls, MN (d)	05374000*	-	1909-17, 1929-80
Zumbro River at Theilman, MN (d)	05374500	1,320	1938-56
Zumbro River at Kellogg, MN (d)	05374900	1,400	1975-90
North Fork Whitewater River near Elba, MN (d)	05376000	101	1939-41, 1967-93
Middle Fork Whitewater River near St. Charles, MN (d)	05376100	-	1988-92
South Fork Whitewater River near Altura, MN (d)	05376500	76.8	1939-71
Whitewater River at Beaver, MN (d)	05377500	288	1936-38, 1939-56
Stockton Valley Creek at Stockton, MN (d)	05378230	-	1982-85
Garvin Brook near Minnesota City, MN (d)	05378235	-	1982-91
Straight Valley Creek near Rollingstone, MN (d)	05378300	5.16	1970-85
Gilmore Creek at Winona, MN (d)	05379000	8.95	1939-63
Mississippi River at LaCrosse, WI (d)	05383500	-	1929-55
North Branch Root River tributary near Stewartville, MN (d)	05383600	0.73	1959-64
Root River near Lanesboro, MN (d)	05384000*	615	1910,11-17, 1940-85, 1987-90
Rush Creek near Rushford, MN (d)	05384500*	129	1942-79
South Fork Root River near Houston, MN (d)	05385500*	275	1953-83
Root River below South Fork near Houston, MN (d)	05386000	1,560	1938-61
Turtle Creek near Austin, MN (d)	05456500	144	1947-51
Heron Lake outlet near Heron Lake, MN (d)	05475000	-	1930-43
	BIG SIOUX RIVER BASIN		
Rock River at Luverne, MN (d)	06483000*	440	1911-14
Little Sioux River near Lakefield, MN (d)	06603000	17.1	1948-63
Jackson County ditch No. 11 near Lakefield, MN (d)	06603500	7.69	1948-61

DISCONTINUED SURFACE-WATER-QUALITY STATIONS

[The following stations were discontinued as continuous-record or periodic-record stations prior to the 1995 water year. Daily or periodic records of chemical (C), biological (Bio), sediment (Sed), temperature (Temp), dissolved oxygen (D.O.), pH (pH), or specific conductance (S.C.) were collected and published for the record shown for each station.]

Station name	Station number	Drainage area (sq mi)	Type of record	Period of record (water years)
STREAMS TRIBUTARY TO LAKE SUPERIOR				
Baptism River near Beaver Bay, MN	04014500	140	C.,Bio.,Sed.,Temp,D.O.,p.H., S.C.	1968-93
Partridge River abv Colby Lake at Hoyt Lakes, MN	04015475	106	Temp, S.C.	1976-85
St. Louis River at Forbes, MN	04018750	713	Sed.	1968-70
St. Louis River at Scanlon, MN	04024000	3430	C.,Bio.,Sed.,Temp.,D.O.,pH.,S.C.	1958-66,68-94
Elim Creek near Holyoke, MN	04024090	1.06	Sed.	1976-79
Skunk Creek below Elim Creek near Holyoke, MN	04024093	8.83	C, Sed., Temp, D.O., pH, S.C.	1976-79
Deer Creek near Holyoke, MN	04024098	7.77	C, Bio., Temp, D.O., pH, S.C.	1977-79
			Sed.	1977-81
RED RIVER OF THE NORTH BASIN				
Buffalo River near Dilworth, MN	05062000	1040	Sed.	1971-81
Roseau River below Roseau, MN	05105300		C, Bio., Sed., Temp, D.O., pH, S.C.	1973-83
LAKE OF THE WOODS BASIN				
Little Fork River at Littlefork, MN	05131500	1730	C, Bio., Sed., Temp,. D.O., pH, S.C.	1967, 69, 71, 73-86
Big Fork River at Big Falls, MN	05132000	1460	C, Bio., Sed., Temp, D.O., pH, S.C.	1968, 71-77
Rainy River at Manitou Rapids, MN	05133500	19,400	C., Bio., Sed., Temp, D.O., pH, S.C.	1968-70,78-94
Elk River near Big Lake, MN	05275000	615	Sed., Temp	1976-81
Crow River at Rockford, MN	05280000	2520	Sed., Temp	1975-81
Mississippi River at Fridley, MN	05288550		Temp, D.O., pH, S.C.	1975-86
Mississippi River at Ford Plant at St. Paul, MN	05288950	19,700	Temp, D.O., pH, S.C.	1974-78, 81-82
MINNESOTA RIVER BASIN				
Whetstone River near Big Stone City, SD	05291000	389	Sed., Temp	1974-88
Yellow Bank River near Odessa, MN	05293000	398	Sed., Temp	1974-88
Chippewa River near Milan, MN	05304500	1870	Sed., Temp	1972-81
Yellow Medicine River near Granite Falls, MN	05313500	653	Sed., Temp	1971-75, 77-81
Redwood River near Marshall, MN	05315000	259	Sed., Temp	1968-71
Redwood River near Redwood Falls, MN	05316500	629	Sed., Temp	1968-70
Cottonwood River near New Ulm, MN	05317000	1280	Sed.	1968-76
Watonwan River near Garden City, MN	05319500	812	Sed.	1977-80
Minnesota River at Burnsville, MN	05330908		Temp, D.O., pH, S.C.	1980-83
Minnesota River at Fort Snelling State Park, St. Paul, MN	05330920	16,900	Temp, D.O., pH, S.C.	1973-83
LOWER MISSISSIPPI RIVER BASIN				
Mississippi River at Industrial Molasses, St. Paul, MN	05331005		Temp, D.O., pH, S.C.	1976-85
Mississippi River at Fifth Street at Newport, MN	05331545		Temp, D.O., pH, S.C.	1979-90
Mississippi River at Grey Cloud Island near Cottage Grove, MN	05331560		Temp, D.O., pH, S.C.	1977-90
Mississippi River at Lock and Dam 2 at Hastings, MN	05331578		Temp, D.O., pH, S.C.	1975-90
ST. CROIX RIVER BASIN				
Snake River near Pine City, MN	05338500	958	C.,Bio.,Temp.,D.O.,pH,S.C.	1963, 65, 67-68, 75-83, 85, 92-94.
St. Croix River at Afton, MN	05341770		Temp, D.O., pH, S.C.	1977-83

LOWER MISSISSIPPI RIVER BASIN

Vermillion River near Empire, MN	05345000	110	Temp, D.O., pH, S.C.	1974-90
Mississippi River at Lock and Dam 3 near Red Wing, MN	05344980	46,600	Temp, D.O., pH, S.C.	1976-83
South Fork Zumbro River at Rochester, MN	05372995	303	Sed., Temp	1981-82
Zumbro River at Kellogg, MN	05374900	1400	Sed., Temp	1975-81
North Fork Whitewater River near Elba, MN	05376000	101	C,Bio,Sed,Temp,D.O.,pH,S.C.	1967-93
Middle Fork Whitewater River near St. Charles, MN	05376100		Sed, Temp, S.C.	1988-92
Whitewater River near Beaver, MN	05376800	271	Sed., Temp	1975-81
Mississippi River at Winona, MN	05378500	59,200	C.Bio., D.O., pH	1963-66, 76-88
Root River near Houston, MN	05385000	1270	Sed., Temp	1975-81
South Fork Root River near Houston, MN	05385500	275	Sed., Temp	1975-81
Cedar River near Austin, MN	05457000	425	Sed.	1971, 73-75, 78-81
			Temp	1973-75, 79-81
			S.C.	1973-75
Des Moines River at Jackson, MN	05476000	1220	Sed., Temp	1968-81

INTRODUCTION

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

Water resources data for the 1995 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 96 stream-gaging stations; stage and contents for 12 lakes and reservoirs; water quality for 23 stream-gaging stations; and water levels for 15 observation wells. Also included are 83 high-flow partial-record stations. These data represent a part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Minnesota.

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

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

Publications similar to this report are published annually by the Geological Survey for all States. These official Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and volume number. For example, this volume is identified as the "U.S. Geological Survey Water-Data Report MN-95-1. For archiving and general distribution, the reports for 1971-1974 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161. Beginning with the 1990 water year, all water-data reports are also available on Compact Disc-Read Only Memory (CD-ROM). All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc.

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

COOPERATION

The U.S. Geological Survey and agencies of the State of Minnesota have had cooperative agreements for the systematic collection of streamflow records since 1909, for ground-water levels since 1948, and for water-quality records since 1952. Organizations that assisted in collecting data through cooperative agreement with the Survey are:

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

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

SUMMARY OF HYDROLOGIC CONDITIONS

Precipitation

Except in the north central and northeast, all of Minnesota received greater than normal (based on data from 1961-90; fig. 2) precipitation during the 1995 water year (fig. 1). Departures from normal ranged from -2.06 inches in the northeast to +6.50 inches in west-central Minnesota. Precipitation during the first two quarters of the 1995 water year was above normal except in the northeastern and southeastern areas of Minnesota. Snowfall during most of the winter was below normal for much of the State. Snow depth was far below normal by mid-January, ranging from 2 inches in southern Minnesota to over 12 inches in the northeast. However, in March, significant amounts of snow fell over much of Minnesota. By the end of the first week in March, most of Minnesota ranked above the median for depth of snow on the ground. By mid-March, mild temperatures had reduced most of the snow cover to near zero. In the third quarter, Minnesota had below-normal precipitation except for the north central, south central, southeast, and southwest. Departures from normal ranged from -4.67 inches in the northeast to +1.97 inches in the southwest. The fourth quarter began with above-normal precipitation over the entire State in July. Heavy rainfall occurred during July 3-4 in west-central Minnesota; more than 10 inches of rain fell on northern Chippewa and southern Swift counties. Heavy rains continued into August, especially in the south. By early September, many areas of southern Minnesota reported 125 to 150 percent of normal precipitation for the period April 1 - September 5, 1995.

Surface Water

Figure 3 shows mean-monthly and annual discharges for water year 1995 compared to normal (median of mean discharges for the period 1961-90) for 7 stations. The stations are located in 4 major basins - Lake Superior, Red River of the North, Lake of the Woods, and the upper Mississippi River. The 1995 mean-annual discharges were greater than the medians for 5 of the 7 stations.

Except for March, monthly-mean discharges in the Pigeon River at Middle Falls near Grand Portage were below normal in water year 1995. The mean discharge for 1995 was 283 ft^3/s, which is 53 percent of normal. Annual runnoff was 6.41 inches, a decrease of 4.37 inches from the previous year.

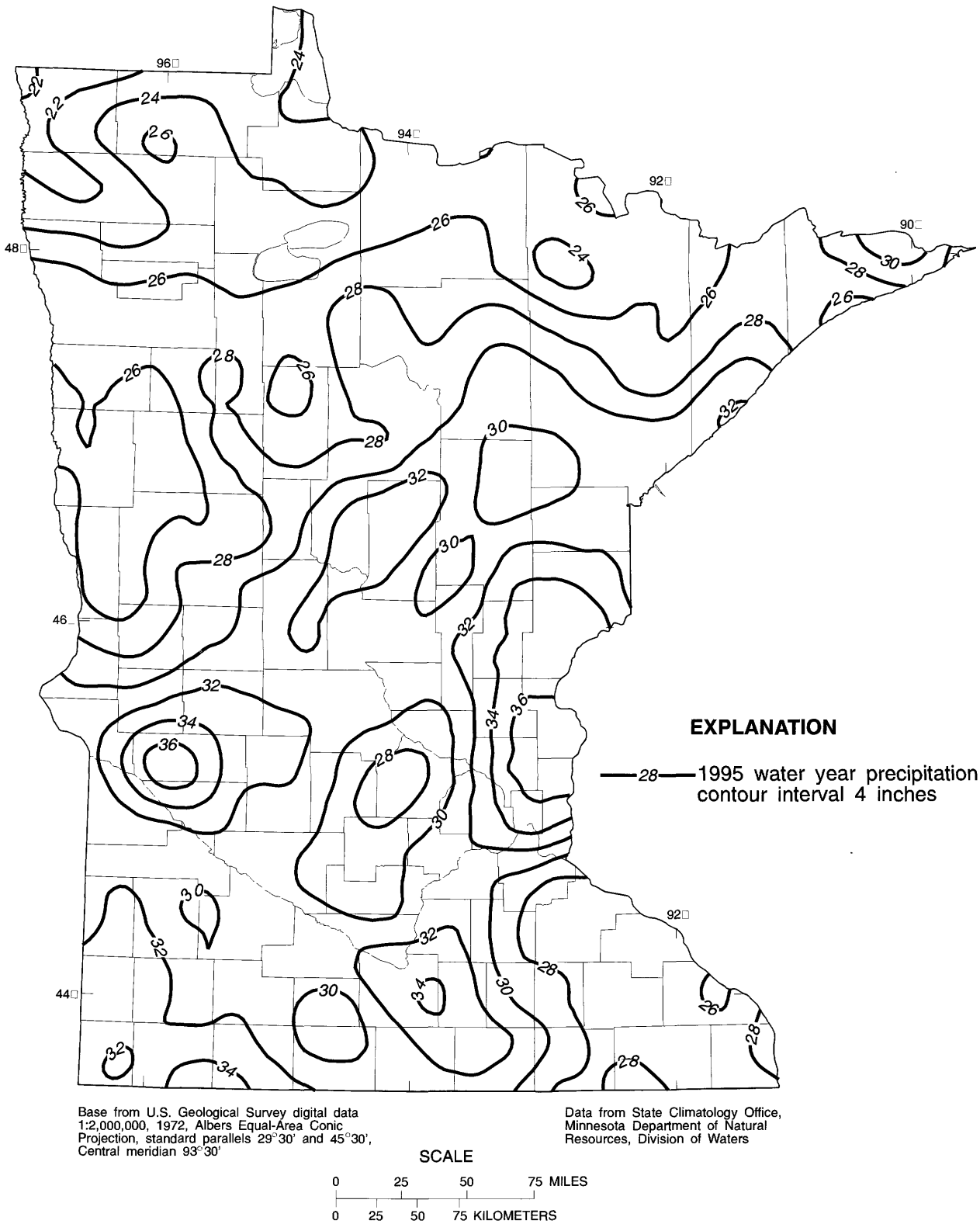


Figure 1.--Precipitation, in inches, during 1995 water year in Minnesota.

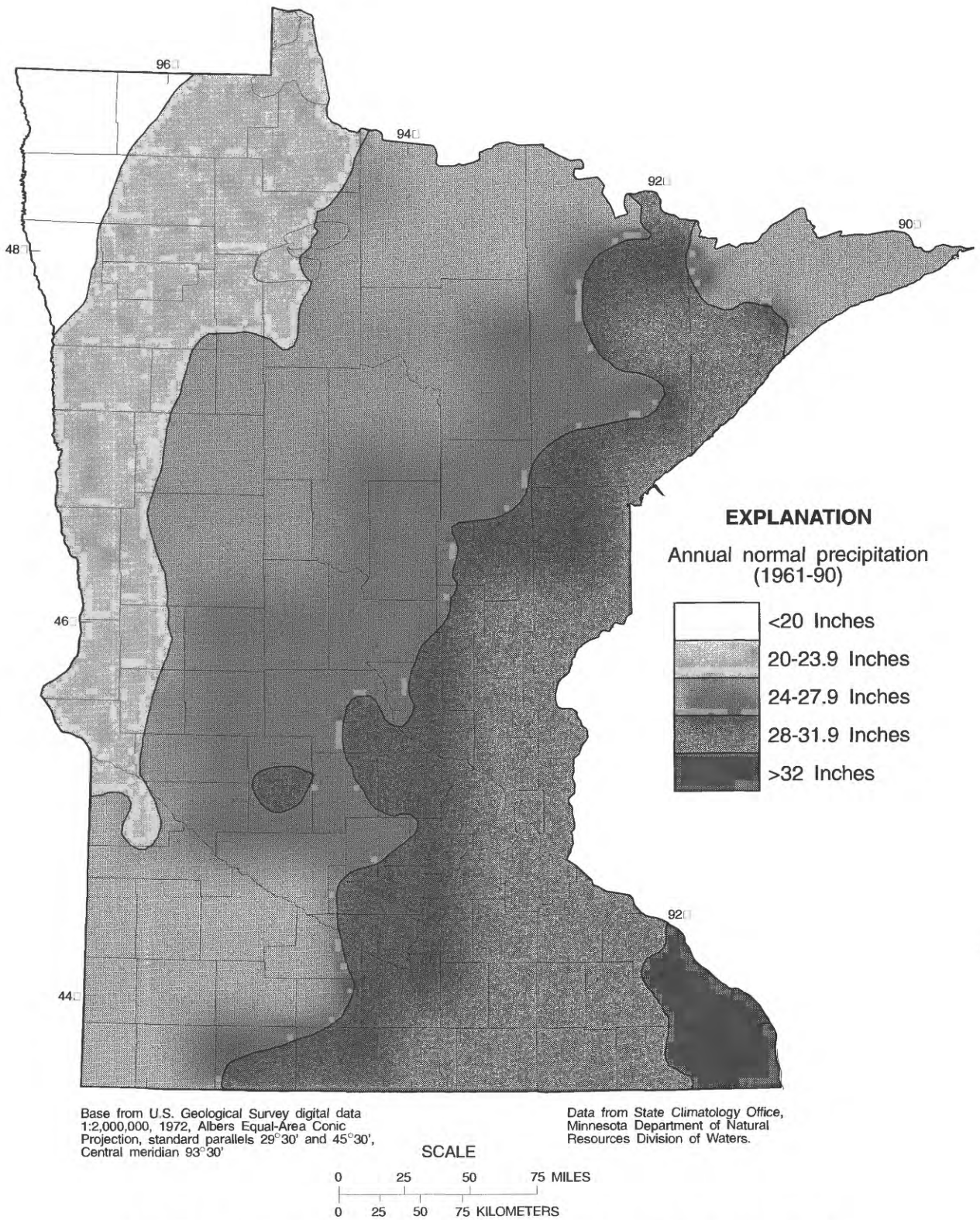


Figure 2.--Average annual precipitation, in inches, for 30-year period, 1961-90, in Minnesota.

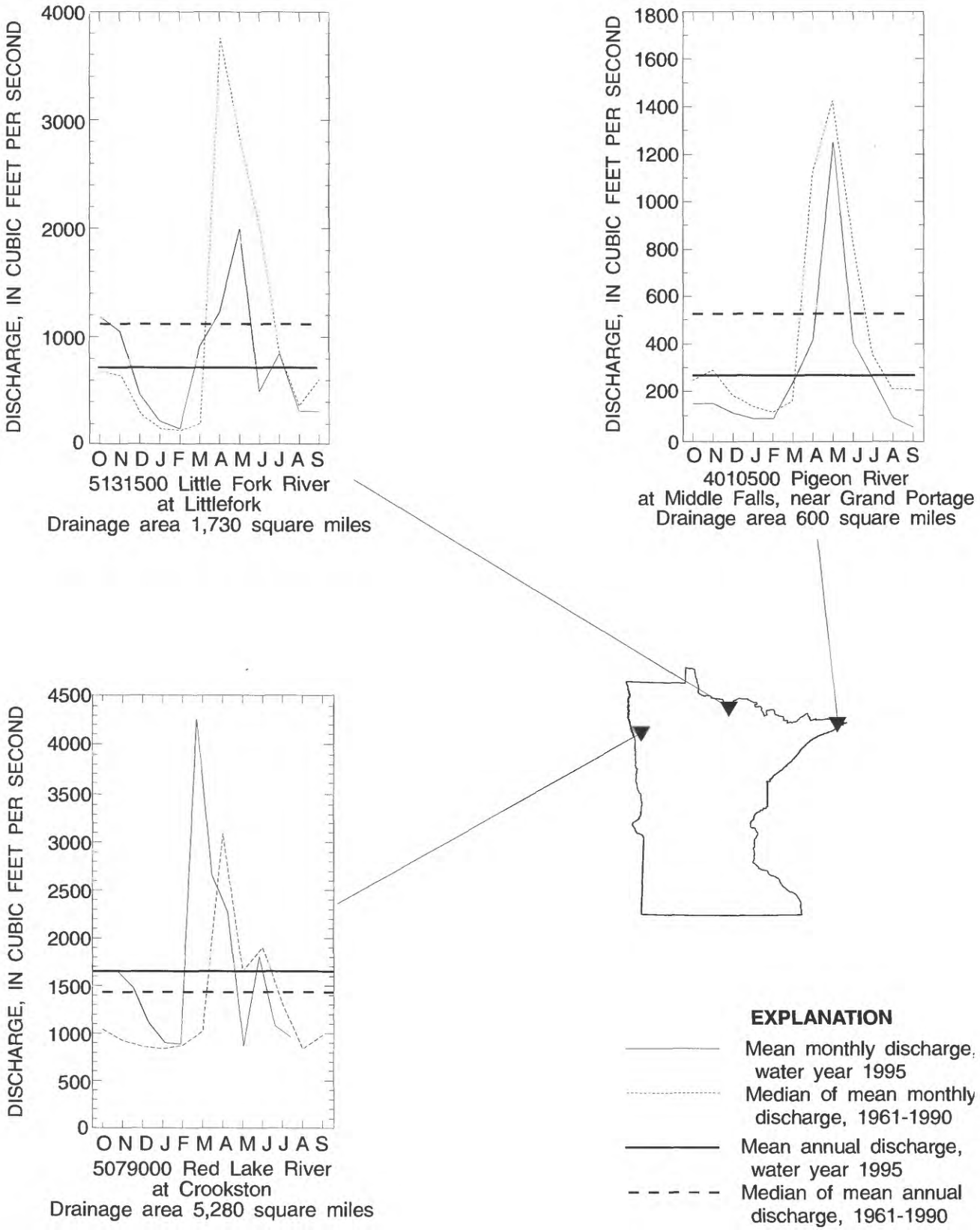
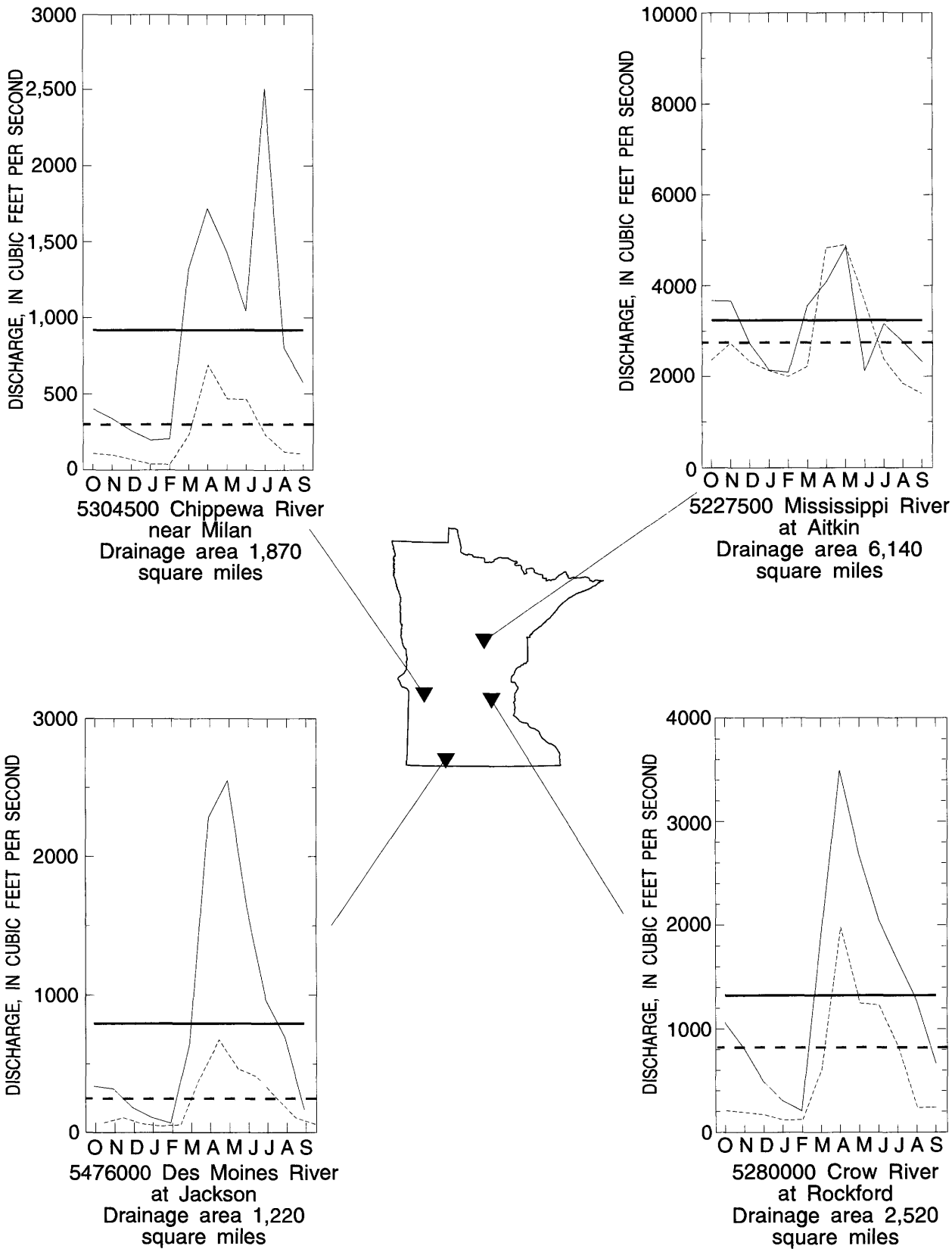


Figure 3.--Comparison of mean discharge for the 1995 water year with the median



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

Except for March and June, monthly-mean discharges in the Red Lake River at Crookston in the Red River of the North basin ranged from 85-158 percent of the monthly median flows. The mean discharge for March was 4257 ft^3/s, 417 percent of normal, and for June the flow was 855 ft^3/s, 45 percent of normal. Water year 1995 ended with an average discharge of 1651 ft^3/s, 115 percent of normal, and runoff of 4.25 inches.

Monthly-mean discharges in the Little Fork River at Littlefork in the Lake of the Woods basin were an average of 192 percent of normal from October to March and were 50 percent of normal from April to September. The annual mean discharge for 1995 was 763 ft^3/s, which is 65 percent of normal. Annual runoff for 1995 was 5.99 inches, a decrease of 3.33 inches from the previous year.

In the Chippewa River near Milan, monthly flows were much greater than normal for the entire year. The month with the greatest departure from normal was July with a discharge of 2507 ft^3/s, which is 1095 percent of normal. June had the smallest departure from normal with a discharge of 1047 ft^3/s, which is 226 percent of normal. The annual mean discharge for 1995 was 906 ft^3/s, which is 298 percent of normal and 153 ft^3/s greater than the previous year.

Flows in the Des Moines River at Jackson in southwest Minnesota were greater than normal for the entire year. Monthly departures from normal ranged from 170 percent for February to 821 percent for August. Monthly mean flows ranged from 57.9 ft^3/s for February to 2560 ft^3/s for May. The annual mean discharge of 828 ft^3/s for 1995 is 345 percent of normal but is 46 ft^3/s less than the flow for the previous year.

Flows in the Crow River at Rockford, located about 30 miles west of the Twin Cities, were higher than normal the entire year. Monthly flows ranged from 168 to 538 percent of normal. The annual mean discharge of 1387 ft^3/s for 1995 is 37 ft^3/s less than last year and is 167 percent of normal.

Flows in the Mississippi River at Aitkin were above normal most of the year. Flows were above normal from October to March, below normal from April to June, and above normal again from July to September. The annual discharge of 3112 ft^3/s for 1995 is 113 percent of normal and is 270 ft^3/s less than last year's.

The Minnesota River drains approximately 17,000 mi^2 that cover a large portion of western and southern Minnesota. Excessive flows in the Minnesota River near Jordan, about 40 miles southwest of the Twin Cities, continued throughout the 1995 water year. Departures from normal monthly flows ranged from 175 percent for March to 649 percent for August. The year ended with a mean flow of 9169 ft^3/s, 244 percent of normal and 504 ft^3/s greater than the previous year.

In the Mississippi River at St. Paul, located 5.5 miles downstream from the mouth of the Minnesota River, monthly flows were again above normal the entire year. The annual discharge of 20,470 ft^3/s for 1995 is 152 percent of normal and is 350 ft^3/s greater than the mean discharge for the previous year.

Flows in the Root River near Houston in southeast Minnesota were above normal during all months except for January and March. The year began with October having a flow that was 198 percent of normal, and the year ended with a flow that was 130 percent of normal. The discharge of 849 ft^3/s for 1995 is greater than normal but is 63 ft^3/s less than last year's mean.

Combined storage in the 6 Mississippi River Headwater Reservoirs (Winnibigoshish, Leech, Pokegama, Pine, Sandy, and Gull), in north-central Minnesota, was 1,535,000 acre-feet at the close of the 1995 water year. This was a decrease of 44,000 acre-feet from the close of last year.

Water Quality

Boxplots for 3 U.S. Geological Survey National Stream-Quality Accounting Network (NASQAN) stations and 1 benchmark station are used to depict variability in concentrations of dissolved solids and nitrate as nitrogen in the State (figs. 4 and 5); there are no water-quality stations in the Missouri River basin in Minnesota.

Boxplots display the central tendency, variation, and skewness of a data set as well as the presence or absence of extreme values. A boxplot consists of a centerline (the median) dividing a rectangle whose ends are defined by the 75th and 25th percentiles. Whiskers extend from the ends of the box to the most extreme observation within 1.5 times the interquartile range (the distance from the 25th to the 75th percentile values) beyond the ends of the box. Values more than 1.5 interquartile ranges from the box ends may indicate extreme hydrologic and chemical conditions or sampling and analytical errors. Observations from 1.5 to 3 interquartile ranges from the box in either direction are plotted individually with a closed circle.

Observations greater than 3 interquartile ranges from the ends of the box are plotted with an open circle. Water year 1995 values are plotted with an "x" to show where these data lie with respect to the distribution of the historic data.

Dissolved-solids concentrations at the benchmark station, Kawishiwi River near Ely, can be significantly affected by dissolved organic content. Concentrations in samples collected in 1995 ranged from 32-40 milligrams per liter. Concentrations in the Mississippi River near Royalton, Minnesota River near Jordan, and Mississippi River at Nininger were generally between the 25th and 75th percentiles except for the summer samples, which were significantly greater than the 75th percentile.

Nitrate concentrations reported as nitrogen (analyzed for nitrate plus nitrite) are shown in figure 5. Although concentrations sometimes vary considerably from the median, they are generally less than 1 mg/L at Kawishiwi River near Ely and Mississippi River near Royalton. The two stations in the southern half of Minnesota, Minnesota River near Jordan and Mississippi River at Nininger, typically have concentrations much greater than the two northern stations as shown in figure 5.

Data for 284 ground-water samples collected in 8 counties are published in this report. Nitrate concentrations (reported as nitrogen) were determined in 176 samples; 52 of those concentrations are above the primary drinking-water statndard of 10 mg/L (Minnesota Pollution Control Agency, 1988). Iron concentrations were determined in 35 samples, and 8 iron concentrations are above the satandard of 300 ug/L. Manganese concentrations were determined in 34 samples, and 13 of these concentrations are above the manganese standard of 50 ug/L.

Ground-Water Levels

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

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Bench-Mark Network is a network of 53 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by human activities.

National Stream Quality Accounting Network (NASQAN) is a nation-wide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in natural or regional water-quality planning and management. The 142 sites in NASQAN are generally located at the downstream ends of the hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for, (2) description of the areal variability of water quality in the

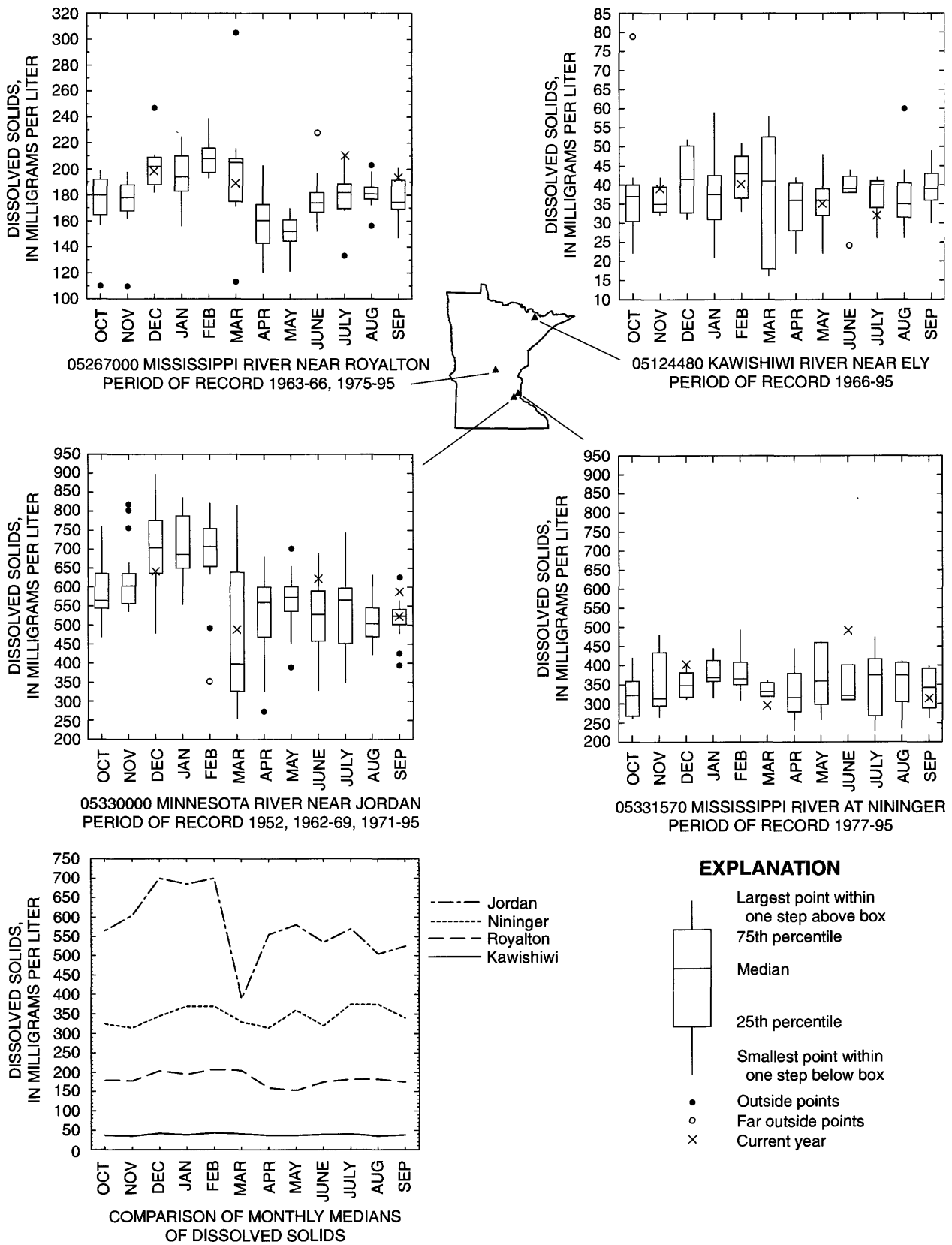


Figure 4. Dissolved-solids concentrations in samples collected during water year 1995 and selected statistics for period of record at four network stations.

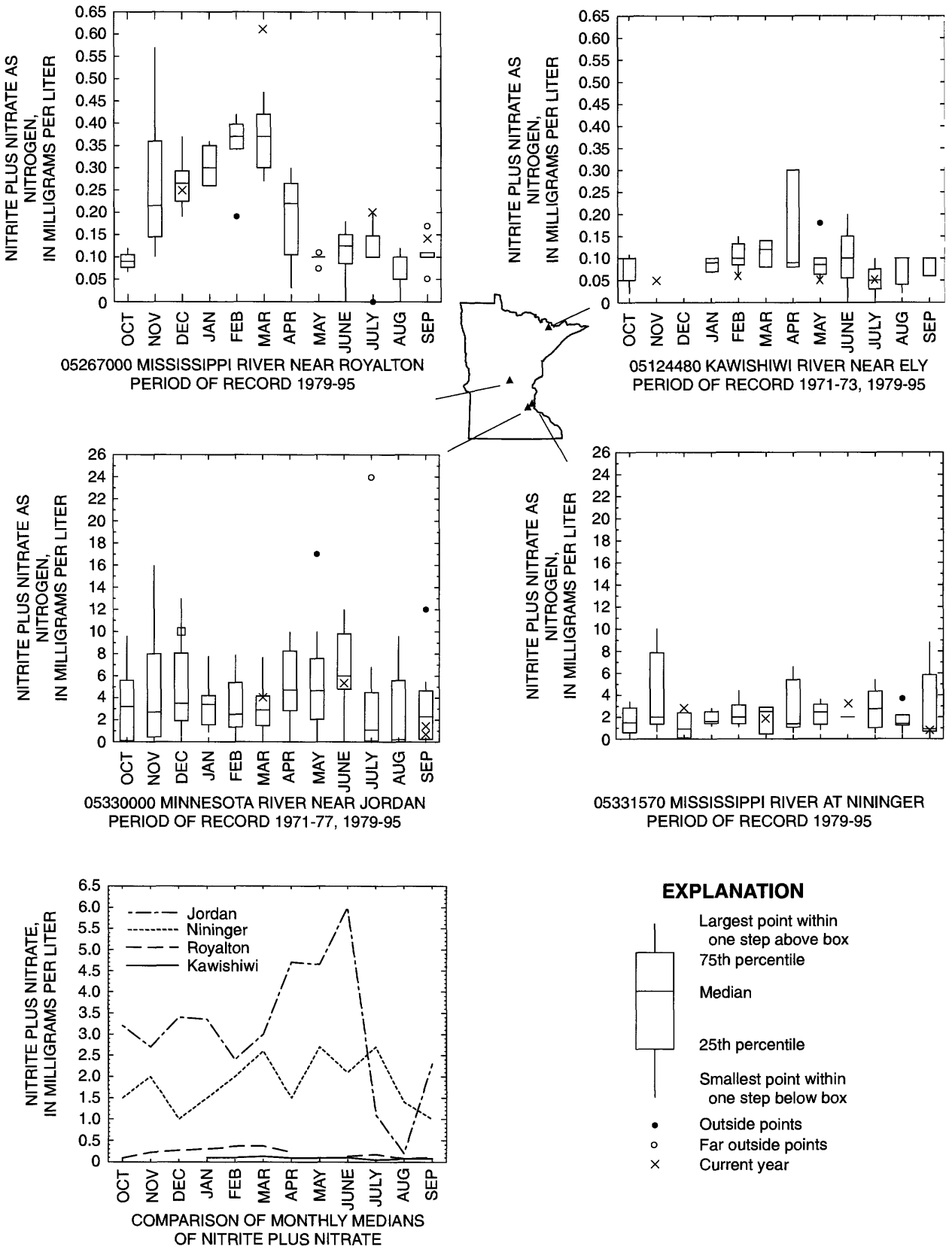


Figure 5. Nitrite plus nitrate concentrations in samples collected during water year 1995 and selected statistics for period of record at four network stations.

Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water quality assessment and hydrologic research.

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

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is a long-term program with goals to describe the status and trends of water-quality conditions for a large, diverse, and geographically distributed part of the Nation's ground- and surface-water resources, and to identify, describe, and explain the major natural and human factors that affect these observed conditions and trends.

Assessment activities have begun in about two-thirds of the study units and ultimately will be conducted in 60 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents will be measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide information for decision making by water-resources managers and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

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

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

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1995 water year that began October 1, 1994, and ended September 30, 1995. A calendar of the water year is provided on the inside of the front cover. The records contain streanflow data, stage and content data for lakes and reservoirs, water-quality data for the surface and ground water, and ground-water-level data. The locations of the stations and wells where the data were collected are shown in figures 7, 8, 9 and 10. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

STATION IDENTIFICATION NUMBERS

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

Downstream Order System and Station Number

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

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

Numbering System for Wells and Miscellaneous Sites

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

The well and miscellaneous site numbering system of the U.S. Geological Survey is based on the grid system of latitude and longitude. The system provides the geographic location of the well or miscellaneous site and a unique number for each site. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the wells or other sites within a one-second grid. See figure 6. Each well site is also identified by a local well number which consists of township, range, and section numbers, three letters designating 1/4, 1/4, 1/4 section location, and a two-digit sequential number.

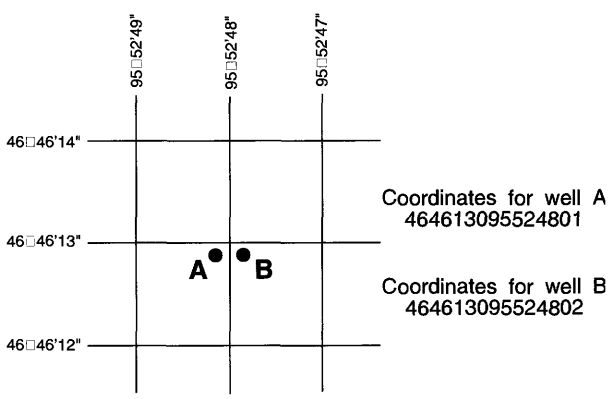


Figure 6. Example of system for numbering wells and miscellaneous sites.

RECORDS OF STAGE AND WATER DISCHARGE

Records of stage and water discharge maya be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean daily discharge may be computed for anytime, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-

recording device, but need not be. Because daily mean discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

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

Data Collection and Computation

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

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

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

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

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

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

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

Data Presentation

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

The records published for each continuous-record surface-water discharge station (gaging station) now consist of four parts, the manuscript or station description; the data table of daily mean values of discharge for the current water year with summary data; a tabular statistical summary of monthly mean flow data for a designated period, by water year; and a summary statistics table that includes statistical data of annual, daily and instantaneous flows as well as data pertaining to annual runoff, 7-day low-flow minimums, and flow duration.

Station manuscript

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

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

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

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

reasonably be considered equivalent with records from the present station.

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

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

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

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

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

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

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

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

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

Data table of daily-mean values

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

Statistics of monthly mean data

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

Summary statistics

A table titled "SUMMARY STATISTICS" follows the statistics of monthly mean data tabulation. This table consists of four columns, with the first column containing the line headings of the statistics being reported. The table provides a statistical summary of yearly, daily, and instantaneous flows, not only for the current water year but also for the previous calendar year and for a designated period, as appropriate. The designated period selected, "WATER YEARS 19__-19__," will consist of all of the station record within the specified water years, inclusive, including complete months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript. All of the calculations for the statistical characteristics designated ANNUAL (see line headings below), except for the ANNUAL 7-DAY MINIMUM" statistic, are calculated for the designated period using complete water years. The other statistical characteristics may be calculated using partial water years.

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

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

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

identified by symbol and corresponding footnotes.

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

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

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

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

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

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

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

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

INSTANTANEOUS LOW FLOW.--The minimum instantaneous discharge occurring for the water year or for the designated period.

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

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

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

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

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

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

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

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

Identifying Estimated Daily Discharge

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

Accuracy of the Records

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

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

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

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff, in inches, are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge

Other Records Available

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

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

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

RECORDS OF SURFACE-WATER QUALITY

Records of surface-water quality ordinarily are obtained at or near

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

Classification of Records

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

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

Arrangement of Records

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

On-Site Measurement and Sample Collection

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

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

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

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

Water Temperature

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

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

Sediment

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

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

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

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

Laboratory Measurements

Samples for indicator bacteria and specific conductance are analyzed locally. All other samples are analyzed in the Geological Survey laboratories in Arvada, Colo., Doraville, Ga., or Iowa City, Ia. Methods used in analyzing sediment samples and computing sediment records are given

in Transactions of Water Resources Investigations(TWRI), Book 5, Chap. C1. Methods used by the U.S. Geological Survey laboratories are given in TWRI, Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4.

Data Presentation

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

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

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

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

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

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

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

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

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

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

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

Remark Codes

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

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

Dissolved Trace-Element Concentrations

Traditionally, dissolved trace-element concentrations have been reported at the microgram per liter (µg/L) level. Recent evidence, mostly from large rivers, indicates that actual dissolved-phase concentrations for a number of trace elements are within the range of 10's and 100's of nanograms per liter (ng/L). Present data above the µg/L level should be used with caution. Such data may actually represent elevated environmental concentrations from natural or human causes; however, these data could reflect contamination introduced during sampling, processing, or analysis. To confidently produce dissolved trace-element data with insignificant contamination, the U.S. Geological Survey will begin using new trace-element protocols in water year 1994. Full implementation of the protocols will take place during the 1995 water year.

Changes in National Trends Network Procedures

Sample handling procedures at all National Trends Network stations were changed substantially on January 11, 1994, in order to reduce contamination from the sample shipping container. The data for samples before and after that date may not be comparable. A summary of differences for data before and after Jan. 11 can be obtained from the NADP/NTN Coordination Office, Colorado State University, Fort Collins, CO 80523 (Telephone: 303-491-5643).

RECORDS OF GROUND-WATER LEVELS

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

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

Data Collection and Computation

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

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

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

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

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

Data Presentation

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

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

AQUIFER.-- This entry designates by name (if a name exists) and geologic age the aquifer(s) open to the well.

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

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

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

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

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

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

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

RECORDS OF GROUND-WATER QUALITY

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

Data Collection and Computation

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

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

Data Presentation

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

ACCESS TO WATSTORE DATA

The U.S. Geological Survey is the principal Federal water-data agency and, as such, collects and disseminates about 70 percent of the water data currently being used by numerous State, local, private, and other Federal agencies to develop and manage our water resources. As part of the U.S. Geological Survey's program of releasing water data to the public, a large-scale computerized system has been developed for the storage and

retrieval of water data collected through its activities. The National Water Data Storage and Retrieval System (WATSTORE) was established in 1972 to provide an effective and efficient means for the processing and maintenance of water data collected through the activities of the U.S. Geological Survey and to facilitate release of the data to the public. A variety of useful products, ranging from data tables to complex statistical analyses such as Log Pearson Type III, can be produced using WATSTORE. The system resides on the central computer facilities of the U.S. Geological Survey at its National Center in Reston, Virginia, and consists of related files and data bases.

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

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

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

In addition to providing direct access to WATSTORE, data can be provided in various machine-readable formats on magnetic tape or floppy disk; and, as noted in the introduction, on CD-ROM discs. Beginning with the 1990 water year, all water-data reports are also be available on Compact disc - Read Only Memory (CD-ROM). All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each of the Water Resources Division's District offices. (See address on the back of the title page.) A limited number of CD-ROM discs will be available for sale by the U.S. Geological Survey, Branch of Information Services, Box 25286, Federal Center, Denver, Colorado 80225.

DEFINITION OF TERMS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Dry mass refers to the weight of residue present after drying in an oven at 60°∞C for zooplankton and 105 °∞C for periphyton, until the mass remains unchanged. This mass represents the total

organic matter, ash and sediment, in the sample. Dry mass values are expressed in the same units as ash mass.

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

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

Bottom material: See Bed Material.

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

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

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

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

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

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

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

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

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

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

Mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period.

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

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

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

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

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

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

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

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

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

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

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

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate ($CaCO_3$).

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

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

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

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

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

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

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

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 milliliters (mL) or liters (L). Numbers of planktonic organisms can be expressed in these terms.

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

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

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

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

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

The classification is as follows:

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

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

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

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

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

Picocurie (PC, pCi) is one trillionth (1×10^{-12}) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7 x 1010 radioactive disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

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

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

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

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

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

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

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

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

Milligrams of carbon per area or volume per unit time [mg C/(m^2 . time) for periphyton and macrophytes and mg (C/(m^3 . 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 pet unit time [mg 0_2/(m^2 . time) for periphyton and macrophytes and mg 0_2/(m^3 . time) for phytoplankton] are the units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in micromhos per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in micromhos). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

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

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

Substrate is the physical surface upon which an organism lived.

Natural substrates refers to any naturally occurring 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. 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 micrometer filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

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

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45 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 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 lambata**

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

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

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

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

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

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

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

Total recoverable refers to the amount of a given constituent that is in solution after a representative water-suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent 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.

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

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

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

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

year after thorough mixing in the reservoir.

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

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

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting specialized work in water-resource 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 to Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

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

1-D1. Water temperature--influential factors, field measurement, and data presentation, by H.H. Stevens, Jr., J.F. Ficke, and G.F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.

1-D2 Guidelines for collection and field analysis of ground-water samples for selected unstable constituents, by W.W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.

2-D1. Application of surface geophysics to ground-water investigations, by A.A.R. Zohdy, G.P. Eaton, and D.R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.

2-D2. Application of seismic-refraction techniques to hydrologic studies, by F.P. Haeni: USGS--TWRI Book 2, Chapter D2. 1988. 86 pages.

2-E1. Application of borehole geophysics to water-resources investigations, by W. S. Keys and L.M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.

2-E2. Borehole geophysics applied to ground-water investigations, by W. S. Keys: USGS--TWRI Book 2, Chapter E2. 1990. 150 pages.

2-F1. Application of drilling, coring, and sampling techniques to test holes and wells, by Eugene Shuter and Warren E. Teasdale: USGS--TWRI Book 2, Chapter F1. 1989. 97 pages.

3-A1. General field and office procedures for indirect discharge measurements, by M.A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.

3-A2. Measurement of peak discharge by the slope-area method, by Tate Dalrymple and M.A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.

3-A3. Measurement of peak discharge at culverts by indirect methods, by G.L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 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.

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3-A9. Measurement of time of travel in streams by dye tracing, by F.A. Kilpatrick and J.F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1989. 27 pages.

3-A10. Discharge ratings at gaging stations, by E.J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 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-A12. Fluorometric procedures for dye tracing,Revised, by J.F. Wilson, Jr., E.D. Cobb, and F.A. Kilpatrick: USGS--TWRI Book 3, Chapter A12. 1986. 34 pages.

3-A13. Computation of continuous records of streamflow, by E.J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.

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3-A15. Computation of water-surface profiles in open channels, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.

3-A16. Measurement of discharge using tracers, by F.A. Kilpatrick and E.D. Cobb: USGS--TWRI Book 3, Chapter A16. 1985. 52 pages.

3-A17. Acoustic velocity meter systems, by Anonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 pages.

3-A18. Determination of stream reaeration coefficients by use of tracers, by F.A. Kilpatrick, R.E. Rathburn, N. Yotsukura, G.W. Parker, and L.L. DeLong: USGS--TWRI Book 3, Chapter A18. 1989. 52 pages.

3-A19. Levels of streamflow gaging stations, by E.J. Kennedy: USGS--TWRI Book 3, Chapter A19. 1990. 27 pages.

3-A20. Simulation of soluable waste transport and buildup in surface waters using tracers, by F.A. Kilpatrick: USGS--TWRI Book 3, Chapter A20. 1993. 38 pages.

3-A21 Stream-gaging cableways, by C. Russell Wagner: USGS--TWRI Book 3, Chapter A21. 1995. 56 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 programmed text for self-instruction, by G.D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.

3-B3. Type curves for selected problems of flow to wells in confined aquifers, by J.E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.

3-B4. Regression modeling of ground-water flow, by Richard L. Cooley and Richard L. Naff: USGS--TWRI Book 3, Chapter B4. 1990. 232 pages.

3-B4. Supplement 1. Regression modeling of ground-water flow - modifications to the computer code for nonlinear regression solution of steady-state ground-water flow problems, by R.L. Cooley: USGS--TWRI Book 3, Chapter B4. 1993. 8 pages.

3-B5. Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems--An introduction, by O.L. Franke, T.E. Reilly, and G.D. Bennett: USGS--TWRI Book 3, Chapter B5. 1987. 15 pages.

3-B6. The principle of superposition and its application in ground-water hydraulics, by T.E. Reilly, O.L. Franke, and G.D. Bennett: USGS--TWRI Book 3, Chapter B6. 1987. 28 pages.

3-B7. Analytical solutions for one-, two-, and three-dimensional solute transport in ground-water systems with uniform flow, by Eliezer J. Wexler: USGS--TWRI Book 3, Chapter B7. 1992. 190 pages.

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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.

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4-A1. Some statistical tools in hydrology, by H.C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.

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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.J. Fishman and L.C. Friedman, editors: USGS--TWRI Book 5, Chapter A1. 1989. 545 pages.

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5-A4. Methods for collection and analysis of aquatic biological and microbiological samples, by L.J. Britton and P.E. Greeson, editors: USGS--TWRI Book 5, Chapter A4. 1989. 363 pages.

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5-A6. Quality assurance practices for the chemical and biological analyses of water and fluvial sediments, by L.C. Friedman and D.E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.

5-C1. Laboratory theory and methods for sediment analysis, by H.P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.

6-A1. A modular three-dimensional finite-difference ground-water flow model, by M.G. McDonald and A.W. Harbaugh: USGS--TWRI Book 6, Chapter A1. 1988. 586 pages.

6-A2. Documentation of a computer program to simulate aquifer-system compaction using the modular finite-difference ground-water flow model, by S.A. Leake and D.E. Prudic: USGS--TWRI Book 6, Chapter A2. 1991. 68 pages.

6-A3. A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 1: Model Description and User's Manual, by L.J. Torak: USGS--TWRI Book 6, Chapter A3. 1993. 136 pages.

6-A4. A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 2: Derivation of finite-element equations and comparisons with analytical solutions, by R.L. Cooley: USGS--TWRI Book 6, Chapter A4. 1992. 108 pages.

6-A5. A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 3: Design philosophy and programming details, by L.J. Torak: USGS--TWRI Book 6, Chapter A5, 1993. 243 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.

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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-A2. Installation and service manual for U.S. Geological Survey manometers, by J.D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 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.

Surface-Water
Station Records

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

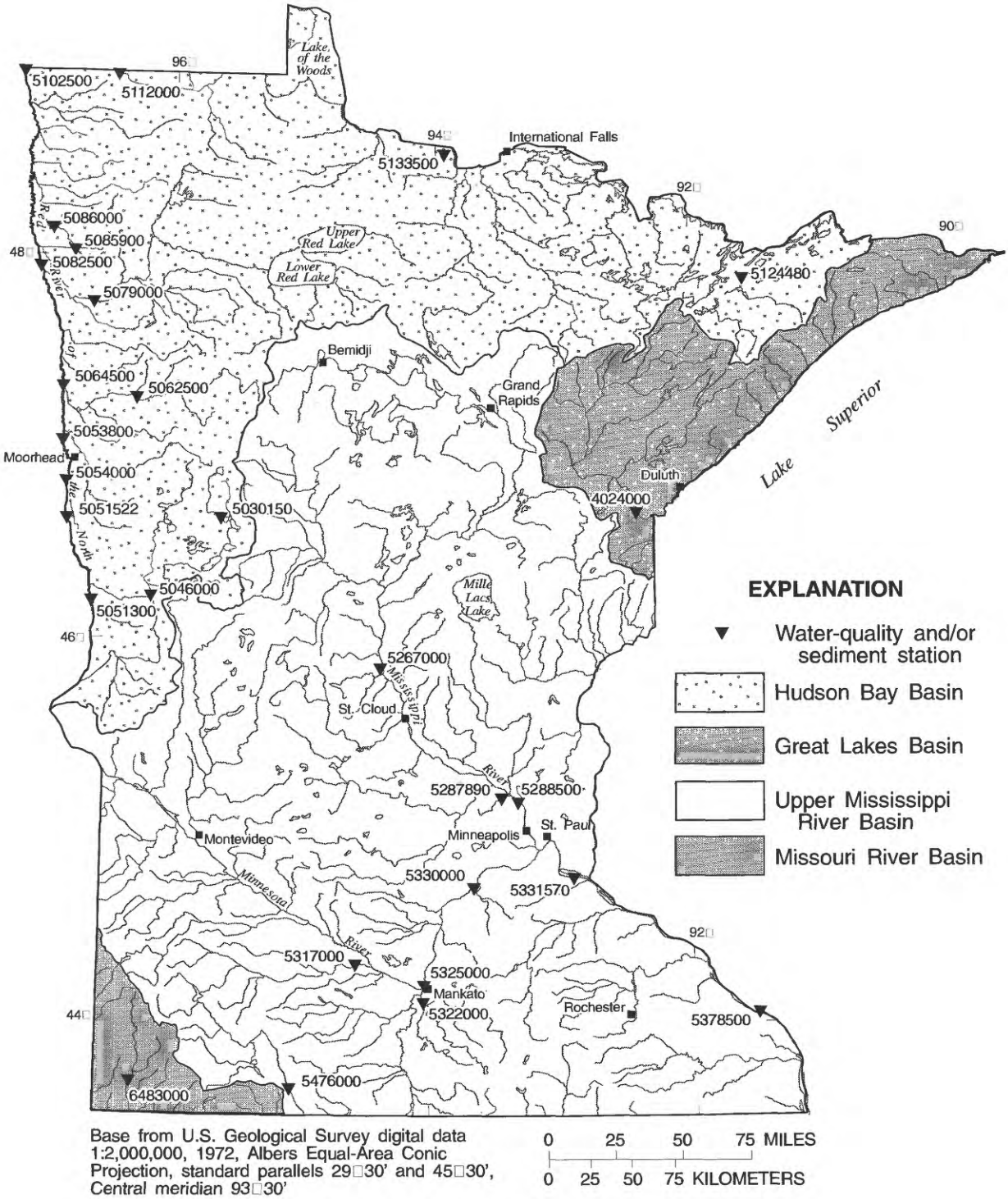


Figure 8.--Location of surface-water quality stations.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04010500 PIGEON RIVER AT MIDDLE FALLS, NEAR GRAND PORTAGE, MN
(International gaging station)

LOCATION.--Lat 48°00'44", long 89°36'58", in SW¼NE¼ sec. 24, T.64 N., R.6 E., Cook County, Hydrologic Unit 04010101, on the Grand Portage Indian Reservation, on right bank 400 ft upstream from Middle Falls, 2.5 mi upstream from Grand Portage Port of Entry, 3.5 mi upstream from mouth, and 4.7 mi northeast of city of Grand Portage.
DRAINAGE AREA.--600 mi².
PERIOD OF RECORD.--June to October 1921, April to November 1922, March 1923 to current year. Published as "at International Bridge" April 1924 to September 1940; as "below International Bridge" October 1940 to September 1965. Monthly discharge only for some periods, published in WSP 1307.
REVISED RECORDS.--WSP 744:1927-28. WSP 804: 1934(M). WSP 974: Drainage area. WSP 1337:1924(M), 1925, 1926-28(M), 1931(M), 1938(M), 1941(M), 1945-46(M), 1947, 1948(M), 1950(M).
GAGE.--Water-stage recorder. Datum of gage is 787.58 ft above sea level. Prior to Sept. 30, 1940, nonrecording gage at International Bridge, 5.8 mi upstream at datum 102.24 ft higher. Oct. 1, 1940, to Dec. 31, 1975, at present site at datum 2.00 ft higher.
REMARKS.--Records good except those for estimated daily discharges, which are poor. Satellite telemeter at station.
COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.
EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	
May 14	6430	*2470	*7.59	(No peak greater than base discharge.)

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	132	158	e190	e95	e94	e96	e315	650	798	211	154	70
2	123	145	e185	e95	e94	e97	e305	666	746	210	147	62
3	115	136	e175	e95	e94	e97	e290	698	703	211	143	59
4	108	129	e170	e95	e94	e97	e280	746	659	211	142	55
5	104	127	e160	e95	e94	e97	e270	1500	618	231	130	51
6	101	124	e150	e95	e94	e97	e270	1670	587	390	122	63
7	112	119	e140	e95	e94	e97	e265	1380	560	403	114	79
8	143	119	e135	e95	e94	e97	e280	1180	529	381	113	69
9	160	117	e130	e95	e94	e97	e270	1240	501	340	113	68
10	167	119	e125	e95	e94	e100	e265	1540	471	300	110	64
11	158	114	e120	e95	e94	e110	e260	1400	452	270	104	57
12	145	113	e115	e95	e94	e125	e280	1250	434	255	103	52
13	134	113	e115	e95	e94	e150	e350	1170	414	252	101	51
14	125	123	e110	e95	e94	e200	e400	2240	402	280	95	53
15	118	126	e110	e95	e94	e300	e460	1990	381	309	90	50
16	113	126	e105	e95	e94	e460	e440	1750	362	302	85	63
17	111	126	e105	e95	e94	e420	393	1790	350	282	82	64
18	118	162	e105	e95	e94	e380	372	1650	339	277	79	61
19	141	180	e100	e95	e95	e360	389	1400	327	286	85	66
20	152	182	e100	e95	e97	e350	494	1290	308	298	83	66
21	156	e200	e100	e95	e100	e340	555	1280	289	294	80	61
22	168	e220	e100	e95	e100	e360	597	1260	273	272	81	58
23	239	e220	e97	e95	e100	e360	613	1190	262	249	79	55
24	253	e220	e97	e95	e100	e355	597	1140	251	231	74	52
25	257	e220	e95	e95	e98	e350	587	1090	243	216	77	51
26	246	e220	e95	e94	e97	e345	576	1030	240	203	77	49
27	225	e215	e95	e94	e96	e340	580	958	231	190	73	48
28	203	e215	e95	e94	e96	e360	621	944	225	178	71	47
29	188	e210	e95	e94	---	e360	632	978	217	167	69	46
30	174	e200	e95	e94	---	e350	641	928	211	161	88	77
31	164	---	e95	e94	---	e330	---	857	---	160	89	---
TOTAL	4853	4798	3704	2939	2671	7677	12647	38855	12383	8020	3053	1767
MEAN	157	160	119	94.8	95.4	248	422	1253	413	259	98.5	58.9
MAX	257	220	190	95	100	460	641	2240	798	403	154	79
MIN	101	113	95	94	94	96	260	650	211	160	69	46
AC-FT	9630	9520	7350	5830	5300	15230	25090	77070	24560	15910	6060	3500
CFSM	.26	.27	.20	.16	.16	.41	.70	2.09	.69	.43	.16	.10
IN.	.30	.30	.23	.18	.17	.48	.78	2.41	.77	.50	.19	.11

e Estimated.

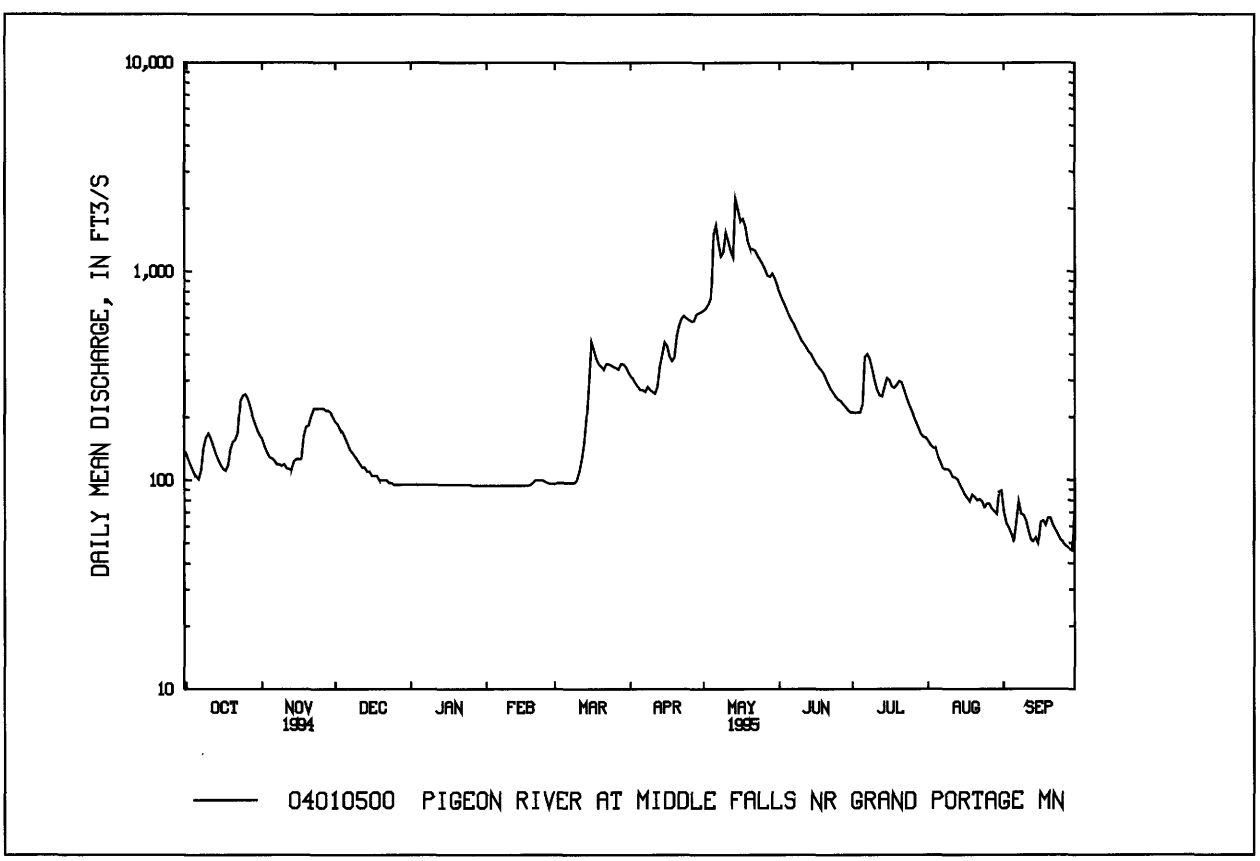
04010500 PIGEON RIVER AT MIDDLE FALLS, NEAR GRAND PORTAGE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	360	348	203	148	124	174	1190	1616	854	410	240	300
MAX	2095	1461	720	431	300	1169	2701	4016	2801	1127	1029	2985
(WY)	1978	1971	1978	1975	1969	1945	1976	1950	1947	1968	1950	1977
MIN	17.4	11.4	2.85	2.18	8.02	60.0	290	138	125	78.0	57.7	40.2
(WY)	1977	1977	1977	1977	1977	1941	1977	1977	1977	1958	1991	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1921 - 1995	
ANNUAL TOTAL	168533		103367			
ANNUAL MEAN	462		283		500	
HIGHEST ANNUAL MEAN					840	1971
LOWEST ANNUAL MEAN					158	1958
HIGHEST DAILY MEAN	3450	Apr 27	2240	May 14	10700	May 5 1934
LOWEST DAILY MEAN	95	Dec 25	46	Sep 29	1.0	Jan 15-21 1977
ANNUAL SEVEN-DAY MINIMUM	95	Dec 25	50	Sep 23	1.0	Jan 15 1977
INSTANTANEOUS PEAK FLOW			2470	May 14	11000	May 5 1934
INSTANTANEOUS PEAK STAGE			7.59	May 14	7.60a	May 5 1934
INSTANTANEOUS LOW FLOW			45	Sep 29		
ANNUAL RUNOFF (AC-FT)	334300		205000		362400	
ANNUAL RUNOFF (CFSM)	.77		.47		.83	
ANNUAL RUNOFF (INCHES)	10.45		6.41		11.33	
10 PERCENT EXCEEDS	1410		636		1290	
50 PERCENT EXCEEDS	158		142		220	
90 PERCENT EXCEEDS	119		79		84	

a Site and datum then in use.



STREAMS TRIBUTARY TO LAKE SUPERIOR

04015330 KNIFE RIVER NEAR TWO HARBORS, MN

LOCATION.--Lat 46°56'49", long 91°47'32", in SW¼NW¼ sec.31, T.52 N., R.11 W., Lake County, Hydrologic Unit 04010102, on right bank 600 ft downstream from bridge on U.S. Highway 61, 0.5 mi upstream from bridge on County Highway 102, in town of Knife River, 0.8 mi upstream from Lake Superior, and 7.8 mi southwest of Two Harbors.

DRAINAGE AREA.--85.6 mi².

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

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

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

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

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 18	--	848	5.37	July 17	0915	1130	5.73
Apr. 24	0215	876	5.41	Aug. 25	1515	*3510	*8.19
May 14	0200	2580	7.28	Sept. 30	a2400	946	5.49
July 4	0415	1460	6.13				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e60	e20	e54	e11	e5.0	e5.0	e100	179	e30	6.1	35	37
2	e50	e20	e52	e10	e5.0	e5.0	e90	161	e28	5.7	22	29
3	e40	e19	e50	e9.8	e5.0	e5.0	e77	148	e26	21	16	22
4	e30	e19	e49	e9.2	e5.0	e5.0	e65	140	e24	950	16	20
5	e22	e18	e47	e8.6	e5.0	e5.0	e59	167	e22	690	15	17
6	e18	e18	e45	e8.2	e5.0	e5.0	e54	158	e21	401	14	53
7	e30	e18	e44	e8.0	e5.0	e5.0	e54	131	e20	194	16	250
8	e66	e18	e42	e7.8	e5.0	e5.0	e56	117	e18	103	15	122
9	e40	e18	e40	e7.6	e5.0	e5.0	e62	257	e17	67	17	64
10	e30	e18	e38	e7.4	e5.0	e5.0	e62	274	e16	44	14	43
11	e24	e18	e36	e7.2	e5.0	e5.1	e62	194	e15	31	11	34
12	e22	e18	e34	e7.0	e5.0	e5.2	e72	147	e14	27	9.8	28
13	e20	e38	e32	e6.8	e5.0	e5.6	e200	453	13	44	22	24
14	e19	e34	e31	e6.6	e5.0	e6.4	e360	1720	12	73	28	20
15	e18	e27	e29	e6.5	e5.0	e9.0	e300	551	11	73	20	20
16	e60	e23	e28	e6.4	e5.0	e18	243	286	10	45	14	134
17	e180	e20	e26	e6.3	e5.0	e30	172	204	9.0	519	11	135
18	e510	e28	e24	e6.2	e5.0	e70	159	146	8.6	234	10	74
19	e250	e25	e23	e6.2	e5.0	e150	215	115	7.7	199	173	55
20	e130	e21	e22	e6.1	e5.0	e350	393	96	6.7	246	135	49
21	e80	104	e21	e6.0	e5.0	e520	367	79	6.0	100	64	37
22	e66	92	e20	e5.8	e5.0	e560	408	68	6.1	104	34	37
23	e58	64	e18	e5.6	e5.0	e400	521	62	6.2	63	22	34
24	e50	e61	e17	e5.5	e5.0	e300	710	e54	6.1	43	20	29
25	e40	e60	e16	e5.4	e5.0	e250	437	e50	5.5	38	1760	30
26	e32	e59	e15	e5.4	e5.0	e210	353	e47	5.3	25	1050	27
27	e27	e58	e14	e5.4	e5.0	e180	303	e54	6.1	20	315	25
28	e24	e58	e13	e5.2	e5.0	e160	254	e66	6.0	26	162	23
29	e23	e57	e13	e5.2	---	e145	220	e46	6.4	22	103	22
30	e22	e56	e12	e5.2	---	e130	203	e35	6.5	16	62	219
31	e21	---	e11	e5.2	---	e115	---	e32	---	24	46	---
TOTAL	2062	1107	916	212.8	140.0	3669.3	6631	6237	389.2	4453.8	4251.8	1713
MEAN	66.5	36.9	29.5	6.86	5.00	118	221	201	13.0	144	137	57.1
MAX	510	104	54	11	5.0	560	710	1720	30	950	1760	250
MIN	18	18	11	5.2	5.0	5.0	54	32	5.3	5.7	9.8	17
AC-FT	4090	2200	1820	422	278	7280	13150	12370	772	8830	8430	3400
CFSM	.78	.43	.35	.08	.06	1.38	2.58	2.35	.15	1.68	1.60	.67
IN.	.90	.48	.40	.09	.06	1.59	2.88	2.71	.17	1.94	1.85	.74

a Rising stage.
e Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

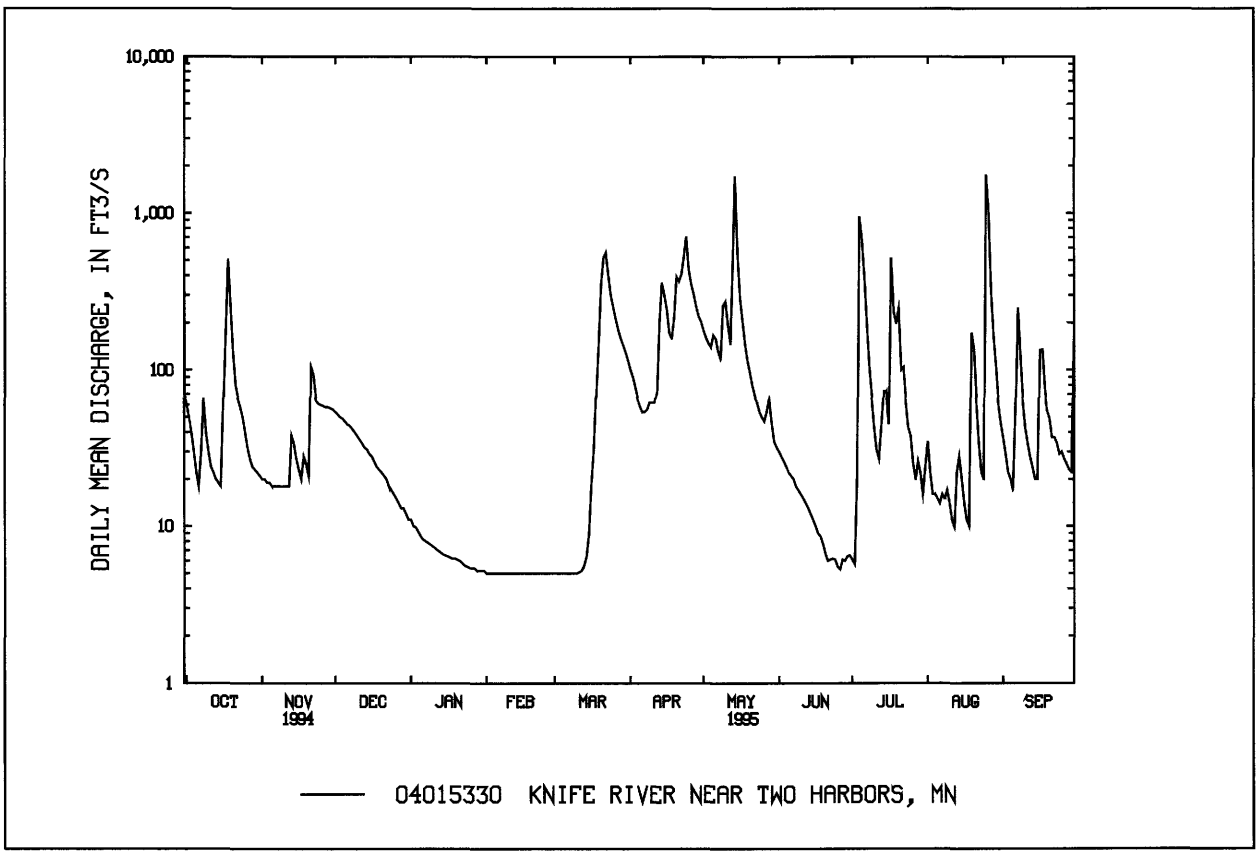
04015330 KNIFE RIVER NEAR TWO HARBORS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	82.5	68.3	21.4	10.9	8.65	54.1	365	167	88.3	85.8	38.5	84.4
MAX	226	198	60.6	31.4	22.2	136	631	427	240	345	163	314
(WY)	1983	1992	1983	1975	1984	1976	1982	1979	1984	1993	1988	1977
MIN	3.06	1.58	.000	.000	.000	8.65	73.6	16.0	13.0	4.87	2.95	1.43
(WY)	1977	1977	1977	1977	1977	1980	1977	1976	1995	1988	1976	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1974 - 1995	
ANNUAL TOTAL	26878.6		31782.9			
ANNUAL MEAN	73.6		87.1		90.2	
HIGHEST ANNUAL MEAN					147	1986
LOWEST ANNUAL MEAN					44.2	1977
HIGHEST DAILY MEAN	1490	Apr 15	1760	Aug 25	4480	May 10 1979
LOWEST DAILY MEAN	5.4	Aug 18	5.0	Feb 1 to Mar 10	.00[a]	Dec 2 1976
ANNUAL SEVEN-DAY MINIMUM	5.6	Feb 7	5.0	Feb 1	.00	Dec 2 1976
INSTANTANEOUS PEAK FLOW			3510	Aug 25	7440	May 10 1979
INSTANTANEOUS PEAK STAGE			8.19	Aug 25	11.16	May 10 1979
INSTANTANEOUS LOW FLOW			4.9	Jun 26		
ANNUAL RUNOFF (AC-FT)	53310		63040		65350	
ANNUAL RUNOFF (CFSM)	.86		1.02		1.05	
ANNUAL RUNOFF (INCHES)	11.68		13.81		14.32	
10 PERCENT EXCEEDS	166		226		222	
50 PERCENT EXCEEDS	22		27		22	
90 PERCENT EXCEEDS	6.2		5.0		4.5	

a Many days in 1977.



STREAMS TRIBUTARY TO LAKE SUPERIOR

04024000 ST. LOUIS RIVER AT SCANLON, MN

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

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

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

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

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

REMARKS.--Records good except those for estimated daily discharges, which are fair. Diurnal fluctuation caused by powerplant upstream.
Flow regulated by Whiteface Reservoir and Boulder, Island, Rice and Fish Lakes, combined capacity, 332,160 acre-ft; the water-discharge table shows the monthly change in contents (+).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2390	2570	2120	e1180	e1260	e1160	3030	2980	2480	515	2050	4960
2	2120	2550	2110	e1160	e1240	e1160	2630	2880	2180	615	1870	3900
3	2150	2410	2330	e1140	e1200	e1170	2430	2760	2090	731	1620	3220
4	2030	2250	2250	e1140	e1170	e1170	2180	2750	1920	1290	1510	3140
5	1910	2320	1960	e1160	e1130	e1180	1940	2670	1840	3900	1450	2860
6	1830	2140	e1700	e1200	e1110	e1180	1520	2660	1780	6000	1350	2820
7	2020	2100	1350	e1300	e1100	e1190	1650	2810	1580	6540	1280	3150
8	2110	2030	e1350	e1350	e1100	e1190	1770	2750	1720	5800	1140	3470
9	1960	1880	e1400	e1390	e1090	e1200	1710	2890	1820	4880	1230	3320
10	2170	1930	e1460	e1400	e1090	e1200	1650	3830	1820	4660	1110	2920
11	2010	1780	e1510	e1400	e1080	e1220	1480	4710	1580	5120	963	2670
12	1860	1750	e1450	e1400	e1080	e1240	1450	4610	1460	4500	998	2250
13	1700	1820	e1600	e1380	e1080	e1300	1640	4320	1340	4450	1080	2050
14	1730	1910	e1590	e1360	e1070	e2500	1810	7070	1210	5040	1090	1820
15	1650	1870	e1580	e1350	e1070	e4000	2530	9060	1120	6950	1020	1660
16	1680	2020	e1570	e1340	e1070	e4600	2870	8210	1060	6700	979	1830
17	1860	1990	e1560	e1330	e1070	4640	2640	7290	1050	5660	918	1900
18	2260	2190	e1540	e1320	e1070	4530	2670	6600	945	5310	769	1930
19	3390	2100	e1520	e1310	e1080	4520	2770	5740	819	4900	1140	1830
20	4700	2330	e1500	e1300	e1090	4560	3510	5170	832	5130	2020	1680
21	4850	2420	e1500	e1300	e1100	4830	4190	4550	734	5360	2640	1500
22	4520	2400	e1500	e1300	e1100	4910	4190	4080	649	4850	2290	1420
23	4290	2360	e1500	e1300	e1110	4730	3980	3680	657	4670	1940	1400
24	4290	2160	e1480	e1300	e1110	4520	4450	3330	694	4030	1840	1320
25	3970	2140	e1450	e1300	e1120	4250	4580	3110	586	3470	2610	1330
26	3760	2010	e1420	e1300	e1130	3920	4230	2870	549	3200	6030	1230
27	3490	1600	e1400	e1300	e1140	3830	3990	2750	517	2900	7640	1240
28	3320	1950	e1350	e1300	e1150	3530	3540	2650	610	2890	7090	1170
29	3160	2060	e1300	e1300	---	3700	3280	2720	525	2790	6530	1130
30	2940	2100	e1250	e1300	---	3480	3160	2790	615	2370	5900	1410
31	2900	---	e1200	e1300	---	3200	---	2550	---	2120	5480	---
TOTAL	85020	63140	48800	40210	31210	89810	83470	126840	36782	127341	75577	66530
MEAN	2743	2105	1574	1297	1115	2897	2782	4092	1226	4108	2438	2218
MAX	4850	2570	2330	1400	1260	4910	4580	9060	2480	6950	7640	4960
MIN	1650	1600	1200	1140	1070	1160	1450	2550	517	515	769	1130
AC-FT	168600	125200	96790	79760	61910	178100	165600	251600	72960	252600	149900	132000
+	26.0	-382	-697	-756	-649	188	397	.897	-133	795	193	17.2
MEAN ‡	2769	1723	897	541	466	3085	3179	4989	1093	4903	2631	2235
CFSM‡	.81	.50	.26	.16	.14	.90	.93	1.45	.32	1.43	.77	.65
IN.‡	.93	.56	.30	.18	.15	1.04	1.04	1.67	.36	1.65	.89	.73

CAL. YR. 94 TOTAL 1155123 MEAN 3165 MAX 17800 MIN 743 MEAN‡ 3215 CFSM‡ .94 IN‡. 12.73
WTR. YR. 95 TOTAL 87430 MEAN 2397 MAX 9060 MIN 515 MEAN‡ 2393 CFSM‡ .70 IN‡ 9.47

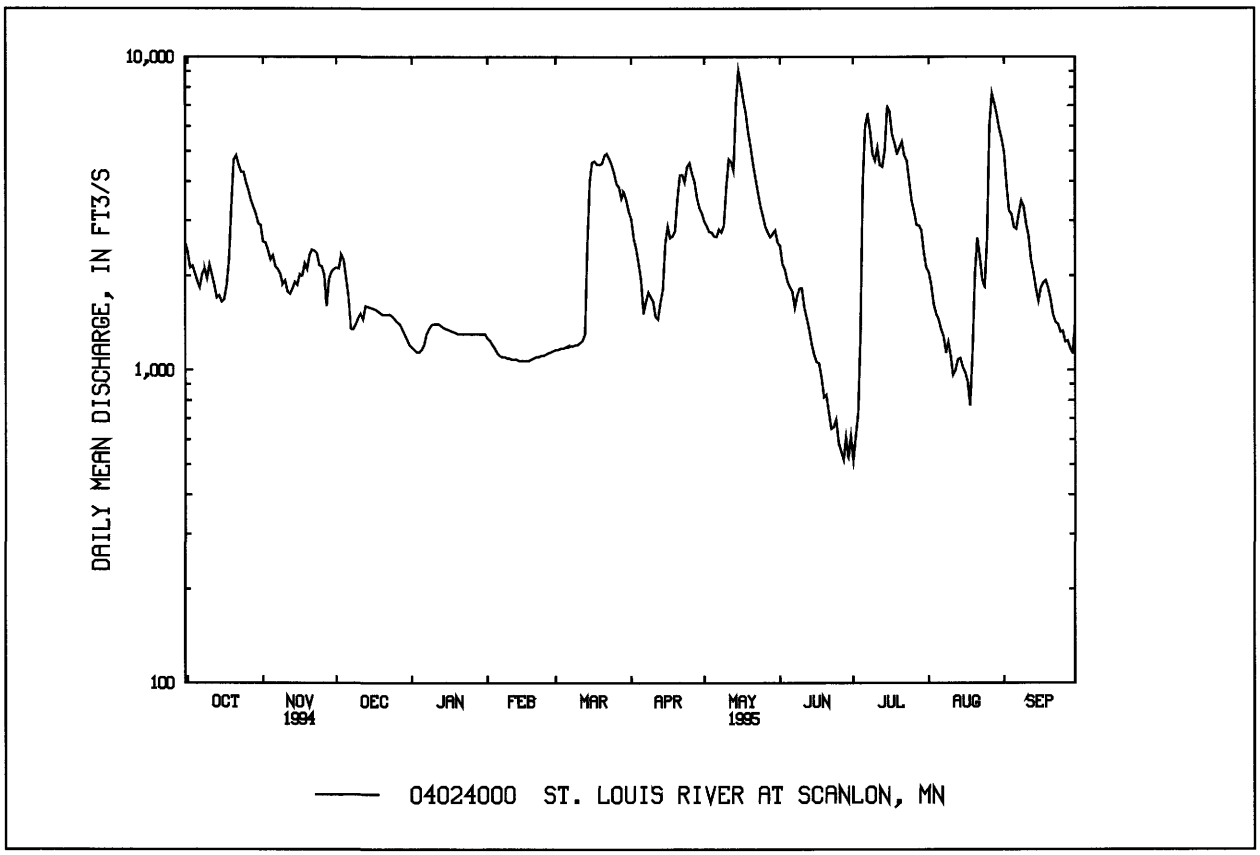
STREAMS TRIBUTARY TO LAKE SUPERIOR

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1908 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1970	1659	1253	1061	1042	1434	5537	5114	3593	2376	1671	1784
MAX	7508	8518	2993	2272	2200	6026	15230	22210	16480	9492	9197	7594
(WY)	1974	1972	1972	1966	1966	1945	1948	1950	1908	1993	1953	1928
MIN	407	473	282	265	249	301	667	593	458	199	377	402
(WY)	1935	1935	1911	1911	1924	1924	1977	1977	1988	1988	1977	1934

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1908 - 1995	
ANNUAL TOTAL	1155123		874730			
ANNUAL MEAN	3165		2397		2361	
HIGHEST ANNUAL MEAN					4276	1972
LOWEST ANNUAL MEAN					945	1924
HIGHEST DAILY MEAN	17800	Apr 16	9060	May 15	37900	May 9 1950
LOWEST DAILY MEAN	743	Aug 21	515	Jul 1	88	Aug 24 1977
ANNUAL SEVEN-DAY MINIMUM	827	Aug 18	560	Jun 25	134	Jul 26 1988
INSTANTANEOUS PEAK FLOW			9970	May 15	37900	May 9 1950
INSTANTANEOUS PEAK STAGE			7.53	May 15	15.80	May 9 1950
ANNUAL RUNOFF (AC-FT)	2291000		1735000		1711000	
ANNUAL RUNOFF (CFSM)	.92		.70		.69	
ANNUAL RUNOFF (INCHES)	12.53		9.49		9.35	
10 PERCENT EXCEEDS	7170		4650		5250	
50 PERCENT EXCEEDS	2020		1870		1380	
90 PERCENT EXCEEDS	1060		1090		640	



STREAMS TRIBUTARY TO LAKE SUPERIOR

04024098 DEER CREEK NEAR HOLYOKE, MN

LOCATION.--Lat 46°31'30", long 92°23'20", in NE¼SE¼ sec.29, T.47 N., R.16 W., Carlton County, Hydrologic Unit 04010301, on left bank 179 ft west of State Highway No. 23, 0.9 mi upstream from mouth and 4.0 mi north of Holyoke.

DRAINAGE AREA.--7.77 mi².

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	4.3	e3.6	e1.6	e1.5	e1.7	5.7	6.2	1.8	.67	2.8	2.4
2	2.6	4.6	e3.5	e1.6	e1.5	e1.7	5.8	5.8	1.7	1.6	2.4	2.2
3	2.5	4.6	e3.3	e1.6	e1.5	e1.7	6.1	5.7	1.7	5.1	1.8	2.1
4	2.5	4.2	e3.3	e1.6	e1.5	e1.7	e6.0	5.4	1.6	3.5	1.6	2.4
5	2.7	4.2	e3.2	e1.6	e1.5	e1.7	e4.7	5.3	1.5	13	1.7	1.9
6	3.1	3.3	e3.1	e1.5	e1.5	e1.7	4.0	4.8	1.7	12	2.2	2.0
7	3.7	3.2	e3.0	e1.5	e1.5	e1.7	3.7	4.5	1.9	5.4	2.9	2.4
8	3.7	3.1	e2.9	e1.5	e1.5	e1.8	4.1	5.1	1.6	1.9	2.0	1.9
9	3.2	3.1	e2.8	e1.5	e1.5	e2.1	4.0	104	1.5	1.6	1.7	1.8
10	2.8	3.2	e2.7	e1.5	e1.5	e2.8	3.8	33	2.4	13	1.6	1.7
11	2.8	3.2	e2.6	e1.5	e1.5	e4.9	3.9	16	2.4	4.7	1.9	2.1
12	2.9	3.1	e2.6	e1.5	e1.5	e10	29	11	1.7	2.8	1.4	1.9
13	2.8	3.6	e2.5	e1.5	e1.6	e45	24	28	1.5	3.0	2.0	1.6
14	2.9	3.8	e2.4	e1.5	e1.6	e110	15	86	1.5	2.3	2.0	1.5
15	2.9	3.3	e2.4	e1.5	e1.6	e90	10	24	1.5	1.8	1.7	1.6
16	3.2	3.4	e2.3	e1.5	e1.7	e66	7.5	21	1.5	1.7	1.7	2.1
17	4.4	3.4	e2.2	e1.5	e1.7	e50	6.8	15	1.5	2.3	1.6	1.6
18	8.7	4.0	e2.2	e1.5	e1.7	e45	7.7	9.6	1.6	2.5	1.7	1.5
19	8.7	4.1	e2.1	e1.5	e1.7	e40	27	6.6	1.5	1.9	4.9	1.7
20	6.3	3.8	e2.1	e1.5	e1.7	e45	46	5.5	1.3	3.4	2.2	1.9
21	4.3	e8.4	e2.0	e1.5	e1.7	e25	35	4.5	1.1	2.2	1.7	1.6
22	5.0	e7.1	e2.0	e1.5	e1.7	e19	22	4.0	.90	3.1	1.6	1.6
23	7.1	e5.3	e1.9	e1.5	e1.7	e15	16	3.5	.89	2.3	1.7	2.2
24	5.8	e4.4	e1.9	e1.5	e1.7	e13	26	3.2	.79	2.4	19	2.4
25	4.8	e4.2	e1.8	e1.5	e1.7	12	17	2.5	.65	2.4	65	2.4
26	4.2	e4.0	e1.8	e1.5	e1.7	13	12	2.3	.77	3.3	17	2.2
27	3.8	e3.9	e1.7	e1.5	e1.7	13	8.9	2.3	.75	2.5	6.4	2.2
28	3.6	e3.8	e1.7	e1.5	e1.7	9.5	7.7	4.1	.97	2.7	14	1.9
29	3.6	e3.7	e1.6	e1.5	---	11	7.0	4.0	.79	2.2	6.9	1.7
30	3.3	e3.7	e1.6	e1.5	---	6.6	6.7	2.6	.79	2.4	4.0	3.3
31	3.7	---	e1.6	e1.5	---	6.1	---	2.1	---	4.4	2.9	---
TOTAL	124.4	122.0	74.4	47.0	44.9	667.7	383.1	437.6	41.80	114.07	182.0	59.8
MEAN	4.01	4.07	2.40	1.52	1.60	21.5	12.8	14.1	1.39	3.68	5.87	1.99
MAX	8.7	8.4	3.6	1.6	1.7	110	46	104	2.4	13	65	3.3
MIN	2.5	3.1	1.6	1.5	1.5	1.7	3.7	2.1	.65	.67	1.4	1.5
AC-FT	247	242	148	93	89	1320	760	868	83	226	361	119
CFSM	.52	.52	.31	.20	.21	2.77	1.64	1.82	.18	.47	.76	.26
IN.	.60	.58	.36	.23	.21	3.20	1.83	2.10	.20	.55	.87	.29

e Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04024098 DEER CREEK NEAR HOLYOKE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1976 - 1995, BY WATER YEAR (WY)

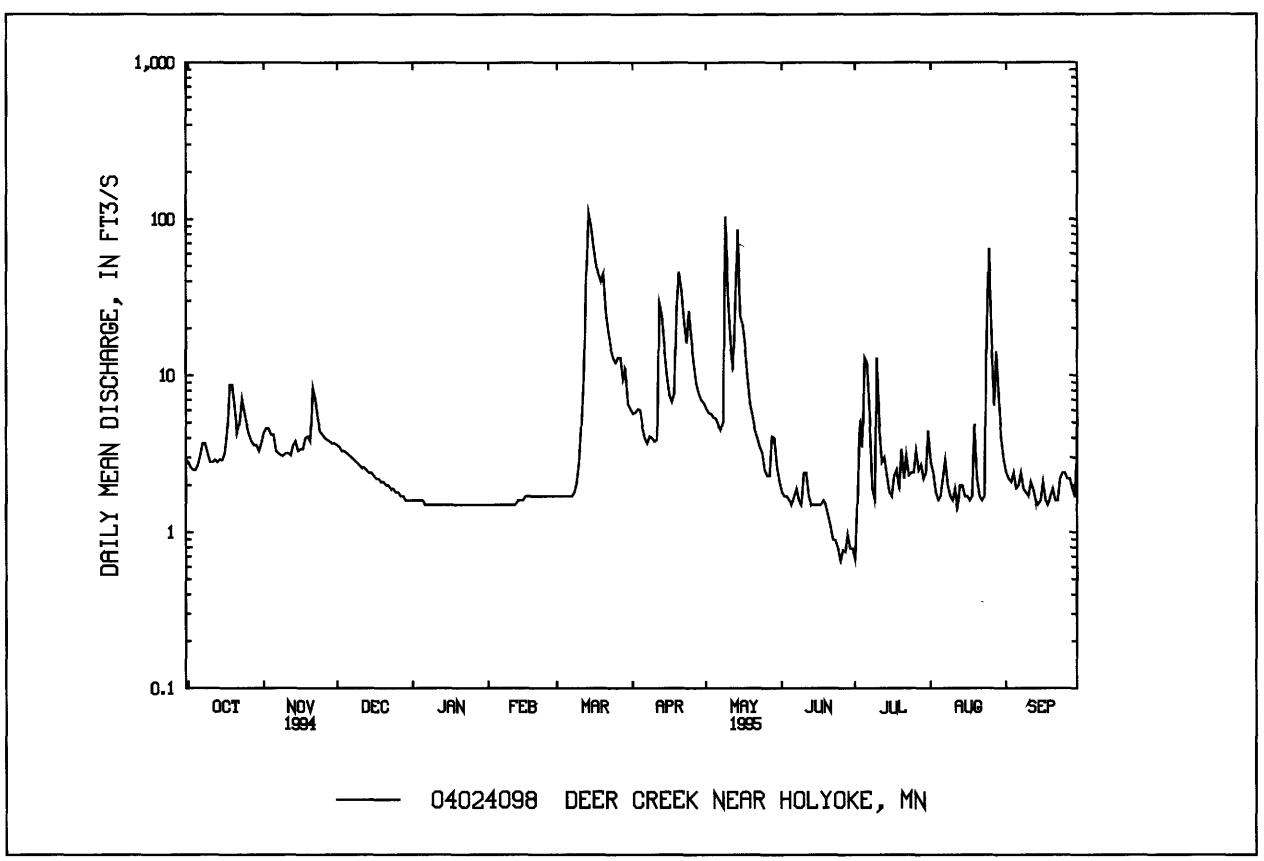
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	6.43	4.44	2.46	1.87	2.29	8.93	22.9	11.0	7.90	6.85	4.97	8.27
MAX	21.8	12.2	3.86	2.92	5.87	21.5	90.8	24.3	31.4	22.3	36.9	30.4
(WY)	1983	1983	1983	1992	1981	1995	1986	1991	1993	1991	1986	1986
MIN	1.69	1.59	1.31	.97	1.06	2.34	4.11	2.15	1.39	1.50	.89	1.24
(WY)	1988	1977	1977	1979	1979	1986	1977	1980	1995	1988	1982	1993

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1976 - 1995	
ANNUAL TOTAL	1961.1		2298.77			
ANNUAL MEAN	5.37		6.30		7.38	
HIGHEST ANNUAL MEAN					19.3	1986
LOWEST ANNUAL MEAN					3.65	1980
HIGHEST DAILY MEAN	249	Apr 26	110	Mar 14	553	Sep 6 1990
LOWEST DAILY MEAN	1.3	Aug 9	.65	Jun 25	.21	Jul 2 1976
ANNUAL SEVEN-DAY MINIMUM	1.4	Aug 6	.77	Jun 25	.47	Aug 10 1982
INSTANTANEOUS PEAK FLOW			218	May 9	2000[a]	Sep 3 1985
INSTANTANEOUS PEAK STAGE			14.88	May 9	32.76[b]	Sep 3 1985
INSTANTANEOUS LOW FLOW			.26	Jul 2	.20[c]	Aug 13 1982
ANNUAL RUNOFF (AC-FT)	3890		4560		5350	
ANNUAL RUNOFF (CFSM)	.69		.81		.95	
ANNUAL RUNOFF (INCHES)	9.39		11.01		12.91	
10 PERCENT EXCEEDS	8.0		13		14	
50 PERCENT EXCEEDS	2.8		2.4		2.5	
90 PERCENT EXCEEDS	1.6		1.5		1.4	

a From rating curve extended above 1000 ft^3/s on basis of flow through culvert computations.

b From floodmark.

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



RED RIVER OF THE NORTH BASIN

05030500 OTTER TAIL RIVER NEAR ELIZABETH, MN

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

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	305	160	255	e215	e305	e310	518	664	625	302	285	232
2	298	160	241	e215	e305	e320	524	656	598	303	288	230
3	302	160	246	e195	e300	e320	554	652	586	319	281	229
4	295	171	251	e190	e300	e320	565	653	582	323	272	226
5	287	190	263	e185	e300	e320	560	652	559	364	270	223
6	272	189	263	e185	e305	e315	561	652	556	368	269	202
7	254	171	265	e180	e305	e310	588	656	558	365	267	218
8	219	165	276	e185	e305	e310	594	660	547	363	267	206
9	222	167	292	e190	e300	e310	590	675	546	373	267	201
10	257	172	e290	e210	e300	e300	591	677	558	368	264	206
11	263	174	e290	e250	e300	e320	600	677	553	366	264	201
12	236	175	e292	e265	e300	e420	616	682	545	375	268	194
13	200	176	e293	e260	e300	e620	645	692	534	371	268	178
14	186	176	e295	e265	e275	622	659	700	515	386	244	165
15	196	177	e290	e275	e260	519	666	701	482	396	225	157
16	198	199	e290	e280	e250	454	664	702	436	389	226	162
17	185	219	e290	e280	e250	407	664	698	420	403	229	164
18	180	211	e290	e280	e250	393	690	693	418	397	230	183
19	178	209	e290	e280	e260	387	687	687	389	395	214	193
20	178	218	e290	e275	e280	370	678	679	358	392	202	182
21	178	248	e285	e275	e300	354	680	670	337	370	203	179
22	178	265	e280	e275	e310	357	676	666	335	367	204	165
23	177	277	e280	e270	e310	364	677	647	336	369	204	156
24	176	286	e280	e270	e310	383	679	641	336	370	175	156
25	170	309	e285	e270	e310	392	678	648	332	359	197	156
26	168	315	e290	e270	e310	408	676	644	336	357	238	149
27	161	307	e290	e270	e310	448	672	645	322	344	266	144
28	158	290	e290	e270	e310	472	672	648	314	338	277	135
29	159	295	e290	e275	---	485	668	641	313	324	253	147
30	159	281	e290	e280	---	490	666	639	306	309	222	150
31	159	---	e250	e290	---	504	---	633	---	287	230	---
TOTAL	6554	6512	8662	7675	8220	12304	18958	20630	13632	11112	7569	5489
MEAN	211	217	279	248	294	397	632	665	454	358	244	183
MAX	305	315	295	290	310	622	690	702	625	403	288	232
MIN	158	160	241	180	250	300	518	633	306	287	175	135
AC-FT	13000	12920	17180	15220	16300	24400	37600	40920	27040	22040	15010	10890
CFSM	.17	.18	.23	.20	.24	.32	.51	.54	.37	.29	.20	.15
IN.	.20	.20	.26	.23	.25	.37	.57	.62	.41	.34	.23	.17

e Estimated.

RED RIVER OF THE NORTH BASIN

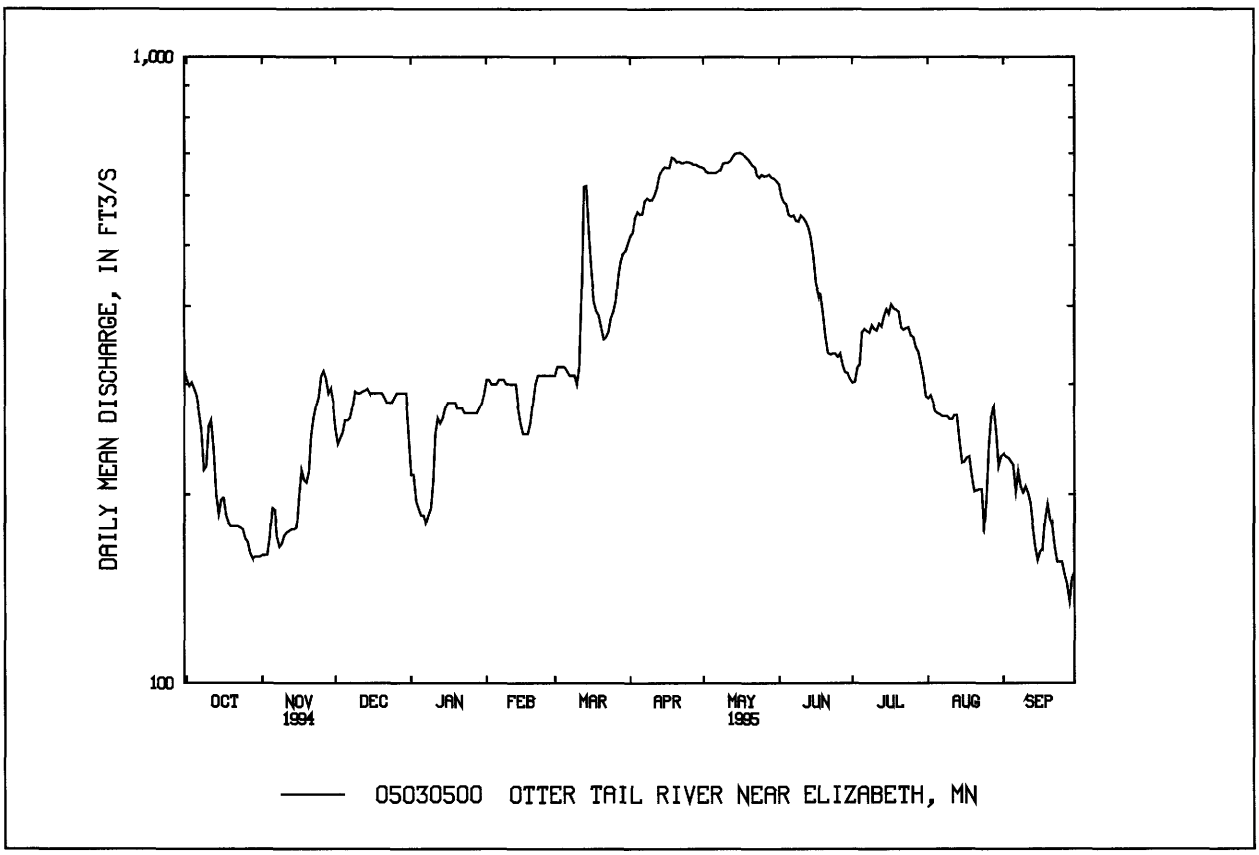
05030500 OTTER TAIL RIVER NEAR ELIZABETH, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	363	310	303	276	314	385	513	620	575	519	386	359
MAX	740	571	489	400	439	443	632	741	702	745	759	817
(WY)	1994	1994	1994	1994	1994	1994	1995	1994	1993	1993	1993	1993
MIN	139	143	141	181	209	314	357	453	454	358	233	183
(WY)	1993	1993	1993	1993	1993	1993	1993	1993	1995	1995	1992	1995

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1992 - 1995	
ANNUAL TOTAL	147044		127317			
ANNUAL MEAN	403		349		419	
HIGHEST ANNUAL MEAN					495	1994
LOWEST ANNUAL MEAN					349	1995
HIGHEST DAILY MEAN	788	May 17	702	May 16	837	Sep 20 1993
LOWEST DAILY MEAN	157	Aug 25	135	Sep 28	122	Oct 27 1992
ANNUAL SEVEN-DAY MINIMUM	159	Oct 28	148	Sep 24	124	Oct 26 1992
INSTANTANEOUS PEAK FLOW			714	Apr 18	842	Sep 20 1993
INSTANTANEOUS PEAK STAGE			7.18	Apr 18	8.52	Feb 18 1994
INSTANTANEOUS LOW FLOW			82a	Sep 28	69	Sep 13 1994
ANNUAL RUNOFF (AC-FT)	291700		252500		303700	
ANNUAL RUNOFF (CFSM)	.33		.28		.34	
ANNUAL RUNOFF (INCHES)	4.45		3.85		4.63	
10 PERCENT EXCEEDS	673		652		733	
50 PERCENT EXCEEDS	400		293		367	
90 PERCENT EXCEEDS	190		178		164	

a Result of regulation.



RED RIVER OF THE NORTH BASIN

05045950 ORWELL LAKE NEAR FERGUS FALLS, MN

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

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

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

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

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

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

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

EXTREMES FOR CURRENT YEAR.--Maximum contents, 12,800 acre-ft, Mar. 20 elevation, 1068.79 ft; minimum, 7630 acre-ft, Feb. 15, elevation, 1063.11 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1064.48	8710	
Oct. 31	1063.95	8260	-450
Nov. 30	1064.45	8680	+420
Dec. 31	1064.44	8670	-10
CAL YR 1994			+290
Jan. 31	1064.25	8510	-160
Feb. 28	1064.25	8510	0
Mar. 31	1066.50	10500	+1990
Apr. 30	1063.83	8170	-2330
May 31	1063.89	8220	+50
June 30	1063.62	8020	-200
July 31	1063.62	8020	0
Aug. 31	1064.07	8360	+340
Sept. 30	1063.89	8220	-140
WTR YR 1995			-490

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RED RIVER OF THE NORTH BASIN

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

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

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

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	426	263	471	e480	440	e450	813	878	844	412	308	324
2	426	257	410	e480	440	e450	984	878	840	413	344	324
3	426	249	354	e470	429	e450	1040	878	837	426	381	324
4	426	244	354	458	419	e450	901	854	833	426	354	324
5	425	244	372	300	419	e450	889	833	785	479	328	295
6	419	244	391	198	426	e450	912	833	727	597	324	272
7	385	244	309	204	492	e430	835	827	641	652	324	272
8	362	244	231	204	519	419	777	867	595	652	324	272
9	362	252	287	379	473	406	777	901	670	648	324	272
10	358	290	330	496	437	392	777	957	723	602	324	272
11	313	324	331	490	429	383	779	1000	723	573	353	272
12	276	324	367	469	426	379	823	1000	723	548	377	272
13	265	324	398	452	437	457	890	1000	723	539	377	272
14	265	284	414	452	422	731	924	1000	680	477	377	272
15	265	246	433	447	362	883	949	1000	641	584	374	279
16	265	237	e440	446	327	687	949	975	618	584	303	279
17	299	271	e450	446	309	115	949	929	606	584	251	279
18	324	299	e450	441	315	595	949	903	606	584	248	244
19	333	301	e450	440	323	874	949	903	547	533	244	197
20	339	301	e450	427	324	1100	949	903	482	496	244	179
21	339	301	e460	412	324	1100	927	903	471	506	272	179
22	339	301	e460	412	387	797	910	903	476	513	293	201
23	339	324	e460	412	e450	790	910	883	477	513	248	217
24	328	339	e460	408	e450	777	910	846	477	486	208	217
25	294	339	e460	405	e460	767	910	821	477	442	258	242
26	258	339	e460	405	e460	765	905	821	477	433	294	258
27	216	339	e460	405	e450	579	903	821	477	433	294	258
28	212	383	e460	405	e450	398	892	821	477	433	309	241
29	227	440	e470	410	---	504	883	821	477	433	324	235
30	231	475	e480	429	---	1040	878	835	446	433	324	237
31	247	---	e480	440	---	998	---	846	---	358	324	---
TOTAL	9989	9022	12802	12722	11599	19066	26843	27640	18576	15792	9631	7781
MEAN	322	301	413	410	414	615	895	892	619	509	311	259
MAX	426	475	480	496	519	1100	1040	1000	844	652	381	324
MIN	212	237	231	198	309	115	777	821	446	358	208	179
AC-FT	19810	17900	25390	25230	23010	37820	53240	54820	36850	31320	19100	15430
CFSM	.18	.16	.23	.22	.23	.34	.49	.49	.34	.28	.17	.14

e Estimated.

RED RIVER OF THE NORTH BASIN

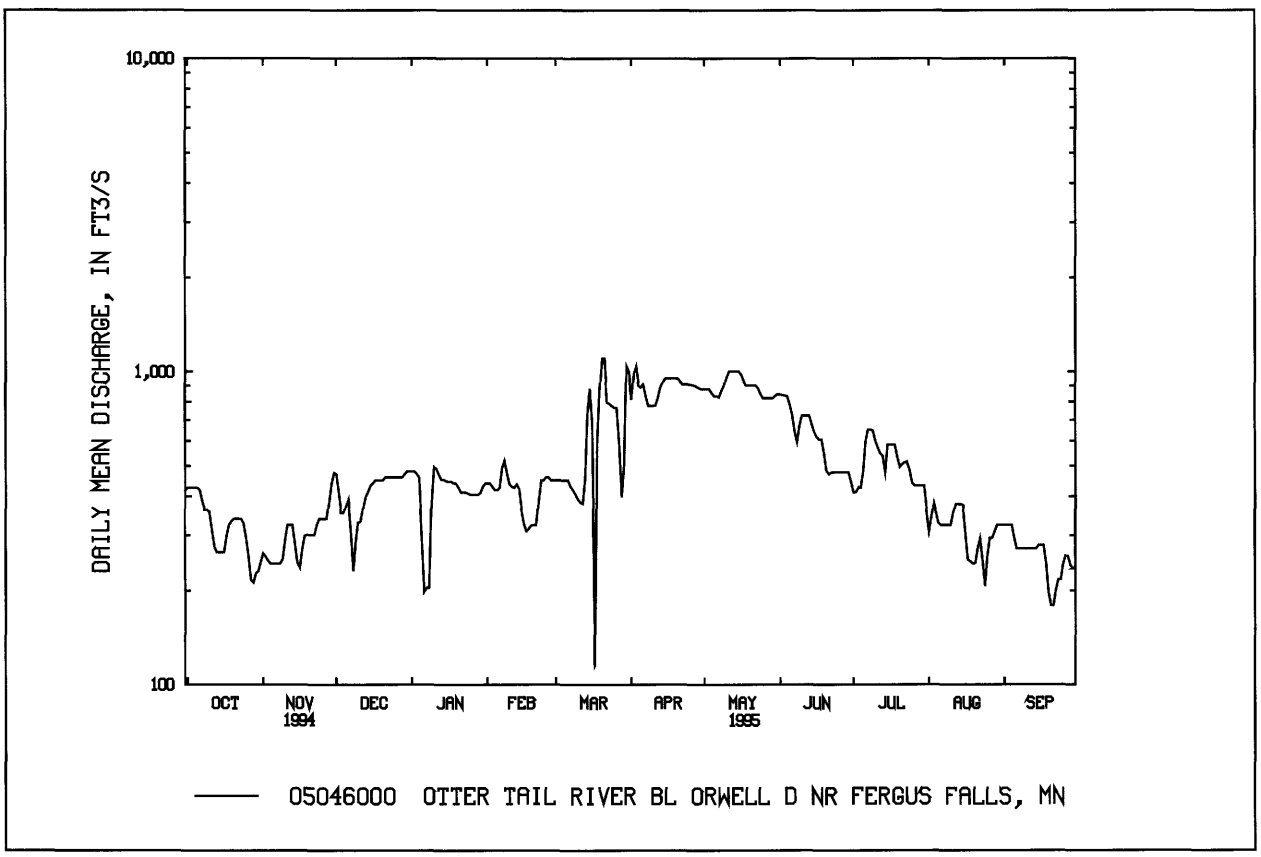
05046000 OTTER TAIL RIVER BELOW ORWELL DAM, NEAR FERGUS FALLS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	236	243	231	222	226	309	465	565	554	407	275	234
MAX	973	831	706	603	647	724	1051	1427	1425	1246	1080	1026
(WY)	1994	1986	1987	1986	1994	1994	1986	1986	1986	1953	1985	1993
MIN	9.15	8.42	8.10	15.1	10.8	23.5	39.5	14.1	14.2	12.8	11.5	7.99
(WY)	1977	1977	1977	1937	1935	1937	1934	1977	1934	1936	1934	1934

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1931 - 1995	
ANNUAL TOTAL	205193		181463			
ANNUAL MEAN	562		497		331	
HIGHEST ANNUAL MEAN					842	1986
LOWEST ANNUAL MEAN					20.4	1934
HIGHEST DAILY MEAN	1230	May 7	1100	Mar 20	1670	Jun 20 1953
LOWEST DAILY MEAN	164	Aug 30	115	Mar 17	1.6	Feb 7 1937
ANNUAL SEVEN-DAY MINIMUM	236	Oct 27	205	Sep 19	5.9	Sep 15 1934
INSTANTANEOUS PEAK FLOW			1250	Mar 20	1710	Jun 17 1953
INSTANTANEOUS PEAK STAGE			4.28	Mar 20	5.60a	Jun 17 1953
INSTANTANEOUS LOW FLOW			11	Jul 14	.70b	Aug 5 1970
ANNUAL RUNOFF (AC-FT)	407000		359900		239700	
ANNUAL RUNOFF (CFSM)	.31		.27		.18	
10 PERCENT EXCEEDS	884		896		726	
50 PERCENT EXCEEDS	550		433		258	
90 PERCENT EXCEEDS	265		255		32	

a Backwater from aquatic vegetation.
b Result of regulation.



05046000 OTTER TAIL RIVER BELOW ORWELL DAM, NEAR FERGUS FALLS, MN--Continued
(National Water Quality Assessment Station)

PERIOD OF RECORD.-- Water years 1961-63, 65-66, 85-86, and 93 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)
NOV										
08...	0800	5.5	5.0	737	--	448	12.2	8.6	8.1	201
FEB										
01...	0900	1.0	-1.0	730	459	476	15.4	7.6	7.9	196
MAR										
15...	1200	--	3.5	745	486	470	12.8	8.1	7.7	211
APR										
05...	0930	2.5	-0.5	730	419	426	13.9	8.3	7.9	172
MAY										
18...	0745	14.5	18.0	735	415	419	10	8.3	7.8	181
JUN										
07...	1000	21.5	11.5	720	414	420	7.6	8.4	8.0	187
27...	0530	23.5	20.0	735	419	410	7.9	8.4	8.0	191
AUG										
24...	1210	24.5	27.0	739	392	408	7.6	8.8	8.0	186

DATE	ALKALINITY LAB (MG/L AS CACO3) (90410)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)
NOV										
08...	214	--	--	<0.015	<0.010	0.50	0.70	<0.050	0.030	<0.010
FEB										
01...	225	0	239	0.190	<0.010	0.80	0.90	0.120	0.040	0.010
MAR										
15...	214	0	257	0.150	0.020	0.70	0.80	0.500	0.050	0.040
APR										
05...	190	0	210	0.020	0.010	0.50	1.3	0.330	0.290	0.020
MAY										
18...	199	0	221	<0.015	<0.010	0.50	0.70	<0.050	0.030	<0.010
JUN										
07...	201	10	206	--	--	--	--	--	--	--
27...	204	16	221	0.040	0.010	0.60	0.80	<0.050	0.080	0.040
AUG										
24...	191	17	193	0.020	<0.010	0.70	1.5	0.070	0.110	0.020

RED RIVER OF THE NORTH BASIN

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
NOV									
08...	<0.010	7.7	1.6	38	30	11	4.9	13	17
FEB									
01...	0.010	--	--	39	30	9.9	5.1	12	11
MAR									
15...	0.040	7.6	0.50	40	29	11	5.8	14	13
APR									
05...	<0.010	--	--	39	25	8.1	4.5	11	19
MAY									
18...	<0.010	--	--	38	27	7.9	3.9	9.8	15
JUN									
07...	--	--	--	37	27	8.3	3.8	9.0	12
27...	0.030	--	--	37	27	8.3	1.8	9.7	13
AUG									
24...	<0.010	8.6	4.4	32	28	9.2	4.1	11	13

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SAMPLE PURPOSE CODE (71999)	SAM-PLING METHOD, CODES (82398)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV									
08...	0.10	15	18	2	267	15.00	10	8	96
FEB									
01...	0.10	18	23	19	276	15.00	40	1	92
MAR									
15...	0.10	17	38	32	274	15.00	10	5	98
APR									
05...	0.10	14	34	13	240	15.00	10	5	98
MAY									
18...	0.10	10	27	4	243	15.00	10	15	100
JUN									
07...	0.10	11	10	7	247	15.00	10	16	96
27...	0.10	13	10	4	245	15.00	10	9	100
AUG									
24...	0.20	18	20	3	235	15.00	10	16	99

RED RIVER OF THE NORTH BASIN

05050000 BOIS DE SIOUX RIVER NEAR WHITE ROCK, SD

LOCATION.--Lat 45°51'45", long 96°34'25", in $SW^1/_4SW^1/_4$ sec.27, T.128 N., R.47 W., Roberts County, Hydrologic Unit 09020101, on Sisseton Indian Reservation, on left bank just downstream from Big Slough Outlet, 300 ft downstream from White Rock Dam, 4 mi south of White Rock, SD and 5 mi northwest of Wheaton.

DRAINAGE AREA.--1,160 mi^2, approximately.

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	6.9	6.6	4.7	5.2	6.9	1330	1210	1190	7.5	4.2	8.3
2	2.1	6.1	6.6	4.4	5.0	7.6	1330	1200	1190	7.4	4.1	8.0
3	5.1	5.6	6.8	4.3	5.3	e7.5	1340	1190	1200	7.3	4.1	7.8
4	5.9	6.0	6.8	e4.2	4.9	e7.5	1300	1180	1190	8.2	3.9	7.5
5	7.8	6.2	8.7	e4.0	4.8	e8.0	1330	1210	1190	11	3.7	7.4
6	9.1	5.8	8.4	e3.9	5.3	e11	1300	1240	1160	18	3.5	7.3
7	9.9	6.6	7.6	e3.9	5.9	e20	1280	1240	1140	13	3.6	6.7
8	9.7	5.5	7.3	e3.9	5.8	e50	1270	1240	1130	12	5.2	6.5
9	9.4	5.4	6.8	e4.0	6.0	e80	1250	1300	1100	11	6.3	6.1
10	10	7.6	6.7	e4.1	e5.8	e110	1240	1320	1080	91	5.7	5.7
11	12	7.8	6.4	e4.2	e5.6	e200	1240	1300	1050	191	5.8	5.6
12	9.7	6.3	6.4	e4.3	e5.6	e300	1250	1270	1020	234	6.8	5.6
13	7.9	7.9	5.5	e4.5	e5.4	e500	1280	1270	993	242	7.1	5.4
14	7.8	6.3	4.8	e4.6	e5.3	e630	1330	1330	950	282	7.1	5.1
15	8.3	6.0	5.2	e4.8	e5.2	e350	1320	1320	891	289	6.8	5.5
16	11	11	4.8	e5.0	e5.3	e160	1310	1290	709	293	6.5	5.9
17	16	6.6	4.8	e5.2	e5.4	e160	1300	1250	578	297	6.2	5.7
18	66	6.6	4.4	e5.5	e5.6	e140	1310	1230	537	254	6.2	5.4
19	158	4.9	4.5	e5.4	e5.8	e100	1290	1230	395	218	5.9	5.3
20	220	5.5	4.5	e5.2	e6.0	e65	1280	1240	288	167	5.5	5.1
21	204	8.3	4.3	e5.0	e6.0	e90	1280	1220	274	121	5.3	5.0
22	160	10	4.2	e4.8	e6.2	e120	1250	1220	182	120	5.0	5.0
23	161	10	4.1	e4.7	e6.2	e170	1250	1200	136	118	4.4	5.0
24	213	8.2	4.1	e4.6	e6.4	e280	1240	1190	133	72	5.7	5.2
25	262	7.0	3.9	e4.5	e6.4	e430	1240	1170	130	5.4	9.3	5.0
26	212	6.5	3.9	e4.4	e6.6	e520	1250	1200	109	5.2	13	4.9
27	205	6.3	4.2	e4.5	6.8	e400	1240	1230	50	5.2	12	4.9
28	144	8.0	4.3	e4.7	6.8	e250	1230	1220	8.6	4.9	11	4.9
29	8.5	6.2	5.1	e4.9	---	e150	1220	1210	8.3	4.7	9.9	6.5
30	6.9	7.0	5.5	e5.2	---	e140	1220	1210	7.9	4.4	9.6	57
31	6.2	---	4.8	5.7	---	e1000	---	1200	---	4.3	8.8	---
TOTAL	2170.2	208.1	172.0	143.1	160.6	6463.5	38300	38330	20019.8	3118.5	202.2	229.3
MEAN	70.0	6.94	5.55	4.62	5.74	208	1277	1236	667	101	6.52	7.64
MAX	262	11	8.7	5.7	6.8	1000	1340	1330	1200	297	13	57
MIN	1.9	4.9	3.9	3.9	4.8	6.9	1220	1170	7.9	4.3	3.5	4.9
AC-FT	4300	413	341	284	319	12820	75970	76030	39710	6190	401	455
CFSM	.06	.01	.00	.00	.00	.18	1.10	1.07	.58	.09	.01	.01
IN.	.07	.01	.01	.00	.01	.21	1.23	1.23	.64	.10	.01	.01

e Estimated.

RED RIVER OF THE NORTH BASIN

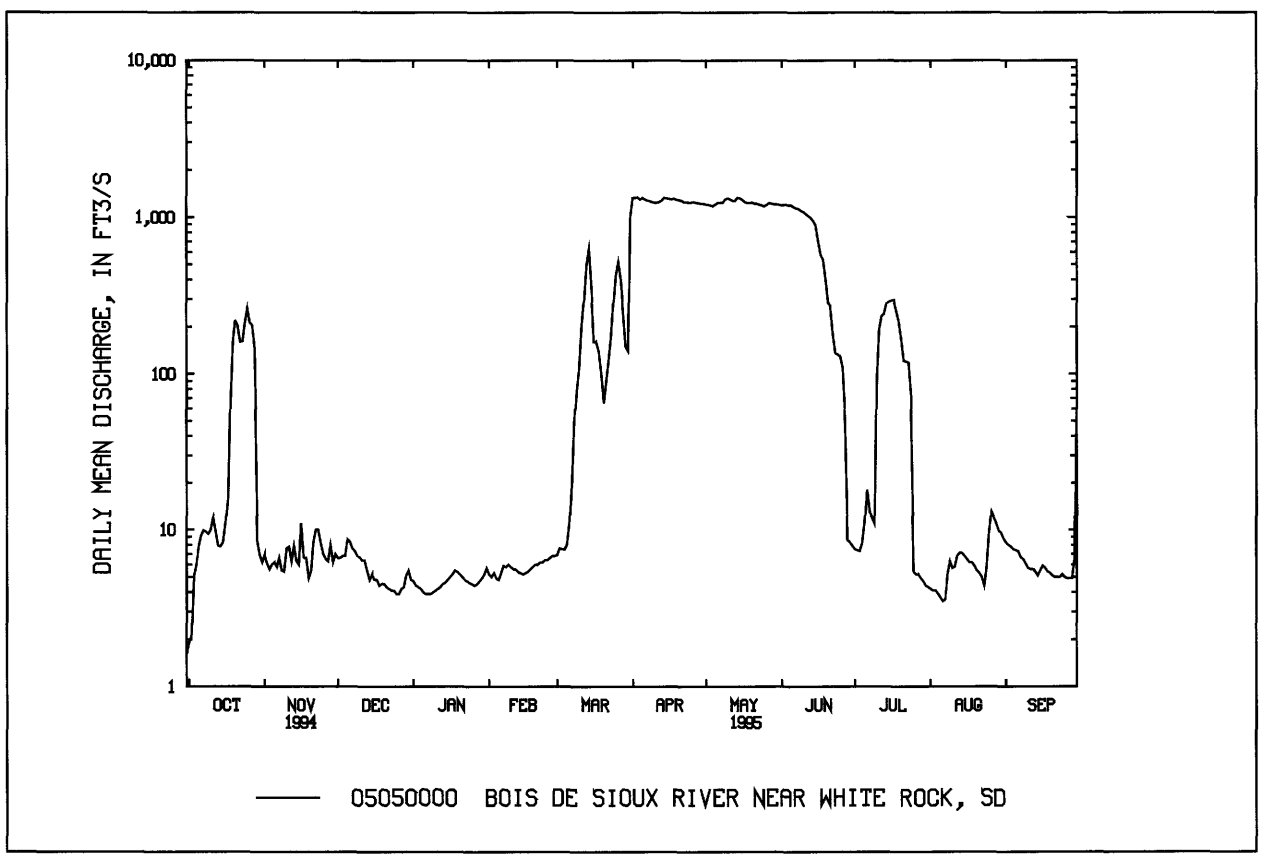
05050000 BOIS DE SIOUX RIVER NEAR WHITE ROCK, SD--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	26.6	11.7	4.89	2.63	3.36	32.1	236	278	243	166	73.6	36.5
MAX	535	258	57.5	36.0	53.0	227	1322	1310	1103	1035	1182	1062
(WY)	1994	1985	1985	1987	1966	1985	1969	1969	1986	1962	1993	1993
MIN	.000	.000	.000	.000	.000	.000	.000	.23	.010	.000	.000	.000
(WY)	1942	1942	1942	1942	1942	1942	1942	1977	1977	1961	1970	1960

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1942 - 1995		
ANNUAL TOTAL	116616.7		109517.3				
ANNUAL MEAN	319		300		93.1[a]		
HIGHEST ANNUAL MEAN					360		1994
LOWEST ANNUAL MEAN					.38		1977
HIGHEST DAILY MEAN	1420	Apr 9	1340	Apr 3	3380	Apr 20	1969
LOWEST DAILY MEAN	1.3	Sep 29	1.9	Oct 1	.00[b]	Oct 1	1941
ANNUAL SEVEN-DAY MINIMUM	2.0	Sep 26	3.9	Aug 1	.00	Oct 1	1941
INSTANTANEOUS PEAK FLOW			1690	Apr 5	3770	Apr 19-21	1969
INSTANTANEOUS PEAK STAGE			11.85	Apr 5	15.07[c]	Apr 19-21	1969
ANNUAL RUNOFF (AC-FT)	231300		217200		67430		
ANNUAL RUNOFF (CFSM)	.28		.26		.080		
ANNUAL RUNOFF (INCHES)	3.74		3.51		1.09		
10 PERCENT EXCEEDS	1100		1240		290		
50 PERCENT EXCEEDS	10		7.8		2.2		
90 PERCENT EXCEEDS	4.8		4.5		.00		

a Median of annual mean discharges is 55 ft^3/s.
b Many days, several years.
c From floodmark.



RED RIVER OF THE NORTH BASIN

05051300 BOIS DE SIOUX RIVER NEAR DORAN, MN

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

DRAINAGE AREA.--1,880 mi^2, approximately.

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	3.3	8.4	e5.6	e5.7	e7.4	1790	1360	1260	1.3	.58	4.8
2	3.8	3.5	e8.3	e5.3	e5.8	e7.5	1700	1360	1240	2.0	.72	4.3
3	5.6	3.4	e8.1	e4.8	e5.7	e8.0	1600	1360	1240	22	1.1	4.0
4	5.7	3.8	e8.0	e4.5	e5.6	e9.0	1540	1360	1240	101	1.4	3.5
5	6.4	4.0	e7.9	e4.3	e5.6	e10	1510	1350	1240	292	1.6	3.3
6	9.6	4.0	7.9	e4.3	e5.8	e15	1500	1360	1230	598	1.7	3.1
7	15	4.2	7.7	e4.3	e5.8	e35	1470	1390	1220	409	1.7	3.1
8	17	4.5	7.4	e4.3	e5.9	e70	1430	1400	1210	215	1.7	2.9
9	18	5.5	e7.3	e4.3	e6.0	e105	1400	1420	1200	131	1.7	2.7
10	18	6.0	e7.1	e4.5	e6.0	e170	1380	1630	1180	81	1.6	2.6
11	17	6.0	e7.0	e4.7	e5.9	e400	1370	1660	1170	191	2.0	2.6
12	16	7.0	e6.8	e4.9	e5.9	e800	1380	1600	1150	273	3.7	2.5
13	17	8.2	e6.6	e5.2	e5.8	e1600	1440	1560	1120	316	3.6	2.3
14	15	7.3	6.5	e5.4	e5.7	e3000	1810	1720	1090	328	3.3	2.2
15	15	7.4	6.4	e5.7	e5.6	3480	1990	1870	1050	356	3.3	2.1
16	17	8.4	e6.1	e6.0	e5.6	4010	1820	1750	968	362	3.3	2.1
17	20	10	e6.0	e6.2	e5.8	4200	1670	1610	747	369	3.1	2.1
18	24	11	e5.9	e6.4	e6.0	4030	1560	1510	654	365	2.7	2.0
19	80	9.4	e5.8	e6.3	e6.3	3720	1530	1430	584	288	2.3	2.0
20	168	10	e5.8	e6.0	e6.5	3150	1520	1380	375	263	2.1	1.9
21	253	11	e5.8	e5.8	e6.6	2250	1490	1360	317	165	2.2	1.9
22	188	8.9	e5.8	e5.7	e6.9	1210	1460	1350	275	130	2.2	1.9
23	161	e8.9	e5.8	e5.5	e7.0	1150	1430	1320	162	129	2.1	2.0
24	161	e9.0	e5.8	e5.3	e7.2	1670	1410	1300	137	126	2.5	2.0
25	246	e9.0	e6.0	e5.1	e7.4	1730	1400	1280	135	63	3.8	2.0
26	268	e8.7	e6.3	e5.0	e7.4	2060	1400	1270	134	8.5	4.8	2.1
27	212	e8.7	e6.5	e5.0	e7.4	3200	1410	1280	97	2.4	5.7	2.1
28	210	e8.7	e6.7	e5.2	e7.4	3410	1400	1300	44	.96	8.6	2.1
29	122	8.7	e6.9	e5.3	---	3490	1380	1300	7.9	.61	8.8	2.5
30	20	9.3	e6.9	e5.4	---	3170	1370	1290	2.7	.82	6.9	9.7
31	5.3	---	e6.2	e5.6	---	2310	---	1270	---	.72	5.6	---
TOTAL	2338.2	217.8	209.7	161.9	174.3	54476.9	45560	44400	22479.6	5590.31	96.40	84.4
MEAN	75.4	7.26	6.76	5.22	6.22	1757	1519	1432	749	180	3.11	2.81
MAX	268	11	8.4	6.4	7.4	4200	1990	1870	1260	598	8.8	9.7
MIN	3.8	3.3	5.8	4.3	5.6	7.4	1370	1270	2.7	.61	.58	1.9
AC-FT	4640	432	416	321	346	108100	90370	88070	44590	11090	191	167
CFSM	.04	.00	.00	.00	.00	.93	.81	.76	.40	.10	.00	.00
IN.	.05	.00	.00	.00	.00	1.08	.90	.88	.44	.11	.00	.00

e Estimated.

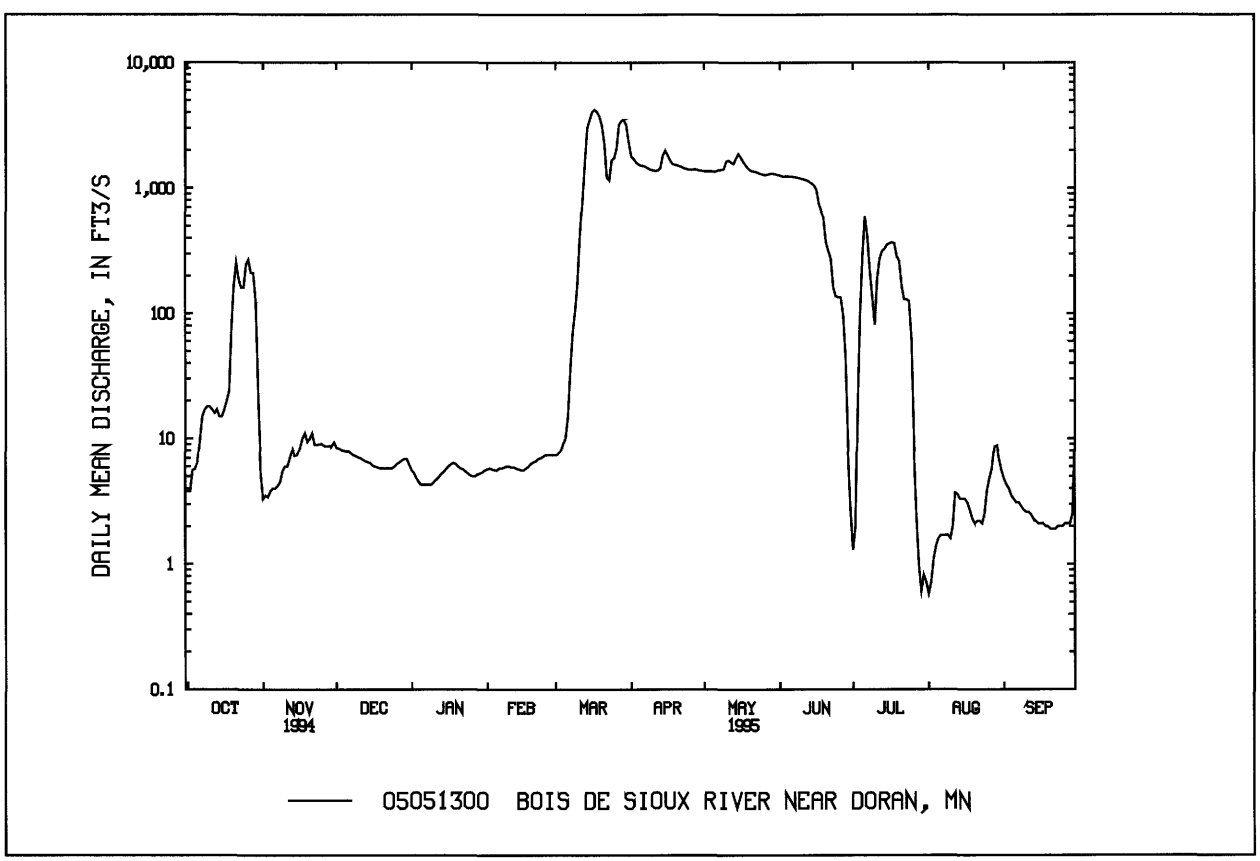
RED RIVER OF THE NORTH BASIN

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	127	8.10	5.00	2.74	3.65	441	733	531	369	614	314	280
MAX	592	20.2	8.48	7.05	7.86	1757	1580	1432	749	1477	1486	1244
(WY)	1994	1994	1990	1994	1994	1995	1994	1995	1995	1993	1993	1993
MIN	.026	1.97	.65	.077	.000	25.5	12.6	11.8	12.6	4.37	.000	.000
(WY)	1991	1991	1991	1991	1990	1990	1990	1990	1990	1990	1990	1990

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1990 - 1995	
ANNUAL TOTAL	156070.5		175789.51			
ANNUAL MEAN	428		482		287	
HIGHEST ANNUAL MEAN					553	1993
LOWEST ANNUAL MEAN					8.77	1990
HIGHEST DAILY MEAN	3080	Apr 1	4200	Mar 17	4200	Mar 17 1995
LOWEST DAILY MEAN	3.3	Nov 1	.58	Aug 1	.00	Jan 7 1990
ANNUAL SEVEN-DAY MINIMUM	3.6	Sep 26	.79	Jul 28	.00	Jan 7 1990
INSTANTANEOUS PEAK FLOW			4290	Mar 16	4290	Mar 16 1995
INSTANTANEOUS PEAK STAGE			22.33	Mar 16	22.33	Mar 16 1995
INSTANTANEOUS LOW FLOW			.58	Aug 1	.58	Aug 1 1995
ANNUAL RUNOFF (AC-FT)	309600		348700		208100	
ANNUAL RUNOFF (CFSM)	.23		.26		.15	
ANNUAL RUNOFF (INCHES)	3.09		3.48		2.08	
10 PERCENT EXCEEDS	1350		1510		1240	
50 PERCENT EXCEEDS	15		8.5		9.3	
90 PERCENT EXCEEDS	6.0		2.3		.13	



RED RIVER OF THE NORTH BASIN

05051300 BOIS DE SIOUX RIVER NEAR DORAN, MN--Continued
(National Water Quality Assessment Station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1993 to September 1995.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)
NOV										
08...	1000	4.5	4.0	735	--	4.5	1270	1260	11.6	8.4
FEB										
01...	1115	0.0	0.0	732	--	E5.7	1820	2090	4.6	7.4
MAR										
15...	1000	1.0	2.0	747	3420	--	384	383	11.0	7.8
APR										
05...	0630	1.0	-2.5	735	--	1510	769	765	11.9	8.2
MAY										
18...	0930	14.5	12.0	740	1520	--	904	901	5.4	7.9
JUN										
07...	1230	21.0	13.0	730	--	1220	985	979	8.9	8.2
27...	0700	21.5	19.5	737	104	--	1090	1070	7.5	8.8
AUG										
24...	1350	24.0	22.5	740	2.7	--	1540	1540	5.0	8.6

DATE	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKALINITY LAB (MG/L AS CACO3) (90410)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)
NOV										
08...	8.1	245	268	10	286	0.020	<0.010	1.0	1.2	<0.050
FEB										
01...	7.6	411	470	0	501	0.370	0.010	2.0	2.1	0.210
MAR										
15...	7.1	65	62	0	79	0.510	0.190	1.7	1.9	3.90
APR										
05...	7.3	124	133	0	151	0.220	0.150	1.2	1.6	3.70
MAY										
18...	7.4	133	141	0	162	0.220	0.050	1.4	1.4	0.600
JUN										
07...	7.8	158	170	0	192	0.080	0.050	0.80	1.4	0.320
27...	8.3	204	220	29	191	0.030	0.010	1.2	1.5	<0.050
AUG										
24...	8.1	265	279	--	--	0.030	<0.010	1.3	1.8	0.060

RED RIVER OF THE NORTH BASIN

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
NOV										
08...	0.200	0.030	0.030	13	0.90	110	80	50	11	19
FEB										
01...	0.100	0.070	0.070	--	--	210	140	88	19	38
MAR										
15...	0.620	0.530	0.450	12	1.7	32	16	15	6.4	9.4
APR										
05...	0.200	0.130	0.110	--	--	77	38	22	8.4	11
MAY										
18...	0.090	0.070	0.060	--	--	80	52	29	8.7	15
JUN										
07...	0.250	0.200	0.170	12	1.4	86	58	33	9.5	16
27...	0.580	0.450	0.430	--	--	100	68	42	<0.10	17
AUG										
24...	0.340	0.200	0.200	15	3.3	130	100	65	12	22

DATE	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SAMPLE PURPOSE CODE (71999)	SAM-PLING METHOD, CODES (82398)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV										
08...	440	0.20	8.0	14	59	956	15.00	10	12	96
FEB										
01...	760	0.30	19	39	640	1700	15.00	40	7	97
MAR										
15...	85	0.20	11	61	82	250	15.00	10	69	92
APR										
05...	230	0.20	15	12	12	534	15.00	10	34	99
MAY										
18...	310	0.20	3.3	15	51	656	15.00	10	8	84
JUN										
07...	330	0.20	6.7	15	71	728	15.00	10	57	98
27...	370	0.20	17	13	20	820	15.00	10	29	99
AUG										
24...	600	0.30	21	9	33	1220	15.00	10	93	100

RED RIVER OF THE NORTH BASIN

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

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

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

WATER-DISCHARGE RECORDS

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	398	265	603	e370	e475	e445	3440	2320	2220	458	375	343
2	432	275	702	e350	e475	e440	2990	2300	2220	430	307	342
3	464	272	717	e340	e475	e490	2830	2280	2210	637	320	342
4	455	260	558	e320	e440	e620	2840	2280	2210	914	368	341
5	442	256	e250	e300	e415	e800	2740	2260	2190	1120	359	337
6	443	255	e270	e200	e400	e950	2640	2230	2160	1680	327	318
7	454	251	e300	e175	e410	e990	2610	2250	2130	1560	321	291
8	439	250	e400	e155	e450	e1000	2530	2270	2050	1270	320	283
9	401	251	e300	e165	e560	e1050	2400	2400	1920	1060	321	280
10	396	266	e450	e265	e580	e1050	2350	2540	1960	940	320	280
11	390	295	e280	e475	e440	e1100	2330	2670	2030	892	324	276
12	360	337	e300	e515	e425	e1100	2360	2700	2020	977	341	273
13	315	350	e360	e520	e470	e1300	2430	2670	2000	1030	373	274
14	297	348	e420	e490	e485	e1900	2690	2790	1980	1010	375	276
15	292	316	e460	e465	e495	e3400	3000	2960	e1950	985	371	280
16	315	268	e470	e460	e420	e5200	3020	2940	e1900	1080	371	277
17	332	250	e460	e460	e345	6200	2870	2790	e1700	1120	330	280
18	383	279	e440	e455	e340	5570	2730	2610	e1500	1100	263	279
19	463	322	e420	e440	e340	4940	2650	2470	e1400	1030	244	259
20	550	334	e410	e450	e345	4470	2630	2380	1110	937	244	211
21	625	350	e410	e435	e345	3820	2600	2350	915	809	247	178
22	637	280	e410	e400	e350	2900	2550	2340	859	724	264	172
23	565	341	e410	e365	e420	2170	2490	2320	748	722	291	181
24	560	414	e410	e380	e510	2460	2450	2290	676	722	312	201
25	583	429	e420	e400	e525	2670	2430	2250	664	661	259	209
26	627	348	e430	e420	e520	e2850	2420	2200	671	510	264	227
27	549	285	e430	e430	e510	e3700	2410	2190	678	444	312	254
28	478	327	e430	e425	e470	4450	2410	2240	595	430	320	262
29	440	297	e440	e420	---	4830	2380	2240	521	424	335	270
30	330	449	e420	e400	---	4570	2340	2230	488	415	345	304
31	271	---	e400	e430	---	4070	---	2220	---	421	345	---
TOTAL	13686	9220	13180	11875	12435	81505	78560	74980	45675	26512	9868	8100
MEAN	441	307	425	383	444	2629	2619	2419	1522	855	318	270
MAX	637	449	717	520	580	6200	3440	2960	2220	1680	375	343
MIN	271	250	250	155	340	440	2330	2190	488	415	244	172
AC-FT	27150	18290	26140	23550	24660	161700	155800	148700	90600	52590	19570	16070

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	322	296	270	260	271	642	1259	1050	1036	779	417	331
MAX	1599	952	820	678	687	2629	4436	3085	2675	2787	2496	2148
(WY)	1994	1987	1987	1986	1987	1995	1969	1986	1962	1993	1993	1993
MIN	5.72	7.40	6.60	8.81	18.0	84.3	138	22.5	90.0	65.6	53.5	2.18
(WY)	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1942 - 1995	
ANNUAL TOTAL	401991		385596			
ANNUAL MEAN	1101		1056		574	
HIGHEST ANNUAL MEAN					1477	1986
LOWEST ANNUAL MEAN					54.0	1977
HIGHEST DAILY MEAN	4900	Mar 23	6200	Mar 17	8940	Apr 10 1969
LOWEST DAILY MEAN	205	Aug 31	155	Jan 8	1.7	Aug 28 1976
ANNUAL SEVEN-DAY MINIMUM	256	Nov 4	197	Sep 20	1.7	Aug 28 1976
INSTANTANEOUS PEAK FLOW			6370	Mar 17	9200	Apr 10 1969
INSTANTANEOUS PEAK STAGE			14.88	Mar 17	17.95	Apr 5 1989
INSTANTANEOUS LOW FLOW					1.7	Aug 28 1976
ANNUAL RUNOFF (AC-FT)	797300		764800		415500	
10 PERCENT EXCEEDS	2440		2610		1390	
50 PERCENT EXCEEDS	600		458		358	
90 PERCENT EXCEEDS	287		272		104	

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

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

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
OCT										
06...	1425	444	526	--	17.5	14.0	--	--	--	--
NOV										
07...	1400	253	498	--	--	7.0	--	--	--	--
JAN										
19...	1450	444	526	--	-9.0	0.0	--	--	--	--
27...	1000	434	530	--	-3.5	0.0	--	--	--	--
MAR										
01...	1230	443	508	--	-15.0	0.0	--	--	--	--
29...	1205	4910	676	7.6	2.0	3.0	280	113	61	32
APR										
11...	1240	2320	672	--	1.0	2.0	--	--	--	--
MAY										
03...	0835	2290	624	--	11.5	9.0	--	--	--	--
JUN										
13...	0945	2000	786	--	21.5	19.0	--	--	--	--
JUL										
25...	0930	705	603	--	--	--	--	--	--	--
SEP										
07...	1015	289	458	8.4	14.0	17.0	220	200	36	31
13...	1350	266	627	--	21.0	20.0	--	--	--	--

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	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)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR										
29...	20	13	0.5	6.1	180	15	0.20	382	460	0.63
SEP										
07...	12	10	0.4	4.3	36	1.7	0.10	241	262	0.36

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
29...	6100	5	20	<1	30	10	0.1	1	2	320
SEP										
07...	204	4	10	<1	10	10	<0.1	<1	<1	180

RED RIVER OF THE NORTH BASIN

05051522 RED RIVER OF THE NORTH AT HICKSON, ND

LOCATION.--Lat 46°39'35", long 96 °47'44", in SW¼ sec.19, T.137 N., R.48 W., Clay County, MN, Hydrologic Unit 09020104, on right bank 60 ft downstream from bridge on township road, and 1 mi southeast of Hickson, ND.

DRAINAGE AREA.--4,300 mi², approximately.

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	264	336	286	e400	e450	e460	5380	2320	2210	544	477	360
2	324	295	409	e375	e465	e450	5080	2300	2200	524	474	358
3	418	278	591	e335	e490	e450	4570	2280	2200	551	408	358
4	456	278	662	e320	e480	e440	3980	2280	2200	1030	360	354
5	464	276	602	e315	e475	e470	3450	2270	2200	1270	384	351
6	459	267	e430	e300	e475	e520	3050	2250	2190	1560	418	350
7	455	265	e280	e290	e460	e600	2780	2240	2150	1990	401	348
8	454	263	e250	e280	e470	e680	2600	2240	2110	2090	379	316
9	450	260	e320	e225	e460	e700	2480	2270	2050	1780	380	294
10	428	258	e380	e200	e450	e750	2380	2340	1970	1360	368	286
11	395	258	e320	e210	e480	e800	2310	2420	1900	1080	362	282
12	388	270	e270	e320	e500	e880	2290	2530	1940	945	362	283
13	378	310	e250	e450	e490	e1200	2270	2620	1950	986	363	280
14	349	342	e280	e490	e480	e1700	2300	2650	1940	1030	384	274
15	315	346	e340	e510	e490	e2200	2390	2680	1910	1050	412	278
16	306	344	e400	e520	e500	e2900	2560	2760	1870	1020	414	279
17	314	320	e440	e520	e500	e3500	2700	2840	1780	1060	406	280
18	331	273	e460	e510	e490	e4500	2730	2840	1600	1110	395	278
19	338	259	e460	e500	e460	e7000	2670	2740	1400	1120	338	278
20	398	278	e430	e490	e400	e7600	2560	2610	1290	1080	293	276
21	470	315	e410	e480	e360	e7000	2510	2480	1180	999	274	252
22	554	271	e420	e475	e340	e6000	2490	2400	984	911	273	216
23	617	221	e430	e450	e340	e5000	2460	2350	884	810	264	190
24	596	238	e420	e425	e330	e3500	2430	2320	811	776	305	182
25	558	288	e420	e400	e360	e2000	2400	2300	724	768	361	192
26	550	341	e420	e425	e400	e1800	2380	2270	695	751	345	208
27	590	333	e425	e445	e450	e2000	2360	2230	726	668	287	221
28	597	315	e430	e455	e470	e3200	2360	2210	737	571	295	240
29	529	266	e435	e450	---	e4500	2350	2220	672	513	332	286
30	477	253	e435	e445	---	s5090	2340	2230	598	492	339	287
31	418	---	e410	e460	---	5400	---	2220	---	486	354	---
TOTAL	13640	8617	12515	12470	12515	83290	84610	74710	47071	30925	11207	8437
MEAN	440	287	404	402	447	2687	2820	2410	1569	998	362	281
MAX	617	346	662	520	500	7600	5380	2840	2210	2090	477	360
MIN	264	221	250	200	330	440	2270	2210	598	486	264	182
AC-FT	27050	17090	24820	24730	24820	165200	167800	148200	93370	61340	22230	16730

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1995, BY WATER YEAR (WY)

MEAN	391	309	277	268	312	878	1762	1082	982	842	508	436
MAX	1558	900	817	747	745	2687	4165	3394	2485	2674	2674	2135
(WY)	1994	1987	1986	1986	1987	1995	1978	1986	1986	1993	1993	1993
MIN	2.02	.000	.000	4.95	14.0	75.9	165	22.0	86.4	73.4	35.6	12.6
(WY)	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1975 - 1995	
ANNUAL TOTAL	416829		400007			
ANNUAL MEAN	1142		1096		671	
HIGHEST ANNUAL MEAN					1604	1986
LOWEST ANNUAL MEAN					53.1	1977
HIGHEST DAILY MEAN	6250	Apr 1	7600	Mar 20	12000	Apr 7 1989
LOWEST DAILY MEAN	221	Nov 23	182	Sep 24	.00	Oct 26 1976
ANNUAL SEVEN-DAY MINIMUM	263	Nov 6	207	Sep 22	00	Oct 26 1976
INSTANTANEOUS PEAK FLOW			8000	Mar 20	12900	Apr 7 1989
INSTANTANEOUS PEAK STAGE			29.63	Mar 20	35.81	Apr 7 1989
ANNUAL RUNOFF (AC-FT)	826800		793400		486100	
10 PERCENT EXCEEDS	2450		2500		1700	
50 PERCENT EXCEEDS	640		474		366	
90 PERCENT EXCEEDS	280		278		80e	

Estimated.

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
OCT										
13...	1210	372	518	--	11.0	11.0	--	--	--	--
NOV										
08...	1010	257	506	--	4.5	--	--	--	--	--
DEC										
21...	1145	408	528	--	-2.5	0.0	--	--	--	--
JAN										
30...	1205	443	546	--	-8.0	0.0	--	--	--	--
MAR										
23...	1340	5330	583	--	5.0	3.5	--	--	--	--
29...	1620	4630	722	7.3	0.5	2.0	310	126	66	35
APR										
06...	1340	3020	672	--	4.5	3.0	--	--	--	--
MAY										
03...	1405	2290	643	--	12.0	9.0	--	--	--	--
JUN										
12...	1630	1950	796	--	27.0	19.5	--	--	--	--
JUL										
25...	1245	768	710	--	--	--	--	--	--	--
SEP										
08...	0930	317	474	8.2	13.5	18.0	230	206	39	31

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L ASK) (00935)	SULFATE DIS-SOLVED (MG/L ASSO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L ASCL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L ASF) (00950)	SOLIDS, SUMOF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT180 DEG.C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR										
29...	21	13	0.5	6.8	200	17	0.20	422	498	0.68
SEP										
08...	12	10	0.3	4.6	39	1.6	0.10	251	279	0.38

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L ASAS) (01000)	IRON, DIS-SOLVED (UG/L ASFE) (01046)	LEAD, DIS-SOLVED (UG/L ASPB) (01049)	LITHIUM DIS-SOLVED (UG/L ASLI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L ASMN) (01056)	MERCURY DIS-SOLVED (UG/L ASHG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L ASMO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L ASSE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L ASSR) (01080)
MAR										
29...	6230	4	20	6	30	20	0.1	1	1	340
SEP										
08...	239	5	10	<1	10	10	<0.1	1	<1	200

RED RIVER OF THE NORTH BASIN

05054000 RED RIVER OF THE NORTH AT FARGO, ND

LOCATION.--Lat 46°51'40", long 96°47'00", in NW¼NE¼ sec.18, T.139 N., R.48 W., Cass County, Hydrologic Unit 09020104, at waterplant on 4th St. S. in Fargo, 25 mi upstream from mouth of Sheyenne River, and at mi 453.

DRAINAGE AREA.--6,800 mi², approximately.

PERIOD OF RECORD.--May 1901 to current year. Published as "at Moorhead, Minn.", 1901. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1902-4, 1906-7, 1910-14, 1916, 1918, 1924. WSP 1388: 1905-6, 1917-20(M), 1935(M), 1938-39(M), 1943.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 861.8 ft above sea level. Oct. 1, 1960, to Sept. 30, 1962, water-stage recorder at present site at datum 5.6 ft higher. See WSP 1728 or 1913 for history of changes prior to Oct. 1, 1960.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by Orwell Reservoir, capacity, 14,100 acre-ft at 1,070 ft above sea level, adjustment of 1912; Lake Traverse, capacity 137,000 acre-ft, available for flood control, other controlled lakes and ponds, and several power-plants. Some small diversions for municipal supply. Figures of daily discharge do not include diversions to cities of Fargo and Moorhead and from Sheyenne River.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	213	466	217	443	e450	e500	e9900	2940	2650	701	775	376
2	229	351	272	437	e440	e500	e10000	2920	2630	675	757	382
3	462	296	445	402	e460	e520	e9500	2900	2610	677	717	379
4	484	286	606	376	e470	e520	e8300	2890	2580	931	637	374
5	519	286	648	e370	e480	e520	e7150	2870	2540	1970	594	367
6	527	275	548	e360	e480	e580	e6100	2860	2520	2360	603	380
7	553	267	376	e340	e495	e665	5330	2850	2500	2860	605	378
8	519	252	228	e330	e470	e760	4620	2830	2430	3270	569	366
9	e505	241	210	e290	e460	e790	4030	2870	2390	3380	560	319
10	e492	220	317	e250	e485	e850	3610	2890	2320	3170	534	291
11	478	213	334	e215	e495	e920	3330	2950	2230	2890	398	274
12	454	237	267	e215	e510	1110	3150	3070	2200	2510	388	e261
13	439	278	229	e340	e500	1580	3070	3200	2210	2410	416	e260
14	426	311	224	e450	e445	2310	3050	3260	2200	2090	416	e260
15	366	325	280	e490	e480	3050	3100	3250	2180	1890	427	e260
16	421	334	349	e520	e480	e4000	3260	3330	2190	1770	446	e260
17	446	325	408	e520	e480	e5000	3480	3560	2160	1700	443	e260
18	449	267	463	e500	e450	e5650	3590	3750	2050	1740	436	e260
19	475	230	477	e480	e400	e8000	3520	3590	1870	1820	406	e260
20	469	221	477	e460	e375	e9800	3340	3290	1700	1790	346	e260
21	505	252	463	e440	e350	e10300	3190	3090	1600	1720	298	e240
22	590	258	454	e440	e335	e10500	3120	2980	1370	1570	280	e220
23	665	162	454	e440	e325	e10200	3090	2910	1160	1420	248	e200
24	702	183	454	e425	e315	e9100	3050	2870	1050	1290	513	e180
25	681	194	454	e400	e340	e8400	3020	2830	941	1210	382	e160
26	646	260	454	e400	e420	e7300	2990	2790	861	1160	403	e190
27	652	315	454	e405	e470	e7350	2970	2760	935	1100	376	e210
28	705	315	451	e410	e480	e8000	2950	2710	937	1010	309	e220
29	681	285	447	e410	---	e8800	2950	2690	862	920	332	e240
30	604	216	447	e415	---	e9200	2950	2690	772	857	352	326
31	550	---	447	e450	---	e9600	---	2670	---	808	363	---
TOTAL	15907	8121	12354	12423	12340	146375	131710	93060	56648	53669	14329	8413
MEAN	513	271	399	401	441	4722	4390	3002	1888	1731	462	280
MAX	705	466	648	520	510	10500	10000	3750	2650	3380	775	382
MIN	213	162	210	215	315	500	2950	2670	772	675	248	160
AC-FT	31550	16110	24500	24640	24480	290300	261200	184600	112400	106500	28420	16690
(+)	1160	1170	1210	1250	1140	1290	1280	1490	1920	1470	1880	1580
*	32710	17280	25710	25890	25620	291600	262500	186100	114300	108000	30300	18270

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1901 - 1995, BY WATER YEAR (WY)

MEAN	308	266	222	205	205	704	1728	1017	1015	856	412	316
MAX	1741	942	800	740	778	4722	9924	4589	5122	5692	3293	2280
(WY)	1994	1907	1987	1986	1987	1995	1969	1986	1962	1962	1993	1993
MIN	.000	.000	.000	.000	.18	26.8	102	8.12	2.87	.000	.000	.000
(WY)	1935	1937	1938	1933	1933	1937	1934	1934	1936	1934	1932	1934

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1901 - 1995	
ANNUAL TOTAL	562719		565349			
ANNUAL MEAN	1542 (*1563)		1549 (*1571)		606	
HIGHEST ANNUAL MEAN					1928	1986
LOWEST ANNUAL MEAN					17.5	1934
HIGHEST DAILY MEAN	11100	Apr 2	10500	Mar 22	24800	Apr 14 1969
LOWEST DAILY MEAN	162	Nov 23	160	Sep 25	00	Jul 25 1932
ANNUAL SEVEN-DAY MINIMUM	214	Nov 19	197	Sep 22	.00	Jul 25 1932
INSTANTANEOUS PEAK FLOW			11000	Mar 22	25300	Apr 15 1969
INSTANTANEOUS PEAK STAGE			28.37	Mar 22	37.34	Apr 15 1969
INSTANTANEOUS LOW FLOW					.00	Jul 25 1932
ANNUAL RUNOFF (AC-FT)	1116000		1121000		438800	

\+ Diversions in acre-feet to cities of Fargo and Moorhead.
* Adjusted for diversions to cities of Fargo and Moorhead.
e Estimated.

RED RIVER OF THE NORTH BASIN

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

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
OCT										
14...	0830	--	541	--	9.5	11.0	--	--	--	--
20...	1610	457	618	--	--	14.5	--	--	--	--
NOV										
09...	1550	265	840	--	11.0	5.0	--	--	--	--
DEC										
16...	0935	353	750	--	-7.0	-0.5	--	--	--	--
JAN										
30...	1130	415	--	--	-15.0	0.0	--	--	--	--
FEB										
02...	0950	432	--	--	-3.5	0.0	--	--	--	--
MAR										
19...	0800	8070	302	--	4.5	0.5	--	--	--	--
APR										
06...	0925	6180	731	7.6	-2.5	2.5	310	156	65	36
MAY										
09...	0740	2870	726	--	5.0	10.5	--	--	--	--
17...	1600	3600	505	--	14.0	11.5	--	--	--	--
JUL										
26...	0840	1150	808	--	--	24.5	--	--	--	--
SEP										
13...	1350	266	627	--	21.0	20.0	--	--	--	--

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	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)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR										
06...	24	14	0.6	8.4	200	18	0.20	446	495	0.67

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
06...	8260	3	40	<1	40	10	<0.1	1	1	320

RED RIVER OF THE NORTH BASIN

05061000 BUFFALO RIVER NEAR HAWLEY, MN

LOCATION.--Lat 46°51'00", long 96°19'45", in NW¼SE¼ sec.14, T.139 N., R.45 W., Clay County, Hydrologic Unit 09020106, near left downstream end of bridge on farm lane, 2 mi southwest of Hawley.

DRAINAGE AREA.--322 mi².

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

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUE

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	97	106	e37	e35	e37	466	128	90	40	46	32
2	31	94	81	e37	e35	e37	439	126	85	44	42	29
3	48	91	e70	e37	e35	e36	421	124	78	50	38	28
4	88	87	e65	e37	e35	e36	409	123	70	56	43	25
5	87	85	e60	e37	e35	e36	397	130	62	174	44	24
6	74	85	e55	e37	e35	e36	313	142	64	282	43	25
7	69	83	e51	e36	e35	e36	262	141	74	215	41	25
8	74	81	e48	e36	e35	e36	235	142	77	150	39	25
9	81	78	e46	e36	e35	e36	210	160	67	125	37	24
10	88	75	e45	e36	e35	e37	185	198	65	113	35	22
11	95	73	e44	e36	e35	e66	177	210	66	97	31	21
12	91	74	e43	e35	e35	e100	178	189	63	90	28	20
13	83	81	e42	e35	e35	e250	196	181	57	210	27	20
14	77	96	e41	e35	e35	e400	207	207	52	363	27	19
15	73	108	e41	e35	e35	e455	212	218	50	328	25	19
16	78	107	e40	e35	e35	e900	215	201	45	215	23	19
17	114	102	e40	e35	e35	847	216	193	42	184	22	18
18	157	99	e39	e35	e35	765	212	199	39	167	21	18
19	199	91	e39	e35	e35	692	206	185	37	151	20	18
20	241	90	e39	e35	e36	604	195	163	35	149	21	17
21	238	111	e40	e35	e37	530	183	154	34	134	25	17
22	219	126	e40	e35	e38	456	176	145	33	122	23	18
23	192	151	e41	e35	e39	398	170	131	31	111	23	18
24	173	136	e42	e35	e39	347	167	125	31	106	36	18
25	156	e130	e43	e35	e39	297	161	130	32	103	57	18
26	142	e125	e43	e35	e39	277	152	132	45	101	74	18
27	131	e120	e43	e35	e39	338	145	123	39	93	62	17
28	124	e120	e41	e35	e38	400	137	119	36	80	49	17
29	117	e118	e40	e35	---	415	134	112	71	69	41	36
30	111	e118	e38	e35	---	471	131	102	40	60	38	49
31	105	---	e37	e35	---	497	---	93	---	52	35	---
TOTAL	3588	3032	1483	1102	1009	9868	6907	4726	1610	4234	1116	674
MEAN	116	101	47.8	35.5	36.0	318	230	152	53.7	137	36.0	22.5
MAX	241	151	106	37	39	900	466	218	90	363	74	49
MIN	31	73	37	35	35	36	131	93	31	40	20	17
AC-FT	7120	6010	2940	2190	2000	19570	13700	9370	3190	8400	2210	1340
CFSM	.36	.31	.15	.11	.11	.99	.72	.47	.17	.42	.11	.07
IN.	.41	.35	.17	.13	.12	1.14	.80	.55	.19	.49	.13	.08

e Estimated.

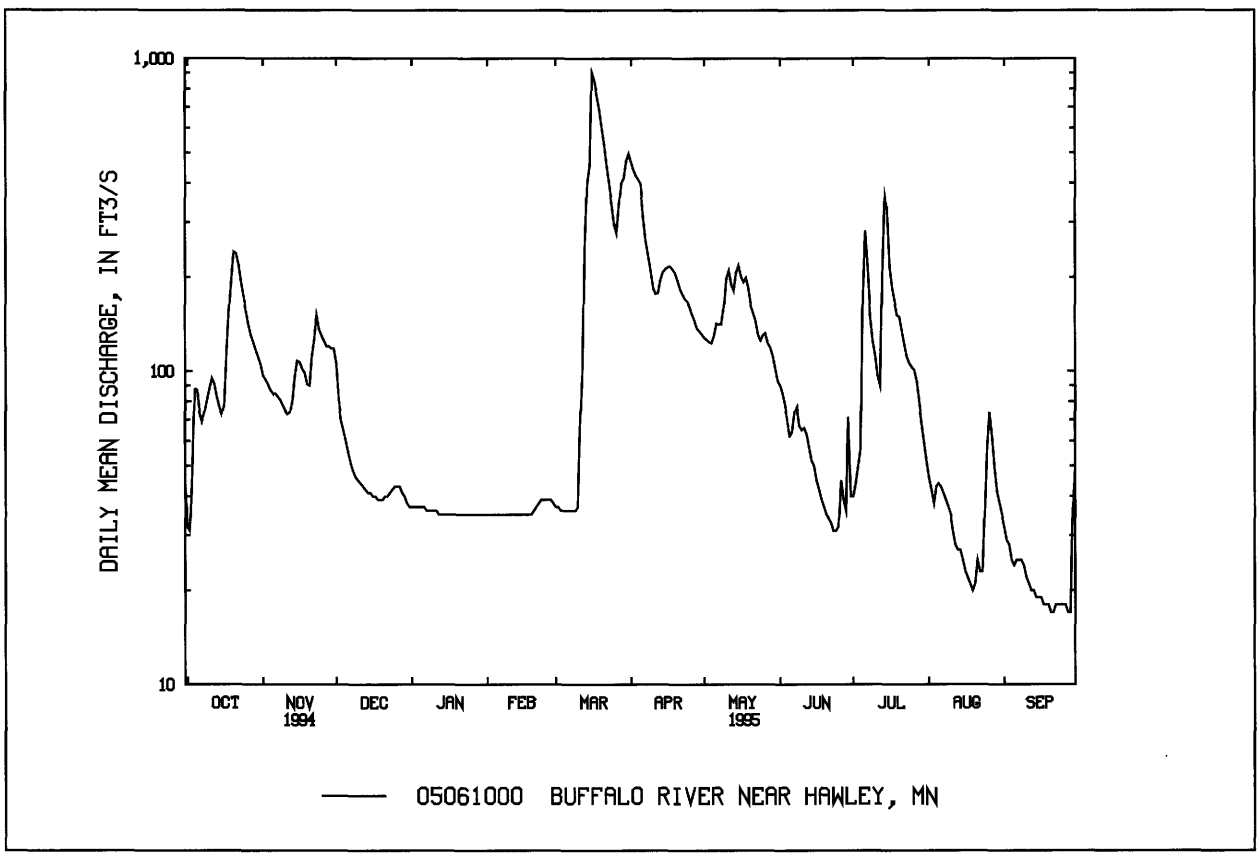
RED RIVER OF THE NORTH BASIN

05061000 BUFFALO RIVER NEAR HAWLEY, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	38.4	35.6	24.5	20.5	21.4	87.4	250	123	97.2	99.8	52.0	37.9
MAX	151	176	63.8	54.7	99.6	434	792	372	530	784	472	182
(WY)	1974	1972	1972	1981	1981	1966	1978	1985	1962	1993	1955	1957
MIN	11.6	12.2	10.6	9.94	9.87	15.0	33.3	21.5	12.7	10.1	5.87	8.52
(WY)	1979	1977	1977	1962	1949	1969	1981	1977	1977	1976	1976	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1945 - 1995		
ANNUAL TOTAL	35582		39349				
ANNUAL MEAN	97.5		108		73.8		
HIGHEST ANNUAL MEAN					168		1993
LOWEST ANNUAL MEAN					16.7		1977
HIGHEST DAILY MEAN	520	Mar 23	900	Mar 16	1970	Jul 1	1975
LOWEST DAILY MEAN	26	Sep 9	17	Sep 20,21,27,28	3.29	Aug 25	1976
ANNUAL SEVEN-DAY MINIMUM	28	Sep 5	18	Sep 17	4.3	Aug 22	1976
INSTANTANEOUS PEAK FLOW					2050	Jul 1	1975
INSTANTANEOUS PEAK STAGE					10.40	Jul 18	1993
INSTANTANEOUS LOW FLOW					2.8	Aug 26	1977
ANNUAL RUNOFF (AC-FT)	70580		78050		53470		
ANNUAL RUNOFF (CFSM)	.30		.33		.23		
ANNUAL RUNOFF (INCHES)	4.11		4.55		3.11		
10 PERCENT EXCEEDS	202		215		175		
50 PERCENT EXCEEDS	67		62		31		
90 PERCENT EXCEEDS	37		28		13		



RED RIVER OF THE NORTH BASIN

05061500 SOUTH BRANCH BUFFALO RIVER AT SABIN, MN

LOCATION.--Lat 46°46'20", long 96°37'40", in SW¼SW¼ sec. 9, T. 138 N., R. 47 W., Clay County, Hydrologic Unit 09020106, near center of span on downstream side of highway bridge, 0.3 mi downstream from Stony Creek and 1 mi east of Sabin.

DRAINAGE AREA.--522 mi².

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

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

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

REMARKS.--Records fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e12	35	e19	e6.8	e4.5	e4.8	549	e46	22	5.9	3.9	20
2	13	34	e18	e6.5	e4.5	e4.8	377	e45	18	6.4	3.0	17
3	14	32	e17	e6.1	e4.5	e4.8	257	e42	19	7.1	1.9	13
4	14	33	e16	e5.8	e4.5	e4.8	166	e42	18	7.6	1.3	9.5
5	14	34	e15	e5.5	e4.5	e4.7	126	e44	15	14	1.1	6.6
6	16	38	e14	e5.3	e4.5	e4.7	122	e45	13	36	1.0	5.2
7	22	40	e13	e5.2	e4.5	e4.7	112	e46	11	68	.97	4.1
8	24	43	e13	e5.2	e4.5	e4.7	91	47	10	73	1.0	3.2
9	22	44	e12	e5.1	e4.5	e4.7	84	57	14	47	1.3	2.0
10	21	46	e12	e5.0	e4.5	e4.8	77	80	18	32	1.3	2.6
11	21	47	e11	e5.0	e4.5	e5.6	e76	126	19	24	.94	3.7
12	21	46	e10	e5.0	e4.5	e7.0	e80	155	18	21	1.0	4.1
13	21	47	e10	e4.9	e4.5	e35	e86	153	15	37	1.5	3.8
14	23	50	e9.6	e4.8	e4.5	e105	e90	141	12	41	1.6	3.4
15	23	51	e9.4	e4.8	e4.5	e350	93	149	9.5	46	1.3	2.8
16	26	52	e9.1	e4.8	e4.5	1650	99	172	7.2	52	1.3	3.0
17	28	55	e8.8	e4.8	e4.5	1260	100	162	5.9	52	1.4	2.4
18	30	55	e8.6	e4.8	e4.6	950	e94	138	3.7	44	1.6	2.4
19	35	52	e8.3	e4.8	e4.7	750	e89	113	3.4	36	1.5	2.2
20	40	52	e8.2	e4.8	e4.8	585	e81	89	2.5	28	1.1	1.6
21	42	e51	e8.1	e4.7	e5.0	419	75	71	2.3	23	.86	1.7
22	41	e47	e8.0	e4.7	e5.1	294	69	58	1.7	20	.70	2.1
23	37	e43	e8.0	e4.6	e5.2	222	69	48	1.8	17	.96	2.2
24	36	e39	e8.0	e4.6	e5.2	193	67	41	1.8	15	1.5	2.0
25	35	e35	e8.0	e4.5	e5.2	165	63	48	1.8	14	2.1	2.6
26	34	e31	e8.0	e4.5	e5.1	180	62	48	2.2	11	2.2	2.8
27	32	e27	e8.0	e4.5	e5.0	357	e60	41	2.1	9.5	3.8	2.2
28	33	e25	e7.9	e4.5	e4.9	568	e56	38	1.7	8.7	9.2	2.0
29	37	e22	e7.8	e4.5	---	825	e52	34	2.2	7.0	17	6.4
30	38	e20	e7.4	e4.5	---	881	e48	30	4.0	6.5	19	26
31	36	---	e7.2	e4.5	---	727	---	26	---	5.6	20	---
TOTAL	841	1226	328.4	155.1	131.3	10576.1	3470	2375	275.8	815.3	107.33	162.6
MEAN	27.1	40.9	10.6	5.00	4.69	341	116	76.6	9.19	26.3	3.46	5.42
MAX	42	55	19	6.8	5.2	1650	549	172	22	73	20	26
MIN	12	20	7.2	4.5	4.5	4.7	48	26	1.7	5.6	.70	1.6
AC-FT	1670	2430	651	308	260	20980	6880	4710	547	1620	213	323
CFSM	.05	.08	.02	.01	.01	.65	.22	.15	.02	.05	.01	.01
IN.	.06	.09	.02	.01	.01	.75	.25	.17	.02	.06	.01	.01

e Estimated.

RED RIVER OF THE NORTH BASIN

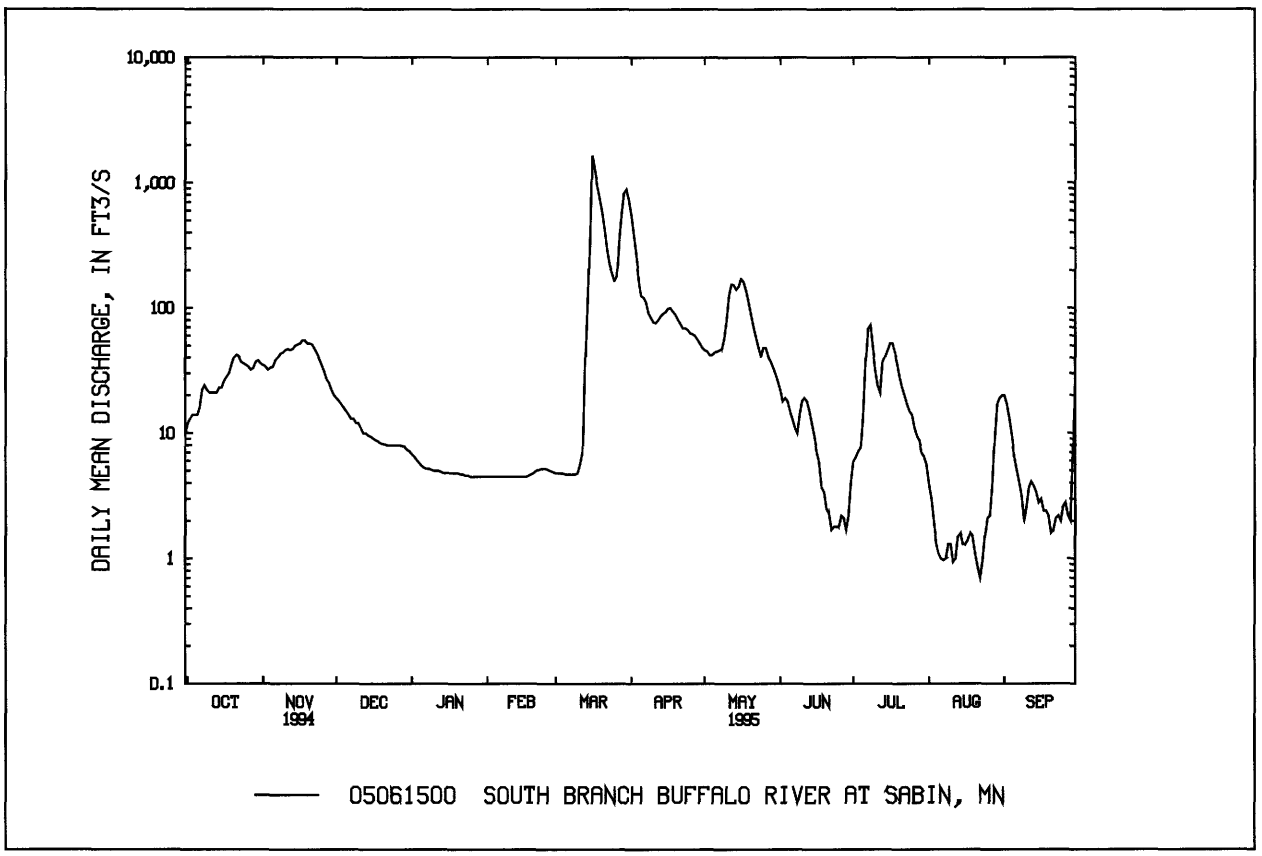
05061500 SOUTH BRANCH BUFFALO RIVER AT SABIN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	14.2	14.7	5.08	1.75	1.68	109	251	76.7	91.4	76.4	11.9	13.7
MAX	51.1	76.7	23.5	13.1	14.0	581	928	580	1068	1112	152	173
(WY)	1978	1972	1978	1978	1987	1966	1969	1962	1962	1975	1993	1986
MIN	.023	2.05	.006	.000	.000	.000	27.9	8.28	1.30	.000	.000	.000
(WY)	1977	1977	1961	1946	1946	1951	1973	1980	1976	1988	1976	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1945 - 1995		
ANNUAL TOTAL	19210.7		20463.93				
ANNUAL MEAN	52.6		56.1		55.8[a]		
HIGHEST ANNUAL MEAN					198		1962
LOWEST ANNUAL MEAN					12.2		1977
HIGHEST DAILY MEAN	720	Mar 24	1650	Mar 16	8200	Jul	1 1975
LOWEST DAILY MEAN	2.2	Aug 6	.70	Aug 22	.00	Dec	13 1945
ANNUAL SEVEN-DAY MINIMUM	3.5	Aug 17	1.1	Aug 6	.00	Dec	13 1945
INSTANTANEOUS PEAK FLOW			1770	Mar 15	8500	Jul	2 1975
INSTANTANEOUS PEAK STAGE			14.41	Mar 15	19.90	Jul	2 1975
INSTANTANEOUS LOW FLOW			.58	Aug 22	.00	Dec	13 1945
ANNUAL RUNOFF (AC-FT)	38100		40590		40450		
ANNUAL RUNOFF (CFSM)	.10		.11		.11		
ANNUAL RUNOFF (INCHES)	1.37		1.46		1.45		
10 PERCENT EXCEEDS	123		96		101		
50 PERCENT EXCEEDS	12		13		7.2		
90 PERCENT EXCEEDS	5.8		2.2		.00		

a Median of annual mean discharges is 41 ft^3/s.



RED RIVER OF THE NORTH BASIN

05062000 BUFFALO RIVER NEAR DILWORTH, MN

LOCATION--Lat 46° 57'40", long 96° 39'40", in SW¼ SE¼ sec. 6, T.140 N., R.47 W., Clay County, Hydrologic Unit 09020106, on left bank 4.5 mi southeast of Kragnes, 6.5 mi northeast of Dilworth, and 9 mi downstream from South Branch.

DRAINAGE AREA.--1,040 mi², approximately.

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	117	e120	e47	e47	e53	1320	236	143	61	77	60
2	42	110	e120	e47	e47	e52	1230	227	130	54	68	59
3	43	106	e115	e47	e46	e51	1080	222	118	52	59	55
4	50	103	e100	e46	e46	e50	924	217	109	59	53	50
5	69	101	e85	e46	e46	e49	831	214	101	76	48	46
6	92	97	e70	e46	e46	e48	556	216	93	194	47	43
7	98	96	e64	e46	e46	e47	474	235	87	354	45	39
8	94	95	e60	e46	e46	e47	443	247	89	371	42	36
9	93	94	e58	e46	e46	e47	400	268	96	316	40	34
10	98	93	e56	e46	e46	e47	363	342	95	247	38	33
11	99	92	e54	e46	e46	e50	335	361	92	198	36	31
12	102	90	e53	e46	e46	e90	314	380	94	162	34	28
13	105	92	e52	e47	e46	e104	309	391	94	171	31	26
14	103	98	e51	e48	e46	e300	312	398	90	296	31	26
15	96	104	e50	e49	e46	e567	330	402	82	418	31	25
16	95	113	e50	e48	e46	e900	344	403	74	447	29	26
17	100	118	e49	e47	e47	e1500	353	401	69	401	28	26
18	113	118	e48	e46	e48	e1800	365	392	63	323	28	26
19	144	117	e47	e46	e48	2110	362	373	57	275	27	24
20	178	114	e47	e45	e49	1830	347	339	53	252	25	23
21	197	110	e47	e45	e50	1560	337	305	49	234	25	23
22	211	e115	e48	e45	e51	1310	320	273	47	215	24	23
23	209	e128	e49	e45	e53	1050	301	246	46	192	25	24
24	197	e130	e51	e45	e54	815	289	220	44	170	39	24
25	181	e128	e52	e45	e54	657	282	203	42	151	68	24
26	170	e126	e52	e45	e54	584	276	211	43	140	63	24
27	155	e124	e52	e45	e54	695	265	217	49	142	73	23
28	144	e121	e51	e45	e53	924	253	204	53	129	79	22
29	135	e120	e50	e45	---	1190	242	189	50	115	69	27
30	128	e120	e49	e45	---	1290	238	175	50	101	62	72
31	121	---	e48	e46	---	1330	---	160	---	90	61	---
TOTAL	3707	3290	1898	1427	1353	21147	13795	8667	2302	6406	1405	1002
MEAN	120	110	61.2	46.0	48.3	682	460	280	76.7	207	45.3	33.4
MAX	211	130	120	49	54	2110	1320	403	143	447	79	72
MIN	42	90	47	45	46	47	238	160	42	52	24	22
AC-FT	7350	6530	3760	2830	2680	41950	27360	17190	4570	12710	2790	1990
CFSM	.11	.11	.06	.04	.05	.66	.44	.27	.07	.20	.04	.03
IN.	.13	.12	.07	.05	.05	.76	.49	.31	.08	.23	.05	.04

e Estimated.

RED RIVER OF THE NORTH BASIN

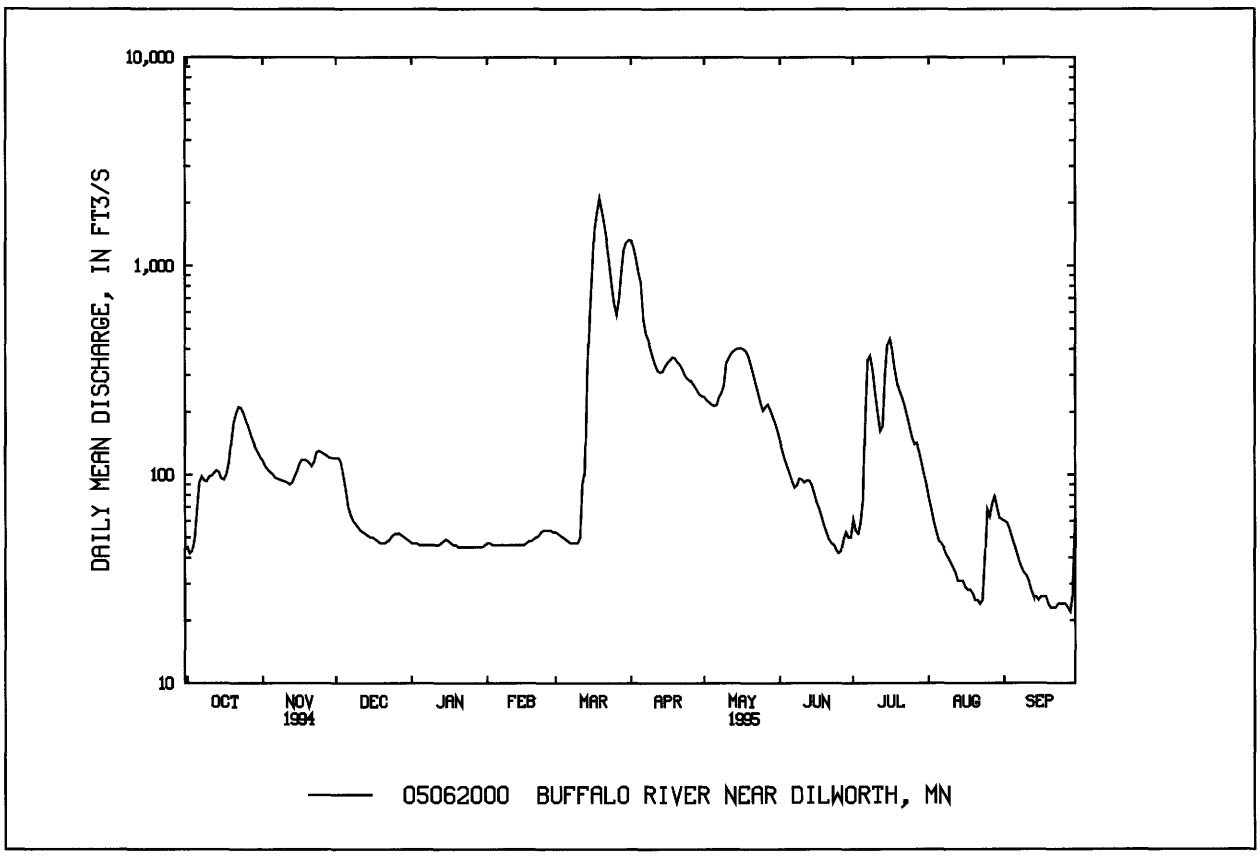
05062000 BUFFALO RIVER NEAR DILWORTH, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	51.5	49.0	29.7	19.8	19.9	184	534	217	195	185	72.4	53.7
MAX	186	305	97.0	53.5	61.1	1308	1984	909	2138	2814	910	517
(WY)	1958	1972	1972	1994	1984	1966	1978	1986	1962	1975	1993	1944
MIN	5.48	8.74	4.75	.87	.76	2.26	33.5	27.2	15.1	2.23	.000	.79
(WY)	1940	1937	1938	1940	1940	1940	1931	1931	1934	1936	1936	1936

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1931 - 1995		
ANNUAL TOTAL	68521		66399				
ANNUAL MEAN	188		182		136		
HIGHEST ANNUAL MEAN					441		1975
LOWEST ANNUAL MEAN					25.6		1934
HIGHEST DAILY MEAN	3200	Mar 24	2110	Mar 19	13500	Jul	2 1975
LOWEST DAILY MEAN	28	Sep 12	22	Sep 28	.00	Jul	22 1936
ANNUAL SEVEN-DAY MINIMUM	32	Sep 7	23	Sep 22	.00	Jul	28 1936
INSTANTANEOUS PEAK FLOW					13600	Jul	2 1975
INSTANTANEOUS PEAK STAGE			18.50a	Mar 18	27.10	Jul	2 1975
INSTANTANEOUS LOW FLOW					.00	Jul	22 1936
ANNUAL RUNOFF (AC-FT)	135900		131700		98340		
ANNUAL RUNOFF (CFSM)	.18		.17		.13		
ANNUAL RUNOFF (INCHES)	2.45		2.38		1.77		
10 PERCENT EXCEEDS	384		376		288		
50 PERCENT EXCEEDS	88		82		36		
90 PERCENT EXCEEDS	48		39		9.5		

a Backwater from ice.



RED RIVER OF THE NORTH BASIN

05062500 WILD RICE RIVER AT TWIN VALLEY, MN

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

DRAINAGE AREA.--888 mi².

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	213	415	e355	e140	e125	e120	e1280	500	343	268	338	172
2	203	414	e390	e135	e125	e120	e1260	512	323	226	314	159
3	221	413	e380	e125	e125	e115	e1200	513	307	190	291	149
4	272	407	e330	e120	e120	e115	e1100	519	293	194	273	143
5	314	403	e260	e120	e120	e110	e1000	510	277	312	257	138
6	299	393	e180	e120	e115	e110	e880	494	277	418	243	143
7	297	372	e150	e120	e110	e110	756	495	288	585	238	145
8	308	347	e160	e120	e105	e110	726	498	287	713	241	145
9	322	328	e160	e120	e105	e110	685	613	284	831	227	140
10	325	359	e155	e115	e105	e115	631	734	265	740	216	135
11	319	301	e150	e115	e105	e120	589	768	243	665	204	130
12	313	291	e160	e115	e105	e250	565	736	223	598	192	126
13	300	309	e170	e115	e105	e1200	558	685	206	628	183	125
14	285	337	e175	e120	e105	e2200	561	684	191	773	174	118
15	269	351	e180	e125	e110	e2000	567	671	175	903	165	112
16	283	352	e190	e135	e110	e1600	562	648	160	943	158	104
17	343	349	e195	e135	e110	e1350	542	599	150	797	150	99
18	438	348	e200	e140	e115	e1320	528	569	141	709	142	98
19	522	326	e200	e140	e115	e1280	511	545	134	675	138	95
20	607	323	e195	e145	e120	e1220	491	531	127	679	133	89
21	631	e310	e190	e145	e120	1190	476	513	120	711	129	87
22	609	e300	e180	e145	e120	1080	470	500	112	696	121	86
23	603	e290	e180	e140	e120	985	466	479	103	647	117	83
24	578	e280	e175	e135	e120	933	476	452	97	597	148	80
25	551	e275	e175	e130	e120	959	491	446	94	549	202	77
26	524	e270	e175	e130	e120	995	497	440	103	506	263	78
27	497	e290	e175	e130	e120	1070	498	436	94	471	284	77
28	473	e320	e175	e130	e120	1110	496	426	92	445	257	72
29	457	e315	e170	e125	---	1160	485	412	88	425	222	86
30	443	e310	e165	e125	---	1230	483	390	197	394	214	133
31	430	---	e150	e130	---	1290	---	368	---	363	188	---
TOTAL	12249	10098	6245	3985	3215	25677	19830	16686	5794	17651	6422	3424
MEAN	395	337	201	129	115	828	661	538	193	569	207	114
MAX	631	415	390	145	125	2200	1280	768	343	943	338	172
MIN	203	270	150	115	105	110	466	368	88	190	117	72
AC-FT	24300	20030	12390	7900	6380	50930	39330	33100	11490	35010	12740	6790
CFSM	.44	.38	.23	.14	.13	.93	.74	.61	.22	.64	.23	.13
IN.	.51	.42	.26	.17	.13	1.08	.83	.70	.24	.74	.27	.14

e Estimated.

RED RIVER OF THE NORTH BASIN

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1995, BY WATER YEAR (WY)

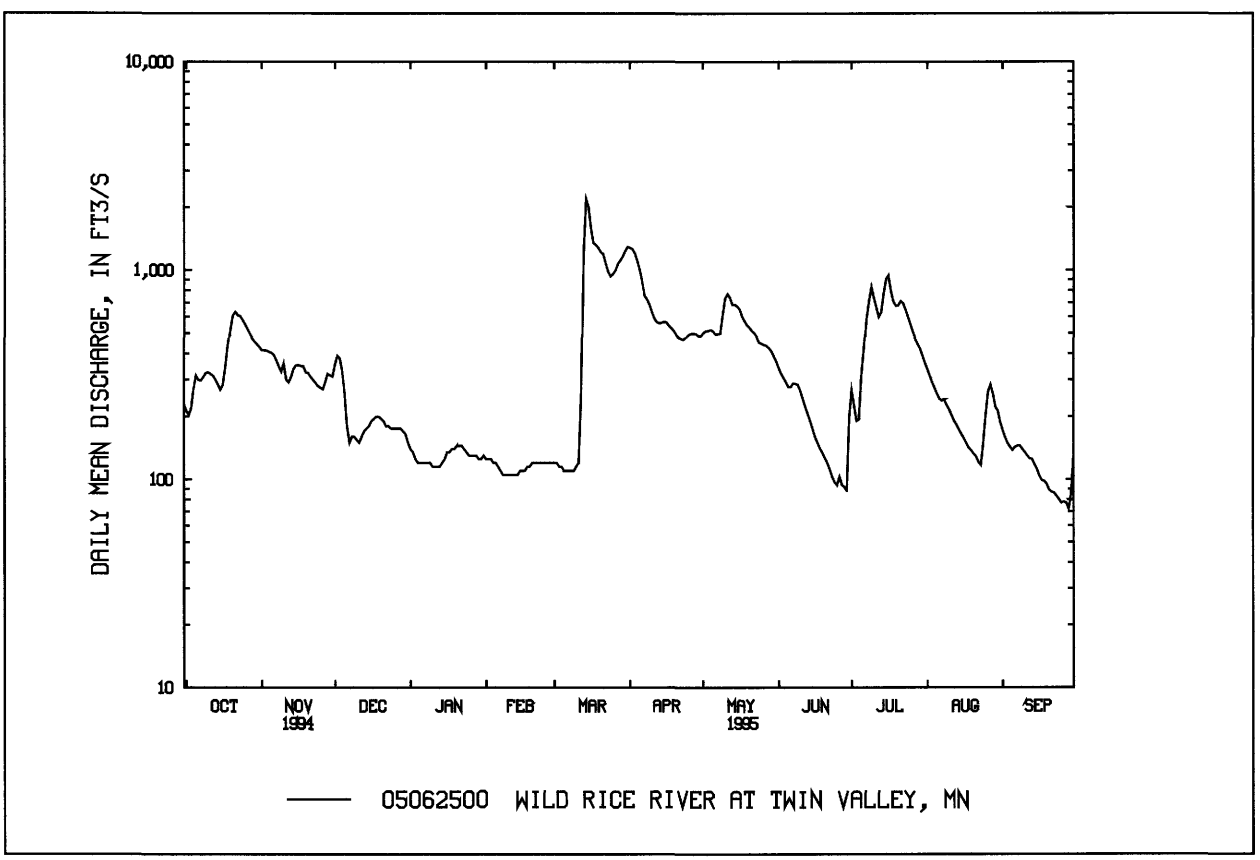
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	88.9	77.4	52.1	39.7	36.7	139	564	416	304	241	108	87.1
MAX	614	488	201	129	115	828	1543	2259	1560	1923	1024	788
(WY)	1974	1972	1995	1995	1995	1995	1979	1950	1943	1909	1993	1973
MIN	6.10	9.31	6.00	4.00	4.00	12.8	73.8	30.9	26.4	8.04	3.02	2.96
(WY)	1933	1933	1933	1933	1933	1940	1931	1977	1977	1934	1932	1936

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1909 - 1995	
ANNUAL TOTAL	124138		131276			
ANNUAL MEAN	340		360		177[a]	
HIGHEST ANNUAL MEAN					500	1950
LOWEST ANNUAL MEAN					22.7	1977
HIGHEST DAILY MEAN	1750	Jun 21	2200	Mar 14	9100	Jul 22 1909
LOWEST DAILY MEAN	85	Sep 10	72	Sep 28	1.1	Aug 13 1932
ANNUAL SEVEN-DAY MINIMUM	90	Jan 21	79	Sep 22	1.3	Aug 11 1932
INSTANTANEOUS PEAK FLOW			2500[b]	Mar 15	9200	Jul 22 1909
INSTANTANEOUS PEAK STAGE			10.94[b]	Mar 15	20.00[c]	Jul 22 1909
INSTANTANEOUS LOW FLOW					.50	Nov 4 1939
ANNUAL RUNOFF (AC-FT)	246200		260400		127900	
ANNUAL RUNOFF (CFSM)	.38		.41		.20	
ANNUAL RUNOFF (INCHES)	5.20		5.50		2.70	
10 PERCENT EXCEEDS	607		718		464	
50 PERCENT EXCEEDS	291		269		66	
90 PERCENT EXCEEDS	91		110		15	

a Median of annual mean discharges is 155 ft^3/s.

b Backwater from ice.

c Site and datum then in use.



05062500 WILD RICE RIVER AT TWIN VALLEY, MN--Continued
(National Water Quality Assessment Station)

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)
NOV										
07...	0900	3.0	5.5	730	--	372	506	517	12.8	8.3
FEB										
08...	0800	0.0	-18.0	739	104	--	596	629	10.8	7.4
MAR										
16...	1115	2.0	11.0	750	--	1600	386	392	12.3	7.4
APR										
13...	0915	4.5	7.5	743	--	558	440	465	12.1	8.1
MAY										
10...	0800	10.5	5.0	737	--	734	570	571	7.6	8.2
JUN										
07...	0900	19.0	9.0	738	--	288	465	475	7.3	7.5
JUL										
05...	1050	19.0	12.5	728	--	312	429	432	7.6	8.2
25...	0930	21.0	23.0	740	--	549	417	415	8.0	8.2
AUG										
30...	0835	22.5	25.0	734	--	214	461	457	7.9	8.2

DATE	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKALINITY LAB (MG/L AS CACO3) (90410)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)
NOV										
07...	8.0	238	256	0	290	<0.015	<0.010	0.70	0.80	0.060
FEB										
08...	7.6	307	322	0	375	0.150	<0.010	0.70	0.80	0.160
MAR										
16...	7.4	--	110	--	--	0.380	0.080	1.5	1.7	3.20
APR										
13...	7.4	--	200	--	--	0.020	0.010	0.60	0.70	0.150
MAY										
10...	7.8	222	248	0	271	<0.015	<0.010	0.80	1.1	0.320
JUN										
07...	8.0	--	230	--	--	0.020	<0.010	0.70	0.80	<0.050
JUL										
05...	7.7	174	189	0	212	0.050	0.020	0.80	1.0	0.740
25...	8.1	202	211	0	246	<0.015	<0.010	0.80	0.90	0.060
AUG										
30...	8.1	200	208	0	244	<0.015	<0.010	0.80	0.90	<0.050

RED RIVER OF THE NORTH BASIN

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
NOV										
07...	0.020	<0.010	0.010	13	0.70	64	28	7.5	3.9	5.2
FEB										
08...	0.020	0.010	<0.010	--	--	75	31	8.5	4.0	4.3
MAR										
16...	0.310	0.150	0.110	9.7	2.5	42	17	4.1	7.4	10
APR										
13...	0.050	<0.010	<0.010	9.6	2.2	55	22	5.9	4.2	6.8
MAY										
10...	0.120	0.030	0.010	12	0.30	72	30	7.7	4.3	10
JUN										
07...	0.040	0.020	0.020	12	0.90	53	25	6.8	3.0	3.6
JUL										
05...	0.120	0.050	0.040	14	1.8	52	21	5.8	2.8	5.9
25...	0.080	0.040	0.040	15	1.9	50	21	5.1	2.1	2.2
AUG										
30...	0.090	0.060	0.050	13	0.70	56	24	6.9	4.2	5.5

DATE	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SAMPLE PURPOSE CODE (71999)	SAM-PLING METHOD, CODES (82398)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV										
07...	32	0.10	16	40	21	337	15.00	10	24	95
FEB										
08...	18	0.10	22	53	400	386	15.00	10	12	95
MAR										
16...	54	0.20	10	110	91	249	15.00	10	220	88
APR										
13...	38	0.10	8.3	68	31	286	15.00	10	73	84
MAY										
10...	50	0.20	9.4	68	30	363	15.00	10	163	84
JUN										
07...	25	0.20	11	79	20	307	15.00	10	28	97
JUL										
05...	31	0.10	16	69	17	283	15.00	10	227	98
25...	13	0.10	22	57	5	273	15.00	10	244	40
AUG										
30...	38	0.10	20	72	15	309	15.00	10	25	95

RED RIVER OF THE NORTH BASIN

05064000 WILD RICE RIVER AT HENDRUM, MN

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

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

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

REVISED RECORDS.--WSP 1728: 1958.

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	277	582	e340	e160	e125	e125	e2300	e620	425	123	409	259
2	266	558	e390	e150	e125	e130	e2200	626	401	257	374	221
3	266	543	e410	e140	e125	e130	e1800	631	366	256	349	195
4	296	539	e405	e130	e125	e130	e1450	628	334	219	319	177
5	365	527	e355	e120	e125	e130	e1200	630	310	324	297	166
6	456	527	e240	e115	e125	e130	e1020	621	299	1220	278	170
7	488	518	e180	e110	e120	e125	e950	614	309	2030	262	171
8	537	492	e185	e105	e115	e120	e860	620	316	1950	248	169
9	540	462	e190	e105	e115	e125	e800	785	323	1640	255	165
10	526	438	e195	e105	e110	e125	e740	1470	322	1490	241	160
11	499	453	e190	e105	e105	e130	e700	1860	304	1320	226	152
12	465	427	e180	e105	e110	e165	e660	1700	276	1060	213	146
13	436	416	e165	e105	e110	e700	e650	1430	250	871	199	142
14	405	440	e165	e110	e110	e1800	e640	1290	229	1290	191	137
15	383	509	e175	e115	e110	e2200	e660	1300	208	1700	180	133
16	378	564	e190	e120	e105	e2400	e680	1250	188	1560	171	126
17	539	561	e195	e125	e105	e3100	e660	1140	171	1400	162	122
18	788	555	e195	e130	e105	e2900	e640	994	155	1210	154	119
19	980	527	e195	e125	e105	e2700	e630	912	143	1070	145	e116
20	1140	497	e195	e130	e110	e2550	e620	859	135	1090	138	e113
21	1240	e470	e195	e130	e110	e2400	e610	809	128	1230	133	110
22	1170	e450	e190	e130	e115	e2200	e600	748	122	1160	129	108
23	1060	e430	e185	e130	e120	e2000	e590	691	116	983	124	107
24	986	e415	e180	e135	e120	e1850	e580	640	112	852	155	105
25	927	e400	e180	e135	e120	e1700	e580	593	107	760	790	105
26	862	e390	e180	e135	e125	e1750	e580	569	105	677	1060	103
27	795	e380	e180	e130	e125	e1850	e570	557	136	606	685	102
28	739	e370	e180	e125	e125	e2000	e580	550	161	566	537	102
29	691	e360	e180	e120	---	e2200	e600	531	147	518	437	107
30	641	e350	e180	e120	---	e2300	e610	503	128	485	346	149
31	611	---	e175	e120	---	e2400	---	463	---	450	302	---
TOTAL	19752	14150	6740	3820	3245	42565	25760	26634	6726	30367	9509	4257
MEAN	637	472	217	123	116	1373	859	859	224	980	307	142
MAX	1240	582	410	160	125	3100	2300	1860	425	2030	1060	259
MIN	266	350	165	105	105	120	570	463	105	123	124	102
AC-FT	39180	28070	13370	7580	6440	84430	51090	52830	13340	60230	18860	8440
CFSM	.40	.29	.14	.08	.07	.86	.54	.54	.14	.61	.19	.09
IN.	.46	.33	.16	.09	.08	.99	.60	.62	.16	.71	.22	.10

e Estimated.

RED RIVER OF THE NORTH BASIN

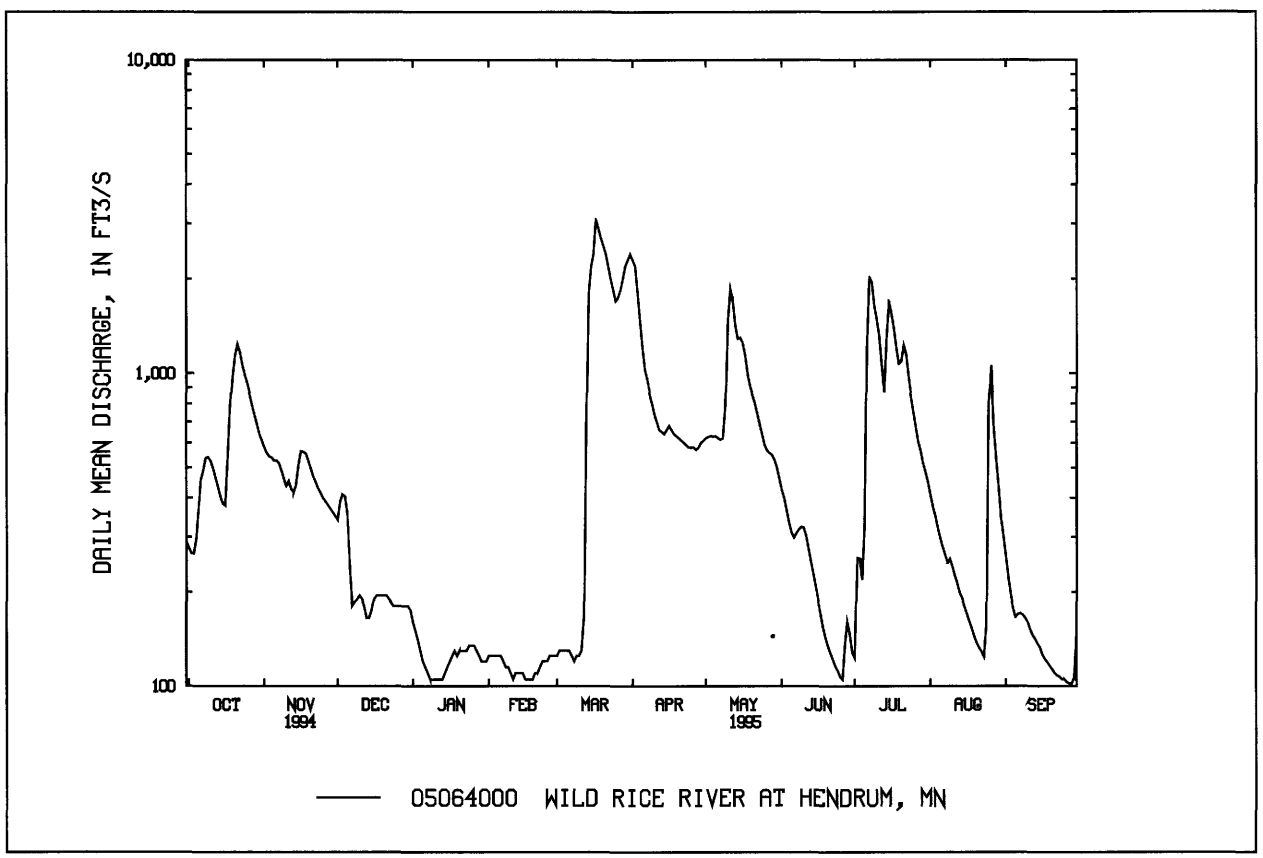
05064000 WILD RICE RIVER AT HENDRUM, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	125	111	66.1	47.4	45.8	293	1075	569	415	345	150	115
MAX	744	784	217	123	124	1485	3261	2074	1776	3136	1833	824
(WY)	1972	1972	1995	1995	1984	1966	1978	1985	1962	1975	1993	1973
MIN	.44	3.32	1.08	.092	.22	.46	106	56.1	9.15	8.82	1.07	.18
(WY)	1949	1949	1977	1977	1977	1949	1981	1977	1952	1951	1977	1948

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1944 - 1995	
ANNUAL TOTAL	178760		193525			
ANNUAL MEAN	490		530		272a	
HIGHEST ANNUAL MEAN					682	1975
LOWEST ANNUAL MEAN					28.9	1977
HIGHEST DAILY MEAN	2600	Apr 3	3100	Mar 17	9220	Apr 10 1978
LOWEST DAILY MEAN	76	Feb 4	102	Sep 27	.00	Sep 13 1948
ANNUAL SEVEN-DAY MINIMUM	76	Feb 4	104	Sep 23	.00	Sep 27 1948
INSTANTANEOUS PEAK FLOW			3200e	Mar 17	9350	Apr 10 1978
INSTANTANEOUS PEAK STAGE			25.30b	Mar 30	32.30b	Apr 21 1979
ANNUAL RUNOFF (AC-FT)	354600		383900		196900	
ANNUAL RUNOFF (CFSM)	.31		.33		.17	
ANNUAL RUNOFF (INCHES)	4.16		4.50		2.31	
10 PERCENT EXCEEDS	1090		1290		685	
50 PERCENT EXCEEDS	380		323		85	
90 PERCENT EXCEEDS	82		115		15	

a Medium of annual mean discharges is 242 ft^3/s.
b Backwater from Red River of the North.
e Estimated.



RED RIVER OF THE NORTH BASIN

05064500 RED RIVER OF THE NORTH AT HALSTAD, MN

LOCATION.--Lat 47 °21'10", long 96 °50'50", on line between secs.24 and 25, T.145 N., R.49 W., Trail County, Hydrologic Unit 09020107, on left bank on upstream side of highway bridge, 0.5 mi west of Halstad, 2.5 mi downstream from Wild Rice River, and at mile 375.2.

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

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

REVISED RECORDS.--WSP 1388:1936, 1950. WSP 1728: Drainage area.

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2070	e3200	e1160	e850	e900	e940	23000	5650	4270	1400	2180	1130
2	2000	e3100	e1140	e840	e900	e960	22600	5390	4240	1370	e2000	1070
3	1960	e3000	e1120	e830	e900	e960	22100	5190	4160	1380	1900	1030
4	1970	2750	e1100	e820	e900	e960	21600	5100	4100	1380	1780	1010
5	1980	2650	e1080	e820	e900	e960	20800	5090	4020	1760	1610	1040
6	1960	2580	e1060	e810	e900	e950	19500	5080	3940	5220	1450	1090
7	2110	2500	e1040	e820	e900	e940	18000	5030	3890	7430	1350	1150
8	2460	2400	e1020	e820	e900	e940	16300	4980	3860	7520	1300	1140
9	2550	2200	e1000	e820	e900	e960	14600	5240	3820	7240	1250	1090
10	2510	1900	e1000	e820	e900	e1050	12900	6740	3730	6910	1190	1040
11	2400	1640	e1020	e820	e900	e1150	12100	7800	3660	6370	1140	991
12	2240	1530	e1050	e820	e900	e1500	11600	7710	3520	e6000	1100	953
13	2120	1480	e1050	e820	e880	e2000	10100	7370	3380	e5700	1060	913
14	1990	1490	e1020	e840	e880	e2500	9620	7270	3280	e5500	1030	888
15	1790	1550	e1000	e850	e870	e3000	9410	7380	3230	5450	1030	831
16	1730	1600	e980	e880	e870	e11500	9360	7440	3160	5380	1030	806
17	2560	1630	e960	e930	e870	e13500	9430	7460	3060	5300	1020	818
18	4640	1650	e960	e970	e870	e14000	9510	7480	2930	5110	1000	811
19	5240	1640	e960	e990	e870	e15000	9510	7470	2790	4920	981	802
20	5110	1570	e980	e1000	e870	e15500	9410	7340	2590	4930	958	786
21	4650	1520	e1000	e980	e860	e16000	9190	7020	2330	4980	918	761
22	4080	1490	e1000	e970	e860	e16500	8890	6520	2120	4800	856	720
23	3630	1380	e1000	e960	e860	e16500	8530	5980	1950	4440	748	669
24	3350	e1350	e990	e930	e860	e17500	8140	5550	1700	4010	859	612
25	3190	e1320	e980	e900	e860	e17500	7660	5310	1500	3610	1670	556
26	3020	e1290	e960	e900	e880	e18000	7070	5160	1370	3310	2500	502
27	2940	e1260	e940	e900	e900	e18000	6640	5040	1300	3120	2130	474
28	3050	e1240	e920	e900	e920	e19000	6330	4930	1430	2980	1760	474
29	3220	e1200	e900	e900	---	e20000	6070	4790	1790	2810	1500	503
30	3300	e1180	e880	e900	---	e21500	5890	4550	1600	2580	1300	e600
31	e3300	---	e860	e900	---	e23000	---	4350	---	2370	1200	---
TOTAL	89120	55290	31130	27310	24780	292770	365860	187410	88720	135280	41800	25260
MEAN	2875	1843	1004	881	885	9444	12200	6045	2957	4364	1348	842
MAX	5240	3200	1160	1000	920	23000	23000	7800	4270	7520	2500	1150
MIN	1730	1180	860	810	860	940	5890	4350	1300	1370	748	474
AC-FT	176800	109700	61750	54170	49150	580700	725700	371700	176000	268300	82910	50100

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1995, BY WATER YEAR (WY)

MEAN	768	685	527	446	458	2270	6788	3153	2541	2607	1118	715
MAX	2875	1843	1253	1023	1052	9444	20080	8994	10310	20060	11700	3360
(WY)	1995	1995	1987	1987	1987	1995	1969	1979	1962	1975	1993	1993
MIN	61.5	92.3	51.2	32.1	45.9	249	705	449	242	153	59.5	38.4
(WY)	1977	1977	1977	1977	1977	1962	1981	1977	1977	1988	1977	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1961 - 1995	
ANNUAL TOTAL	1163551		1364730			
ANNUAL MEAN	3188		3739		1855	
HIGHEST ANNUAL MEAN					3968	1975
LOWEST ANNUAL MEAN					214	1977
HIGHEST DAILY MEAN	16400	Apr 2	23000	Mar 31	41500	Apr 22 1979
LOWEST DAILY MEAN	741	Sep 9	474	Sep 27	10	Sep 2 1976
ANNUAL SEVEN-DAY MINIMUM	835	Feb 3	532	Sep 24	17	Aug 28 1976
INSTANTANEOUS PEAK FLOW			23300	Mar 31	42000	Apr 22 1979
INSTANTANEOUS PEAK STAGE			30.51	Mar 31	39.00	Apr 22 1979
INSTANTANEOUS LOW FLOW					5.4	Oct 8 1936
ANNUAL RUNOFF (AC-FT)	2308000		2707000		1344000	
10 PERCENT EXCEEDS	6350		9260		4060	
50 PERCENT EXCEEDS	2160		1640		747	
90 PERCENT EXCEEDS	900		860		206	

e Estimated.

05064500 RED RIVER OF THE NORTH AT HALSTAD, MN--Continued
(National Stream Quality Accounting Network Station)
(National Water Quality Assessment Program)

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)
OCT												
21...	1145	4740	--	710	--	--	14.5	13.0	--	--	--	--
NOV												
04...	1400	2730	--	925	--	--	7.0	7.0	--	--	--	--
16...	1045	1660	--	882	8.1	733	4.5	4.0	13.3	105	390	253
JAN												
06...	1240	819	--	834	--	--	-12.0	0.0	--	--	--	--
26...	1100	--	900	771	7.7	745	-2.5	0.5	11.0	78	350	278
MAR												
11...	1810	11200	--	410	--	--	12.0	2.0	--	--	--	--
31...	1325	22100	--	600	--	--	1.0	3.0	--	--	--	--
APR												
10...	1120	12800	--	677	7.9	753	4.5	3.0	12.2	92	290	--
18...	1200	9530	--	728	--	--	6.5	5.0	--	--	--	--
25...	1020	7730	--	808	--	--	8.0	8.5	--	--	--	--
MAY												
11...	1000	7850	--	770	8.2	740	8.5	12.0	9.0	86	340	187
JUN												
15...	0900	--	3230	911	8.2	740	21.5	20.0	7.8	88	390	206
21...	1010	2360	--	805	--	--	29.5	24.5	--	--	--	--
JUL												
10...	1450	6870	--	598	--	--	27.0	25.5	--	--	--	--
AUG												
03...	1325	1910	--	919	--	--	22.5	25.0	--	--	--	--
SEP												
14...	1525	911	--	903	--	--	17.5	19.5	--	--	--	--

DATE	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	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)
NOV												
16...	--	82	44	47	21	1	7.6	294	8	170	22	0.20
JAN												
26...	--	73	41	38	19	0.9	7.2	339	0	110	17	0.20
APR												
10...	175	63	31	30	18	0.8	9.7	--	--	160	14	0.20
MAY												
11...	--	71	40	31	16	0.7	8.5	228	0	160	19	0.20
JUN												
15...	--	79	48	40	18	0.9	8.4	252	0	240	17	0.20

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)
NOV											
16...	18	545	585	0.80	2620	0.010	0.290	0.300	0.300	0.030	0.97
JAN											
26...	21	476	513	0.70	1250	0.010	0.410	0.420	0.420	0.160	0.64
APR											
10...	15	437	469	0.64	16200	0.040	1.86	1.90	1.90	0.090	1.2
MAY											
11...	12	460	512	0.70	10900	0.030	1.37	1.40	1.40	0.050	1.2
JUN											
15...	12	571	632	0.86	5510	0.020	0.560	0.580	0.580	0.040	1.2

DATE	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N) (00607)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)
NOV											
16...	0.67	1.0	0.70	1.3	0.200	0.110	0.100	13	15	10	1.5
JAN											
26...	0.64	0.80	0.80	1.2	0.070	0.050	0.060	18	28	--	--
APR											
10...	0.71	1.3	0.80	3.2	0.260	0.120	0.100	21	15	9.4	2.8
MAY											
11...	0.95	1.2	1.0	2.6	0.230	0.110	0.110	13	4	12	0.60
JUN											
15...	0.76	1.2	0.80	1.8	0.280	0.130	0.120	<3	1	--	--

RED RIVER OF THE NORTH BASIN

05067500 MARSH RIVER NEAR SHELLY, MN

LOCATION.--Lat 47°24'45", long 96°45'50", in NE¼NW¼ sec.3, T.145 N., R.48 W., Norman County, Hydrologic Unit 09020107, near center of span on downstream truss of bridge, 3.8 mi southeast of Shelly and 10 mi upstream from mouth.

DRAINAGE AREA.--151 mi².

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	24	---	---	---	.00	451	35	15	1.3	e14	1.0
2	3.6	21	---	---	---	.00	301	33	12	1.2	e10	.88
3	5.8	19	---	---	---	.00	207	33	9.1	1.2	e7.0	.62
4	11	17	---	---	---	.00	131	34	7.4	2.1	e6.0	.47
5	19	17	---	---	---	.00	106	33	6.1	94	e5.2	.52
6	24	14	---	---	---	.00	90	33	34	828	e4.8	1.3
7	41	11	---	---	---	.00	71	31	63	966	e4.5	1.4
8	51	9.1	---	---	---	.00	61	34	56	704	e4.0	4.0
9	47	11	---	---	---	.00	56	100	36	471	e3.2	5.4
10	41	11	---	---	---	.00	49	399	24	346	e2.5	2.6
11	32	10	---	---	---	.00	43	386	19	257	e2.2	1.3
12	27	9.0	---	---	---	e10	41	296	15	170	e2.0	1.1
13	23	13	---	---	---	e300	41	212	11	113	e1.8	.73
14	19	28	---	---	---	e900	38	151	7.4	88	e1.6	.44
15	15	42	---	---	---	1040	37	116	5.5	99	e1.4	.31
16	21	47	---	---	---	998	45	91	3.9	116	e1.2	.32
17	102	55	---	---	---	811	52	75	3.1	106	e1.1	.28
18	199	55	---	---	---	599	51	61	2.5	e95	e.90	.22
19	174	42	---	---	---	467	47	50	2.2	e90	e1.5	.13
20	146	e38	---	---	---	429	44	44	1.9	e84	e5.0	.09
21	116	e34	---	---	---	416	41	46	1.9	e82	e3.5	.03
22	92	e28	---	---	---	285	37	43	1.6	e80	e2.5	.03
23	74	e24	---	---	---	190	36	38	1.4	e72	e3.0	.06
24	62	e20	---	---	---	176	33	36	1.2	e68	e4.0	.05
25	54	e18	---	---	---	162	37	31	1.2	e60	e13	.03
26	49	e17	---	---	---	238	37	28	2.5	e52	e10	.00
27	44	e16	---	---	---	860	37	28	3.3	e44	e8.0	.00
28	40	e15	---	---	---	1170	33	27	2.8	e36	e5.5	.03
29	35	e14	---	---	---	1470	32	25	2.6	e30	e3.5	.35
30	31	e13	---	---	---	1310	33	22	1.9	e24	e1.9	1.8
31	27	---	---	---	---	814	---	18	---	e18	1.2	---
TOTAL1	629.8	692.1	---	---	--- 12645.00	2318	2589	354.5	5198.8	136.00	25.49	
MEAN	52.6	23.1	---	---	---	408	77.3	83.5	11.8	168	4.39	.85
MAX1	99	55	---	---	---	1470	451	399	63	966	14	5.4
MIN	3.6	9.0	---	---	---	.00	32	18	1.2	1.2	.90	.00
AC-FT	3230	1370	---	---	---	25080	4600	5140	703	10310	270	51
CFSM	.35	.15	---	---	---	2.70	.51	.55	.08	1.11	.03	.01
IN.	.40	.17	---	---	---	3.12	.57	.64	.09	1.28	.03	.01

e Estimated.

RED RIVER OF THE NORTH BASIN

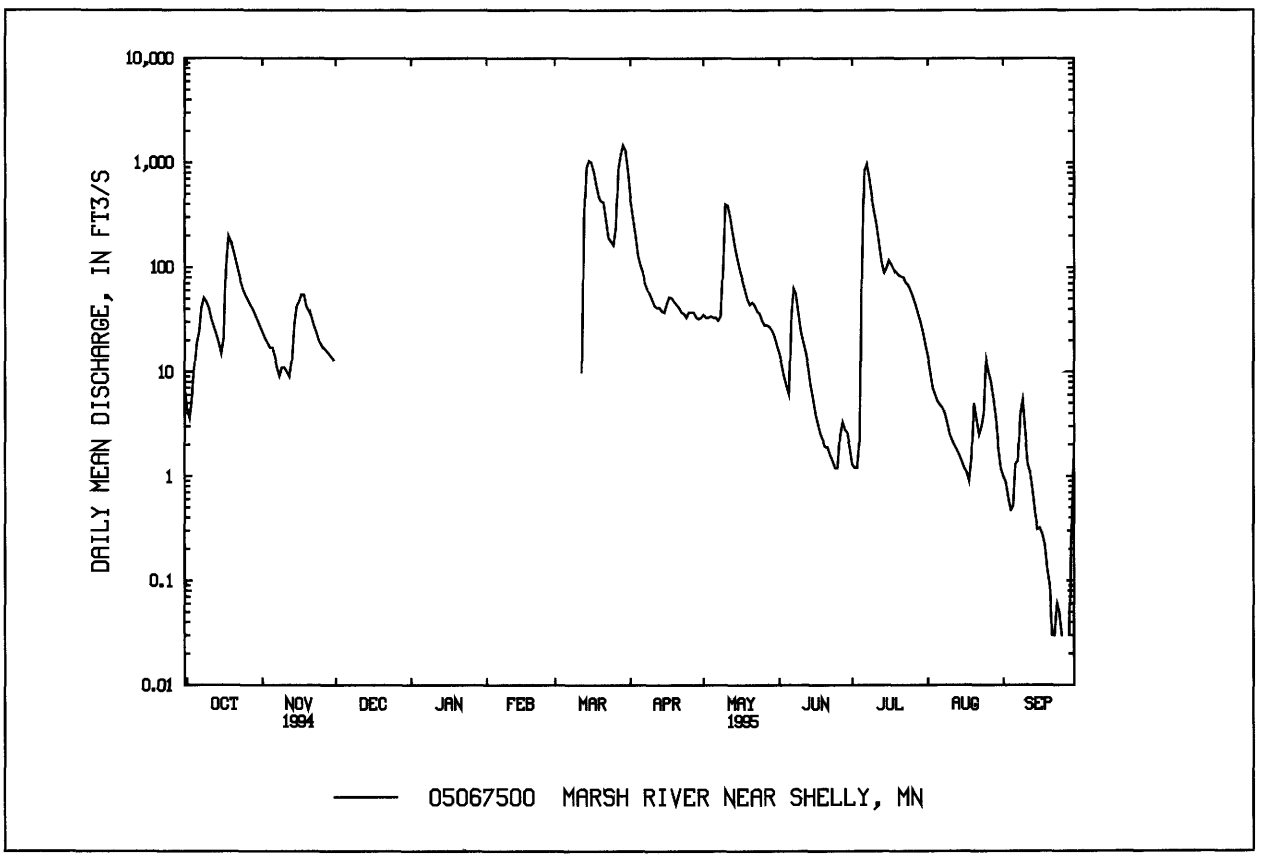
05067500 MARSH RIVER NEAR SHELLY, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	13.3	11.0	5.60	3.79	3.29	76.7	285	125	80.2	75.5	20.4	13.0
MAX	130	102	77.1	64.5	62.1	437	1537	2617	1030	820	363	144
(WY)	1952	1952	1951	1951	1951	1945	1950	1950	1950	1950	1949	1944
MIN	.000	.000	.000	.000	.000	.000	.078	.87	.000	.000	.000	.000
(WY)	1955	1956	1956	1946	1946	1964	1981	1980	1980	1961	1959	1954

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1944 - 1995	
ANNUAL MEAN					63.3a	
HIGHEST ANNUAL MEAN					543a	1950
LOWEST ANNUAL MEAN					1.24a	1977
HIGHEST DAILY MEAN	935	Jul 9	1470	Mar 29	4740	Apr 19 1979
LOWEST DAILY MEAN	.38	Aug 20	.00b	Mar 1-11	.00c	Sep 4 1945
ANNUAL SEVEN-DAY MINIMUM	.46	Aug 15	.00	Mar 1	.00	Sep 12 1945
INSTANTANEOUS PEAK FLOW			1500	Mar 29	4880	Apr 19 1979
INSTANTANEOUS PEAK STAGE			15.21	Mar 29	23.36d	Apr 19 1979

a Based on complete water years only, 1945-83, 86-89.
b Observed days only.
c Many days, several years.
d From floodmark.



RED RIVER OF THE NORTH BASIN

05069000 SAND HILL RIVER AT CLIMAX, MN

LOCATION.--Lat 47°36'43", long 96°48'52", in NE¼NE¼ sec.30, T.148 N., R.48 W., Polk County, Hydrologic Unit 09020301, on left bank 25 ft upstream from bridge on U.S. Highway 75 in Climax and 3.7 mi upstream from mouth.

DRAINAGE AREA.--426 mi².

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	104	109	61	e28	e22	e22	e620	110	63	e27	e82	31
2	92	104	e64	e27	e22	e22	e580	110	56	e49	e77	32
3	87	97	e66	e26	e22	e22	e500	117	51	e45	e72	e29
4	90	87	e63	e26	e22	e22	e440	118	51	95	e67	e25
5	88	80	e60	e25	e22	e22	e380	117	47	508	e63	e23
6	89	76	e50	e25	e22	e22	e330	118	46	1050	e59	e30
7	102	73	e45	e24	e22	e22	e290	114	53	658	55	e40
8	100	70	e41	e24	e22	e22	e270	115	63	e570	53	e70
9	99	68	e39	e24	e22	e22	e250	144	62	e500	47	e64
10	102	64	e37	e23	e22	e22	e230	312	57	463	46	e52
11	106	62	e35	e23	e22	e25	e220	300	52	414	46	42
12	108	62	e34	e23	e22	e50	209	261	47	371	e44	e35
13	103	67	e34	e23	e22	e170	195	243	45	243	e41	e30
14	100	94	e33	e23	e22	e460	186	237	42	558	38	e26
15	93	118	e32	e23	e22	e510	178	232	43	525	35	e23
16	94	137	e32	e22	e22	e1050	176	225	47	e495	32	e20
17	130	136	e31	e22	e22	e1300	169	219	41	478	32	e18
18	159	131	e31	e22	e22	e1230	161	204	35	e420	32	e17
19	194	e118	e31	e22	e22	e1150	157	190	33	356	31	e16
20	207	e122	e31	e22	e22	e1080	147	176	28	338	29	14
21	204	e110	e31	e22	e22	e900	141	168	27	320	28	e14
22	213	e100	e31	e22	e22	e800	132	148	e26	284	29	e14
23	209	e105	e30	e22	e22	e700	125	136	24	e250	29	e14
24	201	e95	e30	e22	e22	e600	122	121	22	212	31	e13
25	194	e80	e30	e22	e22	e460	116	110	e22	e190	50	e13
26	188	e66	e30	e22	e22	e480	113	103	27	177	55	21
27	177	e60	e29	e22	e22	e520	112	96	e28	131	42	19
28	169	e68	e29	e22	e22	e560	111	89	29	112	38	20
29	153	e66	e29	e22	---	e600	111	83	e29	104	36	e19
30	133	e64	e29	e22	---	e620	112	76	28	e98	41	e35
31	119	---	e28	e22	---	e630	---	69	---	90	34	---
TOTAL	4207	2689	1176	719	616	14115	6883	4861	1224	10131	1394	819
MEAN	136	89.6	37.9	23.2	22.0	455	229	157	40.8	327	45.0	27.3
MAX	213	137	66	28	22	1300	620	312	63	1050	82	70
MIN	87	60	28	22	22	22	111	69	22	27	28	13
AC-FT	8340	5330	2330	1430	1220	28000	13650	9640	2430	20090	2760	1620
CFSM	.32	.21	.09	.05	.05	1.07	.54	.37	.10	.77	.11	.06
IN.	.37	.23	.10	.06	.05	1.23	.60	.42	.11	.88	.12	.07

e Estimated.

RED RIVER OF THE NORTH BASIN

05069000 SAND HILL RIVER AT CLIMAX, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 1995, BY WATER YEAR (WY)

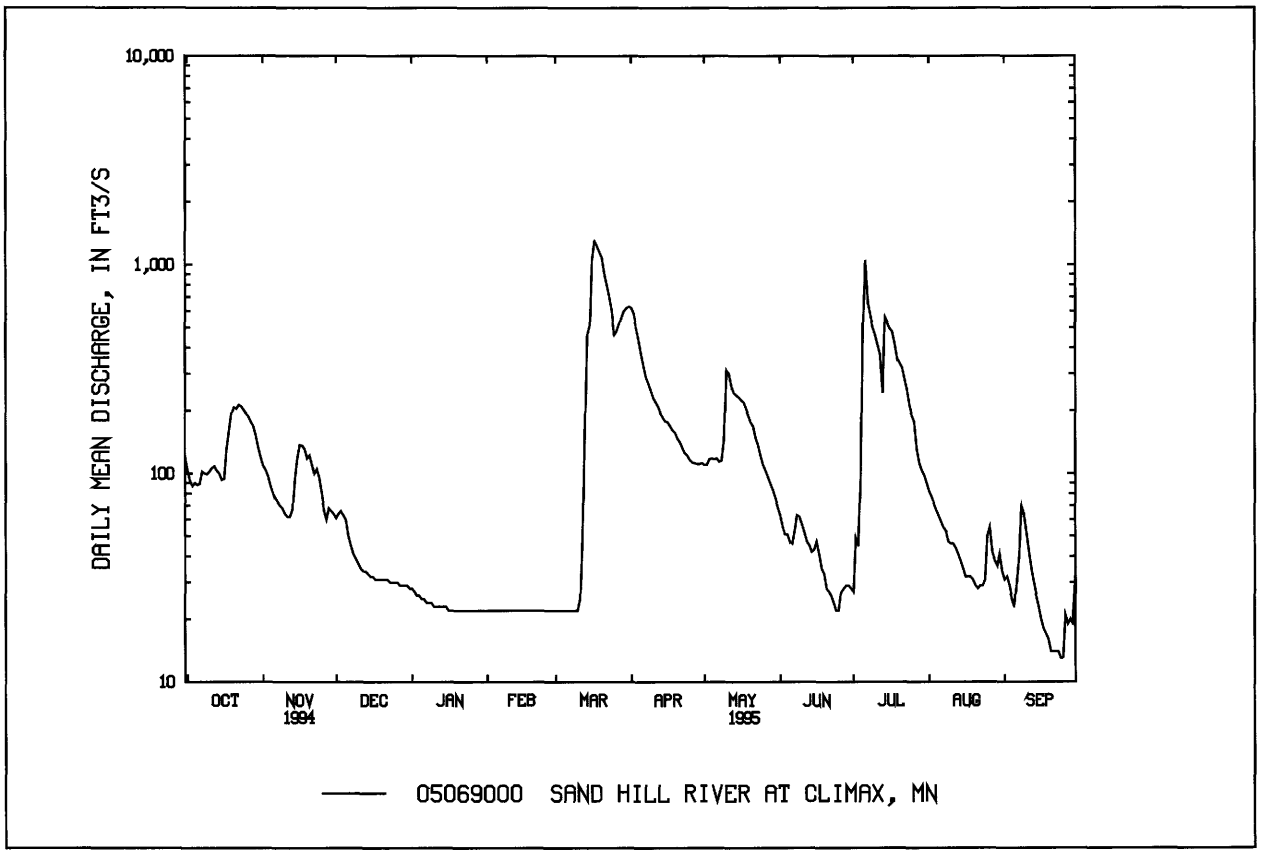
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	33.7	28.3	17.3	12.6	12.4	81.8	340	118	94.5	72.4	38.3	27.1
MAX	223	209	48.7	30.1	46.8	455	946	1156	596	376	426	124
(WY)	1972	1972	1972	1986	1984	1995	1978	1950	1984	1994	1993	1994
MIN	9.43	8.64	5.11	2.02	3.55	5.81	25.3	23.7	11.5	8.95	6.30	6.49
(WY)	1977	1956	1964	1962	1962	1948	1981	1958	1980	1980	1961	1955

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1943 - 1995	
ANNUAL TOTAL	43124		48834			
ANNUAL MEAN	118		134		72.6a	
HIGHEST ANNUAL MEAN					204	1950
LOWEST ANNUAL MEAN					18.4	1977
HIGHEST DAILY MEAN	1540	Jul 9	1300	Mar 17	4360	Apr 14 1965
LOWEST DAILY MEAN	14	Jan 26	13	Sep 24,25	1.0	Jan 17 1962
ANNUAL SEVEN-DAY MINIMUM	14	Jan 26	14	Sep 19	1.1	Jan 12 1962
INSTANTANEOUS PEAK FLOW			1340	Mar 17	4560	Apr 14 1965
INSTANTANEOUS PEAK STAGE			17.07b	Mar 31	32.79c	Apr 23 1979
ANNUAL RUNOFF (AC-FT)	85540		96860		52580	
ANNUAL RUNOFF (CFSM)	.28		.31		.17	
ANNUAL RUNOFF (INCHES)	3.77		4.26		2.32	
10 PERCENT EXCEEDS	267		362		148	
50 PERCENT EXCEEDS	68		60		22	
90 PERCENT EXCEEDS	14		22		8.8	

a Median of annual mean discharges is 57 ft^3/s.

b Backwater from Red River of the North.

c From floodmark (backwater from Red River of the North).



RED RIVER OF THE NORTH BASIN

05074000 LOWER RED LAKE NEAR RED LAKE, MN

LOCATION.--Lat 47°57'27", long 95°16'34", in $SW^1/_4NW^1/_4$ sec. 28, T. 152 N., R. 36 W., Clearwater County, Hydrologic Unit 09020302, on Red Lake Indian Reservation, on left bank just upstream from dam at outlet, 13 mi northwest of city of Red Lake.

DRAINAGE AREA.--1,950 mi^2, approximately.

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

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

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

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

EXTREMES FOR CURRENT YEAR.--Maximum daily, 1,174.94 ft, Aug. 4; minimum daily, 1,173.52 ft, Oct. 28.

MONTHEND ELEVATION, IN FEET, OCTOBER 1994 TO SEPTEMBER 1995

Oct. 31 ..... 1173.88	Feb. 28 ..... 1173.71	June 30 ..... 1174.48
Nov. 30..... 1173.86	Mar. 31 ..... 1173.81	July 31 ..... 1174.87
Dec 31 ..... 1173.81	Apr. 30..... 1174.07	Aug. 31..... 1174.59
Jan. 31 ..... ------	May 31..... 1174.10	Sept. 30..... 1174.51

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

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RED RIVER OF THE NORTH BASIN

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

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

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	657	602	e1050	e750	e780	e800	1030	849	510	1010	760	490
2	687	585	e1150	e750	e780	e810	996	846	509	1030	757	466
3	751	586	e1100	e750	e780	e810	963	877	507	1030	764	449
4	798	655	e950	e750	e780	e820	892	892	502	1050	737	435
5	820	725	e800	e750	e780	e800	738	901	494	1130	725	430
6	831	767	e700	e750	e780	e800	708	897	496	1290	720	505
7	835	794	e720	e750	e780	e800	890	900	515	1210	717	666
8	833	803	e750	e750	e780	e800	928	911	531	906	714	656
9	830	808	e780	e750	e780	e800	930	971	522	645	710	608
10	831	812	e800	e750	e780	e800	915	1100	505	455	696	567
11	831	791	e790	e760	e780	e820	913	1090	496	356	678	533
12	829	562	e770	e760	e780	e850	902	1070	492	318	672	508
13	836	338	e760	e770	e800	e1000	911	1220	487	453	674	482
14	847	269	e750	e770	e810	e1500	942	1260	484	643	670	458
15	858	261	e750	e780	e820	e1900	956	1250	483	822	647	446
16	886	232	e750	e780	e830	e2100	933	1260	477	867	629	431
17	905	182	e750	e780	e840	e2300	914	1260	475	904	620	419
18	916	552	e750	e780	e850	e2400	907	1230	469	939	604	412
19	933	744	e750	e780	e850	2670	901	1210	466	939	747	413
20	936	819	e750	e780	e850	2290	893	1180	410	979	763	408
21	927	836	e750	e780	e850	1350	879	1170	214	974	666	400
22	926	840	e750	e780	e840	891	869	1170	141	943	599	394
23	929	1010	e750	e780	e830	1010	876	1130	226	917	646	393
24	924	1110	e750	e780	e820	992	891	963	552	897	678	388
25	915	1100	e750	e780	e800	982	881	582	713	879	711	380
26	924	1050	e750	e780	e700	1020	867	450	831	848	680	375
27	928	967	e750	e780	e820	1340	864	515	910	843	631	371
28	857	e950	e750	e780	e850	1660	864	541	952	826	604	371
29	759	e920	e750	e780	---	1430	864	535	1010	802	582	387
30	677	e950	e750	e780	---	1190	859	527	1020	788	551	527
31	628	---	e750	e780	---	1090	---	515	---	763	517	---
TOTAL	26044	21620	24620	23820	22520	38825	26876	29272	16399	26456	20869	13768
MEAN	840	721	794	768	804	1252	896	944	547	853	673	459
MAX	936	1110	1150	780	850	2670	1030	1260	1020	1290	764	666
MIN	628	182	700	750	700	800	708	450	141	318	517	371
AC-FT	51660	42880	48830	47250	44670	77010	53310	58060	32530	52480	41390	27310
CFSM	.37	.31	.35	.33	.35	.54	.39	.41	.24	.37	.29	.20
IN.	.42	.35	.40	.39	.36	.63	.43	.47	.27	.43	.34	.22

e Estimated.

RED RIVER OF THE NORTH BASIN

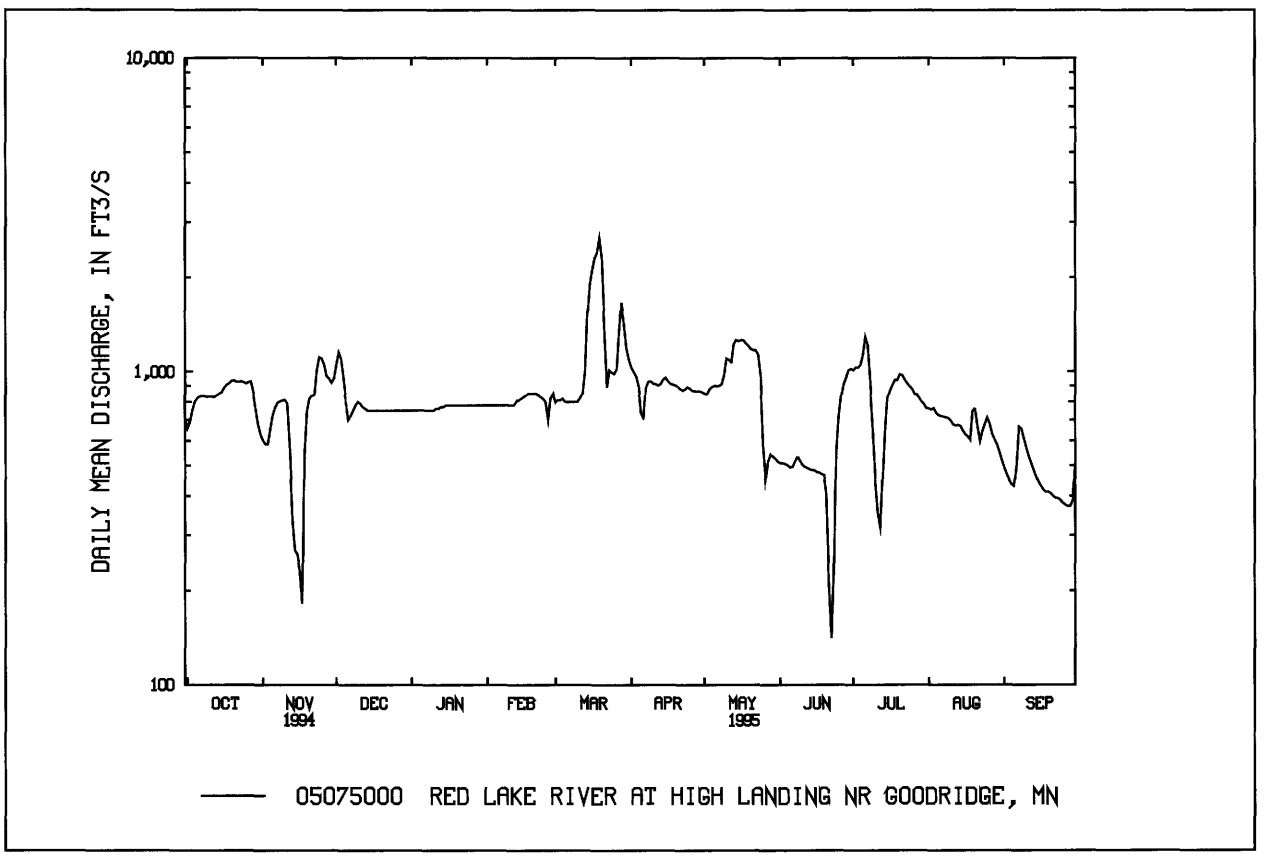
05075000 RED LAKE RIVER AT HIGH LANDING, NEAR GOODRIDGE, MN

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	527	495	453	451	448	488	656	662	656	572	497	515
MAX	1955	1730	1539	1424	1366	1453	1980	3179	2161	2474	1478	1733
(WY)	1951	1951	1951	1951	1951	1951	1951	1950	1950	1975	1975	1950
MIN	2.11	1.61	.000	.000	.000	.000	24.7	5.58	1.04	5.92	.026	.000
(WY)	1934	1934	1934	1934	1934	1936	1933	1933	1936	1934	1934	1934

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1930 - 1995	
ANNUAL TOTAL	232799		291089			
ANNUAL MEAN	638		798		535	
HIGHEST ANNUAL MEAN					1407	1951
LOWEST ANNUAL MEAN					6.21	1934
HIGHEST DAILY MEAN	1960	Jul 9	2670	Mar 19	4040	Jul 7 1975
LOWEST DAILY MEAN	182	Nov 17	141	Jun 22	.00a	Oct 11 1931
ANNUAL SEVEN-DAY MINIMUM	244	Mar 30	342	Nov 12	.00	Nov 16 1933
INSTANTANEOUS PEAK FLOW			2720	Mar 19	4060	Jul 7 1975
INSTANTANEOUS PEAK STAGE			11.58	Mar 19	13.44	Jul 3 1975
ANNUAL RUNOFF (AC-FT)	461800		577400		387700	
ANNUAL RUNOFF (CFSM)	.28		.35		.23	
ANNUAL RUNOFF (INCHES)	3.77		4.71		3.16	
10 PERCENT EXCEEDS	869		1050		1160	
50 PERCENT EXCEEDS	620		780		430	
90 PERCENT EXCEEDS	286		473		34	

a Many days, several years.



RED RIVER OF THE NORTH BASIN

05076000 THIEF RIVER NEAR THIEF RIVER FALLS, MN

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

DRAINAGE AREA.--959 mi².

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	665	e56	e200	e50	e.35	e1.4	1260	190	158	39	104	66
2	651	598	e160	e46	e.35	e1.3	1180	184	143	29	102	65
3	532	614	e130	e42	e.30	e1.2	e1100	189	145	23	105	63
4	98	604	e115	e40	e.25	e1.1	e900	220	139	20	104	63
5	37	585	e100	e34	e.20	e1.0	e600	238	131	71	153	62
6	29	161	e95	e30	e.20	e1.0	e650	231	71	527	169	80
7	27	23	e90	e24	e.20	e1.0	e700	220	135	521	167	148
8	e25	80	e88	e20	e.20	e1.0	e750	224	123	405	167	201
9	e24	108	e84	e16	e.20	e1.0	e800	232	102	316	164	161
10	e23	108	e82	e12	e.30	e1.0	e850	265	87	252	163	129
11	e22	109	e84	e10	e.25	e1.0	e810	299	71	73	163	105
12	e21	110	e90	e8.0	e.20	e1.0	760	283	59	36	165	96
13	e21	177	e96	e6.0	e.20	e300	697	486	49	27	166	91
14	e20	458	e100	e4.0	e.20	e1000	706	739	43	24	157	81
15	e20	499	e100	e2.0	e.15	e1500	709	611	38	25	66	72
16	e20	443	e98	e1.6	e.10	e1900	702	623	33	35	46	69
17	e50	408	e98	e1.4	e.20	e1800	678	735	28	50	42	68
18	e200	554	e96	e1.2	e.40	e1700	595	641	18	123	47	69
19	e500	655	e94	e1.1	e.60	e1500	577	548	14	208	61	70
20	e800	705	e90	e1.0	e.80	e1300	553	497	28	247	67	66
21	e400	546	e88	e.90	e1.0	e1100	545	460	19	204	60	66
22	e150	e450	e86	e.80	e1.2	e900	532	425	14	209	67	65
23	e90	e380	e84	e.70	e1.3	e800	547	390	11	181	73	64
24	e50	e390	e82	e.60	e1.3	e780	579	365	10	155	87	73
25	e40	e400	e80	e.50	e1.4	787	427	351	10	138	84	64
26	e35	e410	e76	e.50	e1.4	791	392	343	41	120	80	61
27	e32	e320	e72	e.50	e1.4	1140	372	341	79	96	77	61
28	e30	e300	e68	e.40	e1.4	1720	331	337	78	110	75	61
29	e28	e270	e62	e.40	---	1880	200	328	64	113	71	63
30	e27	e230	e58	e.40	---	1640	185	313	51	109	68	70
31	e26	---	e52	e.35	---	1410	---	234	---	106	67	---
TOTAL	4693	10751	2898	356.35	16.05	23961.0	19687	11542	1992	4592	3187	2473
MEAN	151	358	93.5	11.5	.57	773	656	372	66.4	148	103	82.4
MAX	800	705	200	50	1.4	1900	1260	739	158	527	169	201
MIN	20	23	52	.35	.10	1.0	185	184	10	20	42	61
AC-FT	9310	21320	5750	707	32	47530	39050	22890	3950	9110	6320	4910
CFSM	.16	.37	.10	.01	.00	.81	.68	.39	.07	.15	.11	.09
IN.	.18	.42	.11	.01	.00	.93	.76	.45	.08	.18	.12	.10

e Estimated.

RED RIVER OF THE NORTH BASIN

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	87.4	66.7	20.1	5.63	3.45	76.5	574	453	279	208	94.6	99.1
MAX	637	844	206	100	45.0	773	2827	4274	1774	2103	1012	1012
(WY)	1986	1972	1945	1910	1910	1995	1966	1950	1962	1975	1993	1993
MIN	.000	.000	.000	.000	.000	.000	7.75	1.83	.032	.000	.000	.000
(WY)1911	1911	1911	1911	1911	1930	1981	1990	1980	1932	1932	1929	

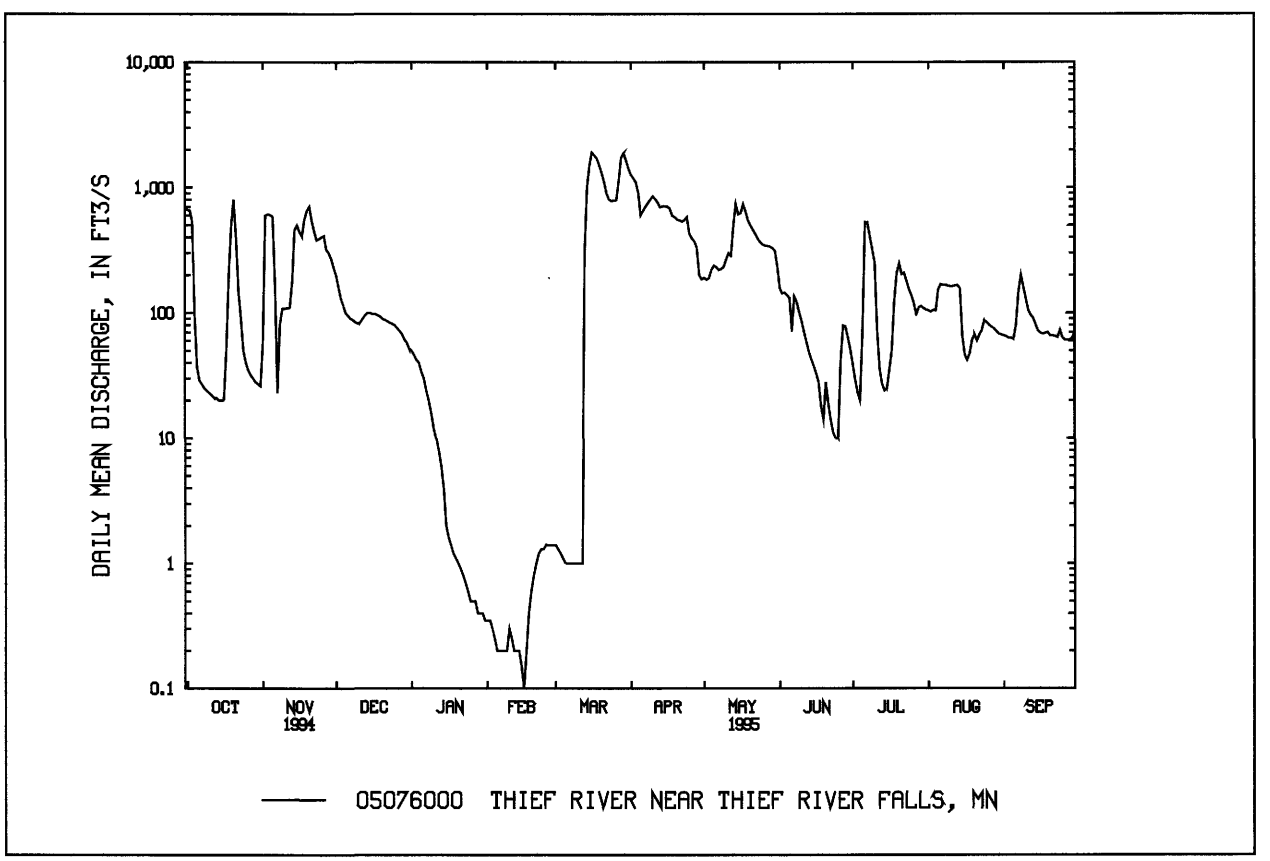
SUMMARY STATISTICSFOR 1994 CALENDAR YEARFOR 1995 WATER YEARWATER YEARS 1909 - 1995

ANNUAL TOTAL	70499.10		86148.40				
ANNUAL MEAN	193		236		163[a]		
HIGHEST ANNUAL MEAN					607		1966
LOWEST ANNUAL MEAN					1.28		1939
HIGHEST DAILY MEAN	1900	Jul 9	1900	Mar 16	5580	May 13	1950
LOWEST DAILY MEAN	.00	Feb 4	.10	Feb 16	.00[b]	Oct 1	1910
ANNUAL SEVEN-DAY MINIMUM	.00	Feb 4	.19	Feb 11	.00	Oct 1	1910
INSTANTANEOUS PEAK FLOW			2080	Mar 29	5610	May 13	1950
INSTANTANEOUS PEAK STAGE			13.05[c]	Mar 14	17.38	May 13	1950
ANNUAL RUNOFF (AC-FT)	139800		170900		118100		
ANNUAL RUNOFF (CFSM)	.20		.25		.17		
ANNUAL RUNOFF (INCHES)	2.73		3.34		2.31		
10 PERCENT EXCEEDS	600		686		516		
50 PERCENT EXCEEDS	71		88		7.7		
90 PERCENT EXCEEDS	.60		1.0		.00		

a Median of annual mean discharges is 112 ft^3/s.

b Many days, several years.

c Ice jam.



RED RIVER OF THE NORTH BASIN

05078000 CLEARWATER RIVER AT PLUMMER, MN

LOCATION.--Lat 47°55'24", long 96°02'46", in SE¼SW¼ sec. 4, T.151 N., R.42 W., Red Lake County, Hydrologic Unit 09020305, on right bank 200 ft downstream from Soo Line Railroad bridge, 300 ft downstream from bridge on U.S. Highway 59, 0.9 mi northwest of railroad depot in Plummer, and 8 mi upstream from Hill River.

DRAINAGE AREA.--512 mi².

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

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

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

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

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Mar. 16	2100	(ice jam)	*9.59	Mar. 18	0100	*1610	9.08
Mar. 30	0400	1010	7.54	July 8	1900	683	6.14
May 12	0600	550	5.60	Sept. 7	0900	691	6.20

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	142	143	e110	e78	e64	e54	485	190	123	101	110	146
2	129	136	e115	e76	e64	e54	409	166	93	106	103	121
3	125	132	e100	e74	e64	e56	349	151	84	93	110	104
4	126	124	e80	e72	e64	e60	229	190	101	93	110	90
5	126	107	e85	e72	e64	e60	230	219	102	148	93	82
6	118	104	e90	e72	e64	e60	279	232	89	454	81	384
7	112	99	e90	e72	e64	e60	269	239	111	600	74	680
8	100	98	e90	e72	e64	e58	216	242	143	668	73	585
9	108	86	e95	e70	e64	e58	214	259	153	655	66	412
10	110	77	e100	e70	e64	e56	194	395	138	596	64	256
11	111	86	e95	e70	e62	e56	168	515	126	513	57	183
12	104	80	e90	e70	e62	e70	158	546	115	446	51	145
13	102	92	e90	e70	e62	e400	207	526	104	422	50	123
14	98	115	e90	e68	e62	e700	200	507	101	420	48	111
15	94	131	e88	e68	e62	e800	203	469	99	465	48	96
16	101	133	e88	e68	e62	e900	204	448	75	477	47	84
17	120	130	e86	e68	e62	e1000	189	432	72	462	41	74
18	125	129	e86	e68	e62	1150	160	401	83	486	47	71
19	135	129	e84	e68	e62	686	159	367	78	476	119	58
20	171	e125	e84	e66	e62	727	148	341	60	449	284	55
21	191	e110	e84	e66	e62	772	136	320	38	409	206	53
22	182	e95	e84	e66	e62	805	145	292	43	336	149	50
23	190	e100	e84	e66	e62	589	156	273	51	292	171	46
24	199	e105	e82	e64	e62	421	164	244	54	248	190	35
25	191	e110	e82	e64	e60	335	154	239	55	229	248	36
26	184	e115	e82	e64	e58	328	137	226	63	207	260	38
27	184	e115	e82	e64	e56	457	141	203	52	188	213	35
28	177	e115	e82	e64	e55	590	162	206	40	186	324	30
29	169	e115	e82	e64	---	865	185	196	63	176	290	34
30	160	e115	e82	e64	---	928	191	173	110	157	246	221
31	153	---	e80	e64	---	637	---	143	---	133	188	---
TOTAL	4337	3351	2742	2122	1737	13792	6241	9350	2619	10691	4161	4438
MEAN	140	112	88.5	68.5	62.0	445	208	302	87.3	345	134	148
MAX	199	143	115	78	64	1150	485	546	153	668	324	680
MIN	94	77	80	64	55	54	136	143	38	93	41	30
AC-FT	8600	6650	5440	4210	3450	27360	12380	18550	5190	21210	8250	8800
CFSM	.27	.22	.17	.13	.12	.87	.41	.59	.17	.67	.26	.29

e Estimated.

RED RIVER OF THE NORTH BASIN

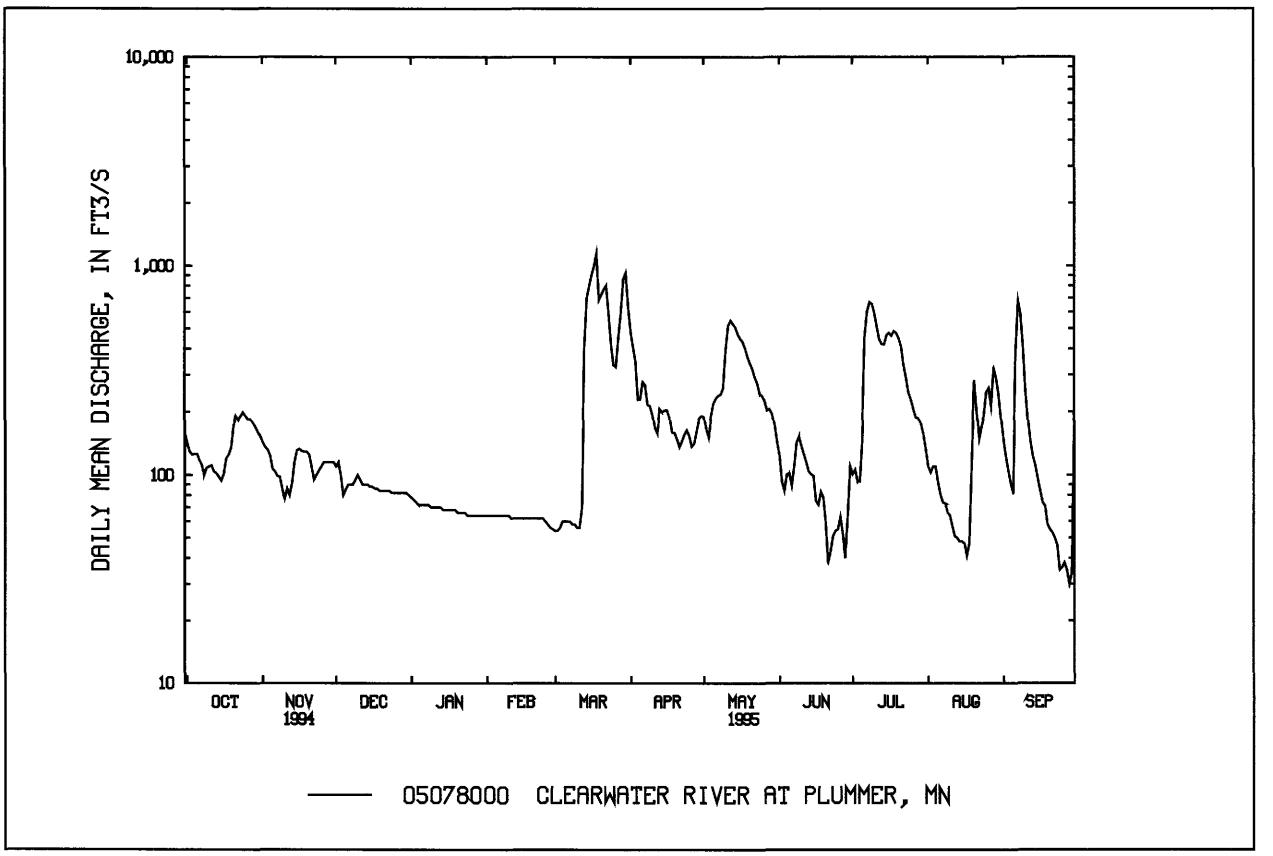
05078000 CLEARWATER RIVER AT PLUMMER, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	114	91.3	63.8	51.1	47.3	115	510	346	251	208	123	107
MAX	483	503	140	90.1	98.4	445	1391	1974	1140	844	507	666
(WY)	1972	1972	1978	1952	1974	1995	1966	1950	1962	1975	1985	1973
MIN	21.5	23.8	24.4	18.4	19.0	22.8	26.8	7.52	30.1	16.0	13.3	14.1
(WY)	1941	1991	1990	1940	1940	1940	1977	1977	1991	1940	1940	1940

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1939 - 1995	
ANNUAL TOTAL	71622		65581			
ANNUAL MEAN	196		180		170	
HIGHEST ANNUAL MEAN					354	1950
LOWEST ANNUAL MEAN					57.0	1990
HIGHEST DAILY MEAN	1390	Jul 9	1150	Mar 18	3840	Apr 25 1979
LOWEST DAILY MEAN	26	Mar 11	30	Sep 28	2.6	May 16 1977
ANNUAL SEVEN-DAY MINIMUM	44	Mar 7	36	Sep 23	2.9	May 10 1977
INSTANTANEOUS PEAK FLOW			1610	Mar 18	3940	Apr 25 1979
INSTANTANEOUS PEAK STAGE			9.59a	Mar 16	12.37a	Apr 18 1979
INSTANTANEOUS LOW FLOW					2.5	May 16 1977
ANNUAL RUNOFF (AC-FT)	142100		130100		123100	
ANNUAL RUNOFF (CFSM)	.38		.35		.33	
10 PERCENT EXCEEDS	467		447		402	
50 PERCENT EXCEEDS	124		110		75	
90 PERCENT EXCEEDS	54		59		32	

a Backwater from ice.



RED RIVER OF THE NORTH BASIN

05078230 LOST RIVER AT OKLEE, MN

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

DRAINAGE AREA.--266 mi².

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	59	e42	e12	e10	e9.0	e250	81	38	22	15	55
2	50	62	e38	e12	e10	e9.0	e220	77	32	22	13	42
3	50	59	e34	e12	e10	e9.0	e190	97	26	20	11	30
4	64	55	e32	e12	e10	e9.0	e175	127	19	20	9.6	18
5	72	49	e30	e12	e10	e9.0	153	130	15	38	9.3	21
6	72	42	e28	e12	e10	e9.0	138	121	14	317	9.1	254
7	73	36	e27	e12	e10	e9.0	123	113	26	440	9.1	336
8	74	31	e26	e12	e10	e9.0	121	114	53	386	9.2	187
9	74	28	e25	e12	e10	e9.0	116	181	62	426	7.6	118
10	73	24	e24	e12	e10	e9.0	111	409	45	e380	5.5	84
11	70	22	e23	e12	e9.5	e10	108	391	30	e240	4.1	68
12	68	24	e22	e12	e9.5	e150	105	300	21	e220	3.6	60
13	65	42	e22	e12	e9.5	e400	116	263	15	e190	3.7	54
14	60	80	e21	e12	e9.5	e900	128	232	12	192	3.3	48
15	55	90	e20	e12	e9.5	e800	127	195	12	207	3.3	44
16	57	81	e18	e12	e9.5	e560	122	170	11	167	3.3	43
17	71	77	e18	e12	e9.5	e450	115	154	10	163	3.3	40
18	87	79	e17	e12	e9.5	e350	109	138	9.1	172	4.2	37
19	125	76	e17	e12	e9.5	e300	93	125	6.8	168	25	37
20	123	85	e16	e11	e9.5	e250	87	118	5.8	176	39	37
21	108	79	e16	e10	e9.5	e220	85	108	4.6	153	26	37
22	104	60	e15	e10	e9.5	e200	83	100	4.0	134	17	37
23	101	e58	e15	e10	e9.5	e180	83	94	9.3	123	48	37
24	95	e55	e14	e10	e9.5	e160	88	84	11	109	61	37
25	90	e50	e14	e10	e9.5	e150	89	78	11	99	82	35
26	82	e48	e13	e10	e9.0	e220	85	72	16	90	64	34
27	79	e46	e13	e10	e9.0	e270	82	70	15	77	56	33
28	75	e44	e13	e10	e9.0	e500	80	67	13	68	247	31
29	70	e38	e12	e10	---	e600	82	62	16	56	168	159
30	64	e40	e12	e10	---	e480	83	53	21	38	102	745
31	60	---	e12	e10	---	e300	---	44	---	23	74	---
TOTAL	2365	1619	649	349	269.5	7540.0	3547	4368	583.6	4936	1136.2	2798
MEAN	76.3	54.0	20.9	11.3	9.62	243	118	141	19.5	159	36.7	93.3
MAX	125	90	42	12	10	900	250	409	62	440	247	745
MIN	50	22	12	10	9.0	9.0	80	44	4.0	20	3.3	18
AC-FT	4690	3210	1290	692	535	14960	7040	8660	1160	9790	2250	5550
CFSM	.29	.20	.08	.04	.04	.91	.44	.53	.07	.60	.14	.35
IN.	.33	.23	.09	.05	.04	1.05	.50	.61	.08	.69	.16	.39

e Estimated.

RED RIVER OF THE NORTH BASIN

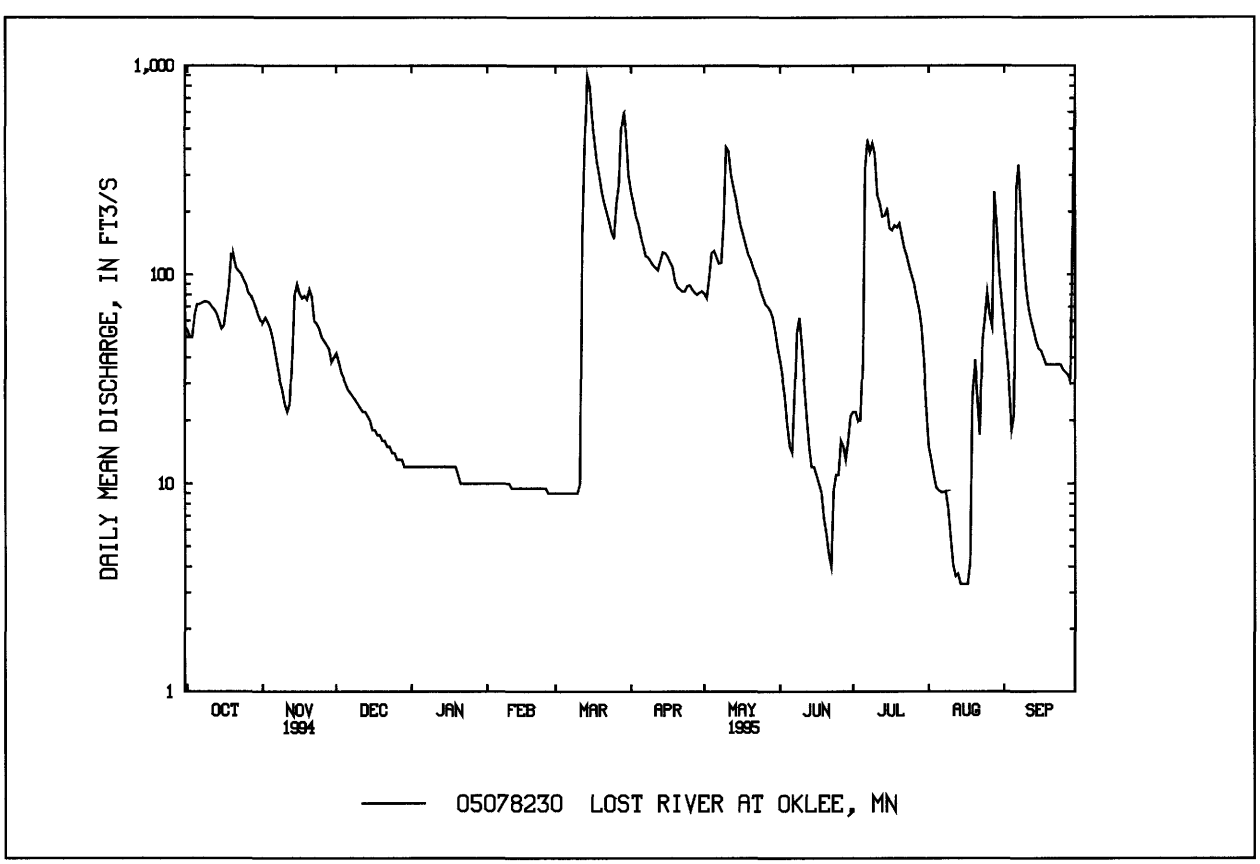
05078230 LOST RIVER AT OKLEE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	46.0	30.6	13.6	8.03	7.72	75.9	292	129	82.7	80.6	40.8	38.9
MAX	470	232	56.6	19.8	25.8	243	745	622	657	442	351	330
(WY)	1972	1972	1978	1986	1984	1995	1966	1962	1962	1962	1985	1973
MIN	1.02	1.11	.050	.002	.000	.19	29.5	10.5	8.20	1.99	1.17	.000
(WY)	1991	1977	1977	1977	1977	1964	1991	1980	1980	1961	1961	1990

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1960 - 1995	
ANNUAL TOTAL	36303.2		30160.3			
ANNUAL MEAN	99.5		82.6		70.1	
HIGHEST ANNUAL MEAN					177	1962
LOWEST ANNUAL MEAN					18.2	1990
HIGHEST DAILY MEAN	1250	Jul 9	900	Mar 14	3040	Apr 11 1969
LOWEST DAILY MEAN	9.7	Feb 2	3.3	Aug 14	.00[a]	Feb 16 1963
ANNUAL SEVEN-DAY MINIMUM	9.7	Feb 2	3.5	Aug 11	.00	Feb 16 1963
INSTANTANEOUS PEAK FLOW					3210	Apr 11 1969
INSTANTANEOUS PEAK STAGE			13.05[b]	Mar 14	16.72[c]	May 24 1962
ANNUAL RUNOFF (AC-FT)	72010		59820		50780	
ANNUAL RUNOFF (CFSM)	.37		.31		.26	
ANNUAL RUNOFF (INCHES)	5.08		4.22		3.58	
10 PERCENT EXCEEDS	190		193		167	
50 PERCENT EXCEEDS	65		42		17	
90 PERCENT EXCEEDS	12		9.5		2.3	

a Many days, several years.
b Observed.
c Present datum.



RED RIVER OF THE NORTH BASIN

05078500 CLEARWATER RIVER AT RED LAKE FALLS, MN

LOCATION.--Lat 47°53'15", long 96°16'25", in NW¼NE¼ sec.22, T.151 N., R.44 W., Red Lake County, Hydrologic Unit 09020305, on left bank 40 ft downstream from Great Northern Railroad bridge in Red Lake Falls, 1.4 mi upstream from mouth, and 3 mi downstream from Badger Creek.

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

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	287	361	e240	e170	e130	e105	1570	471	287	158	287	318
2	262	345	e235	e170	e130	e100	1400	460	258	155	254	250
3	253	337	e220	e170	e130	e90	1310	447	223	160	241	209
4	250	324	e170	e170	e130	e105	965	499	217	180	248	189
5	257	305	e150	e160	e130	e115	776	590	223	e350	242	185
6	262	292	e160	e160	e125	e120	767	611	230	694	215	397
7	267	291	e170	e160	e120	e115	801	617	253	1110	202	1410
8	249	280	e160	e160	e120	e115	739	628	289	1360	188	1240
9	248	274	e170	e160	e125	e110	674	757	327	1380	183	861
10	252	251	e180	e160	e130	e120	628	1350	313	1290	166	587
11	254	236	e185	e160	e130	e130	594	1550	286	1200	159	420
12	248	241	e190	e160	e130	e350	544	1400	265	1000	146	331
13	236	272	e195	e160	e130	e1000	565	1290	244	908	135	273
14	229	378	e195	e150	e130	e1700	650	1240	223	991	127	238
15	217	479	e200	e150	e130	e2200	637	1130	212	1090	119	213
16	225	484	e190	e150	e130	2410	631	1000	200	1060	117	190
17	246	454	e190	e150	e130	2460	606	924	173	1120	111	173
18	305	442	e190	e150	e130	2350	574	854	163	1140	111	164
19	470	408	e180	e150	e130	1850	525	783	166	1100	142	163
20	745	383	e180	e150	e130	1850	498	726	152	1060	248	143
21	702	e350	e180	e150	e130	1610	463	686	127	992	340	140
22	608	e300	e180	e150	e130	1540	436	639	99	855	254	134
23	567	e270	e180	e150	e130	1340	453	596	96	738	218	127
24	549	e270	e170	e150	e125	1090	463	553	100	645	283	122
25	529	e270	e170	e150	e125	929	479	504	103	564	338	109
26	497	e260	e170	e140	e125	976	449	478	154	523	417	107
27	469	e250	e170	e140	e120	1500	435	432	233	473	366	110
28	448	e250	e170	e140	e115	1410	434	411	137	433	514	106
29	427	e250	e170	e140	---	2470	465	396	108	401	799	111
30	400	e240	e170	e140	---	2860	472	372	123	367	581	740
31	381	---	e170	e140	---	2110	---	329	---	330	417	---
TOTAL	11339	9547	5650	4760	3570	35230	20003	22723	5984	23827	8168	9760
MEAN	366	318	182	154	127	1136	667	733	199	769	263	325
MAX	745	484	240	170	130	2860	1570	1550	327	1380	799	1410
MIN	217	236	150	140	115	90	434	329	96	155	111	106
AC-FT	22490	18940	11210	9440	7080	69880	39680	45070	11870	47260	16200	19360
CFSM	.27	.23	.13	.11	.09	.83	.49	.54	.15	.56	.19	.24
IN.	.31	.26	.15	.13	.10	.96	.54	.62	.16	.65	.22	.27

e Estimated.

RED RIVER OF THE NORTH BASIN

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

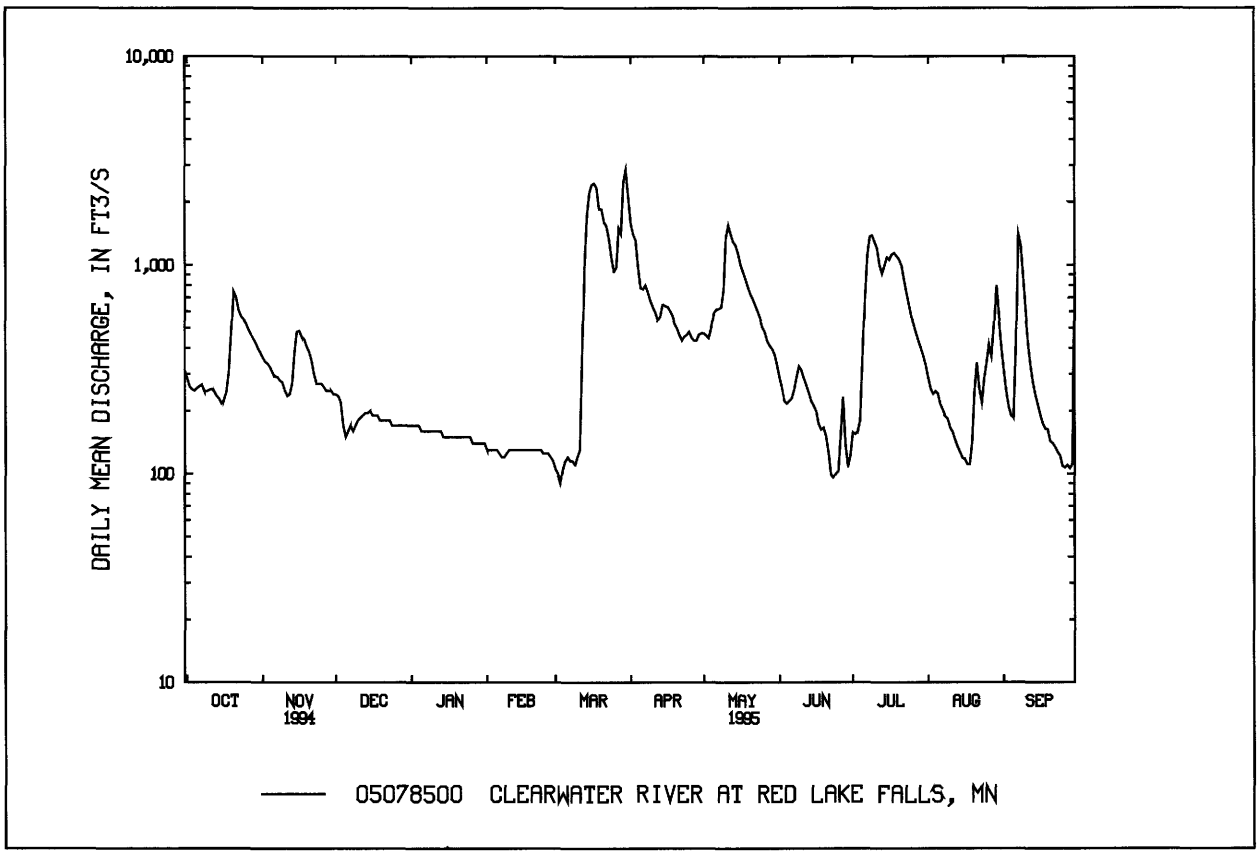
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	181	137	87.0	69.3	63.8	238	1115	664	477	373	205	181
MAX	1350	1233	260	220	150	1136	3458	5059	3042	1673	1686	1267
(WY)	1972	1972	1910	1910	1984	1995	1966	1950	1962	1994	1985	1973
MIN	10.0	19.0	21.4	21.4	19.1	13.6	61.0	32.2	26.5	8.34	1.49	2.92
(WY)	1935	1935	1937	1940	1937	1937	1981	1977	1980	1936	1936	1936

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1909 - 1995	
ANNUAL TOTAL	162461		160561			
ANNUAL MEAN	445		440		313a	
HIGHEST ANNUAL MEAN					855	1950
LOWEST ANNUAL MEAN					64.4	1939
HIGHEST DAILY MEAN	5210	Jul 9	2860	Mar 30	9930	Apr 25 1979
LOWEST DAILY MEAN	72	Feb 17	90	Mar 3	.10	Sep 15 1936
ANNUAL SEVEN-DAY MINIMUM	72	Feb 17	107	Feb 27	.24	Sep 12 1936
INSTANTANEOUS PEAK FLOW			3110	Mar 30	10300	Apr 25 1979
INSTANTANEOUS PEAK STAGE			13.25b	Mar 14	15.85b	Mar 6 1983
INSTANTANEOUS LOW FLOW					.00	Sep 15 1936
ANNUAL RUNOFF (AC-FT)	322200		318500		226600	
ANNUAL RUNOFF (CFSM)	.32		.32		.23	
ANNUAL RUNOFF (INCHES)	4.41		4.36		3.10	
10 PERCENT EXCEEDS	934		1070		779	
50 PERCENT EXCEEDS	270		252		107	
90 PERCENT EXCEEDS	75		127		37	

a Median of annual mean discharges is 280 ft^3/s.

b Backwater from ice.



05078500 CLEARWATER RIVER AT RED LAKE FALLS, MN--Continued
(National Water Quality Assessment Station)

PERIOD OF RECORD.-- Water years 1964-66, 79, 92, and 95.

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)
JUL 18...	0715	21.0	14.5	740	1140	537	538	7.69	8.1	7.9

DATE	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKALINITY LAB (MG/L AS CACO3) (90410)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)
JUL 18...	219	233	0	267	0.060	0.070	1.2	1.5	0.420

DATE	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C) (00689)	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)
JUL 18...	0.130	0.070	0.090	18	2.5	69	26	7.1	4.5

DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SAMPLE PURPOSE CODE (71999)	SAMPLING METHOD, CODES (82398)
JUL 18...	7.5	46	0.20	19	55	8	365	15.00	10

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RED RIVER OF THE NORTH BASIN

05079000 RED LAKE RIVER AT CROOKSTON, MN

LOCATION.--Lat 47°46'32", long 96°36'33", in SW¼SW¼ sec.30, T.150 N., R.46 W., Polk County, Hydrologic Unit 09020303, on right bank 100 ft upstream from Sargent Street bridge in Crookston, 0.3 mi downstream from Interstate Power Co.'s dam, 0.6 mi downstream from bridge on U.S. Highway 75, and 53 mi upstream from mouth.

DRAINAGE AREA.--5,280 mi², approximately.

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1470	1130	e1300	e900	e850	e850	5100	1740	1250	1110	1200	1080
2	1400	1030	e1450	e900	e850	e890	4400	1750	1130	1110	1110	963
3	1340	1250	e1700	e900	e850	e910	3990	1720	1060	1100	1030	868
4	1260	1580	e1550	e900	e850	e920	3550	1720	1010	1150	1010	809
5	1160	1610	e1450	e900	e850	e920	2990	1830	972	1300	971	830
6	1250	1650	e1350	e910	e850	e930	2940	1960	975	1630	993	844
7	1290	1420	e1300	e910	e850	e920	2890	1980	1020	2640	1010	1670
8	1290	1120	e1250	e910	e850	e920	2870	1970	979	3080	983	2210
9	1250	1180	e1200	e910	e850	e910	2870	2040	1090	3200	954	2030
10	1250	1240	e1150	e920	e850	e910	2830	2550	1050	2740	952	1700
11	1250	1180	e1100	e920	e860	e900	2710	3190	1050	2310	926	1390
12	1290	1210	e1080	e920	e870	e950	2530	3220	949	1870	958	1170
13	1210	1270	e1060	e920	e880	e3000	2420	2980	893	1490	930	1030
14	1170	1220	e1040	e910	e890	e7000	2430	3100	847	1440	902	928
15	1220	1410	e1020	e900	e900	e9500	2480	3370	775	1570	1170	868
16	1240	1630	e1000	e890	e910	e10000	2530	3070	775	1820	934	814
17	1310	1490	e980	e880	e920	e9800	2480	2900	736	1930	698	747
18	1360	1410	e960	e880	e920	e9400	2420	2930	660	2060	787	715
19	1950	1390	e940	e870	e920	e8000	2270	2760	662	2100	851	714
20	2340	1750	e920	e870	e920	e5700	2210	2560	651	2170	922	696
21	2560	2170	e910	e870	e910	e5400	2170	2440	621	2210	1120	667
22	2470	1790	e910	e870	e900	e5000	2100	2320	600	2070	1130	657
23	2350	1290	e900	e870	e890	4510	2040	2230	441	1900	990	554
24	2290	1480	e900	e860	e880	3880	2090	2120	323	1760	1020	731
25	2240	1950	e900	e850	e870	3630	2170	2040	314	1620	1070	616
26	2190	1910	e900	e850	e850	3270	2060	1850	530	1520	1220	602
27	2160	1620	e900	e850	e840	4440	1970	1520	975	1430	1350	586
28	2220	e1500	e900	e850	e800	5000	1910	1430	1100	1330	1350	572
29	1950	e1450	e900	e850	---	7590	1900	1440	1130	1260	1640	597
30	1390	e1400	e900	e850	---	9060	1770	1420	1080	1240	1510	655
31	1270	---	e900	e850	---	6870	---	1350	---	1220	1270	---
TOTAL	50390	43730	33720	27440	24430	131980	79090	69500	25648	55380	32961	28313
MEAN	1625	1458	1088	885	872	4257	2636	2242	855	1786	1063	944
MAX	2560	2170	1700	920	920	10000	5100	3370	1250	3200	1640	2210
MIN	1160	1030	900	850	800	850	1770	1350	314	1100	698	554
AC-FT	99950	86740	66880	54430	48460	261800	156900	137900	50870	109800	65380	56160
CFSM	.31	.28	.21	.17	.17	.81	.50	.42	.16	.34	.20	.18
IN.	.36	.31	.24	.19	.17	.93	.56	.49	.18	.39	.23	.20

e Estimated.

RED RIVER OF THE NORTH BASIN

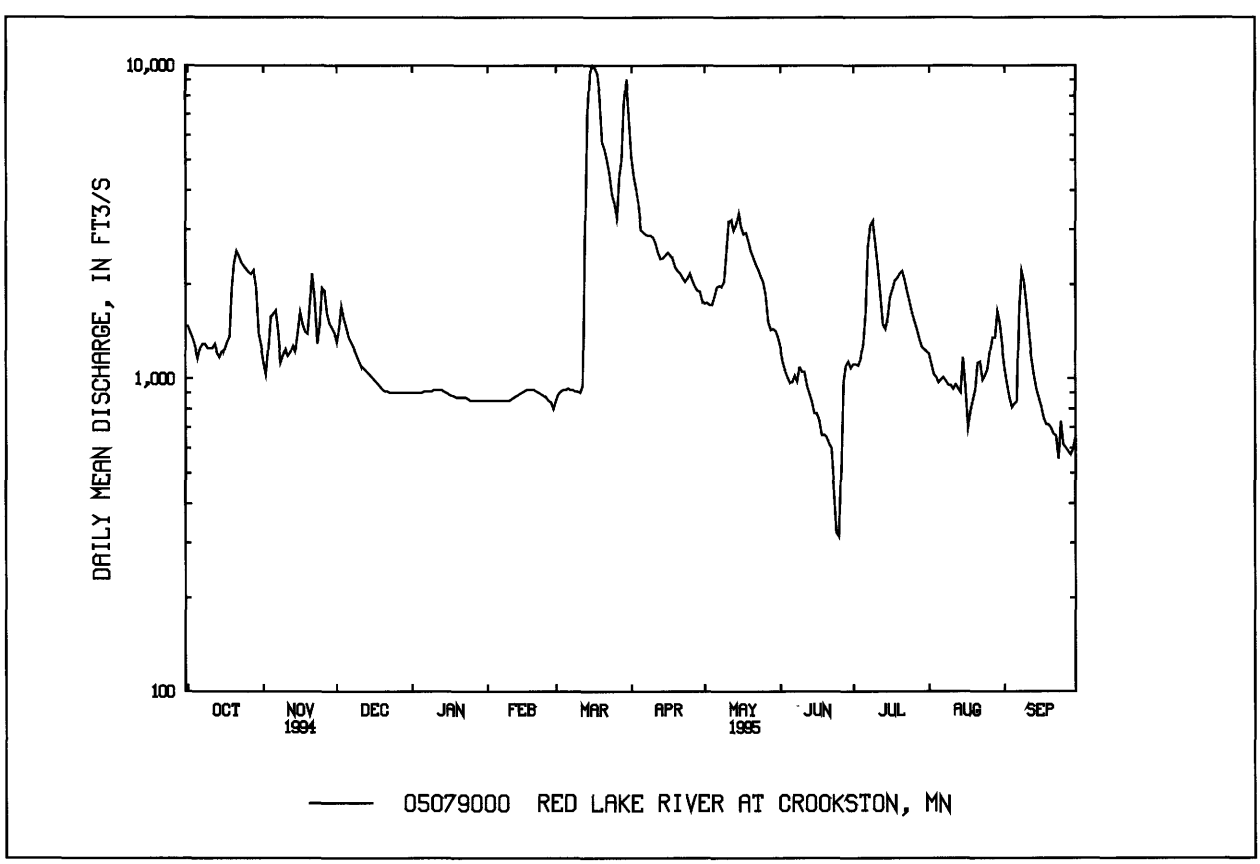
05079000 RED LAKE RIVER AT CROOKSTON, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1901 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	814	669	553	499	474	973	2921	2033	1635	1290	817	811
MAX	2836	3172	1900	1663	1464	4257	10260	15290	7205	6851	3868	3009
(WY)	1972	1972	1904	1951	1951	1995	1966	1950	1962	1975	1985	1905
MIN	8.02	10.1	5.34	15.6	17.8	24.9	232	154	80.4	26.2	12.3	8.87
(WY)	1937	1937	1937	1934	1937	1936	1981	1934	1934	1936	1934	1934

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1901 - 1995	
ANNUAL TOTAL	543942		602582			
ANNUAL MEAN	1490		1651		1120	
HIGHEST ANNUAL MEAN					3129	1950
LOWEST ANNUAL MEAN					83.6	1934
HIGHEST DAILY MEAN	13200	Jul 10	10000	Mar 16	27100	Apr 12 1969
LOWEST DAILY MEAN	600	Feb 2	314	Jun 25	2.5	Sep 29 1936
ANNUAL SEVEN-DAY MINIMUM	600	Feb 2	497	Jun 20	3.9	Sep 28 1936
INSTANTANEOUS PEAK FLOW			10300e	Mar 16	28400	Apr 12 1969
INSTANTANEOUS PEAK STAGE			18.27a	Mar 16	27.33	Apr 12 1969
INSTANTANEOUS LOW FLOW					.00b	Jul 13 1960
ANNUAL RUNOFF (AC-FT)	1079000		1195000		811500	
ANNUAL RUNOFF (CFSM)	.28		.31		.21	
ANNUAL RUNOFF (INCHES)	3.83		4.25		2.88	
10 PERCENT EXCEEDS	2370		2880		2500	
50 PERCENT EXCEEDS	1090		1200		670	
90 PERCENT EXCEEDS	618		850		111	

a Backwater from ice.
b Caused by regulation of powerplant upstream.
e Estimated.



05079000 RED LAKE RIVER AT CROOKSTON, MN--Continued
(National Water Quality Assessment Station)

PERIOD OF RECORD.--Water years 1962, 1974-76, 1979 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)
NOV										
15...	1115	4.0	3.0	750	1410	425	427	13.4	7.8	8.0
FEB										
08...	1045	0.0	-17.0	741	850	360	382	12.6	7.7	7.9
MAR										
19...	0630	1.0	5.0	735	8000	315	278	11.3	7.8	7.4
MAY										
15...	1000	14.0	11.5	740	3370	528	527	9.5	8.2	7.8
JUN										
16...	0900	24.5	18.5	740	775	439	432	7.1	8.6	8.0
22...	0900	28.5	21.5	741	600	374	357	6.9	8.5	8.2
JUL										
18...	0920	22.5	21.5	740	2060	451	456	7.7	8.2	8.0

DATE	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKALINITY LAB (MG/L AS CACO3) (90410)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS TOTAL (MG/L AS P) (00665)
NOV										
15...	173	192	0	211	<0.015	0.020	0.80	0.80	0.080	0.030
FEB										
08...	185	190	0	225	0.070	<0.010	0.70	0.80	0.110	<0.010
MAR										
19...	84	97	0	102	0.250	0.050	0.90	1.2	1.50	0.250
MAY										
15...	187	208	0	228	<0.015	<0.010	0.50	1.1	0.090	0.070
JUN										
16...	179	193	8	204	0.020	<0.010	0.80	1.4	0.130	0.080
22...	--	178	--	--	0.020	<0.010	0.70	0.80	<0.050	0.080
JUL										
18...	184	197	0	224	0.060	0.040	1.1	1.1	0.360	0.110

RED RIVER OF THE NORTH BASIN

05079000 RED LAKE RIVER AT CROOKSTON, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
NOV										
15...	<0.010	<0.010	13	1.3	54	22	6.2	3.3	5.7	30
FEB										
08...	<0.010	<0.010	--	--	46	18	4.4	3.0	2.7	8.0
MAR										
19...	0.130	0.110	11	2.9	31	11	2.8	6.8	7.1	27
MAY										
15...	<0.010	<0.010	16	1.9	67	25	5.8	3.8	6.6	66
JUN										
16...	0.010	<0.010	--	--	53	21	6.3	3.1	4.9	36
22...	0.030	0.030	14	1.1	45	18	5.0	2.8	3.6	21
JUL										
18...	0.060	0.060	17	1.6	55	22	5.7	3.3	5.5	38

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SAMPLE PURPOSE CODE (71999)	SAM-PLING METHOD, CODES (82398)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV									
15...	0.10	9.3	100	13	266	15.00	10	14	93
FEB									
08...	0.10	13	16	8	243	15.00	10	9	91
MAR									
19...	0.10	7.9	110	41	180	15.00	10	216	74
MAY									
15...	0.10	8.0	23	5	350	15.00	10	66	97
JUN									
16...	0.10	8.3	9	16	280	15.00	10	22	99
22...	0.10	11	14	13	241	15.00	10	22	98
JUL									
18...	0.20	16	28	7	304	15.00	10	--	--

RED RIVER OF THE NORTH BASIN

05082500 RED RIVER OF THE NORTH AT GRAND FORKS, ND

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

DRAINAGE AREA.--30,100 mi^2 , approximately, including 3,800 mi^2 in closed basins.

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4130	5040	3130	e2000	e1850	e1560	e34700	8330	6180	2830	3870	2960
2	3960	4800	3270	e1950	e1800	e1600	e34000	8020	5920	e2700	3590	2650
3	3860	4540	3550	e1900	e1750	e1700	e32800	7750	5730	e2750	3350	2410
4	3740	4450	3750	e1800	e1750	e1750	e31000	7530	5550	e2800	3190	2240
5	3620	4570	3470	e1800	e1750	e1750	e29600	7430	5420	e3200	3040	2160
6	3570	4540	3100	e1750	e1800	e1800	e28600	7510	5290	4930	2850	2270
7	3630	4480	2720	e1700	e1800	e1800	e27600	7630	5290	8760	2710	2290
8	3810	4280	e2500	e1700	e1800	e1800	e26200	7610	5310	e11600	2600	2770
9	4050	3900	e2400	e1700	e1750	e1750	e24800	7680	5200	e12200	2510	3590
10	4100	3740	e2350	e1750	e1750	e1750	e22600	8470	5170	e12400	2400	3520
11	4090	3560	e2250	e1750	e1800	e1800	e20800	11500	5060	e11200	2340	3160
12	4040	3280	e2150	e1750	e1850	e1850	e18800	13900	4980	e10700	2290	2780
13	3940	3220	e2100	e1700	e1800	e2400	e17600	14600	4750	e9800	2260	2480
14	3850	3190	e2150	e1650	e1800	e6100	e16400	14400	4540	e9600	2200	2280
15	3750	3160	e2200	e1600	e1800	e13000	e15100	14300	4360	e9400	2110	2110
16	3650	3340	e2150	e1650	e1850	e17500	e14300	14400	4200	e9100	2220	1970
17	3620	3640	e2150	e1750	e1900	e21500	e13800	14100	4110	e8900	2240	1890
18	4470	3710	e2150	e1850	e1950	e23800	e13500	13800	3980	e8700	2100	1810
19	6620	3620	e2150	e1900	e1900	e25400	e13200	13500	3800	8280	2060	1780
20	7980	3520	e2200	e1950	e1850	e26200	e13000	13200	3630	7980	2000	1730
21	8460	3690	e2200	e1950	e1800	e28000	e12700	12600	3490	8060	2020	1710
22	8290	3510	e2250	e1850	e1800	e28500	e12400	12000	3320	8290	2110	1660
23	7730	3070	e2300	e1850	e1760	e28000	e11800	11100	3060	8070	2150	1590
24	7200	2820	e2250	e1900	e1730	e27500	e11600	10000	2740	7430	2070	1470
25	6850	2680	e2250	e1900	e1690	e27000	e10800	8960	2420	6730	2070	1530
26	6560	2440	e2250	e1900	e1680	e27000	e10500	8160	2150	6030	2610	1430
27	6260	2330	e2250	e1900	e1640	e27800	e9860	7650	2120	5460	3640	1350
28	5990	2430	e2250	e1950	e1590	e28600	e9350	7180	2240	5050	3740	1310
29	5980	2690	e2150	e1850	---	e30000	9470	6950	2430	4710	3490	1320
30	5800	3020	e2100	e1850	---	e33000	8880	6770	2810	4440	3450	1370
31	5330	---	e2000	e1900	---	e34200	---	6520	---	4170	3320	---
TOTAL	158930	107260	76140	56400	49990	476410	555760	313550	125250	226270	82600	63590
MEAN	5127	3575	2456	1819	1785	15370	18530	10110	4175	7299	2665	2120
MAX	8460	5040	3750	2000	1950	34200	34700	14600	6180	12400	3870	3590
MIN	3570	2330	2000	1600	1590	1560	8880	6520	2120	2700	2000	1310
AC-FT	315200	212800	151000	111900	99160	945000	1102000	621900	248400	448800	163800	126100

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1904 - 1995, BY WATER YEAR (WY)

MEAN	1379	1175	949	807	777	2497	9265	4946	3861	3275	1739	1427
MAX	5127	5218	3073	1929	1869	15370	31480	36510	19340	25270	17050	6251
(WY)	1995	1972	1972	1951	1952	1995	1979	1950	1962	1975	1993	1993
MIN	12.1	30.5	17.8	18.8	2.87	42.1	954	373	151	88.8	30.6	20.3
(WY)	1937	1937	1937	1937	1937	1937	1938	1934	1934	1936	1934	1936

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1904 - 1995	
ANNUAL TOTAL	2010950		2292150			
ANNUAL MEAN	5509		6280		2655	
HIGHEST ANNUAL MEAN					7580	1950
LOWEST ANNUAL MEAN					244	1934
HIGHEST DAILY MEAN	26500	Jul 12	34700	Apr 1	80900	Apr 23 1979
LOWEST DAILY MEAN	1400	Feb 7	1310	Sep 28	1.8	Sep 2 1977
ANNUAL SEVEN-DAY MINIMUM	1420	Feb 4	1400	Sep 24	2.5	Feb 12 1937
INSTANTANEOUS PEAK FLOW			34800	Mar 31	85000	Apr 10 1897
INSTANTANEOUS PEAK STAGE			39.81	Mar 31	50.20	Apr 10 1897
ANNUAL RUNOFF (AC-FT)	3989000		4546000		1924000	
10 PERCENT EXCEEDS	11700		14200		5960	
50 PERCENT EXCEEDS	3890		3490		1310	
90 PERCENT EXCEEDS	1580		1750		267	

e Estimated.

05082500 RED RIVER OF THE NORTH AT GRAND FORKS, ND--Continued
(National Water Quality Assessment Program)

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)
NOV												
02...	1650	4730	--	890	--	--	8.5	7.0	--	--	--	--
07...	1155	--	4480	750	8.0	733	7.5	4.0	12.3	98	330	--
23...	1120	2990	--	818	--	--	-1.0	0.0	--	--	--	--
JAN												
10...	1420	1760	--	691	--	--	-6.0	0.0	--	--	--	--
FEB												
01...	1625	1840	--	641	--	--	-6.0	0.0	--	--	--	--
09...	1130	--	1750	631	7.7	735	-2.0	0.5	11.2	81	290	257
MAR												
20...	1345	26300	--	313	7.2	740	6.5	0.5	10.4	74	150	--
28...	1110	28600	--	410	--	--	1.0	1.0	--	--	--	--
APR												
12...	1130	18800	--	495	--	--	3.0	4.5	--	--	--	--
18...	1015	13600	--	658	--	--	2.0	5.0	--	--	--	--
25...	1435	10800	--	710	--	--	11.5	8.5	--	--	--	--
MAY												
25...	0830	8940	--	782	--	--	16.0	13.0	--	--	--	--
JUN												
02...	0745	--	5920	800	8.2	738	18.0	20.0	7.3	83	350	212
22...	0700	3350	--	828	8.2	740	20.0	23.5	7.7	93	350	214
22...	1435	3350	--	829	--	--	28.5	27.5	--	--	--	--
JUL												
12...	1055	10700	--	594	--	--	32.0	27.0	--	--	--	--
AUG												
07...	0900	2720	--	753	--	--	32.0	26.0	--	--	--	--
31...	1100	3330	--	612	--	--	25.0	22.5	--	--	--	--

DATE	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	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)
NOV												
07...	255	72	36	40	20	1	8.0	--	--	150	17	0.20
FEB												
09...	--	65	32	24	15	0.6	5.4	314	0	78	11	0.10
MAR												
20...	103	35	14	9.5	11	0.3	12	--	--	46	11	0.20
JUN												
02...	--	73	40	32	16	0.7	6.9	259	0	180	15	0.20
22...	--	73	41	35	17	0.8	7.2	261	0	200	17	0.20

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)
NOV											
07...	17	494	524	0.71	6340	<0.010	--	0.220	0.220	0.050	1.0
FEB											
09...	18	390	423	0.58	2000	0.020	0.370	0.390	0.390	0.110	0.59
MAR											
20...	12	216	233	0.32	16500	0.170	2.83	3.00	3.00	0.310	1.4
JUN											
02...	8.2	485	550	0.75	8790	0.010	0.400	0.410	0.410	0.030	1.1
22...	12	516	570	0.78	5160	<0.010	--	0.500	0.500	0.030	0.97

DATE	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N) (00607)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)
NOV											
07...	0.85	1.1	0.90	1.3	0.220	0.120	0.090	9	3	--	--
FEB											
09...	0.59	0.70	0.70	1.1	0.030	0.030	0.040	17	25	--	--
MAR											
20...	0.89	1.7	1.2	4.7	0.490	0.370	0.330	84	63	--	--
JUN											
02...	0.77	1.1	0.80	1.5	0.190	0.070	0.060	5	2	11	1.2
22...	0.67	1.0	0.70	1.5	0.240	0.110	0.120	<3	2	11	2.6

RED RIVER OF THE NORTH BASIN

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

LOCATION.--Lat 48°10'27", long 96°59'55", in SW¼SW¼NW¼ sec. 8,T.154 N.,R.49 W., Marshall County, Hydrologic Unit 09020309, on right bank 100 ft upstream from bridge on Minnesota State Highway 220, 1/2 mi south of Alvarado.

DRAINAGE AREA.--218 mi².

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

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

REMARKS.-- Records poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	e13	e20	e4.0	e.00	e.00	442	39	18	.79	e40	1.4
2	27	e11	e18	e3.6	e.00	e.00	262	37	17	.55	e32	1.5
3	25	e10	e16	e3.2	e.00	e.00	191	36	15	.59	e35	1.6
4	22	e9.0	e15	e2.9	e.00	e.00	143	39	15	3.1	e29	1.8
5	22	e8.5	e14	e2.6	e.00	e.00	91	46	14	6.4	e24	1.8
6	21	e7.8	e13	e2.3	e.00	e.00	88	47	14	11	e19	7.0
7	22	e7.6	e12	e2.0	e.00	e.00	54	46	32	16	e14	4.2
8	22	e7.2	e12	e1.8	e.00	e.00	45	44	27	35	e11	6.3
9	21	e6.8	e11	e1.6	e.00	e.00	52	49	23	76	e9.0	7.5
10	e21	e6.5	e11	e1.4	e.00	e.00	57	55	17	176	e7.0	13
11	e20	e6.4	e10	e1.3	e.00	e2.0	51	81	14	225	e6.0	11
12	e19	e6.3	e9.5	e1.2	e.00	e25	47	93	11	166	e6.5	13
13	e18	e7.0	e9.0	e1.0	e.00	e100	44	96	8.2	117	e7.5	13
14	e17	e15	e8.5	e.90	e.00	e500	44	163	8.8	81	e9.0	13
15	e16	e75	e8.0	e.80	e.00	e850	45	206	77	61	e6.0	13
16	e15	e150	e7.5	e.75	e.00	e1250	45	127	81	47	e4.5	12
17	e15	e135	e7.0	e.65	e.00	1420	43	176	62	36	e3.0	11
18	e17	e125	e6.5	e.60	e.00	1170	40	217	42	34	e2.0	11
19	e25	e135	e6.0	e.55	e.00	790	39	151	29	103	e5.0	12
20	e45	e150	e6.0	e.45	e.00	500	37	109	29	337	e2.5	12
21	e60	e160	e6.1	e.35	e.00	655	36	84	18	423	e1.0	12
22	e65	e170	e6.2	e.25	e.00	425	34	64	21	383	e.50	12
23	e55	e150	e6.3	e.20	e.00	355	35	51	28	e325	.29	12
24	e45	e135	e6.6	e.15	e.00	345	37	43	26	e250	.24	12
25	e35	e90	e6.7	e.10	e.00	325	68	36	23	e200	.33	11
26	e30	e65	e6.8	e.05	e.00	321	71	32	17	e160	.39	11
27	e25	e50	e6.5	e.00	e.00	608	59	28	9.1	e125	.61	11
28	e21	e40	e6.0	e.00	e.00	1020	50	26	3.3	e100	1.0	12
29	e18	e30	e5.5	e.00	---	1210	46	24	1.5	e80	.85	12
30	e16	e25	e5.0	e.00	---	1220	42	22	1.1	e60	.74	12
31	e15	---	e4.5	e.00	---	935	---	20	---	e50	.74	---
TOTAL	823	1807.1	286.2	34.70	0.00	14026.00	2338	2287	702.0	3688.43	278.69	284.1
MEAN	26.5	60.2	9.23	1.12	.000	452	77.9	73.8	23.4	119	8.99	9.47
MAX	65	170	20	4.0	.00	1420	442	217	81	423	40	13
MIN	15	6.3	4.5	.00	.00	.00	34	20	1.1	.55	.24	1.4
AC-FT	1630	3580	568	69	.00	27820	4640	4540	1390	7320	553	564

e Estimated.

RED RIVER OF THE NORTH BASIN

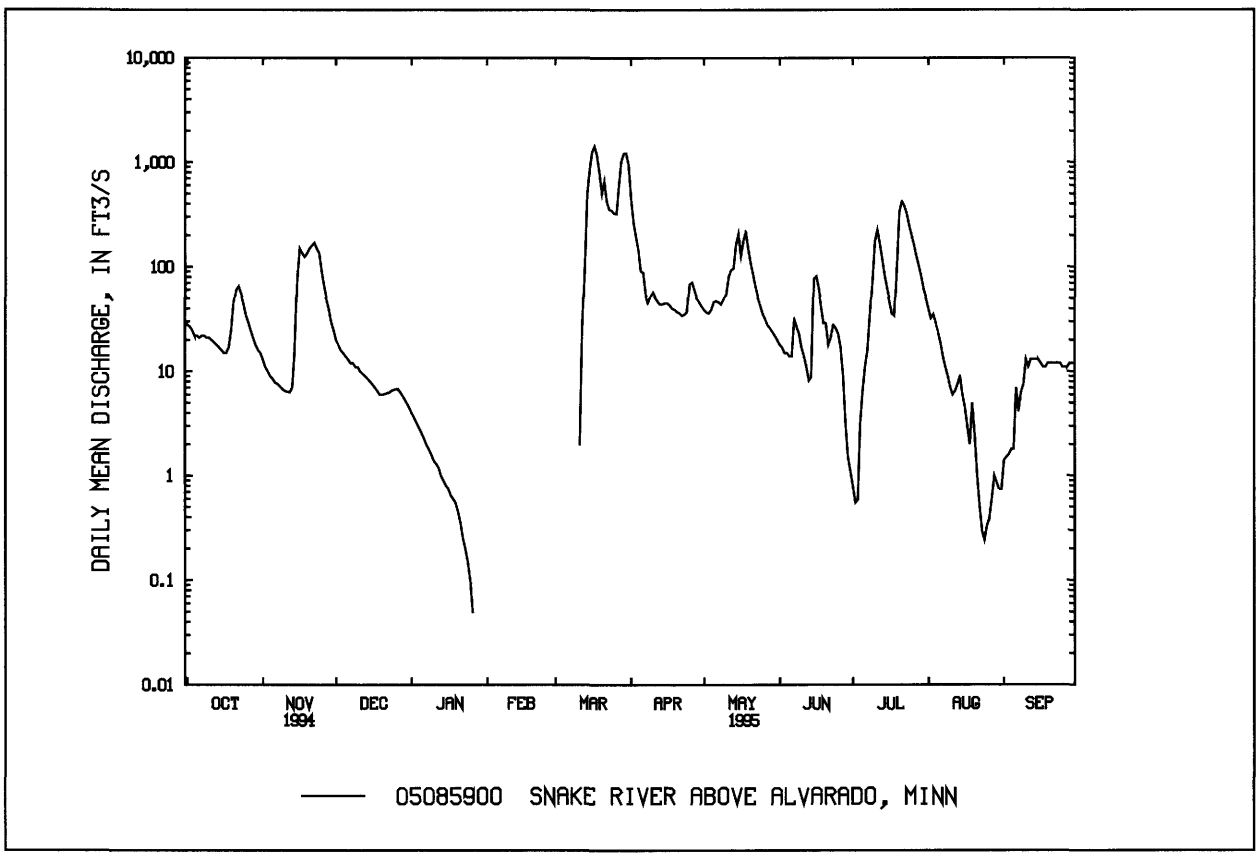
05085900 SNAKE RIVER ABOVE ALVARADO, MN

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	12.2	23.3	3.86	.48	.030	193	58.6	31.5	21.8	109	63.6	126
MAX	26.5	60.2	9.23	1.12	.068	452	77.9	73.8	26.2	139	168	264
(WY)	1995	1995	1995	1995	1993	1995	1995	1995	1994	1994	1993	1993
MIN	.000	.000	.000	.002	.000	2.98	26.7	4.18	15.6	69.2	8.99	9.47
(WY)	1993	1993	1993	1993	1995	1993	1994	1993	1993	1993	1995	1995

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1993 - 1995	
ANNUAL TOTAL	16656.83		26555.22			
ANNUAL MEAN	45.6		72.8		53.9	
HIGHEST ANNUAL MEAN					72.8	1995
LOWEST ANNUAL MEAN					39.5	1994
HIGHEST DAILY MEAN	675	Sep 19	1420	Mar 17	1420	Mar 14 1995
LOWEST DAILY MEAN	.00	Feb 11	.00	Jan 27	.00	Oct 1 1992
ANNUAL SEVEN-DAY MINIMUM.00		Feb 11	.00	Jan 27	.00	Oct 1 1992
INSTANTANEOUS PEAK FLOW			1500	Mar 17	3410a	Apr 20 1979
INSTANTANEOUS PEAK STAGE			21.95	Mar 17	21.95	Mar 17 1995
ANNUAL RUNOFF (AC-FT)	33040		52670		39080	
10 PERCENT EXCEEDS	119		160		125	
50 PERCENT EXCEEDS	15		15		9.1	
90 PERCENT EXCEEDS	.07		.00		.00	

a Maximum observed.



RED RIVER OF THE NORTH BASIN

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

WATER-QUALITY RECORDS

PERIOD OF RECORD.-- October 1993 to September, 1995 (discontinued).
REMARKS.--Records fair.

WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH CIFIC CONDUCTANCE LAB (US/CM) (90095)	WATER WHOLE OXYGEN, DISSOLVED (MG/L) (00300)	FIELD (STANDARD UNITS) (00400)
NOV										
07...	0900	2.0	4.5	733	--	7.6	996	995	12.4	8.0
MAR										
17...	1200	0.5	10.5	755	1480	--	302	306	12.4	8.2
MAY										
08...	1130	13.5	12.5	735	44	--	832	826	7.5	8.5
JUN										
08...	0850	13.0	10.0	755	--	27	521	531	8.0	7.8

DATE	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKALINITY LAB (MG/L AS CACO3) (90410)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)
NOV										
07...	8.1	335	364	17	375	0.020	<0.010	1.1	1.2	0.720
MAR										
17...	7.3	--	93	--	--	0.310	0.170	1.2	1.7	3.00
MAY										
08...	7.9	300	331	0	366	0.020	<0.010	1.0	1.1	0.090
JUN										
08...	7.1	166	197	0	203	0.140	0.190	1.1	1.2	1.60

RED RIVER OF THE NORTH BASIN

05085900 SNAKE RIVER ABOVE ALVARADO, MN

DATE	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTAS-SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	CHLO-SIUM, DIS-SOLVED (MG/L AS K) (00935)	RIDE, DIS-SOLVED (MG/L AS CL) (00940)
NOV										
07...	0.050	0.040	0.030	--	--	110	62	19	8.0	29
MAR										
17...	0.510	0.330	0.330	11	2.6	30	13	5.2	8.4	8.1
MAY										
08...	0.040	0.020	<0.010	15	1.1	93	52	13	5.2	18
JUN										
08...	0.340	0.360	0.350	12	>5.0	48	29	11	5.7	11

DATE	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SAMPLE PURPOSE CODE (71999)	SEDI-SAM-PLING METHOD, CODES (82398)	SED. SUSP. SIEVE MENT, SUS-PENDED (MG/L) (80154)	DIAM. % FINER THAN .062 MM (70331)
NOV										
07...	170	0.20	11	28	30	691	15.00	10	14	88
MAR										
17...	34	0.20	11	69	23	196	15.00	10	118	99
MAY										
08...	120	0.20	0.62	29	16	543	15.00	10	28	100
JUN										
08...	68	0.30	11	9	4	346	15.00	10	399	100

DATE	TIME	TEMPER-ATURE (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)
NOV				
04...	0935	2.0	964	--
07...	0900	2.0	996	8.0
22...	1325	0.5	892	--
DEC				
20...	1050	0.0	1370	--
MAR				
17...	1200	0.5	302	8.2
17...	1205	0.5	302	8.2
20...	1300	1.5	527	--
24...	1105	3.5	710	--
APR				
01...	1310	2.0	602	--
MAY				
08...	1130	13.5	832	8.5
JUN				
08...	0850	13.0	521	7.8
09...	0600	14.5	640	--

RED RIVER OF THE NORTH BASIN

05087500 MIDDLE RIVER AT ARGYLE, MN

LOCATION.--Lat 48°20'25", long 96°48'58", in NE¼NW¼ sec.15, T.156 N., R.48 W., Marshall County, Hydrologic Unit 09020309, on left bank 30 ft upstream of bridge on County Highway 4 in Argyle and 14 mi upstream from mouth.

DRAINAGE AREA.--265 mi²

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	41	e50	e12	e5.6	e2.6	627	e38	38	27	45	9.7
2	36	37	e45	e12	e5.4	e2.5	458	e36	32	20	32	9.7
3	30	31	e40	e11	e5.2	e2.5	348	e34	29	15	25	11
4	26	28	e37	e11	e5.0	e2.5	269	e32	24	12	19	12
5	23	27	e35	e11	e4.8	e2.5	205	e30	20	14	15	13
6	22	25	e33	e10	e4.6	e2.5	155	e28	17	14	13	17
7	25	24	e30	e10	e4.4	e2.5	137	e26	15	29	11	17
8	23	22	e28	e9.9	e4.2	e2.5	131	e25	14	45	11	11
9	24	21	e26	e9.8	e4.0	e2.5	116	e24	13	74	9.7	15
10	26	20	e24	e9.7	e3.8	e2.5	113	e23	15	94	8.2	14
11	25	19	e22	e9.6	e3.6	e2.5	108	e22	14	e88	7.5	11
12	27	19	e21	e9.5	e3.5	e2.5	100	e150	13	e60	6.7	12
13	25	21	e20	e9.4	e3.5	e10	94	e300	12	e40	5.9	14
14	30	24	e19	e9.3	e3.5	e50	88	e270	11	29	6.1	11
15	30	108	e18	e9.2	e3.5	e660	88	e230	9.4	23	5.2	9.3
16	34	287	e18	e9.1	e3.4	e1200	93	e200	8.0	26	4.5	8.6
17	28	375	e17	e9.0	e3.3	e1000	97	e180	6.7	21	4.5	e8.4
18	38	383	e17	e8.5	e3.2	e800	98	e160	5.6	20	5.8	e8.2
19	42	e300	e16	e8.0	e3.1	e650	97	e150	4.7	55	5.3	e8.0
20	79	e250	e15	e7.8	e3.0	e600	91	e200	4.1	135	5.5	e8.0
21	121	e200	e15	e7.6	e3.0	e550	e85	e180	4.2	188	e6.0	e8.0
22	147	e170	e15	e7.4	e3.0	456	e78	e170	4.2	216	e9.5	e8.0
23	148	e150	e15	e7.3	e3.0	399	e70	e150	3.6	250	7.6	e8.0
24	133	e130	e15	e7.2	e3.0	352	e65	e130	4.2	260	9.0	e7.5
25	112	e120	e15	e7.0	e3.0	305	e60	e125	3.9	257	11	e7.5
26	93	e100	e15	e7.0	e3.0	283	e55	103	3.6	240	12	e7.5
27	81	e90	e15	e7.0	e2.8	385	e50	87	3.7	204	11	e7.0
28	72	e80	e15	e7.0	e2.7	527	e45	79	4.1	163	11	e7.0
29	62	e70	e13	e6.6	---	615	e43	73	4.7	127	11	e7.0
30	51	e60	e13	e6.2	---	724	e40	58	22	95	11	e7.0
31	45	---	e12	e5.8	---	788	---	47	---	66	11	---
TOTAL	1700	3232	689	271.9	104.1	10384.1	4104	3360	363.7	2907	356.0	302.4
MEAN	54.8	108	22.2	8.77	3.72	335	137	108	12.1	93.8	11.5	10.1
MAX	148	383	50	12	5.6	1200	627	300	38	260	45	17
MIN	22	19	12	5.8	2.7	2.5	40	22	3.6	12	4.5	7.0
AC-FT	3370	6410	1370	539	206	20600	8140	6660	721	5770	706	600
CFSM	.21	.41	.08	.03	.01	1.26	.52	.41	.05	.35	.04	.04
IN.	.24	.45	.10	.04	.01	1.46	.58	.47	.05	.41	.05	.04

e Estimated.

RED RIVER OF THE NORTH BASIN

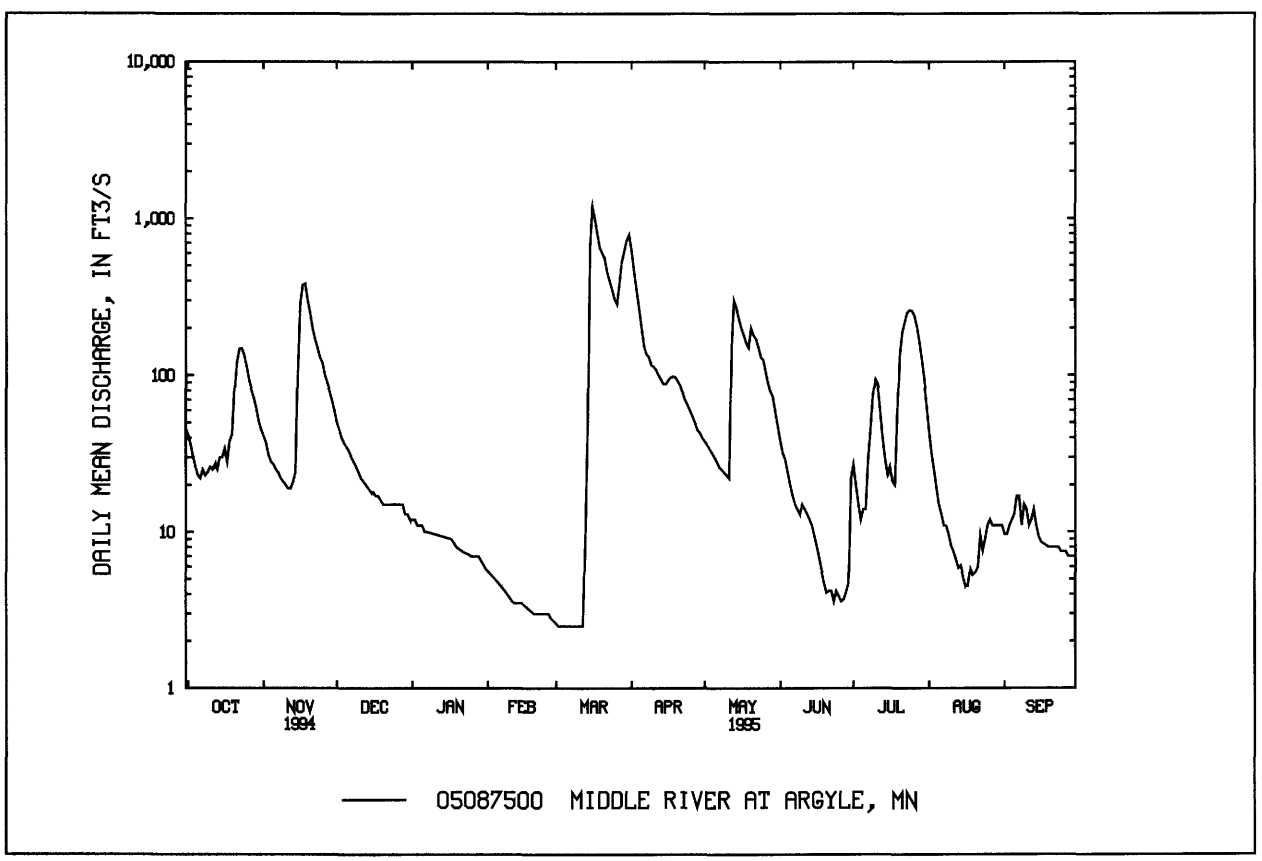
05087500 MIDDLE RIVER AT ARGYLE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	10.0	7.51	2.78	1.19	.82	32.0	198	70.8	68.7	55.0	11.0	16.2
MAX	94.1	108	22.2	8.77	3.72	335	747	330	660	688	265	272
(WY)	1983	1995	1995	1995	1995	1995	1966	1970	1970	1975	1993	1993
MIN	.000	.000	.000	.000	.000	.000	.20	2.12	.37	.000	.000	.000
(WY)	1954	1954	1954	1953	1953	1954	1991	1981	1973	1961	1961	1952

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1945 - 1995		
ANNUAL TOTAL	19526.3		27774.2				
ANNUAL MEAN	53.5		76.1		39.4[a]		
HIGHEST ANNUAL MEAN					112		1966
LOWEST ANNUAL MEAN					1.60		1977
HIGHEST DAILY MEAN	684	Sep 19	1200	Mar 16	3790	Jul	4 1975
LOWEST DAILY MEAN	1.0	Feb 1	2.5	Mar 2	00[b]	Aug	1 1952
ANNUAL SEVEN-DAY MINIMUM	1.0	Jan 31	2.5	Mar 2	.00	Aug	18 1952
INSTANTANEOUS PEAK FLOW			1300	Mar 16	4260	Jul	3 1975
INSTANTANEOUS PEAK STAGE			14.22	Mar 16	16.59[c]	Ju l	3 1975
ANNUAL RUNOFF (AC-FT)	38730		55090		28530		
ANNUAL RUNOFF (CFSM)	.20		.29		.15		
ANNUAL RUNOFF (INCHES)	2.74		3.90		2.02		
10 PERCENT EXCEEDS	147		202		82		
50 PERCENT EXCEEDS	21		20		2.1		
90 PERCENT EXCEEDS	1.5		4.1		.00		

a Median of annual mean discharges is 31 ft^3/s.
b Many days, several years.
c Present datum.



RED RIVER OF THE NORTH BASIN

05092000 RED RIVER OF THE NORTH AT DRAYTON, ND

LOCATION.--Lat 48 34'20", long 97 08'50", in SE 1/4 SE 1/4 SE 1/4 sec.24, T.159 N., R.51 W., Pembina County, Hydrologic Unit 09020311, on downstream side of bridge on North Dakota State Highway 11, at the North Dakota-Minnesota border, 1.5 mi northeast of Drayton, and at mile 206.7.

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

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

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4350	5580	3320	e2290	e1850	e1700	e37800	e10400	7130	e2780	4420	3340
2	4230	5210	3680	e2250	e1850	e1700	e37700	e9800	6710	e3000	4090	3140
3	4100	4940	e3800	e2200	e1850	e1700	e37600	e9400	6340	e2980	3800	2880
4	3980	4670	e3820	e2190	e1850	e1700	e37500	e9050	6040	e2870	3530	2640
5	3850	4470	e3850	e2110	e1850	e1700	e37300	e8750	5750	e2870	3330	2440
6	3730	4430	e3700	e2090	e1800	e1700	e37200	e8500	5500	e3070	3180	2310
7	3620	4420	e3300	e2010	e1800	e1700	e35900	e8550	5550	e4140	3030	2250
8	3600	4400	e3100	e2000	e1750	e1700	e35000	e8800	5700	e6710	2910	2260
9	3660	4340	e2900	e1950	e1750	e1800	e34200	e8800	5730	e10000	2770	2350
10	3820	4130	e2750	e1920	e1750	e1920	e33400	e8900	5490	e12500	2650	2860
11	3940	3910	e2600	e1920	e1750	e1920	e32400	9510	5240	e13900	2550	3210
12	3980	3740	e2530	e1920	e1750	e1920	e30900	11000	5060	e14000	2460	3200
13	3980	3590	e2500	e1920	e1750	e2500	e29800	13200	4910	e12700	2420	2970
14	3980	3470	e2410	e1920	e1750	e2700	e26400	14700	4730	e11600	2360	2720
15	3900	3420	e2400	e1920	e1750	e5300	e24800	15700	4540	e10300	2300	2510
16	3850	3450	e2380	e1920	e1750	e10600	e23100	16500	4380	e9210	2220	2310
17	3780	3650	e2330	e1920	e1750	e14300	e22100	e16500	4360	e8860	2170	2190
18	3720	3980	e2310	e1920	e1750	e17300	e21000	e16200	4280	e8880	2280	2080
19	3950	4250	e2300	e1920	e1750	e19800	e20100	e15400	4160	e9000	2290	1990
20	5170	4290	e2300	e1920	e1750	e21800	e19300	e14600	4050	e9080	2240	1920
21	6840	4260	e2310	e1920	e1750	e23500	e18400	e13800	3920	e9090	2170	1840
22	8090	4260	e2330	e1920	e1750	e29000	e17700	e13000	e3700	e9140	2080	1770
23	8680	4260	e2360	e1920	e1750	e33600	e16900	e12200	e3450	e9190	2030	1710
24	8770	4040	e2380	e1920	e1750	e36400	e16100	e11500	e3270	e9090	2090	1690
25	8430	3450	e2400	e1920	e1750	e36600	e15200	e10800	e3050	e8700	2120	1680
26	7900	3140	e2400	e1900	e1750	e35800	e14300	e10100	e2830	e8100	2120	1610
27	7410	3130	e2400	e1880	e1750	e34800	e13500	e9500	e2610	7700	2200	1550
28	6950	3130	e2400	e1870	e1700	e34300	e12500	e9000	e2400	6790	2790	1520
29	6540	3070	e2400	e1800	---	e34500	e11800	e8450	e2380	5990	3350	1460
30	6270	3070	e2380	e1850	---	e36000	e11000	8170	e2530	5280	3470	1370
31	5950	---	e2300	e1850	---	e37400	---	7610	---	4790	3410	---
TOTAL	161020	120150	84340	60960	49550	487360	760900	348390	135790	242310	84830	67770
MEAN	5194	4005	2721	1966	1770	15720	25360	11240	4526	7816	2736	2259
MAX	8770	5580	3850	2290	1850	37400	37800	16500	7130	14000	4420	3340
MIN	3600	3070	2300	1800	1700	1700	11000	7610	2380	2780	2030	1370
AC-FT	319400	238300	167300	120900	98280	966700	1509000	691000	269300	480600	168300	134400

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 1995, BY WATER YEAR (WY)

MEAN	1809	1519	1209	1055	1027	2908	13820	8191	5191	4602	2420	1840
MAX	5194	5653	3072	2065	1876	15720	38390	58890	23420	28240	21580	7912
(WY)	1995	1972	1972	1966	1952	1995	1966	1950	1962	1975	1993	1993
MIN	317	277	149	174	201	280	1275	938	676	348	243	329
(WY)	1991	1977	1977	1990	1977	1962	1981	1977	1977	1988	1977	1988

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1949 - 1995	
ANNUAL TOTAL	2227100		2603370			
ANNUAL MEAN	6102		7133		3815	
HIGHEST ANNUAL MEAN					10510	1950
LOWEST ANNUAL MEAN					536	1977
HIGHEST DAILY MEAN	27900	Apr 6	37800	Apr 1	91000	Apr 28 1979
LOWEST DAILY MEAN	1400	Jan 7	1370	Sep 30	110	Dec 23 1989
ANNUAL SEVEN-DAY MINIMUM	1400	Feb 8	1550	Sep 24	118	Dec 28 1989
INSTANTANEOUS PEAK FLOW			37800	Apr 1	92900	Apr 28 1979
INSTANTANEOUS PEAK STAGE			39.73	Apr 3	43.66	Apr 28 1979
INSTANTANEOUS LOW FLOW					7.7	Oct 16 1936
ANNUAL RUNOFF (AC-FT)	4417000		5164000		2764000	
10 PERCENT EXCEEDS	14900		17100		8420	
50 PERCENT EXCEEDS	3950		3620		1700	
90 PERCENT EXCEEDS	1550		1750		460	

e Estimated.

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
NOV										
03...	1350	5040	970	--	7.5	6.5	--	--	--	--
JAN										
10...	1310	1940	796	--	-6.0	0.0	--	--	--	--
FEB										
02...	1310	1850	728	--	-3.0	0.0	--	--	--	--
MAR										
25...	1500	36600	450	--	2.0	1.0	--	--	--	--
29...	1520	34500	501	--	0.5	1.0	--	--	--	--
APR										
01...	1225	37800	602	--	3.0	5.0	--	--	--	--
05...	1150	37300	610	--	-2.0	1.0	--	--	--	--
13...	1215	29800	650	7.9	9.0	4.0	270	160	61	29
21...	1205	18500	720	--	8.0	7.5	--	--	--	--
28...	1130	12600	800	--	6.0	6.0	--	--	--	--
MAY										
24...	1110	11600	986	--	15.0	13.0	--	--	--	--
JUN										
21...	1300	4120	840	--	27.5	26.0	--	--	--	--
JUL										
13...	1230	12700	629	--	29.0	25.0	--	--	--	--
AUG										
08...	1020	3070	850	--	28.0	26.0	--	--	--	--
SEP										
27...	1255	1500	843	7.8	24.0	15.0	340	244	72	38

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	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)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR										
13...	29	18	0.8	8.4	150	26	0.20	400	430	0.58
SEP										
27...	49	24	1	8.2	150	43	0.20	507	520	0.71

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
13...	34600	3	20	<1	30	10	<0.1	2	<1	310
SEP										
27...	2110	4	10	<1	40	10	<0.1	2	<1	330

RED RIVER OF THE NORTH BASIN

05094000 SOUTH BRANCH TWO RIVERS AT LAKE BRONSON, MN

LOCATION.--Lat 48°43'50", long 96°39'50", in $SW^1/_4SW^1/_4$ sec.30, T.161 N., R.46 W., Kittson County, Hydrologic Unit 09020312, on left bank 70 ft upstream from culvert on U.S. Highway 59 at Lake Bronson and 3.4 mi downstream from dam at outlet of Bronson Lake.

DRAINAGE AREA.--444 mi^2.

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

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

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

REMARKS.--Records fair except those for estimated daily discharges, which are poor. Flow partly regulated since 1937 by Bronson Lake, usable capacity, 3,700 acre-ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	167	58	e26	e8.0	e5.0	e3.0	974	69	82	31	29	25
2	160	57	e24	e8.0	e5.0	e3.0	684	69	67	22	17	3.0
3	151	56	e23	e8.0	e5.0	e3.0	e350	70	64	12	538	2.0
4	128	56	e21	e7.5	e4.9	e3.0	e200	76	64	13	564	1.7
5	4.2	56	e20	e7.0	e4.9	e3.0	e140	90	65	24	483	2.9
6	1.9	56	e19	e7.0	e4.8	e3.0	e100	110	65	69	387	25
7	1.8	56	e18	e7.0	e4.8	e3.0	e110	165	66	104	285	51
8	1.7	56	e17	e7.0	e4.7	e3.0	e120	184	65	178	114	52
9	2.1	56	e16	e7.0	e4.6	e3.0	e125	177	63	62	186	43
10	13	54	e16	e7.0	e4.5	e3.0	e130	109	61	118	130	50
11	29	54	e15	e7.0	e4.3	e3.5	133	69	37	140	47	43
12	39	55	e15	e7.0	e4.1	e30	170	145	13	73	19	24
13	42	59	e15	e7.0	e4.0	e100	200	451	12	36	46	24
14	41	64	e14	e7.0	e3.8	e450	197	1070	12	36	52	24
15	40	272	e13	e6.8	e3.7	e700	199	901	13	35	45	16
16	42	e350	e12	e6.8	e3.6	e1200	161	710	13	49	40	2.5
17	78	e300	e11	e6.6	e3.6	e1600	98	626	13	244	31	2.0
18	111	e240	e10	e6.4	e3.6	e1700	123	507	14	630	25	1.7
19	107	e180	e9.6	e6.2	e3.5	e1500	134	415	13	608	30	1.6
20	57	e150	e9.2	e6.0	e3.5	e1400	131	400	13	806	37	2.5
21	62	e150	e9.0	e6.0	e3.4	e1200	127	228	9.4	694	83	5.2
22	77	e110	e8.6	e5.8	e3.3	e1100	142	259	4.6	788	100	6.3
23	84	e90	e8.2	e5.6	e3.3	e1000	130	223	22	734	94	8.8
24	86	e55	e8.0	e5.4	e3.2	825	127	129	56	651	84	24
25	87	e45	e8.0	e5.4	e3.2	806	140	162	39	531	56	30
26	85	e42	e8.0	e5.4	e3.1	789	121	172	90	362	42	49
27	78	e38	e8.0	e5.4	e3.1	1050	106	87	86	120	30	35
28	73	e35	e8.0	e5.3	e3.0	1750	118	105	69	161	30	2.7
29	67	e31	e8.0	e5.3	---	1570	71	97	57	135	30	2.0
30	62	e29	e8.0	e5.2	---	1360	70	85	31	65	28	1.5
31	59	---	e8.0	e5.1	---	1210	---	85	---	63	28	---
TOTAL	2036.7	2910	413.6	200.2	111.5	21373.5	5631	8045	1279.0	7594	3710	561.4
MEAN	65.7	97.0	13.3	6.46	3.98	689	188	260	42.6	245	120	18.7
MAX	167	350	26	8.0	5.0	1750	974	1070	90	806	564	52
MIN	1.7	29	8.0	5.1	3.0	3.0	70	69	4.6	12	17	1.5
AC-FT	4040	5770	820	397	221	42390	11170	15960	2540	15060	7360	1110
CFSM	.15	.22	.03	.01	.01	1.55	.42	.58	.10	.55	.27	.04
IN.	.17	.24	.03	.02	.01	1.79	.47	.67	.11	.64	.31	.05

e Estimated.

RED RIVER OF THE NORTH BASIN

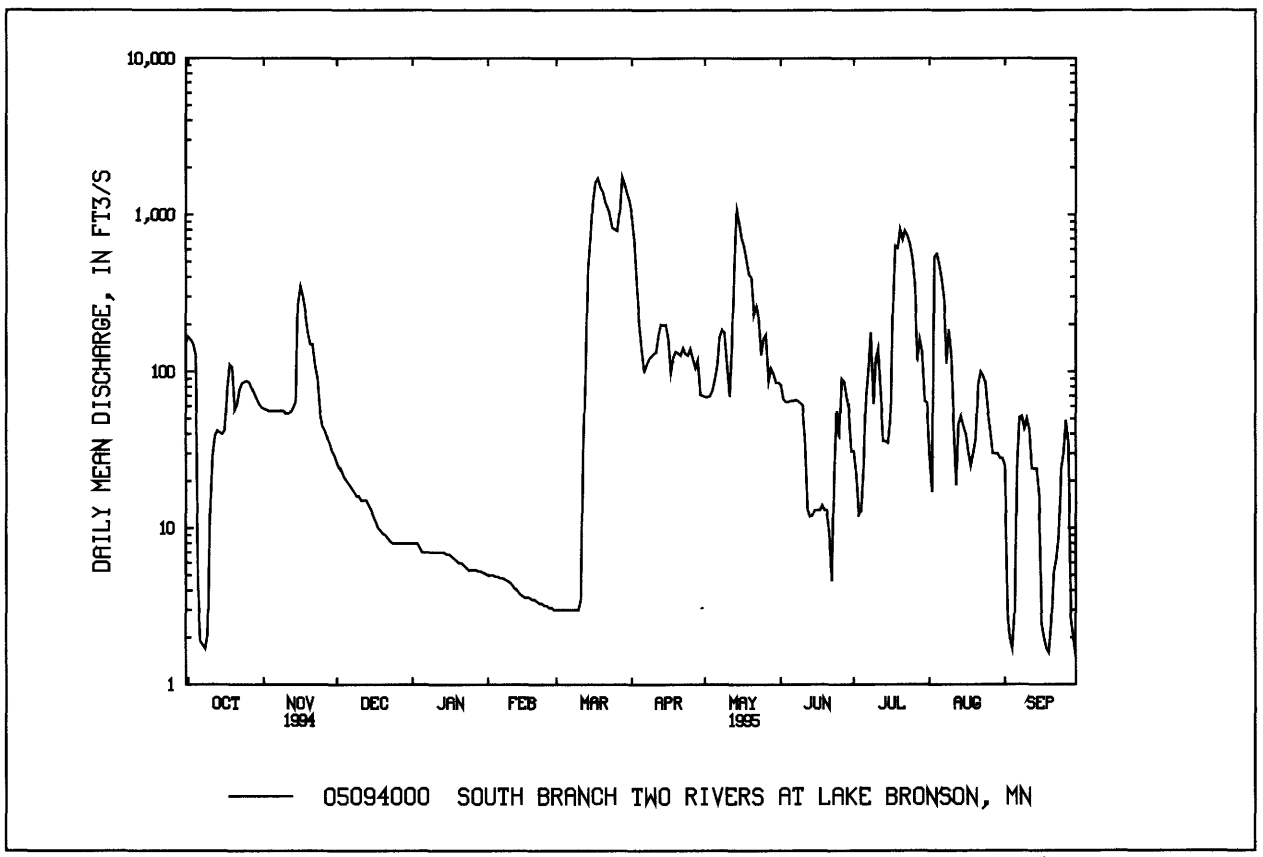
05094000 SOUTH BRANCH TWO RIVERS AT LAKE BRONSON, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	19.9	12.9	4.77	2.88	3.22	72.4	394	191	159	108	49.5	45.2
MAX	153	97.0	34.5	12.1	23.6	689	1977	1338	1336	1136	1349	525
(WY)	1958	1995	1992	1992	1981	1995	1966	1970	1970	1956	1993	1957
MIN	.40	.38	.13	.12	.12	.66	.54	.98	1.43	.44	.089	.000
(WY)	1991	1990	1987	1987	1987	1934	1991	1991	1980	1988	1988	1937

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1929 - 1995	
ANNUAL TOTAL	24561.78		53865.9			
ANNUAL MEAN	67.3		148		88.7a	
HIGHEST ANNUAL MEAN					312	1966
LOWEST ANNUAL MEAN					2.89	1934
HIGHEST DAILY MEAN	800	Mar 26	1750	Mar 28	5290	Apr 5 1966
LOWEST DAILY MEAN	.21	Jun 4	1.5	Sep 30	.00b	Jul 25 1937
ANNUAL SEVEN-DAY MINIMUM	3.7	Feb 10	3.0	Feb 28	.00	Aug 2 1937
INSTANTANEOUS PEAK FLOW			2080	Mar 28	5410	Apr 5 1966
INSTANTANEOUS PEAK STAGE			12.84c	Mar 18	18.23	Apr 5 1966
ANNUAL RUNOFF (AC-FT)	48720		106800		64280	
ANNUAL RUNOFF (CFSM)	.15		.33		.20	
ANNUAL RUNOFF (INCHES)	2.06		4.51		2.72	
10 PERCENT EXCEEDS	163		450		216	
50 PERCENT EXCEEDS	21		45		4.7	
90 PERCENT EXCEEDS	3.9		3.5		.80	

a Median of annual mean discharges is 58 ft^3/s.
b Many days, several years.
c From floodmark, ice jam.



RED RIVER OF THE NORTH BASIN

05102500 RED RIVER OF THE NORTH AT EMERSON, MANITOBA
(International Gaging Station)

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

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5260	6710	e3990	e2500	e1800	e1720	e42000	17300	9570	3340	5510	4130
2	5080	6430	e3850	e2460	e1800	e1720	42400	16200	9150	3470	5050	4030
3	4940	6110	e3780	e2420	e1800	e1710	41700	15400	8760	3600	4730	3810
4	4800	5830	e3850	e2380	e1810	e1690	40600	14500	8330	3600	4590	3570
5	4660	5580	e3850	e2320	e1810	e1690	39900	13800	8020	3570	4660	3240
6	4480	5330	e3780	e2250	e1800	e1680	38800	13200	7730	3570	4560	3060
7	4340	5260	e3740	e2190	e1800	e1640	38100	12700	7420	3740	4270	3000
8	4270	5190	e3600	e2120	e1800	e1600	38500	12400	7310	4840	3950	2930
9	4310	5120	e3340	e2060	e1790	e1600	38500	12200	7340	7240	3600	2910
10	4590	5010	e3070	e2000	e1800	e1600	38800	12100	7240	9960	3260	2920
11	4800	4840	e2860	e1940	e1800	e1590	38800	12200	7030	11800	3030	3100
12	4940	4660	e2680	e1890	e1800	e1590	38800	12600	6780	13000	2860	3410
13	4940	4480	e2620	e1870	e1790	e1600	38500	13500	6530	13400	2720	3500
14	4870	4410	e2590	e1850	e1780	e1740	37800	14700	6290	13000	2610	3370
15	4730	4410	e2580	e1830	e1780	e2370	37100	15700	6070	12000	2520	3090
16	4590	4520	e2600	e1800	e1770	e4480	36400	16600	5830	10900	2440	2820
17	4450	4730	e2590	e1780	e1780	e8090	35700	17100	5610	9990	2360	2610
18	4380	e5120	e2600	e1760	e1780	e12100	34500	17300	5370	9640	2340	2450
19	4450	e5370	e2580	e1750	e1780	e15700	33300	17400	5190	9680	2480	2330
20	5190	e5370	e2580	e1760	e1770	e19000	32100	17100	5010	9850	2840	2240
21	6780	e5370	e2570	e1780	e1760	e23000	30700	16700	4840	9990	3990	2150
22	8470	e5330	e2570	e1790	e1760	e27200	29300	16300	4660	10100	4770	2070
23	9430	e5260	e2570	e1800	e1770	e31400	27900	15700	4520	10200	5260	2010
24	9750	e5160	e2570	e1790	e1760	e34300	26400	15100	4410	10200	5260	1960
25	9640	e4700	e2570	e1800	e1750	e36000	25000	14300	4270	10100	4840	1920
26	9250	e3670	e2570	e1800	e1750	e37400	23500	13600	4100	9750	4240	1870
27	8760	e4270	e2570	e1800	e1740	e38800	22200	12800	3850	9110	3780	1810
28	8260	e4380	e2560	e1800	e1730	e39500	21000	12000	3600	8300	3480	1770
29	7770	e4240	e2550	e1800	---	e40300	19700	11300	3390	7420	3570	1760
30	7310	e4130	e2540	e1800	---	e41000	18500	10700	3290	6640	3880	1730
31	6990	---	e2520	e1800	---	e41700	---	10100	---	6000	4100	---
TOTAL	186480	150990	91290	60690	49860	475510	1006500	442600	181510	258000	117550	81570
MEAN	6015	5033	2945	1958	1781	15340	33550	14280	6050	8323	3792	2719
MAX	9750	6710	3990	2500	1810	41700	42400	17400	9570	13400	5510	4130
MIN	4270	3670	2520	1750	1730	1590	18500	10100	3290	3340	2340	1730
AC-FT	369900	299500	181100	120400	98900	943200	1996000	877900	360000	511700	233200	161800

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 1995, BY WATER YEAR (WY)

MEAN	1513	1332	973	800	762	2215	12810	8369	4919	3974	2060	1624
MAX	6015	5163	2945	2053	1914	15340	45820	72820	25430	28020	27000	10010
(WY)	1995	1972	1995	1951	1952	1995	1966	1950	1962	1975	1993	1993
MIN	28.6	23.7	33.3	7.05	1.21	2.25	1282	663	196	121	46.6	23.6
(WY)	1937	1937	1937	1937	1937	1937	1938	1934	1934	1936	1934	1934

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1912 - 1995	
ANNUAL TOTAL	2322300		3102550			
ANNUAL MEAN	6362		8500		3454	
HIGHEST ANNUAL MEAN					12100	1950
LOWEST ANNUAL MEAN					333	1934
HIGHEST DAILY MEAN	26900	Apr 8	42400	Apr 2	94400	May 13 1950
LOWEST DAILY MEAN	1450	Jan 10	1590	Mar 11	.90	Feb 6 1937
ANNUAL SEVEN-DAY MINIMUM	1460	Feb 4	1600	Mar 7	.97	Feb 4 1937
INSTANTANEOUS PEAK FLOW			42400	Apr 2	95500	May 13 1950
INSTANTANEOUS PEAK STAGE			784.80	Apr 2	791.19	May 1 1979
INSTANTANEOUS LOW FLOW					.90	Feb 6 1937
ANNUAL RUNOFF (AC-FT)	4606000		6154000		2503000	
10 PERCENT EXCEEDS	14300		23200		7760	
50 PERCENT EXCEEDS	4660		4450		1410	
90 PERCENT EXCEEDS	1480		1780		261	

e Estimated.

RED RIVER OF THE NORTH BASIN

05102500 RED RIVER OF THE NORTH AT EMERSON, MANITOBA--Continued
(National Stream-Quality Accounting Network Station)

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1977 to current year.

WATER TEMPERATURE: October 1977 to current year.

REMARKS.--Records of daily mean values of water temperature and specific conductance are furnished by Water Survey of Canada.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily mean, 2,180 microsiemens, Dec. 8, 1989; minimum daily mean, 259 microsiemens, Apr. 14, 1989.

WATER TEMPERATURES: Maximum daily mean, 26.7°C, Aug. 16, 1988; minimum daily mean, 0.0°C, on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily mean, 972 microsiemens, May 26; minimum daily mean, 311 microsiemens, Mar. 20.

WATER TEMPERATURES: Maximum daily mean, 25.2°C, June 19 and 20; minimum daily mean, 0.0°C, on many days during the winter months.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
MAR											
08...	1400	1590	--	760	7.7	--	-12.5	0.5	12.5	--	300
21...	1515	--	23000	313	7.8	744	5.0	0.5	10.5	75	--
23...	1000	--	31400	361	7.8	735	1.0	0.5	10.7	77	--
29...	1045	--	40300	432	8.0	752	0.5	1.5	11.7	85	--
APR											
28...	1115	--	21000	694	8.1	--	--	7.5	--	--	--

DATE	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	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 PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
MAR											
08...	256	68	32	35	20	0.9	5.6	312	0	88	29

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG.C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED MG/L AS N) (00618)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
MAR											
08...	0.20	17	431	477	0.65	2050	0.010	0.560	0.570	0.570	0.080
21...	--	--	--	--	--	--	0.160	3.04	3.20	3.20	0.290
23...	--	--	--	--	--	--	0.150	2.95	3.10	3.10	0.290
29...	--	--	--	--	--	--	0.130	3.17	3.30	3.30	0.270
APR											
28...	--	--	--	--	--	--	0.030	0.800	0.830	0.830	0.080

DATE	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N) (00607)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL MG/L AS N) (00625)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)
MAR										
08...	0.72	0.62	0.80	0.70	1.4	0.070	0.040	0.030	14	26
21...	1.1	0.91	1.4	1.2	4.6	0.420	0.360	0.350	--	--
23...	1.5	0.91	1.8	1.2	4.9	0.550	0.330	0.310	--	--
29...	0.93	0.83	1.2	1.1	4.5	0.300	0.260	0.230	--	--
APR										
28...	0.92	0.72	1.0	0.80	1.8	0.150	0.100	0.100	--	--

RED RIVER OF THE NORTH BASIN

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

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	648	833	901	806	747	690	498	695	900	890	755	712
2	660	805	950	795	740	692	501	707	893	904	751	707
3	672	794	955	788	724	684	529	709	884	923	766	621
4	688	830	920	775	719	676	541	714	872	878	763	616
5	702	867	876	768	714	672	547	715	861	822	703	620
6	699	905	879	760	715	666	547	730	850	809	694	633
7	699	885	895	755	713	664	552	744	861	736	715	651
8	694	861	894	747	707	679	556	748	876	778	732	655
9	712	833	891	743	703	695	561	762	863	749	751	671
10	710	814	880	749	699	696	576	767	875	680	780	696
11	748	812	891	757	692	704	592	780	867	548	780	724
12	733	806	887	763	688	720	605	782	849	506	768	751
13	721	795	897	763	686	721	646	789	855	565	766	741
14	805	836	929	763	688	715	620	819	854	589	766	662
15	861	829	938	763	699	671	628	837	858	641	770	646
16	893	818	930	762	708	587	636	855	857	679	760	651
17	886	805	926	762	704	498	639	873	850	690	756	700
18	895	805	900	768	702	427	636	900	850	677	751	716
19	912	772	876	775	697	341	639	917	850	669	751	732
20	891	761	846	778	693	311	638	922	848	653	759	767
21	867	747	829	776	690	318	638	936	856	647	573	800
22	835	756	831	765	696	313	638	938	855	677	585	814
23	870	770	828	757	700	324	636	928	869	734	587	814
24	768	798	816	753	698	344	645	929	865	705	604	819
25	600	835	822	756	692	355	661	958	869	711	652	829
26	687	861	831	765	690	372	676	972	869	724	674	814
27	737	849	840	776	689	383	682	948	870	756	684	811
28	756	856	842	778	689	389	694	925	869	773	678	804
29	784	871	830	778	---	431	698	910	872	756	662	799
30	810	893	823	774	---	454	702	908	869	750	686	798
31	838	---	824	754	---	474	---	904	---	749	684	---
MEAN	767	823	877	767	703	538	612	839	865	722	713	7

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.1	6.7	.0	.1	.4	.3	1.9	8.9	18.5	21.3	21.6	20.8
2	12.5	6.6	.0	.1	.4	.3	2.3	9.0	19.1	21.4	21.8	20.7
3	11.8	6.5	.0	.1	.4	.3	2.3	9.1	19.6	21.6	22.0	20.6
4	11.1	6.1	.0	.0	.4	.3	1.0	9.4	20.2	21.4	22.0	20.9
5	10.9	5.7	.0	.1	.4	.3	.2	9.5	20.9	20.5	22.2	21.2
6	10.9	5.4	.0	.1	.4	.3	.0	10.0	21.0	19.5	22.8	20.7
7	11.0	5.2	.0	.1	.4	.3	.1	11.0	20.9	21.6	23.3	18.9
8	10.5	5.1	.1	.1	.4	.3	.4	11.8	20.0	20.9	23.8	17.9
9	9.9	4.8	.1	.1	.3	.3	.8	12.1	19.7	21.3	23.5	17.6
10	9.6	4.6	.1	.1	.3	.3	1.4	12.4	19.7	21.6	22.6	17.5
11	9.6	4.4	.1	.1	.3	.3	1.9	13.0	19.7	21.5	22.2	17.6
12	9.8	4.1	.1	.0	.3	.3	2.3	13.5	20.1	22.5	21.9	18.4
13	10.1	4.3	.0	.0	.3	.3	3.0	13.1	20.6	23.6	22.0	18.7
14	10.2	4.4	.0	.0	.3	.3	3.9	12.5	21.1	24.4	21.7	18.0
15	10.2	4.2	.0	.0	.3	.2	4.7	12.3	21.5	24.9	21.3	17.5
16	10.4	3.6	.0	.1	.3	.1	4.9	12.3	22.8	25.0	21.8	17.4
17	10.7	2.9	.0	.3	.3	.0	4.9	12.6	23.8	24.6	22.2	16.4
18	11.1	3.0	.0	.4	.3	.0	5.2	13.8	24.5	24.5	22.7	15.6
19	11.0	.4	.0	.4	.3	.0	5.4	14.5	25.2	24.5	21.8	14.5
20	10.5	.1	.0	.4	.3	.0	6.0	14.5	25.2	23.9	21.5	13.5
21	10.5	.0	.0	.4	.3	.0	6.6	14.5	25.0	23.0	20.6	12.7
22	10.4	.0	.1	.4	.3	.0	7.0	14.8	25.0	22.8	20.3	11.8
23	10.5	.0	.2	.3	.3	.0	7.5	14.7	25.0	22.9	20.4	11.3
24	9.9	.0	.2	.3	.3	.0	7.7	14.6	25.0	22.9	20.5	11.6
25	9.3	.0	.2	.3	.3	.4	8.1	14.7	23.8	22.8	20.4	12.1
26	9.0	.0	.2	.3	.3	1.0	8.2	15.0	23.4	22.8	20.4	12.7
27	8.5	.0	.1	.3	.3	1.2	8.2	15.4	23.3	22.9	20.2	13.1
28	8.3	.1	.1	.4	.3	1.4	8.1	15.6	23.6	23.0	19.9	13.7
29	8.1	.0	.2	.4	---	1.4	8.2	16.0	23.4	22.8	20.2	14.2
30	7.6	.0	.2	.4	---	1.3	8.6	16.8	21.8	22.9	21.1	14.0
31	7.1	---	.2	.4	---	1.4	---	17.6	---	22.9	21.1	---
MEAN	10.1	2.9	.1	.2	.3	.4	4.4	13.1	22.1	22.7	21.6	

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RED RIVER OF THE NORTH BASIN

05104500 ROSEAU RIVER BELOW SOUTH FORK NEAR MALUNG, MN

LOCATION.--Lat 48°47'30", long 95°44'40", in NW¼SW¼ sec.6, T.161 N., R.39 W., Roseau County, Hydrologic Unit 09020314, on left bank 0.3 mi downstream from South Fork and 1.5 mi northwest of Malung.

DRAINAGE AREA.--573 mi².

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

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

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

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	130	122	e170	23	13	8.3	584	156	129	e60	56	14
2	119	e120	e150	e24	13	7.9	505	153	119	e55	46	11
3	109	119	e135	e23	13	7.2	434	154	110	e50	61	7.6
4	92	113	e120	e21	12	7.2	404	156	100	e52	62	8.0
5	64	105	109	e19	11	7.2	326	167	87	e60	62	4.1
6	65	101	97	e17	9.8	7.0	244	185	79	e150	60	8.1
7	73	97	e90	15	9.7	6.7	216	196	76	e330	50	11
8	80	97	e85	15	9.6	6.7	182	199	75	e400	37	12
9	84	96	e78	13	e9.5	6.5	159	203	67	e330	31	29
10	86	95	e72	13	e9.5	6.4	152	212	64	e270	25	30
11	86	93	65	e14	e9.5	6.8	143	226	64	e230	20	25
12	85	92	62	e14	e9.5	7.6	137	237	62	e200	16	21
13	82	115	61	e14	e9.2	e100	130	319	59	e160	13	16
14	78	272	57	e14	e8.5	e300	137	444	54	e140	11	15
15	82	557	56	e14	7.8	e700	155	493	40	e110	8.3	12
16	111	643	55	e14	8.3	e950	172	465	24	e150	7.0	7.4
17	149	658	51	e14	8.3	e1200	179	500	22	e220	5.2	5.8
18	190	e700	49	e13	8.4	e1500	183	533	21	e290	9.9	6.0
19	227	e780	48	e13	8.4	e1350	184	502	19	e400	89	7.4
20	248	e820	46	e13	8.5	e1200	185	450	17	e370	247	10
21	250	e800	46	e13	8.4	e1100	185	383	e16	e320	186	10
22	233	e760	42	e13	8.5	e950	183	321	e15	e280	126	7.5
23	207	e700	37	e13	8.6	e850	176	269	e15	e240	95	6.7
24	191	e640	36	e13	8.4	e720	173	238	e15	e200	67	8.3
25	178	e560	35	e13	8.3	672	173	218	e50	179	62	7.0
26	168	e500	e34	e13	8.3	631	169	198	e84	145	61	9.3
27	161	e400	e33	e13	8.3	797	164	187	e80	114	55	10
28	151	e300	e31	e13	8.3	897	161	177	e75	93	42	7.9
29	144	e220	e30	e13	---	837	158	165	e70	74	32	4.5
30	135	e190	e28	e13	---	751	156	154	e65	64	23	3.5
31	128	---	26	13	---	669	---	143	---	62	17	---
TOTAL	4186	10865	2034	463	263.6	16259.5	6509	8403	1773	5798	1682.4	335.1
MEAN	135	362	65.6	14.9	9.41	524	217	271	59.1	187	54.3	11.2
MAX	250	820	170	24	13	1500	584	533	129	400	247	30
MIN	64	92	26	13	7.8	6.4	130	143	15	50	5.2	3.5
AC-FT	8300	21550	4030	918	523	32250	12910	16670	3520	11500	3340	665
CFSM	.24	.63	.11	.03	.02	.92	.38	.47	.10	.33	.09	.02
IN.	.27	.71	.13	.03	.02	1.06	.42	.55	.12	.38	.11	.02

e Estimated.

RED RIVER OF THE NORTH BASIN

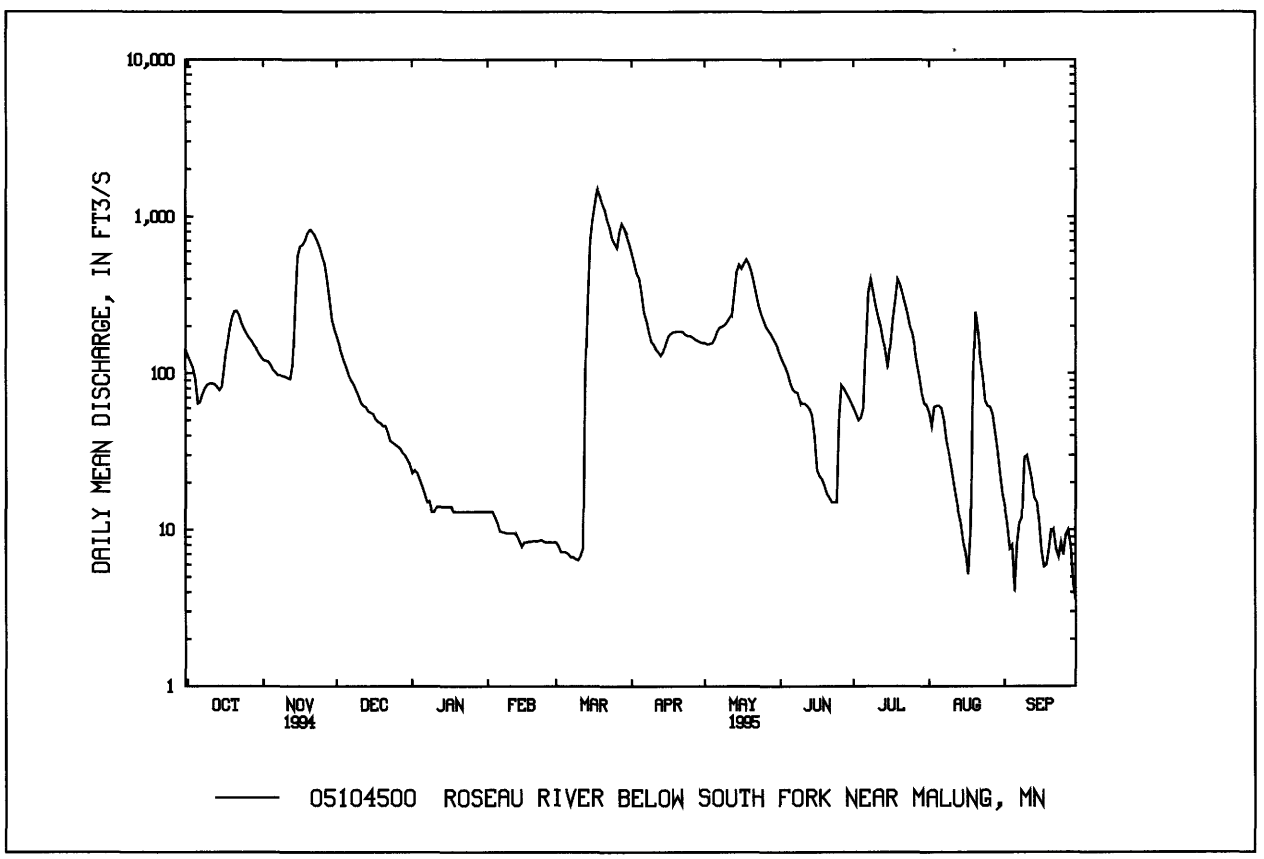
05104500 ROSEAU RIVER BELOW SOUTH FORK NEAR MALUNG, MN

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	68.6	50.6	15.5	7.27	5.37	65.4	575	296	218	157	63.6	84.0
MAX	351	362	65.6	21.0	14.4	524	2035	1589	1140	1152	585	710
(WY)	1983	1995	1995	1966	1986	1995	1966	1950	1968	1968	1968	1957
MIN.	029	.16	.013	.000	.000	.83	5.60	8.77	4.16	.092	.000	.025
(WY)	1991	1991	1977	1977	1977	1977	1991	1990	1980	1980	1961	1988

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1947 - 1995	
ANNUAL TOTAL	55026.4		58571.6			
ANNUAL MEAN	151		160		134[a]	
HIGHEST ANNUAL MEAN					304	1950
LOWEST ANNUAL MEAN					7.28	1990
HIGHEST DAILY MEAN	2540	Sep 16	1500	Mar 18	5670	Jul 18 1968
LOWEST DAILY MEAN	6.0	Feb 28	3.5	Sep 30	.00[b]	Jul 23 1961
ANNUAL SEVEN-DAY MINIMUM	6.4	Feb 25	6.8	Mar 5	.00	Jul 23 1961
INSTANTANEOUS PEAK FLOW					5750	Jul 18 1968
INSTANTANEOUS PEAK STAGE			16.56[c]	Mar 14	23.37[d]	Apr 3 1966
INSTANTANEOUS LOW FLOW			3.1	Sep 5		
ANNUAL RUNOFF (AC-FT)	109100		116200		96910	
ANNUAL RUNOFF (CFSM).	26		.28		.23	
ANNUAL RUNOFF (INCHES)	3.57		3.80		3.17	
10 PERCENT EXCEEDS	362		456		310	
50 PERCENT EXCEEDS	88		78		17	
90 PERCENT EXCEEDS	8.4		8.3		1.5	

a Median of annual mean discharges is 114 ft^3/s.
b Many days, several years.
c Highwater mark, backwater from ice.
d Backwater from ice.



RED RIVER OF THE NORTH BASIN

05107500 ROSEAU RIVER AT ROSS, MN

LOCATION.--Lat 48°54'37", long 95°55'18", in NE¼SE¼ sec. 27, T. 163 N., R. 41 W., Roseau County, Hydrologic Unit 090203014, on left bank 300 ft downstream from highway bridge, 0.2 mi. north of Ross, and 2.3 mi downstream from Pine Creek.

DRAINAGE AREA.--1,220 mi^2, approximately.

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

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

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

REMARKS.--Records good. High flow affected by natural storage in Roseau Lake.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, about 19 ft in 1896. Other oustanding floods reached the following stages, from information by local residents: flood of July 1919, 17.5 ft; flood of 1927, about 16 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	374	456	126	108	39
2	---	---	---	---	---	---	---	366	417	119	90	33
3	---	---	---	---	---	---	---	367	379	105	124	27
4	---	---	---	---	---	---	---	390	343	96	171	21
5	---	---	---	---	---	---	---	418	313	108	137	18
6	---	---	---	---	---	---	---	442	281	218	109	23
7	---	---	---	---	---	---	---	457	272	446	91	47
8	---	---	---	---	---	---	---	480	287	595	75	56
9	---	---	---	---	---	---	---	490	267	618	60	59
10	---	---	---	---	---	---	---	491	234	581	50	59
11	---	---	---	---	---	---	---	494	205	525	44	57
12	---	---	---	---	---	---	---	554	180	467	35	51
13	---	---	---	---	---	---	---	844	160	405	30	43
14	---	---	---	---	---	---	---	992	142	341	26	36
15	---	---	---	---	---	---	---	968	126	284	23	31
16	---	---	---	---	---	---	---	951	107	251	19	25
17	---	---	---	---	---	---	---	962	87	331	15	19
18	---	---	---	---	---	---	563	975	74	470	18	15
19	---	---	---	---	---	---	544	975	65	617	49	15
20	---	---	---	---	---	---	525	960	58	627	158	17
21	---	---	---	---	---	---	506	948	53	589	282	19
22	---	---	---	---	---	---	491	919	47	567	255	23
23	---	---	---	---	---	---	478	884	45	539	197	20
24	---	---	---	---	---	---	467	848	41	491	158	16
25	---	---	---	---	---	---	455	804	41	436	128	17
26	---	---	---	---	---	---	444	758	113	374	108	18
27	---	---	---	---	---	---	430	710	163	305	94	17
28	---	---	---	---	---	---	416	660	152	247	83	17
29	---	---	---	---	---	---	408	604	145	200	71	19
30	---	---	---	---	---	---	391	548	129	163	60	18
31	---	---	---	---	---	---	---	500	---	134	49	---
TOTAL	---	---	---	---	---	---	6118	21133	5382	11375	2917	875
MEAN	---	---	---	---	---	---	471	682	179	367	94.1	29.2
MAX	---	---	---	---	---	---	563	992	456	627	282	59
MIN-	--	---	---	---	---	---	391	366	41	96	15	15
AC-FT	---	---	---	---	---	---	12140	41920	10680	22560	5790	1740
CFSM	---	---	---	---	---	---	.39	.56	.15	.30	.08	.02
IN.	---	---	---	---	---	---	.19	.64	.16	.35	.09	.03

RED RIVER OF THE NORTH BASIN

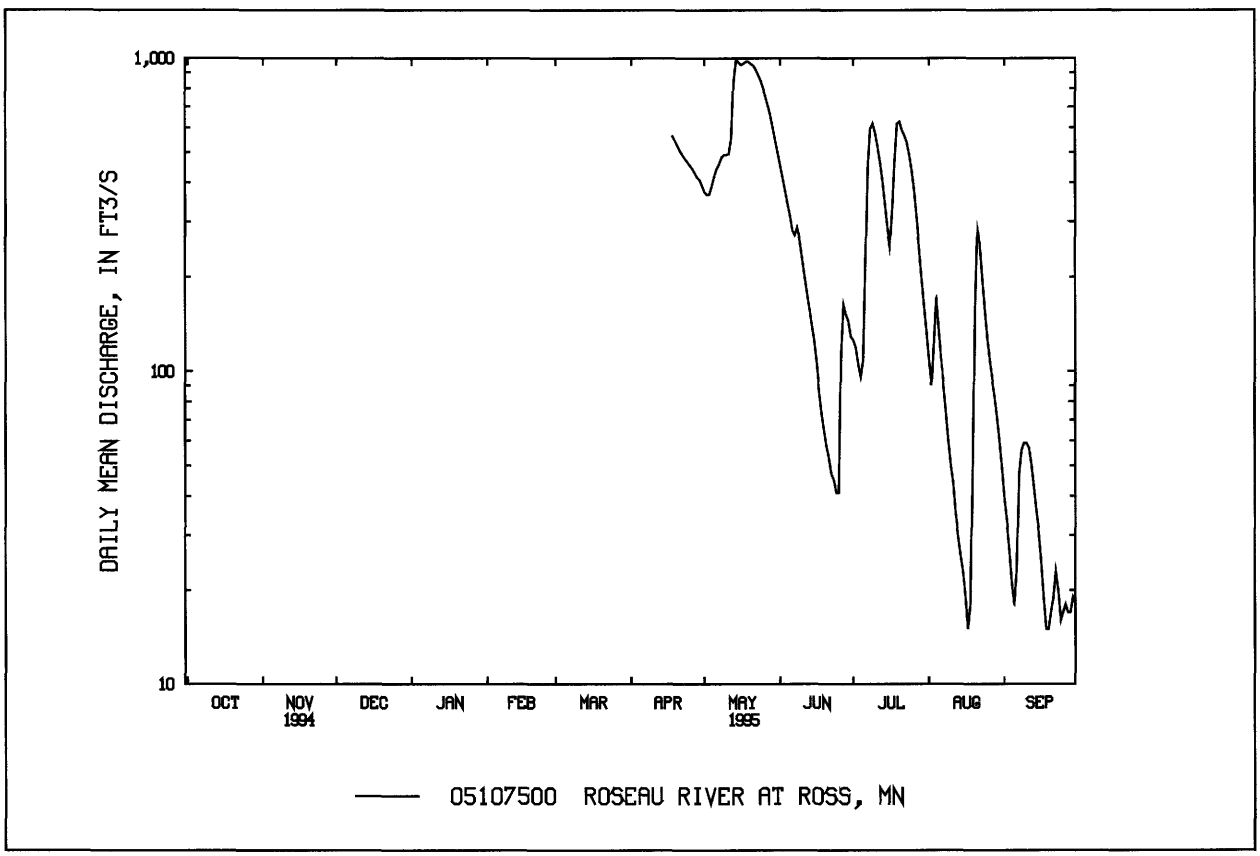
05107500 ROSEAU RIVER AT ROSS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	133	91.9	29.5	14.5	11.3	78.6	848	853	462	281	120	133
MAX	974	512	107	57.7	27.8	551	3234	4583	2258	1494	1352	1041
(WY)	1942	1957	1978	1966	1981	1946	1966	1950	1970	1968	1968	1968
MIN	1.91	1.63	.27	.001	.000	2.76	32.1	29.5	6.83	1.39	.84	.38
(WY)	1991	1977	1977	1977	1977	1989	1991	1988	1980	1980	1961	1990

SUMMARY STATISTICS	FOR 1995 WATER YEAR		WATER YEARS 1929 - 1995	
ANNUAL MEAN			255[a]	
HIGHEST ANNUAL MEAN			725	1950
LOWEST ANNUAL MEAN			28.9	1934
HIGHEST DAILY MEAN	992	May 14	6510	May 12 1950
LOWEST DAILY MEAN	15	Aug 17,Sep 18,19	.00	Aug 29 1961
ANNUAL SEVEN-DAY MINIMUM	17	Sep 24	.00	Jan 3 1977
INSTANTANEOUS PEAK FLOW	998	May 14	6560	May 12 1950
INSTANTANEOUS PEAK STAGE	9.23	May 14	18.25	May 12 1950
INSTANTANEOUS LOW FLOW	12	Aug 18	.00[b]	Aug 29 1961
ANNUAL RUNOFF (AC-FT)			185000	
ANNUAL RUNOFF (CFSM)			.21	
ANNUAL RUNOFF (INCHES)			2.84	
10 PERCENT EXCEEDS	637		825	
50 PERCENT EXCEED	175		36	
90 PERCENT EXCEEDS	20		5.6	

a Median of annual mean discharges is 230 ft^3/s.
b Many days, 1961.



RED RIVER OF THE NORTH BASIN

05112000 ROSEAU RIVER BELOW STATE DITCH 51, NEAR CARIBOU, MN
(International Gaging Station)

LOCATION.--Lat 48°58'54", long 96°27'46", in SE¼SW¼ sec.34, T.164 N., R.45 W., Kittson County, Hydrologic Unit 09020314, on left bank 400 ft downstream from State ditch 51 (known locally as Caribou cutoff ditch) and 0.6 mi west of Caribou.

DRAINAGE AREA.--1,570 mi², approximately.

PERIOD OF RECORD.--April to October 1917, April 1920 to current year (no winter records in water years 1931, 1932, 1934-36, 1938-40, 1944-72). Published as "at Caribou," prior to April 1929; as "below Cutoff ditch, near Caribou" April 1929 to September 1936. Records published for both sites April 1929 to September 1930. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1938(M). WSP 1508: 1917(M), 1920, 1932(M), 1934-35(M). WSP 1913: 1954(M).

GAGE.--Water-stage recorder. Datum of gage is 1,002.31 ft above sea level (levels by Geodetic Survey of Canada). Prior to Apr. 1, 1929, nonrecording gage at site at Caribou 0.6 mi upstream at datum 0.95 ft lower.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Satellite telemeter at station. Occasionally, at high stages, there is some natural diversion of flow above station to headwaters of Two Rivers.

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1916 is reported to have reached a stage of about 15.5 ft at former site.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1260	388	e660	e105	e36	e23	2030	446	665	104	135	49
2	1220	364	e660	e100	e36	e23	2010	424	565	96	99	43
3	1150	373	e660	e90	e36	e23	1980	405	479	93	87	37
4	1050	369	e640	e78	e34	e23	e1950	399	411	85	96	34
5	920	356	e610	e66	e32	e23	e1920	413	359	91	136	31
6	759	338	e570	e58	e31	e23	e1900	438	321	116	119	36
7	630	328	e530	e52	e31	e23	e1890	467	301	231	95	39
8	549	321	e470	e47	e30	e23	e1870	490	277	441	80	46
9	484	322	e420	e43	e30	e23	e1830	510	276	636	68	57
10	446	322	e360	e40	e29	e23	e1780	521	260	724	56	59
11	425	314	e320	e39	e28	e23	1740	525	227	723	47	58
12	455	313	e290	e39	e27	e25	1710	549	194	660	42	58
13	458	427	e270	e38	e27	e31	1660	691	163	583	37	55
14	433	669	e250	e38	e26	e200	1600	887	140	506	33	50
15	428	913	e230	e38	e26	e500	1540	978	121	391	28	45
16	433	1040	e220	e38	e25	e610	1470	1020	105	303	28	41
17	463	1130	e205	e38	e25	e670	1390	1040	90	304	26	37
18	514	1190	e190	e38	e24	e750	1310	1060	76	407	29	35
19	595	1230	e180	e37	e24	e800	1230	1060	66	560	31	32
20	657	1270	e170	e37	e24	e850	1160	1060	58	672	34	30
21	706	e1270	e160	e37	e24	e900	1090	1060	53	693	104	29
22	752	e1270	e155	e37	e24	e1050	1020	1070	53	673	244	29
23	746	e1240	e150	e36	e24	e1240	945	1060	48	652	241	31
24	700	e1100	e145	e36	e24	e1550	861	1050	49	638	191	34
25	673	e950	e140	e36	e24	e2200	788	1040	45	598	143	33
26	622	e820	e135	e36	e24	e2300	711	1020	42	553	112	32
27	560	e720	e130	e36	e24	e2250	611	988	67	473	94	31
28	504	e680	e125	e36	e23	2150	544	953	118	364	84	33
29	456	e670	e120	e36	---	2110	507	906	120	283	74	33
30	430	e660	e115	e36	---	2080	480	854	115	227	66	34
31	416	---	e110	e36	---	2050	---	761	---	177	57	---
TOTAL	19894	21357	9390	1457	772	24569	41527	24145	5864	13057	2716	1191
MEAN	642	712	303	47.0	27.6	793	1384	779	195	421	87.6	39.7
MAX	1260	1270	660	105	36	2300	2030	1070	665	724	244	59
MIN	416	313	110	36	23	23	480	399	42	85	26	29
AC-FT	39460	42360	18630	2890	1530	48730	82370	47890	11630	25900	5390	2360
CFSM	.41	.45	.19	.03	.02	.50	.88	.50	.12	.27	.06	.03
IN.	.47	.51	.22	.03	.02	.58	.98	.57	.14	.31	.06	.03

e Estimated.

RED RIVER OF THE NORTH BASIN

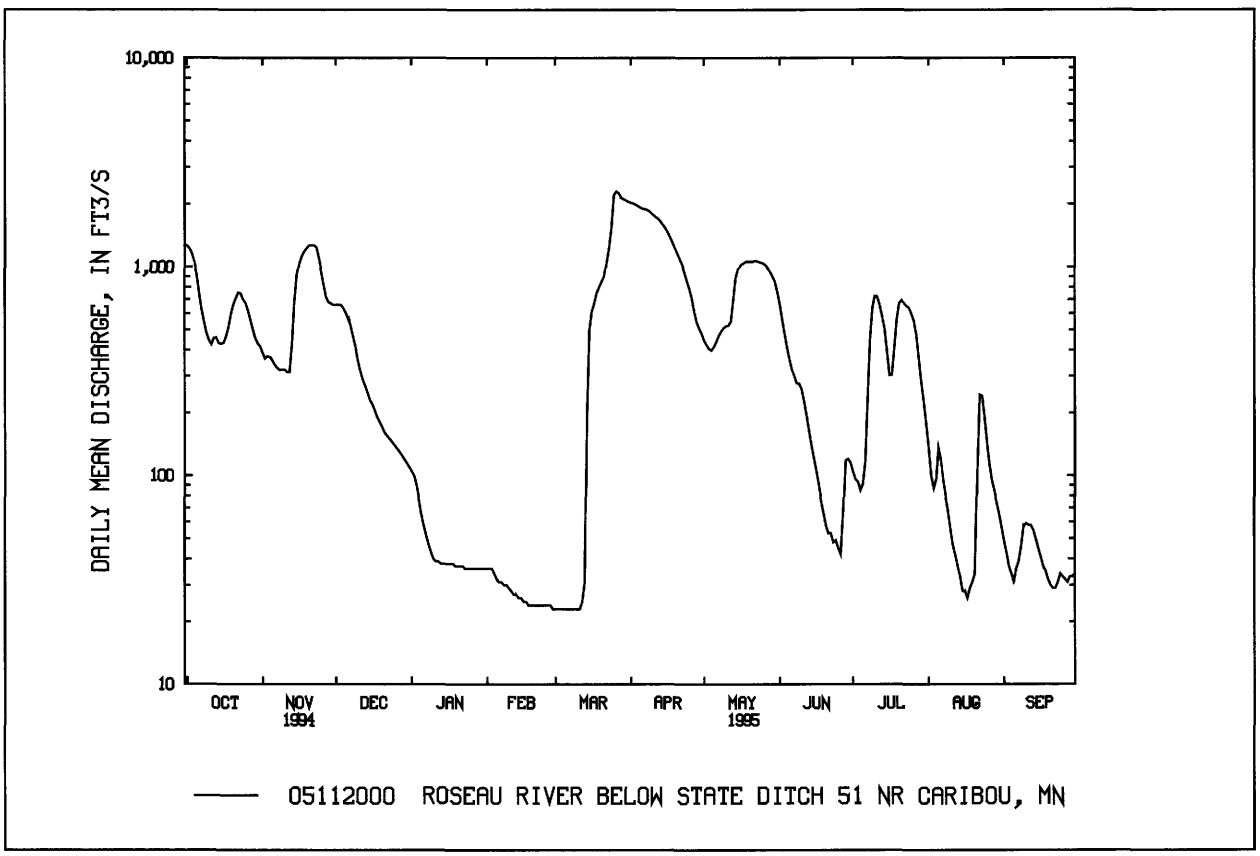
05112000 ROSEAU RIVER BELOW STATE DITCH 51, NEAR CARIBOU, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1917 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	170	125	51.6	24.8	19.4	120	805	905	559	392	159	182
MAX	1302	712	303	134	75.1	793	2167	3029	2588	1653	1582	1451
(WY)	1942	1995	1995	1927	1927	1995	1966	1950	1970	1968	1993	1968
MIN	.12	.26	.53	.090	.060	1.57	38.2	26.9	6.70	.65	2.09	.30
(WY)	1991	1991	1991	1991	1991	1989	1981	1988	1980	1980	1936	1990

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1917 - 1995	
ANNUAL TOTAL	132406		165939			
ANNUAL MEAN	363		455		290	
HIGHEST ANNUAL MEAN					683	1927
LOWEST ANNUAL MEAN					35.9	1977
HIGHEST DAILY MEAN	1300	Sep 26	2300	Mar 26	4020	May 19 1950
LOWEST DAILY MEAN	17	Feb 12	23	Feb 28 to Mar 11	.00a	Sep 15 1990
ANNUAL SEVEN-DAY MINIMUM	17	Feb 12	23	Feb 28	.04	Sep 12 1990
INSTANTANEOUS PEAK FLOW			2350	Mar 26	4080	May 19 1950
INSTANTANEOUS PEAK STAGE			10.36b	Mar 25	11.81	May 1 1950
INSTANTANEOUS LOW FLOW			22	Aug 17	.00c	Aug 13 1936
ANNUAL RUNOFF (AC-FT)	262600		329100		209800	
ANNUAL RUNOFF (CFSM).	23		.29		.18	
ANNUAL RUNOFF (INCHES)	3.14		3.93		2.51	
10 PERCENT EXCEEDS	804		1170		1190	
50 PERCENT EXCEEDS	271		270		76	
90 PERCENT EXCEEDS	28		29		8.5	

a Also occurred Sept 15-17, 1990.
b Backwater from ice.
c Also occurred Sept 15-17, Oct 12,13, and Nov 13, 1990.



05112000 ROSEAU RIVER BELOW STATE DITCH 51, NEAR CARIBOU, MN--Continued
(National Water Quality Assessment Station)

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	TEMPERATURE WATER (DEG C) (00020)	BAROMETRIC PRESSURE ATURE AIR HG) (00025)	DISCHARGE, INST. CUBIC (MM OF SECOND (00061)	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)
NOV									
09...	1000	10.0	748	37	--	431	440	13.7	8.1
MAR									
02...	1245	-18.5	758	--	23	670	660	2.0	7.3
22...	0900	--	735	--	1050	223	223	10.1	7.6
MAY									
09...	0915	E8.0	736	507	--	425	411	9.4	8.0
JUN									
13...	0845	19.5	745	163	--	389	390	9.7	8.1

DATE	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKALINITY LAB (MG/L AS CACO3) (90410)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN,AM GEN, MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- NO2+NO3 DISSOLVED (MG/L AS N) (00631)
NOV										
09...	7.8	205	220	0	250	0.020	<0.010	0.90	1.0	<0.050
MAR										
02...	7.5	340	343	0	415	0.150	<0.010	0.90	0.90	0.370
22...	7.2	86	88	0	105	0.210	0.040	1.0	1.0	0.990
MAY										
09...	7.8	182	200	0	222	<0.015	<0.010	0.70	0.80	<0.050
JUN										
13...	7.8	183	196	0	223	<0.015	<0.010	1.1	1.2	<0.050

DATE	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C) (00689)	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)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)
NOV										
09...	0.070	0.050	0.040	20	0.60	55	22	9.3	2.6	7.1
MAR										
02...	0.040	0.020	0.020	--	--	87	34	12	2.7	5.3
22...	0.210	0.160	0.140	10	>5.0	26	9.3	2.3	4.6	4.2
MAY										
09...	0.030	0.020	0.010	--	--	51	20	4.8	1.8	3.5
JUN										
13...	0.070	0.040	0.020	23	0.40	48	19	6.5	1.4	4.0

DATE	SULFATE DISSOLVED (MG/L AS SO4) (00945)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SAMPLE PURPOSE CODE (71999)	SAMPLING METHOD, CODES (82398)	SEDIMENT, SUSPENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV										
09...	14	0.10	15	100	25	296	15.00	4010	17	86
MAR										
02...	19	0.20	26	340	250	432	15.00	10	6	96
22...	10	0.10	6.9	100	46	139	15.00	10	6	98
MAY										
09...	18	0.10	4.3	76	12	271	15.00	10	17	98
JUN										
13...	13	0.10	7.0	73	30	258	15.00	10	11	100

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LAKE OF THE WOODS BASIN

05124480 KAWISHIWI RIVER NEAR ELY, MN
(Hydrologic Bench-mark Station)

LOCATION.--Lat 47°55'22", long 91°32'06", in SE¼SE¼ sec.24, T.63 N., R.10 W., Lake County, Hydrologic Unit 09030001, in Superior National Forest, on left bank upstream from rapids, 2 mi upstream from South Kawishiwi River, 2.2 mi southwest of Fernberg Lookout Tower and 14 mi east of Ely.

DRAINAGE AREA.--253 mi².

PERIOD OF RECORD.--June 1966 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,450 ft above sea level, from topographic map.

REMARKS.--Records good.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	105	98	91	90	73	57	77	220	357	126	86	36
2	103	98	91	89	72	56	77	227	349	120	82	35
3	100	97	91	87	72	56	78	237	339	126	78	34
4	99	95	91	86	71	55	80	247	330	135	76	34
5	96	93	91	86	69	54	78	262	321	152	73	35
6	93	91	92	86	69	54	78	270	312	169	70	35
7	96	88	93	84	68	54	79	280	303	176	68	35
8	95	88	93	83	66	54	79	289	291	180	66	33
9	95	85	94	82	65	54	79	305	282	183	63	32
10	94	84	94	82	66	54	77	317	272	184	59	30
11	90	84	94	82	65	54	77	328	262	185	56	29
12	89	83	94	82	64	55	88	334	252	181	53	28
13	86	86	94	83	64	59	97	343	241	182	52	27
14	83	89	94	83	63	62	101	356	233	182	50	27
15	81	88	94	83	65	63	104	359	224	180	47	27
16	79	86	94	82	65	64	106	375	214	170	46	28
17	79	85	94	80	65	64	110	382	205	163	45	27
18	89	86	95	82	64	64	115	383	196	155	43	26
19	96	86	94	81	64	64	124	388	186	149	52	27
20	98	85	93	79	63	71	130	391	178	146	49	27
21	98	89	93	79	62	73	136	394	169	139	46	26
22	99	90	93	79	62	73	144	397	164	135	43	25
23	102	90	92	79	61	73	152	400	172	129	41	25
24	104	88	91	79	60	73	162	400	164	123	40	24
25	107	88	91	78	60	73	171	396	155	119	44	24
26	108	88	90	77	59	73	180	391	146	112	46	23
27	107	86	90	76	59	72	191	387	139	107	44	23
28	108	90	90	76	57	72	199	386	138	102	43	23
29	105	91	90	75	---	72	206	379	136	94	41	22
30	101	91	90	75	---	72	212	371	133	90	40	33
31	99	---	90	74	---	73	---	363	---	90	38	---
TOTAL	2984	2666	2861	2519	1813	1967	3587	10557	6863	4484	1680	860
MEAN	96.3	88.9	92.3	81.3	64.7	63.5	120	341	229	145	54.2	28.7
MAX	108	98	95	90	73	73	212	400	357	185	86	36
MIN	79	83	90	74	57	54	77	220	133	90	38	22
AC-FT	5920	5290	5670	5000	3600	3900	7110	20940	13610	8890	3330	1710
CFSM	.38	.35	.36	.32	.26	.25	.47	1.35	.90	.57	.21	.11
IN.	.44	.39	.42	.37	.27	.29	.53	1.55	1.01	.66	.25	.13

LAKE OF THE WOODS BASIN

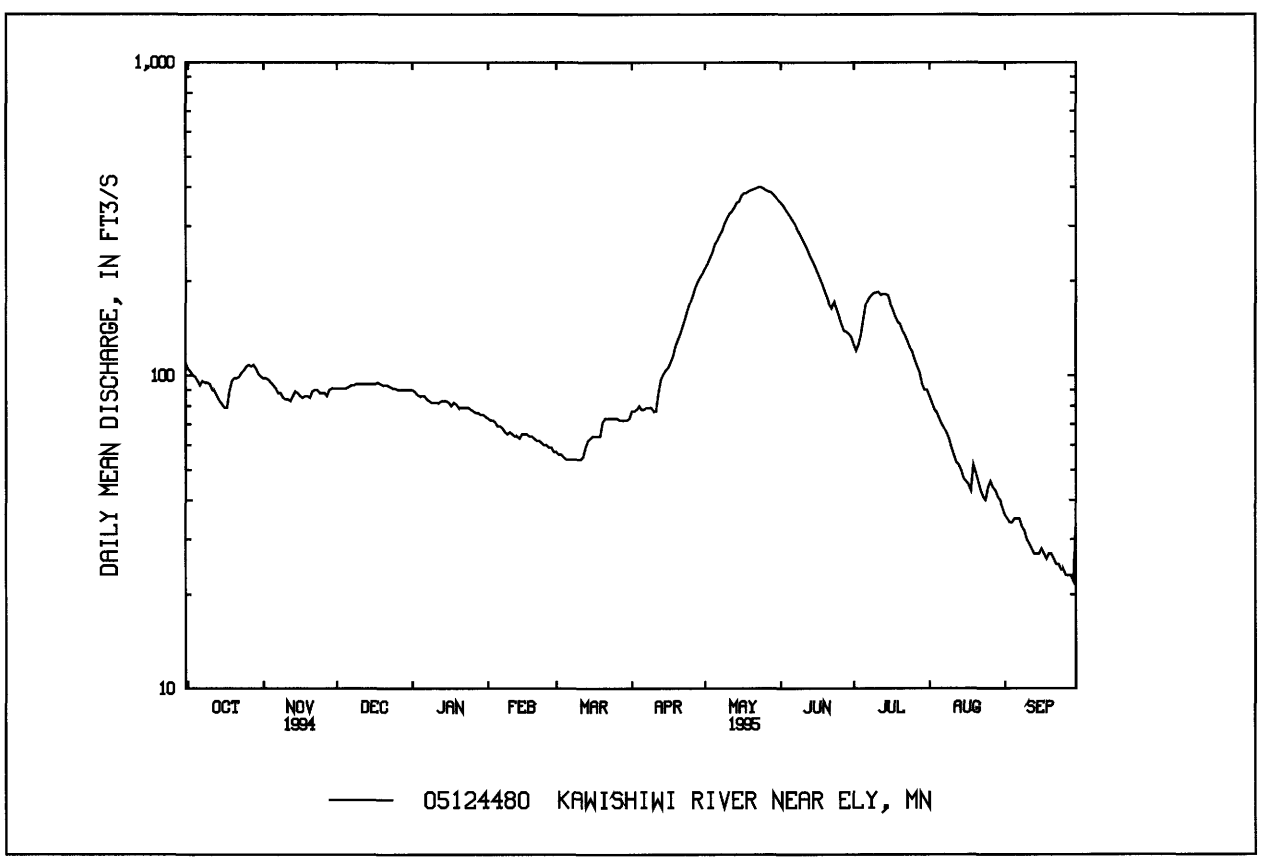
05124480 KAWISHIWI RIVER NEAR ELY, MN--Continued
(Hydrologic bench-mark station)

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	156	165	133	91.6	67.5	56.2	236	656	390	203	144	144
MAX	881	684	345	163	107	85.2	785	1133	1069	467	758	698
(WY)	1978	1971	1983	1984	1971	1969	1976	1979	1970	1968	1988	1988
MIN	12.1	9.43	7.25	5.32	4.77	5.87	8.95	13.3	115	74.5	46.7	18.5
(WY)	1977	1977	1977	1977	1977	1977	1977	1977	1977	1980	1976	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1966 - 1995	
ANNUAL TOTAL	80704		42841			
ANNUAL MEAN	221		117		205	
HIGHEST ANNUAL MEAN					313	1971
LOWEST ANNUAL MEAN					94.5	1977
HIGHEST DAILY MEAN	1010	Jun 20	400	May 23,24	1710	Apr 24 1976
LOWEST DAILY MEAN	42	Mar 17	22	Sep 29	4.5a	Jan 31 1977
ANNUAL SEVEN-DAY MINIMUM	43	Mar 14	23	Sep 23	4.6	Jan 29 1977
INSTANTANEOUS PEAK FLOW			400	May 22	1720	Apr 24 1976
INSTANTANEOUS PEAK STAGE			4.29	May 22	5.92	Apr 24 1976
INSTANTANEOUS LOW FLOW			22	Sep 28,29	4.5b	Jan 30 1977
ANNUAL RUNOFF (AC-FT)	160100		84980		148200	
ANNUAL RUNOFF (CFSM).	87		.46		.81	
ANNUAL RUNOFF (INCHES)	11.87		6.30		10.99	
10 PERCENT EXCEEDS	671		265		519	
50 PERCENT EXCEEDS	94		88		105	
90 PERCENT EXCEEDS	50		43		38	

a Occurred Jan 31 to Feb 2, 1977.
b Occurred Jan 30 to Feb 2, 1977.



LAKE OF THE WOODS BASIN

05124480 KAWISHIWI RIVER NEAR ELY, MN--Continued
(Hydrologic bench-mark station)

WATER QUALITY RECORDS

PERIOD OF RECORD.--Water years 1966 to current year.

REMARKS.--Letter E indicates estimated value, letter K indicates non-ideal colony count.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	TUR-BID-ITY (NTU) (00076)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)
NOV											
01...	1200	98	29	31	7.5	6.8	6.0	6.0	1.2	717	10.6
FEB											
02...	1030	72	32	35	6.8	7.4	0.5	-4.0	0.80	720	9.8
MAY											
09...	1345	317	30	33	7.2	7.5	9.0	7.0	0.80	718	10.0
JUL											
18...	1220	153	E37	32	E6.8	7.5	21.0	23.0	1.1	720	6.0

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
NOV										
01...	K2	170	2.9	1.3	1.0	0.30	11	11	0	13
FEB										
02...	K1	<38	3.0	1.4	1.0	0.30	10	12	0	12
MAY										
09...	K3	170	2.8	1.3	0.90	0.30	12	11	0	15
JUL										
18...	K4	K1500	2.9	1.4	1.0	0.30	13	11	0	15

DATE	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)
NOV										
01...	1.8	0.30	<0.10	2.7	39	<0.010	<0.050	0.017	0.28	<0.010
FEB										
02...	1.8	0.30	<0.10	3.2	40	<0.010	0.060	0.020	0.30	<0.010
MAY										
09...	1.4	0.20	0.10	3.1	35	<0.010	<0.050	<0.015	0.40	0.010
JUL										
18...	1.8	0.30	<0.10	2.7	32	<0.010	<0.050	0.020	0.40	<0.010

LAKE OF THE WOODS BASIN

05124480 KAWISHIWI RIVER NEAR ELY, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)
NOV										
01...	0.013	<0.010	6	65	30	3	<3	210	<4	2
FEB										
02...	<0.010	<0.010	2	93	40	3	<3	190	<4	5
MAY										
09...	0.020	<0.010	2	95	20	3	<3	160	<4	2
JUL										
18...	<0.010	<0.010	3	71	20	3	3	140	<4	2

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L) (09511)	RA-226 2 SIGMA WATER, DISS, (PCI/L) (76001)	URANIUM NATURAL DIS-SOLVED (UG/L AS U) (22703)	URANIUM NATURAL 2 SIGMA WATER, DISS, (UG/L) (75990)
NOV										
01...	<10	1	<1	<1.0	12	<6	0.05	0.020	<0.01	<1.0
FEB										
02...	<10	2	<1	<1.0	11	<6	--	--	--	--
MAY										
09...	20	1	<1	<1.0	11	<6	--	--	<0.01	0.0
JUL										
18...	<10	<1	<1	<1.0	12	<6	--	--	--	--

LAKE OF THE WOODS BASIN

05127000 KAWISHIWI RIVER NEAR WINTON, MN

LOCATION.--Lat 47°56'05", long 91°45'50", in NE¼NW¼ sec.20, T.63 N., R.11 W., Lake County, Hydrologic Unit 09030001, Superior National Forest, at powerplant of Minnesota Power Co., just upstream from Fall Lake, and 1.8 mi east of Winton.

DRAINAGE AREA.--1,229 mi².

PERIOD OF RECORD.--June 1905 to June 1907, October 1912 to September 1919 (fragmentary), September 1923 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WDR MN-77-1: Drainage area.

REMARKS.--No estimated daily discharges. Records good. Daily discharge computed from powerplant records. Flow regulated by powerplant and by Camp Six, Bald Eagle, Gabbro, Little Gabbro, Birch, White Iron, South Farm, and Garden Lakes.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	875	689	761	574	438	389	784	270	1150	114	485	437
2	858	645	669	522	438	376	762	263	1150	113	639	434
3	829	696	657	515	438	370	639	271	1150	339	881	483
4	685	876	561	462	438	364	361	333	1150	440	878	762
5	599	881	501	359	438	346	290	355	1150	718	812	598
6	617	881	540	338	441	347	265	437	1150	877	229	676
7	695	842	562	290	409	346	276	440	1220	876	291	746
8	833	533	550	350	393	346	275	492	1210	1040	190	747
9	696	497	565	350	378	342	302	897	1140	1370	283	632
10	608	638	558	350	369	321	285	1140	1140	1370	284	602
11	591	570	593	362	353	321	140	1140	1140	1610	86	663
12	639	627	543	445	341	321	167	1140	1140	1790	245	557
13	671	415	506	442	321	387	298	1140	1140	1950	247	691
14	643	705	585	450	316	439	418	1720	1010	2140	306	691
15	625	585	533	442	305	439	465	2080	887	2110	90	691
16	522	567	547	442	321	442	465	2080	827	2090	90	692
17	658	552	537	442	321	461	465	2080	675	2090	90	692
18	877	516	519	440	313	461	259	1960	656	2100	90	692
19	877	420	559	438	272	461	87	1830	863	1820	632	692
20	877	464	551	438	219	701	.00	1840	938	1370	566	686
21	877	508	488	438	302	877	.00	1840	416	1370	233	667
22	877	602	481	438	579	877	.00	1840	253	1370	114	517
23	877	556	485	438	715	877	.00	1840	490	1370	113	230
24	770	545	457	438	494	877	142	1840	569	1290	113	231
25	691	464	423	438	441	877	269	1840	497	1130	513	549
26	728	463	497	438	428	877	275	1840	486	1140	743	692
27	877	463	539	438	394	877	329	1840	526	1120	455	372
28	877	466	472	438	394	877	436	1840	282	1010	351	273
29	877	664	511	438	---	877	436	1840	329	703	287	125
30	833	877	507	438	---	847	324	1840	312	704	445	556
31	685	---	520	438	---	784	---	1420	---	726	307	---
TOTAL	23244	18207	16777	13269	11009	17504	9214.00	41728	25046	38260	11088	17076
MEAN	750	607	541	428	393	565	307	1346	835	1234	358	569
MAX	877	881	761	574	715	877	784	2080	1220	2140	881	762
MIN	522	415	423	290	219	321	.00	263	253	113	86	125
+	-29.2	2.15	-123	-131	0	-147	239	190	-14.0	-3.12	-23.9	20.4
MEAN ‡	721	609	418	297	292	418	546	1536	821	1231	334	590
CFSM ‡	.59	.50	.34	.24	.32	.34	.44	1.25	.67	1.00	.27	.47
IN. ‡	.68	.56	.39	.28	.33	.39	.49	1.44	.75	1.15	.31	.54

CAL YR 1994 TOTAL 425212.00 MEAN 1165 MAX 6080 MIN .00 MEAN‡ 1166 CFSM‡ .94 IN‡ 12.88
WTR YR 1995 TOTAL 242422.00 MEAN 664 MAX 2140 MIN .00 MEAN‡ 662 CFSM‡ .54 IN‡ 7.31

+ Change in contents, equivalent in cubic feet per second, in Camp Six, Bald Eagle, Gabbro, Little Gabbro, Birch, White Iron, Farm, South Farm, and Garden Lakes.

‡ Adjusted for change in reservoir contents.

LAKE OF THE WOODS BASIN

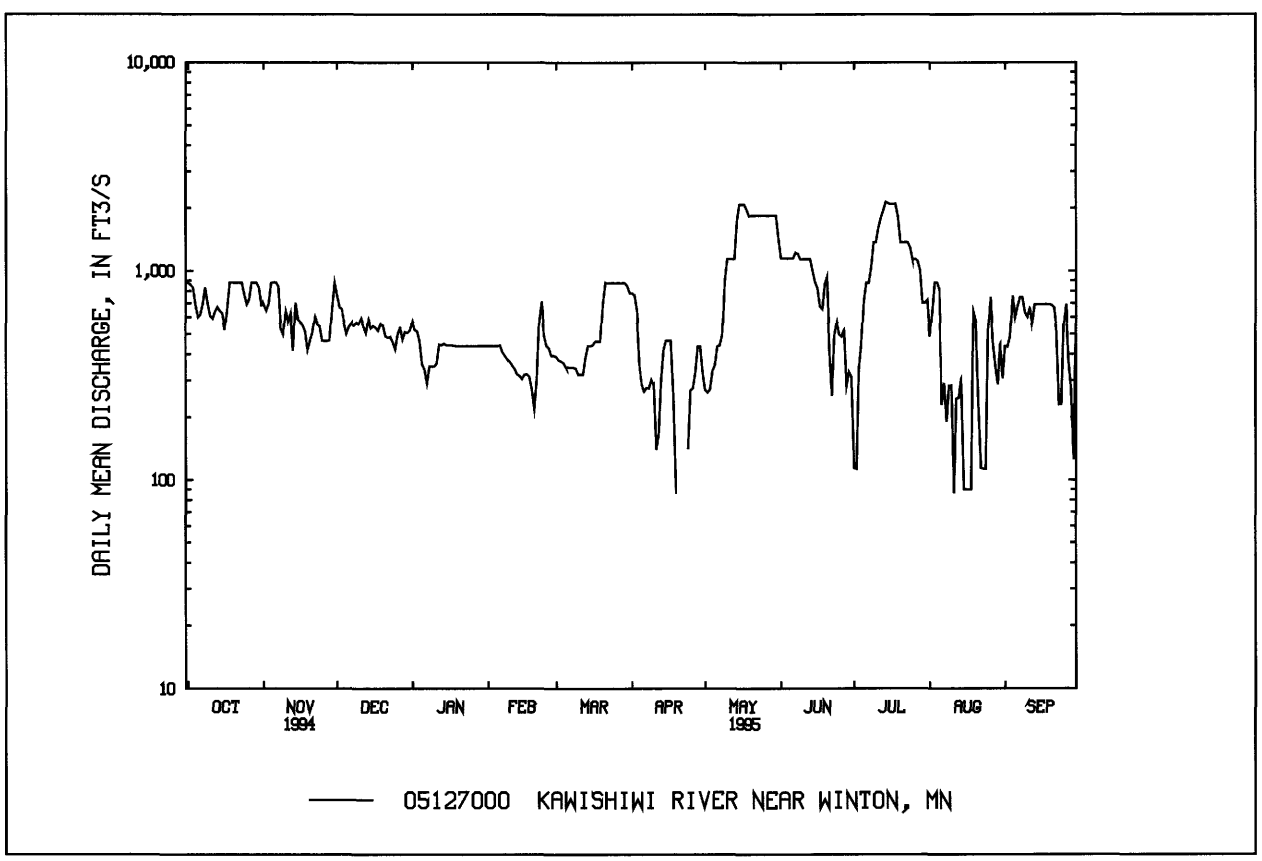
05127000 KAWISHIWI RIVER NEAR WINTON, MN

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1905 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	891	744	586	449	344	373	1173	3098	1954	1149	692	753
MAX	4277	3572	1422	862	770	844	5020	9278	5661	2748	3775	3149
(WY)	1947	1971	1983	1978	1927	1945	1945	1950	1968	1944	1988	1928
MIN	66.5	8.97	76.1	80.3	74.5	103	19.3	111	519	217	51.7	38.1
(WY)	1924	1924	1977	1977	1977	1924	1924	1924	1980	1961	1919	1919

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1905 - 1995	
ANNUAL TOTAL	425212.00		242422.00			
ANNUAL MEAN	1165		664		1028	
HIGHEST ANNUAL MEAN					1967	1950
LOWEST ANNUAL MEAN					240	1924
HIGHEST DAILY MEAN	6080	Jun 20	2140	Jul 14	16000	May 18 1950
LOWEST DAILY MEAN	.00	Feb 19	.00	Apr 20	.00[a]	Aug 24 1905
ANNUAL SEVEN-DAY MINIMUM	215	Sep 7	70	Apr 18	.00	Oct 13 1923
ANNUAL RUNOFF (AC-FT)	843400		480800		744500	
ANNUAL RUNOFF (CFSM)	.95		54		.84	
ANNUAL RUNOFF (INCHES)	12.87		7.34		11.36	
10 PERCENT EXCEEDS	2630		1170		2430	
50 PERCENT EXCEEDS	617		537		591	
90 PERCENT EXCEEDS	397		274		194	

a Many days, several years.



LAKE OF THE WOODS BASIN

05127500 BASSWOOD RIVER NEAR WINTON, MN
(International Gaging Station)

LOCATION.--Lat 48°04'57", long 91°39'09", in SE¼SE¼ sec.30, T.65 N., R.10 W., Lake County, Hydrologic Unit 09030001, in Superior National Forest, on island in Jackfish Bay of Basswood Lake, used to determine discharge at outlet [lat 48°06'21", long 91°38'51", in sec.19, T.65 N., R.10 W., on international boundary 14 mi northeast of Winton].

DRAINAGE AREA.--1,740 mi², approximately (above outlet of Basswood Lake).

PERIOD OF RECORD.--March to June 1924, September 1925 to March 1928, January 1930 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 955: Drainage area. WSP 1145: 1935, 1937.

GAGE.--Water-stage recorder. Datum of gage is 1,296.80 ft above sea level, 1928 datum, (levels by Geodetic Survey of Canada). Prior to Oct. 27, 1938, nonrecording gages at several sites in vicinity of gage, at datum 3.0 ft higher. Oct. 28, 1938, to Sept. 30, 1966, water-stage recorder at datum 3.0 ft higher.

REMARKS.--Records good. Satellite telemeter at station. Some regulation by powerplant on Kawishiwi River at Winton, and by many lakes located upstream from station.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1140	1150	893	802	637	552	899	883	2160	791	1160	464
2	1140	1130	900	794	637	552	921	892	2110	763	1100	451
3	1140	1120	911	793	634	547	932	907	2060	772	1070	448
4	1130	1110	914	787	634	540	947	943	2000	776	1060	446
5	1120	1100	912	781	634	543	944	979	1950	817	1040	454
6	1120	1090	909	759	632	544	929	1010	1910	840	1010	474
7	1120	1110	903	744	624	544	906	1030	1920	848	974	477
8	1120	1100	906	732	625	544	879	1060	1870	862	928	475
9	1100	1090	918	708	623	544	854	1110	1830	882	873	478
10	1100	1080	910	703	629	538	829	1160	1780	903	810	482
11	1090	1060	910	698	628	536	809	1210	1730	949	762	484
12	1070	1040	903	692	623	531	845	1290	1680	997	731	484
13	1060	1050	898	693	617	537	861	1380	1600	1110	705	487
14	1040	1040	895	694	610	539	855	1470	1590	1230	654	501
15	1020	1040	889	693	616	544	850	1550	1520	1330	614	513
16	1010	1030	890	691	617	550	849	1650	1470	1410	588	539
17	1000	1010	880	687	617	558	847	1710	1400	1480	562	548
18	1080	1000	879	688	612	566	851	1760	1340	1530	542	555
19	1090	999	878	679	603	568	857	1810	1280	1580	596	576
20	1110	988	872	673	601	608	852	1860	1230	1580	560	576
21	1120	982	871	675	598	636	849	1950	1170	1580	533	580
22	1140	975	860	671	582	662	846	2010	1110	1560	529	571
23	1170	971	854	668	571	689	852	2050	1060	1540	520	570
24	1180	951	844	660	568	721	856	2130	995	1520	515	561
25	1180	939	840	659	566	747	854	2200	964	1500	510	544
26	1190	941	830	656	561	777	850	2230	917	1470	502	530
27	1180	944	819	653	556	804	850	2240	884	1440	500	528
28	1170	906	812	645	554	821	847	2240	882	1360	496	530
29	1160	894	811	643	---	848	850	2220	868	1300	498	525
30	1150	889	809	641	---	865	863	2220	836	1250	488	631
31	1160	---	806	632	---	885	---	2200	---	1190	468	---
TOTAL	34600	30729	27126	21694	17009	19440	26033	49354	44116	37160	21898	15482
MEAN	1116	1024	875	700	607	627	868	1592	1471	1199	706	516
MAX	1190	1150	918	802	637	885	947	2240	2160	1580	1160	631
MIN	1000	889	806	632	554	531	809	883	836	763	468	446
AC-FT	68630	60950	53800	43030	33740	38560	51640	97890	87500	73710	43430	30710
CFSM	.64	.59	.50	.40	.35	.36	.50	.91	.85	.69	.41	.30
IN.	.74	.66	.58	.46	.36	.42	.56	1.06	.94	.79	.47	.33

LAKE OF THE WOODS BASIN

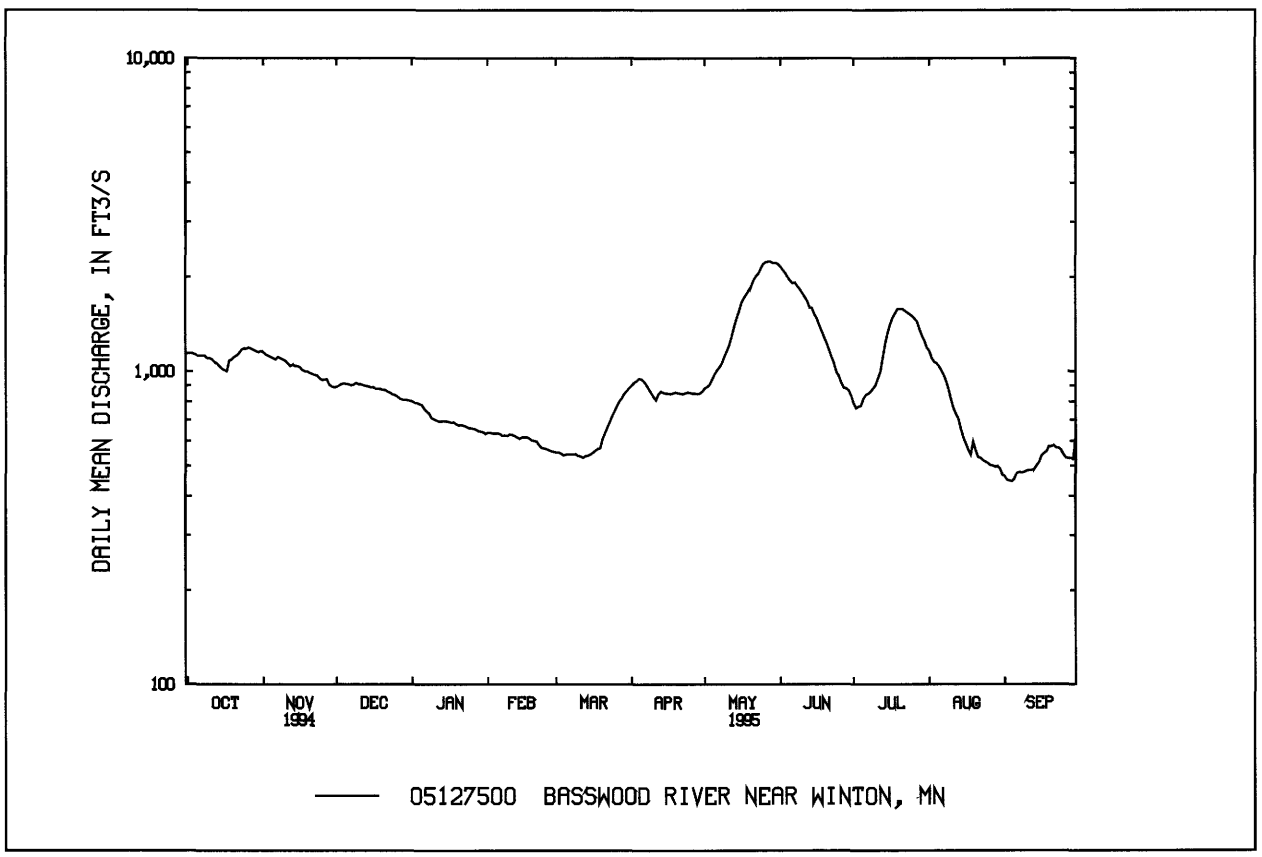
05127500 BASSWOOD RIVER NEAR WINTON, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1092	1001	862	718	592	566	1198	3725	2892	1824	1114	1006
MAX	5320	3879	2510	1475	1229	1143	5069	9114	7332	4453	3487	5034
(WY)	1978	1971	1983	1966	1966	1966	1945	1950	1950	1944	1944	1988
MIN	65.1	60.2	76.2	86.2	95.0	135	269	225	696	512	323	120
(WY)	1977	1977	1977	1977	1977	1977	1977	1977	1980	1980	1980	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1931 - 1995	
ANNUAL TOTAL	620776		344641			
ANNUAL MEAN	1701		944		1392	
HIGHEST ANNUAL MEAN					2643	1950
LOWEST ANNUAL MEAN5					57	1958
HIGHEST DAILY MEAN	5760	Jun 27	2240	May 27,28	15200	May 24 1950
LOWEST DAILY MEAN	536	Mar 12	446	Sep 4	58	Nov 3 1976
ANNUAL SEVEN-DAY MINIMUM	537	Mar 10	458	Aug 31	58	Nov 24 1950
INSTANTANEOUS PEAK STAGE			4.38	May 28	9.94a	May 24 1950
INSTANTANEOUS LOW FLOW			441	Sep 3	55	Nov 18 1976
ANNUAL RUNOFF (AC-FT)	1231000		683600		1009000	
ANNUAL RUNOFF (CFSM).	98		.54		.80	
ANNUAL RUNOFF (INCHES)	13.27		7.37		10.86	
10 PERCENT EXCEEDS	4070		1530		3240	
50 PERCENT EXCEEDS	1040		868		858	
90 PERCENT EXCEEDS	600		540		380	

a Present datum.



LAKE OF THE WOODS BASIN

05128000 NAMAKAN RIVER AT OUTLET OF LAC LA CROIX, ONTARIO
(International Gaging Station)

LOCATION.--Lat 48°21'14", long 92°13'01", at Campbell's Camp, on Lac La Croix Lake, used to determine discharge at outlet [Lat 48°23'00", long 92°10'40", 2.5 mi east of Campbell's Camp].

DRAINAGE AREA.--5,170 mi².

PERIOD OF RECORD.--September 1921 to January 1922, April 1922 to current year, in reports of Geological Survey. Monthly discharge only for some periods, published in WSP 1308. August 1921 to current year, in reports of Water Survey of Canada.

GAGE.--Water-stage recorder. Gage readings have been reduced to elevations, United States and Canada Boundary Survey datum. Prior to October 1933, nonrecording gages at various sites on Lac la Croix. October 1933 to Mar. 13, 1963, nonrecording gage at present site and datum.

REMARKS.--Records good. Satellite telemeter at station.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2850	2890	2690	2250	1880	1680	1850	2730	4800	3420	e2660	1740
2	2830	2890	2670	2230	1870	1660	1870	2750	4840	3370	e2630	1700
3	2800	2870	2660	e2210	1850	1650	1880	2770	4870	3330	e2600	1660
4	2770	2880	2630	e2200	1830	1650	1900	2800	4910	3280	e2560	1620
5	2740	2880	2620	2180	1830	1640	1930	2830	4910	3330	e2540	1620
6	2740	2850	2620	2160	1830	1640	1930	2890	4910	3270	e2500	1610
7	2720	2880	2610	2150	1810	1640	1930	2950	4980	3250	e2470	1580
8	2710	2850	2590	2130	1800	1630	1970	2980	4940	3230	e2440	1540
9	2690	2860	2590	2120	1790	1620	2000	3060	4910	3170	e2400	1510
10	2700	2880	2580	e2110	1780	1610	2010	3130	4870	3110	2380	1480
11	2670	2840	2580	e2100	1790	1600	2020	3180	4800	3080	2350	1450
12	2660	2840	2580	e2090	1790	1600	2100	3260	4730	3020	2330	1410
13	2650	2870	2550	e2090	1780	1610	2160	3340	4700	3010	2320	1380
14	2620	2810	2510	e2080	1770	1620	2210	3370	4660	2980	2190	1380
15	2600	2850	2500	e2070	1770	1630	2230	3480	4590	2950	2180	1350
16	2590	2850	2490	e2060	1770	1640	2260	3530	4520	2890	2170	1290
17	2580	2830	2460	e2060	1780	1640	2290	3600	4450	2880	2140	1280
18	2630	2810	2450	2050	1770	1640	2320	3670	4380	2870	2130	1270
19	2630	2810	2430	2040	1760	1640	2350	3740	4310	2860	2200	1280
20	2660	2830	2420	2020	1750	1670	2380	3740	4240	2810	2140	1260
21	2670	2800	2410	2010	1740	1690	2410	3960	4170	2820	2090	1240
22	2690	2780	2380	2000	1730	1710	2430	4060	4100	2770	2080	1220
23	2650	2820	2370	2000	1720	1720	2490	4130	3990	2780	2030	1210
24	2720	2760	2360	1980	1710	1730	2540	4240	3880	2760	2030	1200
25	2790	2760	2340	1970	1710	1740	2570	4340	3850	2760	1970	1180
26	2840	2790	2320	1960	1710	1750	2590	4450	3780	2770	1930	1170
27	2860	2800	2310	1950	1690	1770	2630	4520	3710	2770	1900	1170
28	2870	2740	2300	1930	1690	1780	2650	4590	3640	2670	1850	1160
29	2790	2720	2290	1920	---	1800	2680	4630	3570	2690	1840	1170
30	2810	2710	2280	1910	---	1810	2710	4700	3480	2720	1790	1290
31	2860	---	2270	1890	---	1830	---	4770	---	e2690	1740	---
TOTAL	84390	84750	76860	63920	49700	52040	67290	112190	132490	92310	68580	41420
MEAN	2722	2825	2479	2062	1775	1679	2243	3619	4416	2978	2212	1381
MAX	2870	2890	2690	2250	1880	1830	2710	4770	4980	3420	2660	1740
MIN	2580	2710	2270	1890	1690	1600	1850	2730	3480	2670	1740	1160
AC-FT1	67400	168100	152500	126800	98580	103200	133500	222500	262800	183100	136000	82160
CFSM	.53	.55	.48	.40	.34	.32	.43	.70	.85	.58	.43	.27
IN.	.61	.61	.55	.46	.36	.37	.48	.81	.95	.66	.49	.30

e Estimated.

LAKE OF THE WOODS BASIN

05128000 NAMAKAN RIVER AT OUTLET OF LAC LA CROIX, ONTARIO--Continued

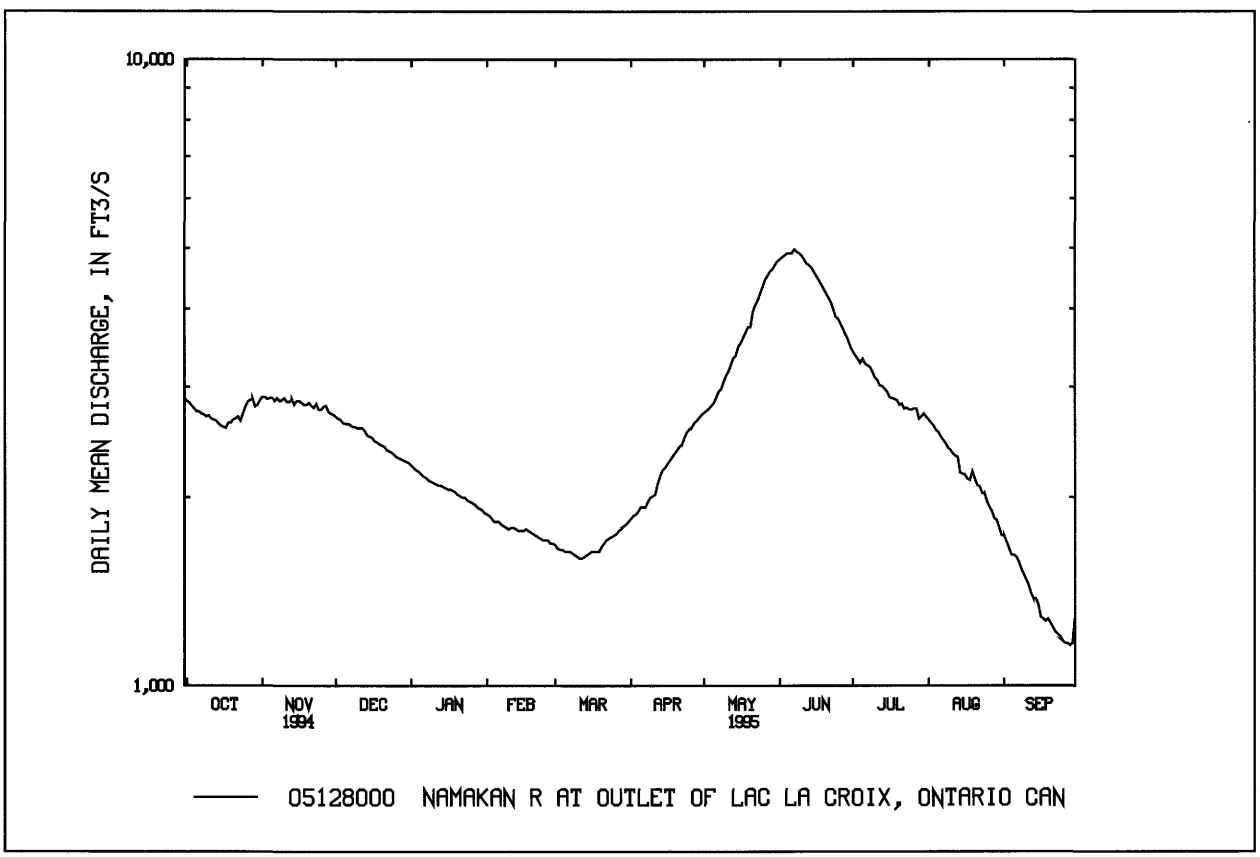
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3085	2884	2563	2170	1873	1662	2537	7636	8006	6137	4038	3186
MAX	14200	10610	7189	4568	3432	2996	9071	16900	22120	15930	11200	13140
(WY)	1978	1978	1972	1978	1966	1966	1945	1938	1950	1968	1944	1988
MIN	835	624	567	547	540	535	614	899	1475	1263	1141	1223
(WY)	1977	1977	1977	1977	1924	1924	1977	1977	1924	1924	1980	1933

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1921 - 1995	
ANNUAL TOTAL	1686110		925940			
ANNUAL MEAN	4619		2537		3833	
HIGHEST ANNUAL MEAN					7270	1950
LOWEST ANNUAL MEAN					964	1924
HIGHEST DAILY MEAN	12700	Jul 3	4980	Jun 7	28200	May 31 1950
LOWEST DAILY MEAN	1540	Mar 26	1160	Sep 28	535	Feb 4 1924
ANNUAL SEVEN-DAY MINIMUM	1540	Mar 26	1180	Sep 23	535	Feb 4 1924
INSTANTANEOUS PEAK FLOW			5050	Jun 7	28200a	May 31 1950
INSTANTANEOUS PEAK STAGE			1185.10	Jun 7	1193.30a	May 31 1950
INSTANTANEOUS LOW FLOW			1130	Sep 28	535b	Feb 1 1924
ANNUAL RUNOFF (AC-FT)	3344000		1837000		777000	
ANNUAL RUNOFF (CFSM)	.89		.49		.74	
ANNUAL RUNOFF (INCHES)	12.13		6.66		10.07	
10 PERCENT EXCEEDS	10600		3810		8340	
50 PERCENT EXCEEDS	2830		2490		2650	
90 PERCENT EXCEEDS	1660		1640		1180	

a Occurred May 31 to June 2, 1950.

b Occurred at times in Feb, Mar, and Apr, 1924.



LAKE OF THE WOODS BASIN

05129115 VERMILION RIVER NEAR CRANE LAKE, MN

LOCATION.--Lat 48°15'53", long 92°33'57", in NE¼NE¼ sec. 30, T.67 N., R.17 W., St. Louis County, Hydrologic Unit 09030002, in Superior National Forest, on left bank 350 ft downstream from bridge on Forest Route 491, 3.5 mi upstream from mouth, and 3.5 mi west of city of Crane Lake.

PERIOD OF RECORD.--August 1979 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,180 ft above sea level, from topographic map.

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 1979 reached a stage of 15.15 ft, from high-water mark, discharge, about 4,600 ft³/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	734	690	547	337	287	e220	726	729	665	229	222	158
2	709	695	539	328	281	e220	687	719	636	215	215	159
3	688	671	530	320	277	e220	654	711	623	221	206	160
4	667	649	526	315	273	e220	609	722	612	234	197	157
5	644	634	514	e315	260	e215	575	798	586	294	193	155
6	627	618	508	e315	247	e215	555	847	560	421	191	162
7	624	605	510	318	245	e215	547	844	550	483	190	173
8	623	599	486	315	239	e215	540	831	553	479	185	176
9	613	581	477	304	247	e215	529	834	536	455	181	171
10	611	567	470	301	264	219	518	912	511	443	169	169
11	609	567	453	309	259	223	499	953	489	414	151	166
12	595	558	448	311	246	240	522	949	459	386	141	163
13	569	575	441	314	240	e300	579	929	433	365	135	154
14	559	586	429	319	234	e500	713	941	412	373	139	144
15	542	582	427	323	239	e680	813	936	404	397	125	142
16	533	583	426	327	250	e840	865	932	395	405	116	159
17	528	594	418	332	259	e920	870	924	390	395	110	156
18	591	637	411	340	263	e930	849	911	359	382	110	153
19	710	682	405	333	266	e920	827	893	335	359	170	160
20	766	697	399	328	265	e900	805	883	313	350	156	157
21	786	720	394	324	265	e860	788	865	298	335	143	155
22	789	675	389	323	260	e840	766	866	290	330	137	154
23	798	658	381	315	256	841	767	858	282	327	147	152
24	788	657	372	307	251	839	802	841	264	317	140	151
25	782	636	366	301	243	834	813	837	254	305	148	148
26	786	607	360	300	235	832	805	837	256	292	151	144
27	791	607	356	299	e224	837	787	819	242	285	151	140
28	787	596	352	300	e220	849	774	789	235	280	153	138
29	778	575	347	300	---	851	752	757	255	258	151	143
30	746	557	346	296	---	821	739	729	244	252	158	221
31	710	---	341	289	---	774	---	697	---	237	159	---
TOTAL	21083	18658	13368	9758	7095	17805	21075	26093	12441	10518	4940	4740
MEAN	680	622	431	315	253	574	702	842	415	339	159	158
MAX	798	720	547	340	287	930	870	953	665	483	222	221
MIN	528	557	341	289	220	215	499	697	235	215	110	138
AC-FT	41820	37010	26520	19350	14070	35320	41800	51760	24680	20860	9800	9400

e Estimated.

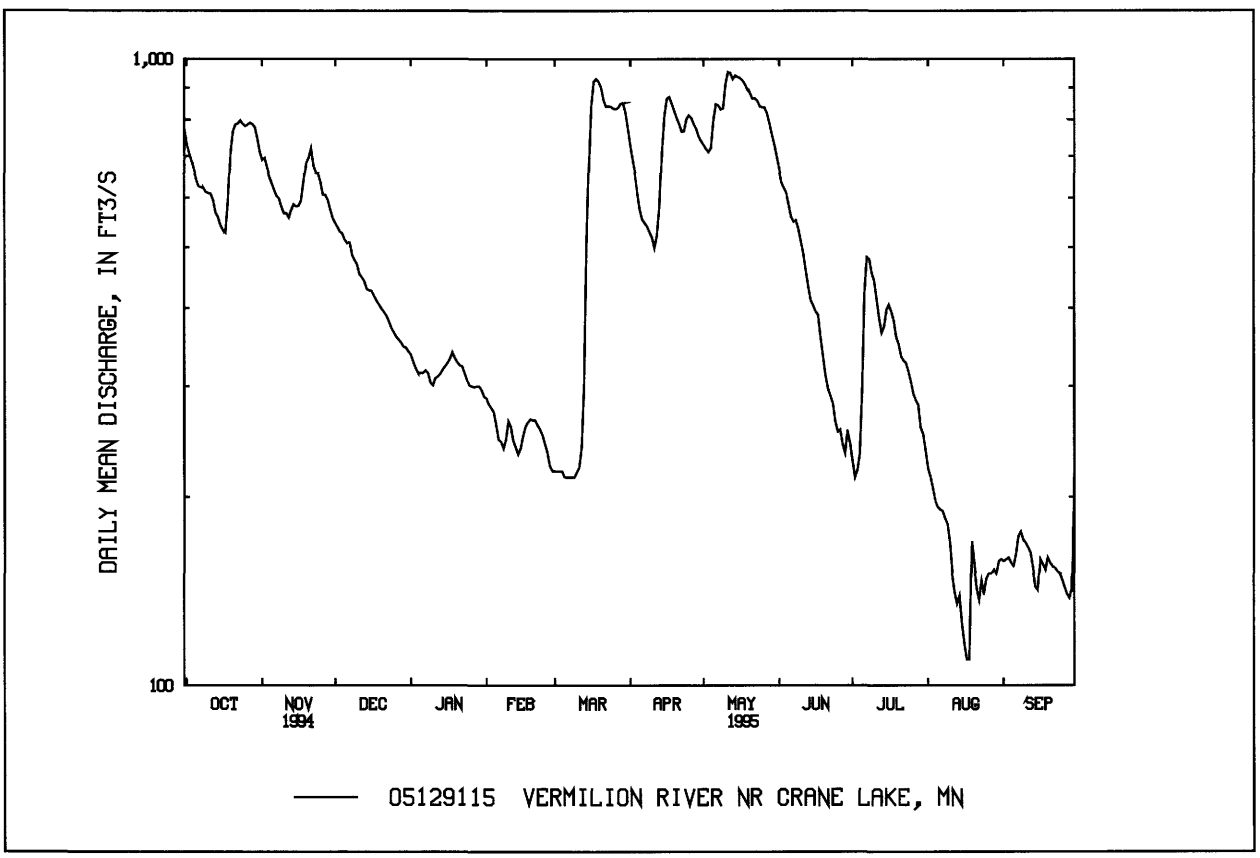
LAKE OF THE WOODS BASIN

05129115 VERMILION RIVER NEAR CRANE LAKE, MN

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1979 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	569	509	403	284	234	289	1092	1369	972	816	508	518
MAX	1175	1138	872	460	368	574	1641	2249	1840	1609	1612	1880
(WY)	1986	1983	1983	1984	1984	1995	1986	1982	1985	1985	1988	1988
MIN	181	152	116	97.8	94.1	89.5	627	507	205	113	60.0	103
(WY)	1980	1988	1988	1988	1988	1988	1987	1980	1980	1980	1980	1984

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1979 - 1995	
ANNUAL TOTAL	299170		167574			
ANNUAL MEAN	820		459		633	
HIGHEST ANNUAL MEAN					819	1994
LOWEST ANNUAL MEAN					326	1980
HIGHEST DAILY MEAN	2310	May 3	953	May 11	4300	Apr 25 1985
LOWEST DAILY MEAN	230	Feb 26	110	Aug 17,18	38	Aug 13 1980
ANNUAL SEVEN-DAY MINIMUM	231	Feb 25	125	Aug 12	40	Aug 10 1980
INSTANTANEOUS PEAK FLOW			968	May 11	4360	Apr 25 1985
INSTANTANEOUS PEAK STAGE			8.65	May 11	15.20	Apr 25 1985
INSTANTANEOUS LOW FLOW			103	Aug 18	38	Aug 13 1980
ANNUAL RUNOFF (AC-FT)	593400		332400		458900	
10 PERCENT EXCEEDS	1680		833		1420	
50 PERCENT EXCEEDS	634		397		428	
90 PERCENT EXCEEDS	250		158		163	



LAKE OF THE WOODS BASIN

05129400 RAINY LAKE NEAR FORT FRANCES, ONTARIO
(International Gaging Station)

LOCATION.--Lat 48°38'30", long 93°20'00", at Five Mile dock, approximately 5 mi northeast of city of Fort Frances.

PERIOD OF RECORD.--January 1910 to September 1917 and October 1934 to current year, in reports of Geological Survey. August 1911 to current year, in reports of Water Survey of Canada. Prior to October 1949, published as "at Ranier, Minn.", and as "at Fort Frances, Ontario" October 1949 to September 1964.

GAGE.--Water-stage recorder. Datum of gage is sea level (United States and Canadian Boundary Survey). January 1910 to December 1949, nonrecording gage 3 mi northeast at Ranier, Minn., at same datum. January 1950 to October 1964, water-stage recorder on Government dock at Pither's Point at Fort Frances, and supplementary gage in town pumping station, 0.5 mi south, used during winter months, at same datum.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation observed, 1,112.97 ft, July 5, 1950; minimum observed, 1,101.26 ft, Apr. 17, 1923, Apr. 2, 1930.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,107.89 ft, July 14; maximum daily elevation, 1,107.84 ft, July 14; minimum, 1,105.02 ft, Mar. 15, minimum daily, 1,105.03 ft, Mar. 16.

MONTHEND ELEVATION, IN SEA LEVEL, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

Oct. 31 ..... 1107.29	Feb. 28 ..... 1105.35	June 30 ..... 1107.48
Nov. 30 ..... 1107.43	Mar. 31 ..... 1105.23	July 31 ..... 1107.43
Dec. 31 ..... 1106.85	Apr. 30 ..... 1105.63	Aug. 31 ..... 1107.54
Jan. 31 ..... 1105.85	May 31 ..... 1106.98	Sept. 30 ..... 1107.41

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

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LAKE OF THE WOODS BASIN

05130500 STURGEON RIVER NEAR CHISHOLM, MN

LOCATION.--Lat 47°40'25", long 92°54'00", in NE¼NW¼ sec.20, T.60 N., R.20 W., St. Louis County, Hydrologic Unit 09030005, on left bank 1,000 ft upstream from highway bridge, 0.6 mi downstream from East Branch Sturgeon River, and 11.5 mi north of Chisholm.

DRAINAGE AREA.--187 mi².

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

REVISED RECORDS.--WSP 1438: 1946.

GAGE.--Water-stage recorder. Datum of gage is 1,305.7 ft above sea level. Prior to Aug. 24, 1944, nonrecording gage at site 1,000 ft downstream at different datum. Aug. 25, 1944, to Sept. 30, 1975, at present site at datum 1.00 ft higher.

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

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

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Sept. 30	2400	*946a	*4.76a	(No other peaks greater than base discharge).			

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	184	183	e105	e48	e37	e27	154	168	147	31	69	73
2	175	177	e100	e47	e36	e27	144	167	139	29	62	65
3	167	173	e96	e46	e36	e27	134	171	133	35	58	62
4	162	169	e93	e45	e36	e27	112	173	123	40	54	57
5	157	166	e90	e45	e35	e27	e115	212	114	56	51	52
6	157	163	e87	e44	e35	e27	e110	233	109	85	49	62
7	162	161	e84	e44	e35	e27	e105	227	116	103	48	83
8	165	158	e82	e44	e34	e27	102	219	118	104	46	81
9	165	155	e79	e43	e34	e27	98	280	112	114	44	84
10	163	149	e77	e43	e32	e27	94	376	106	117	40	82
11	166	144	e76	e42	e31	e27	88	403	97	104	37	68
12	162	137	e75	e42	e30	e28	102	373	91	91	36	61
13	153	151	e73	e41	e29	e32	135	341	84	100	38	56
14	148	148	e71	e40	e28	e80	217	350	80	109	37	52
15	146	145	e70	e40	e28	e170	283	357	75	113	34	59
16	148	143	e68	e40	e28	e220	299	357	71	107	32	94
17	155	142	e66	e39	e28	e250	280	338	68	106	31	81
18	218	157	e64	e39	e28	e255	259	313	64	103	35	74
19	308	164	e63	e39	e28	e250	238	276	60	101	109	74
20	367	164	e62	e38	e28	e240	228	260	56	101	87	69
21	378	e160	e60	e38	e27	e235	226	250	57	144	83	63
22	350	e150	e59	e38	e27	e230	223	238	53	302	73	60
23	326	e145	e58	e38	e27	237	218	223	50	302	64	57
24	304	e145	e57	e38	e27	214	212	209	45	288	70	58
25	281	e145	e56	e38	e27	202	210	201	40	231	122	57
26	258	e135	e55	e38	e27	190	205	198	37	186	129	56
27	239	e125	e54	e38	e27	189	197	192	36	152	132	54
28	227	e120	e53	e38	e27	199	187	189	36	133	127	53
29	219	e115	e52	e38	---	196	182	183	37	107	111	55
30	207	e110	e50	e38	---	180	174	171	34	89	100	278
31	193	---	e49	e37	---	165	---	157	---	79	86	---
TOTAL	6610	4499	2184	1266	852	4059	5331	7805	2388	3762	2094	2180
MEAN	213	150	70.5	40.8	30.4	131	178	252	79.6	121	67.5	72.7
MAX	378	183	105	48	37	255	299	403	147	302	132	278
MIN	146	110	49	37	27	27	88	157	34	29	31	52
AC-FT	13110	8920	4330	2510	1690	8050	10570	15480	4740	7460	4150	4320
CFSM1	.14	.80	.38	.22	.16	.70	.95	1.35	.43	.65	.36	.39
IN.	1.31	.89	.43	.25	.17	.81	1.06	1.55	.48	.75	.42	.43

a Rising stage.
e Estimated.

LAKE OF THE WOODS BASIN

05130500 STURGEON RIVER NEAR CHISHOLM, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1995, BY WATER YEAR (WY)

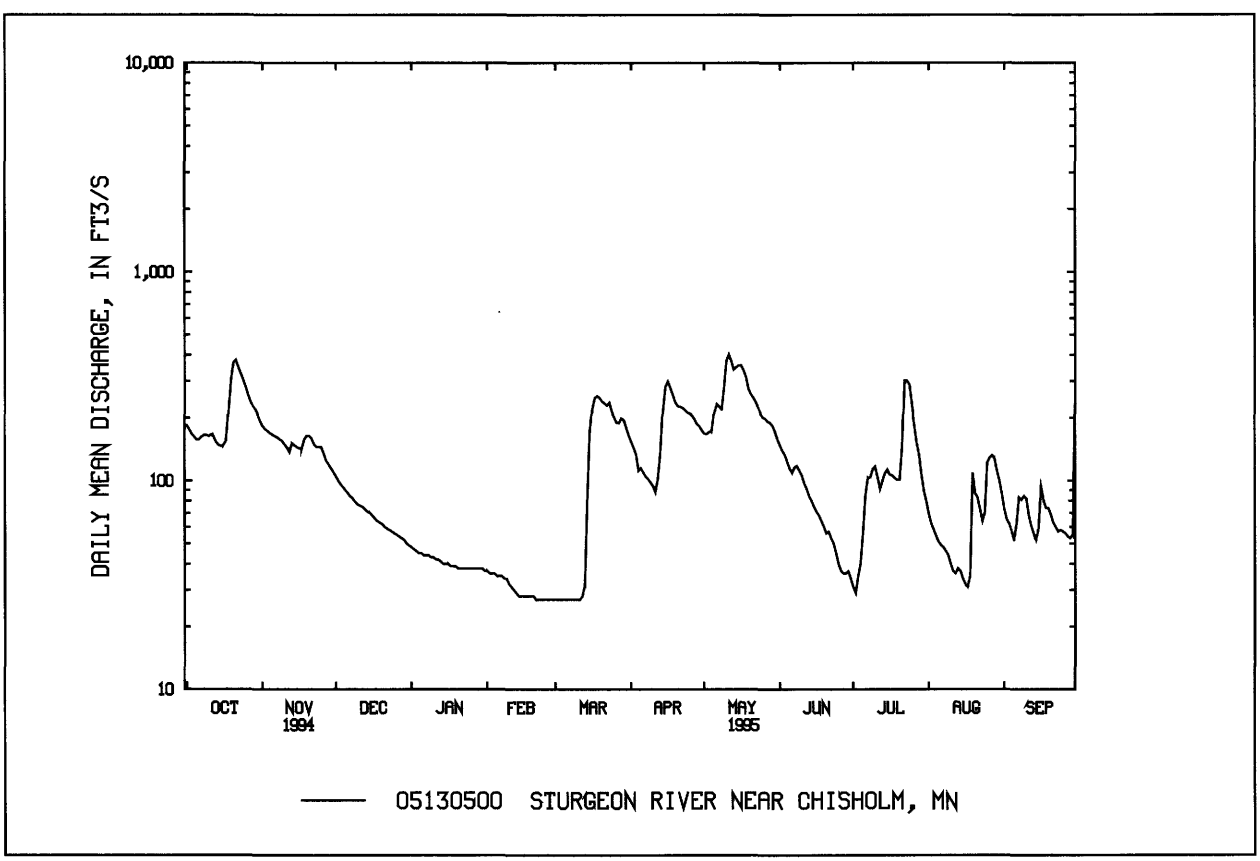
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	113	89.8	46.4	28.3	22.7	50.1	362	303	185	118	71.9	94.9
MAX	369	264	115	66.0	47.7	337	868	1451	528	623	268	424
(WY)	1974	1978	1978	1966	1984	1945	1948	1950	1944	1993	1988	1977
MIN	7.85	8.90	4.82	3.98	4.54	10.0	41.0	22.9	14.7	5.99	12.6	4.60
(WY)	1977	1977	1977	1977	1977	1957	1977	1977	1988	1988	1961	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1942 - 1995		
ANNUAL TOTAL	64960		43030				
ANNUAL MEAN	178		118		124		
HIGHEST ANNUAL MEAN					208		1950
LOWEST ANNUAL MEAN					63.1		1977
HIGHEST DAILY MEAN	1360	Jun 19	403	May 11	3530	May 8	1950
LOWEST DAILY MEAN	29	Feb 12	27	Feb 21	2.5	Jul 30	1988
ANNUAL SEVEN-DAY MINIMUM	29	Feb 12	27	Feb 21	3.0	Jul 24	1988
INSTANTANEOUS PEAK FLOW			946a	Sep 30	3630b	May 7	1950
INSTANTANEOUS PEAK STAGE			4.76	Sep 30	7.41c	May 7	1950
ANNUAL RUNOFF (AC-FT)	128800		85350		89820		
ANNUAL RUNOFF (CFSM).	95		.63		.66		
ANNUAL RUNOFF (INCHES)	12.92		8.56		9.01		
10 PERCENT EXCEEDS	356		237		294		
50 PERCENT EXCEEDS	145		94		57		
90 PERCENT EXCEEDS	34		33		17		

a Rising stage.

b From rating extended above 1600 ft^3/s, on basis of slope-area measurement of peak flow.

c Present datum.



LAKE OF THE WOODS BASIN

05131500 LITTLE FORK RIVER AT LITTLEFORK, MN

LOCATION.--Lat 48°23'45", long 93°32'57", in NE¼SE¼ sec.9, T.68 N., R.25 W., Koochiching County, Hydrologic Unit 09030005, on right bank at town of Littlefork, 0.9 mi upstream from bridge on State Highway 217, 2.8 mi upstream from Beaver Creek, and 19 mi upstream from mouth.

DRAINAGE AREA.--1,730 mi², approximately.

PERIOD OF RECORD.--June to November 1909, April to November 1910, April 1911 to June 1917, September 1917, October 1917 to March 1919 (gage heights only), June 1928 to current year.

REVISED RECORDS.--WSP 955: Drainage area. WSP 1508: 1913, 1916, 1928-32, 1934. WRD MN-74: 1963.

GAGE.--Water-stage recorder. Datum of gage is 1,083.59 ft above sea level. June 23, 1909, to Mar. 4, 1917, nonrecording gage and July 21, 1937, to Oct. 23, 1979, water-stage recorder at site 1.2 mi downstream at datum 10.53 ft lower; Mar. 5 to Sept. 30, 1917, and June 22, 1928, to July 20, 1937, non-recording gage at site 1.18 mi downstream at datum 10.53 ft lower.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	996	1180	e920	e275	e190	e106	e960	1340	1170	199	453	469
2	946	1130	e870	e270	e188	e106	e800	1300	1060	233	389	437
3	897	1080	e830	e265	e186	e106	e700	1270	980	237	330	392
4	870	1030	e780	e258	e184	e106	e620	1270	769	227	300	357
5	837	984	e740	e247	e182	e106	e590	1390	629	295	276	319
6	792	955	e700	e238	e180	e106	e570	1540	585	697	247	301
7	766	923	e660	e230	e176	e106	e640	1650	546	1160	228	289
8	748	911	e620	e222	e174	e106	e760	1690	582	1400	219	279
9	748	891	e580	e217	e168	e106	e730	1710	711	1400	211	267
10	748	853	e540	e210	e164	e106	e700	2050	736	1250	197	304
11	736	823	e500	e208	e156	e106	641	2830	685	1080	178	334
12	736	817	e470	e206	e150	e110	619	3020	622	953	173	312
13	736	822	e454	e204	e145	e150	635	2920	567	809	165	296
14	711	857	e420	e204	e140	e250	922	2870	502	722	148	276
15	699	888	e400	e204	e135	e1000	1690	2670	447	800	136	253
16	699	922	e380	e204	e130	e1500	2290	2580	416	903	129	229
17	717	940	e360	e204	e127	e1800	2290	2690	376	893	127	215
18	850	1010	e340	e204	e124	e2000	2030	2910	343	923	128	213
19	1250	1270	e320	e204	e122	e1900	1860	2780	308	992	162	272
20	1650	1420	e310	e204	e118	e1830	1690	2550	282	1060	182	324
21	1920	e1400	e300	e204	e116	e1750	1570	2330	260	1050	376	326
22	2050	e1330	e300	e204	e114	e1680	1500	2080	246	977	562	326
23	2150	e1240	e295	e204	e112	e1600	1480	1930	231	918	496	324
24	2060	e1190	e290	e202	e110	e1600	1540	1800	222	1040	444	308
25	1940	e1150	e290	e200	e109	e1530	1560	1630	213	1160	423	291
26	1820	e1120	e290	e199	e108	e1450	1540	1570	199	1080	404	283
27	1700	e1080	e285	e198	e107	e1370	1480	1620	225	959	423	271
28	1620	e1040	e285	e196	e107	e1430	1420	1570	268	812	506	260
29	1490	e1000	e285	e194	---	e1410	1420	1480	240	684	519	274
30	1380	e960	e280	e192	---	e1300	1380	1390	216	580	510	393
31	1260	---	e280	e190	---	e1130	---	1280	---	491	506	---
TOTAL	36522	31216	14374	6661	4022	27956	36627	61710	14636	25984	9547	9194
MEAN	1178	1041	464	215	144	902	1221	1991	488	838	308	306
MAX	2150	1420	920	275	190	2000	2290	3020	1170	1400	562	469
MIN	699	817	280	190	107	106	570	1270	199	199	127	213
AC-FT	72440	61920	28510	13210	7980	55450	72650	122400	29030	51540	18940	18240
CFSM	.68	.60	.27	.12	.08	.52	.71	1.15	.28	.48	.18	.18
IN.	.79	.67	.31	.14	.09	.60	.79	1.33	.31	.56	.21	.20

e Estimated.

LAKE OF THE WOODS BASIN

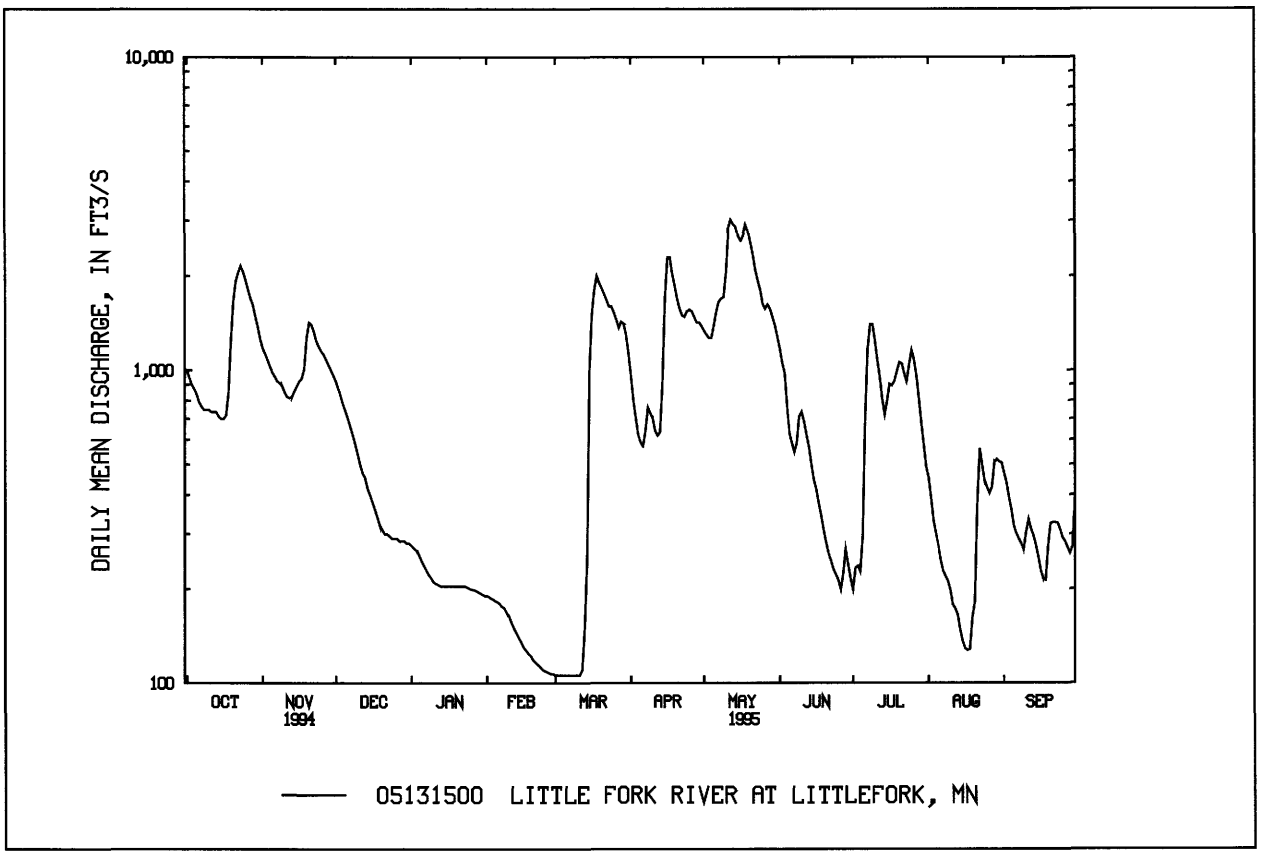
05131500 LITTLE FORK RIVER AT LITTLEFORK, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	860	682	305	145	109	279	3143	2867	1783	975	554	750
MAX	3320	3044	972	477	270	3022	8421	12190	5490	3643	2679	5189
(WY)	1947	1972	1983	1966	1969	1945	1966	1950	1944	1944	1988	1977
MIN	43.4	60.8	52.6	43.5	42.2	50.2	292	173	182	75.4	34.3	29.2
(WY)	1977	1977	1977	1931	1963	1940	1977	1977	1988	1988	1936	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1909 - 1995	
ANNUAL TOTAL	458950		278449			
ANNUAL MEAN	1257		763		1053	
HIGHEST ANNUAL MEAN					1912	1966
LOWEST ANNUAL MEAN					306	1931
HIGHEST DAILY MEAN	6810	Jun 30	3020	May 12	25000	Apr 18 1916
LOWEST DAILY MEAN	117	Feb 10	106	Mar 1-11	21	Aug 26 1936
ANNUAL SEVEN-DAY MINIMUM	118	Feb 9	106	Mar 1	22	Aug 21 1936
INSTANTANEOUS PEAK FLOW			3040	May 12	25000a	Apr 18 1916
INSTANTANEOUS PEAK STAGE			7.93b	Mar 28	37.00a	Apr 18 1916
ANNUAL RUNOFF (AC-FT)	910300		552300		762900	
ANNUAL RUNOFF (CFSM)	.73		.44		.61	
ANNUAL RUNOFF (INCHES)	9.87		5.99		8.27	
10 PERCENT EXCEEDS	3210		1660		2790	
50 PERCENT EXCEEDS	817		580		360	
90 PERCENT EXCEEDS	180		160		85	

a Occurred Apr. 18, 1916 and May 11, 1950, site and datum then in use.
b Backwater from ice.



LAKE OF THE WOODS BASIN

05133500 RAINY RIVER AT MANITOU RAPIDS, MN
(International Gaging Station)

LOCATION.--Lat 48°38'04", long 93°54'47", in NW$^1/_4$SE$^1/_4$ sec.36, T.160 N., R.26 W., Koochiching County, Hydrologic Unit 09030004, on left bank at Manitou Rapids, 4 mi west of Indus.

DRAINAGE AREA.--19,400 mi^2, approximately.

PERIOD OF RECORD.--July 1928 to current year. Monthly discharge only for some periods, published in WSP 1308. October 1911 to October 1924 (gage heights only) at site near Birchdale in files of U.S. Army Corps of Engineers. Published as "near Birchdale" 1932-34.

GAGE.--Water-stage recorder. Datum of gage is 1,062.48 ft above sea level. Prior to Nov. 10, 1934, nonrecording gage at site near Birchdale, 7 mi. downstream at different datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Satellite telemeter at station. Diurnal fluctuation caused by powerplant at International Falls. Some regulation at low and medium flows by Rainy and Namakan Lakes.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11000	14700	16300	e11900	e11100	e9750	15300	8450	7480	4650	7840	7690
2	11000	14500	15500	e11400	e9980	e9760	14800	8040	7700	4510	6950	7690
3	11700	14500	16400	e12300	e8410	e10600	14200	7840	7800	4450	6530	6320
4	12600	14300	16800	e14900	e8410	e9270	13700	7880	7750	4480	6380	5710
5	12600	14200	e16200	e13400	e5720	e7750	13300	8080	7530	4670	6110	4880
6	12600	14000	e16000	e12600	e5650	e6960	13000	8260	7390	5080	5030	6940
7	12700	14000	e16100	e12600	e8210	e8770	13000	8570	7370	7890	4610	7670
8	13100	13900	e16200	e9440	e8210	e8420	13300	9010	7350	9590	4500	7600
9	13300	13800	e15800	e10100	e8350	e8580	13300	8990	7450	8640	4750	7440
10	13300	13700	e15700	e11700	e7970	e8730	13100	9160	7550	8810	4670	5800
11	13200	13600	e15600	e11900	e7960	e8420	12900	9920	7460	10200	4640	5620
12	13100	13500	e15400	e12000	e5680	e6350	12700	10700	7260	10300	4600	7110
13	13000	13700	e15200	e11700	e5820	e6530	12700	11000	6900	10400	4640	7500
14	12900	14100	e14700	e11700	e8150	e8810	12700	10900	6650	11600	4540	6780
15	12800	14800	e15000	e12200	e8100	e9360	12500	10700	6320	11700	4630	5900
16	13000	14800	e15300	e12000	e8210	13100	12800	10400	5960	10800	4460	5060
17	13100	14100	e15100	e12700	e7690	14000	13000	10300	5820	11100	4400	4870
18	13400	14600	e15200	e12400	e8650	13900	13200	10300	5140	12300	4520	4760
19	14100	15600	e15100	e12100	e8500	12700	12800	10200	4980	12700	4840	4850
20	15200	15200	e15100	e12000	e8630	13000	12200	9930	4780	12900	4750	4930
21	15600	15800	e15100	e11900	e9780	14400	11300	9870	4990	13300	4820	5000
22	16200	16300	e15100	e11800	e11000	14600	10300	9410	5240	12700	5130	5000
23	16700	15800	e12200	e11800	e9720	14300	8640	8940	4510	10600	5390	4960
24	17100	16700	e11600	e11800	e9720	14600	8570	8750	4460	11300	5480	4910
25	17000	17000	e11900	e11900	e9810	15300	9880	8440	4470	12400	5570	4850
26	16600	16400	e11600	e12200	e8640	15300	10200	8170	4460	12500	6650	4820
27	16200	15900	e12600	e12500	e8600	15400	10300	8070	4400	12200	5700	4750
28	15800	15900	e11300	e12000	e9760	15600	10100	8020	4490	10700	5660	4690
29	15700	16200	e11400	e12100	---	15800	9360	7870	4660	9420	7180	4720
30	15700	16300	e11700	e11600	---	16000	8930	7700	4700	7140	7430	4900
31	15400	---	e12000	e12000	---	15700	---	7570	---	6660	7520	---
TOTAL	435700	447900	449200	372640	236430	361760	362080	281440	183020	295690	169920	173720
MEAN	14050	14930	14490	12020	8444	11670	12070	9079	6101	9538	5481	5791
MAX	17100	17000	16800	14900	11100	16000	15300	11000	7800	13300	7840	7690
MIN	11000	13500	11300	9440	5650	6350	8570	7570	4400	4450	4400	4690
AC-FT	864200	888400	891000	739100	469000	717600	718200	558200	363000	586500	337000	344600
CFSM	.72	.77	.75	.62	.44	.60	.62	.47	.31	.49	.28	.30
IN.	.84	.86	.86	.71	.45	.69	.69	.54	.35	.57	.33	.33

e Estimated.

LAKE OF THE WOODS BASIN

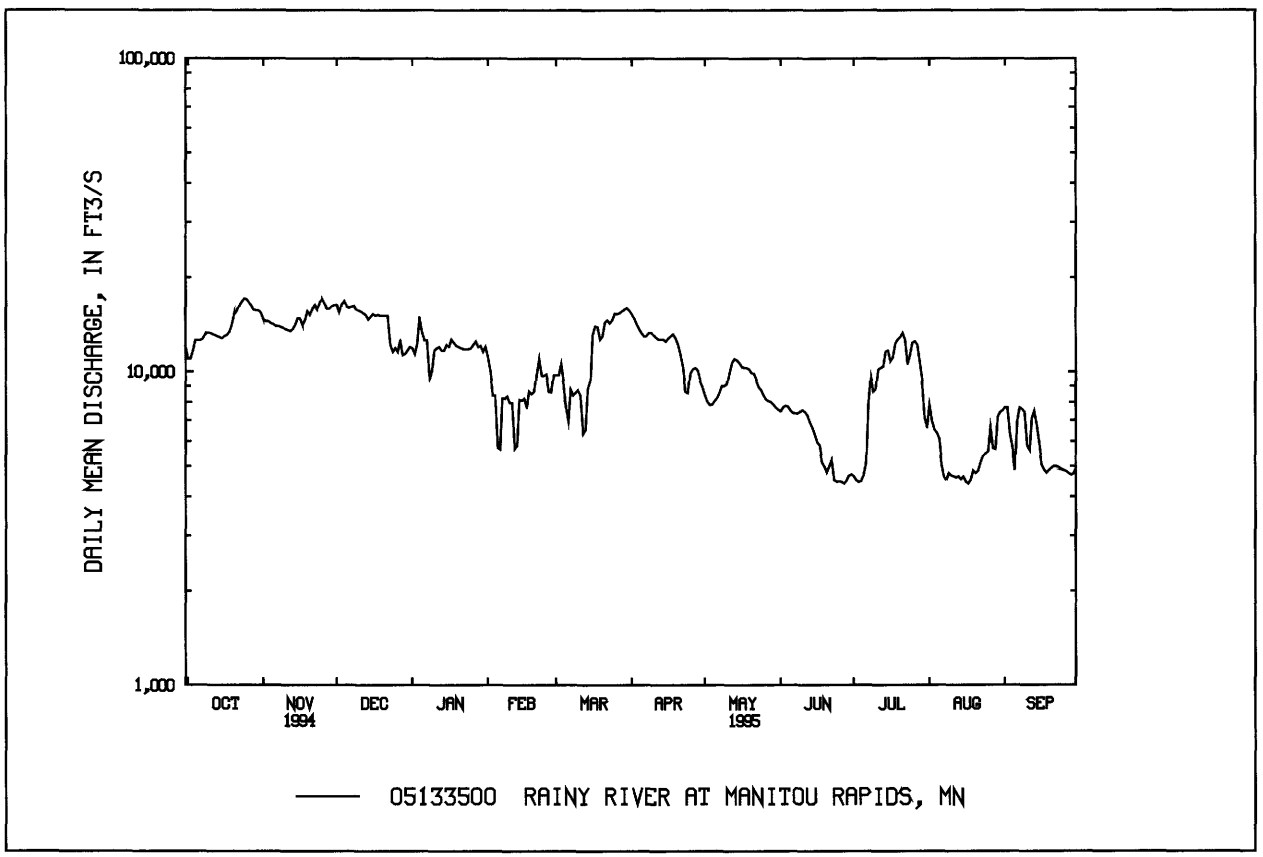
05133500 RAINY RIVER AT MANITOU RAPIDS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	11920	11180	10110	9128	8736	8997	15300	19320	19910	16560	11430	11230
MAX	42410	37280	27790	18430	17240	16640	38100	52880	49480	47970	33700	30620
(WY)	1942	1972	1972	1972	1969	1945	1966	1950	1950	1950	1944	1988
MIN4	728	3796	3190	2900	3129	2926	4378	4106	3676	3483	3422	4168
(WY)	1981	1977	1930	1931	1931	1931	1977	1977	1980	1980	1980	1958

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1929 - 1995	
ANNUAL TOTAL	5215090		3769500			
ANNUAL MEAN	14290		10330		12830	
HIGHEST ANNUAL MEAN					23260	1950
LOWEST ANNUAL MEAN					4470	1931
HIGHEST DAILY MEAN	35500	Jul 11	17100	Oct 24	71300	May 11 1950
LOWEST DAILY MEAN	4630	Mar 6	4400	Jun 27,Aug 17	928	Dec 26 1929
ANNUAL SEVEN-DAY MINIMUM	6310	Mar 20	4490	Jun 23	1500	Dec 24 1929
INSTANTANEOUS PEAK FLOW			17300	Nov 24	71600	May 12 1950
INSTANTANEOUS PEAK STAGE			11.24a	Dec 13	21.04	May 12 1950
ANNUAL RUNOFF (AC-FT)	10340000		7477000		9297000	
ANNUAL RUNOFF (CFSM)	.74		.53		.66	
ANNUAL RUNOFF (INCHES)	10.00		7.23		8.99	
10 PERCENT EXCEEDS	23600		15400		25200	
50 PERCENT EXCEEDS	13600		10300		10300	
90 PERCENT EXCEEDS	7070		4860		5000	

a Backwater from ice.



LAKE OF THE WOODS BASIN

05140521 LAKE OF THE WOODS AT SPRINGSTEEL ISLAND NEAR WARROAD, MN

LOCATION.--Lat 48°56'45", long 95°18'24", in SW¼SW¼ sec. 9, T. 163 N., R. 36 W., Roseau County, Hydrologic Unit 09030009, at Springsteel Resort on Springsteel Island, 2.8 mi north of Warroad.

DRAINAGE AREA.--27,200 mi².

PERIOD OF RECORD.--June 1985 to current year.

GAGE.--Water-stage recorder. Datum at gage is 1,000.00 ft above sea level, Lake of the Woods datum.

REMARKS.--Satellite telemeter at station. Water level subject to fluctuation caused by changes in direction and velocity of wind and seiches.

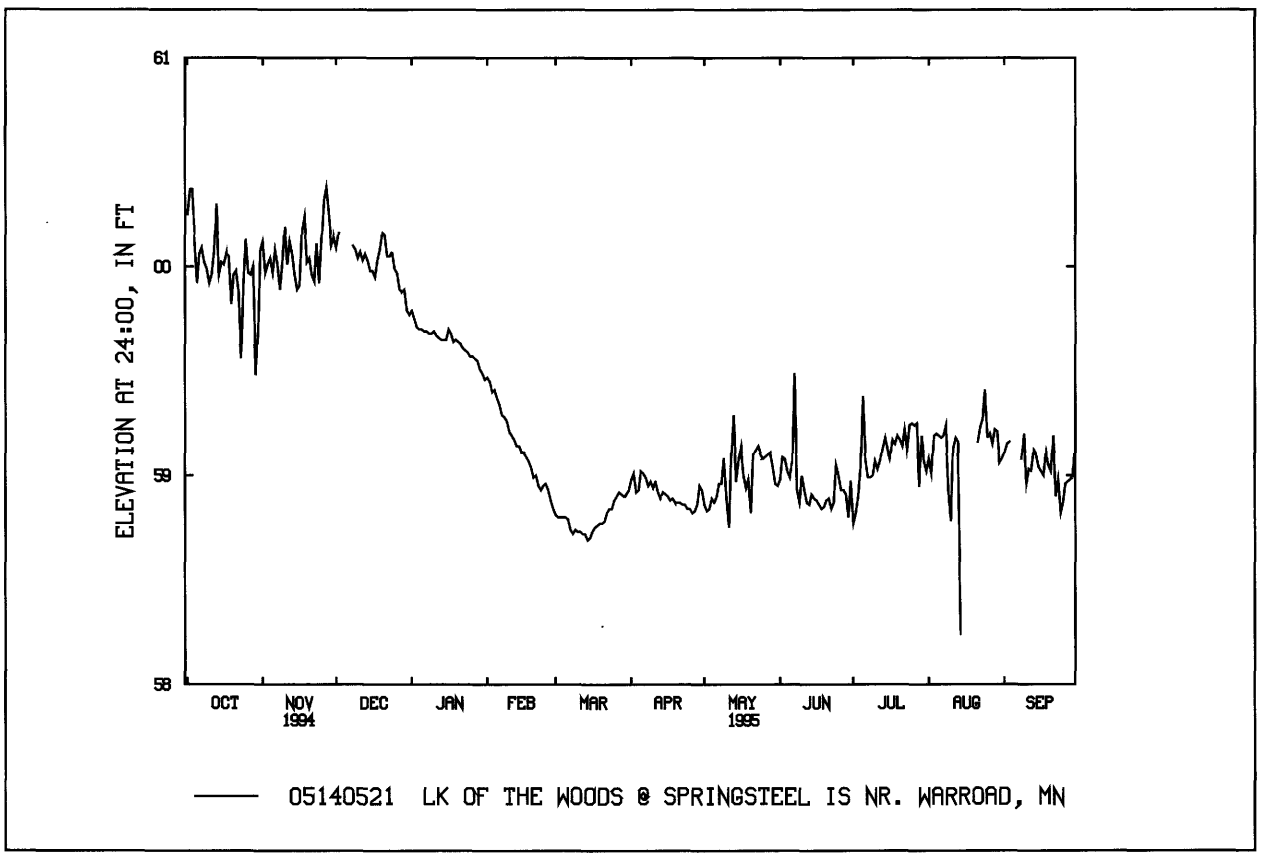
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 62.24 ft, July 5, 1989; maximum daily, 61.81 ft, July 6, 7, 1985; minimum, 57.22 ft, Nov. 22, 1990; minimum daily, 57.43 ft, Mar. 18, 19, 20, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 61.18 ft, Nov. 18; maximum daily, 60.38 ft, Nov. 27; minimum, 57.71 ft, Aug. 14; minimum daily, 58.24 ft, Aug. 14.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60.25	60.12	60.09	59.79	59.47	58.81	58.98	58.86	58.98	58.77	59.08	59.11
2	60.37	59.97	60.16	59.75	59.45	58.80	59.01	58.83	59.09	58.82	59.01	59.15
3	60.37	60.01	---	59.71	59.40	58.80	58.92	58.84	59.08	58.90	59.19	59.16
4	60.12	60.04	---	59.70	59.41	58.80	58.93	58.89	59.02	59.03	59.20	---
5	59.92	59.97	---	59.70	59.37	58.80	59.02	58.87	58.99	59.38	59.19	---
6	60.06	60.08	---	59.69	59.34	58.79	59.01	58.90	59.07	59.08	59.18	---
7	60.09	60.01	---	59.69	59.29	58.74	58.99	58.96	59.49	58.99	59.19	---
8	60.02	59.89	60.10	59.68	59.28	58.72	58.95	58.96	58.93	58.99	59.24	59.08
9	59.99	60.02	60.08	59.68	59.26	58.74	58.97	59.08	58.87	59.00	58.93	59.20
10	59.92	60.19	60.04	59.69	59.21	58.73	58.94	58.89	59.00	59.07	58.78	58.96
11	59.96	60.01	60.07	59.67	59.19	58.73	58.97	58.75	58.93	59.03	59.13	59.03
12	60.07	60.12	60.03	59.66	59.17	58.72	58.92	59.10	58.87	59.07	59.18	59.02
13	60.30	60.06	60.06	59.65	59.14	58.72	58.89	59.29	58.86	59.13	59.16	59.12
14	59.96	59.96	60.03	59.65	59.14	58.69	58.92	58.97	58.91	59.18	58.24	59.10
15	60.02	59.89	59.98	59.65	59.11	58.70	58.91	59.07	58.89	59.12	---	59.04
16	60.01	59.91	59.98	59.70	59.11	58.73	58.90	59.14	58.88	59.08	---	59.02
17	60.06	60.17	59.95	59.68	59.09	58.75	58.88	59.00	58.86	59.17	---	59.00
18	60.05	60.24	60.03	59.64	59.07	58.76	58.89	58.94	58.84	59.15	---	59.11
19	59.82	60.02	60.08	59.65	59.04	58.77	58.87	58.98	58.85	59.19	---	59.05
20	59.96	60.04	60.16	59.64	58.99	58.77	58.87	58.82	58.88	59.17	---	59.02
21	59.98	59.96	60.15	59.63	59.00	58.78	58.87	59.10	58.89	59.14	59.16	59.19
22	59.88	59.93	60.05	59.61	58.95	58.82	58.86	59.12	58.84	59.22	59.23	58.90
23	59.56	60.11	60.05	59.60	58.93	58.84	58.86	59.14	58.87	59.12	59.27	58.98
24	59.92	59.92	60.07	59.59	58.95	58.84	58.84	59.10	59.05	59.24	59.41	58.82
25	60.13	60.13	59.99	59.57	58.96	58.88	58.84	59.08	59.00	59.25	59.18	58.87
26	59.97	60.32	59.97	59.57	58.93	58.90	58.82	59.09	58.93	59.24	59.20	58.96
27	59.96	60.38	59.89	59.56	58.88	58.92	58.83	59.10	58.93	59.25	59.15	58.97
28	60.00	60.25	59.88	59.55	58.84	58.91	58.86	59.11	58.91	58.95	59.22	58.98
29	59.48	60.10	59.89	59.51	---	58.90	58.95	59.04	58.80	59.19	59.21	59.00
30	59.70	60.14	59.79	59.49	---	58.91	58.93	58.96	58.97	59.07	59.06	59.14
31	60.08	---	59.77	59.46	---	58.93	---	58.95	---	59.02	59.08	---
MEAN	60.00	60.07	---	59.64	59.14	58.80	58.91	59.00	58.95	59.10	---	---
MAX	60.37	60.38	---	59.79	59.47	58.93	59.02	59.29	59.49	59.38	---	---
MIN	59.48	59.89	---	59.46	58.84	58.69	58.82	58.75	58.80	58.77	---	---


61
60
59
58
ELEVATION AT 24:00, IN FT
OCT
NOV
1994
DEC
JAN
FEB
MAR
APR
MAY
1995
JUN
JUL
AUG
SEP
05140521 LK OF THE WOODS @ SPRINGSTEEL IS NR. WARROAD, MN

MISSISSIPPI RIVER MAIN STEM

05200510 MISSISSIPPI RIVER NEAR BEMIDJI, MN

LOCATION.--Lat 47°29'00", long 94°43'40", in SE¼SW¼ sec.3, T.146 N., R.32 W., Beltrami County, Hydrologic Unit 07010101, 3.5 mi east of Bemidji on right bank 100 ft upstream of County Highway 12 and 400 ft downstream from Stump Lake dam.

DRAINAGE AREA.--610 mi², approximately.

PERIOD OF RECORD.--September 1987 to current year (no winter records).

GAGE.--Water-stage recorder. Elevation of gage is 1,315 ft above sea level from topographic map.

REMARKS.--Records good. Regulated by Stump Lake dam upstream from station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	313	310	---	---	---	---	681	375	321	72	248	180
2	313	342	---	---	---	---	667	377	291	70	183	180
3	313	367	---	---	---	---	666	375	292	70	94	180
4	302	367	---	---	---	---	657	370	288	71	32	177
5	313	367	---	---	---	---	643	371	289	80	30	179
6	313	367	---	---	---	---	640	370	316	92	30	178
7	313	365	---	---	---	---	620	368	332	88	125	180
8	313	381	---	---	---	---	607	367	334	85	185	180
9	310	402	---	---	---	---	607	372	281	85	182	178
10	311	402	---	---	---	---	513	374	238	84	181	177
11	313	399	---	---	---	---	452	371	240	83	182	176
12	313	399	---	---	---	---	455	369	237	76	182	178
13	313	399	---	---	---	127	448	367	212	83	183	178
14	313	400	---	---	---	124	444	371	188	186	173	176
15	313	398	---	---	---	130	443	398	186	311	154	175
16	313	395	---	---	---	227	443	451	131	309	123	174
17	313	416	---	---	---	274	447	475	94	346	108	172
18	311	430	---	---	---	267	447	489	94	374	108	172
19	311	428	---	---	---	266	447	550	96	374	108	173
20	310	428	---	---	---	314	446	616	93	374	108	175
21	310	429	---	---	---	421	404	611	99	384	109	175
22	310	427	---	---	---	618	386	606	101	388	110	174
23	312	425	---	---	---	640	384	607	100	388	111	172
24	312	424	---	---	---	590	383	598	100	370	112	172
25	310	---	---	---	---	540	379	598	98	360	112	172
26	310	---	---	---	---	550	381	524	94	361	111	172
27	310	---	---	---	---	644	384	471	87	361	112	173
28	310	---	---	---	---	707	384	472	72	353	155	175
29	310	421	---	---	---	702	380	470	73	350	180	175
30	311	---	---	---	---	701	375	467	72	352	179	175
31	310	---	---	---	---	691	---	429	---	353	180	---
TOTAL	9652	9888	---	---	---	8533	14613	14029	5449	7333	4190	5273
MEAN	311	396	---	---	---	449	487	453	182	237	135	176
MAX	313	430	---	---	---	707	681	616	334	388	248	180
MIN	302	310	---	---	---	124	375	367	72	70	30	172
AC-FT	19140	19610	---	---	---	16930	28980	27830	10810	14550	8310	10460
CFSM	.51	.65	---	---	---	.74	.80	.74	.30	.39	.22	.29
IN.	.59	.60	---	---	---	.52	.89	.86	.33	.45	.26	.32

e Estimated.

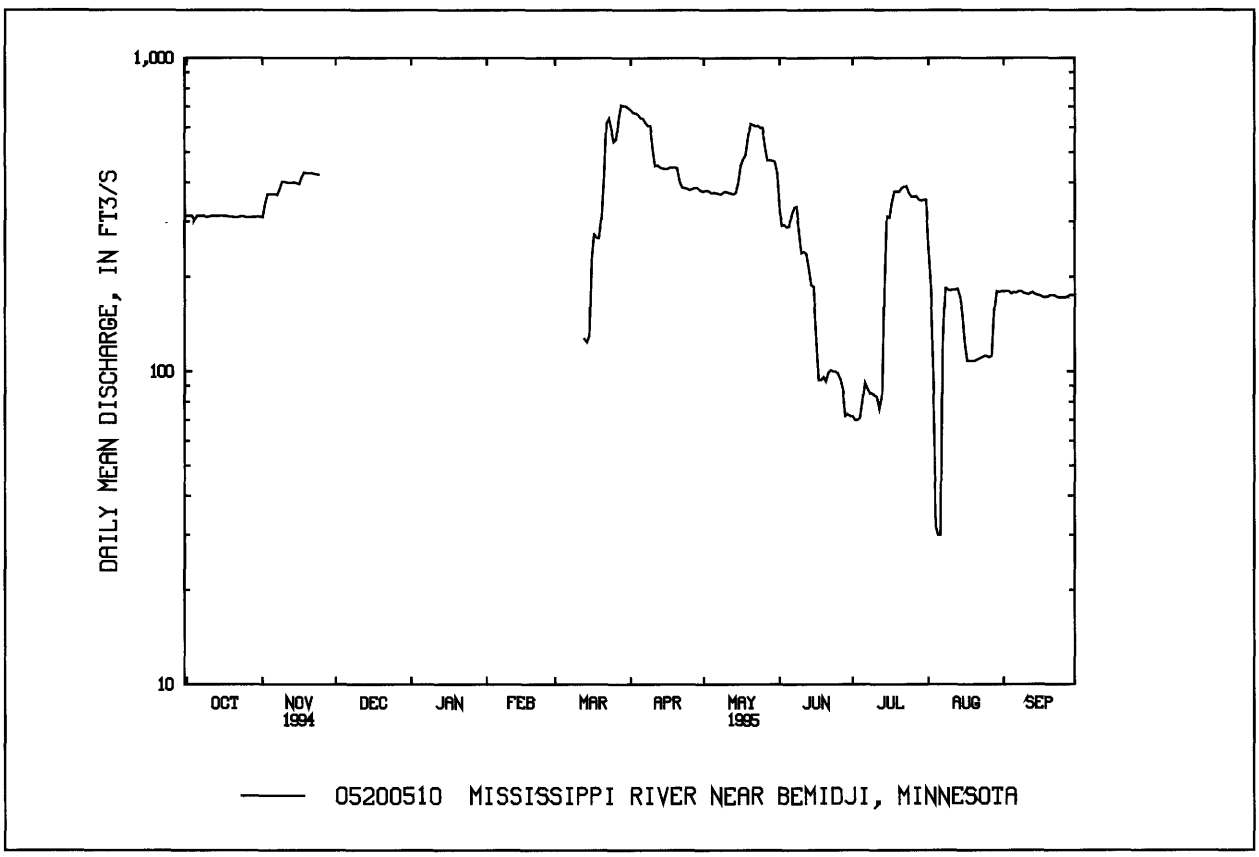
MISSISSIPPI RIVER MAIN STEM

05200510 MISSISSIPPI RIVER NEAR BEMIDJI, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	179	---	---	---	---	---	295	363	221	217	186	199
MAX	311	---	---	---	---	---	487	479	329	363	471	401
(WY)	1995	---	---	---	---	---	1995	1989	1993	1993	1993	1993
MIN7	5.5	---	---	---	---	---	148	181	104	62.2	61.9	62.3
(WY)	1991	---	---	---	---	---	1992	1992	1988	1988	1989	1990

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1987 - 1995	
HIGHEST DAILY MEAN	430	Nov 18	707	Mar 28	771	Apr 28 1989
LOWEST DAILY MEAN	87	Sep 8	30	Aug 5,6	22	Jul 12 1988
INSTANTANEOUS PEAK FLOW			748	Mar 27	938	May 7 1993
INSTANTANEOUS PEAK STAGE			4.53	Mar 27	4.93	May 7 1993



MISSISSIPPI RIVER MAIN STEM

05201000 WINNIBIGOSHISH LAKE NEAR DEER RIVER, MN

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

DRAINAGE AREA.--1,442 mi².

PERIOD OF RECORD.--April 1884 to current year. Prior to October 1941 monthend contents only, published in WSP 1308. Published as Winnibigoshish Reservoir near Deer River October 1941 to September 1956.

REVISED RECORDS.--WSP 1308: 1905(M).

GAGE.--Water-stage recorder. Datum of gage is in mean sea level (levels by U.S. Army Corps of Engineers). Prior to July 8, 1949, nonrecording gage at same site, and July 9, 1949, to July 10, 1973, water-stage recorder at same site and at datum of 1,288.94 ft above mean sea level.

REMARKS.--Reservoir is formed by Winnibigoshish Lake and several other natural lakes controlled by a concrete and timber dam, completed in 1884; storage began in 1884. Capacity between elevations 1,294.94 ft and 1,303.14 ft (maximum allowable range) is 668,737 acre-ft of which 439,636 acre-ft is controlled storage between elevations 1,294.94 ft and 1,300.94 ft (normal operating range). Contents shown herein are contents above elevation 1,286.00 ft. Prior to September 1978, published contents as contents above elevation 1,288.94 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 996,500 acre-ft, capacity table then in use, July 30, 1905, elevation, 1,303.39 ft; minimum observed, 33,680 acre-ft, below zero of capacity table then in use, Oct. 20, 1931, elevation, 1,288.25 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 738,600 acre-ft, July 17, elevation, 1,298.78 ft; minimum, 615,200 acre-ft, Feb. 21, elevation, 1,296.90 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1298.10	694000	
Oct. 31	1297.72	669000	-25000
Nov. 30	1297.39	647300	-21700
Dec. 31	1297.20	634900	-12400
CAL YR 1994			+3970
Jan. 31	1297.00	621700	-13200
Feb. 28	1296.95	618500	-3200
Mar. 31	1297.49	653900	+35400
Apr. 30	1297.90	680800	+26900
May 31	1298.16	697900	+17100
June 30	1298.39	713000	+15100
July 31	1298.47	718200	+5200
Aug. 31	1298.38	712300	-5900
Sept. 30	1298.02	688700	-23600
WTY YR 1995			-24700

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LEECH LAKE RIVER BASIN

05202000 WILLIAMS LAKE NEAR AKELEY, MN

LOCATION.--Lat 46° 57'24", long 94 °40'26", in SE$^1/_4$ NW$^1/_4$ sec. 12, T. 140 N., R. 32 W., Hubbard County, Hydrologic Unit 07010102, on northwest shore of Williams Lake, 4 mi southeast of Akeley.

DRAINAGE AREA.--0.88 mi2.

PERIOD OF RECORD.--October 1988 to current year. August 1977 to September 1988, in files of the U.S. Geological Survey's Hydrology of Lakes Section in Denver, Colorado.

GAGE.--Water-stage recorder. Datum of gage is 1,379.09 ft above sea level. Prior to Oct. 1, 1990, at datum 2.00 ft higher.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 3.33 ft, present datum, June 25, 1989; minimum, 1.32 ft, Dec. 13, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 2.64 ft, July 22; minimum, 1.99 ft, Oct.2, 3, 15, 16 .

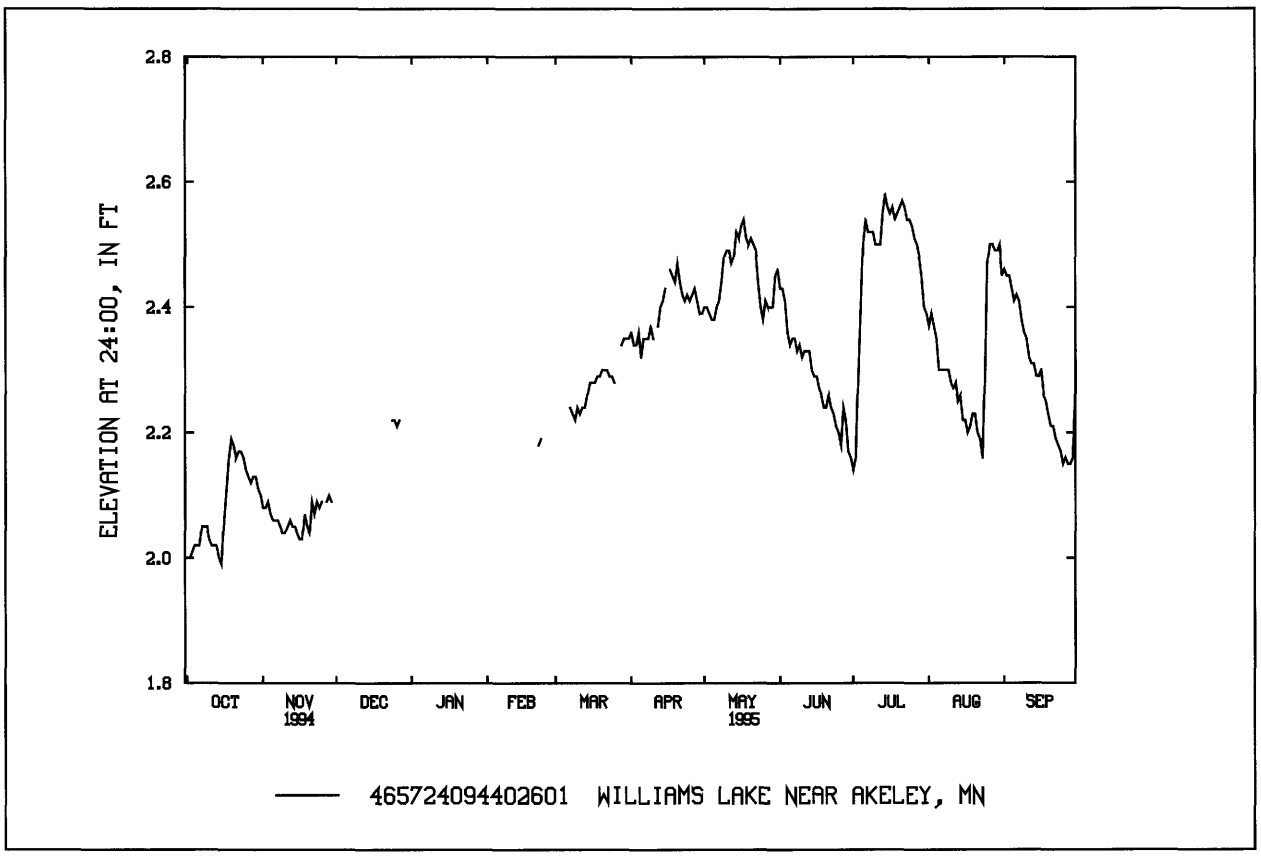
GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.00	2.08	---	---	---	---	2.36	2.40	2.43	2.14	2.37	2.46
2	2.00	2.08	---	---	---	---	2.34	2.40	2.43	2.16	2.39	2.45
3	2.01	2.09	---	---	---	2.19	2.34	2.39	2.41	2.29	2.37	2.45
4	2.02	2.07	---	---	---	---	2.36	2.38	2.36	2.39	2.35	2.43
5	2.02	2.06	---	---	---	---	2.32	2.38	2.34	2.50	2.30	2.41
6	2.02	2.06	---	---	---	---	2.35	2.40	2.35	2.54	2.30	2.42
7	2.05	2.06	---	---	---	2.24	2.35	2.41	2.35	2.52	2.30	2.41
8	2.05	2.05	---	---	---	2.23	2.35	2.44	2.33	2.52	2.30	2.38
9	2.05	2.04	---	---	---	2.22	2.37	2.48	2.34	2.52	2.30	2.36
10	2.03	2.04	---	---	---	2.24	2.35	2.49	2.32	2.50	2.28	2.35
11	2.02	2.05	---	---	---	2.23	---	2.49	2.33	2.50	2.27	2.32
12	2.02	2.06	---	2.23	---	2.24	2.37	2.47	2.33	2.50	2.28	2.31
13	2.02	2.05	---	---	---	2.24	2.40	2.48	2.33	2.55	2.25	2.31
14	2.00	2.05	---	---	---	2.26	2.41	2.52	2.30	2.58	2.26	2.29
15	1.99	2.04	---	---	---	2.28	2.43	2.51	2.29	2.56	2.22	2.29
16	2.06	2.03	---	---	---	2.28	---	2.53	2.29	2.55	2.22	2.30
17	2.11	2.03	---	---	---	2.28	2.46	2.54	2.27	2.56	2.20	2.26
18	2.16	2.07	---	---	---	2.29	2.45	2.51	2.26	2.54	2.21	2.25
19	2.19	2.05	---	---	---	2.29	2.44	2.50	2.24	2.55	2.23	2.23
20	2.18	2.04	---	---	---	2.30	2.47	2.51	2.24	2.56	2.23	2.21
21	2.16	2.09	---	---	---	2.30	2.44	2.50	2.26	2.57	2.20	2.21
22	2.17	2.07	2.20	---	2.18	2.30	2.42	2.49	2.24	2.56	2.19	2.19
23	2.17	2.09	---	---	2.19	2.29	2.41	2.44	2.23	2.54	2.16	2.18
24	2.16	2.08	2.22	---	---	2.29	2.42	2.40	2.21	2.54	2.29	2.17
25	2.14	2.09	2.22	---	---	2.28	2.41	2.38	2.20	2.53	2.47	2.15
26	2.13	---	2.21	---	---	---	2.42	2.41	2.18	2.51	2.50	2.16
27	2.12	2.09	2.22	---	---	---	2.43	2.40	2.24	2.50	2.50	2.15
28	2.13	2.10	---	---	---	2.34	2.41	2.40	2.22	2.48	2.49	2.15
29	2.13	2.09	---	---	---	2.35	2.39	2.40	2.17	2.45	2.49	2.16
30	2.11	---	---	---	---	2.35	2.39	2.45	2.16	2.40	2.50	2.26
31	2.10	---	---	---	---	2.35	---	2.46	---	2.39	2.45	---
MEAN	2.08	---	---	---	---	---	---	2.45	2.29	2.48	2.32	2.29
MAX	2.19	---	---	---	---	---	---	2.54	2.43	2.58	2.50	2.46
MIN	1.99	---	---	---	---	---	---	2.38	2.16	2.14	2.16	2.15

LEECH LAKE RIVER BASIN

05202000 WILLIAMS LAKE NEAR AKELEY, MN--Continued



LEECH LAKE RIVER BASIN

05206000 LEECH LAKE AT FEDERAL DAM, MN

LOCATION (REVISED).--Lat 47°10'14", long 94°17'12", in SE¼SE¼ sec.25, T.143 N., R.29 W., Cass County, Hydrologic Unit 07010102, on Leech Lake Indian Reservation, at head of Leech Lake River, 1 mi. northeast of Battle Point, 6 mi southwest of town of Federal Dam.

DRAINAGE AREA.--1,163 mi².

PERIOD OF RECORD.--April 1884 to current year. Monthend contents only for some periods, published in WSP 1308. Prior to October 1956, published as "Leech Lake Reservoir."

GAGE.--Water-stage recorder. Datum of gage is in mean sea level (levels by U.S. Army Corps of Engineers). Prior to Dec. 31, 1884, nonrecording gage 0.5 mi north of outlet to Leech Lake River at datum 98.47 ft higher. Dec. 31, 1884, to May 24, 1931, nonrecording gage 0.5 mi north of outlet to Leech Lake River and May 25, 1931, to July 10, 1973, water-stage recorder at same site and at datum 92.70 ft higher.

REMARKS.--Reservoir is formed by Leech Lake and several other natural lakes controlled by concrete and timer dam; storage began in 1884; original timber structure completed in 1884, replaced by present dam in 1902. Capacity between elevation 1,292.70 ft and 1,297.94 ft (maximum allowable range) is 688,985 acre-ft of which 352,637 acre-ft is controlled storage between elevations 1,292.70 ft and 1,295.70 Reservoir is formed by Leech Lake and several other natural lakes controlled by concrete and timber dam; storage began in 1884; original timber structure completed in 1884, replaced by present dam in 1902. Capacity between elevation 1,292.70 ft and 1,297.94 ft (maximum allowable range) is 688,985 acre-ft of which 352,637 acre-ft is controlled storage between elevations l,292.70 ft and 1,295.70 ft (normal operating range). Contents shown herein are contents above elevation 1,290.00 ft. Prior to September 1978, published contents as contents above elevation 1,292.20 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 734,300 acre-ft, capacity table then in use, June 30, 1916, elevation, 1,297.88 ft; minimum, 51,380 acre-ft, capacity table then in use, Dec. 8, 24, 1976, elevation, 1,292.69 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 633,100 acre-ft, Oct. 24, elevation, 1295.09 ft; minimum, 490,500 acre-ft, Mar. 10, elevation, 1,293.96 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

Date	Elevation	Contents	Change in contents
Sept. 30	1294.60	571100	
Oct. 31	1294.71	585000	+13900
Nov. 30	1294.42	548400	-24000
Dec. 31	1294.31	534480	-10100
CAL YR 1993			+13920
Jan. 31	1294.17	516800	-31600
Feb. 28	1294.01	496500	-20300
Mar. 31	1294.25	526900	+30400
Apr. 30	1294.57	567300	+40400
May 31	1294.58	568600	+1300
June 30	1294.42	548400	-20200
July 31	1294.77	592600	+44200
Aug. 31	1294.60	571100	-21500
Sept. 30	1294.20	520600	-50500
WTR YR 1994			-50540

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MISSISSIPPI RIVER MAIN STEM

05210500 POKEGAMA LAKE NEAR GRAND RAPIDS, MN

LOCATION.--Lat 47°10'00", long 93°33'20", in NW$^1/_4$ sec.17, T.54 N., R.25 W., Itasca County, Hydrologic Unit 07010101, at narrows on U.S. Highway 169, 4 mi south of Grand Rapids and at mile 1,184 upstream from Ohio River.

DRAINAGE AREA.--3,265 mi^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 in mean sea level (levels by U.S. Army Corps of Engineers). Prior to May 30, 1949, nonrecording gage at Pooles Arm of Pokegama Lake 5 mi northwest, and May 31, 1949, to July 12, 1973, water-stage recorder at same site and at datum 64.42 ft higher.

REMARKS.--Reservoir is formed by Pokegama Lake and several other natural lakes controlled by concrete dam; storage began in 1884; original timber dam completed in 1884, replaced by present structure in 1888-89. Capacity between elevation 1,270.42 ft and 1,276.42 ft (maximum allowable range) is 80,126 acre-ft of which 52,483 acre-ft is controlled storage between elevations 1,270.42 ft and 1,274.42 ft (normal operating range). Contents shown herein are contents above elevation 1,267.00 ft. Prior to September 1978, published contents as contents above elevation 1,268.92 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 132,160 acre-ft, May 23, 1986, elevation, 1,275.28 ft; maximum elevation, 1,277.92 ft, May 8, 1897; minimum contents observed, 4,520 acre-ft, below zero of capacity table then in use, Sept. 30, 1934, elevation, 1,268.54 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 104,600 acre-ft, July 6, elevation, 1,273.82 ft; minimum, 66,960 acre-ft, Jan. 12, elevation, 1,271.29 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

	Elevation	Contents	Change in contents
Sept. 30	1273.26	95470	
Oct. 31	1272.66	86510	-8960
Nov. 30	1271.78	73810	-12700
Dec. 31	1271.60	71250	-2560
CAL YR 1994			-570
Jan. 31	1271.44	68980	-2270
Feb. 28	1271.40	68420	-560
Mar. 31	1272.20	79790	+11370
Apr. 30	1272.76	88010	+8220
May 31	1273.51	99370	+11360
June 30	1273.37	97100	-2270
July 31	1273.31	96220	-880
Aug. 31	1273.19	94420	-1800
Sept. 30	1273.45	98380	+3960
WTR YR 1995			+2910

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MISSISSIPPI RIVER MAIN STEM

05211000 MISSISSIPPI RIVER AT GRAND RAPIDS, MN

LOCATION.--Lat 47°13'56", long 93°31'48", in SW¼NW¼ sec.21, T.55 N., R.25 W., Itasca County, Hydrologic Unit 07010103, on left bank, in super-calendar room of Blandin Paper Mill in Grand Rapids, 400 ft downstream from Blandin Dam, 400 ft upstream from bridge on U.S. Highway 169, 2.5 mi upstream from Prairie River, and at mile 1,182 upstream from Ohio River.

DRAINAGE AREA.--3,370 mi², approximately.

PERIOD OF RECORD.--October 1883 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as "at Pokegama Dam near Grand Rapids" 1942-44.

GAGE.--Water-stage recorder. Datum of gage is 1,242.03 ft above mean sea level. See WSP 1914 for history of changes prior to Jan. 17, 1951.

REMARKS.--Records fair. Flow regulated by Winnibigoshish Lake (station 05201000), Leech Lake (station 05206000), Pokegama Lake (station 05210500) and occasionally at low flow by powerplant at Blandin Dam. Backwater from Prairie River occurs at times in most years.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1700	2680	1320	e1960	e1790	e1570	1050	1220	1640	301	2090	938
2	1690	2670	1520	e1950	e1780	e1580	1060	1210	1720	302	2100	965
3	1820	2550	1780	e1900	e1800	e1580	1050	1200	1870	332	2030	1010
4	1960	2560	1810	e1880	e1800	e1580	1080	1190	1810	375	2000	969
5	1990	2610	2000	e1850	e1780	e1580	1080	1240	1700	585	1910	1050
6	2160	2600	2180	e1800	e1760	e1580	1060	1270	1410	887	2030	1260
7	2240	2610	e2070	e1890	e1750	e1580	737	1310	1440	1350	1990	1310
8	2260	2520	e2020	e1870	e1750	e1580	557	1140	1400	1330	2030	1170
9	2250	2500	e2020	e1860	e1780	e1560	545	1010	1410	1300	2060	1110
10	2230	2460	e1840	e1870	e1800	e1430	578	985	1410	1540	1970	1090
11	2200	2470	e1840	e1870	e1780	e1450	582	1150	1390	1780	1950	1190
12	2150	2440	e1840	e1870	e1760	e1450	782	1440	1290	1770	1980	1210
13	2170	2450	e1830	e1870	e1750	e1470	976	1620	1140	1860	2020	1170
14	2160	2400	e1830	e1850	e1740	e1480	954	1680	1170	2040	1930	1200
15	2190	2470	e1820	e1840	e1740	e1500	973	1680	1170	2200	1800	1220
16	2210	2450	e1820	e1840	e1740	e1510	994	1720	942	2180	1620	1200
17	2310	2450	e1820	e1830	e1740	1520	996	1690	836	2220	1450	1210
18	2630	2430	e1820	e1860	e1740	1440	1010	1650	836	2260	1270	1210
19	2610	2350	e1820	e1860	e1720	1340	1060	1640	864	2330	1360	1190
20	2630	2360	e1820	e1860	e1710	1730	1110	1640	831	2470	1270	1180
21	2690	2390	e1800	e1830	e1700	2300	1040	1690	807	2410	1330	1190
22	2760	2310	e1800	e1810	e1700	2660	1090	1720	843	2420	1320	1210
23	2740	2350	e1800	e1800	e1700	2740	1150	1690	572	2360	1280	1220
24	2720	2360	e1800	e1800	e1530	2670	1490	1680	562	2370	1370	1190
25	2720	2310	e1800	e1800	e1570	2500	1430	1690	526	2330	1560	1210
26	2740	2310	e1800	e1810	e1580	2490	1420	1650	492	2310	1840	1220
27	2780	2210	e1800	e1820	e1580	2360	1340	1610	293	2150	1790	1220
28	2760	1850	e1900	e1820	e1580	2170	1240	1650	339	2150	1900	1250
29	2710	1670	e1920	e1810	---	1940	1210	1600	344	2140	1860	1260
30	2680	1490	e1940	e1810	---	1760	1250	1600	286	2170	1670	1410
31	2660	---	e1970	e1810	---	1420	---	1620	---	2150	1240	---
TOTAL	73520	71280	57150	57300	48150	55520	30894	45885	31343	54372	54020	35232
MEAN	2372	2376	1844	1848	1720	1791	1030	1480	1045	1754	1743	1174
MAX	2780	2680	2180	1960	1800	2740	1490	1720	1870	2470	2100	1410
MIN	1690	1490	1320	1800	1530	1340	545	985	286	301	1240	938
AC-FT	145800	141400	113400	113700	95510	110100	61280	91010	62170	107800	107100	69880
CFSM	.70	.71	.55	.55	.51	.53	.31	.44	.31	.52	.52	.35
IN.	.81	.79	.63	.63	.53	.61	.34	.51	.35	.60	.60	.39

e Estimated.

MISSISSIPPI RIVER MAIN STEM

05211000 MISSISSIPPI RIVER AT GRAND RAPIDS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1995, BY WATER YEAR (WY)

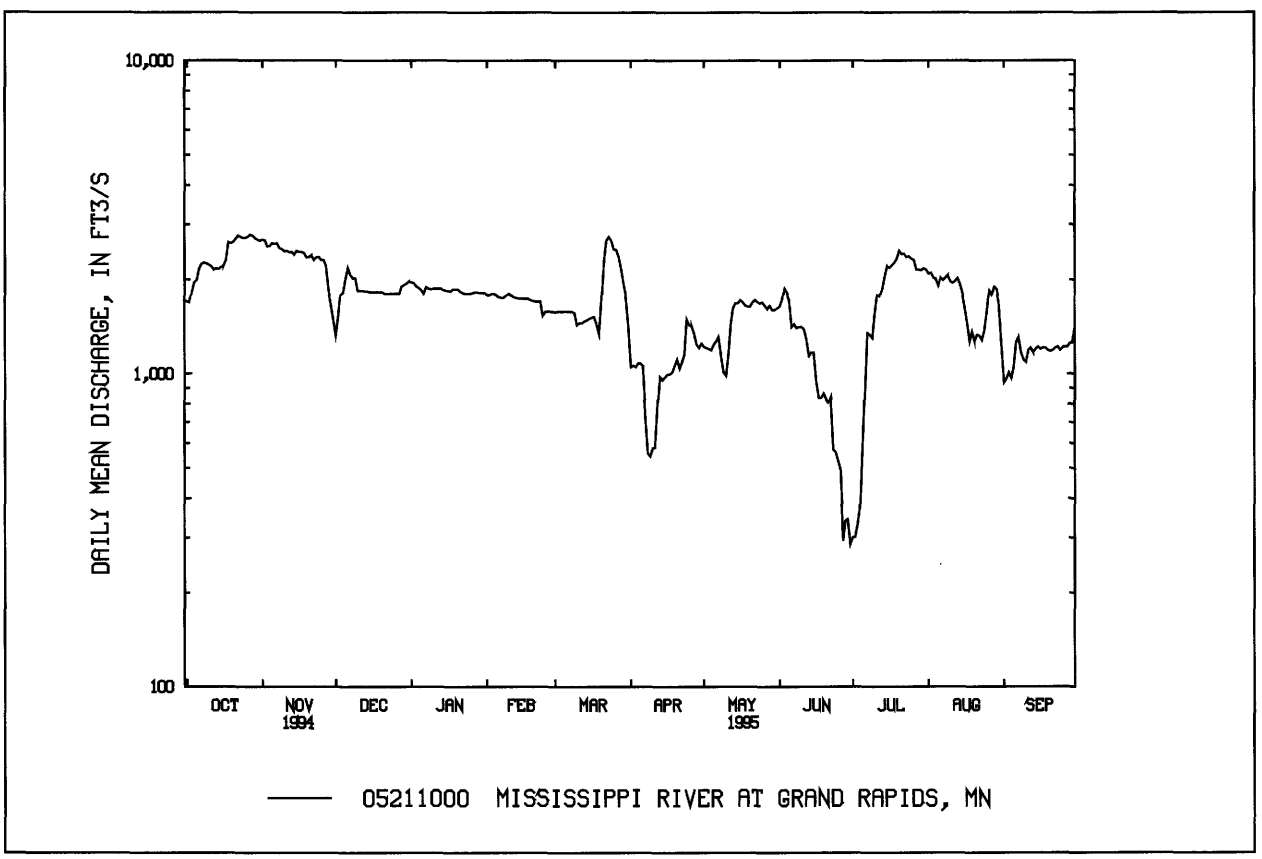
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1428	1558	1455	1468	1469	1380	1188	1268	1308	1394	1262	1248
MAX	2865	2496	2375	2410	2729	2762	3442	3026	3271	3363	3711	3542
(WY)	1986	1954	1954	1952	1945	1945	1945	1979	1962	1962	1950	1950
MIN	187	174	186	168	177	198	247	32.5	206	125	98.3	195
(WY)	1977	1977	1977	1977	1977	1977	1959	1949	1988	1961	1961	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1942 - 1995	
ANNUAL TOTAL	652658		614666			
ANNUAL MEAN	1788		1684		1376[a]	
HIGHEST ANNUAL MEAN					2265	1950
LOWEST ANNUAL MEAN					277	1977
HIGHEST DAILY MEAN	3380	Jul 12	2780	Oct 27	4610	Apr 17 1969
LOWEST DAILY MEAN	191	Jun 6	286	Jun 30	.00	Oct 2 1948
ANNUAL SEVEN-DAY MINIMUM	688	Mar 31	314	Jun 27	24	May 9 1949
INSTANTANEOUS PEAK FLOW			2820	Mar 22	12500[b]	Sep 3 1948
INSTANTANEOUS PEAK STAGE			8.00	Mar 22	15.20[c]	Sep 3 1948
INSTANTANEOUS LOW FLOW			189	Jun 23,30		
ANNUAL RUNOFF (AC-FT)	1295000		1219000		996900	
ANNUAL RUNOFF (CFSM)	.53		.50		.41	
ANNUAL RUNOFF (INCHES)	7.20		6.79		5.55	
10 PERCENT EXCEEDS	2670		2430		2320	
50 PERCENT EXCEEDS	1720		1740		1360	
90 PERCENT EXCEEDS	996		1000		353	

a Average based on 112 years of record is 1190 ft^3/s; median of annual mean discharges is 1080 ft3/s.

b From rating curve extended above 4500 ft^3/s.

c From floodmark, caused by dam failure.



SANDY RIVER BASIN

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 upstream from mouth, and 14 mi north of McGregor.

DRAINAGE AREA.--421 mi^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 in mean sea level (levels by U.S. Army Corps of Engineers). Prior to Sept. 23, 1949, nonrecording gage and Sept. 24, 1949, to Nov. 28, 1962, water-stage recorder at site 1 mi upstream at datum 1,207.71 ft, adjustment of 1912. Nov. 29, 1962, to June 30, 1973, water-stage recorder at present site at datum 1,207.71 ft, adjustment of 1912.

REMARKS.--Lake is formed by concrete dam which controls Sandy, Flowage, Snake, and Aitkin Lakes. Storage began in 1893; original timber crib dam completed in 1895, replaced by present structure in 1911. Capacity between elevation 1,214.31 ft and 1,221.31 ft (top of structure) is 73,037 acre-ft, of which 37,539 acre-ft is controlled storage between elevations 1,214.31 ft and 1,218.31 ft (normal operating range). Contents shown herein are contents above elevation 1,207.00 ft. Prior to September 1978, published contents as contents above elevation 1,209.03 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 167,200 acre-ft, capacity table then in use, May 19, 1950, elevation, 1,224.82 ft; minimum observed, 5,950 acre-ft, below zero of capacity table then in use, Jan. 20, 1921, elevation, 1,207.96 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 66,480 acre-ft, May 19, elevation, 1,216.79 ft; minimum, 44,120 acre-ft, Mar. 3, elevation, 1,214.28 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1216.26	61440	
Oct. 31	1215.82	57380	-4060
Nov. 30	1215.23	52140	-5240
Dec. 31	1215.01	50240	-1900
CAL YR 1994			+1370
Jan. 31	1214.47	45690	-4550
Feb. 28	1214.31	44360	-1330
Mar. 31	1215.99	58950	+14590
Apr. 30	1216.29	61720	+2770
May 31	1216.28	61630	-90
June 30	1216.22	61070	-560
July 31	1216.30	61820	+750
Aug. 31	1216.61	64770	+2950
Sept. 30	1216.46	63340	-1430
WTR YR 1995			+1900

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MISSISSIPPI RIVER MAIN STEM

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 downstream from Ripple River and at mile 1,055.9 upstream from Ohio River.

DRAINAGE AREA.--6,140 mi², approximately.

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

GAGE.--Water-stage recorder. Datum of gage is 1,182.41 ft above sea level (levels by U.S. Army Corps of Engineers). Mar. 1, 1945, to Mar. 14, 1961, nonrecording gage, and Mar. 15, 1961, to Sept. 30, 1967, water-stage recorder at same site at datum 3.0 ft higher. Diversion channel: Non-recording gage and crest-stage gage. Datum of gage is 1,182.02 ft above sea level. Apr. 9, 1955, to Apr. 10, 1956, nonrecording gage at site 4 mi downstream at different datum. Apr. 11, 1956, to Sept. 30, 1967, non-recording gage at same site at datum 3.0 ft higher.

REMARKS.--Records fair. Flow regulated by Winnibigoshish Lake (sta 05201000), Leech Lake (sta 05206000), Pokegama Lake (sta 05210500), and Sandy Lake (sta 05218500). Water diverted at medium and high stages into Aitkin diversion channel 6.5 mi above station, bypasses station and returns to river 15.5 mi below station. Diversion began Apr. 2, 1955. These records include flow in diversion channel. Gage height telemeter and U.S. Army Corps of Engineers satellite telemeter at station.

EXTREMES FOR CURRENT YEAR.--Main channel: Maximum discharge, 4,560 ft³/s, May 17, gage height, 11.50 ft. Diversion channel: Maximum discharge, 2,460 ft³/s, May 17, gage height, 10.78 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2780	4540	e3300	e2450	e2100	e2100	e4900	4430	3650	782	3000	4070
2	2700	4390	e3200	e2400	e2100	e2100	e4750	4230	3470	758	2930	3880
3	2660	4250	e3100	e2350	e2100	e2100	e4600	3980	3310	808	2870	3530
4	2640	4140	e3000	e2300	e2100	e2100	4480	3830	3190	860	2800	3180
5	2680	4050	e2900	e2250	e2100	e2100	4180	3710	3130	1130	2690	2940
6	2760	3960	e2800	e2200	e2100	e2100	4000	3640	3120	1850	2590	2720
7	2850	3890	e2700	e2150	e2100	e2100	3850	3620	3050	2470	2550	2540
8	2930	3850	e2700	e2100	e2100	e2100	3710	3630	2920	2880	2530	2480
9	3030	3790	e2700	e2100	e2100	e2100	3580	3730	2760	3160	2540	2450
10	3110	3710	e2700	e2100	e2100	e2100	3320	3960	2710	3350	2530	2380
11	3180	3660	e2700	e2100	e2100	e2100	3010	4060	2660	3400	2530	2260
12	3200	3630	e2700	e2100	e2100	e2100	2780	3950	2570	3480	2490	2150
13	3180	3600	e2700	e2100	e2100	e2200	2700	4060	2480	3630	2500	2020
14	3150	3600	e2700	e2100	e2100	e2300	2810	5250	2390	3760	2510	1960
15	3090	3560	e2700	e2100	e2100	e2600	3080	6300	2230	3910	2540	1920
16	3090	3550	e2700	e2100	e2100	e3100	3350	6750	2070	4120	2560	1900
17	3130	3540	e2700	e2100	e2100	e3500	3520	6950	1900	4240	2480	1870
18	3370	3560	e2700	e2100	e2100	e3800	3690	6900	1760	4210	2370	1850
19	3790	3560	e2700	e2100	e2100	e4100	4020	6760	1610	4130	2350	1820
20	4210	3520	e2650	e2100	e2100	e4500	4350	6560	1460	4080	2370	1800
21	4490	3530	e2600	e2100	e2100	e4700	4620	6320	1360	4050	2400	1790
22	4670	3510	e2600	e2100	e2100	e5000	4740	6080	1310	4090	2310	1800
23	4770	3480	e2600	e2100	e2100	e5300	4750	5850	1270	4110	2210	1800
24	4840	3440	e2600	e2100	e2100	e5600	4760	5630	1250	4090	2180	1790
25	4900	3410	e2600	e2100	e2100	e6000	4870	5220	1240	4010	2240	1780
26	4910	e3200	e2600	e2100	e2100	e5900	5000	4690	1140	3860	2810	1780
27	4910	e3200	e2550	e2100	e2100	e5800	5030	4380	1030	3690	3540	1760
28	4860	e3300	e2550	e2100	e2100	e5600	5000	4230	970	3550	3970	e1750
29	4800	e3400	e2500	e2100	---	e5300	4870	4140	926	3390	4150	e2400
30	4730	e3350	e2500	e2100	---	e5150	4650	4050	829	3210	4180	e3400
31	4650	---	e2500	e2100	---	e5050	---	3880	---	3100	4140	---
TOTAL	114060	110170	84250	66500	58800	110700	122970	150770	63765	98158	85860	69770
MEAN	3679	3672	2718	2145	2100	3571	4099	4864	2125	3166	2770	2326
MAX	4910	4540	3300	2450	2100	6000	5030	6950	3650	4240	4180	4070
MIN	2640	3200	2500	2100	2100	2100	2700	3620	829	758	2180	1750
AC-FT	226200	218500	167100	131900	116600	219600	243900	299100	126500	194700	170300	138400
CFSM	.60	.60	.44	.35	.34	.58	.67	.79	.35	.52	.45	.38
IN.	.69	.67	.51	.40	.36	.67	.75	.91	.39	.59	.52	.42

e Estimated.

MISSISSIPPI RIVER MAIN STEM

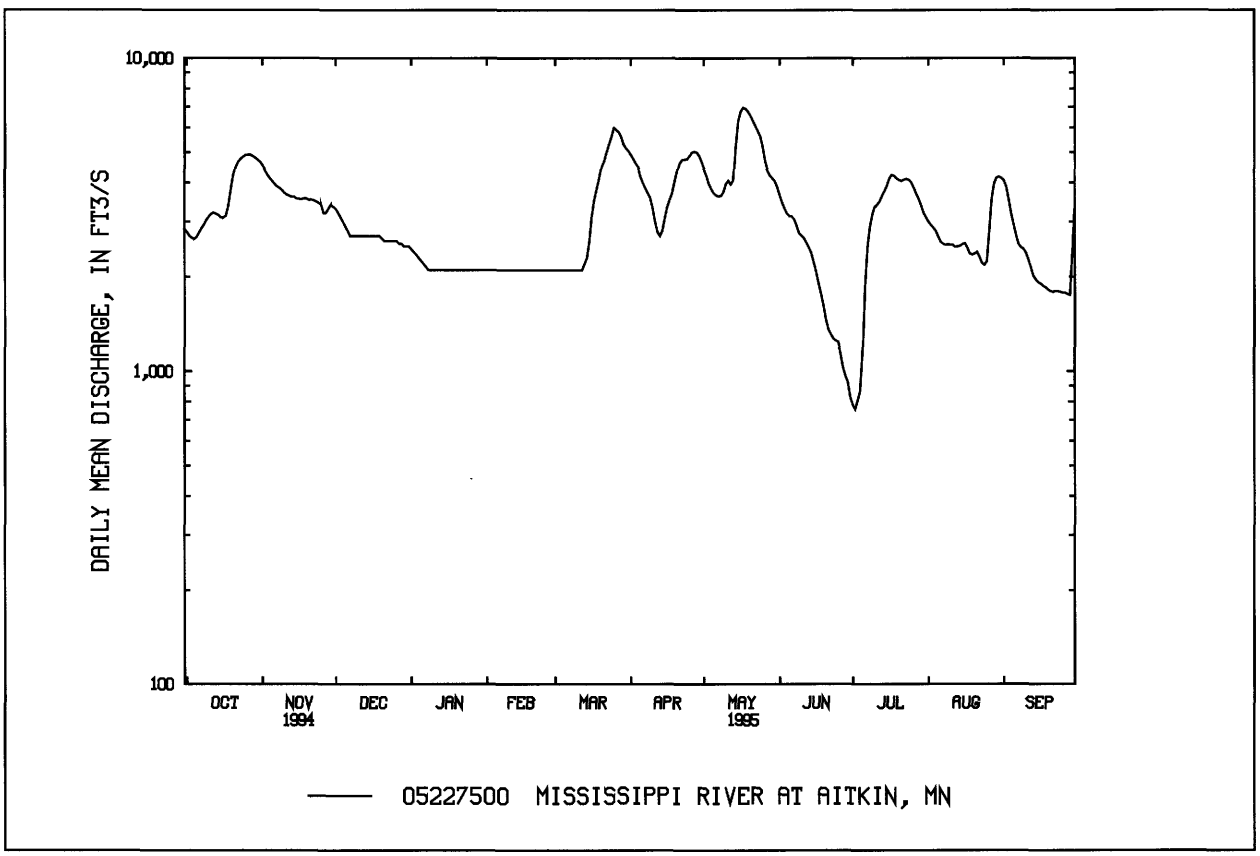
05227500 MISSISSIPPI RIVER AT AITKIN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2591	2659	2186	1910	1823	2209	5094	5228	3674	3000	2314	2238
MAX	6534	6756	3762	3525	3196	5415	10830	15510	8072	8201	8270	6689
(WY)	1966	1972	1972	1966	1966	1945	1966	1950	1965	1993	1953	1986
MIN	313	328	324	345	398	638	1074	669	539	346	273	321
(WY)	1977	1977	1977	1977	1977	1977	1977	1958	1988	1961	1961	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1945 - 1995	
ANNUAL TOTAL	1280280		1135773			
ANNUAL MEAN	3508		3112		2902	
HIGHEST ANNUAL MEAN					4985	1966
LOWEST ANNUAL MEAN					796	1977
HIGHEST DAILY MEAN	7950	May 2	6950	May 17	19900	May 20 1950
LOWEST DAILY MEAN	1710	Jun 9	758	Jul 2	153	Sep 1 1961
ANNUAL SEVEN-DAY MINIMUM	1770	Sep 1	848	Jun 28	195	Aug 26 1961
INSTANTANEOUS PEAK FLOW			6980	May 17	20000	May 20 1950
INSTANTANEOUS PEAK STAGE			12.95a	Mar 25	22.49b	May 20 1950
INSTANTANEOUS LOW FLOW			750	Jul 2	151	Sep 1 1961
ANNUAL RUNOFF (AC-FT)	2539000		2253000		2102000	
ANNUAL RUNOFF (CFSM)	.57		.51		.47	
ANNUAL RUNOFF (INCHES)	7.76		6.88		6.42	
10 PERCENT EXCEEDS	6310		4750		5770	
50 PERCENT EXCEEDS	2940		2800		2300	
90 PERCENT EXCEEDS	2100		2050		950	

a Backwater from ice.
b Present datum.



PINE RIVER BASIN

05230500 PINE RIVER RESERVOIR AT CROSS LAKE, MN

LOCATION.--Lat 46°40'09", long 94°06'44", in SW$^1/_4$NW$^1/_4$ sec.21, T.137 N., R.27 W., Crow Wing County, Hydrologic Unit 07010105, at dam on Pine River, at outlet of Cross Lake at city of Cross Lake.

DRAINAGE AREA.--562 mi^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 in mean sea level (levels by U.S. Army Corps of Engineers). Prior to May 3, 1949, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by Trout, Whitefish, Rush, and Cross Lakes and several other natural lakes controlled by timber crib dams; storage began in 1886; dam completed in 1886. Capacity between elevations 1,226.32 ft and 1,234.82 ft (maximum allowable range) is 118,703 acre-ft of which 53,272 acre-ft is controlled storage between elevations 1,226.32 ft and 1,230.32 ft (normal operating range). Contents shown herein are contents above an elevation 1,216.00 ft. Prior to September 1978, published contents as contents above elevation 1,218.67 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 173,600 acre-ft, capacity table then in use, July 10, 1916, elevation, 1,234.56 ft; minimum observed, 1,310 acre-ft, below zero of capacity table then in use, Aug. 20, 1918, elevation, 1,217.67 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 106,300 acre-ft, July 6, elevation, 1,229.68 ft; minimum, 75,620 acre-ft, Mar. 2, elevation, 1,227.39 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

Date	Elevation (feet)	Contents (acre-feet)	Change in content (acre-feet)
Sept. 30	1229.11	98500	
Oct. 31	1229.02	97280	-1220
Nov. 30	1228.46	89750	-7530
Dec. 31	1228.07	84570	-5180
CAL YR 1994			-790
Jan. 31	1227.56	77850	-6720
Feb. 28	1227.40	75750	-2100
Mar. 31	1228.24	92160	+16410
Apr. 30	1229.09	982220	+6060
May 31	1229.39	102300	+4080
June 30	1229.36	101900	-400
July 31	1229.39	102300	+400
Aug. 31	1229.44	103000	+700
Sept. 30	1229.38	102200	-800
WTR YR 1995			+3700

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MISSISSIPPI RIVER MAIN STEM

05242300 MISSISSIPPI RIVER AT BRAINERD, MN

LOCATION.--Lat 46°22'40", long 94°10'59", in SE$^1/_4$/SW$^1/_4$ sec. 18, T. 145 N., R.30 W., Crow Wing County, Hydrologic Unit 07010104, on left bank in hydro-plant of Potlach Corporation, Northwest Paper Division in Brainerd, 12.7 mi upstream from Crow Wing River, and at mile 1003.7 upstream from Ohio River.

DRAINAGE AREA.--7,320 mi^2, approximately.

PERIOD OF RECORD.--October 1987 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,146.96 ft above mean sea level.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow regulated by Winnibigoshish Lake (sta. 05201000), Leech Lake (sta. 05206000), Pokegama Lake (sta. 05210500), Sandy Lake (sta. 05218500), Pine River Reservoir at Cross Lake (sta. 05230500), and by hydro-plant in Brainerd.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3210	5500	3370	e2850	e2300	e2100	e6140	5770	4580	927	3450	5250
2	3140	5330	3720	e2800	e2300	e2100	e5900	5620	4330	1040	3470	5110
3	3160	5120	3680	e2750	e2300	e2050	e5650	5150	4100	1250	3370	4950
4	2980	5070	3730	e2700	e2250	e2050	e5350	4950	3880	1300	3290	4470
5	2960	4820	3540	e2650	e2250	e2050	5350	4700	3720	1520	3140	4030
6	3100	4780	2970	e2600	e2250	e2000	4890	4560	3740	2260	3000	3690
7	3160	4510	2960	e2600	e2250	e2000	4690	4430	3770	3030	3210	3500
8	3280	4540	3080	e2600	e2250	e2000	4530	4540	3500	3580	2980	3200
9	3350	4520	2780	e2600	e2200	e2000	4420	4470	3380	3940	2940	3240
10	3330	4430	2750	e2540	e2200	e2050	4390	4710	3230	4270	2940	3030
11	3510	4380	2840	e2550	e2200	e2100	4010	4900	3070	4200	2940	2850
12	3600	4420	e2900	e2550	e2200	e2300	3780	4820	3170	4450	2920	2760
13	3540	4300	e3000	e2600	e2150	e2550	3660	5130	2940	4510	2900	2480
14	3540	4220	e3090	e2600	e2150	e3000	3850	5700	2910	4820	2880	2400
15	3520	4290	e3050	e2600	e2150	e3240	4070	7360	2600	4770	3030	2230
16	3560	4090	e3000	e2600	e2150	e3580	4380	8230	2540	4980	2990	2360
17	3760	4300	e3050	e2600	e2150	e3770	4440	8640	2360	5320	3030	2130
18	4130	4130	e3100	e2550	e2150	e3930	4990	8690	1960	5380	2960	2270
19	4510	4350	e3150	e2500	e2150	e4040	5110	8570	2040	5140	3160	2160
20	4830	4230	e3200	e2500	e2100	e4210	5710	8420	1740	4980	2780	2210
21	5210	4220	e3200	e2450	e2100	e4390	5990	8060	1570	4890	2740	2090
22	5450	4220	e3200	e2400	e2100	e4670	6060	7590	1460	4940	2740	2090
23	5650	4230	e3200	e2400	e2100	e5230	6220	7440	1410	4840	2620	2230
24	6000	4150	e3150	e2350	e2100	e5740	6210	7010	1350	4850	3040	2090
25	5840	4150	e3150	e2350	e2100	e6440	6180	6660	1410	4840	2910	2000
26	5890	3730	e3100	e2350	e2100	e7630	6340	6100	1500	4690	3230	2130
27	5920	3090	e3100	e2350	e2100	e7410	6310	5710	1200	4510	3970	1910
28	5900	2570	e3050	e2300	e2100	e7020	6410	5270	1180	4270	4650	2010
29	5760	3180	e3050	e2300	---	e6830	6260	5030	1010	4070	5030	1940
30	5720	3180	e3000	e2300	---	e6600	6130	4950	919	3850	5180	2820
31	5690	---	e2950	e2300	---	e6370	---	4770	---	3880	5180	---
TOTAL	133200	128050	97110	78190	60900	121450	157420	187950	76569	121297	102670	85630
MEAN	4297	4268	3133	2522	2175	3918	5247	6063	2552	3913	3312	2854
MAX	6000	5500	3730	2850	2300	7630	6410	8690	4580	5380	5180	5250
MIN	2960	2570	2750	2300	2100	2000	3660	4430	919	927	2620	1910
AC-FT	264200	254000	192600	155100	120800	240900	312200	372800	151900	240600	203600	169800
CFSM	.59	.58	.43	.34	.30	.54	.72	.83	.35	.53	.45	.39
IN.	.68	.65	.49	.40	.31	.62	.80	.96	.39	.62	.52	.44

e Estimated.

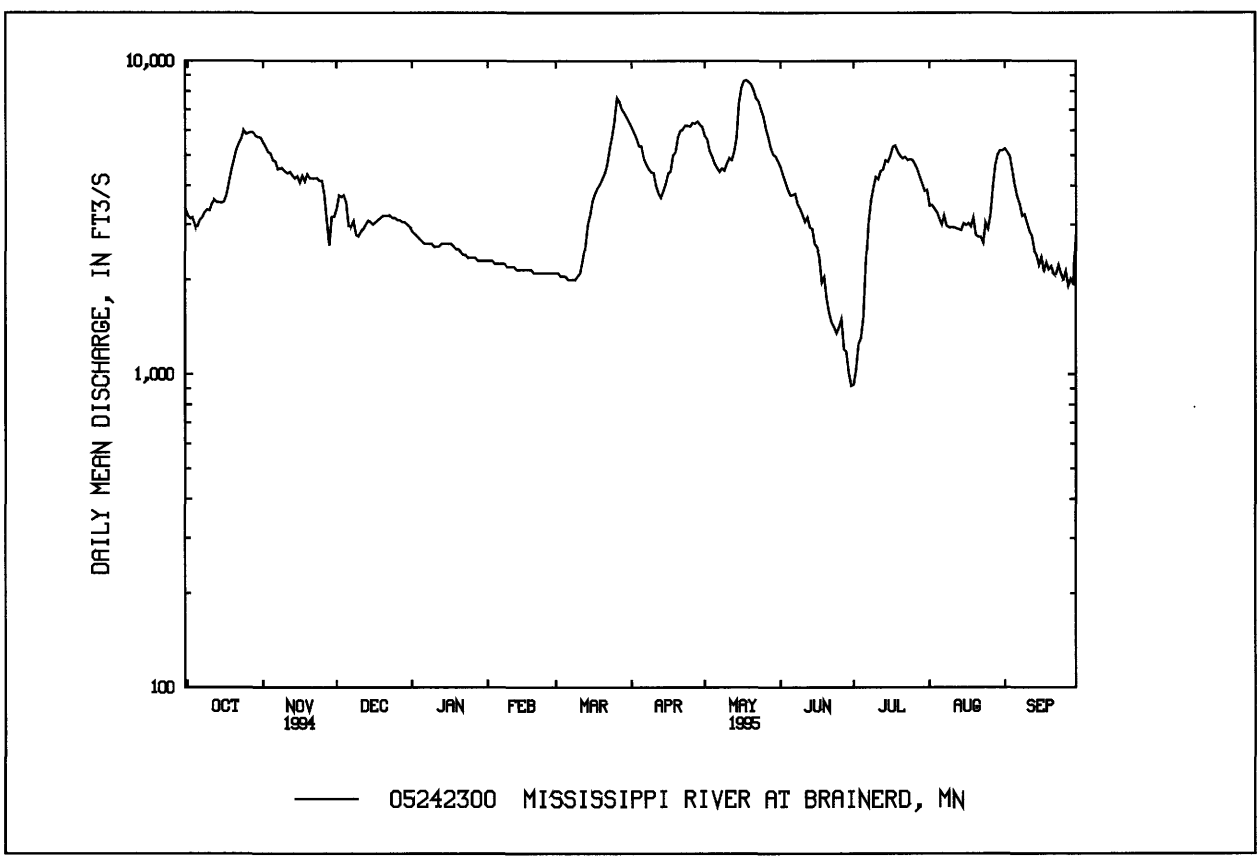
MISSISSIPPI RIVER MAIN STEM

05242300 MISSISSIPPI RIVER AT BRAINERD, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2673	2762	2387	2170	1945	2502	5157	5043	3562	3942	2247	2461
MAX	4297	4268	3545	3121	2887	3918	8601	6923	6193	10260	5071	3681
(WY)	1995	1995	1994	1994	1994	1995	1989	1989	1990	1993	1993	1993
MIN	1840	1931	1362	1140	1040	1435	3400	1928	662	442	935	1166
(WY)	1992	1993	1991	1991	1991	1991	1990	1988	1988	1988	1990	1990

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1987 - 1995	
ANNUAL TOTAL	1542630		1350436			
ANNUAL MEAN	4226		3700		3125	
HIGHEST ANNUAL MEAN					4084	1994
LOWEST ANNUAL MEAN					1950	1988
HIGHEST DAILY MEAN	10200	May 2	8690	May 18	12100	Jul 11-13 1993
LOWEST DAILY MEAN	1810	Jun 10	919	Jun 30	348	Jul 30 1988
ANNUAL SEVEN-DAY MINIMUM	2040	Aug 31	1080	Jun 27	357	Jul 29 1988
INSTANTANEOUS PEAK FLOW			8880	May 17	12200	Jul 10 1993
INSTANTANEOUS PEAK STAGE			11.20	May 17	13.65	Jul 10 1993
INSTANTANEOUS LOW FLOW			850	Jun 30	273	Jul 12 1988
ANNUAL RUNOFF (AC-FT)	3060000		2679000		2264000	
ANNUAL RUNOFF (CFSM)	.58		.51		.43	
ANNUAL RUNOFF (INCHES)	7.84		6.86		5.80	
10 PERCENT EXCEEDS	7500		5800		5460	
50 PERCENT EXCEEDS	3420		3240		2520	
90 PERCENT EXCEEDS	2540		2100		1220	



CROW WING RIVER BASIN

05243725 STRAIGHT RIVER NEAR PARK RAPIDS, MN

LOCATION.--Lat 46°52'30", long 95°03'56", in NW¼NE¼ sec. 11, T. 139 N., R. 35 W., Hubbard County, Hydrologic Unit 07010106, upstream from culvert on U.S. Highway 71 3.2 mi south of Park Rapids.

DRAINAGE AREA.--53.2 mi².

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1970-71, 1973, 1975-76. October 1986 to current year (no winter records in 1987, 1990-91). Records of hourly water temperature, available in files of the Geological Survey.

GAGE.--Water-stage recorder. Elevation of gage is 1,400 ft above mean sea level, from topographic map.

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

EXTREMES OUTSIDE PERIOD OF RECORD.--A discharge of 35 ft³/s was measured Aug. 4, 1976.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	62	68	e81	e66	e64	e66	77	69	59	56	52	73
2	62	68	e80	e66	e64	e66	76	68	59	56	51	70
3	66	67	e80	e65	e64	e66	77	68	59	65	52	66
4	69	67	e80	e65	e64	e66	74	67	58	64	52	64
5	70	67	e80	e65	e64	e66	74	71	58	64	51	63
6	69	67	e79	e65	e64	e66	73	73	58	63	55	66
7	70	68	e79	e65	e64	e66	72	72	60	60	59	65
8	71	68	e79	e64	e64	e66	73	72	59	60	70	65
9	74	68	e78	e64	e64	e67	71	77	58	58	87	66
10	72	68	e78	e64	e64	e68	71	78	58	56	80	64
11	69	68	e77	e64	e64	e71	71	77	57	55	72	63
12	67	67	e77	e64	e64	e77	72	73	56	55	67	62
13	66	71	e77	e64	e64	e81	74	73	55	55	65	61
14	66	72	e76	e64	e64	e85	74	77	54	58	65	62
15	67	72	e76	e64	e64	e90	75	75	53	58	63	61
16	74	72	e75	e64	e65	e91	75	72	51	57	60	63
17	79	71	e75	e64	e65	e92	75	71	50	56	58	62
18	84	74	e74	e64	e65	e90	74	72	50	55	57	62
19	87	77	e74	e64	e65	e88	74	71	49	57	59	60
20	83	77	e73	e64	e65	e85	73	70	49	59	58	61
21	82	81	e72	e64	e65	81	73	68	48	62	56	61
22	80	69	e72	e64	e65	78	72	66	47	63	55	61
23	78	88	e71	e64	e65	77	73	66	47	60	55	61
24	76	79	e70	e64	e65	75	74	64	47	59	67	61
25	74	75	e70	e64	e66	74	72	64	48	57	81	61
26	72	68	e69	e64	e66	77	72	64	49	56	91	61
27	71	78	e69	e64	e66	81	71	64	49	54	95	61
28	70	75	e68	e64	e66	85	70	64	49	56	93	62
29	70	79	e68	e64	---	82	69	63	55	53	88	64
30	70	e80	e67	e64	---	80	69	62	59	52	84	73
31	68	---	e67	e64	---	78	---	61	---	53	78	---
TOTAL	2238	2169	2311	1993	1809	2381	2190	2152	1608	1792	2076	1905
MEAN	72.2	72.3	74.5	64.3	64.6	76.8	73.0	69.4	53.6	57.8	67.0	63.5
MAX	87	88	81	66	66	92	77	78	60	65	95	73
MIN	62	67	67	64	64	66	69	61	47	52	51	60
AC-FT	4440	4300	4580	3950	3590	4720	4340	4270	3190	3550	4120	3780
CFSM	1.36	1.36	1.40	1.21	1.21	1.44	1.37	1.30	1.01	1.09	1.26	1.19
IN.1	.56	1.52	1.62	1.39	1.26	1.66	1.53	1.50	1.12	1.25	1.45	1.33

e Estimated.

CROW WING RIVER BASIN

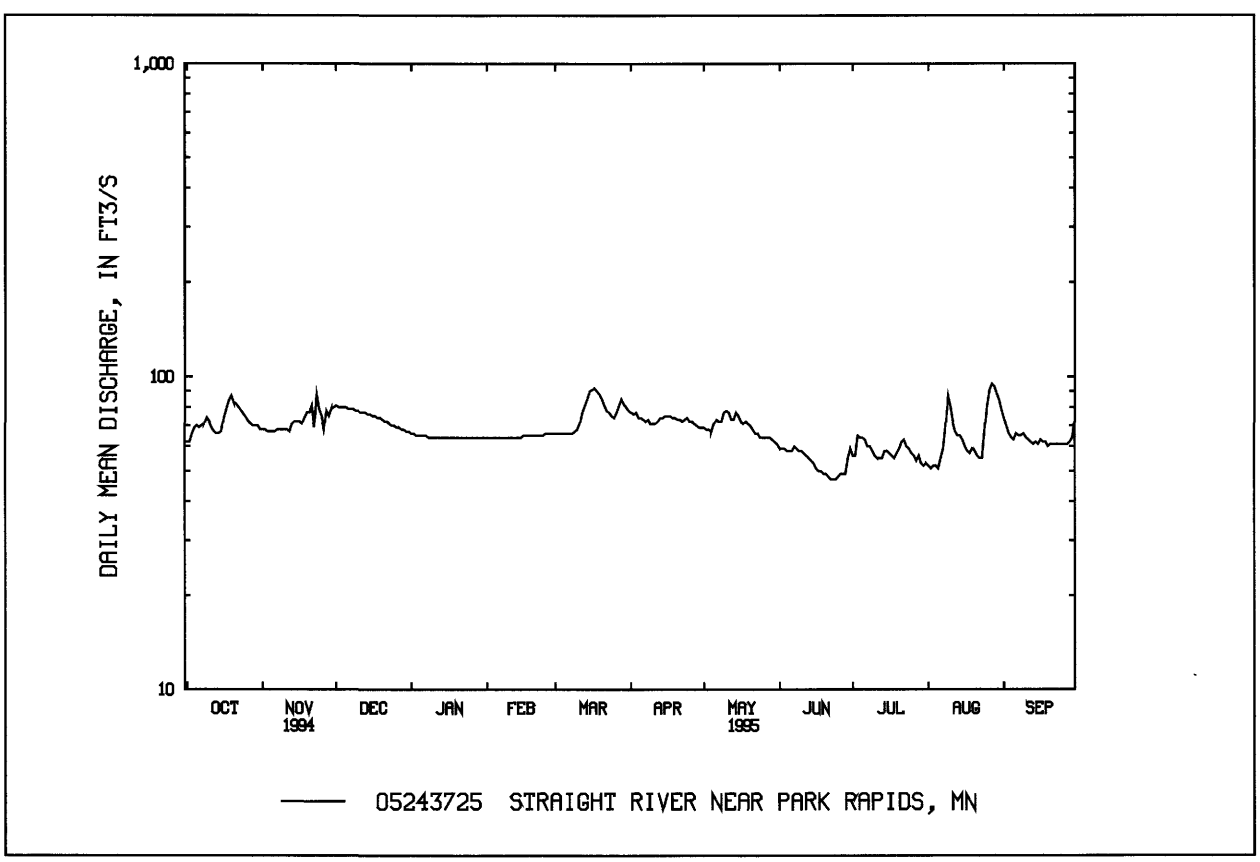
05243725 STRAIGHT RIVER NEAR PARK RAPIDS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	56.5	58.6	55.2	48.5	50.3	61.7	65.9	61.8	54.8	53.4	51.3	55.1
MAX	73.6	72.7	74.5	64.3	64.6	76.8	77.7	69.4	68.8	70.5	74.7	73.6
(WY)	1987	1994	1995	1995	1995	1995	1994	1995	1994	1993	1993	1993
MIN	42.2	47.4	46.0	41.9	44.8	50.9	56.1	46.2	41.9	39.5	35.9	38.7
(WY)	1993	1989	1989	1992	1992	1989	1991	1992	1992	1988	1990	1990

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1987 - 1995	
ANNUAL TOTAL	24350		24624			
ANNUAL MEAN	66.7		67.5		56.9	
HIGHEST ANNUAL MEAN					67.5	1995
LOWEST ANNUAL MEAN					48.0	1992
HIGHEST DAILY MEAN	88	Nov 23	95	Aug 27	95	Aug 27 1995
LOWEST DAILY MEAN	50	Jan 15	47	Jun 22-24	28	Jan 9 1992
ANNUAL SEVEN-DAY MINIMUM	50	Jan 24	48	Jun 19	34	Aug 5 1990
INSTANTANEOUS PEAK FLOW			106	Mar 27	106	Mar 27 1995
INSTANTANEOUS PEAK STAGE			2.80a	Jan 4	2.84b	Mar 6 1994
INSTANTANEOUS LOW FLOW			44	Jun 21	25c	Jan 9 1992
ANNUAL RUNOFF (AC-FT)	48300		48840		41240	
ANNUAL RUNOFF (CFSM)	1.25		1.27		1.07	
ANNUAL RUNOFF (INCHES)	17.03		17.22		14.54	
10 PERCENT EXCEEDS	80		79		74	
50 PERCENT EXCEEDS	68		66		54	
90 PERCENT EXCEEDS	51		56		42	

a Maximum observed, backwater from ice.
b From floodmark, backwater from ice.
c Result of freezeup.



CROW WING RIVER BASIN

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 upstream from highway bridge, 0.2 mi north of Nimrod, and 0.7 mi upstream from Cat River.

DRAINAGE AREA.--1,010 mi² (2,620 km²), approximately.

PERIOD OF RECORD.--April 1910 to September 1914, July 1930 to September 1981, October 1991 to current year (winter records incomplete prior to 1940). October 1981 to September 1987, annual maximums only.

REVISED RECORDS.--WSP 1508: 1910-11, 1913-14, 1937, 1942(M), 1944(M).

GAGE.--Water-stage recorder. Datum of gage is 1,313.27 ft above sea level (levels by Wadena County Highway Department from Minnesota Department of Transportation bench mark). Apr. 15, 1910, to Sept. 30, 1914, nonrecording gage at same site, at datum 2.2 ft lower. July 28, 1930, to Nov. 4, 1949, nonrecording gages at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow affected by natural storage in many lakes.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	434	595	e430	e390	e380	e385	843	616	532	258	298	678
2	424	591	e420	e390	e380	e390	868	617	523	291	285	684
3	470	573	e420	e390	e380	e390	923	611	514	424	282	691
4	485	552	e420	e390	e380	e390	902	604	497	428	280	676
5	485	531	e420	e390	e380	e395	853	605	491	522	270	649
6	487	514	e420	e390	e380	e395	825	601	499	582	269	628
7	505	497	e420	e390	e380	e395	817	602	489	565	303	605
8	568	492	e420	e390	e380	e395	808	598	491	532	283	583
9	545	485	e420	e390	e380	e395	792	639	485	507	297	564
10	504	488	e420	e380	e380	e395	772	673	509	478	280	545
11	488	496	e420	e380	e380	e400	758	672	503	455	279	528
12	475	503	e420	e380	e380	e430	761	683	468	449	286	514
13	462	529	e420	e380	e380	e500	775	731	439	461	296	500
14	452	531	e420	e380	e380	e800	832	855	430	478	299	488
15	443	533	e420	e380	e380	e1050	847	849	414	475	290	486
16	538	537	e420	e380	e380	e1250	846	818	393	462	279	476
17	586	544	e420	e380	e380	e1340	805	787	372	490	279	457
18	661	589	e420	e380	e380	e1400	781	764	347	490	277	435
19	713	585	e420	e380	e380	e1460	796	749	317	487	277	422
20	717	585	e420	e380	e380	e1520	792	737	296	484	264	422
21	697	616	e420	e380	e380	1540	800	717	285	483	258	417
22	689	e560	e420	e380	e380	1010	799	696	277	503	256	413
23	690	e560	e420	e380	e380	925	799	680	278	489	253	391
24	686	e580	e420	e380	e380	861	811	658	268	482	360	370
25	683	e590	e420	e380	e380	814	768	653	260	468	547	354
26	677	e540	e410	e380	e380	811	728	629	257	440	688	342
27	663	e510	e410	e380	e380	847	706	611	250	413	710	328
28	646	e485	e410	e380	e380	850	692	596	255	388	655	317
29	607	e460	e410	e380	---	824	662	575	264	353	648	309
30	574	e440	e400	e380	---	804	627	546	260	328	655	378
31	583	---	e400	e380	---	821	---	536	---	315	659	---
TOTAL	17637	16091	12950	11870	10640	24182	23788	20708	11663	13980	11362	14650
MEAN	569	536	418	383	380	780	793	668	389	451	367	488
MAX	717	616	430	390	380	1540	923	855	532	582	710	691
MIN	424	440	400	380	380	385	627	536	250	258	253	309
AC-FT	34980	31920	25690	23540	21100	47960	47180	41070	23130	27730	22540	29060
CFSM	.56	.53	.41	.38	.38	.77	.79	.66	.38	.45	.36	.48

e Estimated.

CROW WING RIVER BASIN

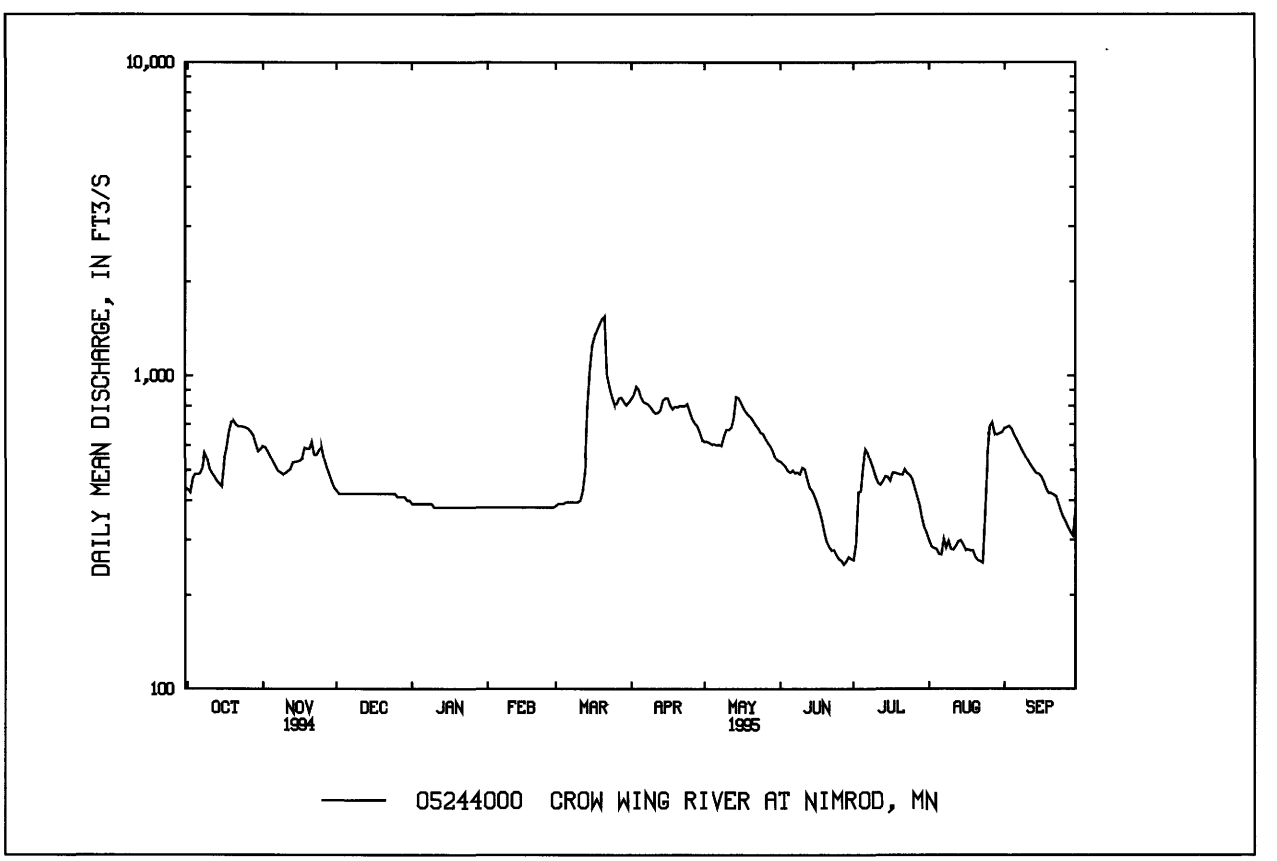
05244000 CROW WING RIVER AT NIMROD, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	403	393	331	292	295	400	742	663	571	434	373	383
MAX	1463	871	596	462	456	780	1624	1615	1354	956	1452	929
(WY)	1974	1972	1952	1966	1966	1995	1966	1950	1965	1949	1944	1944
MIN	137	146	131	125	170	171	202	181	149	84.0	74.3	131
(WY)	1937	1937	1940	1940	1940	1940	1911	1911	1934	1936	1936	1934

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1910 - 1995		
ANNUAL TOTAL	202689		189521				
ANNUAL MEAN	555		519		471		
HIGHEST ANNUAL MEAN					719		1966
LOWEST ANNUAL MEAN					230		1940
HIGHEST DAILY MEAN	1060	May 1	1540	Mar 21	3580	Oct 10	1973
LOWEST DAILY MEAN	297	Sep 10	250	Jun 27	45	Aug 7	1936
ANNUAL SEVEN-DAY MINIMUM	316	Sep 6	258	Jun 25	55	Aug 3	1936
INSTANTANEOUS PEAK FLOW			1900	Mar 21	3700	Oct 10	1973
INSTANTANEOUS PEAK STAGE			6.15a	Mar 19	7.64a	Apr 20	1950
INSTANTANEOUS LOW FLOW			242	Jun 28	45	Aug 7	1936
ANNUAL RUNOFF (AC-FT)	402000		375900		341400		
ANNUAL RUNOFF (CFSM)	.55		.51		.47		
10 PERCENT EXCEEDS	841		799		788		
50 PERCENT EXCEEDS	504		475		374		
90 PERCENT EXCEEDS	339		307		198		

a Backwater from ice.



CROW WING RIVER BASIN

05245100 LONG PRAIRIE RIVER AT LONG PRAIRIE, MN

LOCATION.--Lat 45°58'30", long 94°51'56", in NE¼NW¼ sec. 20, T. 129 N., R. 33 W., Todd County, Hydrologic Unit 07010108, on right bank 90 ft upstream from bridge on First Avenue at Long Prairie and 400 ft downstream from Venewitz Creek.

DRAINAGE AREA.--432 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 1,281.74 ft above mean sea level.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	56	117	88	e55	e53	e52	395	308	283	163	175	241
2	54	125	80	e54	e53	e54	368	299	280	162	176	235
3	72	110	84	e53	e52	e57	337	288	269	197	172	223
4	79	103	83	e54	e51	e69	303	281	262	292	169	210
5	81	97	e70	e55	e50	e75	267	275	260	320	165	204
6	84	89	e65	e56	e49	e84	281	270	283	342	168	201
7	85	84	61	e56	e48	e94	263	270	325	343	179	193
8	86	81	61	e56	e48	e108	245	270	336	346	178	180
9	85	78	60	e55	e48	121	234	287	334	347	183	175
10	81	76	61	e55	e49	128	224	308	359	352	183	173
11	76	73	65	e55	e50	137	220	323	374	351	204	169
12	69	72	66	e55	e52	152	226	331	379	349	241	166
13	65	77	e63	e54	e52	336	238	350	373	314	270	164
14	62	77	e60	e54	e52	e620	267	394	360	281	293	157
15	61	74	e55	e54	e52	e641	306	435	339	267	305	158
16	88	73	e52	e53	e52	648	339	463	288	258	334	160
17	115	73	e54	e52	e53	675	357	477	255	239	342	154
18	186	86	e55	e51	e54	888	379	488	229	234	359	149
19	213	82	e58	e50	e54	926	402	501	214	233	361	150
20	224	82	e59	e50	e54	860	414	463	202	236	346	145
21	222	87	e60	e52	e54	764	421	428	189	227	338	146
22	201	e84	e61	e53	e53	658	429	394	184	216	319	145
23	179	e82	e62	e54	e52	562	427	361	191	213	288	145
24	163	84	e62	e54	e51	464	423	335	190	211	295	145
25	152	e85	e62	e54	e50	391	398	316	180	198	304	137
26	142	91	e61	e54	e50	357	379	306	176	188	294	133
27	134	e85	e60	e54	e50	351	363	298	173	183	275	125
28	129	e80	e60	e54	e51	367	355	314	170	184	262	119
29	127	e80	e60	e53	---	391	335	310	165	174	254	123
30	121	85	e59	e53	---	405	319	304	162	166	249	222
31	126	---	e57	e54	---	407	---	297	---	177	246	---
TOTAL	3618	2572	1964	1666	1437	11842	9914	10744	7784	7763	7927	5047
MEAN	117	85.7	63.4	53.7	51.3	382	330	347	259	250	256	168
MAX	224	125	88	56	54	926	429	501	379	352	361	241
MIN	54	72	52	50	48	52	220	270	162	162	165	119
AC-FT	7180	5100	3900	3300	2850	23490	19660	21310	15440	15400	15720	10010
CFSM	.27	.20	.15	.12	.12	.88	.76	.80	.60	.58	.59	.39

e Estimated.

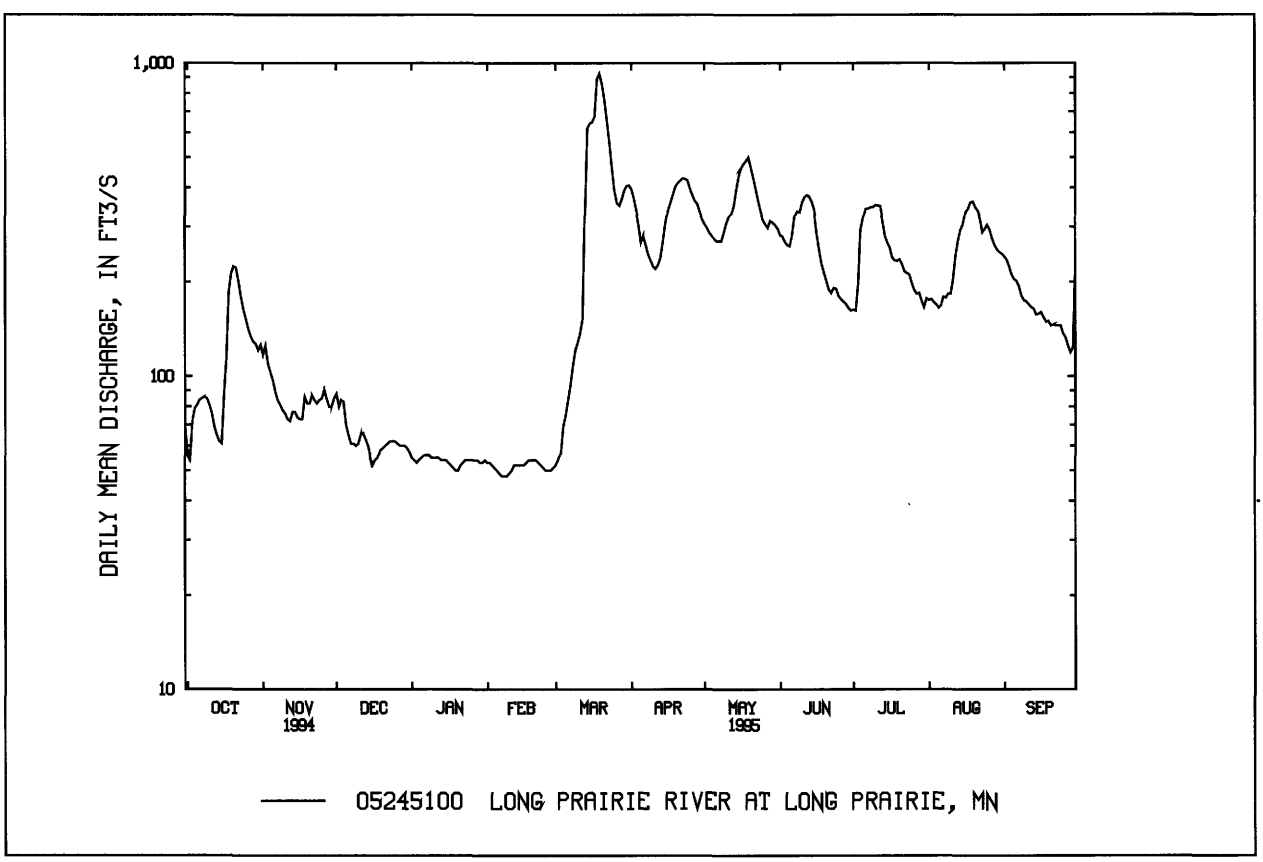
CROW WING RIVER BASIN

05245100 LONG PRAIRIE RIVER AT LONG PRAIRIE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	123	112	72.0	58.1	57.4	179	343	254	208	187	139	122
MAX	512	425	270	217	208	441	748	653	422	777	715	607
(WY)	1987	1972	1987	1987	1987	1985	1986	1986	1985	1972	1972	1986
MIN	13.4	8.69	3.19	1.05	1.62	19.8	71.8	45.5	27.5	4.73	10.0	5.32
(WY)	1977	1977	1977	1977	1977	1989	1977	1977	1988	1988	1989	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1972 - 1995	
ANNUAL TOTAL	64660		72278			
ANNUAL MEAN	177		198		155	
HIGHEST ANNUAL MEAN					366	1972
LOWEST ANNUAL MEAN					25.2	1977
HIGHEST DAILY MEAN	885	May 1	926	Mar 19	2900	Jul 22 1972
LOWEST DAILY MEAN	52	Dec 16	48	Feb 7-9	.84	Jan 12 1977
ANNUAL SEVEN-DAY MINIMUM	56	Dec 14	49	Feb 5	.84	Jan 12 1977
INSTANTANEOUS PEAK FLOW			1040	Mar 18	3270	Jul 22 1972
INSTANTANEOUS PEAK STAGE			6.31	Mar 18	9.37	Jul 22 1972
INSTANTANEOUS LOW FLOW					.84	Jan 12 1977
ANNUAL RUNOFF (AC-FT)	128300		143400		112000	
ANNUAL RUNOFF (CFSM)	.41		.46		.36	
10 PERCENT EXCEEDS	412		373		361	
50 PERCENT EXCEEDS	100		169		93	
90 PERCENT EXCEEDS	72		54		23	



CROW WING RIVER BASIN

05246500 GULL LAKE NEAR BRAINERD, MN

LOCATION.--Lat 46°24'40", long 94°21'26", in NE¼ sec. 20, T. 134 N., R. 29 W., Cass County, Hydrologic Unit 07010106, in pool of dam on Gull River, 800 ft south of outlet of Gull Lake, 0.2 mi upstream from Gull Lake Dam, and 8 mi northwest of Brainerd.

DRAINAGE AREA.--287 mi².

PERIOD OF RECORD.--August 1911 to current year. Prior to October 1941 monthend contents only, published in WSP 1308. Published as Gull Lake Reservoir October 1941 to September 1956.

GAGE.--Water-stage recorder. Datum of gage is in mean sea level (levels by U.S. Army Corps of Engineers). Prior to Aug. 10, 1949, nonrecording gage 800 ft north of present site at same datum. Aug. 11, 1949, to June 30, 1973, water-stage recorder at present site and at datum 1,188.14 ft, adjustment of 1912.

REMARKS.--Reservoir is formed by Gull Lake and several other natural lakes controlled by concrete dam completed in 1913; storage began in 1912. Capacity between elevation 1,192.75 ft and 1,194.75 ft (maximum allowable range and normal operating range) is 26,008 acre-ft. Contents shown herein are contents above elevation 1,188.00 ft. Prior to September 1978, published contents as contents above elevation 1,188.75 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 74,800 acre-ft, capacity table then in use, June 30, 1914, elevation, 1,195.05 ft; minimum observed, 22,250 acre-ft, capacity table then in use, Mar. 20, 1924, elevation. 1,190.75 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 65,200 acre-ft, Aug. 9, elevation, 1,194.32 ft; minimum, 49,340 acre-ft, Feb. 12, elevation, 1,193.10.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1193.84	58940	
Oct. 31	1193.96	60500	+1560
Nov. 30	1193.62	56070	-4430
Dec. 31	1193.35	52580	-3490
CAL YR 1994			+250
Jan. 31	1193.17	50250	-2330
Feb. 28	1193.11	49470	-780
Mar. 31	1193.67	56720	+7250
Apr. 30	1193.82	58680	+1960
May 31	1194.00	61020	+2340
June 30	1193.94	60240	-780
July 31	1194.03	61420	+1180
Aug. 31	1194.14	62850	+1430
Sept. 30	1194.03	61420	-1430
WTR YR 1995			-+2480

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CROW WING RIVER BASIN

05247500 CROW WING RIVER NEAR PILLAGER, MN

LOCATION.--Lat 46°18'18", long 94°22'38", in SW¼NE¼ sec. 30, T. 133 N., R. 29 W., Cass County, Hydrologic Unit 07010106, at Sylvan dam powerplant of Minnesota Power Co., 3.6 mi above mouth and 4.9 mi southeast of Pillager.

DRAINAGE AREA.--3,520 mi², approximately,

PERIOD OF RECORD.--October 1968 to September 1986, October 1987 to current year. Records for August 1924 to September 1968 available in files of the Minnesota District Office.

GAGE.--Water stage recorder. Datum of gage is 1,151.00 ft, adjustment of 1912. Prior to January 16, 1991, staff gage attached to retaining wall approximately 20 ft below the turbine outlet bays. Datum of staff gage is 1,150.00 ft, adjustment of 1912.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Discharge computed on the basis of powerplant records prior to January 16, 1991. Records for Oct. 1, 1968 to Sept. 30, 1975, were adjusted for storage change in the Sylvan dam reservoir. Flow partly regulated by powerplants and Gull Lake (station 05246500).

COOPERATION.--Records collected by Minnesota Power Company prior to February 1991, in connection with a Federal Power Commision project.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum daily discharge since 1924, 18,300 ft³/s, Apr. 14, 1965.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	712	1560	1040	1020	860	811	2440	2710	1870	663	1080	2630
2	632	1640	1110	1040	919	810	3300	2460	1680	671	869	2450
3	760	1710	1260	979	831	794	3310	2380	1720	1020	925	2390
4	858	1630	1260	953	895	796	3350	2400	1720	1500	992	2200
5	930	1550	1500	843	868	881	3260	2360	1580	1960	996	2110
6	937	1460	1410	792	861	795	3140	2240	1580	2600	832	2020
7	949	1290	967	847	891	780	3080	2200	1560	2700	1380	1760
8	1020	1260	961	805	811	802	2990	2250	1520	2820	1450	1790
9	1040	1420	1010	833	819	744	2860	2700	1490	2660	1750	1660
10	1080	1330	1110	814	857	724	2750	2750	1480	2380	2150	1570
11	994	1270	1110	749	846	791	2690	2870	1470	2130	2440	1520
12	970	1260	1080	847	827	803	2770	2820	1470	2170	2640	1240
13	928	1310	1050	851	808	1380	2780	2870	1480	1820	2590	1260
14	880	1340	1050	880	752	2480	2780	3530	1410	1990	2600	1280
15	933	1330	1050	897	843	3060	3410	4210	1140	1930	2550	1200
16	1130	1370	1020	877	768	e3400	3380	3860	1310	1970	2360	1250
17	1360	1350	986	918	748	e4400	3530	3870	1170	1790	2200	1210
18	2530	1560	1090	941	777	e5100	3510	3700	1020	1990	2130	1250
19	2740	1590	1060	944	792	e6600	3850	3750	1030	1760	2450	1210
20	2740	1210	1060	933	683	e5600	4080	3540	1030	1690	2140	1020
21	2790	1600	1100	893	792	e5200	4180	3100	885	1560	2190	1020
22	2810	1550	1090	891	824	e3400	3990	3090	832	1500	1930	995
23	2650	1240	1090	961	748	e2200	3840	2910	729	1400	1780	999
24	2590	1220	1090	907	785	e3500	3870	2770	678	1310	1930	1060
25	2570	1340	1080	905	804	e4300	3750	2600	655	1310	2480	984
26	2370	1260	1080	933	803	e3900	3520	2570	679	1320	2940	917
27	2130	986	1080	945	797	e3600	3460	2460	733	1280	3300	1020
28	1980	984	1080	866	806	e3400	3310	2440	742	1150	3380	1020
29	1980	1070	1090	890	---	e4800	3150	2320	687	1020	3370	872
30	1840	1130	1130	869	---	4450	2880	2140	671	1040	3020	1630
31	1690	---	1110	895	---	3160	---	1960	---	1230	2970	---
TOTAL	49523	40820	34204	27718	22815	83461	99210	87830	36021	52334	65814	43537
MEAN	1598	1361	1103	894	815	2692	3307	2833	1201	1688	2123	1451
MAX	2810	1710	1500	1040	919	6600	4180	4210	1870	2820	3380	2630
MIN	632	984	961	749	683	724	2440	1960	655	663	832	872
AC-FT	98230	80970	67840	54980	45250	165500	196800	174200	71450	103800	130500	86360
CFSM	.48	.41	.33	.27	.25	.82	1.00	.86	.36	.51	.64	.44
IN.	.56	.46	.39	.31	.26	.94	1.12	.99	.41	.59	.74	.49

e Estimated.

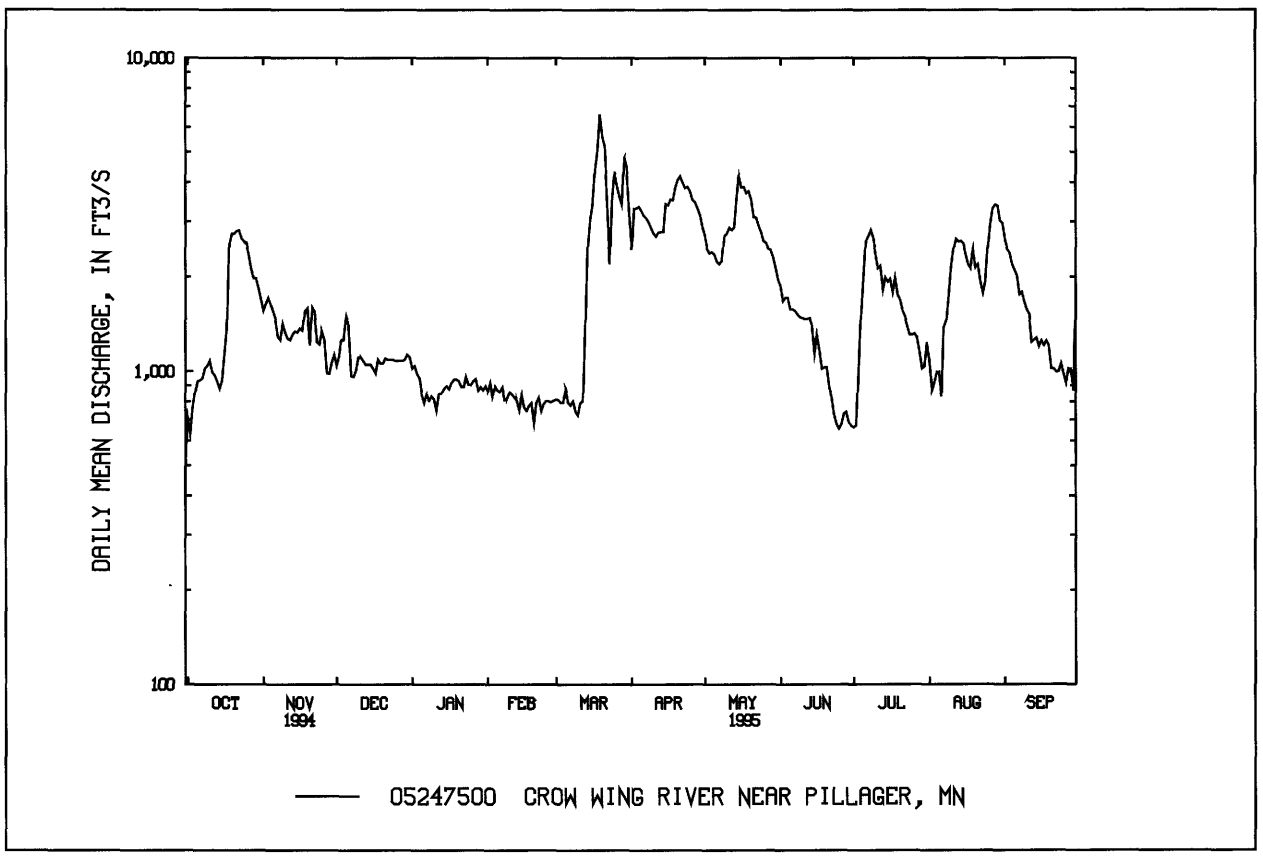
CROW WING RIVER BASIN

05247500 CROW WING RIVER NEAR PILLAGER, MN

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1969 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1154	1143	789	648	649	1344	3083	2303	1609	1343	964	915
MAX	3771	3674	1544	1188	1125	2996	7429	5671	3625	3295	3520	3309
(WY)	1974	1972	1972	1986	1986	1972	1969	1986	1993	1972	1972	1986
MIN	215	215	199	218	255	548	882	545	447	206	120	161
(WY)	1977	1977	1977	1977	1977	1981	1981	1977	1988	1988	1976	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1969 - 1995	
ANNUAL TOTAL	598096		643287			
ANNUAL MEAN	1639		1762		1330	
HIGHEST ANNUAL MEAN					2564	1972
LOWEST ANNUAL MEAN					446	1977
HIGHEST DAILY MEAN	6260	May 3	6600	Mar 19	16600	Apr 12 1969
LOWEST DAILY MEAN	527	Sep 30	632	Oct 2	60	Aug 10 1976
ANNUAL SEVEN-DAY MINIMUM	630	Sep 26	690	Jun 25	68	Aug 9 1976
ANNUAL RUNOFF (AC-FT)	1186000		1276000		963500	
ANNUAL RUNOFF (CFSM)	.50		.53		.40	
ANNUAL RUNOFF (INCHES)	6.74		7.25		5.48	
10 PERCENT EXCEEDS	3840		3360		2820	
50 PERCENT EXCEEDS	1110		1340		878	
90 PERCENT EXCEEDS	818		805		416	



MISSISSIPPI RIVER MAIN STEM

05261000 MISSISSIPPI RIVER NEAR FORT RIPLEY, MN

LOCATION.--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, 1.0 mile north of Fort Ripley, and a mile 982.1 upstream from Ohio River.

DRAINAGE AREA.--11,010 mi², approximately.

PERIOD OF RECORD.--June 1987 to current year. Operated as high-flow partial-record station October 1971 to June 1987. Prior to Oct. 1971 stage records collected by U.S. Weather Service.

GAGE.--Water-stage recorder. Datum of gage is 1,133.84 above sea level. Aug. 1904 to June 1987 nonrecording gages at different datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow partly regulated by powerplants and Winnibigoshish, Leech, Pokegama, Sandy, and Gull Lakes and by Pine River Reservoir (see stations 05201000, 05206000, 05210500, 05218500, 05230500, 05246500).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4380	7030	e4900	e3850	e3100	e2650	8790	8310	6540	1970	4980	8120
2	4290	6960	4810	e3800	e3100	e2650	9530	7890	6280	1930	4530	7620
3	4480	6730	e4750	e3750	e3050	e2600	9560	7550	5960	2070	4350	7460
4	4410	6670	e4700	e3700	e3050	e2600	9110	7270	5790	2630	4410	6890
5	4390	6420	e4700	e3650	e3000	e2600	8580	7060	5540	3450	4240	6240
6	4510	6280	e4600	e3600	e3000	e2600	8260	6860	5430	4650	4080	5830
7	4540	5930	e4300	e3600	e3000	e2600	7730	6610	5520	5540	4020	5340
8	4570	5790	e4000	e3550	e3000	e2600	7570	6670	5340	6420	4690	4940
9	4750	5930	e3800	e3500	e3000	e2600	7270	7230	5190	6730	4450	5180
10	4660	5870	e3500	e3500	e2950	e2650	7100	7340	5080	6730	4880	4590
11	4810	5680	e3600	e3500	e2950	e2700	6730	7670	4900	6640	5220	4350
12	4810	5720	e3800	e3480	e2900	e2800	6570	7700	4880	6710	5380	3900
13	4780	5720	e4000	e3500	e2900	e4000	6420	7800	4870	6580	5440	3700
14	4640	5580	e4000	e3500	e2900	e6500	6110	9180	4690	6800	5440	3410
15	4690	5670	e4000	e3500	e2900	e7300	6930	11500	4300	6860	5540	3330
16	4920	5600	e4050	e3450	e2850	e8000	7250	12400	4120	6980	5460	3250
17	5220	5630	e4100	e3450	e2850	e9100	7740	13100	3960	7120	5260	3090
18	6660	5650	e4150	e3450	e2800	e10000	7930	13100	3490	7460	5100	3150
19	7190	6030	e4200	e3400	e2800	e11600	8650	12700	3320	9640	5380	3130
20	7720	5550	e4250	e3350	e2800	e10800	9430	12200	3160	6930	5140	2810
21	8010	5740	e4300	e3300	e2800	e10600	9980	11500	2860	6660	4900	2770
22	8360	5870	e4300	e3300	e2750	e10600	10200	11000	2660	6560	4770	2540
23	8380	5580	e4300	e3300	e2750	e11000	9900	10400	2600	6460	4430	2630
24	8610	5430	e4250	e3250	e2700	11200	9880	9820	2320	6320	4630	2690
25	8270	5520	e4200	e3250	e2700	11300	9880	9320	2380	6300	5260	2470
26	8260	5340	e4150	e3250	e2700	12300	9560	8700	2380	6170	5830	2500
27	7890	4550	e4150	e3250	e2700	12300	9480	8230	2380	6110	6520	2430
28	7790	3960	e4000	e3200	e2650	11200	9430	7800	2250	5790	7530	2480
29	7670	4600	e4000	e3200	---	11200	9110	7410	2180	5380	8000	2360
30	7460	e4700	e3950	e3200	---	11200	8730	7180	1960	5160	8220	3310
31	7320	---	e3900	e3150	---	9980	---	6910	---	5200	8190	---
TOTAL	188440	171730	129710	106730	80650	221830	253410	278410	122330	179950	166270	122510
MEAN	6079	5724	4184	3443	2880	7156	8447	8981	4078	5805	5364	4084
MAX	8610	7030	4900	3850	3100	12300	10200	13100	6540	9640	8220	8120
MIN	4290	3960	3500	3150	2650	2600	6110	6610	1960	1930	4020	2360
AC-FT	373800	340600	257300	211700	160000	440000	502600	552200	242600	356900	329800	243000
CFSM	.55	.52	.38	.31	.26	.65	.77	.82	.37	.53	.49	.37

e Estimated.

MISSISSIPPI RIVER MAIN STEM

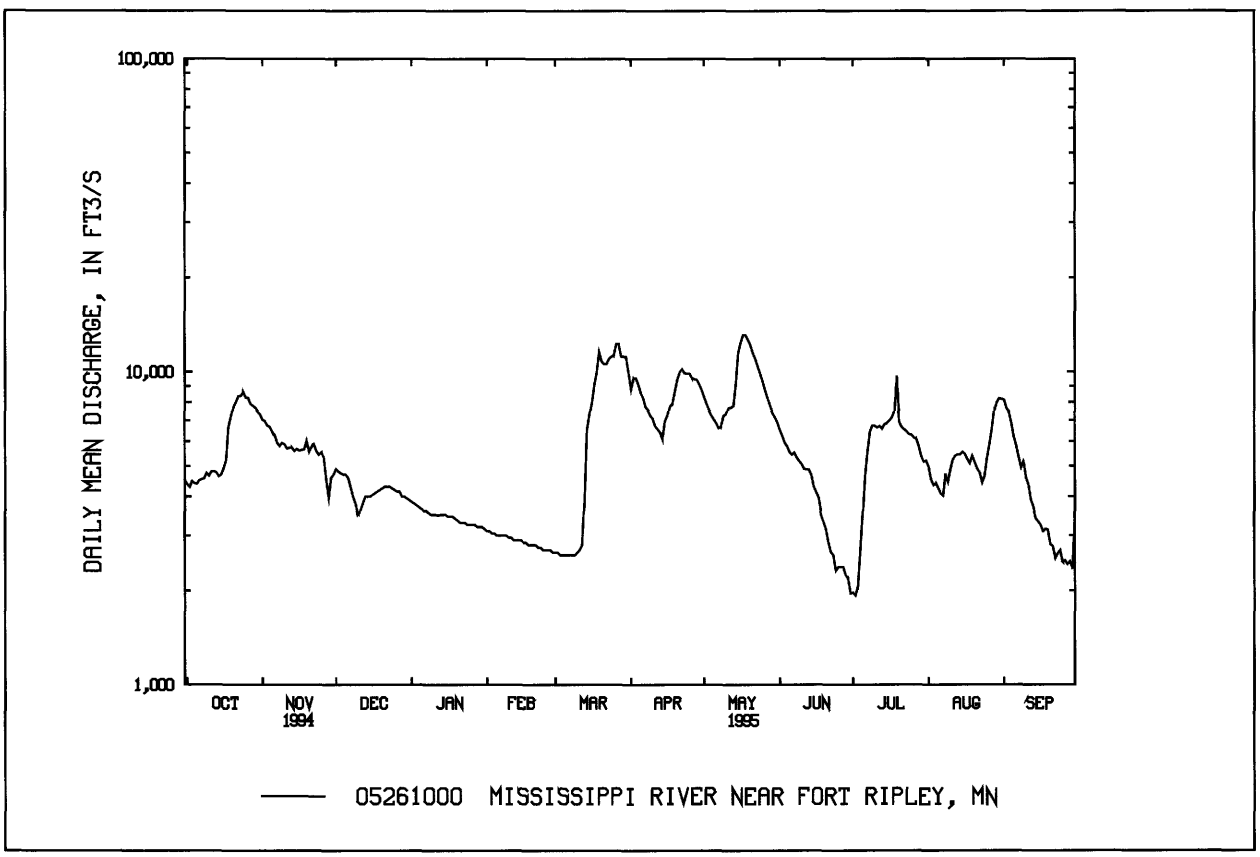
05261000 MISSISSIPPI RIVER NEAR FORT RIPLEY, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3624	3682	3007	2722	2499	4328	8037	7689	5193	5310	3325	3484
MAX	6079	5724	4303	3931	3559	7156	12210	10610	9972	13710	7293	5657
(WY)	1995	1995	1994	1994	1994	1995	1989	1994	1993	1993	1993	1993
MIN	2563	2624	1827	1518	1508	2559	5510	3025	1196	729	1517	1769
(WY)	1993	1993	1991	1991	1991	1993	1990	1988	1988	1988	1989	1990

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1987 - 1995	
ANNUAL TOTAL	2180880		2021970			
ANNUAL MEAN	5975		5540		4452	
HIGHEST ANNUAL MEAN					5759	1994
LOWEST ANNUAL MEAN					2813	1988
HIGHEST DAILY MEAN	17000	May 3	13100	May 17	17000	May 3 1994
LOWEST DAILY MEAN	2840	Sep 3	1930	Jul 2	558	Jul 30 1988
ANNUAL SEVEN-DAY MINIMUM	2960	Sep 6	2110	Jun 27	626	Jul 24 1988
INSTANTANEOUS PEAK FLOW			13300	May 17	17100	May 3 1994
INSTANTANEOUS PEAK STAGE			10.75a	Mar 17	10.78a	Dec 22 1993
INSTANTANEOUS LOW FLOW					528	Jul 30 1988
ANNUAL RUNOFF (AC-FT)	4326000		4011000		3225000	
ANNUAL RUNOFF (CFSM)	.54		.50		.40	
10 PERCENT EXCEEDS	9330		9360		8470	
50 PERCENT EXCEEDS	4780		4920		3500	
90 PERCENT EXCEEDS	3350		2700		1740	

a Backwater from ice.



MISSISSIPPI RIVER MAIN STEM

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN

LOCATION.--Lat 45°51'41", long 94°21'33", in lot 2, sec. 20, T. 39 N., R. 32 W., Morrison County, Hydrologic Unit 07010104, at plant of Minnesota Power Co., 4 mi northwest of Royalton, 4.5 mi downstream from Swan River, and at mile 956 upstream from Ohio River.

DRAINAGE AREA.--11,600 mi², approximately.

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

REMARKS.--Records fair. Discharge computed based on powerplant records adjusted by correction factors based on current-meter measurements and regression analysis using nearby gaging stations. Flow partly regulated by powerplants and Winnibigoshish, Leech, Pokegama, Sandy, and Gull Lakes and by Pine River Reservoir (see stations 05201000, 05206000, 05210500, 05218500, 05230500, 05246500).

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4600	7350	5120	3970	3180	2710	9690	8900	6800	1980	5150	8600
2	4420	7280	5050	3920	3180	2710	10200	8280	6520	1940	4660	8010
3	4640	7030	4950	3860	3130	2660	10600	8050	6180	2100	4470	7810
4	4570	6970	4890	3810	3130	2660	10200	7260	6000	3090	4540	7170
5	4560	6700	4880	3760	3080	2660	9190	7270	5740	3770	4360	6490
6	4700	6540	4770	3710	3080	2660	9130	6800	5630	5060	4200	6000
7	4720	6160	4440	3710	3080	2660	8370	6670	5740	6090	4150	5480
8	4760	6010	4110	3660	3080	2660	7960	6510	5550	7050	4890	5060
9	4960	6180	3890	3600	3080	2660	7690	7170	5390	7310	4630	5350
10	4850	6120	3560	3600	3030	2720	7270	7350	5280	7200	5130	4710
11	5020	5920	3680	3600	3030	2770	7560	7870	5070	7030	5520	4390
12	5020	5970	3920	3590	2970	2990	7100	7810	5060	7060	5650	4120
13	4970	5970	4150	3610	2970	5040	6620	7990	5050	6900	5740	3890
14	4820	5810	4170	3610	2970	7260	5850	9480	4860	7140	5710	3660
15	4870	5920	4160	3610	2970	8370	7490	11500	4430	7220	5800	3800
16	5130	5840	4210	3560	2920	9750	7970	13200	4230	7350	5700	3730
17	5470	5880	4250	3550	2920	10800	8590	13600	4060	7520	5480	3670
18	7120	5910	4310	3550	2870	13300	8790	13600	3550	7890	5300	6560
19	7730	6330	4360	3500	2870	15400	9870	13300	3380	9300	5610	3520
20	8320	5790	4420	3450	2870	15800	10500	12800	3210	7280	5340	3300
21	8630	6010	4470	3390	2870	14600	11000	11900	2890	6970	5080	2940
22	8930	6150	4470	3390	2820	13100	11400	11500	2690	6840	4940	3050
23	8920	5800	4470	3390	2820	12400	10900	10900	2630	6640	4550	2800
24	9150	5660	4410	3340	2760	12200	11000	10300	2330	6590	4790	3050
25	8740	5750	4350	3340	2760	11900	10700	9760	2410	6580	5510	2820
26	8710	5540	4290	3340	2760	12700	10500	9090	2420	6440	6160	2640
27	8290	4680	4290	3340	2760	13300	10200	8580	2420	6380	6980	2970
28	8170	4030	4130	3290	2710	12400	10300	8120	2290	6030	8130	2650
29	8050	4730	4130	3290	---	12200	9880	7710	2210	5570	8620	2840
30	7810	4850	4080	3290	---	12600	9520	7480	1970	5330	8830	3740
31	7670	---	4020	3230	---	11400	---	7190	---	5380	8740	---
TOTAL	198320	178880	134400	109860	82670	257040	276040	287940	125990	189030	174360	134820
MEAN	6397	5963	4335	3544	2952	8292	9201	9288	4200	6098	5625	4494
MAX	9150	7350	5120	3970	3180	15800	11400	13600	6800	9300	8830	8600
MIN	4420	4030	3560	3230	2710	2660	5850	6510	1970	1940	4150	2640
AC-FT	393400	354800	266600	217900	164000	509800	547500	571100	249900	374900	345800	267400
CFSM	.55	.51	.37	.31	.25	.71	.79	.80	.36	.53	.48	.39
IN.	.64	.57	.43	.35	.27	.82	.89	.92	.40	.61	.56	.43

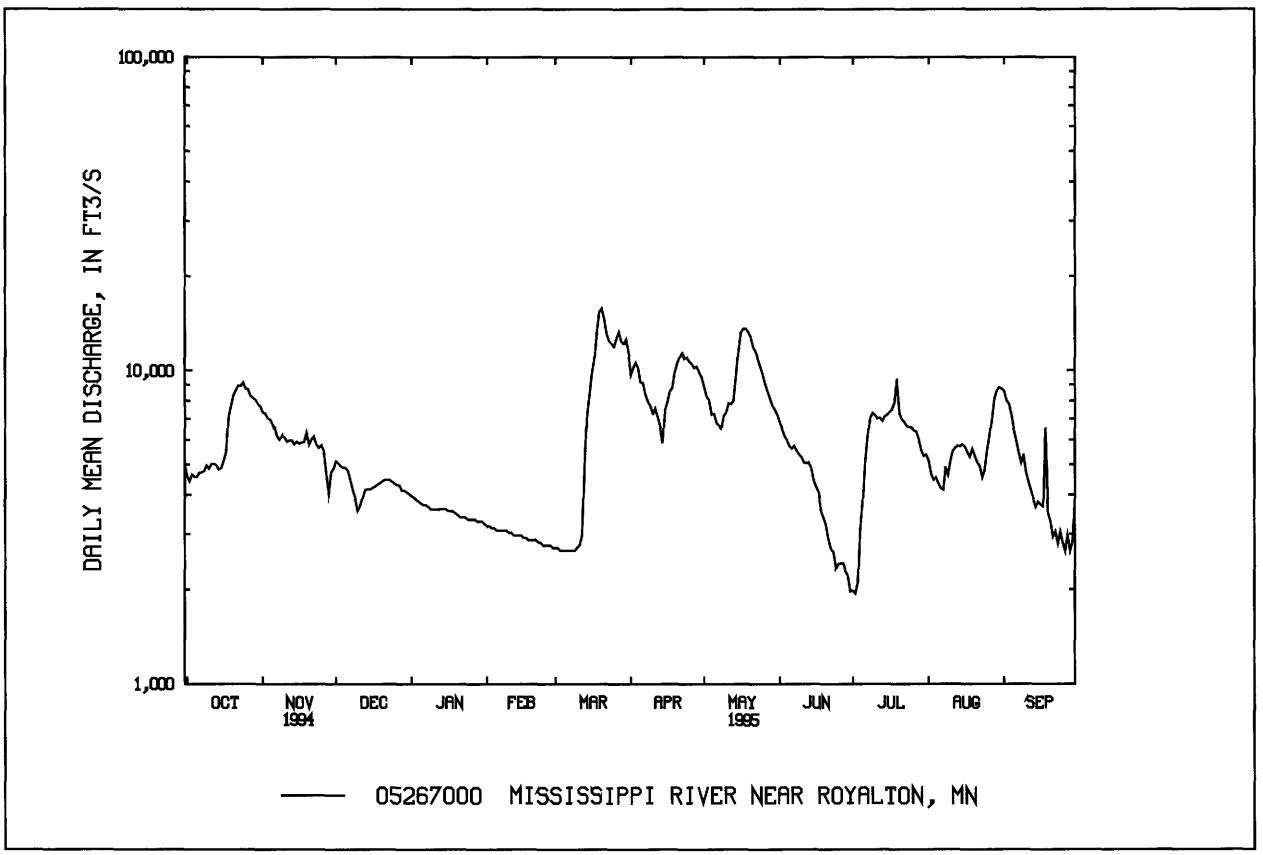
MISSISSIPPI RIVER MAIN STEM

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3999	3786	2960	2639	2523	3733	8919	8497	6399	4734	3629	3546
MAX	12930	14640	6456	5713	5048	12290	22200	24600	18160	15250	15230	12940
(WY)	1966	1972	1952	1966	1984	1966	1966	1950	1965	1993	1953	1986
MIN	632	618	627	534	758	968	1924	1663	1071	648	449	535
(WY)	1937	1937	1935	1935	1937	1940	1931	1977	1988	1988	1934	1934

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1924 - 1995	
ANNUAL TOTAL	2345700		2149350			
ANNUAL MEAN	6427		5889		4641	
HIGHEST ANNUAL MEAN					9555	1966
LOWEST ANNUAL MEAN					1213	1934
HIGHEST DAILY MEAN	18300	May 3	15800	Mar 20	37700	Apr 16 1965
LOWEST DAILY MEAN	3200	Sep 3	1940	Jul 2	254	Nov 25 1936
ANNUAL SEVEN-DAY MINIMUM	3290	Sep 6	2130	Jun 27	358	Sep 3 1936
ANNUAL RUNOFF (AC-FT)	4653000		4263000		3362000	
ANNUAL RUNOFF (CFSM)	.55		.51		.40	
ANNUAL RUNOFF (INCHES)	7.52		6.89		5.44	
10 PERCENT EXCEEDS	10000		10200		9580	
50 PERCENT EXCEEDS	5120		5130		3360	
90 PERCENT EXCEEDS	3710		2870		1280	



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.
REMARKS.--Letter K indicates non-ideal colony count, letter E indicates estimated value.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
DEC												
07...	1125	5260	293	327	8.1	7.8	0.0	2.5	746	8.1	71	39
MAR												
16...	1030	E9700	303	318	7.2	7.5	0.0	3.0	742	12.2	170	K5300
JUL												
03...	1330	2140	333	329	8.1	7.3	22.5	7.5	730	7.1	1600	10
SEP												
20...	1100	3290	298	303	8.2	7.9	16.0	4.0	742	9.0	93	180

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 WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)
DEC												
07...	41	13	5.3	1.7	150	160	0	182	7.1	4.9	0.10	9.3
MAR												
16...	39	13	5.4	4.1	147	144	0	179	6.0	6.4	<0.10	11
JUL												
03...	43	14	6.7	1.6	154	162	0	188	8.0	7.3	0.10	11
SEP												
20...	38	12	5.1	1.7	138	149	0	168	6.6	5.4	<0.10	11

MISSISSIPPI RIVER MAIN STEM

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)
DEC											
07...	198	<0.010	0.250	0.020	0.50	0.020	<0.010	<0.010	7	66	30
MAR											
16...	189	<0.010	0.610	0.450	1.1	0.170	0.150	0.130	10	85	10
JUL											
03...	210	0.010	0.200	0.040	0.60	0.050	0.020	0.020	37	89	30
SEP											
20...	193	<0.010	0.140	<0.015	0.70	0.040	0.020	0.020	--	--	10

DATE	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)
DEC											
07...	37	<3	150	<4	22	<10	<1	<1	<1.0	73	<6
MAR											
16...	39	<3	140	<4	62	<10	<1	<1	<1.0	68	<6
JUL											
03...	47	<3	32	7	28	<10	<1	<1	<1.0	90	<6
SEP											
20...	36	<3	89	<4	7	20	<1	<2	<1.0	79	<6

SAUK RIVER BASIN

05270500 SAUK RIVER NEAR ST. CLOUD, MN

LOCATION.--Lat 45°33'35", long 94°14'00", in SW¼SW¼ sec. 8, T. 124 N., R. 28 W., Stearns County, Hydrologic Unit 07010203, on right bank 0.5 mi northwest of Waite Park, 3 mi west of St. Cloud, and 5 mi upstream from mouth.

DRAINAGE AREA.--925 mi².

PERIOD OF RECORD.--July 1909 to December 1912, April to December 1913, May to November 1929, March 1930 to September 1931, April to November 1932, March to November 1933, March 1934 to September 1981, October 1990 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORD--WSP 895: Drainage area. WSP 1308: 1912(M), 1932 (M). WSP 1508: 1937(m).

GAGE.--Water-stage recorder. Datum of gage is 1,034.63 ft above mean sea level. Prior to Nov. 22, 1934, nonrecording gage on highway bridge 1 mi downstream at datum 6.77 ft lower.

REMARKS:.--Records good except those for estimated daily discharge, which are fair. Flow regulated by powerplants and reservoirs above station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	229	694	290	e188	e161	e144	1620	1110	686	499	341	858
2	221	650	284	e183	e161	e143	1570	1090	649	472	324	805
3	266	618	302	e183	e161	e142	1500	1070	611	453	310	767
4	313	588	319	e180	e160	e141	1420	1030	572	565	307	726
5	335	566	338	e177	e160	e141	1320	990	600	645	305	673
6	360	542	356	e178	e161	e140	1250	953	875	713	311	647
7	391	523	349	e179	e162	e140	1200	927	820	738	310	586
8	417	497	e305	e180	e163	e140	1130	902	773	803	298	546
9	410	469	e295	e183	e165	e145	1080	893	761	839	293	514
10	402	445	e285	e185	e166	e200	1020	907	818	837	284	481
11	403	428	e280	e183	e166	e400	1000	894	855	815	317	452
12	392	396	e271	e185	e165	e500	1020	874	834	806	338	419
13	377	373	e268	e182	e164	e700	1020	883	823	794	343	392
14	360	380	e262	e181	e162	e900	970	976	812	773	394	359
15	352	334	e257	e180	e160	e1100	902	946	793	754	385	351
16	401	315	e252	e180	e158	e1300	954	956	772	776	381	354
17	438	306	e250	e179	e155	e1500	972	959	766	763	384	334
18	531	354	e249	e178	e152	1840	993	955	757	726	386	317
19	591	311	e245	e172	e151	2050	1110	958	740	690	504	305
20	597	287	e241	e170	e151	2110	1130	959	727	659	479	295
21	652	331	e238	e164	e151	2110	1150	919	710	620	462	286
22	759	347	e235	e165	e150	2050	1210	911	687	584	445	284
23	885	316	e230	e170	e150	1950	1240	897	671	546	428	266
24	891	292	e228	e170	e149	1880	1250	859	651	523	436	252
25	871	292	e225	e169	e149	1790	1240	835	613	492	447	257
26	861	311	e221	e168	e148	1730	1240	805	575	465	819	257
27	856	292	e218	e166	e147	1730	1230	773	562	452	953	253
28	841	334	e213	e163	e145	1710	1200	751	577	449	945	245
29	817	316	e208	e161	---	1710	1180	776	557	411	988	254
30	780	299	e190	e160	---	1710	1150	748	531	384	953	326
31	735	---	e189	e161	---	1680	---	719	---	366	913	---
TOTAL	16734	12206	8093	5423	4393	33926	35271	28225	21178	19412	14783	12861
MEAN	540	407	261	175	157	1094	1176	910	706	626	477	429
MAX	891	694	356	188	166	2110	1620	1110	875	839	988	858
MIN	221	287	189	160	145	140	902	719	531	366	284	245
AC-FT	33190	24210	16050	10760	8710	67290	69960	55980	42010	38500	29320	25510
CFSM	.58	.44	.28	.19	.17	1.18	1.27	.98	.76	.68	.52	.46

e Estimated.

SAUK RIVER BASIN

05270500 SAUK RIVER NEAR ST. CLOUD, MN--Continued

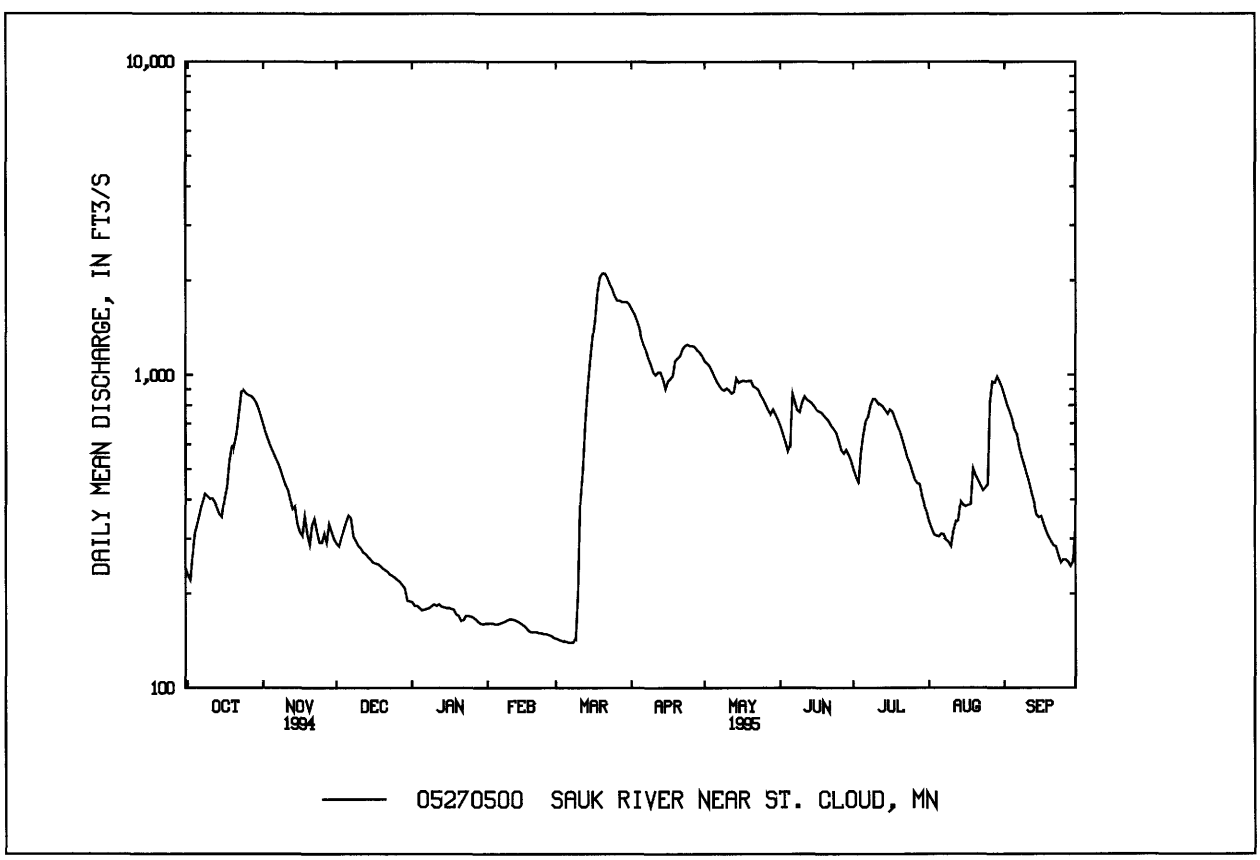
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	155	168	130	95.0	103	310	783	490	408	316	204	182
MAX	555	1091	528	336	568	1380	2810	1572	1333	1262	1250	1136
(WY)	1958	1972	1972	1980	1966	1966	1965	1975	1957	1993	1972	1957
MIN	6.22	6.18	5.15	3.25	7.61	28.7	16.5	7.84	15.9	10.6	10.5	10.7
(WY)	1934	1934	1935	1935	1935	1940	1934	1934	1934	1934	1933	1933

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1909 - 1995	
ANNUAL TOTAL	193665		212505			
ANNUAL MEAN	531		582		295[a]	
HIGHEST ANNUAL MEAN					732	1972
LOWEST ANNUAL MEAN					51.0	1931
HIGHEST DAILY MEAN	1780	May 4	2110	Mar 20	7940	Apr 14 1965
LOWEST DAILY MEAN	189	Dec 31	140	Mar 6	1.3	Jan 6 1935
ANNUAL SEVEN-DAY MINIMUM	202	Feb 21	141	Mar 2	1.5	Jan 2 1935
INSTANTANEOUS PEAK FLOW			2140	Mar 20	9100	Apr 13 1965
INSTANTANEOUS PEAK STAGE			6.04[b]	Mar 17	10.68	Apr 13 1965
INSTANTANEOUS LOW FLOW					.30	Nov 25 1936
ANNUAL RUNOFF (AC-FT)	384100		421500		213400	
ANNUAL RUNOFF (CFSM)	.57		.63		.32	
10 PERCENT EXCEEDS	1120		1110		707	
50 PERCENT EXCEEDS	347		447		130	
90 PERCENT EXCEEDS	213		164		35	

a Median of annual mean discharges is 264 ft^3/s.

b Backwater from ice.



MISSISSIPPI RIVER MAIN STEM

05270700 MISSISSIPPI RIVER AT ST. CLOUD, MN

LOCATION.--Lat 45°32'50", long 94°08'44", in SE¼SW¼ sec. 1, T. 35 N., R. 31 W., Sherburne County, Hydrologic Unit 07010203, on left bank about 250 ft below the left downstream end of the City of St. Cloud hydropower dam and at mile 926.3 upstream from Ohio River.

DRAINAGE AREA.--13,320 mi², approximately.

PERIOD OF RECORD.--October 1988 to current year.

GAGE.--Water-stage recorder. Datum of gage is 958.49 ft above sea level.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow partly regulated by powerplants and reservoirs.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5350	8720	6260	e4700	e4250	e3600	13900	e12200	9030	2880	5690	10300
2	4980	8360	6200	e4400	e4150	e3600	14500	e11900	8580	2640	4960	9920
3	5500	8080	6630	e4200	e4100	e3600	13600	e11600	7690	2770	4960	9550
4	6740	7990	5620	e4200	e4050	e3600	12700	e11400	7510	4850	4750	9170
5	5660	7690	5210	e4250	e4000	e3550	12400	e11100	7620	4720	4820	8270
6	5610	7520	5140	e4400	e3950	e3550	11800	9570	8000	5720	4650	7810
7	5760	7010	4920	e4500	e3900	e3550	11000	9160	7690	6750	4600	7150
8	5920	7010	5130	e4550	e3850	e3600	10600	9000	7540	7990	4860	6540
9	5720	6990	4760	e4600	e3800	e3600	10200	9190	7190	8640	4920	6280
10	6130	6990	4400	e4650	e3700	e3600	10100	9830	7460	8640	4850	6300
11	5610	6810	3720	4730	e3650	e3600	9960	10300	7320	8690	6080	5950
12	5920	6890	e4100	4970	e3700	e4200	9270	10300	7030	8690	5650	5810
13	6150	6980	e4350	5000	e3750	e6000	8410	10900	6800	8480	6420	4950
14	5420	6540	e4600	5060	e3800	e8200	8430	12300	7110	8200	6090	4900
15	5440	6650	e4750	5260	e3900	e9600	9640	14200	6250	8690	6310	5120
16	6010	6900	e4850	5120	e3900	e11000	10700	16700	5670	8240	6180	4990
17	6440	7010	e5000	4950	e3950	e12500	10900	16400	6030	8770	6090	4530
18	8010	6800	e5100	e4800	e4000	e14500	11300	17300	5420	8460	5950	4450
19	10300	7310	e5200	e4600	e4000	e16500	12500	16800	5120	9000	6390	4920
20	10800	6690	e5400	e4450	e3950	e18000	13500	16500	4650	8090	6300	4140
21	10800	6920	e5500	e4300	e3900	e19000	14400	15200	4540	7760	5740	4250
22	11800	7100	e5600	e4200	e3850	e17700	14400	14900	3950	7710	5680	4180
23	11500	6720	5730	e4300	e3800	17500	14100	14100	3800	7280	5790	3820
24	11400	6680	5840	e4450	e3750	16800	14200	12400	3760	7340	6150	4470
25	11300	6570	5680	e4500	e3700	16800	13700	12600	3230	6930	6850	4190
26	10700	6070	5830	e4500	e3700	18500	13600	12000	3690	6560	8210	3930
27	10100	4910	5760	e4450	e3700	17400	13000	11200	3340	6970	8700	4060
28	10100	4290	5690	e4400	e3650	16900	12800	10900	3560	6600	9710	4120
29	9780	5060	5620	e4400	---	17300	12600	10000	2880	6370	10500	4240
30	9120	5710	5300	e4350	---	16300	12300	9520	2930	5590	10800	5390
31	8820	---	e5000	e4300	---	14400	---	9150	---	5730	10600	---
TOTAL	242890	204970	162890	141540	108400	328550	360510	378620	175390	215750	199250	173700
MEAN	7835	6832	5255	4566	3871	10600	12020	12210	5846	6960	6427	5790
MAX	11800	8720	6630	5260	4250	19000	14500	17300	9030	9000	10800	10300
MIN	4980	4290	3720	4200	3650	3550	8410	9000	2880	2640	4600	3820
AC-FT	481800	406600	323100	280700	215000	651700	715100	751000	347900	427900	395200	344500
CFSM	.59	.51	.39	.34	.29	.80	.90	.92	.44	.52	.48	.43

e Estimated.

MISSISSIPPI RIVER MAIN STEM

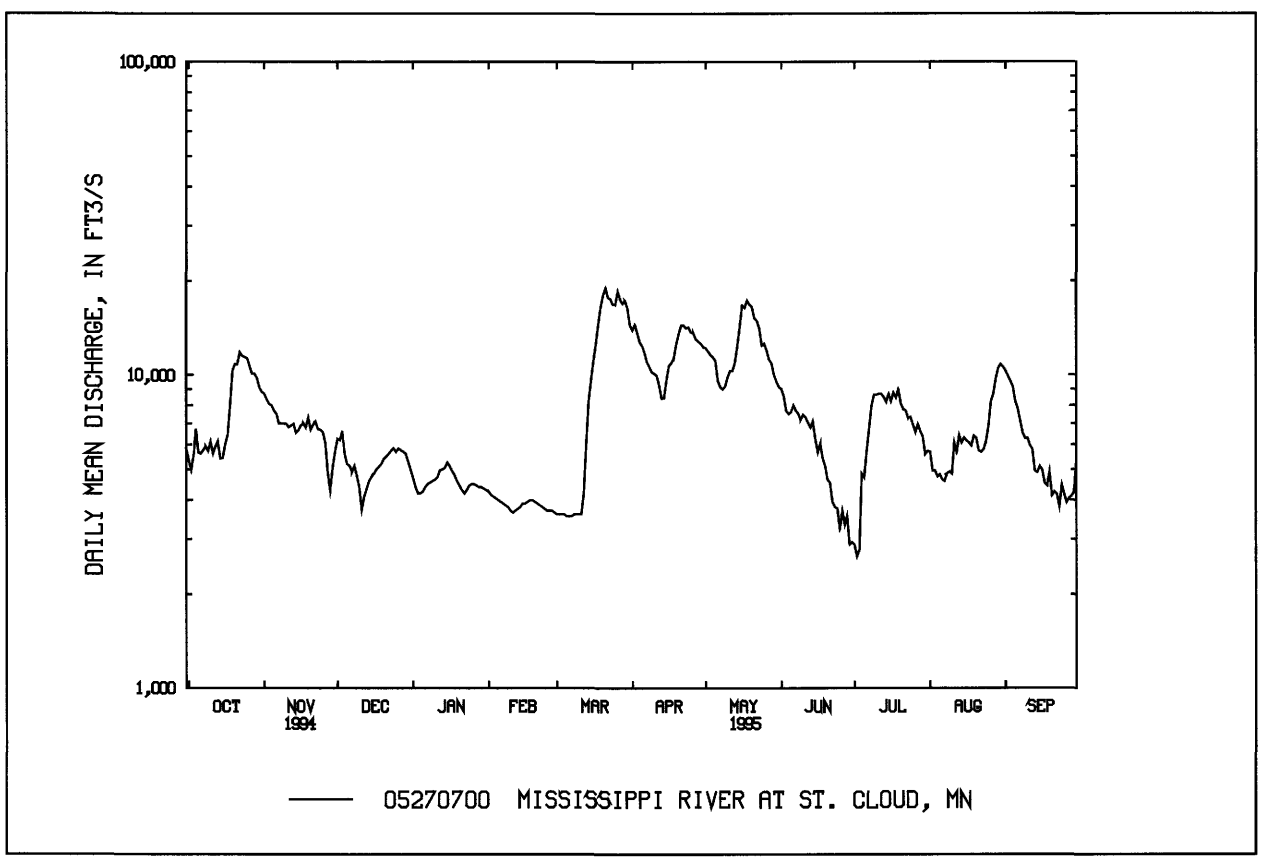
05270700 MISSISSIPPI RIVER AT ST. CLOUD, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4488	4549	3741	3480	3182	6508	11200	10710	7522	7901	4349	5057
MAX	7835	6832	5359	5114	4923	10600	15760	13850	12730	16830	9079	7360
(WY)	1995	1995	1994	1994	1994	1995	1989	1994	1993	1993	1993	1988
MIN	3106	2953	2310	1927	1815	3860	6576	6210	3743	3930	1535	2297
(WY)	1993	1989	1991	1991	1990	1989	1990	1992	1992	1989	1989	1990

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1988 - 1995	
ANNUAL TOTAL	2938250		2692460			
ANNUAL MEAN	8050		7377		6042	
HIGHEST ANNUAL MEAN					7844	1994
LOWEST ANNUAL MEAN					4615	1990
HIGHEST DAILY MEAN	22300	May 2	19000	Mar 21	22300	May 2 1994
LOWEST DAILY MEAN	3720	Dec 11	2640	Jul 2	1010	Aug 2 1989
ANNUAL SEVEN-DAY MINIMUM	3920	Sep 6	3000	Jun 27	1250	Aug 13 1989
INSTANTANEOUS PEAK FLOW					23300	May 2 1994
INSTANTANEOUS PEAK STAGE			8.77a	Mar 19	8.77a	Mar 19 1994
INSTANTANEOUS LOW FLOW					484	Oct 18 1992
ANNUAL RUNOFF (AC-FT)	5828000		5340000		4377000	
ANNUAL RUNOFF (CFSM)	.60		.55		.45	
10 PERCENT EXCEEDS	14500		12600		12000	
50 PERCENT EXCEEDS	6260		6180		4930	
90 PERCENT EXCEEDS	4750		3840		2200	

a Backwater from ice.



ELK RIVER BASIN

05275000 ELK RIVER NEAR BIG LAKE, MN

LOCATION.--Lat 45°20'02", long 93°40'00", in NE¼SW¼4 sec.23, T.22 N., R.27 W., Sherburne County, Hydrologic Unit 07010203, on right bank at upstream side of highway bridge, 4 mi east of Big Lake and 4 mi downstream from St. Francis River.

DRAINAGE AREA.--615 mi².

PERIOD OF RECORD.--April 1911 to September 1917, April to September 1931, April to November 1932, March to November 1933, March 1934 to September 1987, October 1990 to current year.

REVISED RECORDS.--WSP 895: 1939. WSP 1308: 1912(M), 1915-17(M).

GAGE.--Water-stage recorder. Datum of gage is 899.60 ft above mean sea level. April 1911 to Sept. 30, 1917, April 1, 1931, to July 26, 1934, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods of estimated daily discharge, which are fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	143	204	e200	e145	e120	e105	1000	669	338	175	112	793
2	143	197	e200	e140	e120	e100	965	611	330	168	110	810
3	152	189	e200	e140	e115	e100	902	560	319	162	107	793
4	160	188	e190	e135	e110	e105	810	516	305	153	105	766
5	159	185	e175	e135	e110	e110	734	480	300	167	108	735
6	156	178	e160	e135	e105	e110	700	446	315	179	149	715
7	168	174	e160	e135	e100	e110	643	419	324	172	165	674
8	174	171	e170	e135	e100	e110	601	405	341	171	159	600
9	172	168	e160	e135	e100	e110	568	413	378	176	159	516
10	163	165	e150	e140	e100	e120	534	421	450	175	153	444
11	154	160	e140	e145	e100	e130	523	421	477	167	162	389
12	145	156	e145	e150	e95	e170	528	417	453	169	196	344
13	143	164	e150	e150	e95	e250	520	434	432	173	218	304
14	142	170	e150	e150	e95	e400	501	477	444	163	239	261
15	137	161	e150	e150	e100	e600	476	478	458	158	234	241
16	150	159	e143	e150	e95	786	486	472	436	192	229	250
17	170	158	e140	e150	e100	956	486	494	389	180	227	246
18	190	156	e140	e150	e105	1730	514	511	337	161	217	248
19	202	154	e140	e145	e105	1310	603	494	295	153	217	249
20	209	160	e145	e140	e110	1010	652	465	265	143	214	252
21	227	176	e150	e135	e110	963	658	429	240	132	198	252
22	259	175	e155	e135	e110	925	688	409	220	126	181	252
23	282	168	e160	e130	e110	908	741	397	210	120	169	252
24	283	191	e160	e130	e110	896	744	382	208	116	168	252
25	269	172	e160	e130	e110	914	718	365	200	113	196	245
26	255	141	e160	e130	e110	993	705	347	197	111	254	232
27	240	220	e160	e125	e110	1080	714	334	190	113	287	222
28	229	e200	e160	e125	e110	1130	738	389	202	124	318	214
29	221	e180	e160	e125	---	1100	740	402	195	126	390	215
30	220	e190	e160	e120	---	1050	715	375	185	119	509	237
31	213	---	e150	e120	---	1020	---	352	---	110	687	---
TOTAL	5930	5230	4943	4260	2960	19401	19907	13784	9433	4667	6837	12003
MEAN	191	174	159	137	106	626	664	445	314	151	221	400
MAX	283	220	200	150	120	1730	1000	669	477	192	687	810
MIN	137	141	140	120	95	100	476	334	185	110	105	214
AC-FT	11760	10370	9800	8450	5870	38480	39490	27340	18710	9260	13560	23810
CFSM	.31	.28	.26	.22	.17	1.02	1.08	.72	.51	.24	.36	.65
IN.	.36	.32	.30	.26	.18	1.17	1.20	.83	.57	.28	.41	.73

e Estimated.

ELK RIVER BASIN

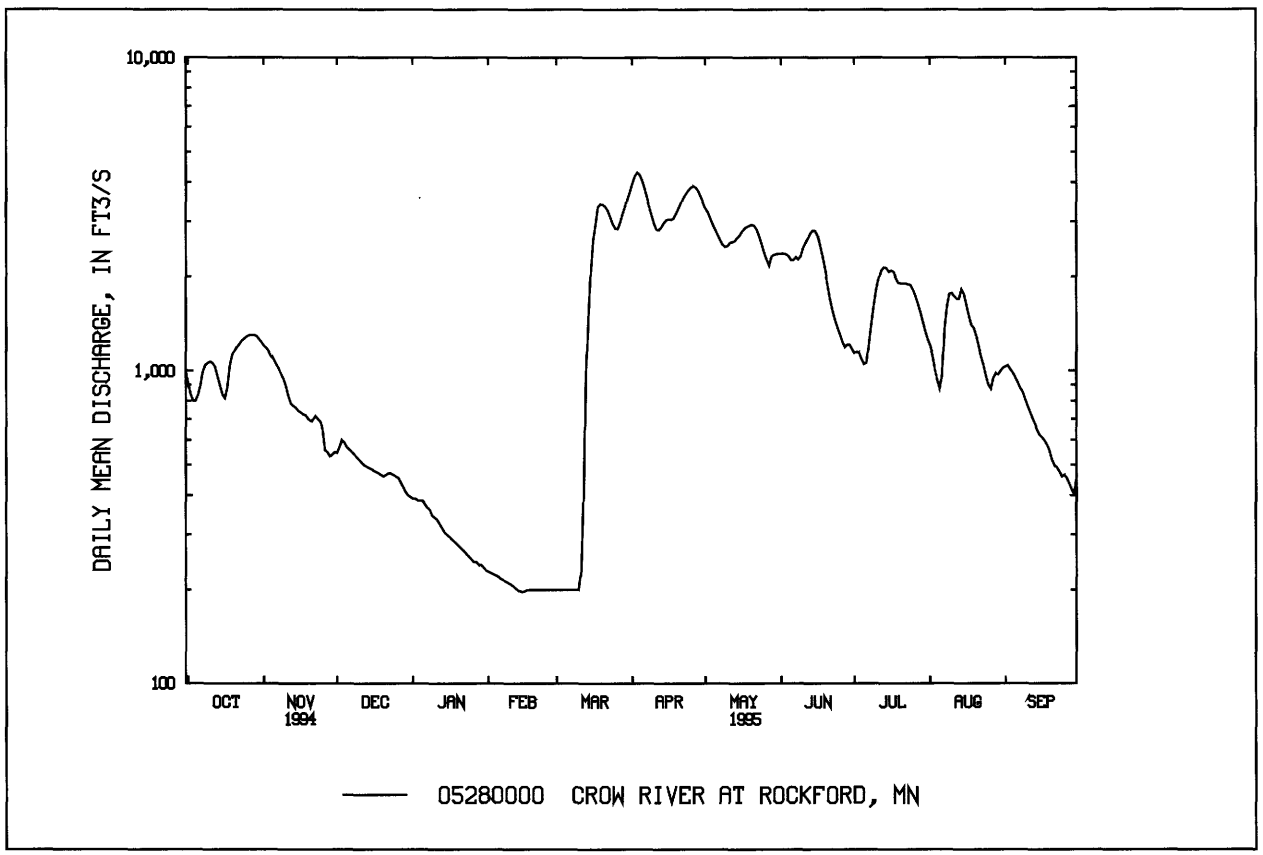
05275000 ELK RIVER NEAR BIG LAKE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	211	212	150	112	117	309	645	443	344	268	178	204
MAX	778	794	410	290	392	1125	1823	1620	1647	1026	926	1050
(WY)	1985	1972	1966	1979	1984	1966	1969	1986	1984	1978	1972	1986
MIN	32.7	56.3	44.1	38.4	29.8	58.8	75.5	37.5	20.5	8.94	8.74	23.4
(WY)	1934	1935	1935	1935	1936	1934	1934	1934	1934	1934	1934	1932

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1911 - 1995		
ANNUAL TOTAL	99526		109355				
ANNUAL MEAN273			300		277a		
HIGHEST ANNUAL MEAN					669		1986
LOWEST ANNUAL MEAN					88.0		1935
HIGHEST DAILY MEAN	1130	May 6	1730	Mar 18	7170	Apr 16	1965
LOWEST DAILY MEAN	114	Aug 23	95	Feb 12	4.0	Aug 1	1934
ANNUAL SEVEN-DAY MINIMUM	121	Aug 18	97	Feb 10	4.5	Jul 27	1934
INSTANTANEOUS PEAK FLOW					7360	Apr 16	1965
INSTANTANEOUS PEAK STAGE					10.86	Apr 16	1965
INSTANTANEOUS LOW FLOW					3.6	Jul 31	1934
ANNUAL RUNOFF (AC-FT)	197400		216900		200800		
ANNUAL RUNOFF (CFSM)	.44		.49		.45		
ANNUAL RUNOFF (INCHES)	6.02		6.61		6.12		
10 PERCENT EXCEEDS	587		693		559		
50 PERCENT EXCEEDS	178		188		166		
90 PERCENT EXCEEDS	133		110		67		

a Median of annual mean discharges is 253 ft^3/s.



CROW RIVER BASIN

05280000 CROW RIVER AT ROCKFORD, MN

LOCATION.--Lat 45°05'12", long 93°44'02", in sec.29, T.119 N., R.24 W., Hennepin County, Hydrologic Unit 07010204, on right bank at Rockford, 150 ft downstream from bridge on State Highway 55 and 1 mi downstream from confluence of North and South Forks.

DRAINAGE AREA.--2,520 mi², approximately.

PERIOD OF RECORD.--April to July 1906 (published as "near Dayton"), June 1909 to September 1917, April to November 1929, March 1930 to September 1931, April to November 1932, March to November 1933, March 1934 to current year. Monthly discharge only for some periods, published in 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 above mean sea level. Apr. 13 to July 21, 1906, nonrecording gage at Berning Mill 14 mi downstream at different datum. June 4, 1909, to Sept. 30, 1917, nonrecording gage at site 600 ft downstream at different datum. Apr. 23, 1929, to Aug. 21, 1934, nonrecording gage at site 600 ft downstream at present datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	914	1200	546	e390	e228	e200	3970	3310	2370	1140	1200	1030
2	839	1180	e570	e390	e226	e200	4180	3220	2370	1150	1120	1040
3	801	1150	e600	e385	e224	e200	4300	3080	2360	1140	1010	1010
4	801	1110	e590	e385	e222	e200	4240	2940	2330	1090	934	985
5	837	1090	e570	e385	e220	e200	4080	2830	2260	1050	876	953
6	893	1050	e560	e375	e217	e200	3840	2720	2260	1060	963	918
7	988	1020	e550	e365	e215	e200	3590	2620	2310	1240	1360	879
8	1040	979	e540	e360	e213	e200	3360	2530	2270	1430	1600	855
9	1060	944	e530	e345	e211	e200	3140	2490	2320	1630	1760	809
10	1070	893	e520	e340	e209	e200	2950	2500	2470	1820	1770	769
11	1060	828	e510	e335	e206	e230	2830	2560	2560	1970	1730	736
12	1030	783	e500	e325	e203	e400	2820	2580	2650	2090	1700	704
13	963	772	e495	e315	e200	e970	2880	2600	2750	2140	1700	676
14	898	761	e490	e305	e198	e1480	2970	2660	2810	2130	1820	646
15	839	744	e485	e300	e197	e2100	3030	2710	2800	2070	1760	622
16	817	736	e480	e295	e198	e2620	3050	2790	2700	2090	1620	612
17	883	724	e475	e290	e200	2930	3040	2850	2520	2070	1500	597
18	1030	721	e470	e285	e200	3340	3070	2890	2320	1980	1400	579
19	1120	701	e465	e280	e200	3410	3180	2910	2110	1910	1370	556
20	1160	691	e460	e275	e200	3400	3300	2930	1900	1900	1290	519
21	1190	697	e465	e270	e200	3350	3440	2910	1710	1900	1190	499
22	1220	716	e470	e265	e200	3260	3580	2830	1570	1900	1110	491
23	1250	700	e470	e260	e200	3110	3680	2690	1460	1890	1040	476
24	1270	687	e465	e255	e200	2950	3770	2540	1380	1880	964	459
25	1290	652	e460	e250	e200	2860	3850	2390	1310	1820	900	464
26	1300	556	e455	e245	e200	2840	3890	2270	1240	1740	874	455
27	1300	e550	e440	e245	e200	2970	3850	2170	1190	1640	948	437
28	1300	533	e425	e240	e200	3150	3750	2320	1210	1540	980	418
29	1290	540	e410	e240	---	3330	3600	2350	1210	1440	974	401
30	1260	550	e400	e235	---	3540	3450	2360	1170	1340	997	458
31	1230	---	e395	e230	---	3740	---	2370	---	1260	1020	---
TOTAL	32943	24258	15261	9460	5787	57980	104680	82920	61890	51450	39480	20053
MEAN	1063	809	492	305	207	1870	3489	2675	2063	1660	1274	668
MAX	1300	1200	600	390	228	3740	4300	3310	2810	2140	1820	1040
MIN	801	533	395	230	197	200	2820	2170	1170	1050	874	401
AC-FT	65340	48120	30270	18760	11480	115000	207600	164500	122800	102100	78310	39780
CFSM	.42	.32	.20	.12	.08	.74	1.38	1.06	.82	.66	.51	.27
IN.	.49	.36	.23	.14	.09	.86	1.55	1.22	.91	.76	.58	.30

e Estimated.

CROW RIVER BASIN

05280000 CROW RIVER AT ROCKFORD, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1906 - 1995, BY WATER YEAR (WY)

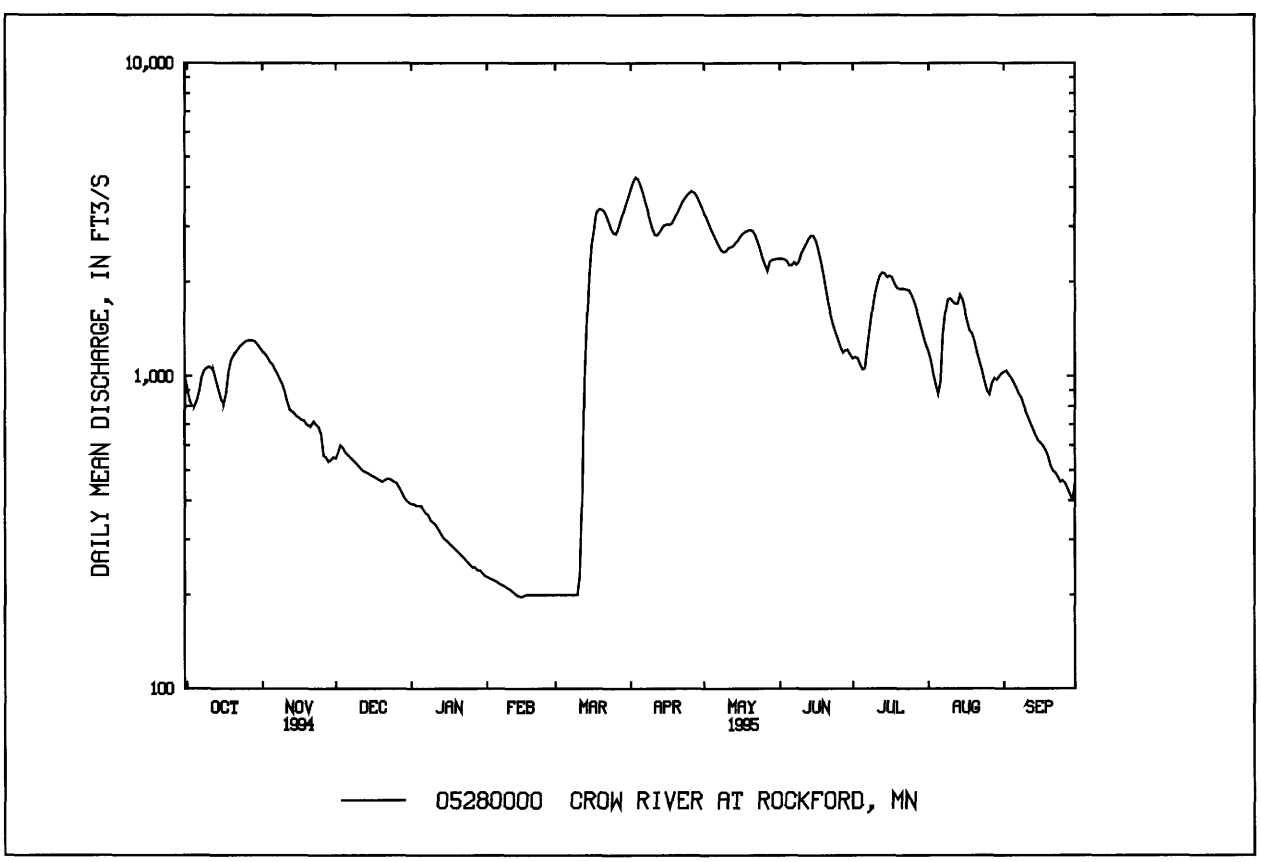
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	441	413	290	168	161	852	2105	1423	1258	983	529	485
MAX	3809	1909	1477	928	1115	4085	9026	5992	6166	6759	2784	4941
(WY)	1986	1972	1983	1992	1966	1983	1965	1986	1906	1993	1993	1991
MIN	16.6	28.3	17.3	12.4	12.5	25.1	57.1	26.7	14.8	5.76	5.87	13.0
(WY)	1934	1937	1938	1938	1959	1934	1934	1934	1934	1934	1934	1933

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1906 - 1995	
ANNUAL TOTAL	493002		506162			
ANNUAL MEAN	1351		1387		790[a]	
HIGHEST ANNUAL MEAN					2754	1986
LOWEST ANNUAL MEAN					64.5	1931
HIGHEST DAILY MEAN	5260	May 6	4300	Apr 3	22100	Apr 16 1965
LOWEST DAILY MEAN	367	Aug 25	197	Feb 15	3.8	Aug 4 1934
ANNUAL SEVEN-DAY MINIMUM	405	Aug 20	199	Feb 13	4.0	Jul 31 1934
INSTANTANEOUS PEAK FLOW			4320	Apr 3	22400	Apr 16 1965
INSTANTANEOUS PEAK STAGE			7.85	Apr 3	19.27[b]	Apr 16 1965
INSTANTANEOUS LOW FLOW					1.8[c]	Nov 15 1936
ANNUAL RUNOFF (AC-FT)	977900		1004000		572600	
ANNUAL RUNOFF (CFSM)	.54		.55		.31	
ANNUAL RUNOFF (INCHES)	7.28		7.47		4.26	
10 PERCENT EXCEEDS	3070		3040		2180	
50 PERCENT EXCEEDS	914		1040		253	
90 PERCENT EXCEEDS	460		225		38	

a Median of annual mean discharges is 605 ft^3/s.

b From floodmark.

c Caused by ice jam upstream.



RUM RIVER BASIN

05284000 MILLE LACS LAKE AT COVE BAY NEAR ONAMIA, MN

LOCATION.--Lat 46°06'36", long 93°37'08", in NE¼NE¼ sec.21, T.42 N., R.26 W., Mille Lacs County, Hydrologic Unit 07010207, in Minnesota Department of Natural Resources boathouse at Cove Bay boatlanding, 3.6 mi northeast of Onamia.

PERIOD OF RECORD.--June 1931 to current year. Monthend records for the period October 1939 to September 1953 published in WSP 1278 (fragmentary 1940-41). Published as "at Wealthwood" prior to October 1939, and as "at Garrison" October 1939 to September 1987 (gage heights collected at Wealthwood October 1939 to September1941, but converted to gage datum at Garrison for publication).

GAGE.--Water-stage recorder. Datum of gage is 1,240.40 ft above mean sea level (levels by Minnesota Department of Natural Resources). Gage readings have been reduced to elevations above sea level. Prior to Oct. 1, 1941, nonrecording gage at Wealthwood, 17 mi north of present site, at various datums; gage readings have been reduced to elevations, adjustment of 1912. Oct. 1, 1941, to Sept. 30, 1958, water-stage recorder at Garrison, 16 mi northwest of present site at datum 1,240.50 ft, adjustment of 1912. To convert these readings to National Geodetic Vertical Datum of 1929, subtract 0.10 ft. Oct. 1, 1958, to Sept. 30, 1987, water stage recorder at Garrison at present datum.

REMARKS.--Water level affected by fixed-crest spillway constructed in 1953 at outlet of Ogechie Lake, 2.7 mi downstream from outlet of Mille Lacs Lake, with crest at elevation 1,250.50 ft. Water level subject to fluctuation caused by change in direction and velocity of wind and by seiches.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 1,253.87 ft, Aug. 14, 1972, affected by wind action and seiche action; maximum daily, 1,253.43 ft, Aug. 22, 1972; minimum observed, 1,245.74 ft, Oct. 16-19, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,253.13 ft, Aug. 25, affected by wind and seiche action; maximum daily, 1,252.37 ft, June 29; minimum, 1,251.01 ft, Aug. 25; minimum daily, 1,251.36 ft, Nov. 1.

MONTHEND ELEVATION, IN FEET ABOVE SEA LEVEL, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

Oct. 31 ..... 1251.40	Feb. 28 ..... 1251.55	June 30 ..... 1252.24
Nov. 30 ..... 1251.43	Mar. 31 ..... 1251.63	July 31 ..... 1251.97
Dec. 31 ..... 1251.50	Apr. 30 ..... 1252.13	Aug. 31 ..... 1251.63
Jan. 31 ..... 1251.52	May 31 ..... 1252.26	Sept. 30 ..... 1251.58

Note--Elevations other than those shown are available.

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RUM RIVER BASIN

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 south of St. Francis and 15.8 mi upstream from mouth.

DRAINAGE AREA.--1,360 mi², approximately.

PERIOD OF RECORD.--May to November 1929, March 1930 to September 1931, April to November 1932, March 1933 to current year.

REVISED RECORDS.--WSP 1308: 1930(M), 1932(M).

GAGE.--Water-stage recorder. Datum of gage is 860.74 ft above mean sea level (levels by Anoka County Highway Department). Prior to Nov. 9, 1933, nonrecording gage at site 50 ft downstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Occasional regulation by Ogechie (also controls Mille Lacs Lake) and Onamia Lakes.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	432	675	512	e270	e241	e270	2500	1520	790	443	747	2660
2	418	648	506	e265	e240	e260	2650	1350	744	432	709	2970
3	425	620	504	e265	e240	e260	2790	1240	699	425	678	3060
4	439	589	500	e260	e242	e260	2840	1150	644	427	653	2880
5	447	556	e490	e260	e220	e265	2740	1090	616	498	635	2510
6	459	534	e470	e260	e215	e280	2540	1030	627	574	675	1980
7	522	525	e450	e260	e215	e290	2290	974	632	604	772	1460
8	571	513	e440	e260	e215	e295	2000	946	646	612	937	1160
9	584	496	e410	e260	e215	e295	1700	951	679	620	1050	1000
10	566	482	e430	e260	e215	e295	1430	963	766	600	1140	902
11	573	466	e420	e260	e215	e310	1280	1000	841	573	1160	836
12	594	459	e370	e265	e220	e360	1210	1090	860	577	1210	784
13	598	464	e365	e270	e220	e430	1140	1210	861	598	1250	728
14	577	465	e360	e270	e225	e500	1110	1310	914	586	1300	690
15	537	457	e360	e270	e225	e660	1110	1330	942	575	1370	669
16	534	463	e360	e270	e225	e840	1150	1310	911	586	1370	661
17	554	471	e355	e270	e230	e1000	1210	1370	820	575	1320	673
18	569	472	e355	e265	e230	e1200	1290	1480	724	560	1230	712
19	600	477	e350	e265	e230	e1700	1470	1590	645	540	1150	722
20	680	467	e350	e250	e230	e2200	1660	1610	589	537	1060	718
21	821	486	e350	e240	e235	2950	1790	1470	551	511	976	709
22	969	514	e345	e215	e235	3640	1910	1260	524	650	910	687
23	1100	516	e340	e210	e255	3860	2080	1090	504	905	848	667
24	1180	506	e335	e205	e260	3760	2320	964	482	895	817	654
25	1180	475	e330	e205	e270	3550	2490	876	467	834	886	642
26	1080	433	e330	e215	e280	3290	2520	816	466	749	988	637
27	972	329	e320	e230	e280	3080	2410	781	469	711	1150	632
28	887	256	e315	e240	e275	2860	2200	829	471	737	1360	594
29	819	450	e280	e245	---	2680	1960	846	460	772	1580	508
30	759	530	e275	e242	---	2510	1720	846	456	780	1870	535
31	711	---	e270	e242	---	2440	---	828	---	788	2250	---
TOTAL	21157	14794	11847	7764	6598	46590	57510	35120	19800	19274	34051	34040
MEAN	682	493	382	250	236	1503	1917	1133	660	622	1098	1135
MAX	1180	675	512	270	280	3860	2840	1610	942	905	2250	3060
MIN4	18	256	270	205	215	260	1110	781	456	425	635	508
AC-FT	41960	29340	23500	15400	13090	92410	114100	69660	39270	38230	67540	67520
CFSM	.50	.36	.28	.18	.17	1.11	1.41	.83	.49	.46	.81	.83

e Estimated.

RUM RIVER BASIN

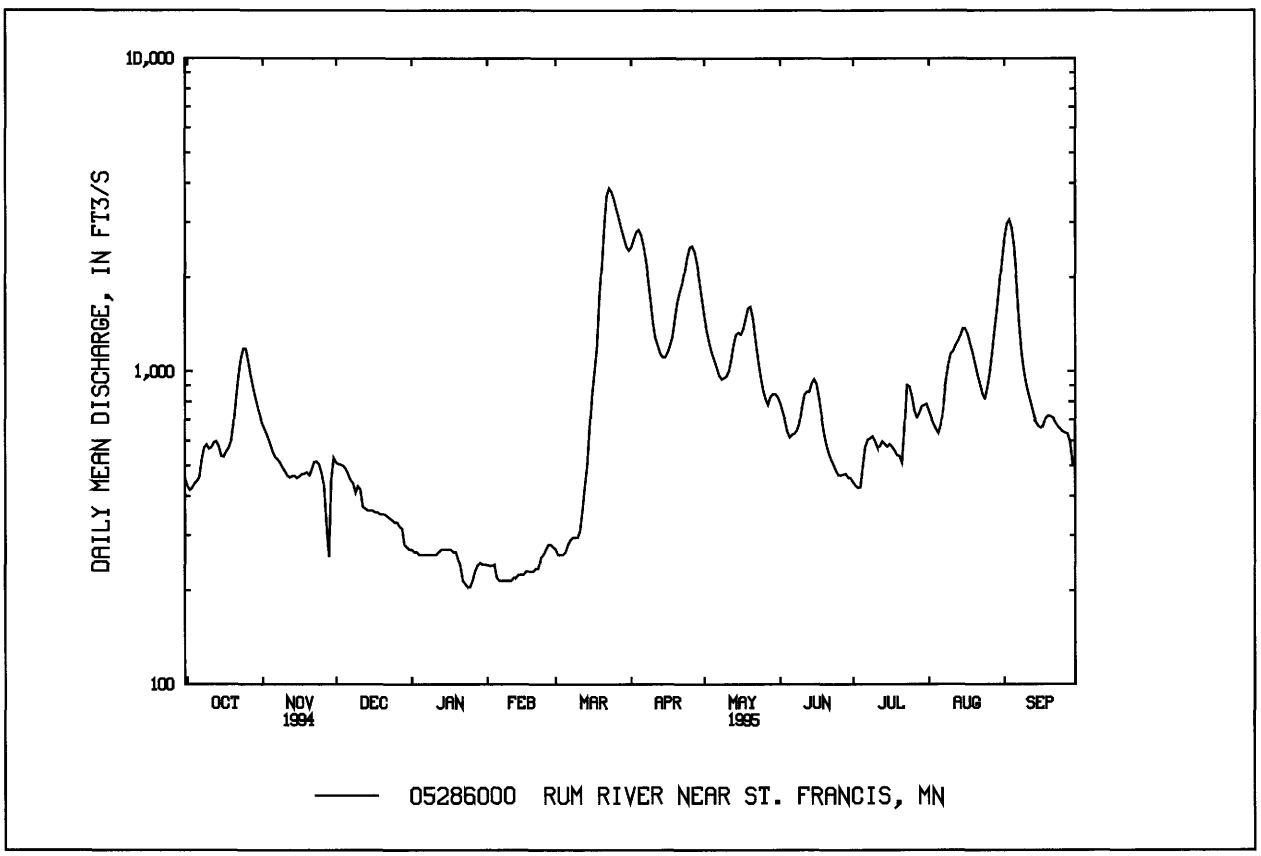
05286000 RUM RIVER NEAR ST. FRANCIS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	463	443	325	242	242	627	1509	1105	883	638	411	437
MAX	2300	1715	1051	660	813	2699	4269	3899	3399	2532	2251	2362
(WY)	1969	1972	1983	1987	1966	1966	1969	1986	1984	1954	1972	1986
MIN	65.4	71.8	55.8	51.5	59.2	75.8	154	73.6	43.7	34.5	37.3	47.1
(WY)	1934	1934	1934	1934	1934	1934	1934	1934	1934	1934	1934	1933

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1929 - 1995		
ANNUAL TOTAL	259539		308545				
ANNUAL MEAN	711		845		630		
HIGHEST ANNUAL MEAN					1512		1986
LOWEST ANNUAL MEAN					66.1		1934
HIGHEST DAILY MEAN	3240	May 5	3860	Mar 23	10000	Apr 13	1969
LOWEST DAILY MEAN	256	Nov 28	205	Jan 24	30	Aug 3	1934
ANNUAL SEVEN-DAY MINIMUM	299	Feb 22	216	Feb 5	31	Aug 1	1934
INSTANTANEOUS PEAK FLOW			3880	Mar 23	10100a	Apr 20	1965
INSTANTANEOUS PEAK STAGE			6.89	Mar 23	11.63	Apr 13	1969
INSTANTANEOUS LOW FLOW			178b	Nov 29	29	Aug18	1934
ANNUAL RUNOFF (AC-FT)	514800		612000		456200		
ANNUAL RUNOFF (CFSM)	.52		.62		.46		
10 PERCENT EXCEEDS	1480		1820		1370		
50 PERCENT EXCEEDS	500		604		360		
90 PERCENT EXCEEDS	313		258		110		

a Also occurred Apr. 13, 1969.
b Result of freezeup.



ELM CREEK BASIN

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 downstream from bridge on Elm Creek Road, 2.5 mi southwest of Champlin.

DRAINAGE AREA.--84.9 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 850.71 ft above mean sea level. Prior to March 15, 1979, nonrecording gage at present site and datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.2	23	18	e7.0	3.5	e2.1	127	56	95	24	8.9	71
2	5.2	22	19	e5.5	3.5	e2.0	118	50	93	21	7.5	63
3	11	20	19	e4.0	3.5	e2.0	107	47	83	19	6.8	56
4	18	18	18	e3.9	3.4	2.1	93	44	69	19	6.0	48
5	19	17	17	e4.0	3.3	1.8	83	41	59	61	5.7	41
6	20	17	18	e4.8	e3.2	1.7	76	38	61	76	15	36
7	42	16	15	e4.9	3.1	1.6	69	35	75	73	58	31
8	53	15	14	e4.5	e3.0	1.5	63	33	79	68	96	27
9	52	15	14	e4.7	2.9	1.5	57	35	76	62	111	24
10	50	13	17	e4.8	2.6	1.4	51	40	78	57	122	22
11	50	13	13	e5.0	e2.6	2.4	48	42	77	53	133	20
12	45	13	13	5.3	e2.5	35	53	44	72	49	139	18
13	39	14	12	5.2	e2.4	122	59	46	65	43	151	16
14	35	14	11	5.1	e2.2	151	62	54	58	38	215	15
15	36	15	11	5.0	e2.5	190	65	54	51	36	223	13
16	36	14	10	4.8	e2.4	225	68	53	45	35	202	13
17	44	14	9.9	5.2	2.4	235	69	50	39	32	181	13
18	48	13	10	5.1	2.0	229	80	46	33	28	166	12
19	48	12	9.8	5.8	2.1	214	108	41	29	25	178	11
20	46	12	9.3	5.6	2.1	199	114	36	25	23	172	10
21	44	15	9.2	5.2	2.0	180	123	32	23	20	156	9.2
22	44	17	9.0	4.9	2.1	160	128	29	21	20	138	9.0
23	45	18	9.2	4.9	2.1	142	127	27	19	18	120	9.0
24	42	20	8.8	4.8	2.1	126	121	25	16	17	101	8.9
25	40	19	8.8	4.5	2.1	115	111	23	15	16	110	8.8
26	37	18	8.8	4.4	2.2	113	101	21	17	14	104	8.4
27	35	19	8.7	4.0	2.2	118	90	20	20	13	101	8.3
28	33	19	8.8	3.7	2.2	127	79	46	28	13	100	8.3
29	30	23	9.0	3.6	---	131	71	66	33	12	95	8.2
30	27	22	9.0	3.5	---	132	63	76	29	11	89	11
31	24	---	e8.0	3.5	---	132	---	87	---	9.7	80	---
TOTAL	1103.4	500	375.3	147.2	72.2	3096.1	2584	1337	1483	1005.7	3390.9	649.1
MEAN	35.6	16.7	12.1	4.75	2.58	99.9	86.1	43.1	49.4	32.4	109	21.6
MAX	53	23	19	7.0	3.5	235	128	87	95	76	223	71
MIN	5.2	12	8.0	3.5	2.0	1.4	48	20	15	9.7	5.7	8.2
AC-FT	2190	992	744	292	143	6140	5130	2650	2940	1990	6730	1290
CFSM	.42	.20	.14	.06	.03	1.18	1.01	.51	.58	.38	1.29	.25
IN.	.48	.22	.16	.06	.03	1.36	1.13	.59	.65	.44	1.49	.28

e Estimated.

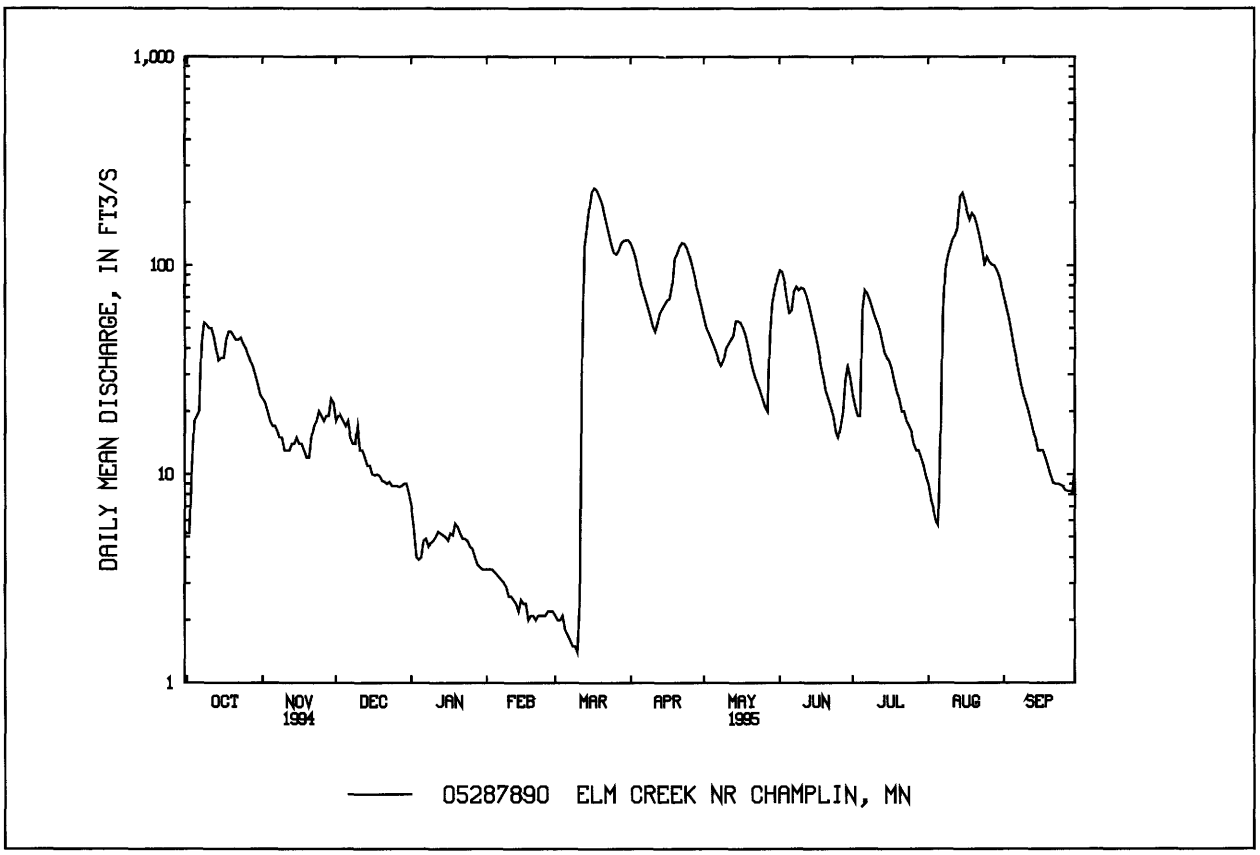
ELM CREEK BASIN

05287890 ELM CREEK NEAR CHAMPLIN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1979 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	29.9	20.4	12.6	5.89	11.1	71.4	89.1	57.4	42.6	34.7	32.7	31.1
MAX	229	67.4	41.3	22.0	99.1	182	221	146	140	157	143	170
(WY)	1986	1994	1992	1992	1984	1992	1986	1991	1991	1993	1993	1991
MIN	1.13	1.03	.92	.74	.91	5.51	5.31	4.95	1.34	.76	1.44	1.08
(WY)	1990	1990	1990	1991	1990	1981	1987	1987	1988	1988	1989	1988

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1979 - 1995	
ANNUAL TOTAL	15164.9		15743.9			
ANNUAL MEAN	41.5		43.1		36.7	
HIGHEST ANNUAL MEAN					75.1	1986
LOWEST ANNUAL MEAN					4.54	1988
HIGHEST DAILY MEAN	494	Apr 30	235	Mar 17	545	Mar 27 1986
LOWEST DAILY MEAN	5.2	Jan 21	1.4	Mar 10	.31	Jun 30 1988
ANNUAL SEVEN-DAY MINIMUM	5.2	Jan 21	1.7	Mar 4	.35	Jun 26 1988
INSTANTANEOUS PEAK FLOW			237	Mar 17	597	Mar 27 1986
INSTANTANEOUS PEAK STAGE			8.15	Mar 17	9.93	Mar 27 1986
INSTANTANEOUS LOW FLOW			1.2	Mar 8	.29	Jul 9 1989
ANNUAL RUNOFF (AC-FT)	30080		31230		26560	
ANNUAL RUNOFF (CFSM)	.49		.51		.43	
ANNUAL RUNOFF (INCHES)	6.64		6.90		5.87	
10 PERCENT EXCEEDS	98		118		107	
50 PERCENT EXCEEDS	18		22		12	
90 PERCENT EXCEEDS	5.7		3.5		1.6	



WATER-QUALITY RECORDS

PERIOD OF RECORD.--February 1988 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)
NOV							
22...	1237	15	579	8.4	1.5	--	747
JAN							
19...	1215	6.1	664	7.2	0.0	--	742
MAR							
14...	1145	52	370	7.2	0.5	--	745
APR							
12...	1115	52	514	8.2	3.5	--	728
27...	1055	90	515	8.0	9.0	--	737
JUN							
23...	1233	18	530	7.6	24.0	--	738
JUL							
05...	1348	59	347	7.6	19.5	--	730
19...	1000	26	480	7.5	20.5	--	--
27...	0945	13	494	7.4	21.5	24.0	--
AUG							
07...	1430	60	374	7.2	21.0	--	738
24...	0920	101	450	7.4	23.0	--	741

DATE	OXYGEN, DIS-SOLVED (MG/L) (00300)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)
NOV							
22...	4.3	<0.010	0.260	0.070	0.90	0.080	0.020
JAN							
19...	9.9	0.010	0.200	0.250	0.80	0.050	0.020
MAR							
14...	9.9	0.040	1.20	0.930	2.3	0.500	0.410
APR							
12...	12.0	0.010	0.220	0.110	1.2	0.090	0.050
27...	9.6	<0.010	<0.050	0.030	1.1	0.070	0.040
JUN							
23...	6.0	0.010	0.090	0.080	1.2	0.250	0.160
JUL							
05...	7.4	0.030	0.440	0.080	1.3	0.260	0.170
19...	4.4	<0.010	0.060	0.090	1.1	0.220	0.170
27...	4.7	<0.010	0.060	0.020	1.0	0.190	0.110
AUG							
07...	4.6	0.020	0.150	0.150	1.2	0.270	0.140
24...	3.3	0.010	0.080	0.100	1.9	0.450	0.250

ELM CREEK BASIN

05287890 ELM CREEK NEAR CHAMPLIN, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)
MAR 14-25	374	7.3	35	11	16	8.8	21	1.8	0.250
APR 12-28	525	8.1	60	17	21	8.3	10	--	0.100
MAY 28-JUN 14	487	7.8	55	17	19	10	24	--	0.200
JUN 22-JUL 02	475	7.9	52	18	18	15	8	--	0.170
JUL 05-19	439	6.2	45	15	17	15	19	--	0.260
AUG 07-23	394	7.8	43	14	15.	14	24	--	0.210

DATE	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)
MAR 14-25	--	39	<0.5	<1.0	<5	3	<10	170	20
APR 12-28	0.070	54	<0.5	<1.0	<5	<3	<10	37	20
MAY 28-JUN 14	0.190	60	<0.5	2.0	<5	6	<10	490	20
JUN 22-JUL 02	0.140	53	<0.5	<1.0	<5	<3	<10	34	<10
JUL 05-19	0.090	46	<0.5	<1.0	<5	<3	<10	52	<10
AUG 07-23	0.170	45	<0.5	2.0	<5	<3	<10	22	<10

ELM CREEK BASIN

05287890 ELM CREEK NEAR CHAMPLIN, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
MAR 14-25	<4	4	<10	<10	1.0	62	<6	<3
APR 12-28	6	2	10	10	<1.0	100	<6	<3
MAY 28-JUN 14	6	180	30	<10	<1.0	100	<6	4
JUN 22-JUL 02	<4	1	10	10	<1.0	120	<6	10
JUL 05-19	5	15	<10	<10	<1.0	94	<6	<3
AUG 07-23	5	4	10	<10	<1.0	90	<6	<3

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MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN

LOCATION.--Lat 45°07'36", long 93°17'48", in SW¼ sec.12, T.119 N., R.21 W., Hennepin County, Hydrologic Unit 07010206, on right bank 0.4 mi downstream from Coon Creek, 1.3 mi downstream from Coon Rapids dam at Coon Rapids, 6.5 mi downstream from Anoka, and at mile 864.8 upstream from Ohio River.

DRAINAGE AREA.--19,100 mi², approximately.

PERIOD OF RECORD.--June 1931 to current year. Prior to October 1931 published as "at Coon Rapids, near Anoka."

GAGE.--Water-stage recorder. Datum of gage is 804.53 ft above sea level. Prior to June 14, 1932, at site 1.2 mi upstream at different datum.

REMARKS.--No estimated daily discharges. Records good. Discharge during period of backwater from ice, Dec. 24 to Feb. 19, computed from discharge furnished by Ford Plant Dam downstream from station adjusted for time of travel, leakage through dam, and diversions to St. Paul and Minneapolis waterworks. Flow slightly regulated by six reservoirs on headwaters; total usable capacity, 1,640,600 acre-ft. Diurnal regulation caused by dam above station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7210	12300	6960	e6020	e5360	e4250	24300	18900	13100	5220	8410	15300
2	7050	11900	7820	e5940	e5530	e5110	23100	18000	13100	5060	8150	15500
3	7120	11400	8260	e4140	e5330	e4600	23400	16900	12500	4880	7430	15000
4	7600	11100	8310	e4430	e5000	4680	23300	16800	11800	4980	7320	14900
5	7800	10800	8170	e4670	e4990	e4370	22300	14800	11500	7590	7090	14000
6	7760	10700	6750	e5260	e5090	e3780	21000	15100	12100	7450	7880	12900
7	8270	10200	6590	e5450	e4860	e4030	20000	14400	12000	8460	7790	11900
8	8430	10000	7190	e5470	e5560	4360	18800	14100	11800	9660	8000	10600
9	8370	9310	6680	e5370	e5780	4440	17700	14100	11800	10900	8800	9660
10	8440	9380	6330	e5680	e3380	4480	16700	14900	12000	11600	8850	9130
11	8550	9320	e5160	e6330	e3980	4690	16100	14900	12400	11700	9160	8820
12	8080	9180	e5200	e6680	e4660	5030	16200	15500	12300	12100	10500	8390
13	8390	9080	e5680	e6300	e4840	6710	15700	15800	12100	12000	10600	7930
14	8560	9080	e5190	e6210	e4900	9050	15100	16700	11900	11700	11800	7100
15	7640	9000	e6250	e5990	e5060	e11900	14600	17800	11900	11700	11200	6940
16	8110	8720	e7090	e6560	e4830	e15300	16000	20100	11200	11900	11200	7130
17	8730	8810	e7220	e6260	e5270	17700	16900	21700	10200	11600	10900	6820
18	9360	8860	e6260	e5790	e5120	23900	17100	21800	10100	11800	10300	6410
19	11400	9020	e5920	e5440	e5200	26400	18500	22100	9110	11700	10500	6270
20	13300	8830	e6540	e5500	e4910	28800	20100	21800	8570	11900	10300	6590
21	13500	9500	e7120	e5780	e4870	30200	21200	21000	7800	11100	9910	5930
22	14100	8780	e7440	e5190	e5140	29700	21900	19900	7410	10900	9070	5940
23	15100	9120	e7670	e4980	5060	28200	22300	19500	6670	11100	8720	5810
24	15500	9150	e7530	e5260	4820	26200	22300	17900	6370	10900	8670	5550
25	15400	8760	e7270	e5920	4620	25600	22500	16500	6210	10600	9180	5990
26	14800	8290	e7220	e5650	4580	25000	22300	16400	5700	10400	10200	5730
27	14300	8180	e7400	e5520	4840	26000	22000	15400	6010	9970	11800	5370
28	13800	7320	7380	e5630	e3710	26800	21300	15700	5860	10200	12400	5420
29	13400	6030	6590	e5390	---	25600	20600	15000	5970	9390	13600	5500
30	13000	5880	7090	e5300	---	25400	19800	14400	5260	9170	14400	5870
31	12600	---	6430	e5540	---	25500	---	13900	---	8350	15000	---
TOTAL	325670	278000	212710	173650	137290	487780	593100	531800	294740	305980	309130	258400
MEAN	10510	9267	6862	5602	4903	15730	19770	17150	9825	9870	9972	8613
MAX	15500	12300	8310	6680	5780	30200	24300	22100	13100	12100	15000	15500
MIN7	050	5880	5160	4140	3380	3780	14600	13900	5260	4880	7090	5370
AC-FT	646000	551400	421900	344400	272300	967500	1176000	1055000	584600	606900	613200	512500
CFSM	.55	.49	.36	.29	.26	.82	1.04	.90	.51	.52	.52	.45
IN..	63	.54	.41	.34	.27	.95	1.16	1.04	.57	.60	.60	.50

e Estimated.

MISSISSIPPI RIVER MAIN STEM

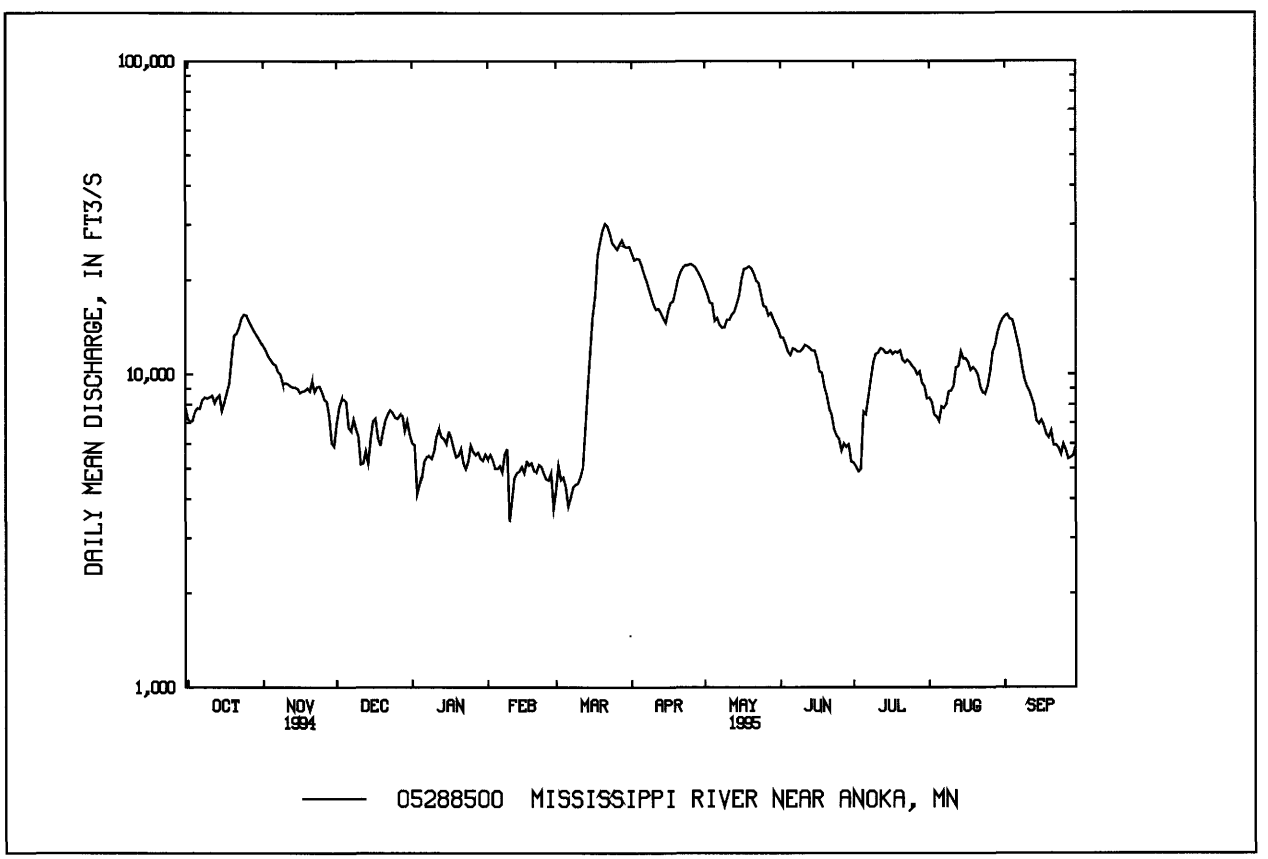
05288500 MISSISSIPPI RIVER NEAR ANOKA, MN

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1995, BY WATER YEAR (WY)

MEAN	6286	6081	4703	4163	4049	7252	17110	14740	11440	8523	5985	5853
MAX	21250	22800	10800	8304	9947	23410	42970	39760	29910	27240	22490	23570
(WY)	1987	1972	1972	1986	1966	1966	1969	1986	1943	1993	1972	1986
MIN	1128	1152	1006	935	1079	1602	3575	2796	1646	1022	715	888
(WY)	1937	1937	1935	1935	1933	1940	1959	1934	1934	1934	1934	1934

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1931 - 1995	
ANNUAL TOTAL	4054230		3908250			
ANNUAL MEAN	11110		10710		8048	
HIGHEST ANNUAL MEAN					17750	1986
LOWEST ANNUAL MEAN					1603	1934
HIGHEST DAILY MEAN	35100	May 4	30200	Mar 21	90300	Apr 17 1965
LOWEST DAILY MEAN	5090	Sep 14	3380	Feb 10	602	Sep 10 1934
ANNUAL SEVEN-DAY MINIMUM	5330	Sep 8	4310	Mar 4	646	Aug 26 1934
INSTANTANEOUS PEAK FLOW					91000	Apr 17 1965
INSTANTANEOUS PEAK STAGE					19.53	Apr 17 1965
INSTANTANEOUS LOW FLOW					529[a]	Aug 29 1976
ANNUAL RUNOFF (AC-FT)	8042000		7752000		5831000	
ANNUAL RUNOFF (CFSM)	.58		.56		.42	
ANNUAL RUNOFF (INCHES)	7.90		7.61		5.73	
10 PERCENT EXCEEDS	19700		20000		17500	
50 PERCENT EXCEEDS	8440		9000		5520	
90 PERCENT EXCEEDS6010	5080	2040				

a Result of regulation.



MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN--Continued

WATER-QUALITY RECORDS

LOCATION.--Sediment samples collected at Camden Avenue bridge, in Minneapolis, 7.0 mi 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, approximately.

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

WATER TEMPERATURES: Water years 1976, 77, 79, 80, 82 to current year.

SUSPENDED SEDIMENT DISCHARGE: August 1975 to current year.

REMARKS.--Sediment samples were collected approximately daily by an observer during the open-water period. In general, daily concentrations and loads for the open-water period are considered good. During the winter period, daily sediment concentrations and loads are based primarily on concentrations of sediment in samples that were collected monthly and on daily water-discharge records. Sediment records for the winter period are considered fair. Water temperatures were obtained by the observer approximately daily during the open-water period and monthly by U.S. Geological Survey personnel during the winter period. Some temperatures are not published because of questionable values.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES.: Maximum observed 31.0°C, Aug. 25, 26, 1976, July 19, 1977, July13, 1995; minimum observed, 0.0°C several days during winter period, each year.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 210 mg/L Apr. 3, 1982; minimum daily mean, 1 mg/L on several days in 1978,1980, 1981, 1982, and 1984.

SEDIMENT LOADS: Maximum daily, 17,400 tons Apr. 20, 1982; minimum daily, 3.9 tons Feb. 2, 1981.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum observed, 31.0°C, July 13; minimum observed: 0.0°C, Mar. 12-14, 16-17..

SEDIMENT CONCENTRATION: Maximum daily mean, 222 mg/L, Mar. 20; minimum daily mean, 2 mg/L, Dec. 2.

SEDIMENT LOADS: Maximum daily, 17,300 tons, Mar. 20; minimum daily, 46 tons, Feb. 10.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.0	8.0	1.0	---	---	---	---	12.0	20.0	---	26.0	23.0
2	13.0	8.0	2.0	---	---	---	---	13.0	20.0	---	25.0	24.0
3	12.0	6.0	1.0	---	---	---	---	13.0	22.0	---	26.0	24.0
4	12.0	7.0	1.0	---	---	---	---	13.0	23.0	---	25.0	25.0
5	13.0	5.0	---	---	---	---	---	16.0	22.0	---	27.0	24.0
6	13.0	6.0	---	---	---	---	---	13.0	22.0	21.0	25.0	25.0
7	14.0	8.0	---	---	---	---	---	10.0	19.0	20.0	24.0	21.0
8	12.0	6.0	---	---	---	---	---	12.0	18.0	21.0	25.0	19.0
9	11.0	7.0	---	---	---	---	---	11.0	18.0	24.0	26.0	19.0
10	12.0	6.0	---	---	---	---	---	12.0	17.0	27.0	27.0	19.0
11	12.0	5.0	---	---	---	---	---	16.0	18.0	27.0	26.0	20.0
12	14.0	6.0	---	---	---	.0	---	15.0	18.0	29.0	26.0	21.0
13	13.0	7.0	---	---	---	.0	---	14.0	20.0	31.0	27.0	19.0
14	13.0	7.0	---	---	---	.0	---	14.0	22.0	29.0	24.0	19.0
15	12.0	6.0	---	---	---	---	---	16.0	24.0	---	25.0	19.0
16	14.0	5.0	---	---	---	.0	---	17.0	26.0	---	25.0	19.0
17	15.0	5.0	---	---	---	.0	---	17.0	26.0	25.0	27.0	19.0
18	15.0	4.0	---	---	---	---	---	17.0	29.0	25.0	27.0	---
19	13.0	4.0	---	---	---	---	---	18.0	28.0	26.0	26.0	---
20	14.0	4.0	---	---	---	---	---	18.0	---	26.0	26.0	15.0
21	14.0	2.0	---	---	---	---	---	17.0	---	23.0	27.0	12.0
22	12.0	2.0	---	---	---	---	---	18.0	---	25.0	27.0	12.0
23	10.0	1.0	---	---	---	---	10.0	16.0	29.0	---	27.0	12.0
24	8.0	2.0	---	---	---	---	10.0	17.0	28.0	27.0	25.0	10.0
25	8.0	2.0	---	---	---	---	11.0	18.0	26.0	27.0	24.0	13.0
26	8.0	1.0	---	---	---	---	10.0	17.0	27.0	27.0	24.0	16.0
27	8.0	---	---	---	---	2.0	10.0	16.0	25.0	25.0	23.0	17.0
28	10.0	---	---	---	---	---	11.0	13.0	26.0	27.0	23.0	18.0
29	10.0	---	---	---	---	---	12.0	14.0	25.0	27.0	23.0	17.0
30	9.0	.0	---	---	---	---	12.0	21.0	22.0	28.0	26.0	17.0
31	9.0	---	---	---	---	---	---	21.0	---	25.0	24.0	---
MEAN	11.8	---	---	---	---	---	---	15.3	---	---	25.4	---
MAX	15.0	---	---	---	---	---	---	21.0	---	---	27.0	---
MIN	8.0	---	---	---	---	---	---	10.0	---	---	23.0	---

MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	8	160	17	571	3	61	10	164	5	72	7	80
2	9	171	19	613	2	50	9	144	5	75	10	138
3	10	201	14	433	5	115	9	101	5	72	12	149
4	10	200	10	289	6	135	9	108	5	67	13	164
5	14	301	7	213	6	135	8	101	5	67	13	153
6	17	359	6	164	6	114	8	114	5	69	15	153
7	21	480	9	249	6	113	8	118	5	66	15	163
8	23	518	6	161	6	126	7	103	5	75	16	188
9	21	475	4	108	6	108	7	101	5	78	16	192
10	14	316	5	136	6	103	9	138	5	46	16	194
11	16	361	4	110	6	84	10	171	5	54	21	263
12	15	319	4	100	6	84	10	180	5	63	21	279
13	14	322	5	126	6	92	9	153	5	65	20	364
14	16	379	7	175	6	84	9	151	5	66	37	914
15	12	250	6	135	5	84	9	146	5	68	71	2270
16	14	316	5	120	5	96	9	159	5	65	123	5090
17	17	400	7	171	5	97	8	135	6	85	110	5250
18	24	609	8	191	5	85	8	125	6	83	151	976
19	42	1280	8	197	5	80	8	118	6	84	215	15400
20	44	1570	7	164	6	106	7	104	6	80	222	17300
21	40	1440	7	192	6	115	7	109	6	79	142	11600
22	34	1300	5	115	6	121	7	98	6	83	104	8310
23	27	1090	6	149	6	124	7	94	6	82	68	5160
24	40	1670	5	114	7	142	6	85	6	78	71	5030
25	53	2210	6	132	7	137	6	96	6	75	59	4080
26	40	1590	6	134	7	136	6	92	6	74	53	3560
27	25	958	6	127	7	140	6	89	6	78	54	3790
28	24	899	6	109	7	139	6	91	6	60	55	3980
29	22	793	5	86	10	178	5	73	---	---	54	3730
30	15	535	5	78	10	191	5	72	---	---	52	3580
31	14	483	---	---	10	174	5	75	---	---	52	3580
TOTAL	---	21955	---	5662	---	3549	---	3608	---	2009	---	114864

MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	APRIL MEAN CONCEN-TRATION (MG/L)	APRIL LOAD (TONS/ DAY)	MAY MEAN CONCEN-TRATION (MG/L)	MAY LOAD (TONS/ DAY)	JUNE MEAN CONCEN-TRATION (MG/L)	JUNE LOAD (TONS/ DAY)	JULY MEAN CONCEN-TRATION (MG/L)	JULY LOAD (TONS/ DAY)	AUGUST MEAN CONCEN-TRATION (MG/L)	AUGUST LOAD (TONS/ DAY)	SEPTEMBER MEAN CONCEN-TRATION (MG/L)	SEPTEMBER LOAD (TONS/ DAY)
1	50	3280	15	780	16	554	20	280	18	405	35	1440
2	48	2990	15	733	20	713	21	293	14	314	27	1130
3	46	2910	14	636	20	677	23	305	10	191	20	817
4	31	1960	18	820	14	461	25	336	14	280	20	811
5	45	2690	13	507	25	763	27	554	19	360	14	539
6	34	1940	35	1420	26	843	29	586	25	532	10	348
7	31	1670	31	1190	36	1150	30	691	20	421	12	386
8	25	1280	20	779	26	844	38	979	17	368	15	422
9	20	976	22	853	22	701	50	1460	24	580	13	338
10	18	826	21	860	19	629	52	1620	23	542	15	369
11	17	753	18	721	20	665	47	1470	24	604	13	299
12	17	757	18	763	18	598	36	1180	29	833	10	221
13	9	380	15	651	14	467	30	957	17	481	12	248
14	9	386	18	811	23	745	37	1180	23	746	16	304
15	11	432	18	874	23	743	34	1080	23	691	10	193
16	13	548	18	974	18	547	31	995	17	509	11	212
17	15	670	17	1010	17	458	28	877	18	523	14	265
18	17	784	17	1030	19	524	26	814	16	455	16	273
19	20	1010	23	1380	20	488	25	779	24	675	15	255
20	32	1710	19	1100	24	547	20	654	25	702	7	125
21	39	2240	20	1150	23	476	25	749	23	607	6	93
22	36	2130	19	1030	21	412	27	785	21	506	9	139
23	41	2470	11	594	22	397	23	682	23	548	7	112
24	23	1400	16	776	22	371	20	578	28	652	5	78
25	20	1210	17	777	27	445	27	771	28	700	4	68
26	21	1280	29	1290	20	312	24	685	20	540	4	62
27	19	1130	28	1160	22	351	22	580	27	861	4	56
28	21	1230	32	1370	13	213	22	596	33	1090	4	59
29	18	1030	26	1040	13	208	12	316	31	1140	4	62
30	20	1040	14	561	18	257	14	340	31	1220	13	211
31	---	---	18	658	---	---	20	450	30	1220	---	---
TOTAL	---	43112	---	28298	---	16559	---	23622	---	19296	---	9935
YEAR		292469										

MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN--ContinuedS

PARTICLE-SIZE DISTRIBUTION OF BED MATERIAL SEDIMENT, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (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 16.00 MM (80172)
JUL 21...	1010	11,100	0	0.8	12	33	62	84	94	98	100

MINNESOTA RIVER BASIN

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 northwest of town of Browns Valley, MN, 5.3 mi northeast of Peever, 7.2 mi downstream from Jorgenson River, and 8 mi upstream from Big Stone Lake.

DRAINAGE AREA.--447 mi².

PERIOD OF RECORD.--October 1939 to September 1981, October 1989 to current year.

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

GAGE.--Water-stage recorder. Datum of gage is 1,002.20 ft above sea level. Oct. 1, 1939, to Mar. 20, 1940, nonrecording gage at site 4.5 mi downstream at different datum. Mar. 21 to Apr. 12, 1940, nonrecording gage at site 100 ft downstream at present datum. April 13 to Aug. 27, 1940, nonrecording gage at present site and datum.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 450 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Mar. 12	1500	*2730	*9.04	May 10	1000	826	5.47
Mar. 28	0430	728	5.29	May 14	2330	840	5.49
Apr. 16	0500	674	5.17	Jun 11	2330	478	4.67

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	9.9	9.7	11	4.8	e15	383	185	201	41	15	22
2	4.0	9.2	12	11	4.8	e14	340	178	187	40	16	18
3	4.9	8.7	12	e9.7	4.7	e14	314	171	173	38	16	15
4	5.0	8.9	12	e9.3	e4.4	e13	305	166	160	41	15	13
5	14	8.7	12	e8.9	e4.3	e13	262	161	148	48	19	12
6	14	8.7	e10	8.8	e4.3	e12	257	154	142	91	41	11
7	11	9.1	e9.2	8.4	e4.3	e12	250	152	140	120	30	9.5
8	9.7	8.9	e8.5	e6.0	e4.3	e12	237	160	149	83	22	8.8
9	9.1	8.9	e6.8	e5.2	e4.3	12	231	300	165	57	18	7.8
10	8.1	8.8	e7.3	4.9	e4.4	12	216	737	160	49	14	7.2
11	7.8	8.7	e6.9	4.7	e4.4	29	203	644	305	47	13	6.8
12	6.5	8.5	e6.8	e4.4	4.3	e1500	188	547	381	43	13	6.1
13	6.3	8.7	e6.0	e4.4	3.9	e2700	198	439	254	40	17	5.4
14	5.9	8.7	e5.7	e4.4	e3.6	1760	289	586	214	38	18	5.6
15	6.4	8.7	e5.6	e4.4	e3.5	1080	449	703	186	36	17	5.3
16	8.1	9.9	e5.6	e4.4	e3.5	743	624	579	161	34	18	5.2
17	11	11	e5.6	e4.4	e3.5	582	508	491	140	35	15	4.6
18	20	8.8	e5.6	e4.4	e3.5	507	438	408	123	42	13	5.6
19	25	8.7	e5.6	e4.4	e3.6	456	425	359	107	44	11	5.2
20	22	9.3	e5.6	e4.4	e3.9	406	428	331	93	39	9.3	4.6
21	19	10	e5.6	e4.4	e4.4	357	372	296	84	35	8.4	4.5
22	16	8.7	e5.8	4.8	e5.2	314	333	273	73	32	7.1	4.4
23	15	13	e5.8	4.8	e6.2	302	298	268	67	28	6.0	4.4
24	13	12	e6.2	4.8	e8.0	334	269	254	62	24	8.3	4.5
25	12	10	e7.4	4.8	e9.2	343	250	235	58	22	12	4.2
26	12	10	9.4	4.8	e12	349	237	221	55	22	22	4.1
27	11	10	11	4.8	e15	549	230	210	52	21	25	4.1
28	10	10	13	4.8	e16	708	219	215	51	21	25	4.1
29	10	9.4	13	4.8	---	648	208	262	50	19	23	4.2
30	9.9	9.2	13	4.7	---	537	196	248	47	18	23	11
31	11	---	13	4.8	---	439	---	216	---	17	28	---
TOTAL	341.4	283.1	261.7	179.8	158.3	14772	9157	10149	4188	1265	538.1	228.2
MEAN	11.0	9.44	8.44	5.80	5.65	477	305	327	140	40.8	17.4	7.61
MAX	25	13	13	11	16	2700	624	737	381	120	41	22
MIN	3.7	8.5	5.6	4.4	3.5	12	188	152	47	17	6.0	4.1
AC-FT	677	562	519	357	314	29300	18160	20130	8310	2510	1070	453
CFSM	.02	.02	.02	.01	.01	1.07	.68	.73	.31	.09	.04	.02
IN.	.03	.02	.02	.01	.01	1.23	.76	.84	.35	.11	.04	.02

e Estimated.

MINNESOTA RIVER BASIN

05290000 LITTLE MINNESOTA RIVER NEAR PEEVER, SD

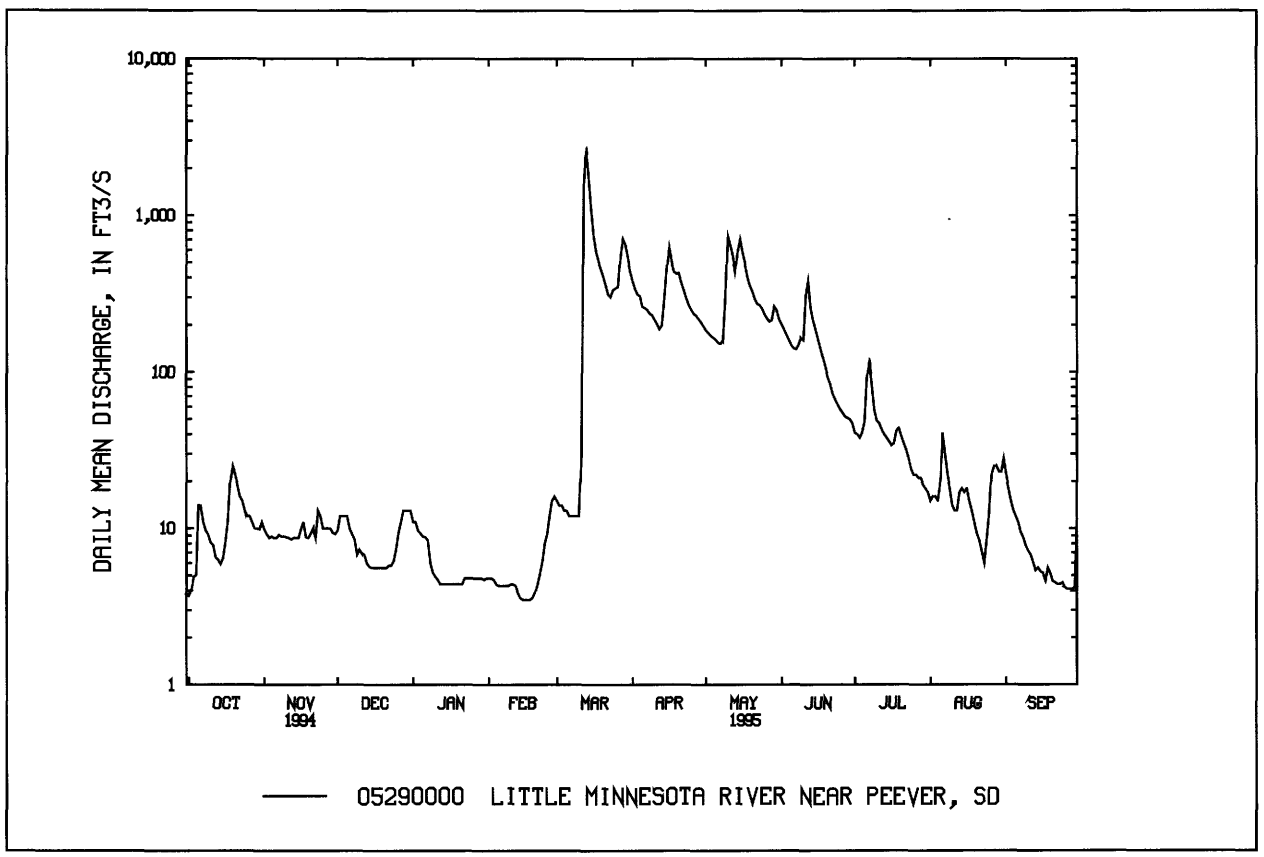
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4.04	4.84	2.82	1.42	2.59	110	202	91.1	74.7	56.1	13.0	4.50
MAX	40.7	34.7	18.2	11.4	21.8	573	1321	531	355	865	235	43.3
(WY)	1943	1958	1994	1994	1976	1943	1952	1962	1942	1993	1993	1993
MIN	.21	.25	.10	.000	.000	.51	2.89	2.20	.41	.041	.059	.074
(WY)	1940	1940	1940	1940	1940	1956	1981	1981	1976	1976	1976	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1940 - 1995		
ANNUAL TOTAL	34563.3		41521.6				
ANNUAL MEAN	94.7		114		47.3[a]		
HIGHEST ANNUAL MEAN					153		1962
LOWEST ANNUAL MEAN					1.37		1981
HIGHEST DAILY MEAN	856	Mar 21	2700	Mar 13	5400	Jul	25 1993
LOWEST DAILY MEAN	3.6	Sep 29	3.5	Feb 15	.00[b]	Jan	1 1940
ANNUAL SEVEN-DAY MINIMUM	3.9	Sep 26	3.6	Feb 13	.00	Jan	1 1940
INSTANTANEOUS PEAK FLOW			2730	Mar 13	8900	Jul	25 1993
INSTANTANEOUS PEAK STAGE			9.04	Mar 13	13.58	Jul	25 1993
INSTANTANEOUS LOW FLOW			2.4	Nov 22	2.4	Nov	22 1994
ANNUAL RUNOFF (AC-FT)	68560		82360		34290		
ANNUAL RUNOFF (CFSM)	.21		.25		.11		
ANNUAL RUNOFF (INCHES)	2.88		3.46		1.44		
10 PERCENT EXCEEDS	303		341		106		
50 PERCENT EXCEEDS	12		13		3.1		
90 PERCENT EXCEEDS	5.6		4.4		.30		

a Median of annual mean discharges is 34 ft^3/s.

b Many days, several years.



MINNESOTA RIVER BASIN

05291000 WHETSTONE RIVER NEAR BIG STONE CITY, SD

LOCATION.--Lat 45°∞17'32", long 96°∞29'14", in $SE^1/_4NW^1/_4$ sec.18, T.121 N., R.46 W., Grant County, Hydrologic Unit 07020001, on right bank 20 ft downstream from former highway bridge site, 1.5 mi west of Big Stone City, and 4.5 mi upstream from Big Stone Lake.
DRAINAGE AREA.--389 mi^2.
PERIOD OF RECORD.--March 1910 to November 1912 (no winter records), and March 1931 to current year. Monthly discharge only for some periods, published in WSP 1308.
REVISED RECORDS.--WSP 895: Drainage area. WSP 1308: 1932(M), 1935(M).
GAGE.--Water-stage recorder. Datum of gage is 996.96 ft in mean sea level, adjustment of 1912. Mar. 8, 1910, to Nov. 30, 1912, nonrecording gage 2 mi downstream at different datum. Mar. 18, 1931, to May 3, 1939, nonrecording gage, at site 20 ft upstream at present datum. May 4, 1939, to Nov. 8, 1952, water-stage recorder at site 80 ft down-stream at present datum.
REMARKS.--Records good except those for estimated daily discharges, which are fair to poor.
EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, about 26 ft in June 1919, present site and datum, from information by local resident, discharge 29,000 ft^3/s, from dam break.
EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 13	--	e700	b8.66	May 29	1300	725	5.45
Mar. 28	0200	2690	9.57	June 11	2300	1090	6.49
Apr. 15	2400	2620	9.47	July 06	1000	*4140	*11.55
Apr. 19	1700	2860	9.83	Aug. 06	0400	448	4.61
May 10	0900	2200	8.77	Aug. 14	0100	435	4.56
May 14	2400	1420	7.26	Aug. 30	0600	294	3.93

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	44	e31	e38	e20	e32	339	226	231	71	75	157
2	25	45	e31	e37	e20	e31	290	218	192	71	73	125
3	34	44	e31	e36	e20	e33	259	205	169	76	72	111
4	42	43	e31	e35	e19	e35	227	194	151	1130	119	120
5	55	43	e35	e33	e19	e33	199	186	139	2380	315	108
6	53	43	e33	e30	e18	e32	188	179	144	3500	391	100
7	56	42	e31	e28	e18	e31	176	176	134	1950	242	94
8	53	42	e30	e26	e18	e30	182	185	131	826	174	92
9	58	42	e29	e24	e19	e32	195	404	130	468	136	87
10	54	41	e29	e23	e19	e40	197	1850	246	290	105	81
11	47	40	e28	e22	e18	e80	190	1180	719	211	116	76
12	42	41	e27	e22	e17	e350	190	693	817	169	168	72
13	39	42	e27	e22	e18	e700	224	505	457	141	305	69
14	37	44	e27	e22	e18	e550	466	967	285	122	398	65
15	34	42	e28	e22	e18	e480	1640	1090	194	109	325	63
16	41	40	e28	e22	e19	305	2170	610	153	114	241	64
17	55	40	e29	e22	e20	216	1130	407	127	158	170	62
18	77	40	e29	e22	e21	209	792	320	108	171	132	61
19	90	41	e29	e21	e23	205	2200	267	96	148	108	60
20	88	35	e30	e21	e25	187	1490	229	89	118	95	58
21	79	e39	e30	e21	e26	159	771	201	84	112	86	58
22	70	e38	e30	e21	e28	141	566	206	79	96	80	57
23	62	e37	e30	e21	e29	215	449	217	79	87	76	56
24	55	e36	e31	e21	e30	365	382	230	82	82	77	57
25	52	e36	e32	e21	e32	350	345	204	83	77	95	56
26	48	e35	e33	e21	e33	636	324	183	81	78	120	54
27	47	e35	e34	e21	e34	2270	296	188	80	77	140	52
28	46	e34	e36	e21	e33	2240	265	278	80	78	130	50
29	45	e33	e37	e21	---	1120	245	621	78	78	183	56
30	46	e32	e38	e20	---	659	232	473	75	77	288	88
31	44	---	e38	e20	---	443	---	313	---	81	223	---
TOTAL	1597	1189	962	757	632	12209	16619	13205	5513	13146	5258	2309
MEAN	51.5	39.6	31.0	24.4	22.6	394	554	426	184	424	170	77.0
MAX	90	45	38	38	34	2270	2200	1850	817	3500	398	157
MIN	23	32	27	20	17	30	176	176	75	71	72	50

b Backwater from ice.
e Estimated.

MINNESOTA RIVER BASIN

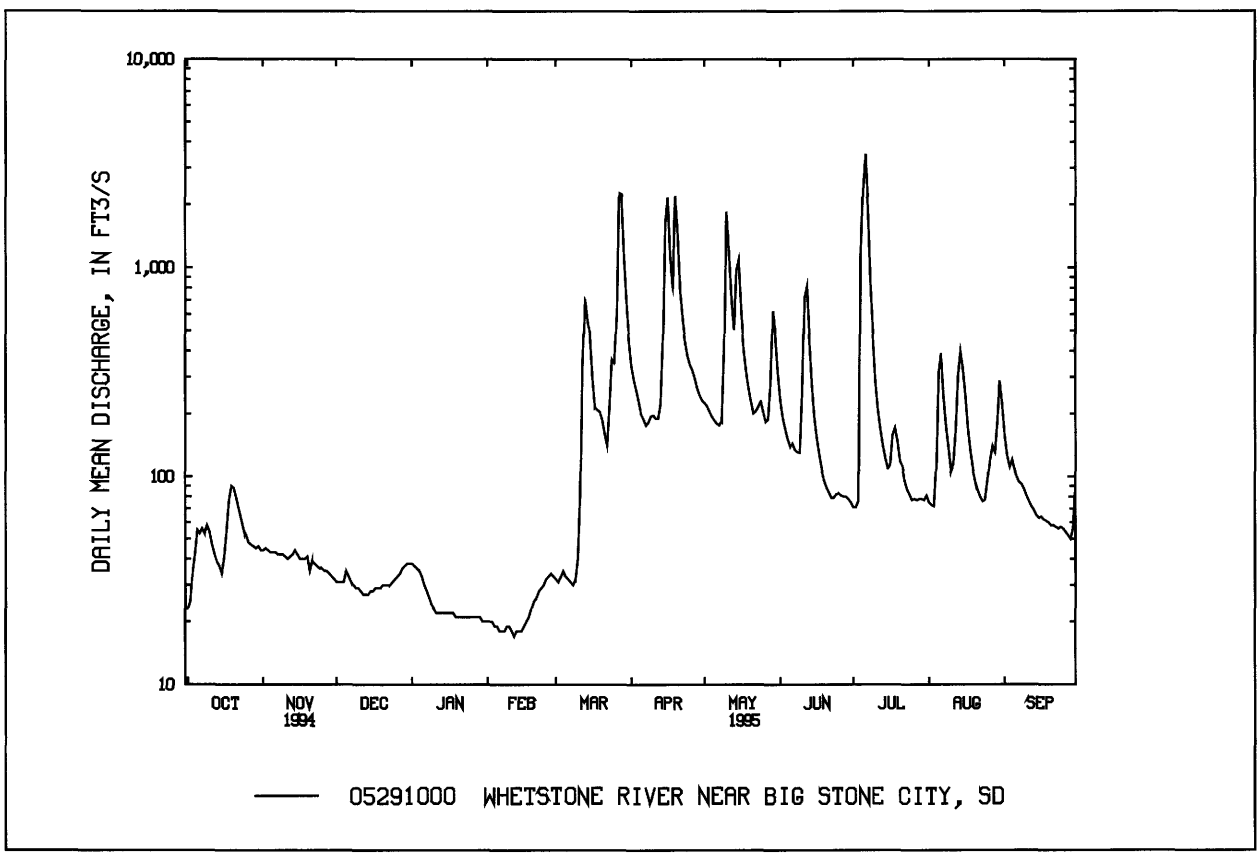
05291000 WHETSTONE RIVER NEAR BIG STONE CITY, S.D.--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	10.0	11.4	8.17	5.60	11.5	155	189	86.6	76.9	60.2	19.9	10.2
MAX	70.5	78.3	43.3	36.3	118	612	1386	491	478	885	327	77.0
(WY)	1958	1972	1972	1994	1984	1978	1952	1972	1984	1993	1991	1995
MIN	.60	.40	.20	.000	.000	2.85	3.63	.77	1.42	.035	.000	.36
(WY)	1932	1935	1935	1934	1934	1969	1934	1934	1936	1934	1934	1935

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1910 - 1995	
ANNUAL TOTAL	59771		73396			
ANNUAL MEAN	164		201		55.4[a]	
HIGHEST ANNUAL MEAN					201	1995
LOWEST ANNUAL MEAN					1.52	1934
HIGHEST DAILY MEAN	3230	Jul 8	3500	Jul 6	6090	Apr 8 1969
LOWEST DAILY MEAN	23	Sep 30	17	Feb 12	.00[b]	Sep 13 1931
ANNUAL SEVEN-DAY MINIMUM	26	Sep 26	18	Feb 6	.00	Jul 31 1933
INSTANTANEOUS PEAK FLOW			4140	Jul 6	6870	Apr 8 1969
INSTANTANEOUS PEAK STAGE			11.55	Jul 6	14.32[c]	Apr 8 1969
INSTANTANEOUS LOW FLOW			17	Feb 12		
ANNUAL RUNOFF (AC-FT)	118600		145600		40130	
ANNUAL RUNOFF (CFSM)	.42		.52		.14	
10 PERCENT EXCEEDS	404		445		100	
50 PERCENT EXCEEDS	52		76		7.5	
90 PERCENT EXCEEDS	31		22		1.3	

a Median of annual mean discharges is 36 ft^3/s.
b No flow at times in many years.
c From floodmark.



MINNESOTA RIVER BASIN

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 downstream from bridge on U.S. Highway 12 and 1,300 ft downstream from dam at outlet of Big Stone Lake, at Ortonville.

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

PERIOD OF RECORD.--February 1938 to current year.

REVISED RECORDS.--WSP 895: 1939. WSP 1508: 1942 (yearly mean).

GAGE.--Water-stage recorder. Datum of gage is 956.38 ft above mean sea level. Prior to Mar. 31, 1939, nonrecording gage on downstream side of dam 1,300 ft upstream at datum 1.31 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Affected by regulation of Big Stone Lake.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	5.2	76	e67	68	66	1640	387	811	59	83	463
2	46	5.0	76	e67	69	66	1410	353	541	56	86	402
3	45	4.9	76	e67	65	66	1270	353	337	87	86	368
4	51	4.6	77	e67	65	66	1090	353	331	1470	80	335
5	48	4.4	e76	e67	65	66	466	354	326	2250	78	199
6	47	4.7	e76	e67	65	66	235	351	324	2370	79	120
7	48	4.8	e75	e67	65	66	234	351	331	2200	85	103
8	46	4.6	e73	e67	65	66	236	446	321	1730	178	92
9	43	4.6	e72	e67	63	66	237	828	319	1210	235	91
10	38	4.4	e71	e67	62	70	e237	1660	334	681	269	88
11	36	4.3	e70	e67	63	76	e416	2100	373	311	300	85
12	35	4.3	e69	e67	62	502	e1080	1650	887	266	301	84
13	35	4.3	e67	e67	62	1740	e1240	1610	1140	180	400	83
14	35	4.3	e67	e67	63	2070	e1170	1940	982	102	805	80
15	34	4.3	e67	e67	63	1990	1930	1910	482	89	716	76
16	34	3.3	e67	e67	63	1820	e2290	1720	160	91	321	74
17	37	1.5	e67	e67	65	1630	e2230	1320	162	106	127	67
18	171	1.7	e67	e67	65	1500	e2140	841	160	99	130	65
19	281	1.4	e67	e67	65	1360	2330	579	158	114	125	65
20	340	1.4	e67	e67	65	1310	2330	586	158	92	120	140
21	370	1.5	e67	e67	65	1080	e2190	562	156	88	120	203
22	392	1.4	e67	e67	65	1000	1830	576	153	90	117	135
23	400	94	e67	e67	65	1010	1620	575	150	179	115	48
24	368	76	e67	e67	65	1020	1400	569	146	276	115	66
25	255	76	e67	e67	63	1020	1230	568	144	273	350	160
26	137	75	e67	e67	63	1360	1000	557	143	383	528	163
27	140	75	e67	e67	e58	2060	792	555	142	551	515	124
28	143	78	e67	e67	e60	2460	585	559	134	585	515	124
29	145	78	e67	e67	---	2420	430	549	83	364	502	124
30	145	76	e67	e67	---	2230	430	709	75	73	523	443
31	68	---	e67	e67	---	1870	---	829	---	80	514	---
TOTAL	4061	708.9	2160	2077	1792	32192	35718	26300	9963	16505	8518	4670
MEAN	131	23.6	69.7	67.0	64.0	1038	1191	848	332	532	275	156
MAX	400	94	77	67	69	2460	2330	2100	1140	2370	805	463
MIN	34	1.4	67	67	58	66	234	351	75	56	78	48
AC-FT	8050	1410	4280	4120	3550	63850	70850	52170	19760	32740	16900	9260
CFSM	.11	.02	.06	.06	.06	.90	1.03	.73	.29	.46	.24	.13

e Estimated.

MINNESOTA RIVER BASIN

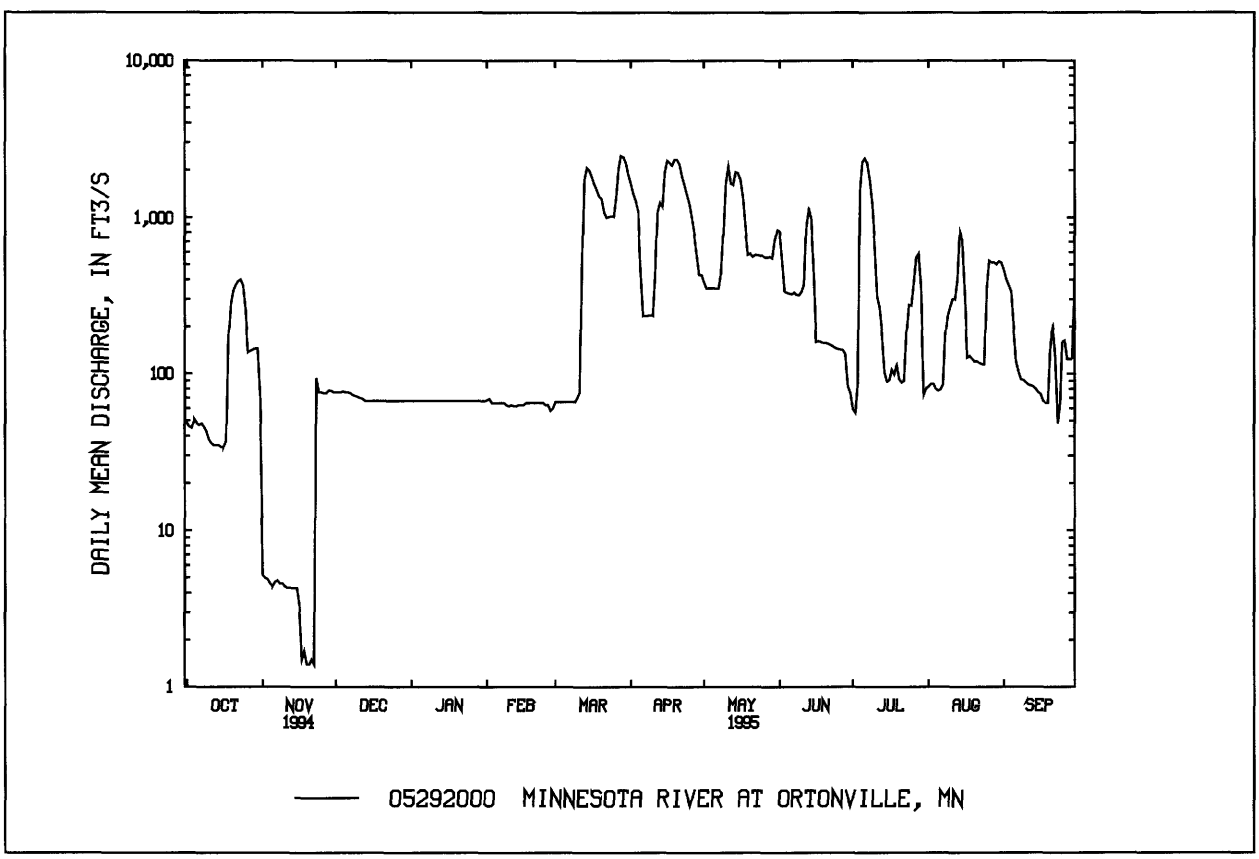
05292000 MINNESOTA RIVER AT ORTONVILLE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	23.4	16.0	17.5	18.4	23.0	186	435	251	184	163	77.5	35.0
MAX	186	166	194	164	150	1519	2195	887	1034	1781	1299	250
(WY)	1987	1943	1943	1943	1943	1994	1952	1986	1962	1993	1993	1942
MIN	.20	.20	.20	.17	.16	1.14	1.27	.91	1.30	1.11	.25	.18
(WY)	1939	1939	1939	1940	1940	1941	1941	1941	1977	1977	1959	1988

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1938 - 1995	
ANNUAL TOTAL	130686.9		144664.9			
ANNUAL MEAN	358		396		121[a]	
HIGHEST ANNUAL MEAN					415	1993
LOWEST ANNUAL MEAN					2.39	1977
HIGHEST DAILY MEAN	2610	Jul 8	2460	Mar 28	3050	Apr 13 1952
LOWEST DAILY MEAN	1.4	Nov 19	1.4	Nov 19	.00	Dec 13 1940
ANNUAL SEVEN-DAY MINIMUM	1.7	Nov 16	1.7	Nov 16	.08	Sep 12 1988
INSTANTANEOUS PEAK FLOW			2530	Jul 6	3060	Apr 13 1952
INSTANTANEOUS PEAK STAGE			9.19	Jul 6	12.92	Apr 13 1952
INSTANTANEOUS LOW FLOW			1.2	Nov 22	.00	Dec 13 1940
ANNUAL RUNOFF (AC-FT)	259200		286900		87420	
ANNUAL RUNOFF (CFSM)	.31		.34		.10	
10 PERCENT EXCEEDS	1270		1360		321	
50 PERCENT EXCEEDS	79		99		16	
90 PERCENT EXCEEDS	24		48		1.0	

a Median of annual mean discharges is 84 ft^3/s.



MINNESOTA RIVER BASIN

05292704 NORTH FORK YELLOW BANK RIVER NEAR ODESSA

LOCATION.--Lat 45 11'21", long 96 24'54", in NW NW NW sec. 22, T. 120 N., R. 46 W., Lac qui Parle County, Hydrologic Unit 070200001, on left bank at upstream side of County Highway 87 bridge, 11.0 mi east-southeast of Milbank, SD, 6.4 mi southwest of Odessa, and 2.9 mi upstream from mouth.

DRAINAGE AREA.--Undetermined.

PERIOD OF RECORD.--May 1991 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 1,020 ft above sea level, from topographic map.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	27	e15	e10	e9.0	e35	223	171	138	28	57	102
2	17	27	e16	e9.0	e9.0	e30	179	164	118	28	64	94
3	22	26	e18	e7.0	e8.5	e28	150	149	104	28	57	93
4	25	24	e17	e8.0	e8.0	e25	124	137	92	174	113	98
5	32	23	e15	e9.0	e7.0	e25	107	127	83	425	211	91
6	33	22	e14	e10	e6.5	e24	100	119	76	1120	207	89
7	32	22	e13	e8.0	e6.0	e23	94	117	75	1220	155	150
8	33	21	e12	e7.0	e5.0	e22	e85	121	72	641	131	125
9	35	21	e12	e7.5	e6.0	e21	e80	297	71	405	110	98
10	32	19	e13	e8.0	e7.0	e25	e80	1250	151	295	93	85
11	30	18	e13	e9.0	e5.0	e60	e85	740	296	216	86	77
12	30	19	e13	e9.0	e4.5	e300	92	431	351	175	91	71
13	27	20	e13	e9.0	e4.0	e700	114	309	190	143	137	65
14	26	20	e14	e10	e4.5	e400	247	506	133	119	214	60
15	25	19	e14	e10	e5.0	e280	1010	680	107	104	197	59
16	28	18	e14	e10	e6.0	e190	1730	365	89	98	169	58
17	34	19	e14	e9.5	e7.0	164	949	248	77	99	124	56
18	55	20	e14	e9.0	e8.0	149	626	188	66	97	102	56
19	78	19	e14	e9.0	e10	143	1870	157	58	108	87	52
20	76	18	e14	e8.5	e15	129	1340	135	51	98	74	49
21	66	e17	e14	e8.0	e18	108	719	117	45	85	65	48
22	55	e16	e14	e7.0	e23	94	521	114	41	77	58	47
23	48	e15	e14	e6.0	e30	125	395	118	37	70	54	46
24	44	e16	e14	e5.0	e40	225	314	115	37	65	55	45
25	41	e17	e14	e6.0	e50	229	298	104	37	62	58	45
26	38	e18	e15	e7.0	e45	403	261	97	36	63	59	44
27	35	e17	e15	e8.0	e40	1530	219	102	34	64	62	42
28	34	e16	e16	e8.5	e35	1650	191	164	34	63	66	41
29	32	e15	e16	e9.0	---	962	171	460	33	59	98	42
30	29	e13	e15	e9.0	---	561	166	297	31	55	130	146
31	28	---	e14	e9.0	---	326	---	176	---	58	123	---
TOTAL	1138	582	443	259.0	422.0	8986	12540	8275	2763	6342	3307	2174
MEAN	36.7	19.4	14.3	8.35	15.1	290	418	267	92.1	205	107	72.5
MAX	78	27	18	10	50	1650	1870	1250	351	1220	214	150
MIN	17	13	12	5.0	4.0	21	80	97	31	28	54	41
AC-FT	2260	1150	879	514	837	17820	24870	16410	5480	12580	6560	4310

e Estimated.

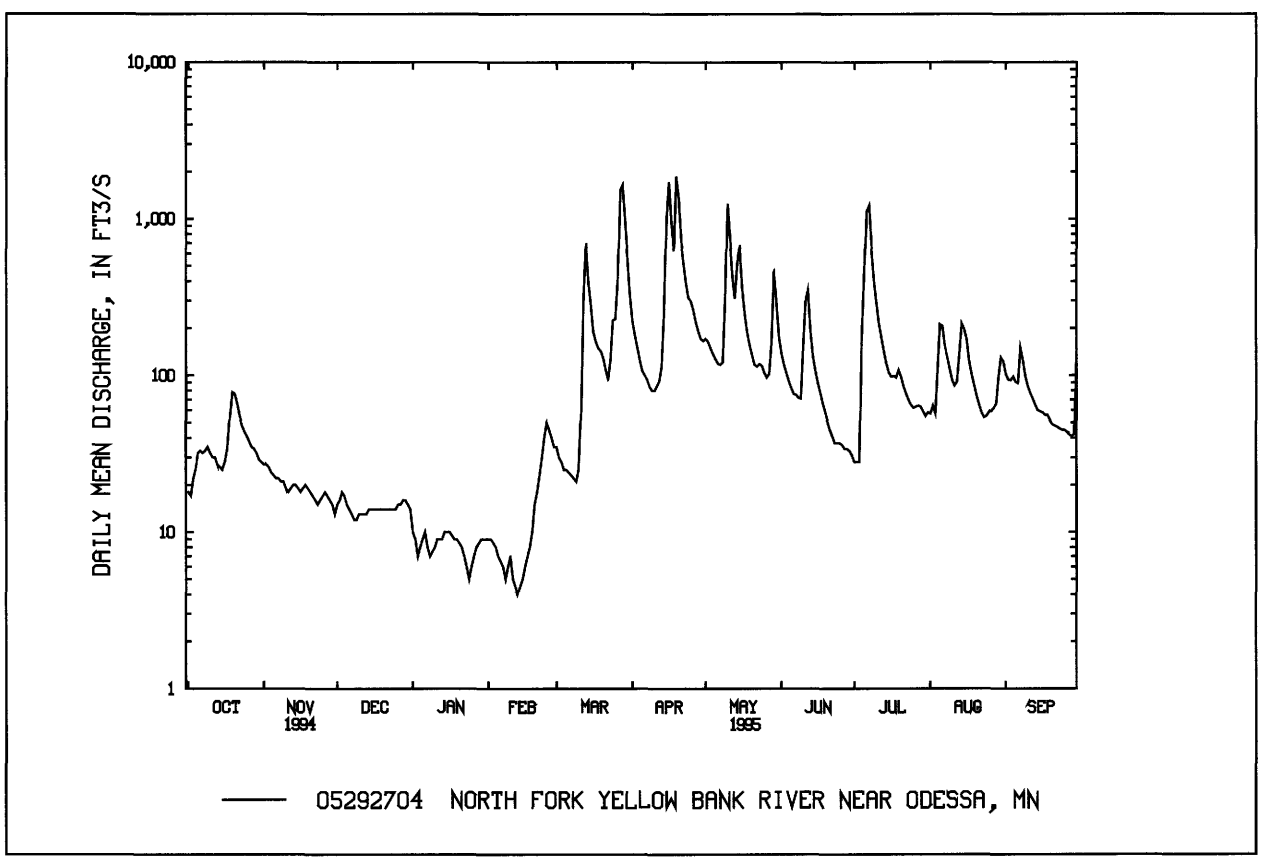
MINNESOTA RIVER BASIN

05292704 NORTH FORK YELLOW BANK RIVER NEAR ODESSA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	16.6	15.9	13.7	9.58	15.8	209	207	118	119	279	53.5	34.0
MAX	36.7	29.5	27.7	17.0	22.9	360	418	267	212	501	107	72.5
(WY)	1995	1994	1994	1994	1994	1994	1995	1995	1992	1993	1995	1995
MIN	3.98	5.59	5.79	6.28	5.55	36.9	21.8	9.14	66.8	135	13.0	6.23
(WY)	1993	1992	1992	1993	1993	1992	1992	1992	1994	1992	1992	1992

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1992 - 1995	
ANNUAL TOTAL	35394		47231.0			
ANNUAL MEAN	97.0		129		91.5	
HIGHEST ANNUAL MEAN					129	1995
LOWEST ANNUAL MEAN					39.8	1992
HIGHEST DAILY MEAN	2300	Jul 8	1870	Apr 19	2300	Jul 8 1994
LOWEST DAILY MEAN	12	Feb 9	4.0	Feb 13	3.0	Dec 3 1991
ANNUAL SEVEN-DAY MINIMUM	13	Dec 7	5.1	Feb 8	3.4	Nov 30 1991
INSTANTANEOUS PEAK FLOW			2420	Apr 19	2580	Jul 8 1994
INSTANTANEOUS PEAK STAGE			14.15	Apr 19	14.62	Jul 8 1994
ANNUAL RUNOFF (AC-FT)	70200		93680		66310	
10 PERCENT EXCEEDS	241		296		214	
50 PERCENT EXCEEDS	31		55		24	
90 PERCENT EXCEEDS	14		9.0		6.0	



MINNESOTA RIVER BASIN

05293000 YELLOW BANK RIVER NEAR ODESSA, MN

LOCATION.--Lat 45°13'35", long 96°21'12", in SW¼SW¼ sec. 6, T. 120 N., R. 45 W., Lac qui Parle County, Hydrologic Unit 07020001, on left bank 150 ft downstream from highway bridge, 2.5 mi southwest of Odessa, and 4.5 mi upstream from mouth.

DRAINAGE AREA.--398 mi².

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

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

GAGE.--Water-stage recorder. Datum of gage is 953.34 ft above mean sea level (U.S. Army Corps of Engineers bench mark). Prior to Aug. 28, 1940, nonrecording gage at site 150 ft upstream at same datum.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft³/s and maximum(*).

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Mar. 14	(daily)	600e	8.65	May 15	1300	992	7.66
Mar. 28	1500	2290	11.33	May 29	2400	581	6.04
Apr. 16	1700	2140	10.95	June 12	0900	577	6.00
Apr. 20	0500	*3140	*13.16	July 07	0900	1750	9.90
May 10	2000	1420	9.02	Aug 06	0900	354	4.88

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	50	72	e49	e29	e18	e85	486	284	303	e76	88	177
2	49	71	e49	e28	e17	e80	390	286	240	e75	e88	164
3	49	69	e46	e27	e18	e76	325	262	196	164	114	e150
4	50	67	e43	e26	e18	e74	271	229	163	202	108	e130
5	52	66	e40	e25	e18	e72	233	203	150	398	230	e130
6	56	65	e37	e23	e18	e70	210	185	150	895	341	e120
7	59	64	e33	e22	e18	e70	189	172	150	1640	296	e105
8	60	63	e31	e21	e18	e70	176	168	163	1200	241	e100
9	61	62	e29	e20	e18	e70	174	231	175	757	206	e95
10	62	61	e27	e19	e18	e70	176	1000	223	e500	150	86
11	63	60	e26	e19	e18	e80	174	1190	423	e350	133	83
12	62	59	e25	e18	e18	e115	175	781	549	e250	127	83
13	60	59	e24	e18	e18	e300	179	567	444	e200	142	80
14	59	59	e24	e18	e18	e600	286	580	321	e160	203	76
15	58	58	e24	e18	e18	e570	732	913	254	e135	239	75
16	57	57	e24	e18	e18	e450	1930	701	e200	e130	247	77
17	58	57	e25	e18	e18	e350	1710	484	e170	e130	216	75
18	63	57	e25	e18	e18	e275	1110	376	e140	e140	165	72
19	77	56	e25	e18	e21	235	1630	304	e125	e135	150	69
20	95	56	e25	e18	e25	220	2680	247	e110	e125	e130	64
21	106	56	e25	e18	e35	213	1510	204	e100	e120	e110	62
22	108	56	e25	e18	e45	210	985	187	e92	e115	e95	59
23	103	e52	e25	e18	e53	207	737	180	e86	e110	e90	58
24	97	e51	e25	e18	e62	272	578	180	e83	e105	e90	58
25	93	e50	e25	e18	e70	335	504	165	e81	e98	e110	55
26	89	e49	e25	e18	e85	465	480	151	e80	e94	e130	53
27	86	e49	e26	e18	e100	1370	406	147	e79	e94	144	52
28	83	e48	e27	e18	e95	2230	346	188	e78	e93	147	52
29	80	e47	e28	e18	---	1720	303	409	e78	e92	e165	52
30	77	e47	e29	e18	---	1030	283	545	e77	e92	e200	52
31	75	---	e29	e18	---	668	---	403	---	e90	e195	---
TOTAL	2197	1743	920	619	914	12652	19368	11922	5483	8765	5090	2564
MEAN	70.9	58.1	29.7	20.0	32.6	408	646	385	183	283	164	85.5
MAX	108	72	49	29	100	2230	2680	1190	549	1640	341	177
MIN	49	47	24	18	17	70	174	147	77	75	88	52
AC-FT	4360	3460	1820	1230	1810	25100	38420	23650	10880	17390	10100	5090
CFSM	.18	.15	.07	.05	.08	1.03	1.62	.97	.46	.71	.41	.21

e Estimated.

MINNESOTA RIVER BASIN

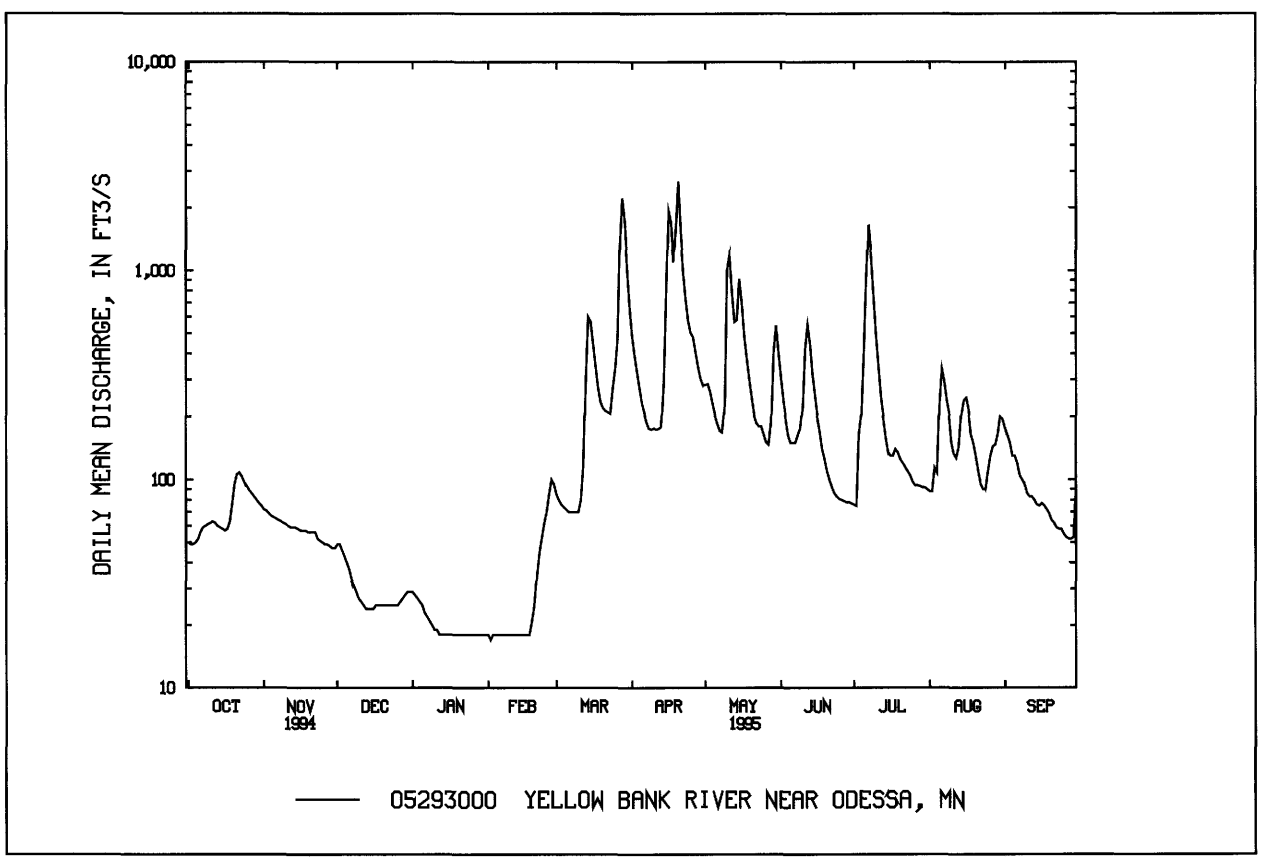
05293000 YELLOW BANK RIVER NEAR ODESSA, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	14.5	18.2	10.3	6.43	12.2	162	243	103	104	68.3	31.4	17.3
MAX	104	201	71.7	68.0	117	653	1341	652	577	741	281	273
(WY)	1985	1972	1994	1994	1984	1986	1952	1972	1992	1993	1991	1985
MIN	.31	.44	.32	.090	.001	1.59	9.13	2.94	1.83	.27	.088	.083
(WY)	1941	1977	1977	1977	1977	1965	1981	1981	1976	1976	1976	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1940 - 1995	
ANNUAL TOTAL	63072		72237			
ANNUAL MEAN	173		198		66.0[a]	
HIGHEST ANNUAL MEAN					225	1986
LOWEST ANNUAL MEAN					3.98	1981
HIGHEST DAILY MEAN	2550	Jul 9	2680	Apr 20	6640	Apr 9 1969
LOWEST DAILY MEAN	24	Dec 13	17	Feb 2	.00[b]	Jan 26 1940
ANNUAL SEVEN-DAY MINIMUM	24	Dec 12	18	Jan 27	.00	Jan 26 1940
INSTANTANEOUS PEAK FLOW			3140	Apr 20	6970	Apr 9 1969
INSTANTANEOUS PEAK STAGE			13.16	Apr 20	19.07[c]	Apr 9 1969
INSTANTANEOUS LOW FLOW			17	Feb 2		
ANNUAL RUNOFF (AC-FT)	125100		143300		47800	
ANNUAL RUNOFF (CFSM)	.43		.50		.17	
10 PERCENT EXCEEDS	430		456		139	
50 PERCENT EXCEEDS	78		86		10	
90 PERCENT EXCEEDS	49		18		1.0	

a Median of annual mean discharges is 50 ft^3/s.
b Many days, several years.
c From floodmark.



MINNESOTA RIVER BASIN

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 upstream from bridge on U.S. Highway 59 and State Highway 119 at Appleton and 8 mi upstream from mouth.

DRAINAGE AREA.--905 mi², approximately.

PERIOD OF RECORD.--March 1931 to September 1935 (no winter records), October 1935 to current year. Prior to October 1953, published as "near Appleton."

REVISED RECORDS.--WSP 1308: 1931(M), 1937(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 978.00 ft above mean sea level. Prior to Dec. 22, 1952, nonrecording gage at site 4 mi upstream at datum 25.17 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow affected by lakes above station. Occasional regulation at low flow by old milldam 500 ft upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 19	1600	205	5.34	June 12	0030	449	5.51
Mar.16	1500	1210	7.19	June 15	1630	480	5.60
Mar.29	0300	*1840	*8.30	July 08	1400	1660	8.03
Apr.20	1400	1290	7.32	Aug. 15	0800	494	5.89
May15	2330	758	6.48	Aug. 30	0100	302	5.10
May26	0900	1380	7.40				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	72	106	107	e58	e58	e56	1520	687	373	239	322	273
2	73	105	96	e57	e57	e56	1420	650	361	234	301	255
3	86	102	97	e55	e57	e57	1310	619	375	249	256	238
4	89	100	91	e53	e56	e57	1190	601	370	352	262	224
5	90	101	52	e53	e56	e58	1050	585	358	482	322	215
6	92	97	e62	e53	e56	e59	928	564	344	741	293	226
7	90	94	e61	e53	e56	e61	876	540	344	1330	e290	210
8	91	94	e60	e53	e56	58	796	532	369	1620	e285	192
9	94	91	e60	e54	e56	83	734	545	369	1450	e275	178
10	93	90	e59	e54	e56	96	682	564	388	1270	e275	167
11	91	90	e58	e54	e56	95	651	573	426	1120	e290	158
12	85	90	e57	e55	e56	136	629	563	435	972	390	152
13	80	90	e56	e55	e55	276	622	568	397	853	453	159
14	79	92	e56	e56	e54	514	677	610	381	741	519	155
15	80	92	e56	e56	e54	944	794	719	428	643	546	170
16	90	94	e55	e56	e54	1140	1010	741	448	584	415	169
17	106	91	e55	e56	e55	969	1040	740	416	540	324	142
18	140	88	e56	e56	e55	1030	1080	745	388	499	293	120
19	189	88	e56	e56	e56	1020	1140	721	357	468	277	110
20	177	97	e56	e56	e56	997	1270	698	330	442	260	105
21	158	96	e57	e57	e56	970	1230	642	310	421	243	106
22	150	74	e57	e57	e56	922	1160	e600	301	398	231	104
23	144	64	e58	e57	e57	865	1110	e540	322	390	221	102
24	137	96	e58	e58	e59	833	1040	e500	279	380	223	100
25	136	84	e59	e58	e60	844	991	e460	267	365	269	99
26	131	77	e60	e58	e61	882	925	e420	256	358	313	97
27	124	65	e61	e58	e58	1150	862	410	253	345	303	97
28	117	43	e61	e58	e57	1650	813	412	256	331	300	95
29	114	62	e61	e58	---	1790	760	413	256	313	307	108
30	112	69	e60	e58	---	1660	726	400	249	298	323	220
31	110	---	e60	e58	---	1600	---	387	---	305	301	---
TOTAL	3420	2622	1958	1734	1579	20928	29036	17749	10406	18733	9682	4746
MEAN	110	87.4	63.2	55.9	56.4	675	968	573	347	604	312	158
MAX	189	106	107	58	61	1790	1520	745	448	1620	546	273
MIN	72	43	52	53	54	56	622	387	249	234	221	95
AC-FT	6780	5200	3880	3440	3130	41510	57590	35210	20640	37160	19200	9410
CFSM	.12	.10	.07	.06	.06	.75	1.07	.63	.38	.67	.35	.17

e Estimated.

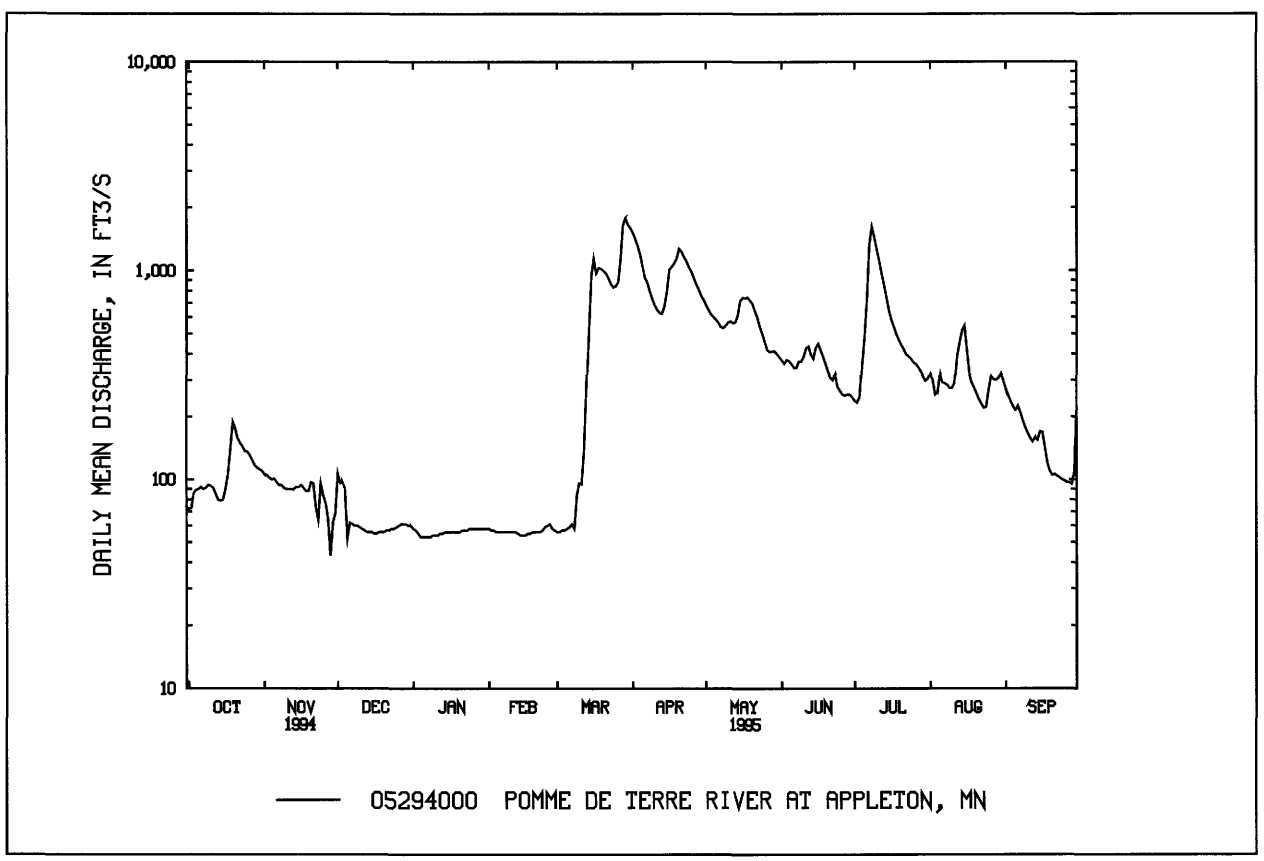
MINNESOTA RIVER BASIN

05294000 POMME DE TERRE RIVER AT APPLETON, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	59.2	57.0	39.9	25.9	24.2	157	359	198	161	141	75.5	55.0
MAX		508	339	182	141	147	675	1587	846	516	1382	752331
(WY)	1985	1985	1987	1987	1987	1995	1969	1969	1965	1993	1993	1986
MIN	.000	3.52	1.00	.000	.000	2.04	20.9	8.09	2.17	.45	.095	.047
(WY)	1989	1989	1937	1937	1936	1969	1934	1934	1933	1988	1988	1988

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1931 - 1995	
ANNUAL TOTAL	101323		122593			
ANNUAL MEAN	278		336		120	
HIGHEST ANNUAL MEAN					363	1986
LOWEST ANNUAL MEAN					21.1	1977
HIGHEST DAILY MEAN	2110	Mar 27	1790	Mar 29	5210	Apr 11 1969
LOWEST DAILY MEAN	43	Nov 28	43	Nov 28	.00	Aug 3 1934
ANNUAL SEVEN-DAY MINIMUM	56	Dec 13	53	Jan 4	.00	Feb 1 1936
INSTANTANEOUS PEAK FLOW			1840	Mar 29	5520	Apr 11 1969
INSTANTANEOUS PEAK STAGE			8.30	Mar 29	14.58	Apr 9 1969
ANNUAL RUNOFF (AC-FT)	201000		243200		87050	
ANNUAL RUNOFF (CFSM)	.31		.37		.13	
10 PERCENT EXCEEDS	690		898		274	
50 PERCENT EXCEEDS	105		178		46	
90 PERCENT EXCEEDS	66		56		6.1	



MINNESOTA RIVER BASIN

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, Hydrologic Unit 07020003, on right bank 40 ft downstream from highway bridge and 0.5 mi southwest of city of Lac qui Parle.

DRAINAGE AREA.--983 mi².

PERIOD OF RECORD.--April 1910 to November 1914; March 1931 to current year (winter records incomplete prior to 1934). Published as "at Lac qui Parle," 1910-14.

REVISED RECORDS.--WSP 1308: 1912(M), 1935(M).

GAGE.--Water-stage recorder. Datum of gage is 951.98 ft above mean sea level (Minnesota Department of Transportation benchmark). Apr. 27, 1910, to Nov. 15, 1914, nonrecording gage at site 2 mi downstream at different datum. Mar. 17, 1931, to Mar. 9, 1937, nonrecording gage at site 40 ft upstream at present datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	115	145	e79	e48	e27	e33	1120	1250	1760	293	229	91
2	114	141	e73	e46	e26	e33	998	1240	1610	271	265	89
3	122	135	e70	e45	e26	e32	892	1210	1350	249	277	85
4	119	132	e67	e43	e26	e31	799	1130	1130	624	283	79
5	143	134	e65	e42	e25	e30	695	1010	982	1080	264	83
6	176	126	e62	e40	e25	e29	614	918	861	1370	269	84
7	177	127	e60	e38	e25	e29	557	854	773	1430	280	80
8	168	122	e58	e36	e25	e28	518	816	709	1420	257	90
9	171	118	e57	e35	e25	e28	487	860	683	1170	231	111
10	172	115	e55	e34	e25	e27	486	1130	689	932	205	99
11	158	114	e54	e32	e25	e60	496	1620	699	805	189	91
12	143	112	e53	e30	e25	e220	495	1860	747	690	179	82
13	131	112	e51	e29	e25	e450	515	1920	741	599	165	76
14	124	117	e49	e28	e25	e840	705	1880	646	526	161	71
15	119	118	e48	e27	e25	e775	1090	1810	568	469	184	68
16	125	114	e47	e27	e25	e650	1340	1880	501	434	211	67
17	125	112	e46	e27	e25	e520	1740	1850	448	532	211	64
18	152	111	e45	e27	e25	e450	2040	1690	409	644	187	62
19	202	106	e45	e27	e25	406	2430	1470	372	646	164	60
20	283	105	e44	e27	e25	384	2590	1240	340	513	145	58
21	296	106	e44	e27	e25	361	3350	1100	310	428	130	56
22	258	108	e44	e27	e25	344	3760	972	284	382	119	55
23	223	88	e44	e27	e27	382	3380	895	319	347	108	55
24	205	98	e45	e27	e30	455	2990	864	346	324	102	54
25	191	118	e46	e27	e31	543	2600	824	342	306	99	54
26	181	119	e47	e27	e32	760	2250	764	346	297	95	55
27	172	95	e48	e27	e33	1070	1960	732	325	293	92	55
28	168	e93	e49	e27	e34	1350	1690	997	322	269	90	52
29	162	e85	e50	e27	---	1460	1470	1210	320	257	90	50
30	157	e82	e52	e27	---	1450	1330	1490	311	238	91	105
31	153	---	e50	e27	---	1300	---	1690	---	229	93	---
TOTAL	5205	3408	1647	985	742	14530	45387	39176	19243	18067	5465	2181
MEAN	168	114	53.1	31.8	26.5	469	1513	1264	641	583	176	72.7
MAX	296	145	79	48	34	1460	3760	1920	1760	1430	283	111
MIN	114	82	44	27	25	27	486	732	284	229	90	50
AC-FT	10320	6760	3270	1950	1470	28820	90030	77710	38170	35840	10840	4330
CFSM	.17	.12	.05	.03	.03	.48	1.54	1.29	.65	.59	.18	.07

e Estimated.

MINNESOTA RIVER BASIN

05300000 LAC QUI PARLE RIVER NEAR LAC QUI PARLE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 1995, BY WATER YEAR (WY)

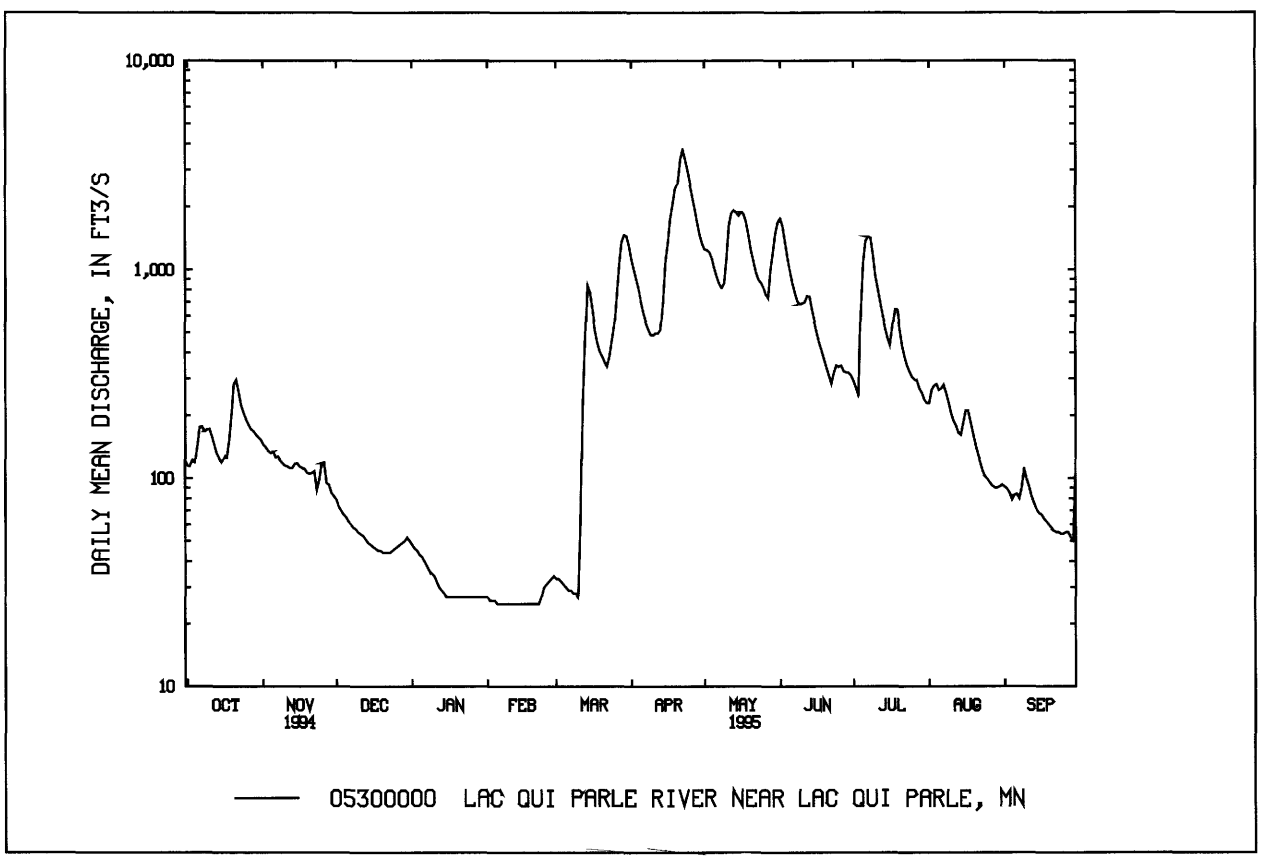
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	32.9	40.5	21.7	9.94	18.4	296	534	230	269	143	76.2	38.2
MAX	482	345	149	88.1	140	1634	3578	1264	1762	1613	765	535
(WY)	1985	1971	1994	1994	1984	1985	1969	1995	1984	1993	1953	1985
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)1932	1932	1932	1932	1934	1934	1934	1934	1934	1934	1931	1931	

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1910 - 1995	
ANNUAL TOTAL	147349		156036			
ANNUAL MEAN	404		427		151[a]	
HIGHEST ANNUAL MEAN					625	1993
LOWEST ANNUAL MEAN					.000	1934
HIGHEST DAILY MEAN	2690	Jun 26	3760	Apr 22	16000	Apr 10 1969
LOWEST DAILY MEAN	44	Dec 20	25	Feb 5	.00[b]	Jul 15 1931
ANNUAL SEVEN-DAY MINIMUM	44	Dec 18	25	Feb 5	.00	Jul 15 1931
INSTANTANEOUS PEAK FLOW			3840	Apr 22	17100	Apr 10 1969
INSTANTANEOUS PEAK STAGE			11.18	Apr 22	19.37[c]	Apr 9 1965
INSTANTANEOUS LOW FLOW			25	Feb 5	.00	Jul 15 1931
ANNUAL RUNOFF (AC-FT)	292300		309500		109100	
ANNUAL RUNOFF (CFSM)	.41		.43		.15	
10 PERCENT EXCEEDS	1040		1270		326	
50 PERCENT EXCEEDS	191		145		19	
90 PERCENT EXCEEDS	74		27		.40	

a Median of annual mean discharges is 113 ft^3/s.

b Many days, several years.

c From floodmark (backwater from ice).



MINNESOTA RIVER BASIN

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 upstream from bridge on State Highway 40, 2.0 mi upstream from small tributary, and 5.5 mi east of Milan.

DRAINAGE AREA.--1,870 mi², approximately.

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

REVISED RECORDS.--WSP 1145: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 959.69 ft above mean sea level. Prior to June 15, 1942, nonrecording gage on bridge 800 ft downstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow regulated by several small lakes upstream from gage.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft³/s, and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 19	1000	631	3.35	June 29	1700	1980	5.56
Mar. 18	0600	3390	7.78	July 6	0100	*8440	*13.48
Mar. 28	0600	3030	7.28	Aug. 5	0200	753	3.58
Apr. 19	1900	2440	6.37	Aug. 14	2000	1270	4.55
May 14	2400	1960	5.56	Aug. 29	2200	935	3.88
June 11	1000	1510	4.70	Sep. 16	0300	610	3.24

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	247	421	e287	e205	e187	e202	1860	1580	1190	1230	707	822
2	245	416	e283	e200	e189	e201	1800	1550	1140	1060	688	779
3	264	403	e281	e200	e190	e208	1730	1490	1100	1430	627	723
4	292	389	e280	e200	e190	e215	1630	1450	1050	7640	626	679
5	323	387	e278	e200	e192	e220	1590	1410	1020	7960	720	641
6	336	378	e275	e200	e193	e222	1540	1380	1020	8160	650	642
7	346	365	e272	e200	e192	e223	1490	1360	1020	7040	637	637
8	340	358	e270	e198	e192	e220	1450	1340	1150	6050	644	601
9	337	348	e269	e195	e192	e222	1430	1360	1100	4900	619	574
10	331	342	e268	e198	e192	e230	1390	1410	1210	3730	602	552
11	317	335	e263	e200	e194	e240	1370	1410	1490	2970	619	530
12	306	332	e261	e202	e196	e700	1390	1380	1400	2510	857	518
13	291	334	e260	e205	e199	e1500	1430	1390	1320	2190	993	504
14	284	329	e258	e207	e202	e2350	1730	1810	1260	1940	1220	484
15	282	327	e257	e208	e204	e2250	1860	1900	1190	1740	1220	500
16	298	327	e257	e205	e206	e2200	1800	1730	1120	1610	1100	595
17	326	332	e256	e196	e209	e2100	1730	1640	1040	1500	1030	596
18	441	326	e256	e192	e211	2570	1790	1560	957	1390	978	564
19	617	322	e255	e198	e218	1810	2370	1500	874	1330	961	537
20	602	314	e255	e199	e220	1670	2290	1440	798	1240	897	507
21	596	322	e255	e199	e222	1570	2100	1400	728	1170	821	501
22	596	301	e252	e198	e223	1480	1980	1380	665	1090	748	484
23	580	e310	e249	e197	e224	1530	1880	1370	749	1030	696	479
24	553	e307	e248	e193	e227	1560	1850	1330	799	1010	668	476
25	526	e302	e246	e191	e229	1510	1810	1280	743	942	689	464
26	504	e301	e244	e190	e225	1730	1760	1240	709	910	716	456
27	487	e299	e244	e190	e220	2560	1710	1230	674	867	738	447
28	474	e295	e240	e190	e210	2940	1640	1300	649	830	761	436
29	462	e291	e232	e194	---	2470	1600	1340	1660	789	884	439
30	443	e290	e225	e195	---	2110	1590	1300	1580	739	926	1130
31	429	---	e215	e192	---	1940	---	1240	---	717	884	---
TOTAL	12475	10103	7991	6137	5748	40953	51590	44500	31405	77714	24926	17297
MEAN	402	337	258	198	205	1321	1720	1435	1047	2507	804	577
MAX	617	421	287	208	229	2940	2370	1900	1660	8160	1220	1130
MIN	245	290	215	190	187	201	1370	1230	649	717	602	436
AC-FT	24740	20040	15850	12170	11400	81230	102300	88270	62290	154100	49440	34310
CFSM	.22	.18	.14	.11	.11	.71	.92	.77	.56	1.34	.43	.31
IN.	.25	.20	.16	.12	.11	.81	1.03	.89	.62	1.55	.50	.34

e Estimated.

MINNESOTA RIVER BASIN

05304500 CHIPPEWA RIVER NEAR MILAN, MN--Continued

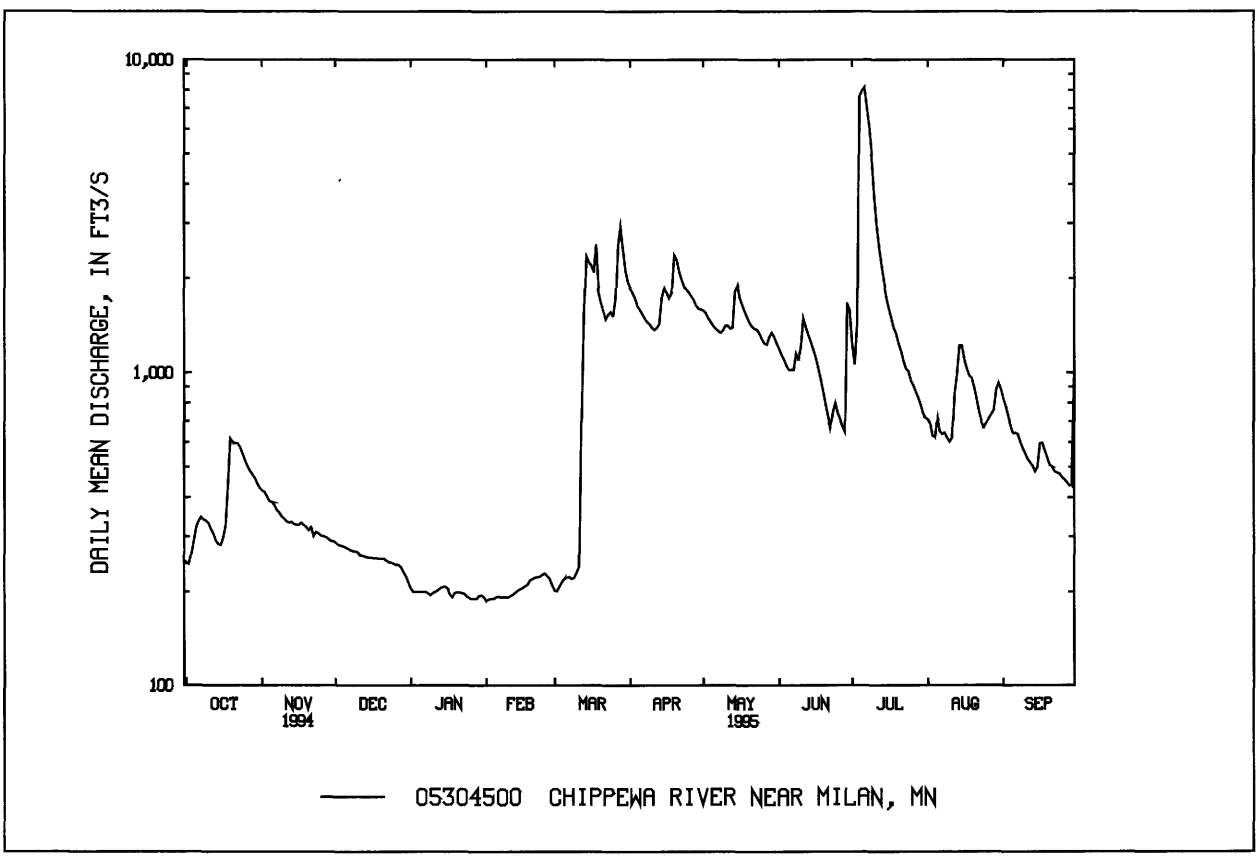
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	203	178	112	64.1	60.9	395	954	636	568	447	256	217
MAX	1996	1318	655	425	404	2141	3661	2462	2248	2507	2183	2273
(WY)	1985	1985	1985	1987	1987	1985	1952	1986	1984	1995	1993	1986
MIN	5.51	8.67	4.77	.094	.000	2.92	90.9	81.6	36.8	15.1	6.19	3.50
(WY)	1977	1977	1977	1940	1940	1965	1959	1939	1940	1940	1976	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1938 - 1995	
ANNUAL TOTAL	263010		330839			
ANNUAL MEAN	721		906		342[a]	
HIGHEST ANNUAL MEAN					1307	1986
LOWEST ANNUAL MEAN					45.4	1940
HIGHEST DAILY MEAN	5840	Mar 23	8160	Jul 6	10100	Apr 10 1969
LOWEST DAILY MEAN	147	Feb 9	187	Feb 1	.00[b]	Jan 4 1940
ANNUAL SEVEN-DAY MINIMUM	149	Feb 6	190	Jan 31	.00	Jan 4 1940
INSTANTANEOUS PEAK FLOW			8440	Jul 6	11400	Apr 9 1969
INSTANTANEOUS PEAK STAGE			13.48	Jul 6	15.45	Apr 9 1969
INSTANTANEOUS LOW FLOW			187	Feb 1		
ANNUAL RUNOFF (AC-FT)	521700		656200		247500	
ANNUAL RUNOFF (CFSM)	.39		.48		.18	
ANNUAL RUNOFF (INCHES)	5.23		6.58		2.48	
10 PERCENT EXCEEDS	1810		1770		929	
50 PERCENT EXCEEDS	341		602		124	
90 PERCENT EXCEEDS	162		200		15	

a Median of annual mean discharges is 269 ft^3/s.

b Many days in 1940.



MINNESOTA RIVER BASIN

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 upstream from bridge on U.S. Highway 212, at Montevideo, and 400 ft downstream from Chippewa River.

DRAINAGE AREA.--6,180 mi², approximately.

PERIOD OF RECORD.--July 1909 to September 1917, October 1917 to September 1929 (no winter records), October 1929 to current year. Prior to October 1939, published as "near Montevideo." Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1035: 1919(M). WSP 1085: 1935-36. WSP 1508: 1912, 1925(M), 1929(M).

GAGE.--Water-stage recorder. Datum of gage is 909.12 ft above mean sea level. July 22, 1909, to Feb. 4, 1932, nonrecording gage at bridge 600 ft downstream at present datum. Feb. 5, 1932, to Nov. 26, 1934, nonrecording gage at bridge 100 ft downstream at present datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	592	1210	940	e460	e229	e400	8630	8310	4270	3400	e3170	1970
2	586	1080	832	e470	e230	e500	9990	7960	4340	3280	e3150	1950
3	594	1320	609	e455	e230	e600	9430	7610	4510	3230	3140	1930
4	587	1390	532	e445	e230	e640	9960	7390	4680	3720	3160	1900
5	585	1270	606	e425	e230	e650	10100	7080	4640	6010	3200	1870
6	588	1260	897	e405	e235	e640	10100	6700	4550	7460	3200	1880
7	583	1210	e830	e390	e238	e620	10100	6300	4410	8300	3140	1880
8	576	961	e750	e380	e238	e600	9740	5950	4300	8940	3140	1860
9	567	749	e710	e365	e239	e610	8840	5670	4180	9120	3140	1840
10	562	665	e730	e340	e240	e640	e7700	5490	4160	9740	3130	1820
11	563	665	e750	e320	e241	717	e6650	5410	4150	9820	3100	1790
12	554	625	e770	e310	e242	902	e5900	5370	4100	9560	3120	1760
13	556	372	e710	e300	e245	1060	e5200	5530	4030	9570	3180	1520
14	541	340	e660	e295	e247	1700	e4800	6020	3950	9500	3170	1460
15	553	420	e640	e290	e248	2480	e4800	6330	3890	9760	3050	1260
16	583	291	e620	e285	e249	2900	e5400	5670	3800	9310	2930	1070
17	584	301	e600	e280	e250	3060	e6000	5260	3720	8790	2830	1020
18	777	618	e590	e280	e251	3310	e6600	5280	3650	7880	2660	999
19	714	689	e570	e280	e252	3820	e7150	5090	3570	6780	2630	990
20	742	659	e550	e280	e254	3930	e7900	4980	3470	5890	2600	965
21	996	718	e532	e280	e255	4170	e8500	4850	3360	5180	2550	950
22	1270	842	e510	e285	e257	4460	e9050	4950	3280	4610	2370	939
23	1400	937	e500	e280	e259	4780	9580	5050	3240	4060	2040	928
24	1320	961	e490	e280	e260	5060	9950	4910	3240	3720	1960	914
25	1270	954	e475	e275	e270	5300	10100	4710	3220	3500	1950	879
26	1210	933	e465	e270	e280	5660	10100	4450	3180	3400	1960	709
27	1170	814	e460	e260	e290	6200	9800	4220	3170	e3350	1950	534
28	1280	774	e456	e250	e325	6710	9440	4200	3160	e3300	1960	535
29	1250	699	e453	e240	---	7110	9060	4250	3240	e3270	1980	533
30	1250	847	e450	e235	---	6930	8690	4260	3390	e3230	2000	619
31	1240	---	e455	e230	---	8270	---	4250	---	e3200	2000	---
TOTAL	25643	24574	19142	9940	7014	94429	249260	173500	114850	190880	83560	39274
MEAN	827	819	617	321	250	3046	8309	5597	3828	6157	2695	1309
MAX	1400	1390	940	470	325	8270	10100	8310	4680	9820	3200	1970
MIN5	41	291	450	230	229	400	4800	4200	3160	3200	1950	533
AC-FT	50860	48740	37970	19720	13910	187300	494400	344100	227800	378600	165700	77900
CFSM	.13	.13	.10	.05	.04	.49	1.34	.91	.62	1.00	.44	.21
IN.	.15	.15	.12	.06	.04	.57	1.50	1.04	.69	1.15	.50	.24

e Estimated.

MINNESOTA RIVER BASIN

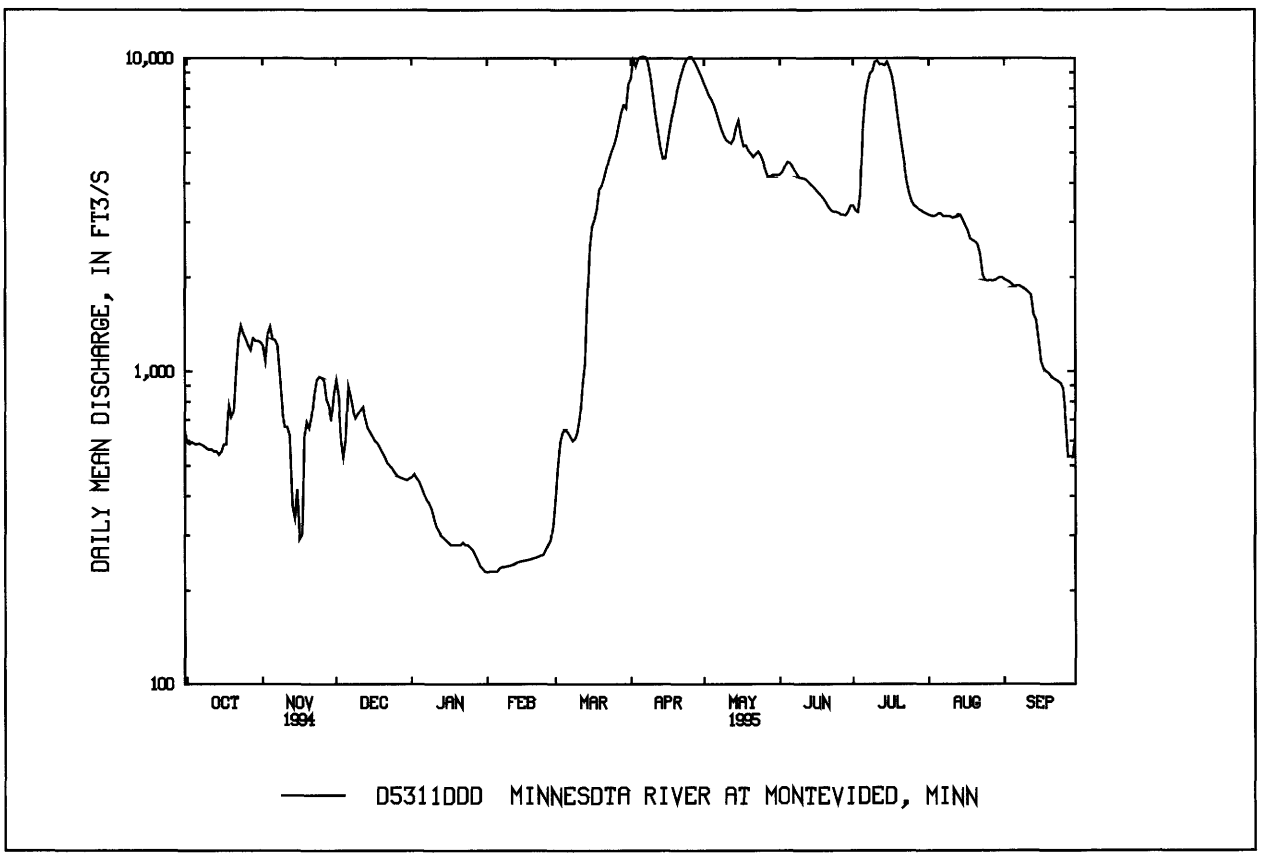
05311000 MINNESOTA RIVER AT MONTEVIDEO, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	315	319	244	162	183	876	2515	1493	1264	1121	575	341
MAX	3171	3164	1352	760	740	5363	12550	7315	5088	7853	7084	2613
(WY)	1987	1985	1985	1987	1987	1994	1952	1986	1984	1993	1993	1986
MIN	.76	1.61	2.35	1.57	1.06	5.06	7.82	3.13	1.40	1.89	.60	.57
(WY)	1934	1935	1935	1934	1937	1934	1934	1934	1934	1933	1933	1933

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1909 - 1995	
ANNUAL TOTAL	821991		1032066			
ANNUAL MEAN	2252		2828		826[a]	
HIGHEST ANNUAL MEAN					2961	1986
LOWEST ANNUAL MEAN					4.43	1934
HIGHEST DAILY MEAN	11300	Mar 25	10100	Apr 5	34400	Apr 13 1969
LOWEST DAILY MEAN	291	Nov 16	229	Feb 1	.00[b]	Aug 14 1933
ANNUAL SEVEN-DAY MINIMUM	424	Nov 12	231	Jan 30	.00	Jul 5 1934
INSTANTANEOUS PEAK FLOW			11100	Apr 2	35100	Apr 12 1969
INSTANTANEOUS PEAK STAGE			16.31	Apr 2	21.68[c]	Apr 12 1969
ANNUAL RUNOFF (AC-FT)	1630000		2047000		598300	
ANNUAL RUNOFF (CFSM)	.36		.46		.13	
ANNUAL RUNOFF (INCHES)	4.95		6.21		1.82	
10 PERCENT EXCEEDS	6030		7650		2080	
50 PERCENT EXCEEDS	1250		1700		238	
90 PERCENT EXCEEDS	520		280		34	

a Median of annual mean discharges is 612 ft^3/s.
b Occurred several days in 1933, 1934, and 1936.
c From highwater mark.



MINNESOTA RIVER BASIN

05313500 YELLOW MEDICINE RIVER NEAR GRANITE FALLS, MN

LOCATION.--Lat 44°43'18", long 95°31'07", in SW¼ sec.35, T.115 N., R.39 W., Yellow Medicine County, Hydrologic Unit 07020004, on right bank 50 ft downstream from highway bridge, 6 mi upstream from mouth, and 8 mi south of town of Granite Falls.

DRAINAGE AREA.--653 mi².

PERIOD OF RECORD.--March 1931 to September 1935 (no winter records), October 1935 to September 1938, October 1939 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1508: 1931, 1934(M), 1937(M), 1946(M), 1950(M).

GAGE.--Water-stage recorder. Datum of gage is 960.64 ft above mean sea level. Mar. 16, 1931, to June 13, 1938, nonrecording gage, on bridge 50 ft upstream at present datum. Oct. 12, 1939, to Nov. 30, 1952, nonrecording gage 500 ft downstream at present datum.

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1919 reached a stage of 17.5 ft, from information by local residents, discharge, 25,200 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 300 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 19	1800	315	3.54	May 16	0700	1620	5.73
Mar. 14	--	e800	4.67	May 31	0700	1670	5.79
Mar. 29	0200	1070	4.98	June 22	0700	432	3.81
Apr. 22	1400	*3110	*7.26	July 18	1100	1650	5.74

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	131	e90	e52	e28	e30	664	1020	1370	209	353	217
2	64	129	e94	e51	e29	e30	564	1060	1090	195	338	212
3	68	124	e91	e50	e29	e29	492	990	938	183	325	188
4	77	119	e88	e49	e29	e29	435	873	841	186	303	194
5	116	119	e80	e48	e30	e28	394	780	726	218	287	251
6	131	116	e72	e47	e31	e28	360	709	652	208	284	233
7	134	109	e71	e46	e31	e27	348	653	599	210	289	195
8	133	107	e80	e44	e32	e27	338	613	545	231	308	177
9	139	104	e83	e43	e31	e27	340	628	503	209	283	170
10	134	99	e78	e41	e30	e28	364	809	478	205	257	160
11	122	98	e80	e39	e30	e33	384	1200	472	187	235	147
12	110	96	e79	e37	e29	e100	419	1420	516	170	211	135
13	107	98	e77	e36	e29	e320	e527	1370	496	159	200	121
14	102	105	e75	e35	e29	e800	690	1300	440	141	206	115
15	98	98	e73	e34	e29	e750	944	1430	404	199	224	103
16	98	97	e72	e34	e29	e450	1300	1600	374	531	281	93
17	110	103	e73	e34	e29	e300	1630	1400	345	1270	264	83
18	180	124	e74	e31	e29	e260	1860	1120	321	1600	231	81
19	287	110	e75	e30	e29	e230	2040	928	295	1330	204	76
20	311	107	e81	e30	e29	213	2180	785	272	1070	184	67
21	289	e95	e86	e30	e29	191	2680	674	253	874	172	67
22	255	88	e86	e30	e29	185	3070	608	261	706	159	67
23	224	e85	e86	e30	e30	192	3020	564	377	565	141	72
24	206	e85	e86	e31	e31	231	2670	548	284	458	132	69
25	188	e87	e83	e32	e31	291	2150	520	259	401	124	69
26	178	85	e78	e34	e31	392	1710	479	246	380	122	69
27	170	51	e72	e34	e31	691	1450	451	236	358	111	66
28	161	51	e64	e33	e31	977	1230	507	231	351	116	64
29	156	63	e60	e31	---	1060	1050	853	234	370	164	65
30	151	87	e55	e30	---	965	975	1410	219	440	181	79
31	141	---	e54	e29	---	797	---	1630	---	398	184	---
TOTAL	4697	2970	2396	1155	834	9711	36278	28932	14277	14012	6873	3705
MEAN	152	99.0	77.3	37.3	29.8	313	1209	933	476	452	222	123
MAX	311	131	94	52	32	1060	3070	1630	1370	1600	353	251
MIN	57	51	54	29	28	27	338	451	219	141	111	64
AC-FT	9320	5890	4750	2290	1650	19260	71960	57390	28320	27790	13630	7350
CFSM	.23	.15	.12	.06	.05	.48	1.85	1.43	.73	.69	.34	.19
IN.	.27	.17	.14	.07	.05	.55	2.07	1.65	.81	.80	.39	.21

e Estimated.

MINNESOTA RIVER BASIN

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

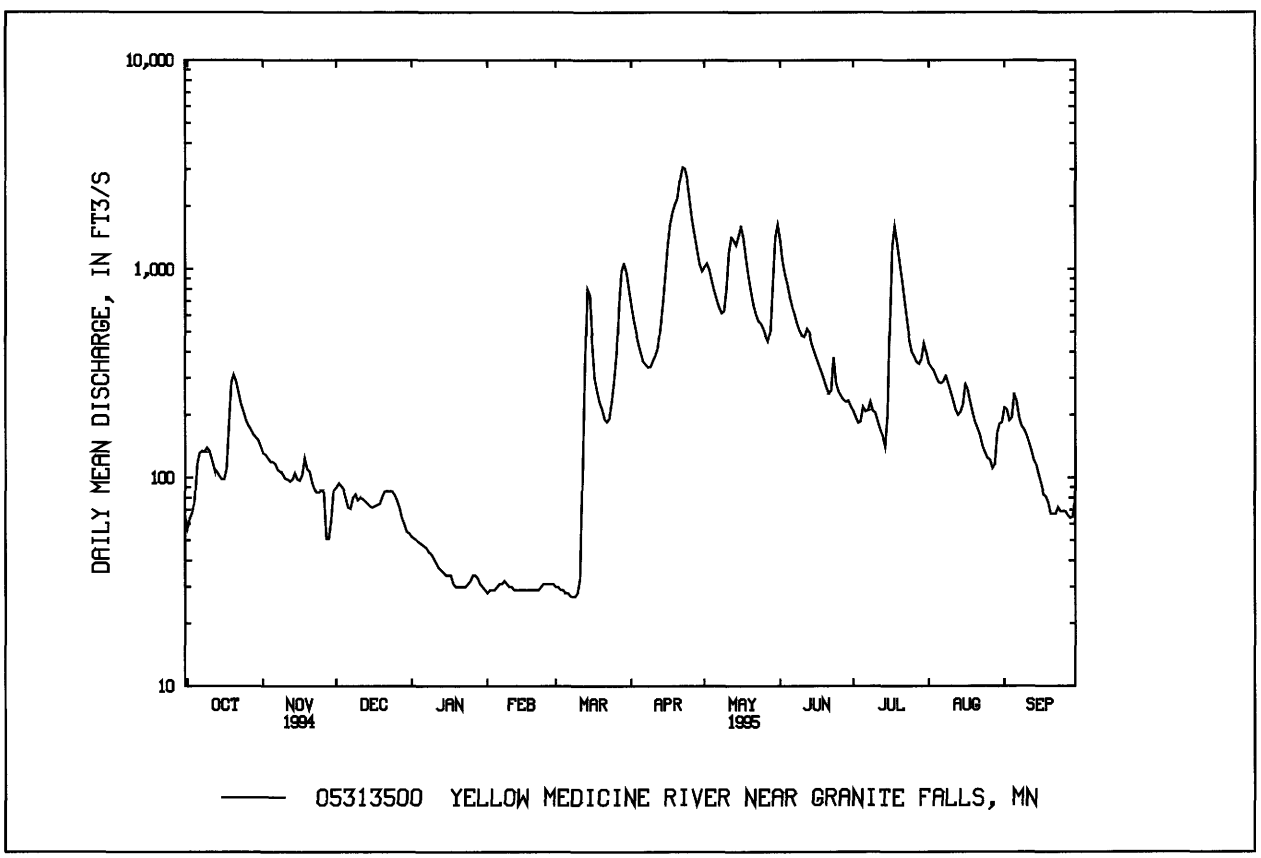
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	35.3	39.8	23.9	12.3	16.0	219	460	195	280	140	69.4	43.9
MAX	409	274	135	75.5	97.1	933	3302	1087	2484	1600	510	1005
(WY)	1987	1971	1987	1987	1966	1986	1969	1944	1984	1993	1953	1986
MIN	1.41	1.60	1.39	.90	.12	3.67	2.58	1.18	1.18	.34	.38	.47
(WY)	1937	1938	1936	1948	1959	1975	1934	1934	1934	1933	1934	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1931 - 1995	
ANNUAL TOTAL	106555		125840			
ANNUAL MEAN	292		345		137[a]	
HIGHEST ANNUAL MEAN					566	1993
LOWEST ANNUAL MEAN					8.32	1959
HIGHEST DAILY MEAN	1900	Mar 9	3070	Apr 22	16400	Apr 10 1969
LOWEST DAILY MEAN	32	Feb 9	27	Mar 7	.00[b]	Jul 26 1931
ANNUAL SEVEN-DAY MINIMUM	33	Feb 5	28	Mar 4	.00	Jan 21 1948
INSTANTANEOUS PEAK FLOW			3110	Apr 22	17200	Apr 10 1969
INSTANTANEOUS PEAK STAGE			7.26	Apr 22	14.90	Apr 10 1969
INSTANTANEOUS LOW FLOW			26	Mar 9		
ANNUAL RUNOFF (AC-FT)	211400		249600		99190	
ANNUAL RUNOFF (CFSM)	.45		.53		.21	
ANNUAL RUNOFF (INCHES)	6.07		7.17		2.85	
10 PERCENT EXCEEDS	755		969		295	
50 PERCENT EXCEEDS	141		161		18	
90 PERCENT EXCEEDS	42		31		2.2	

a Median of annual mean discharges is 86 ft^3/s.

b Many days, several years.



MINNESOTA RIVER BASIN

05315000 REDWOOD RIVER NEAR MARSHALL, MN

LOCATION.--Lat 44°25'49", long 95°50'43", in $SE^1/_4SW^1/_4$ sec.12, T.111 N., R.42 W., Lyon County, Hydrologic Unit 07020006, on right bank 2.0 mi upstream from Redwood River diversion structure on southwest edge of town of Marshall, MN. Prior to Apr. 10, 1980, at site 5 mi downstream.

DRAINAGE AREA.--259 mi^2.

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

REVISED RECORDS.--WDR MN-89-2: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,188.23 ft above mean sea level. March 1940 to April 9, 1980, nonrecording gage 5.0 mi downstream from present site at datum 43.35 ft lower (crest-stage gage added June 12, 1968). Since March 1964, nonrecording gage and crest-stage gage on diversion channel 1.5 mi downstream at datum 1,100.00 ft above sea level.

REMARKS.--Records good except those for estimated daily discharges which are poor. Water diverted at medium and high stages into diversion channel 2.0 mi below station. Diversion began Mar. 18, 1964. Unknown amount of natural diversion into Cottonwood River basin occurs at extremely high stages 0.8 mi below station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e51	64	e35	e28	e51	e67	350	665	485	120	359	154
2	e45	64	e34	e27	e49	e70	300	611	554	118	343	182
3	e40	62	e33	e26	e48	e73	264	567	582	115	309	219
4	53	60	e32	e25	e47	e75	227	534	429	114	313	199
5	54	59	e30	e25	e47	e79	207	496	391	119	351	170
6	53	58	e29	e24	e46	e85	198	466	370	130	441	164
7	52	56	e28	e23	e46	e95	189	438	335	131	363	148
8	52	56	e27	e23	e46	e130	191	439	301	129	326	129
9	49	55	e27	e22	e45	e170	196	577	287	127	303	115
10	46	53	e26	e22	e45	e215	166	775	348	123	261	104
11	44	60	e25	e22	e45	502	189	754	383	119	240	99
12	43	56	e24	e21	e46	1090	204	664	324	115	220	96
13	44	54	e23	e21	e47	564	e255	709	284	114	229	94
14	42	53	e22	e21	e48	309	363	960	262	110	221	94
15	40	53	e22	e21	e49	270	856	824	243	110	198	85
16	42	51	e21	e21	e53	224	1010	722	229	128	180	85
17	51	50	e21	e21	e60	175	965	742	206	126	156	80
18	130	48	e21	e21	e70	144	996	692	184	111	149	81
19	149	47	e21	e21	e76	120	1290	619	168	108	155	95
20	126	45	e20	e22	e80	113	1350	549	159	109	149	95
21	120	48	e21	e23	e82	108	1340	490	151	110	141	75
22	125	44	e21	e24	e81	101	1170	438	148	105	129	72
23	118	49	e22	e25	e80	114	999	408	143	101	123	75
24	106	50	e22	e27	e77	123	903	372	138	103	121	73
25	94	43	e23	e29	e74	172	827	345	133	106	116	72
26	83	46	e23	e31	e72	497	766	324	132	112	118	57
27	78	40	e24	e33	e66	631	717	326	135	283	125	53
28	73	e39	e25	e36	e65	580	650	616	134	561	129	48
29	70	e38	e27	e39	---	551	630	729	128	543	146	62
30	68	e36	e29	e42	---	475	682	598	123	402	158	122
31	65	---	e30	e46	---	399	---	530	---	372	168	---
TOTAL	2206	1537	788	812	1641	8321	18450	17979	7889	5174	6740	3197
MEAN	71.2	51.2	25.4	26.2	58.6	268	615	580	263	167	217	107
MAX	149	64	35	46	82	1090	1350	960	582	561	441	219
MIN	40	36	20	21	45	67	166	324	123	101	116	48
AC-FT	4380	3050	1560	1610	3250	16500	36600	35660	15650	10260	13370	6340
CFSM	.27	.20	.10	.10	.23	1.04	2.37	2.24	1.02	.64	.84	.41

e Estimated.

MINNESOTA RIVER BASIN

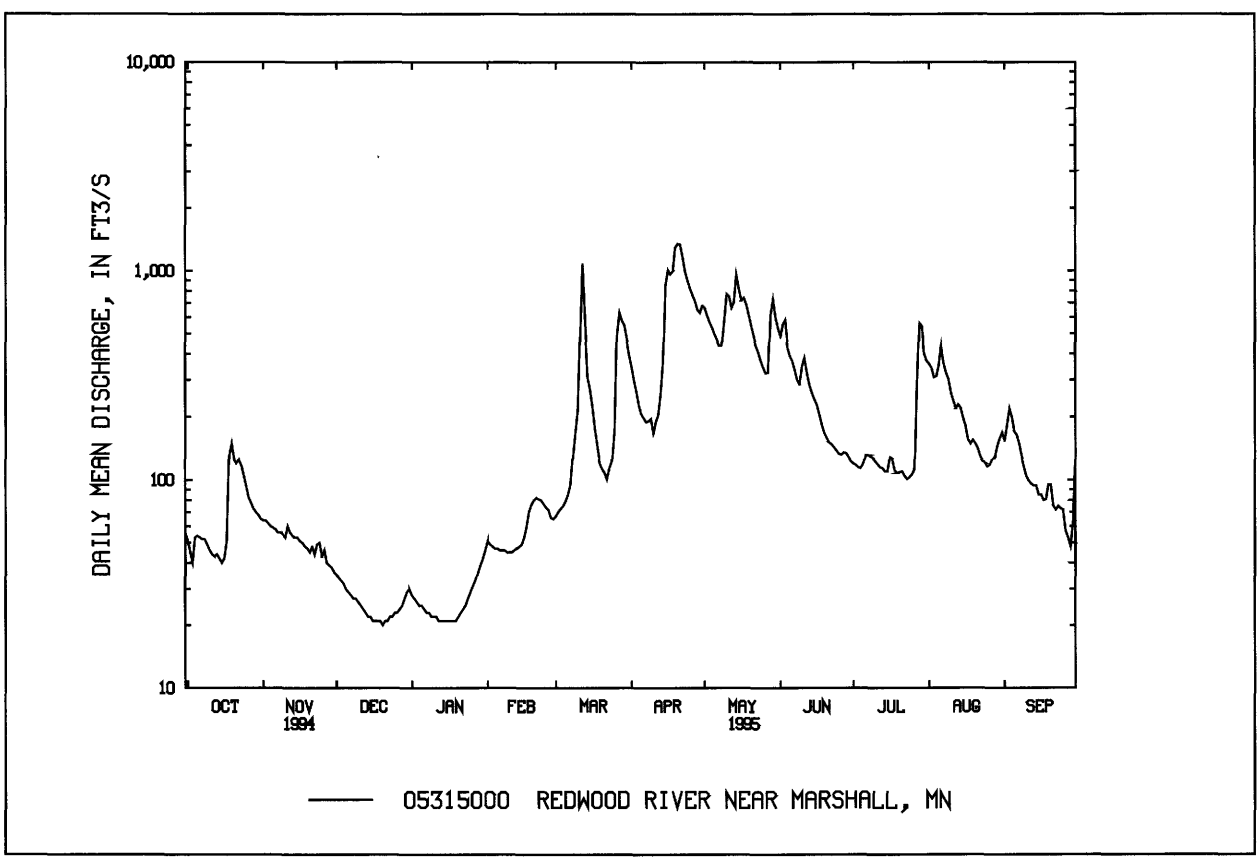
05315000 REDWOOD RIVER NEAR MARSHALL, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	23.1	22.7	13.2	8.08	14.0	121	218	120	117	70.0	35.0	27.1
MAX	222	153	82.3	59.4	101	571	1152	1205	936	1161	610	292
(WY)	1969	1980	1994	1994	1983	1983	1969	1993	1993	1993	1993	1986
MIN	.029	.58	.87	.000	.090	2.70	7.36	3.90	.83	.058	.042	.007
(WY)	1977	1977	1977	1977	1979	1965	1990	1981	1976	1976	1941	1941

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1940 - 1995	
ANNUAL TOTAL	58935		74734			
ANNUAL MEAN	161		205		66.4a	
HIGHEST ANNUAL MEAN					421	1993
LOWEST ANNUAL MEAN					5.13	1981
HIGHEST DAILY MEAN	1390	Jun 23	1350	Apr 20	5300	May 9 1993
LOWEST DAILY MEAN	20	Dec 20	20	Dec 20	.00b	Jul 28 1940
ANNUAL SEVEN-DAY MINIMUM	21	Dec 16	21	Dec 16	.00	Jul 28 1940
INSTANTANEOUS PEAK FLOW			1390	Apr 21	6380	May 9 1993
INSTANTANEOUS PEAK STAGE			13.69	Apr 21	17.00	May 9 1993
INSTANTANEOUS LOW FLOW			20e	Dec 20		
ANNUAL RUNOFF (AC-FT)	116900		148200		48130	
ANNUAL RUNOFF (CFSM)	.62		.79		.26	
10 PERCENT EXCEEDS	351		571		151	
50 PERCENT EXCEEDS	85		110		11	
90 PERCENT EXCEEDS	40		25		1.8	

a Median of annual mean discharges is 42 ft^3/s.
b Many days, several years.
e Estimated.



MINNESOTA RIVER BASIN

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 upstream from highway bridge, 3 mi west of town of Redwood Falls, and 8.5 mi upstream from mouth.

DRAINAGE AREA.--629 mi².

PERIOD OF RECORD.--July 1909 to September 1914 (no winter records except 1911-12). August 1930 to September 1935 (no winter records), October 1935 to current year.

REVISED RECORDS.--WDR MN-89-2: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 972.33 ft above sea level. July 1909 to September 1914, nonrecording gage at bridge 20 ft downstream at datum 0.22 ft lower. August 1930 to Oct. 25, 1949, nonrecording gage, at bridge 20 ft downstream at present datum.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft³/s and maximum (*):

		Discharge	Gage height			Discharge	Gage height
Date	Time	(ft³/s)	(ft)	Date	Time	(ft³/s)	(ft)
Oct. 19	0300	677	3.64	May 31	2300	1190	4.73
Mar. 16	--	e1500	5.79	June 29	1300	404	3.06
Mar. 29	1700	1220	4.73	July 5	1000	583	3.44
Apr. 22	0900	*3010	*7.54	July 17	1700	587	3.45
May 14	1100	1430	5.22	July 30	1000	747	3.79

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	120	239	e112	e112	e35	e48	1100	1150	1170	293	584	208
2	115	238	e111	e115	e35	e47	947	1120	1080	260	535	191
3	162	224	e110	e119	e35	e47	818	1090	946	234	500	187
4	233	213	e109	e120	e35	e48	e640	1020	923	249	477	252
5	253	210	e109	e121	e35	e51	e540	938	861	559	494	249
6	267	203	e108	e112	e34	e54	e480	874	776	456	484	276
7	267	197	e107	e107	e35	e60	e420	825	735	371	534	239
8	266	194	e104	e100	e35	e65	e390	786	687	399	501	207
9	245	187	e101	e96	e35	e74	e380	819	642	366	446	182
10	226	178	e99	e90	e35	e83	e490	1010	627	297	403	163
11	211	171	e98	e85	e36	e95	574	1090	659	276	364	147
12	198	178	e96	e80	e36	e105	588	1140	694	247	332	134
13	188	181	e95	e75	e37	e122	711	1260	671	220	306	124
14	179	171	e93	e73	e37	e140	1030	1410	619	198	317	112
15	176	163	e93	e70	e39	166	1270	1350	571	190	309	105
16	175	159	e92	e65	e41	e1500	1300	1370	523	241	290	99
17	181	162	e90	e62	e43	e900	1340	1410	480	508	262	91
18	386	165	e90	e59	e50	e550	1730	1310	443	483	234	88
19	673	151	e90	e56	e58	e425	2530	1200	396	383	213	95
20	661	141	e90	e53	e62	e350	2510	1100	356	378	205	108
21	603	149	e90	e50	e67	e275	2650	970	322	317	192	100
22	538	143	e91	e47	e70	e246	2970	853	303	281	179	96
23	492	124	e92	e45	e70	e350	2730	788	319	246	161	91
24	443	e120	e93	e43	e68	e520	2420	737	293	215	150	90
25	398	e119	e95	e41	e65	e620	2040	696	272	205	138	86
26	358	e118	e98	e39	e62	e800	1750	659	257	305	140	83
27	330	e117	e100	e38	e58	1100	1530	630	257	381	135	81
28	311	e116	e102	e38	e53	1150	1350	788	276	666	134	76
29	288	e115	e105	e37	---	1210	1250	1100	384	731	147	76
30	261	e114	e109	e37	---	1210	1200	1130	349	741	187	183
31	247	---	e111	e35	---	1170	---	1170	---	667	207	---
TOTAL	9451	4960	3083	2220	1301	13581	39678	31793	16891	11363	9560	4219
MEAN	305	165	99.5	71.6	46.5	438	1323	1026	563	367	308	141
MAX	673	239	112	121	70	1500	2970	1410	1170	741	584	276
MIN	115	114	90	35	34	47	380	630	257	190	134	76
AC-FT	18750	9840	6120	4400	2580	26940	78700	63060	33500	22540	18960	8370
CFSM	.48	.26	.16	.11	.07	.70	2.10	1.63	.90	.58	.49	.22
IN.	.56	.29	.18	.13	.08	.80	2.35	1.88	1.00	.67	.57	.25

e Estimated.

MINNESOTA RIVER BASIN

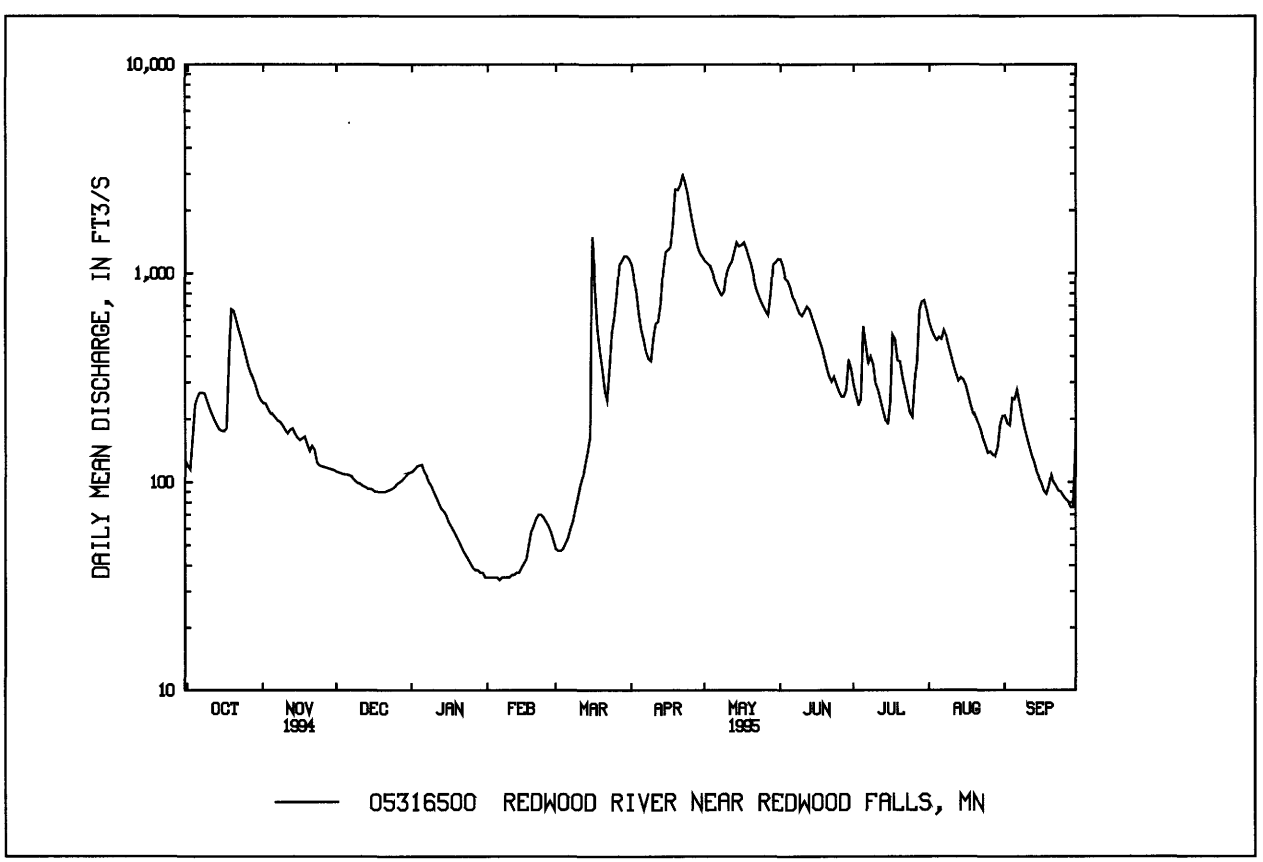
05316500 REDWOOD RIVER NEAR REDWOOD FALLS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	51.1	55.0	31.2	15.3	19.3	231	409	214	256	148	78.6	52.5
MAX	395	541	245	104	167	1289	2880	1530	2724	1994	934	673
(WY)	1987	1980	1983	1994	1983	1983	1969	1993	1993	1993	1993	1986
MIN	.84	.96	.46	.19	.20	1.54	14.6	2.75	1.01	.44	.51	.31
(WY)	1937	1936	1936	1940	1937	1965	1934	1934	1934	1934	1934	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1909 - 1995	
ANNUAL TOTAL	124407		148100			
ANNUAL MEAN	341		406		144[a]	
HIGHEST ANNUAL MEAN					789	1993
LOWEST ANNUAL MEAN					10.8	1959
HIGHEST DAILY MEAN	1800	Aug 11	2970	Apr 22	13200	Apr 9 1969
LOWEST DAILY MEAN	52	Aug 9	34	Feb 6	.00[b]	Jan 17 1940
ANNUAL SEVEN-DAY MINIMUM	59	Aug 3	35	Jan 31	.01	Jan 25 1940
INSTANTANEOUS PEAK FLOW			3010	Apr 22	19700	Jun 18 1957
INSTANTANEOUS PEAK STAGE			7.54	Apr 22	15.92[c]	Jun 18 1957
INSTANTANEOUS LOW FLOW			34	Feb 6		
ANNUAL RUNOFF (AC-FT)	246800		293800		104600	
ANNUAL RUNOFF (CFSM)	.54		.65		.23	
ANNUAL RUNOFF (INCHES)	7.36		8.76		3.12	
10 PERCENT EXCEEDS	780		1100		304	
50 PERCENT EXCEEDS	210		213		25	
90 PERCENT EXCEEDS	83		54		2.1	

a Median of annual mean discharges is 93 ft^3/s.
b Occurred several days in 1940 and 1959.
c From floodmark.



MINNESOTA RIVER BASIN

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 upstream from highway bridge, 1.8 mi south of New Ulm, and 3.2 mi upstream from mouth.

DRAINAGE AREA.--1,280 mi², approximately.

PERIOD OF RECORD.--July 1909 to December 1913, March 1931 to March 1938, August 1938 to current year (winter records incomplete prior to 1936).

REVISED RECORDS.--WSP 355: 1912.

GAGE.--Water-stage recorder. Datum of gage is 796.83 ft above mean sea level. July 1, 1909, to Dec. 13, 1913, nonrecording gage at site 2.7 mi upstream at different datum. Mar. 15, 1931, to Mar. 31, 1938, nonrecording gage 2.2 mi upstream at datum 11.41 ft higher. Aug. 23, 1938, to June 25, 1948, nonrecording gage at present site and datum.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Mar. 27	2000	2910	8.77	May 30	1700	2580	8.39
Apr. 20	1800	*4770	*11.35	July 29	1600	3570	9.79
May 15	1200	4020	10.43				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	277	e315	e200	e180	e93	e82	1700	1660	2350	800	1650	265
2	264	e310	e195	e170	93	e80	1520	1680	2110	846	1320	266
3	256	e300	e190	e150	91	e78	1370	1650	1850	776	1130	266
4	e260	e295	e185	e140	90	e80	1220	1580	1640	686	958	266
5	e300	290	e185	e130	88	e80	1110	1490	1500	767	830	255
6	e345	279	e180	e125	87	e80	1070	1390	1450	1020	782	666
7	e350	270	e180	e120	83	e78	1030	1320	1430	1110	769	504
8	e330	264	e178	e118	e82	e76	1000	1280	1420	1130	767	386
9	e310	258	e176	e115	80	74	995	1290	1250	1030	760	326
10	e300	254	e174	e110	80	82	1010	1650	1170	922	704	288
11	e295	250	e170	e110	e80	116	1060	2250	1120	801	621	267
12	e290	247	e168	e115	e80	493	1430	2370	1080	710	550	252
13	e285	246	e166	e120	e80	706	1920	2350	1050	637	616	236
14	e285	243	e165	e120	e80	e950	2230	3190	1010	559	872	226
15	e280	240	e165	e115	79	989	2690	3990	e880	561	807	217
16	e290	239	e170	e115	77	1100	3030	3680	e820	522	678	207
17	e300	236	e170	e118	74	846	3030	3120	e760	612	599	198
18	e305	236	e170	e115	71	588	3030	2920	e720	833	528	194
19	e330	234	e180	e115	69	450	3730	2470	e660	787	475	225
20	e385	233	e187	e112	68	417	4660	2100	e640	777	416	227
21	e435	231	e190	e105	69	372	4600	1840	e611	757	376	242
22	e450	233	e192	e100	72	336	4350	1640	e630	710	353	245
23	e415	234	e194	e90	73	338	4000	1500	e660	664	331	242
24	e380	235	e196	e85	75	346	3460	1390	e640	630	309	234
25	e355	234	e196	e96	77	462	2940	1300	e700	570	287	226
26	e340	235	e198	e86	79	1760	2520	1230	e900	588	273	219
27	e330	235	e198	e86	76	2790	2200	1180	e1050	763	269	214
28	e327	236	e200	e88	83	2840	1960	1260	e980	2350	263	210
29	e325	229	e200	e88	---	2550	1800	1750	755	3450	263	207
30	e322	217	e200	e88	---	2260	1690	2500	813	3160	263	414
31	e320	---	e198	e90	---	1960	---	2530	---	2240	263	---
TOTAL	10036	7558	5716	3515	2229	23459	68355	61550	32649	31768	19082	8190
MEAN	324	252	184	113	79.6	757	2278	1985	1088	1025	616	273
MAX	450	315	200	180	93	2840	4660	3990	2350	3450	1650	666
MIN	256	217	165	85	68	74	995	1180	611	522	263	194
AC-FT	19910	14990	11340	6970	4420	46530	135600	122100	64760	63010	37850	16240
CFSM	.25	.20	.14	.09	.06	.59	1.78	1.55	.85	.80	.48	.21

e Estimated.

MINNESOTA RIVER BASIN

05317000 COTTONWOOD RIVER NEAR NEW ULM, MN--Continued

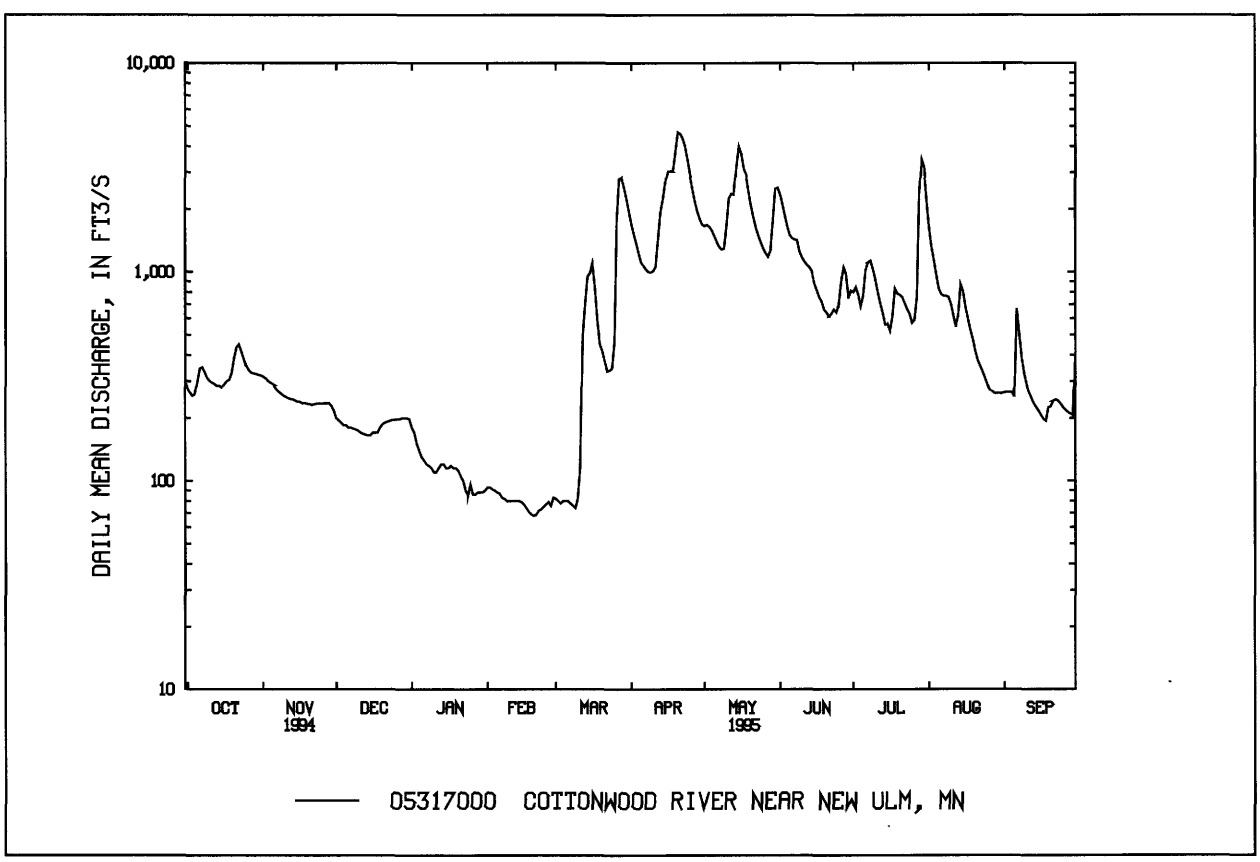
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	170	149	98.7	53.1	92.2	626	972	569	596	346	185	156
MAX	3208	1099	572	282	628	2236	7075	3497	5831	3815	1791	2438
(WY)	1969	1980	1980	1992	1983	1983	1969	1993	1993	1993	1993	1986
MIN	4.57	7.97	5.77	1.61	1.47	13.9	40.0	7.57	8.58	4.37	1.05	3.28
(WY)	1934	1940	1936	1940	1940	1965	1959	1934	1911	1934	1934	1933

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1909 - 1995	
ANNUAL TOTAL	275711		274107			
ANNUAL MEAN	755		751		362[a]	
HIGHEST ANNUAL MEAN					1796	1993
LOWEST ANNUAL MEAN					41.1	1940
HIGHEST DAILY MEAN	4500	Apr 27	4660	Apr 20	27100	Apr 9 1969
LOWEST DAILY MEAN	136	Aug 9	68	Feb 20	.60	Aug 1 1934
ANNUAL SEVEN-DAY MINIMUM	154	Aug29	71	Feb 17	.64	Feb 1 1940
INSTANTANEOUS PEAK FLOW			4770	Apr 20	28700	Apr 10 1969
INSTANTANEOUS PEAK STAGE			11.35	Apr 20	20.86	Apr 8 1965
INSTANTANEOUS LOW FLOW			67[b]	Feb 20	.50	Nov 27 1952
ANNUAL RUNOFF (AC-FT)	546900		543700		262100	
ANNUAL RUNOFF (CFSM)	.59		.59		.28	
10 PERCENT EXCEEDS	1840		2020		813	
50 PERCENT EXCEEDS	385		326		75	
90 PERCENT EXCEEDS	166		88		11	

a Median of annual mean discharges is 235 ft^3/s.

b Minimum observed, probably lower on Mar. 7.



WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1961-62, 1964-68, 1971-72, 1974-76, 1989-92, 1995.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	AMETRYN WATER, DISS, REC, (UG/L) (38401)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)
MAY												
28...	1115	1540	1110	8.1	10.5	0.020	9.30	0.030	0.040	<0.05	0.07	0.06

DATE	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	DEISO-PROPYL ATRAZIN WATER, DISS, REC (UG/L) (04038)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	PRO-METRYN, WATER, DISS, REC (UG/L) (04036)	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	PROP-AZINE WATER DISS REC (UG/L) (38535)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)
MAY											
28...	0.06	<0.05	0.14	0.17	0.28	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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MINNESOTA RIVER BASIN

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 downstream from bridge on State Highway 68, 0.7 mi above mouth, 1.5 mi south of Courtland.

DRAINAGE AREA.--230 mi², approximately.

PERIOD OF RECORD.--October 1973 to current year. September 1969 to September 1973, operated as a low-flow station only.

GAGE.--Water-stage recorder. Datum of gage is 788.25 ft above mean sea level.

REMARKS.--Records fair.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 17	1200	218	4.74	May 19	1000	392	*5.73
Mar.12	2130	250	4.76	June 6	2330	245	4.95
Mar.16	1330	225	4.45	July 20	0400	184	4.40
Mar.26	1000	394	5.48	July 28	0400	800	5.14
Apr. 13	0130	316	5.18	Aug.13	2400	284	5.05
Apr.19	1400	*396	5.61				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	103	83	67	53	20	20	316	203	224	112	172	e56
2	98	80	59	52	20	18	276	197	232	119	185	e53
3	103	77	59	e45	21	17	241	190	229	124	180	e52
4	120	76	57	e40	22	17	209	184	216	120	152	e52
5	125	74	32	34	22	17	193	177	204	106	131	e50
6	125	71	34	33	21	17	176	172	211	88	132	e47
7	123	70	56	31	19	15	169	164	227	80	127	e46
8	118	67	53	28	18	15	169	161	199	69	126	e48
9	118	66	45	26	17	13	169	170	183	59	134	e48
10	118	63	45	26	17	16	164	186	179	49	138	e46
11	105	62	43	27	16	32	168	190	168	41	136	e46
12	98	72	44	27	14	186	276	193	162	37	130	e41
13	96	72	40	27	12	196	295	220	153	34	212	e37
14	93	63	40	27	12	168	265	316	141	35	253	e35
15	89	65	40	27	11	181	259	299	134	46	209	e33
16	93	71	39	27	11	211	272	281	124	50	191	e31
17	193	67	39	28	11	183	279	299	113	89	174	e29
18	182	61	39	28	11	155	313	352	107	66	156	e29
19	158	55	39	28	11	139	387	385	100	119	137	e30
20	148	55	39	27	11	150	353	368	89	159	e100	e34
21	139	71	39	25	11	145	341	328	81	118	e95	e38
22	131	64	39	24	15	131	356	286	76	107	e90	e37
23	121	55	39	22	18	138	370	244	71	90	e87	e35
24	113	74	39	21	19	138	361	220	69	79	e84	e35
25	108	69	39	20	22	183	332	202	93	75	e84	e36
26	104	63	40	20	22	380	290	187	113	121	e82	e34
27	100	55	43	19	22	334	253	178	101	148	e77	e34
28	96	38	47	19	21	316	230	198	98	258	e72	e33
29	91	40	51	20	---	330	215	218	96	171	e68	e40
30	90	47	52	20	---	352	210	209	104	149	e63	e50
31	87	---	53	20	---	348	---	211	---	153	e60	---
TOTAL	3586	1946	1390	871	467	4561	7907	7188	4297	3071	4037	1215
MEAN	116	64.9	44.8	28.1	16.7	147	264	232	143	99.1	130	40.5
MAX	193	83	67	53	22	380	387	385	232	258	253	56
MIN	87	38	32	19	11	13	164	161	69	34	60	29
AC-FT	7110	3860	2760	1730	926	9050	15680	14260	8520	6090	8010	2410
CFSM	.50	.28	.19	.12	.07	.64	1.15	1.01	.62	.43	.57	.18
IN.	.58	.31	.22	.14	.08	.74	1.28	1.16	.69	.50	.65	.20

e Estimated.

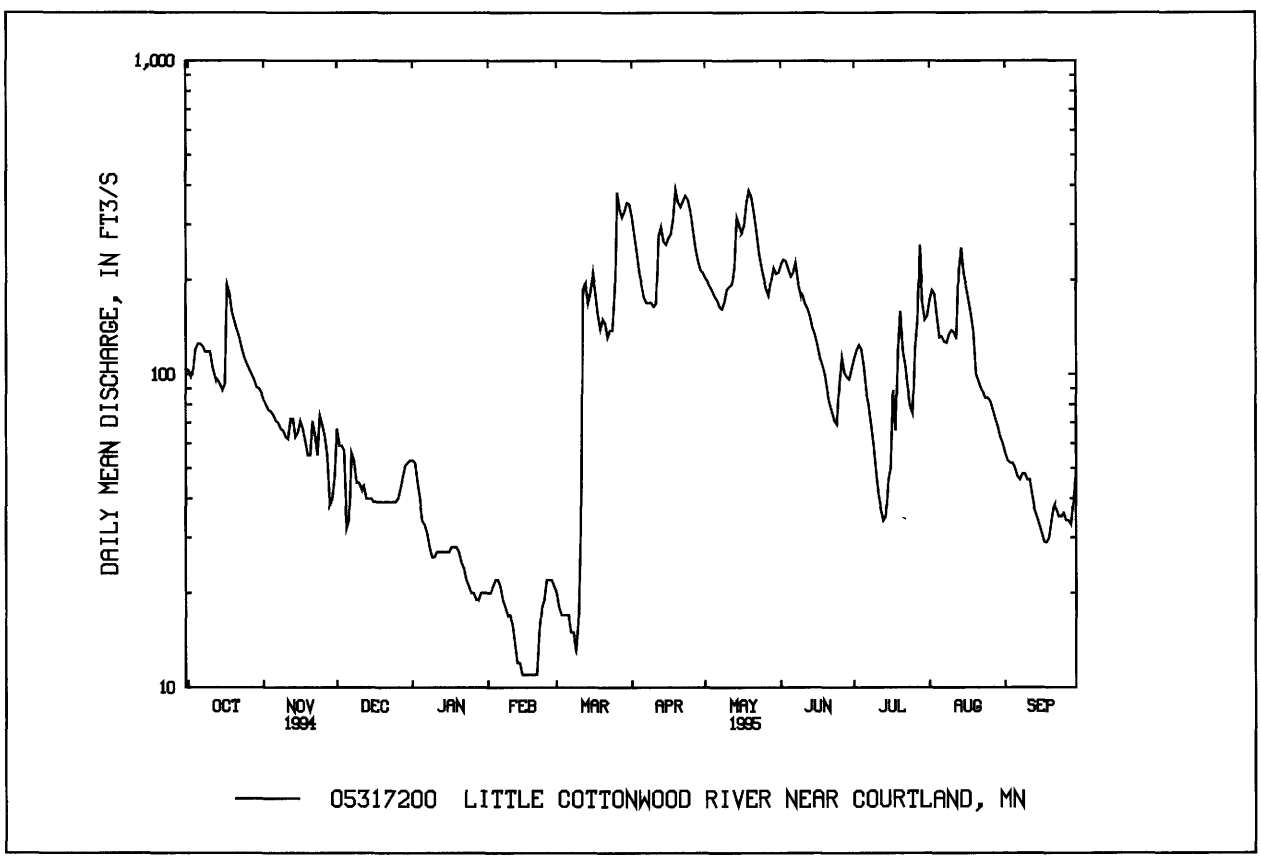
MINNESOTA RIVER BASIN

05317200 LITTLE COTTONWOOD RIVER NEAR COURTLAND, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	39.3	43.2	26.4	14.2	19.3	119	163	120	134	86.8	55.9	46.9
MAX	163	134	118	80.1	105	360	463	418	750	553	248	262
(WY)	1987	1983	1992	1992	1983	1992	1983	1993	1993	1993	1993	1986
MIN	.75	.70	.21	.15	.38	5.79	9.64	4.17	2.39	.63	.81	.54
(WY)	1976	1977	1977	1977	1977	1975	1990	1981	1976	1988	1976	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1974 - 1995	
ANNUAL TOTAL	37942		40536			
ANNUAL MEAN	104		111		72.6	
HIGHEST ANNUAL MEAN					239	1993
LOWEST ANNUAL MEAN					9.18	1989
HIGHEST DAILY MEAN	627	Sep 13	387	Apr 19	2850	Jun 20 1993
LOWEST DAILY MEAN	14	Aug 8	11	Feb 15	.02	Sep 12 1977
ANNUAL SEVEN-DAY MINIMUM	16	Feb 1	11	Feb 15	.08	Sep 11 1977
INSTANTANEOUS PEAK FLOW			396	Apr 19	3520	Jun 20 1993
INSTANTANEOUS PEAK STAGE			5.73	May19	10.45	Jun 20 1993
INSTANTANEOUS LOW FLOW			10	Feb 19	.01	Sep 17 1977
ANNUAL RUNOFF (AC-FT)	75260		80400		52580	
ANNUAL RUNOFF (CFSM)	.45		.48		.32	
ANNUAL RUNOFF (INCHES)	6.14		6.56		4.29	
10 PERCENT EXCEEDS	204		242		195	
50 PERCENT EXCEEDS	87		82		24	
90 PERCENT EXCEEDS	19		20		1.2	



MINNESOTA RIVER BASIN

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 downstream from bridge on County Highway 13, 1.5 miles west of Garden City, 7.3 mi upstream from mouth, and 9.2 mi downstream from Perch Creek.

DRAINAGE AREA.--812 mi².

PERIOD OF RECORD.--March 1940 to September 1945, September 1976 to current year. 1953, 1960, 1961, and 1969 (one or more discharge measurements each year).

REVISED RECORDS.--WDR MN-78-2: 1977.

GAGE.--Water-stage recorder. Datum of gage is 905.05 ft above mean sea level. Prior to September 30, 1945, nonrecording gage at site 200 ft upstream and at datum 0.17 ft higher.

REMARKS.--Records good except those for the periods of estimated daily discharge, which are poor.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 7, 1965, reached a stage of 18.89 ft at datum 0.17 ft higher, from floodmarks, discharge, 19,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 900 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct.20	0600	940	3.48	May31	1200	1470	4.53
Mar.16	--	e900	--	June 6	1800	1740	4.98
Mar.31	1800	*2370	*6.01	July 28	1900	1970	5.35
Apr.15	0900	2050	5.48	Aug. 8	1400	1440	4.49
May 17	1600	2170	5.69				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	264	367	257	e197	e71	e64	2140	1040	1400	600	1510	99
2	250	354	322	e190	e72	e63	1840	1100	1270	536	1090	93
3	247	351	305	e180	e70	e62	1570	1070	1130	480	847	87
4	263	334	289	e160	e68	e60	1370	999	1000	429	685	81
5	309	314	211	e152	e68	e57	1190	938	901	407	619	77
6	356	296	157	e143	e67	e58	1080	879	1100	388	749	76
7	420	286	e240	e138	e66	e56	998	827	1380	402	1220	67
8	418	270	e235	e131	e66	e55	944	802	1220	360	1430	65
9	404	268	e210	e126	e66	e55	942	817	1090	324	1350	62
10	373	263	e185	e125	e66	e62	967	945	1020	287	1100	63
11	335	247	e200	e126	e66	e180	991	1130	984	255	879	59
12	311	241	e190	e125	e65	e320	1300	1210	916	226	713	56
13	294	240	e185	e122	e65	e580	1750	1220	841	203	597	54
14	277	242	e190	e121	e65	e640	1980	1420	774	197	505	52
15	259	242	e200	e119	e65	e850	2020	1690	716	198	432	51
16	254	226	e190	e113	e64	e900	1930	1980	656	229	374	49
17	358	214	e165	e110	e64	649	1790	2150	608	288	328	46
18	660	213	e165	e107	e66	554	1690	2070	573	299	285	42
19	870	220	e175	e100	e66	492	1740	1880	527	348	245	57
20	934	215	e180	e98	e66	471	1830	1570	487	354	209	66
21	868	233	e186	e96	e66	488	1970	1330	450	411	187	71
22	782	288	e185	e91	e67	503	2010	1150	417	393	168	64
23	700	294	e189	e82	e67	516	1910	1030	398	352	149	57
24	634	269	e191	e78	e68	533	1750	935	387	340	135	54
25	573	290	e196	e71	e69	600	1550	857	442	322	127	54
26	516	287	e200	e72	e70	1340	1370	789	420	470	120	54
27	478	306	e200	e72	e69	2050	1230	749	425	1130	110	50
28	456	244	e201	e71	e67	2220	1110	816	437	1880	110	49
29	442	183	e202	e70	---	2070	1020	1090	530	1940	111	48
30	411	172	e201	e72	---	2100	989	1350	610	1930	108	58
31	381	---	e200	e71	---	2280	---	1450	---	1890	104	---
TOTAL	14097	7969	6402	3529	1875	20928	44971	37283	23109	17868	16596	1861
MEAN	455	266	207	114	67.0	675	1499	1203	770	576	535	62.0
MAX	934	367	322	197	72	2280	2140	2150	1400	1940	1510	99
MIN	247	172	157	70	64	55	942	749	387	197	104	42
AC-FT	27960	15810	12700	7000	3720	41510	89200	73950	45840	35440	32920	3690
CFSM	.56	.33	.25	.14	.08	.83	1.85	1.48	.95	.71	.66	.08

e Estimated.

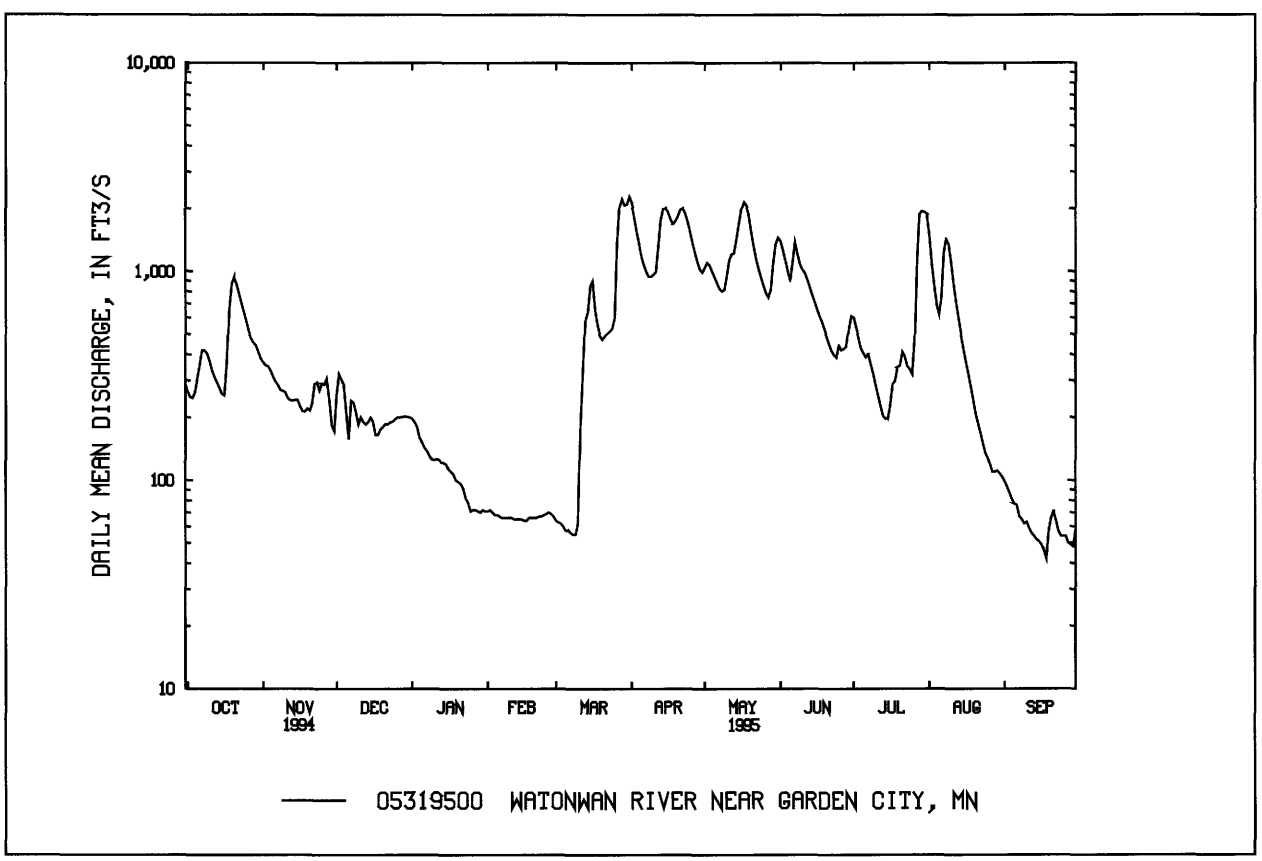
MINNESOTA RIVER BASIN

05319500 WATONWAN RIVER NEAR GARDEN CITY, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	200	229	144	68.8	96.5	583	860	618	867	441	244	213
MAX	686	826	530	319	626	2105	2696	2025	4494	2389	1095	819
(WY)	1993	1993	1992	1992	1983	1992	1993	1993	1993	1993	1979	1993
MIN	5.37	7.69	3.76	2.70	2.39	19.3	33.7	16.1	17.3	8.27	6.56	3.63
(WY)	1990	1977	1990	1977	1977	1940	1990	1940	1989	1940	1989	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1940 - 1995		
ANNUAL TOTAL	195263		196488				
ANNUAL MEAN	535		538		394		
HIGHEST ANNUAL MEAN					1330		1993
LOWEST ANNUAL MEAN					43.7		1989
HIGHEST DAILY MEAN	2040	Aug 13	2280	Mar 31	13400	Jun 20	1993
LOWEST DAILY MEAN	72	Feb 9	42	Sep 18	1.8	Dec 24	1989
ANNUAL SEVEN-DAY MINIMUM	72	Feb 9	50	Sep 12	1.9	Jan 20	1977
INSTANTANEOUS PEAK FLOW			2370	Mar 31	13900	Jun 20	1993
INSTANTANEOUS PEAK STAGE			6.01	Mar 31	15.91	Jun 20	1993
INSTANTANEOUS LOW FLOW			35	Sep 18			
ANNUAL RUNOFF (AC-FT)	387300		389700		285500		
ANNUAL RUNOFF (CFSM)	.66		.66		.49		
10 PERCENT EXCEEDS	1280		1390		1080		
50 PERCENT EXCEEDS	364		296		130		
90 PERCENT EXCEEDS	110		65		11		



MINNESOTA RIVER BASIN

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 downstream from powerplant (reactivated in 1984) operated by Rapidan Redevelopment Limited Partnership, 2 mi west of Rapidan, 3.5 mi downstream from Watonwan River, and 7.8 mi upstream from Le Sueur River.

DRAINAGE AREA.--2,430 mi², approximately.

PERIOD OF RECORD.--July 1909 to November 1910 (published as "at Rapidan Mills," no winter records), October 1939 to September 1945, July 1949 to current year.

REVISED RECORDS.--WSP 895: Drainage area. WSP 1508: 1910.

GAGE.--Water-stage recorder. Datum of gage is 807.83 ft above mean sea level. July 20, 1909, to Apr. 28, 1910, nonrecording gage at site 0.2 mi upstream at different datum. Apr. 29 to Nov. 12, 1910, nonrecording gage at site 800 ft upstream at different datum. Oct. 4 to Nov. 14, 1939, nonrecording gage at present site and datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1130	1470	705	619	211	436	4750	3260	5720	3560	2790	455
2	1090	1350	787	595	e220	351	4140	3300	5800	3310	2290	205
3	1140	1350	976	563	e210	317	3830	3220	5180	3020	1900	370
4	1060	1260	940	546	e200	270	3430	2940	4360	2580	1690	250
5	1730	1180	737	529	e190	322	3120	2800	3830	2210	1620	348
6	2110	1200	547	501	e180	295	2800	2560	3830	2200	1770	381
7	2110	1150	481	e470	184	296	2700	2670	4690	2040	2580	185
8	2080	1080	594	e440	185	265	2570	2360	4650	1840	3510	304
9	2440	1060	646	e410	176	282	2460	2440	4830	1590	3220	185
10	2590	1060	627	404	160	201	2760	2510	5180	1530	2840	182
11	2490	922	639	421	170	256	2990	2870	5190	1330	2410	199
12	2130	1010	500	e400	166	434	3540	3070	4540	1340	1980	232
13	1990	946	662	e380	164	997	4660	3150	3980	1150	2090	152
14	1800	750	679	e370	142	1620	5460	3320	e3320	1020	1500	176
15	1660	906	676	e360	139	2190	5840	4310	3040	1200	1300	181
16	1650	919	730	365	142	2760	6010	5140	3010	965	1310	167
17	1700	719	726	375	125	2510	5630	5500	2730	1180	1250	179
18	2080	769	704	308	115	1950	5030	e5200	2570	1060	1120	141
19	2700	823	589	e310	106	1760	5130	e4820	2320	1130	875	158
20	2970	832	737	e290	119	1550	5620	e4420	2100	1250	924	182
21	2800	832	700	297	134	1500	5910	e4070	2010	1230	903	176
22	2530	878	592	e270	151	1510	5990	e3590	1910	1280	630	225
23	2420	922	671	268	177	1430	5900	e3210	1720	1210	723	264
24	2140	825	589	265	235	1390	5840	2770	1650	1170	511	262
25	2110	876	577	246	245	1490	5750	2610	1700	1250	594	259
26	1940	958	595	206	368	2380	5330	2450	1700	1810	370	239
27	1790	962	596	195	445	3750	4680	2380	1880	2960	378	226
28	1720	969	655	214	523	4990	4110	2420	2380	4300	591	228
29	1560	732	646	215	---	5570	3730	3070	3010	3820	212	231
30	1590	699	643	215	---	5680	3520	4430	3440	3400	489	226
31	1510	---	649	212	---	5330	---	5150	---	3150	223	---
TOTAL	60760	29409	20595	11259	5582	54082	133230	106010	102270	61085	44593	6968
MEAN	1960	980	664	363	199	1745	4441	3420	3409	1970	1438	232
MAX	2970	1470	976	619	523	5680	6010	5500	5800	4300	3510	455
MIN	1060	699	481	195	106	201	2460	2360	1650	965	212	141
AC-FT	120500	58330	40850	22330	11070	107300	264300	210300	202900	121200	88450	13820
CFSM	.81	.40	.27	.15	.08	.72	1.83	1.41	1.40	.81	.59	.10
IN.	.93	.45	.32	.17	.09	.83	2.04	1.62	1.57	.94	.68	.11

e Estimated.

MINNESOTA RIVER BASIN

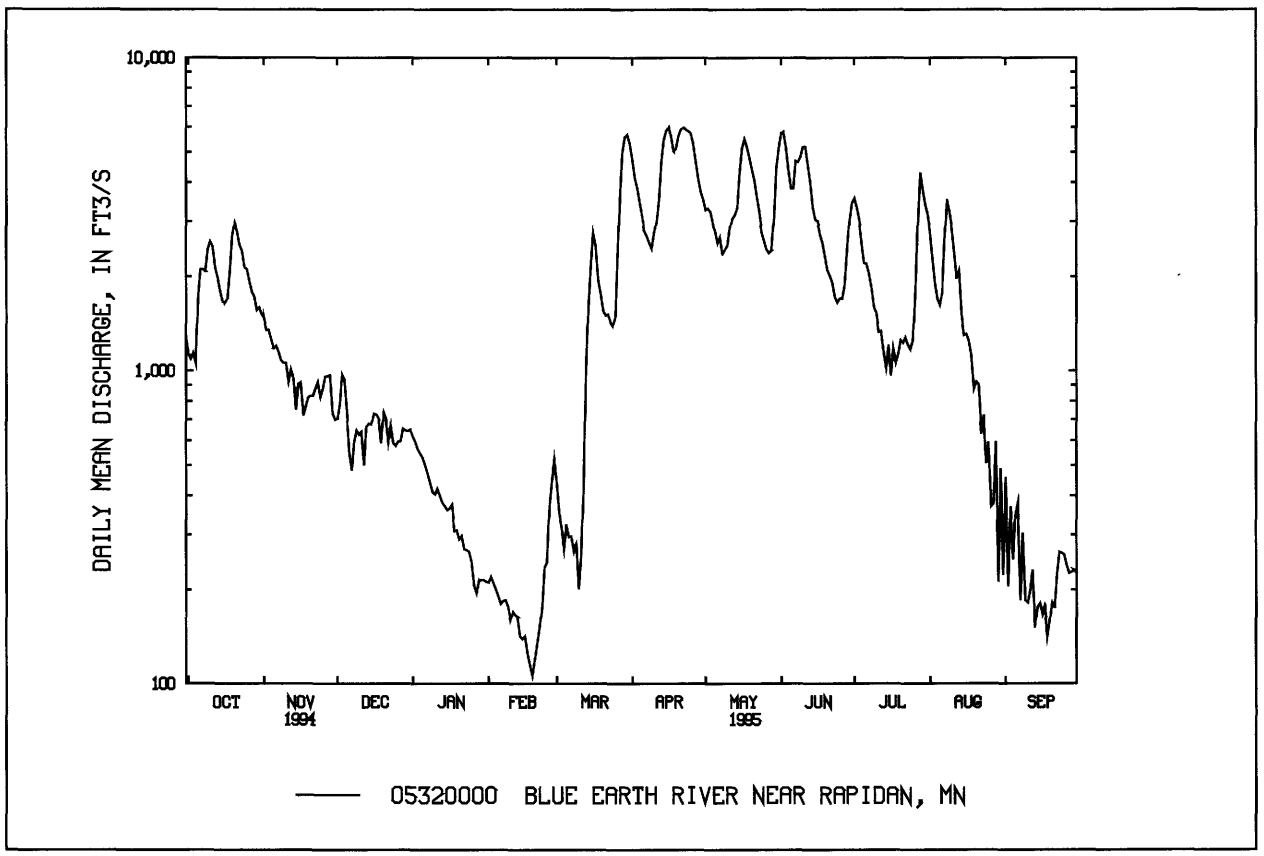
05320000 BLUE EARTH RIVER NEAR RAPIDAN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	561	532	341	202	243	1395	2655	1710	2078	1310	690	540
MAX	5121	2878	1724	1093	1793	6277	13230	5775	11700	8540	5541	4313
(WY)	1969	1993	1992	1992	1983	1983	1965	1991	1993	1993	1979	1993
MIN	22.5	26.7	16.0	14.8	14.2	92.4	142	53.4	110	30.9	37.7	22.1
(WY)	1940	1940	1956	1977	1959	1968	1977	1940	1976	1940	1976	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1909 - 1995		
ANNUAL TOTAL	631208		635843				
ANNUAL MEAN	1729		1742		1040		
HIGHEST ANNUAL MEAN					4518		1993
LOWEST ANNUAL MEAN					105		1940
HIGHEST DAILY MEAN	5490	Mar 15	6010	Apr 16	42500	Apr 9	1965
LOWEST DAILY MEAN	210	Feb 17	106	Feb 19	7.4	Oct 28	1955
ANNUAL SEVEN-DAY MINIMUM	226	Feb 8	126	Feb 15	8.1	Oct 24	1955
INSTANTANEOUS PEAK FLOW			7310	Apr 24	43100	Apr 9	1965
INSTANTANEOUS PEAK STAGE			7.67	Apr 24	21.36a	Apr 9	1965
INSTANTANEOUS LOW FLOW			66b	Sep 30	6.9	Oct 12	1955
ANNUAL RUNOFF (AC-FT)	1252000		1261000		753400		
ANNUAL RUNOFF (CFSM)	.71		.72		.43		
ANNUAL RUNOFF (INCHES)	9.66		9.73		5.81		
10 PERCENT EXCEEDS	3900		4380		2740		
50 PERCENT EXCEEDS	1330		1180		338		
90 PERCENT EXCEEDS	411		206		39		

a From floodmark.
b Result of regulation.



MINNESOTA RIVER BASIN

05320500 LE SUEUR RIVER NEAR RAPIDAN, MN

LOCATION.--Lat 44°06'40", long 94°02'28", in SW sec.35, T.108 N., R.27 W., Blue Earth County, Hydrologic Unit 07020011, on right bank 600 ft downstream from highway bridge, 1.8 mi northeast of Rapidan, and 2.3 mi upstream from mouth.

DRAINAGE AREA.--1,100 mi², approximately.

PERIOD OF RECORD.--October 1939 to September 1945, July 1949 to current year.

GAGE.--Water-stage recorder. Datum of gage is 775.76 ft above mean sea level. Prior to Nov. 15, 1939, nonrecording gage at same site and datum.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct.09	0900	2940	5.74	June 09	1400	3300	5.96
Mar.28	1800	2260	4.87	June 30	1700	2960	5.59
Apr. 14	1500	2900	5.52	July 16	0200	1560	4.09
Apr.21	1800	3270	5.90	July 20	1400	1920	4.50
May16	1700	2090	4.68	July 28	1400	4410	6.97
May31	1600	2400	5.01	Aug.09	0300	*4700	*7.23

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	914	718	392	345	e90	e94	1550	1570	2250	2780	2690	375
2	819	690	469	345	e96	e95	1340	1350	2030	2470	2200	354
3	911	650	468	332	e92	e95	1200	1230	1850	2120	1740	321
4	1730	631	458	e305	e86	e94	1050	1210	1600	1810	1390	295
5	2170	607	420	e288	e87	e93	954	1110	1390	1560	1400	275
6	2200	575	302	e270	e87	e94	881	1040	1570	1270	2360	385
7	2490	545	292	e258	e88	e92	857	975	3000	1060	4130	414
8	2810	534	342	e245	e88	e94	829	956	3190	966	4470	370
9	2880	527	352	e223	e86	e94	830	984	3230	825	4520	330
10	2780	505	350	e210	e88	e95	908	1030	2990	730	4080	302
11	2540	479	348	e195	e86	e100	1080	1070	2560	672	3490	280
12	2310	458	348	e200	e80	e120	1830	1060	2140	607	2870	262
13	2070	450	348	e198	e80	e450	2470	1080	1830	543	2350	249
14	1790	439	345	e187	e81	e760	2800	1350	1590	527	1920	234
15	1530	439	e330	e178	e82	810	2810	1720	1380	1250	1570	223
16	1370	427	e325	e171	e82	852	2610	2030	1200	1420	1530	214
17	1510	408	e335	e170	e83	927	2340	1980	1030	1140	1790	204
18	1660	402	e325	e169	e82	774	2200	1800	910	837	1790	e300
19	1660	402	e311	e144	e84	679	2780	1600	807	1160	1460	e400
20	1650	399	e302	e143	e85	610	2980	1400	732	1820	1170	e455
21	1550	398	e300	e134	e86	555	3150	1220	665	1540	968	e450
22	1450	405	e304	e130	e89	515	3180	1080	624	1130	836	e440
23	1300	439	e303	e121	e90	499	3130	963	568	837	734	e390
24	1250	462	e303	e118	e92	491	3060	877	540	774	654	e410
25	1110	476	e302	e100	e92	475	2860	805	518	727	656	e420
26	990	475	e310	e86	e94	901	2590	744	572	1560	598	e400
27	889	472	e320	e88	e96	1650	2350	721	1570	2820	550	351
28	818	472	337	e92	e95	2140	2090	830	2180	4270	516	337
29	775	437	346	e93	---	2210	1880	1400	2740	4110	492	318
30	745	369	348	e91	---	2040	1720	1980	2810	3870	467	307
31	734	---	345	e89	---	1800	---	2330	---	3210	420	---
TOTAL	49405	14690	10680	5718	2447	20298	60309	39495	50066	50415	55811	10065
MEAN	1594	490	345	184	87.4	655	2010	1274	1669	1626	1800	335
MAX	2880	718	469	345	96	2210	3180	2330	3230	4270	4520	455
MIN	734	369	292	86	80	92	829	721	518	527	420	204
AC-FT	97990	29140	21180	11340	4850	40260	119600	78340	99310	100000	110700	19960
CFSM	1.44	.44	.31	.17	.08	.59	1.81	1.15	1.50	1.47	1.62	.30

e Estimated.

MINNESOTA RIVER BASIN

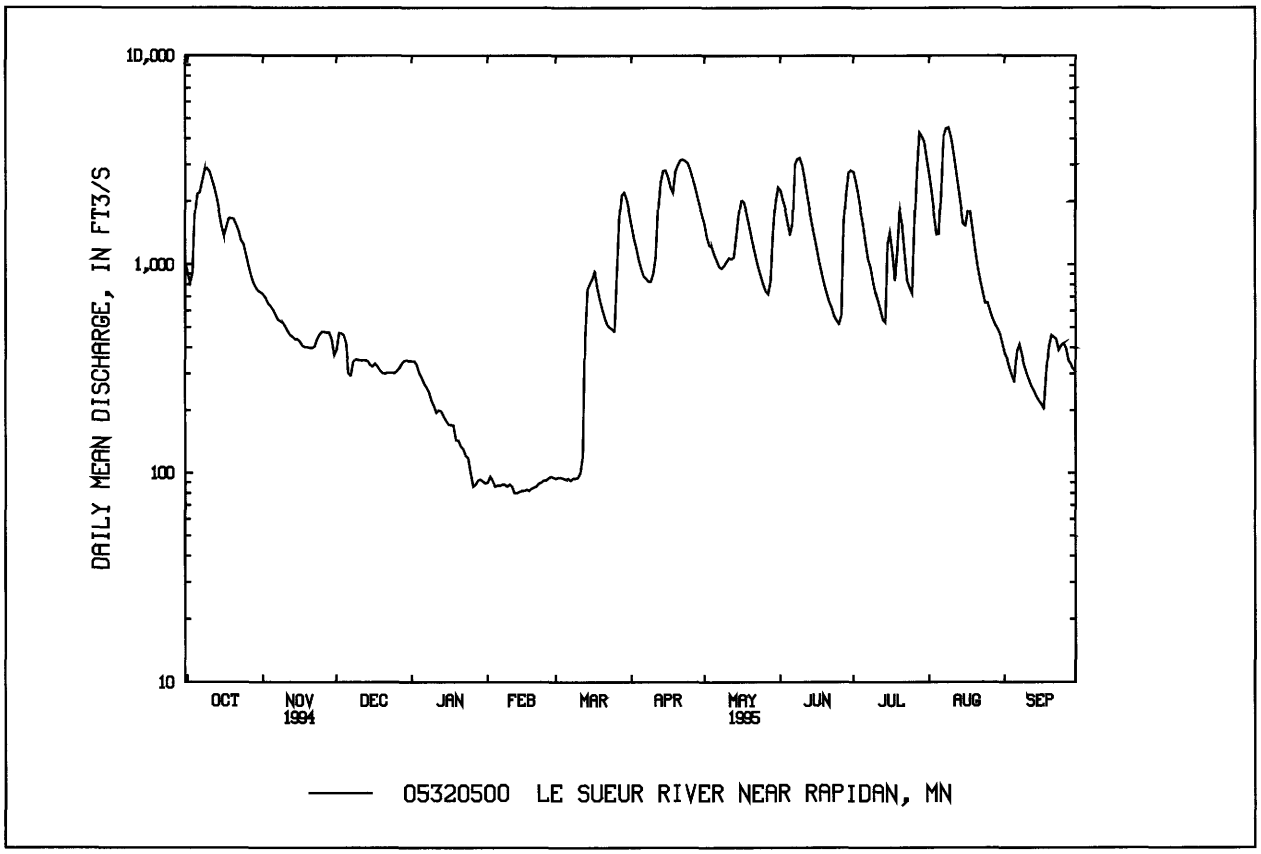
05320500 LE SUEUR RIVER NEAR RAPIDAN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1995, BY WATER YEAR (WY)

MEAN	321	262	147	81.4	124	804	1330	911	947	619	417	258
MAX	3300	1561	698	493	1299	3465	6563	3706	3913	2760	3656	1526
(WY)	1969	1993	1992	1992	1984	1983	1965	1960	1993	1993	1993	1993
MIN	7.41	11.1	5.04	2.96	1.68	33.0	48.3	18.8	40.4	20.6	8.20	7.55
(WY)	1990	1956	1959	1957	1959	1964	1957	1940	1950	1988	1989	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1940 - 1995	
ANNUAL TOTAL	302539		369399			
ANNUAL MEAN	829		1012		521	
HIGHEST ANNUAL MEAN					2035	1993
LOWEST ANNUAL MEAN					51.4	1977
HIGHEST DAILY MEAN	3470	Apr 29	4520	Aug 9	23400	Apr 8 1965
LOWEST DAILY MEAN	110	Feb 7	80	Feb 12	1.6	Feb 9-25 1959
ANNUAL SEVEN-DAY MINIMUM	116	Feb 3	81	Feb 12	1.6	Feb 9 1959
INSTANTANEOUS PEAK FLOW			4700	Aug 9	24700	Apr 8 1965
INSTANTANEOUS PEAK STAGE			7.23	Aug 9	22.72a	May 22 1960
INSTANTANEOUS LOW FLOW					1.6	Feb 9 1959
ANNUAL RUNOFF (AC-FT)	600100		732700		377100	
ANNUAL RUNOFF (CFSM)	.75		.91		.47	
10 PERCENT EXCEEDS	1930		2480		1450	
50 PERCENT EXCEEDS	575		656		142	
90 PERCENT EXCEEDS	156		94		16	

a From floodmark.



MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MN

LOCATION(REVISED).--Lat 44$_{\infty}$°10'08", long 94°00'11", in SE$^1/_4$SW$^1/_4$ sec. 7, T. 108 N., R. 26 W., Blue Earth County, Hydrologic Unit 07020007, on right bank 300 ft downstream from Memorial bridge in Mankato, 2.0 mi downstream from Blue Earth River and at mile 106.2 upstream from Mississippi River.

DRAINAGE AREA.--14,900 mi^2, approximately.

PERIOD OF RECORD.--May 1903 to current year (no winter records 1904, 1906-10, 1918-29). Monthly discharge only for some periods, published in WSP 1308. Published as "near Mankato": 1903-21.

REVISED RECORDS.--WSP 875: 1917. WSP 955: Drainage area. WSP 1085: 1929. WSP 1238: 1903, 1908, 1919. WSP 1508: 1916(M), 1918(M), 1926(M), 1928, 1930, 1932(M), 1938(M). WDR-MN-76-1: 1881(M).

GAGE.--Water-stage recorder. Datum of gage is 747.92 ft above sea level. Prior to Oct. 19, 1921, nonrecording gage, at site 1.8 mi upstream at datum 6.4 ft higher. Mar. 15, 1922, to Nov. 30, 1924, nonrecording gage, and Dec. 1, 1924 to May 24, 1971, recorder at site 0.2 mi upstream at present datum. May 25, 1971 to Aug. 14, 1977, recorder at site 0.5 mi upstream at present datum. Aug. 14, 1977 to July 27, 1978, nonrecording gage and from July 28, 1978 to Sept. 30, 1993, recording gage at site 0.7 mi upstream of present site.

REMARKS.--Records fair.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, 29.9 ft, Apr. 26, 1881, near present site and datum, from floodmark (discharge, 110,000 ft^3/s).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAILY MEAN VALUE

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4180	5080	2710	e2100	e1230	e990	19100	23200	19300	12900	14500	4230
2	3930	4830	e2700	e2100	e1230	e1010	18300	22500	19500	12600	12600	4070
3	4040	4670	e2760	e2050	e1200	e1030	17700	21900	18900	11900	11100	3970
4	4750	4670	e2850	e2000	e1180	e1070	16700	21000	17800	11200	10100	3780
5	5900	4430	e2650	e2000	e1140	e1090	15800	20100	16700	10500	9680	3820
6	6910	4420	e2500	e1950	e1100	e1120	15000	19200	16400	10400	10600	4750
7	7340	4370	e2400	e1900	e1080	e1150	14500	18500	18900	10300	12700	5090
8	7620	4290	e2300	e1870	e1060	e1190	14400	17600	19500	10300	14100	4890
9	7900	4180	e2250	e1850	e1030	e1260	14200	17200	19400	10200	13900	4310
10	7920	4130	e2250	e1820	e1010	e1400	14300	16700	19200	10400	12900	4090
11	7480	3900	e2200	e1800	e1000	e1650	14800	16900	18500	10500	11800	4040
12	6810	3690	e2100	e1740	e990	e2200	16100	17300	17100	10600	10500	3940
13	6260	3590	e2050	e1700	e980	e2900	18400	17600	15800	10700	10000	3750
14	5750	3340	e2000	e1670	e970	e4500	19900	18200	14700	10900	9540	3640
15	5260	3370	e2000	e1640	e960	e7000	20700	20000	13900	12100	8660	3510
16	5090	3590	e2000	e1600	e940	8670	21300	22100	13200	12400	8340	3360
17	5660	3000	e2000	e1550	e940	8840	21500	23200	12500	12500	8390	3150
18	6450	2880	e2050	e1520	e930	8600	21300	23000	11900	12500	8080	2980
19	7060	2940	e2050	e1500	e930	8040	22200	22000	11100	13100	7450	2990
20	7390	2910	e2050	e1450	e930	8090	23700	20900	10500	14700	6910	2930
21	7730	3090	e2100	e1420	e930	8020	25400	19600	10100	15500	6500	2900
22	7840	3170	e2100	e1400	e930	7830	26500	18400	9640	16200	5870	2920
23	7470	3290	e2150	e1400	e930	7670	27200	17100	9230	16100	5660	2900
24	7020	3300	e2150	e1370	e930	7610	27500	16000	8860	15400	5260	2760
25	6730	3300	e2150	e1350	e940	7940	27500	15000	8820	14400	5030	2650
26	6530	3430	e2150	e1320	e950	10400	27100	14300	8770	14300	4700	2590
27	6120	3510	e2150	e1300	e960	13800	26400	13600	9700	15400	4420	2500
28	5870	3490	e2150	e1270	e970	16600	25500	13500	10900	18500	4420	2420
29	5600	3100	e2170	e1250	---	18500	24700	14400	12200	18600	4140	2320
30	5410	2810	e2170	e1230	---	19500	24000	16600	12800	17800	4210	2280
31	5230	---	e2150	e1230	---	19600	---	18200	---	16300	4170	---
TOTAL	195250	110770	69460	50350	28370	209270	621700	575800	425820	409200	266230	103530
MEAN	6298	3692	2241	1624	1013	6751	20720	18570	14190	13200	8588	3451
MAX7	920	5080	2850	2100	1230	19600	27500	23200	19500	18600	14500	5090
MIN	3930	2810	2000	1230	930	990	14200	13500	8770	10200	4140	2280
AC-FT	387300	219700	137800	99870	56270	415100	1233000	1142000	844600	811600	528100	205400
CFSM	.42	.25	.15	.11	.07	.45	1.39	1.25	.95	.89	.58	.23

e Estimated.

MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MN--Continued

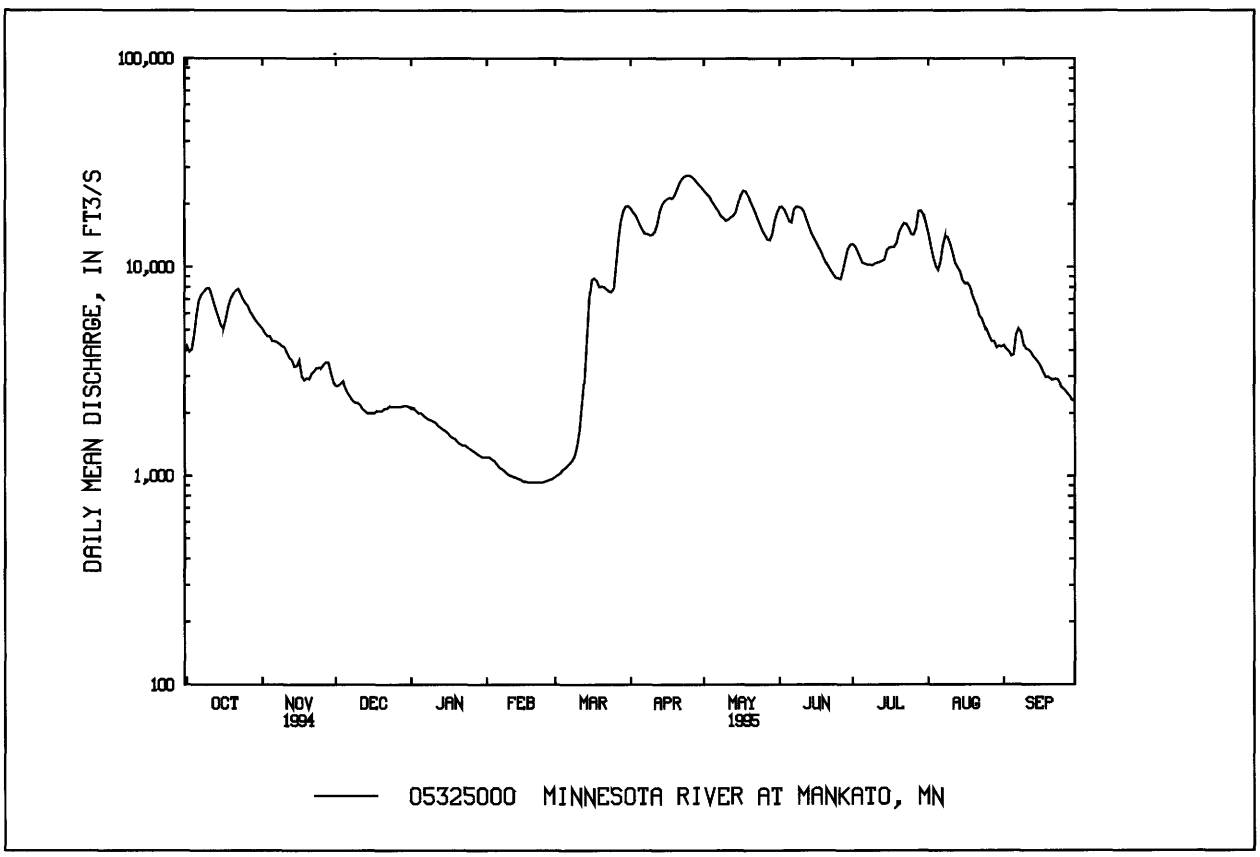
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1568	1463	963	599	727	4406	8871	5607	5966	4451	2332	1663
MAX	14600	7225	4770	3009	4505	18230	44780	22540	34230	33130	23520	11070
(WY)	1969	1993	1983	1992	1983	1983	1969	1993	1993	1993	1993	1993
MIN	66.1	83.5	80.9	61.5	58.4	132	609	101	194	58.3	37.4	56.6
(WY)	1934	1934	1934	1940	1940	1934	1931	1934	1934	1934	1934	1934

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1903 - 1995		
ANNUAL TOTAL	2626460		3065750				
ANNUAL MEAN	7196		8399		3354[a]		
HIGHEST ANNUAL MEAN					14890		1993
LOWEST ANNUAL MEAN					136		1934
HIGHEST DAILY MEAN	21200	Apr 29	27500	Apr 24,25	92700	Apr 10	1965
LOWEST DAILY MEAN	1340	Feb 10	930	Feb 18-24	31	Aug 3	1934
ANNUAL SEVEN-DAY MINIMUM	1340	Feb 10	930	Feb 18	33	Jul 29	1934
INSTANTANEOUS PEAK FLOW			27600	Apr 24	94100	Apr 10	1965
INSTANTANEOUS PEAK STAGE			18.88	Apr 24	30.11	Jun 21	1993
INSTANTANEOUS LOW FLOW					26[b]	Aug 4	1934
ANNUAL RUNOFF (AC-FT)	5210000		6081000		2430000		
ANNUAL RUNOFF (CFSM)	.48		.56		.23		
10 PERCENT EXCEEDS	15200		19200		8730		
50 PERCENT EXCEEDS	5410		5660		1180		
90 PERCENT EXCEEDS	1880		1230		183		

a Median of annual mean discharges is 2623 ft^3/s.

b Minimum observed.



MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1963-66, 1968 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: October 1967 to September 30, 1981 October 1982 to current year (fragmentary records).

SUSPENDED-SEDIMENT DISCHARGE: October 1967 to current year.

REMARKS.--Sediment samples were collected approximately daily by an observer during the open-water period. In general, daily concentrations and loads for the open-water period are considered good. During the winter period, daily sediment concentrations and loads are based primarily on concentrations of sediment in samples that were collected monthly and on daily water-discharge records. Sediment records for the winter period are considered fair. Water temperatures were obtained by the observer approximately daily during the open-water period and monthly by U.S. Geological Survey personnel during the winter period. Some temperatures are not published because of questionable values.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: Maximum observed, 31.0°C, July 4-9, 1989; minimum observed, 0.0°C on many days each year.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 2850 mg/L, Aug. 7, 1968; minimum daily mean, 9 mg/L, Jan. 15-19, 1991.

SEDIMENT LOADS: Maximum daily, 414,000 tons, June 21, 1993; minimum daily, 5.2 tons, Nov. 6, 1976.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum observed, 29.0°C, July 14; minimum observed, 1.0°C, Mar.9. Assumed to be 0.0°C, many days during winter..

SEDIMENT CONCENTRATIONS: Maximum daily mean, 821 mg/L, Mar. 28; minimum daily mean, 85 mg/L, Sep. 21.

SEDIMENT LOADS: Maximum daily, 39,700 tons, Mar. 29; minimum daily, 239 tons, Feb. 18-20.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY INSTANTANEOUS VALUES

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

MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	168	1900	127	1740	207	1510	109	618	103	342	122	326
2	147	1560	112	1470	197	1440	109	618	103	342	130	355
3	120	1310	118	1490	197	1470	108	598	103	334	137	381
4	205	2630	137	1730	200	1540	108	583	103	328	137	396
5	245	3910	156	1860	196	1400	108	583	103	317	138	406
6	249	4650	139	1660	191	1290	108	569	103	306	138	417
7	276	5470	125	1470	186	1210	107	549	102	297	139	432
8	289	5940	147	1700	181	1120	107	540	102	292	142	456
9	293	6250	124	1410	176	1070	107	534	102	284	162	551
10	275	5890	132	1470	171	1040	107	526	102	278	190	718
11	218	4390	152	1600	167	992	107	520	102	275	222	989
12	171	3150	170	1700	163	924	106	498	102	273	258	1530
13	141	2380	166	1610	159	880	106	487	101	267	279	2180
14	133	2060	166	1490	155	837	106	478	101	265	224	2720
15	120	1710	179	1630	149	805	106	469	100	259	349	6600
16	142	1950	200	1940	145	783	106	458	98	249	473	11100
17	165	2520	199	1610	140	756	106	444	97	246	489	11700
18	200	3490	203	1580	135	747	106	435	95	239	457	10600
19	253	4830	140	1110	130	720	105	425	95	239	425	9230
20	264	5270	151	1190	125	692	105	411	95	239	450	9830
21	249	5200	182	1520	120	680	105	403	96	241	315	6820
22	235	4970	192	1650	120	680	105	397	96	241	271	5730
23	221	4460	194	1730	115	668	105	397	98	246	211	4370
24	208	3950	196	1750	115	668	105	388	100	251	194	3990
25	196	3570	198	1760	112	650	105	383	102	259	330	7070
26	185	3260	199	1850	112	650	104	371	104	267	562	15800
27	174	2880	201	1900	110	639	104	365	110	285	813	30300
28	164	2600	203	1910	110	639	104	357	120	314	821	36800
29	155	2340	204	1710	110	644	104	351	---	---	794	39700
30	146	2130	206	1560	110	644	104	345	---	---	690	36300
31	137	1940	---	---	109	633	104	345	---	---	553	29300
TOTAL	---	108560	---	48800	---	28421	---	14445	---	7775	---	287097

MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	APRIL MEAN CONCEN-TRATION (MG/L)	APRIL LOAD (TONS/ DAY)	MAY MEAN CONCEN-TRATION (MG/L)	MAY LOAD (TONS/ DAY)	JUNE MEAN CONCEN-TRATION (MG/L)	JUNE LOAD (TONS/ DAY)	JULY MEAN CONCEN-TRATION (MG/L)	JULY LOAD (TONS/ DAY)	AUGUST MEAN CONCEN-TRATION (MG/L)	AUGUST LOAD (TONS/ DAY)	SEPTEMBER MEAN CONCEN-TRATION (MG/L)	SEPTEMBER LOAD (TONS/ DAY)
1	439	22600	245	15400	284	14800	422	14700	301	11800	181	2070
2	349	17200	182	11000	273	14400	408	13900	313	10600	193	2120
3	283	13500	180	8570	262	13400	408	13100	296	8870	205	2200
4	274	12400	175	22500	252	12100	410	12400	290	7910	218	2220
5	261	11100	170	21700	221	9960	302	8570	395	10300	231	2390
6	223	9020	168	19700	274	12200	307	8610	547	15700	246	3160
7	305	11900	166	8310	628	32100	301	8380	676	23200	262	3600
8	306	11900	109	5190	411	21600	294	8180	638	24300	266	3510
9	301	11500	161	7490	327	17100	287	7910	574	21500	240	2800
10	296	11400	155	7000	299	15500	268	7520	512	17800	216	2390
11	313	12500	147	6690	275	13700	222	6290	536	17100	194	2120
12	353	15400	183	8560	252	11700	196	5600	447	12700	175	1860
13	483	24000	216	10300	236	10100	202	5840	373	10100	157	1590
14	635	34100	250	12300	235	9320	238	6990	311	8010	139	1360
15	660	36900	272	14700	236	8850	217	7080	271	6330	117	1110
16	390	22400	321	19200	236	8430	258	8650	281	6320	110	998
17	238	13800	293	18400	237	8010	311	10500	300	6790	100	850
18	317	18200	280	17400	238	7650	253	8530	312	6810	95	764
19	407	24400	290	17300	246	7380	254	8980	305	6140	90	727
20	362	23200	257	14500	272	7710	292	11600	297	5540	87	688
21	344	23600	226	12000	264	7200	267	11200	290	5080	85	666
22	412	29500	196	9760	261	6800	242	10600	280	4440	86	678
23	528	38800	176	8140	326	8120	219	9520	266	4070	90	705
24	555	41200	209	9020	300	7190	228	9490	252	3590	95	708
25	367	27200	191	7720	273	6490	230	8940	239	3240	100	715
26	255	18700	178	6880	327	7750	235	9070	226	2870	114	797
27	259	18400	173	6350	519	13600	300	12500	214	2550	125	844
28	289	19900	168	6130	466	13700	390	19500	199	2380	107	699
29	306	20400	175	6820	572	18800	370	18600	179	2000	110	689
30	318	20600	234	10500	443	15300	340	16300	173	1970	120	739
31	---	---	289	14200	---	---	345	15200	172	1930	---	---
TOTAL	---	615720	---	363730	---	360960	---	324250	---	271940	---	45767
YEAR		2477465										

MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L) (00535)
MAR									
08...	1120	1190	1110	8.0	1.0	756	--	4	3
14...	1415	E4500	761	7.2	1.5	737	--	82	24
21...	1430	8000	754	8.1	4.5	736	12.6	143	23
29...	1200	18500	732	7.7	4.0	748	13.7	292	32
APR									
06...	0930	15100	945	7.9	4.5	742	13.2	64	13
12...	1020	16000	867	8.4	3.0	733	14.8	91	14
19...	1030	22200	876	8.1	5.0	745	13.5	160	20
26...	0945	27200	894	8.5	10.0	742	12.0	70	10
MAY									
03...	0910	22000	901	7.9	12.0	747	10.5	62	9
10...	1115	16800	912	7.9	12.5	740	9.6	56	2
17...	1210	23200	939	8.1	12.5	739	11.5	108	11
24...	0945	27400	1080	7.5	16.0	745	9.4	78	7
31...	0930	18100	1100	8.2	14.5	742	8.9	96	12
JUN									
07...	0950	19000	897	7.8	21.5	733	7.2	404	44
13...	1000	16000	963	8.3	19.0	741	8.7	70	18
21...	0845	10200	1060	8.1	26.5	744	7.0	53	10
28...	1350	10800	864	7.9	23.5	739	7.8	226	26
JUL									
05...	1420	10400	918	8.2	22.5	735	7.8	130	20
13...	0845	10800	860	7.7	28.0	739	12.2	111	16
18...	0930	10600	762	8.1	25.5	744	8.3	--	--
26...	0940	14300	874	7.9	25.0	742	7.1	260	42
AUG									
01...	1210	14400	825	8.0	24.0	748	7.0	162	34
07...	1140	12700	805	8.1	24.0	741	7.2	352	44
15...	0930	8870	801	8.3	20.5	741	8.0	148	20
25...	1140	4840	881	8.2	26.0	738	9.1	141	25
30...	1320	4140	848	8.4	25.5	736	10	121	16

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)
MAR									
08...	0.020	1.50	0.060	0.100	0.060	139	84	4.60	0.600
14...	0.040	2.20	0.500	0.360	0.230	154	--	15.0	0.600
21...	0.050	2.50	0.410	0.170	0.110	258	--	8.70	<0.100
29...	0.100	10.0	0.170	0.140	0.120	584	80	12.0	<0.100
APR									
06...	0.060	7.40	0.040	0.180	0.060	183	--	10.0	1.10
12...	0.040	6.50	0.020	0.070	0.040	216	--	26.0	1.20
19...	0.030	9.10	0.020	0.050	0.040	330	--	20.0	0.900
26...	0.030	8.30	<0.015	0.050	0.020	228	--	42.0	0.700
MAY									
03...	0.020	5.30	<0.015	0.100	<0.010	113	--	34.0	0.800
10...	0.020	5.00	0.020	0.080	0.010	147	--	17.0	<0.100
17...	0.040	6.60	0.020	0.050	0.020	474	--	--	--
24...	0.030	5.40	0.030	0.050	<0.010	236	--	10.0	0.900
31...	0.040	9.00	0.030	0.090	0.040	297	--	11.0	0.500
JUN									
07...	0.050	7.80	0.030	0.280	0.060	686	--	18.0	1.60
13...	0.040	8.80	0.040	0.090	0.060	234	--	8.90	0.900
21...	0.050	6.10	0.060	0.070	0.070	282	--	11.0	1.40
28...	0.060	6.60	0.070	0.130	0.100	468	--	7.30	1.00
JUL									
05...	0.050	7.60	0.030	0.170	0.100	286	--	6.90	1.20
13...	0.040	7.50	0.020	0.100	0.090	176	--	11.0	1.60
18...	0.040	3.10	0.030	0.240	0.110	196	--	12.0	2.10
26...	0.060	3.20	0.040	0.160	0.130	148	75	24.0	2.60
AUG									
01...	0.050	5.50	<0.015	0.130	0.090	328	90	10.0	1.20
07...	0.030	5.00	<0.015	0.170	0.110	486	88	14.0	1.00
15...	0.020	4.10	0.050	0.130	0.130	263	--	18.0	1.60
25...	<0.010	1.20	0.020	0.240	0.100	238	--	33.0	3.70
30...	0.020	1.50	<0.015	0.180	0.090	188	--	29.0	2.60

MINNESOTA RIVER BASIN

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 downstream from bridge on County Road 6, 1.6 mi upstream from mouth, and 3.1 mi north of Henderson.

DRAINAGE AREA.--237 mi².

PERIOD OF RECORD.--October 1973 to current year. May 1970 to September 1973, operated as a low-flow station only.

REVISED RECORDS.--WDR-MN-80-2: 1974-75, 1977-79.

GAGE.--Water-stage recorder. Datum of gage is 728.56 ft above mean sea level.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct.06	2300	381	4.79	Apr. 19	0300	591	5.40
Oct.17	0230	638	5.65	May 14	0800	506	5.11
Mar.16	1630	650	5.59	June 07	1830	*882	*6.24
Mar.27	1630	799	6.02				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	281	163	e91	e38	e21	e15	e537	219	206	59	59	46
2	256	163	e92	e35	e22	e13	e481	206	196	54	51	40
3	249	155	e91	e33	e22	e13	e392	191	182	50	44	33
4	253	149	e86	e31	e21	e13	296	179	165	48	40	29
5	260	141	e76	e29	e20	e13	235	169	155	48	39	27
6	282	133	e65	e27	e19	e13	197	164	147	71	54	27
7	343	127	e68	e26	e17	e13	185	155	375	140	82	26
8	311	124	e66	e25	e16	e13	176	165	429	168	80	31
9	286	119	e53	e25	e16	e13	166	201	367	179	91	46
10	264	116	e47	e25	e15	e12	156	327	404	178	93	43
11	243	113	e48	e24	e16	116	163	331	438	154	85	34
12	223	111	e53	e24	e17	e250	298	329	423	119	80	29
13	209	121	e53	e25	e16	e240	326	349	424	93	90	26
14	195	117	e52	e26	e12	228	303	473	381	77	72	24
15	198	113	e51	e28	e11	250	298	422	318	126	61	23
16	205	112	e51	e28	e10	428	319	417	254	145	52	22
17	508	107	e50	e27	e10	367	339	422	194	106	45	22
18	455	105	e50	e27	e10	293	426	416	162	97	40	18
19	366	105	e50	e29	e11	235	540	378	143	93	38	23
20	316	105	e51	e32	e11	e220	464	332	128	84	35	21
21	296	128	e52	e28	e12	e205	479	280	114	77	31	21
22	292	111	e53	e27	e13	e184	489	236	106	101	28	21
23	268	125	e52	e25	e15	e204	496	213	96	102	25	20
24	253	129	e50	e25	e16	e204	486	198	97	83	24	18
25	235	117	e46	e26	e16	e250	448	181	89	75	22	19
26	224	107	e44	e24	e17	e514	394	167	84	70	23	18
27	213	108	e45	e23	e17	e710	342	164	86	63	26	17
28	194	87	e47	e22	e16	e676	294	181	82	59	33	17
29	180	97	e46	e22	---	e657	256	200	75	62	45	16
30	172	123	e42	e21	---	e625	232	207	68	76	50	30
31	162	---	e39	e21	---	e590	---	210	---	72	50	---
TOTAL	8192	3631	1760	828	435	7577	10213	8082	6388	2929	1588	787
MEAN	264	121	56.8	26.7	15.5	244	340	261	213	94.5	51.2	26.2
MAX	508	163	92	38	22	710	540	473	438	179	93	46
MIN	162	87	39	21	10	12	156	155	68	48	22	16
AC-FT	16250	7200	3490	1640	863	15030	20260	16030	12670	5810	3150	1560
CFSM	1.12	.51	.24	.11	.07	1.03	1.44	1.10	.90	.40	.22	.11
IN.	1.29	.57	.28	.13	.07	1.19	1.60	1.27	1.00	.46	.25	.12

e Estimated.

MINNESOTA RIVER BASIN

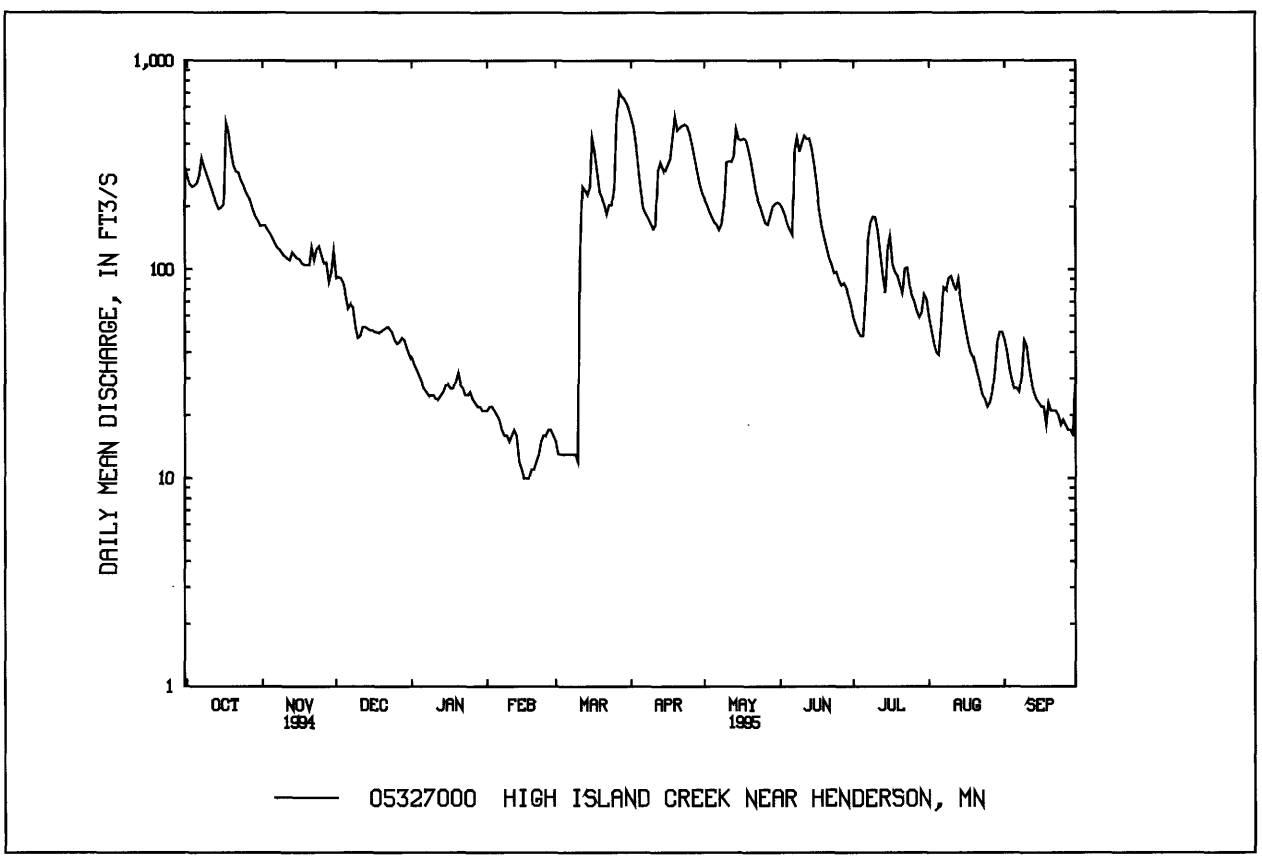
05327000 HIGH ISLAND CREEK NEAR HENDERSON, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	81.6	66.0	37.9	16.2	21.0	166	242	157	175	123	76.8	115
MAX	298	219	111	72.5	121	547	593	506	991	989	353	592
(WY)	1986	1993	1983	1992	1984	1992	1983	1993	1993	1993	1993	1991
MIN	1.51	2.11	1.37	.98	1.28	6.27	6.69	3.32	1.58	.80	1.16	1.18
(WY)	1990	1990	1976	1977	1989	1975	1990	1976	1976	1976	1976	1974

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1974 - 1995	
ANNUAL TOTAL	67782.7		52410			
ANNUAL MEAN	186		144		104	
HIGHEST ANNUAL MEAN					346	1993
LOWEST ANNUAL MEAN					9.23	1976
HIGHEST DAILY MEAN	720	Mar 15	710	Mar 27	2190	Jun 23 1993
LOWEST DAILY MEAN	6.7	Aug 24	10	Feb 16	.46	Oct 3 1976
ANNUAL SEVEN-DAY MINIMUM	15	Feb 12	11	Feb 14	.59	Jul 10 1976
INSTANTANEOUS PEAK FLOW			882	Jun 7	2750	Jun 17 1993
INSTANTANEOUS PEAK STAGE			6.24	Jun 7	9.72	Jun 17 1993
INSTANTANEOUS LOW FLOW			10	Feb 16	.20a	Jan 4 1981
ANNUAL RUNOFF (AC-FT)	134400		104000		75140	
ANNUAL RUNOFF (CFSM)	.78		.61		.44	
ANNUAL RUNOFF (INCHES)	10.64		8.23		5.95	
10 PERCENT EXCEEDS	428		366		306	
50 PERCENT EXCEEDS	129		91		30	
90 PERCENT EXCEEDS	22		18		1.7	

a Result of freezeup.



MINNESOTA RIVER BASIN

05330000 MINNESOTA RIVER NEAR JORDAN, MN

LOCATION.--Lat 44°41'35", long 93°38'30", in NW¼SW¼ sec.7, T.114 N., R.23 W., Carver County, Hydrologic Unit 07020012, on pier at center downstream side of bridge, 1.5 mi northwest of Jordan, and at mile 39.4 uptream from Mississippi River.

DRAINAGE AREA.--16,200 mi², approximately.

PERIOD OF RECORD.--September 1934 to current year. Prior to Oct. 1, 1966, published as "near Carver, Minn".

REVISED RECORDS.--WSP 955: Drainage area. WSP 1508: 1935. WDR MN-87-2: 1976 (cal. yr. summary).

GAGE.--Water-stage recorder. Datum of gage is 690.00 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1966, water-stage recorder 2.8 mi downstream with auxiliary nonrecording gage at present site and present datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5340	6060	3350	e2750	e1470	e1350	19700	27100	16500	12400	17700	4160
2	4960	5910	3250	e2650	e1460	e1350	20400	25600	17500	12800	17400	4060
3	4790	5690	e3400	e2550	e1440	e1350	20700	25300	18400	12800	16400	4040
4	4890	5560	e3450	e2450	e1420	e1360	20500	24400	19000	12500	14300	3910
5	5390	5390	e3350	e2350	e1400	e1360	19900	23500	19200	12000	12200	3830
6	6340	5160	e3200	e2290	e1380	e1370	19400	22500	19000	11300	11000	3770
7	7880	5050	2920	e2250	e1360	e1380	18600	21700	18700	10900	11100	4350
8	8720	4970	2860	e2200	e1340	e1390	17900	20900	18800	10600	12000	4910
9	8830	4870	2850	e2150	e1320	e1400	17100	20400	19400	10500	13100	4660
10	8790	4750	e2850	e2100	e1300	e1450	16500	19900	20100	10300	13700	4440
11	8760	4660	e2800	e2100	e1300	e1790	16200	19500	20500	10400	13700	4090
12	8370	4490	e2750	e2100	e1300	e2780	16300	19200	20500	10500	13000	3850
13	7740	4330	e2750	e2100	e1280	e4270	17000	19000	20200	10500	12200	3700
14	7100	4200	e2730	e2100	e1260	e5410	17800	19200	19500	10600	11100	3560
15	6600	3950	e2750	e2100	e1250	e6540	18800	19500	18600	10900	10300	3420
16	6200	3850	e2800	e2050	e1250	e8070	19900	20100	17500	11800	9220	3320
17	7160	3940	e2800	e2000	e1250	9040	20900	20700	16200	12300	8670	3170
18	9070	3830	e2800	e1950	e1250	9210	21900	21800	14800	12500	8580	3020
19	9690	3420	e2850	e1900	e1250	9120	23100	23000	13600	12600	8330	2970
20	9520	3410	e2900	e1870	e1250	8820	24100	23600	12400	12800	7700	2920
21	9290	3510	e2900	e1830	e1250	8890	25100	23200	11500	13600	7040	2850
22	9400	3630	e2950	e1790	e1260	8830	26100	22400	10800	14600	6530	2790
23	9380	3680	e2950	e1750	e1270	8710	27400	21400	10200	15200	5960	2750
24	8960	3830	e2950	e1700	e1290	8700	28500	20400	9740	15700	5600	2760
25	8430	3850	e3000	e1670	e1300	8720	29200	19500	9240	15800	5290	2780
26	7950	3750	e3000	e1640	e1300	10200	29600	18500	9060	15800	5000	2760
27	7670	e3800	e3000	e1600	e1300	12900	29500	17400	9150	15400	4760	2700
28	7270	e3700	e3000	e1570	e1320	15000	29300	16600	9810	15200	4490	2600
29	6910	e3600	e2950	e1540	---	16400	28700	15900	10700	15600	4430	2570
30	6540	e3500	e2900	e1520	---	17600	28000	15500	11700	16400	4300	2600
31	6250	---	e2850	e1510	---	18700	---	15800	---	17200	4130	---
TOTAL	234190	130340	91860	62130	36820	213460	668100	643500	462300	401500	299230	103310
MEAN	7555	4345	2963	2004	1315	6886	22270	20760	15410	12950	9653	3444
MAX	9690	6060	3450	2750	1470	18700	29600	27100	20500	17200	17700	4910
MIN	4790	3410	2730	1510	1250	1350	16200	15500	9060	10300	4130	2570
AC-FT	464500	258500	182200	123200	73030	423400	1325000	1276000	917000	796400	593500	204900
CFSM	.47	.27	.18	.12	.08	.43	1.37	1.28	.95	.80	.60	.21
IN.	.54	.30	.21	.14	.08	.49	1.53	1.48	1.06	.92	.69	.24

e Estimated.

MINNESOTA RIVER BASIN

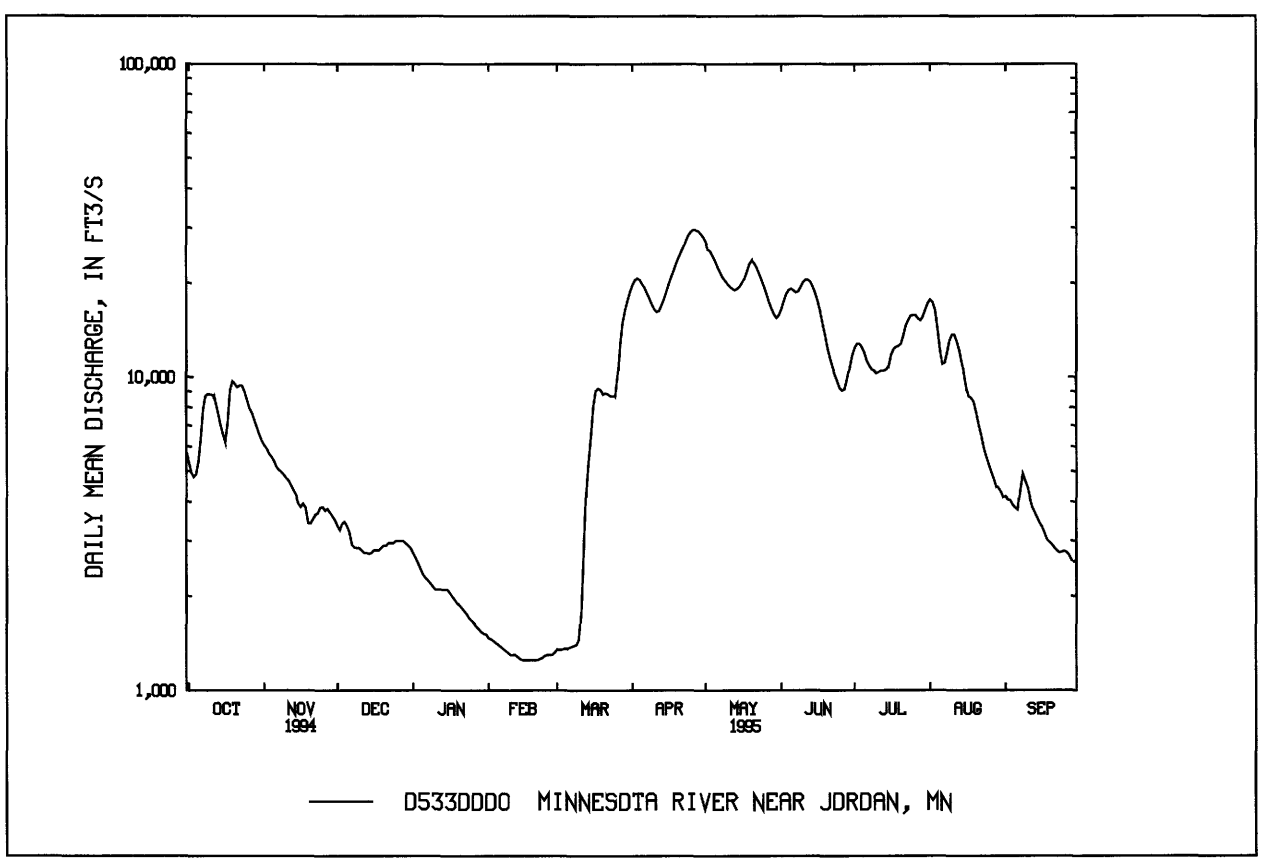
05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1935 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2141	2007	1423	865	926	5066	11620	7715	7458	5724	3266	2302
MAX	16030	7989	5216	3344	3992	21170	48210	25510	41460	38640	25660	14460
(WY)	1969	1993	1983	1992	1983	1983	1969	1993	1993	1993	1993	1993
MIN	167	178	158	111	130	322	926	923	633	279	178	183
(WY)	1935	1935	1977	1940	1940	1940	1959	1959	1976	1936	1936	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1935 - 1995	
ANNUAL TOTAL	3129270		3346740			
ANNUAL MEAN	8573		9169		4217[a]	
HIGHEST ANNUAL MEAN					16910	1993
LOWEST ANNUAL MEAN					687	1940
HIGHEST DAILY MEAN	22200	May 2	29600	Apr 26	112000	Apr 11 1965
LOWEST DAILY MEAN	1750	Feb 4	1250	Feb 15	85	Jan 21 1940
ANNUAL SEVEN-DAY MINIMUM	1750	Feb 4	1250	Feb 15	89	Jan 20 1940
INSTANTANEOUS PEAK FLOW			29700	Apr 26	117000	Apr 11 1965
INSTANTANEOUS PEAK STAGE			24.99	Apr 26	35.07	Apr 12 1965
INSTANTANEOUS LOW FLOW					79	Nov 17 1955
ANNUAL RUNOFF (AC-FT)	6207000		6638000		3055000	
ANNUAL RUNOFF (CFSM)	.53		.57		.26	
ANNUAL RUNOFF (INCHES)	7.19		7.69		3.54	
10 PERCENT EXCEEDS	16700		20300		11300	
50 PERCENT EXCEEDS	6870		6540		1690	
90 PERCENT EXCEEDS	2310		1460		300	

a Median of annual mean discharges is 3400 ft^3/s.



05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued
(National Stream-quality Accounting Setwork Station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1952, 1963-69, 1972 to current year.
REMARKS.--Letter K indicates non-ideal colony count.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
DEC												
08...	1230	2870	958	978	7.8	8.0	0.0	26	753	12.7	53	91
MAR												
23...	1240	8710	717	732	7.8	7.9	5.0	43	745	11.2	K18	K2100
JUN												
28...	1010	9740	915	866	7.6	8.0	23.0	68	738	6.3	E700	3400
SEP												
07...	1130	4300	870	828	8.2	8.0	22.5	43	748	7.8	80	170
28...	1200	2640	831	770	8.4	8.0	15.5	32	738	13.9	--	--

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 WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)
DEC												
08...	120	47	23	4.7	--	331	--	--	160	29	0.30	19
MAR												
23...	86	34	15	5.7	224	220	0	273	130	20	0.30	16
JUN												
28...	100	46	19	4.4	216	266	0	264	190	19	0.40	19
SEP												
07...	94	46	24	6.4	246	271	0	300	170	22	0.30	25
28...	76	45	26	5.1	--	231	--	--	160	26	0.20	12

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)
DEC												
08...	640	0.010	10.0	0.100	--	0.70	0.080	0.060	0.040	175	65	20
MAR												
23...	488	0.060	4.00	0.360	--	1.2	0.130	0.120	0.110	304	90	<10
JUN												
28...	621	0.080	5.30	0.030	--	1.1	0.270	0.100	0.090	242	88	<10
SEP												
07...	587	<0.010	1.40	<0.015	--	0.80	0.260	0.120	0.100	--	--	<10
28...	522	<0.010	0.660	<0.015	0.40	1.9	0.180	<0.010	<0.010	157	95	<10

MINNESOTA RIVER BASIN

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)
DEC												
08...	--	71	--	--	--	<3	--	11	--	38	120	<10
MAR												
23...	--	59	--	--	--	<3	--	18	--	25	13	<10
JUN												
28...	--	75	--	--	--	<3	--	<3	--	41	1	<10
SEP												
07...	--	78	--	--	--	<3	--	10	--	35	3	10
28...	2	56	<0.5	<1.0	<5	<3	1	6	<1	37	<1	<10

DATE	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L) (09511)	RA-226 2 SIGMA WATER, DISS, (PCI/L) (76001)	URANIUM NATURAL DIS-SOLVED (UG/L AS U) (22703)	URANIUM NATURAL 2 SIGMA WATER, DISS, (UG/L) (75990)
DEC												
08...	2	2	<1.0	370	<6	--	--	--	0.20	0.040	13	<1.0
MAR												
23...	2	2	<1.0	280	<6	--	--	--	--	--	8.8	0.2
JUN												
28...	2	3	<1.0	380	<6	--	--	--	--	--	--	--
SEP												
07...	3	<2	<1.0	390	<6	--	--	--	--	--	--	--
28...	2	1	<1.0	330	<6	12	5.8	>5.0	--	--	--	--

MISSISSIPPI RIVER MAIN STEM

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 upstream from Robert Street Bridge, 6 mi downstream from Minnesota River, and at mile 839.3 upstream from Ohio River.

DRAINAGE AREA.--36,800 mi^2, approximately.

PERIOD OF RECORD.--Water year 1867-69, 1872-92 (annual maximums), March 1892 to current year (prior to 1901, fragmentary during some winters). Records prior to March 1892, published in the 19th Annual Report, Part 4, have been found to be unreliable and should not be used. Monthly discharge only for some periods, published in WSP 1308. Gage-height records (winter records incomplete) collected at same site since 1866 are contained in reports of U.S. Weather Bureau, War Department and MIssissippi River Commission.

REVISED RECORDS.--WSP 285: 1892-96. WSP 715: Drainage area. WSP 875: 1938. WSP 895: 1939. WSP 1308: 1867(M). WSP 1508: 1897, 1898(M). 1903(M), 1917-18(M). 1928(M), 1929. WRD MN-74: 1973.

GAGE.--Water-stage recorder. Datum of gage is 683.62 ft above mean sea level. Prior to Mar. 18, 1925, nonrecording gage at several sites within 300 ft of present site at present datum. Since September 1938, auxiliary water-stage recorder 5.6 mi downstream.

REMARKS.--Records good. Slight regulation except during extreme floods by reservoirs on headquarters and by power plants. Beginning July 20, 1939, sewage from Minnespolis and St. Paul, which formerly entered above station, was diverted to a sewage-disposal plant, thence to river below station. Figures do not include this diversion.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13800	19000	9520	e9340	e7010	e5000	43900	50900	31300	17400	25500	19100
2	12700	18600	10500	e8900	e6810	e5480	43700	49300	31300	18100	25700	19500
3	12100	18000	e11200	e8740	e6970	e6370	43500	47400	31500	18300	24700	19600
4	12000	17200	e11500	e6780	e6730	e5860	44200	45800	31200	18100	23900	19000
5	12600	16800	e11800	e6960	e6390	e5960	44400	44000	32200	17900	22100	18800
6	13400	16300	e11700	e7100	e6360	e5650	43100	42100	33900	20000	19700	17900
7	14300	16000	e10100	e7580	e6450	e5060	42000	41000	34700	19100	19200	16700
8	16400	15400	e9820	e7710	e6210	e5320	40100	39700	33100	19700	19200	16000
9	17500	15100	10200	e7690	e6900	e5650	38100	39000	33200	20600	20400	15600
10	17500	14200	9590	e7540	e7100	e5750	36300	38400	33800	21700	22400	14400
11	17600	14200	9230	e7820	e4670	e5800	35500	38000	34400	22200	23000	13600
12	17600	14100	e8060	e8440	e5250	e6060	35200	37600	34900	22400	23400	12900
13	16700	13700	e8000	e8740	e5910	e6350	34500	37900	34800	22900	24000	12300
14	16400	13400	e8430	e8370	e6070	e9630	34400	38300	34400	22800	23200	11800
15	15900	13300	e7980	e8280	e6130	e14600	34900	38900	33700	22600	23300	10800
16	14500	13100	e9010	e8060	e6290	e18600	36300	40800	32100	23000	21900	10500
17	14500	12700	e9870	e8620	e6030	e23600	37200	42900	30200	24200	20700	10500
18	16200	12700	e10100	e8310	e6460	29900	39500	43800	28100	24400	19800	10100
19	18800	12800	e9110	e7800	e6300	33600	41300	45200	25400	24800	19100	9530
20	21500	12900	e8760	e7410	e6390	35900	43700	46000	23100	24800	19100	9250
21	23200	12200	e9440	e7420	e6100	37900	45700	46300	21300	25200	18300	9540
22	23200	12900	e10100	e7640	e6050	38000	47500	45800	19600	25300	17200	8830
23	23900	12300	e10400	e7020	e6310	37600	48900	45100	18500	26500	15700	8760
24	24900	12800	e10700	e6750	e6230	36100	50100	43600	17200	26700	14800	8570
25	24800	12900	e10500	e6990	e6000	35400	51700	41000	16400	26700	14300	8240
26	24200	12600	e10300	e7610	e5820	36300	52700	39100	15700	26600	14500	8690
27	23100	e12200	e10300	e7300	e5790	38300	53500	37800	15000	26800	15300	8460
28	22200	e12000	e10500	e7130	e6050	41500	53700	38000	15400	26400	16600	8080
29	21300	e11100	e10400	e7210	---	42200	53400	35200	16000	25200	16900	8070
30	20500	e9770	e9640	e6930	---	42700	52500	32900	17000	25000	18100	8060
31	19700	---	e10000	e6810	---	43400	---	31700	---	24900	18700	---
TOTAL	563000	420270	306760	239000	174780	669540	1301500	1283500	809400	710300	620700	373180
MEAN	18160	14010	9895	7710	6242	21600	43380	41400	26980	22910	20020	12440
MAX	24900	19000	11800	9340	7100	43400	53700	50900	34900	26800	25700	19600
MIN	12000	9770	7980	6750	4670	5000	34400	31700	15000	17400	14300	8060
AC-FT	1117000	833600	608500	474100	346700	1328000	2582000	2546000	1605000	1409000	1231000	740200
CFSM	.49	.38	.27	.21	.17	.59	1.18	1.13	.73	.62	.54	.34
IN.	.57	.42	.31	.24	.18	.68	1.32	1.30	.82	.72	.63	.38

e Estimated.

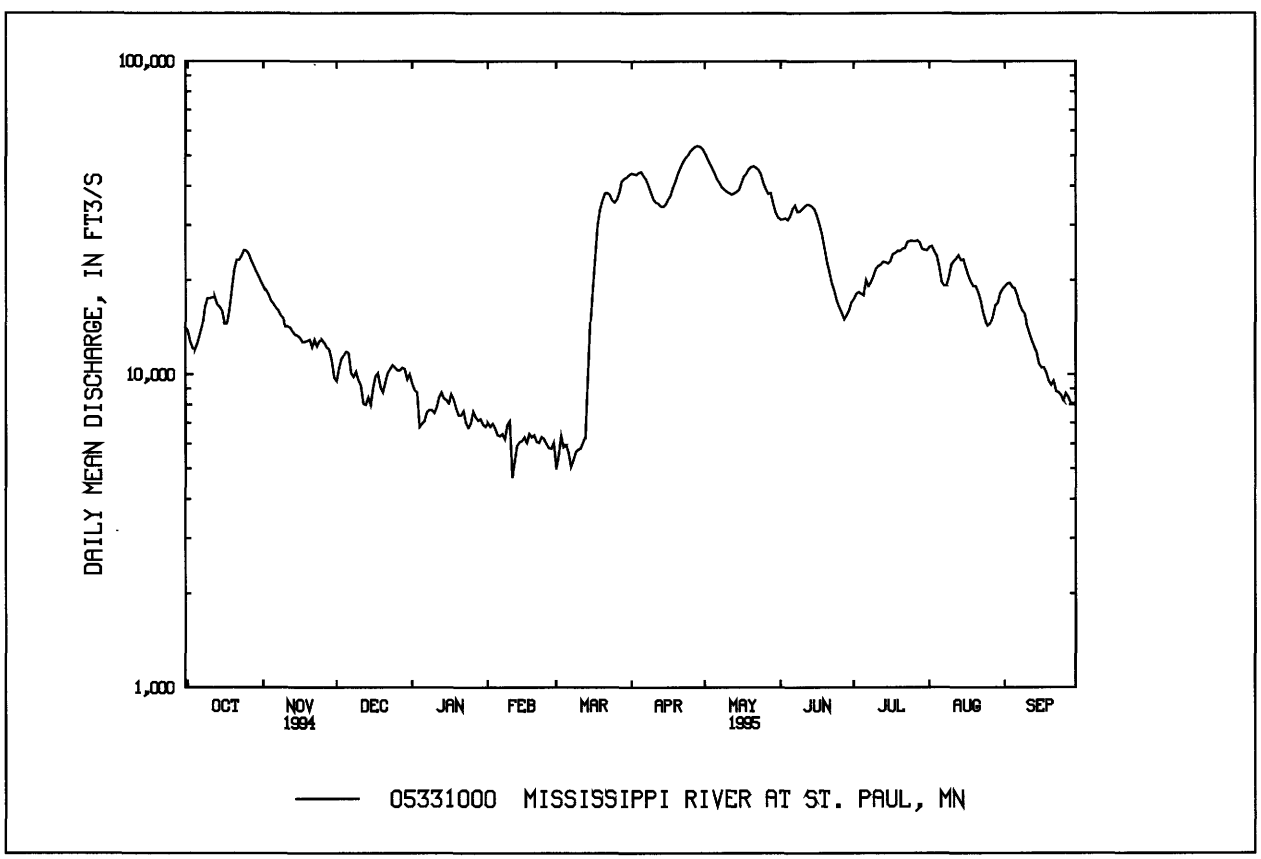
MISSISSIPPI RIVER MAIN STEM

05331000 MISSISSIPPI RIVER AT ST. PAUL, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1892 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	8423	7598	5479	4470	4411	10970	25140	20500	17980	14130	8796	8098
MAX	38210	27660	16080	11500	14700	43240	91610	66470	57170	73590	42550	34380
(WY)	1987	1972	1983	1983	1966	1983	1969	1986	1993	1993	1993	1986
MIN	1289	1348	1277	1097	1300	1757	3421	3085	1980	1272	864	1143
(WY)	1937	1937	1935	1935	1895	1940	1895	1934	1934	1934	1934	1934

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1892 - 1995	
ANNUAL TOTAL	7362970		7471930			
ANNUAL MEAN	20170		20470		11390	
HIGHEST ANNUAL MEAN					29580	1986
LOWEST ANNUAL MEAN					1935	1934
HIGHEST DAILY MEAN	58900	May 5	53700	Apr 28	171000	Apr 16 1965
LOWEST DAILY MEAN	7360	Feb 10	4670	Feb 11	632	Aug 26 1934
ANNUAL SEVEN-DAY MINIMUM	7590	Feb 7	5600	Mar 5	741	Aug 26 1934
INSTANTANEOUS PEAK FLOW			53900	Apr 27	171000	Apr 16 1965
INSTANTANEOUS PEAK STAGE			10.96	Apr 27	26.01	Apr 16 1965
ANNUAL RUNOFF (AC-FT)	14600000		14820000		8252000	
ANNUAL RUNOFF (CFSM)	.55		.56		.31	
ANNUAL RUNOFF (INCHES)	7.44		7.55		4.21	
10 PERCENT EXCEEDS	37100		41400		26900	
50 PERCENT EXCEEDS	16000		17200		6970	
90 PERCENT EXCEEDS	9020		6740		2680	



MISSISSIPPI RIVER MAIN STEM

05331570 MISSISSIPPI RIVER AT NININGER, MN
(National Stream-quality Accounting Network Station)

WATER-QUALITY RECORDS

LOCATION.--Lat 44°46'22", long 92°54'07", NE$^1/_4$NE$^1/_4$ 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 upstream from Ohio River.

DRAINAGE AREA.--37,000 mi^2 (95,000 km^2), approximately.

PERIOD OF RECORD.--January 1977 to September 1995 (discontinued)..

REMARKS.--Water-discharge computed on the basis of discharge for Mississippi River at St. Paul (station 05331000) adjusted for inflow and travel time.

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
DEC												
09...	1015	10300	619	653	8.0	7.7	0.0	3.0	752	12.6	500	220
MAR												
17...	1050	19300	470	480	7.4	7.4	3.0	8.5	752	12.0	340	440
JUN												
29...	1200	16100	755	727	7.6	7.9	24.5	66	739	6.0	220	300
SEP												
08...	1245	17400	494	481	8.0	7.9	20.0	22	749	7.6	99	99

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 WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)
DEC												
09...	77	29	21	3.4	220	226	0	268	64	31	0.30	13
MAR												
17...	51	19	15	5.9	152	159	0	185	40	23	0.20	11
JUN												
29...	82	35	20	4.0	208	237	0	254	120	23	0.30	16
SEP												
08...	54	22	15	3.9	166	178	1	200	49	19	0.20	18

MISSISSIPPI RIVER MAIN STEM

05331570 MISSISSIPPI RIVER AT NININGER, MN

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)
DEC											
09...	402	0.020	2.80	0.110	0.80	0.140	0.120	0.020	8	85	10
MAR											
17...	296	0.040	1.90	0.430	1.5	0.290	0.200	0.170	27	98	20
JUN											
29...	490	0.100	3.20	0.060	1.2	0.460	0.130	0.110	546	87	20
SEP											
08...	314	0.010	0.800	<0.015	0.80	0.150	0.140	0.110	106	87	<10

DATE	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)
DEC											
09...	54	<3	55	27	44	<10	1	1	<1.0	190	<6
MAR											
17...	45	<3	94	10	91	<10	2	<1	<1.0	130	<6
JUN											
29...	73	<3	4	25	50	<10	2	2	<1.0	270	<6
SEP											
08...	53	<3	28	12	27	<10	2	<2	<1.0	160	<6

ST. CROIX RIVER BASIN

05336700 KETTLE RIVER BELOW SANDSTONE, MN

LOCATION.--Lat 46°06'20", long 92°51'50", in NW¼SW¼ sec.22, T.42 N., R.20 W., Pine County, Hydrologic Unit 07030003, on Sandstone Federal Correctional Institution property, on left bank about 900 ft downstream from abandoned powerplant dam, 1.8 mi south of Sandstone.

DRAINAGE AREA.--863 mi².

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

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 931.50 ft above mean sea level. (Minnesota Department of Transportation bench mark).

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1965 reached a stage of 12.96 ft, from flood marks, discharge, 13,400 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft³/s and maximum (*)

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Mar.20	--	e3700	--	Aug.26	1500	*5440	*8.74
Apr.15	0800	3620	7.60				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	468	471	347	e232	e189	e180	e1250	1120	582	163	178	1650
2	423	444	335	e232	e185	e190	e1240	1020	539	169	173	1310
3	399	424	329	e222	e175	e190	e1180	943	503	265	178	1060
4	377	395	318	e221	e172	e190	e1100	890	459	356	196	908
5	369	375	308	e225	e172	e190	e1060	835	449	588	201	821
6	349	368	e290	e229	e171	e190	e1000	792	512	911	223	765
7	366	358	e280	e230	e171	e192	e980	743	559	929	260	692
8	462	341	e270	e229	e171	e200	e943	698	562	754	254	619
9	528	330	275	e220	e171	e240	e934	980	520	616	253	558
10	509	316	e270	e215	e172	e310	e1450	1980	550	538	241	503
11	468	302	e250	e210	e175	e350	e1670	2000	608	566	235	456
12	435	294	e260	e205	e180	e440	e2000	1810	582	614	240	415
13	404	292	e270	e205	e195	e462	e2300	1760	525	584	256	382
14	379	318	e275	e206	e200	e462	e2200	2730	476	531	264	342
15	357	344	e280	e219	e200	e1380	e1950	3550	429	494	243	325
16	378	342	281	e230	e200	e1900	e1860	3210	384	423	243	337
17	625	331	273	e230	e198	e2400	e1780	2730	353	403	220	336
18	1140	328	287	e230	e197	e3000	e1720	2400	317	414	213	326
19	1700	343	277	e220	e195	e3600	e1950	2000	311	417	256	311
20	1540	351	257	e215	e190	e3700	e2730	1670	267	401	428	307
21	1320	363	e234	e215	e187	e2700	3050	1390	229	373	418	285
22	1170	422	e249	e215	e180	e2000	2640	1220	208	349	369	270
23	1030	427	e245	e213	e175	e1800	2440	1070	202	299	329	256
24	924	435	e235	e205	e172	e1680	2250	925	199	284	706	249
25	839	400	e231	e206	e172	e1540	2120	826	192	264	2340	248
26	756	346	e229	e200	e172	e1310	1910	743	178	246	5120	245
27	679	335	e229	e190	e171	e1300	1720	677	175	229	5050	236
28	629	315	e230	e185	e171	e1300	1540	650	171	224	4200	228
29	583	343	e230	e190	---	e1300	1380	656	166	207	3540	223
30	541	335	e230	e189	---	e1300	1240	656	165	197	2780	270
31	503	---	e232	e189	---	e1260	---	616	---	191	2110	---
TOTAL	20650	10788	8306	6622	5079	37256	51587	43290	11372	12999	31717	14933
MEAN	666	360	268	214	181	1202	1720	1396	379	419	1023	498
MAX	1700	471	347	232	200	3700	3050	3550	608	929	5120	1650
MIN	349	292	229	185	171	180	934	616	165	163	173	223
AC-FT	40960	21400	16470	13130	10070	73900	102300	85870	22560	25780	62910	29620
CFSM	.77	.42	.31	.25	.21	1.39	1.99	1.62	.44	.49	1.19	.58
IN.	.89	.47	.36	.29	.22	1.61	2.22	1.87	.49	.56	1.37	.64

e Estimated.

ST. CROIX RIVER BASIN

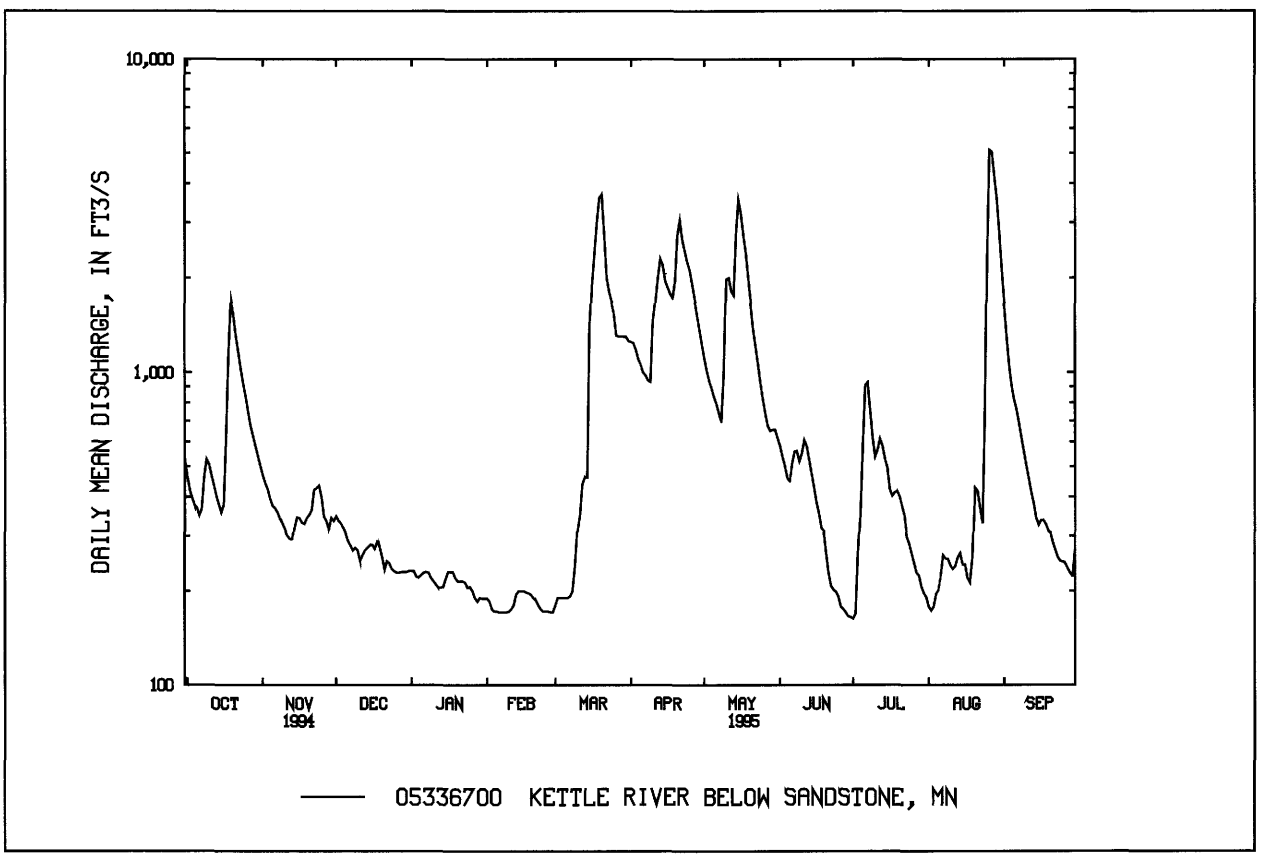
05336700 KETTLE RIVER BELOW SANDSTONE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	747	585	277	179	172	543	2297	1288	898	663	399	585
MAX	2652	2414	652	411	417	1742	4653	3168	2799	2869	2094	3065
(WY)	1969	1972	1984	1984	1984	1973	1969	1986	1993	1972	1972	1986
MIN	80.6	85.8	98.3	77.3	98.5	141	435	222	131	110	86.4	71.3
(WY)	1977	1977	1977	1971	1977	1980	1977	1980	1988	1988	1976	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1968 - 1995	
ANNUAL TOTAL	254412		254599			
ANNUAL MEAN	697		698		719	
HIGHEST ANNUAL MEAN					1390	1972
LOWEST ANNUAL MEAN					254	1977
HIGHEST DAILY MEAN	5830	Apr 17	5120	Aug 26	16400	Jul 23 1972
LOWEST DAILY MEAN	157	Sep 13	163	Jul 1	43	Nov 12 1976
ANNUAL SEVEN-DAY MINIMUM	173	Sep 8	170	Jun 26	62	Jan 14 1971
INSTANTANEOUS PEAK FLOW			5440	Aug 26	17200	Jul 23 1972
INSTANTANEOUS PEAK STAGE			8.74	Aug 26	15.38	Jul 23 1972
INSTANTANEOUS LOW FLOW			155	Aug 1	25a	Nov 11 1977
ANNUAL RUNOFF (AC-FT)	504600		505000		521200	
ANNUAL RUNOFF (CFSM)	.81		.81		.83	
ANNUAL RUNOFF (INCHES)	10.97		10.97		11.33	
10 PERCENT EXCEEDS	1470		1800		1780	
50 PERCENT EXCEEDS	358		351		289	
90 PERCENT EXCEEDS	200		190		128	

a Occurred Nov. 11,12,1977, result of freezeup.



ST. CROIX RIVER BASIN

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 upstream from bridge on County Highway 77, 1.1 mi upstream from mouth and 2.5 mi north of Mora.

DRAINAGE AREA.--102 mi².

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1969-74; July 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is 991.20 ft above mean sea level (Kanabec County bench mark).

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 26, 1972, reached a stage of 14.0 ft, from information by local resident (discharge not determined). Result of dam failure and backwater from collapsed bridge.

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

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Mar. 21	0530	530	4.32	Aug. 27	0030	*1580	*6.00

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	32	29	e15	e10	e9.0	251	107	35	6.7	21	206
2	9.6	29	29	e15	e10	e9.0	255	94	37	5.7	18	163
3	11	30	27	e15	e10	e10	306	86	37	7.4	13	131
4	11	25	e28	e14	e9.0	e10	311	79	32	8.8	11	108
5	9.2	23	e29	e14	e9.0	e10	276	76	34	37	9.4	93
6	10	23	e28	e14	e9.0	e10	235	66	50	63	11	80
7	19	20	e26	e14	e9.0	e10	203	64	84	75	77	75
8	21	22	e24	e14	e9.0	e10	182	71	81	72	124	55
9	26	20	e26	e14	e9.0	e10	166	90	72	70	115	48
10	23	19	e26	e13	e9.0	e13	151	114	86	59	84	40
11	21	17	e27	e13	e9.0	e20	144	126	113	46	98	34
12	20	18	e27	e12	e9.0	e30	163	126	137	50	110	32
13	20	22	e27	e12	e10	e35	191	145	127	50	112	30
14	20	23	e27	e12	e10	55	212	207	110	43	115	27
15	17	24	e27	e12	e11	142	220	231	91	39	105	25
16	30	22	e26	e13	e11	253	224	215	71	30	88	32
17	47	21	e25	e13	e11	349	220	188	60	24	72	29
18	65	22	e25	e13	e11	432	256	154	50	21	59	26
19	104	24	e25	e13	e11	468	348	126	40	19	58	29
20	114	24	e21	e12	e10	510	435	109	34	19	45	22
21	106	31	e18	e12	e10	513	424	91	29	15	39	20
22	98	29	e17	e12	e10	449	371	76	24	23	31	19
23	85	31	e17	e12	e9.0	375	314	72	22	20	27	19
24	75	31	e17	e11	e9.0	309	275	62	21	21	116	20
25	68	29	e16	e11	e9.0	265	232	53	19	21	558	20
26	57	30	e16	e11	e9.0	248	198	47	19	18	1220	21
27	50	31	e15	e10	e9.0	280	169	45	14	26	1380	20
28	47	35	e15	e10	e9.0	268	151	60	11	46	852	18
29	42	31	e15	e10	---	267	134	44	9.3	36	534	20
30	37	32	e15	e10	---	260	121	38	7.8	26	382	34
31	36	---	e15	e10	---	251	---	36	---	26	282	---
TOTAL	1309.8	770	705	386	270.0	5880.0	7138	3098	1557.1	1023.6	6766.4	1496
MEAN	42.3	25.7	22.7	12.5	9.64	190	238	99.9	51.9	33.0	218	49.9
MAX	114	35	29	15	11	513	435	231	137	75	1380	206
MIN	9.2	17	15	10	9.0	9.0	121	36	7.8	5.7	9.4	18
AC-FT	2600	1530	1400	766	536	11660	14160	6140	3090	2030	13420	2970
CFSM	.41	.25	.22	.12	.09	1.86	2.33	.98	.51	.32	2.14	.49
IN.	.48	.28	.26	.14	.10	2.14	2.60	1.13	.57	.37	2.47	.55

e Estimated.

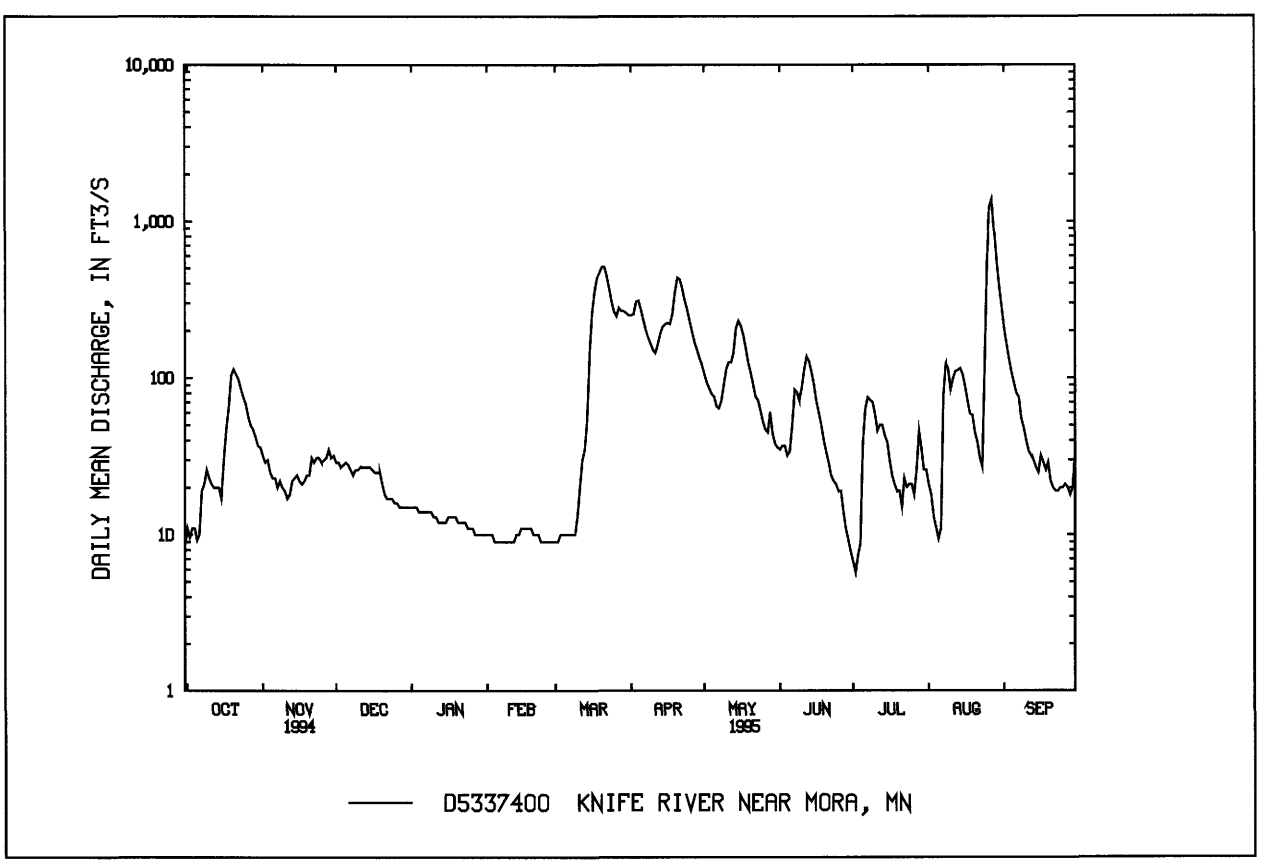
ST. CROIX RIVER BASIN

05337400 KNIFE RIVER NEAR MORA, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	50.5	40.3	25.2	13.1	13.3	73.3	219	106	63.4	56.7	32.9	39.9
MAX	242	206	109	28.8	48.9	238	472	338	233	171	218	257
(WY)	1985	1978	1978	1984	1984	1983	1986	1986	1984	1975	1995	1986
MIN	1.84	1.38	1.17	1.14	1.16	14.3	30.5	12.5	3.06	.98	1.86	2.15
(WY)	1977	1990	1990	1977	1990	1975	1977	1980	1988	1988	1976	1987

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1974 - 1995	
ANNUAL TOTAL	20068.7		30399.9			
ANNUAL MEAN	55.0		83.3		61.4	
HIGHEST ANNUAL MEAN					135	1986
LOWEST ANNUAL MEAN					16.8	1988
HIGHEST DAILY MEAN	627	Apr 16	1380	Aug 27	1610	Apr 1 1986
LOWEST DAILY MEAN	4.5	Sep 3	5.7	Jul 2	.76	Jul 7 1988
ANNUAL SEVEN-DAY MINIMUM	5.7	Aug 12	8.1	Jun 28	.86	Jul 23 1988
INSTANTANEOUS PEAK FLOW			1580	Aug 27	1840	May 10 1979
INSTANTANEOUS PEAK STAGE			6.00	Aug 27	6.69	Nov 24 1977
INSTANTANEOUS LOW FLOW			5.1	Jul 2	.74	Jul 6,28 1988
ANNUAL RUNOFF (AC-FT)	39810		60300		44490	
ANNUAL RUNOFF (CFSM)	.54		.82		.60	
ANNUAL RUNOFF (INCHES)	7.32		11.09		8.18	
10 PERCENT EXCEEDS	170		233		148	
50 PERCENT EXCEEDS	22		29		21	
90 PERCENT EXCEEDS	7.2		10		4.8	



ST. CROIX RIVER BASIN

05338500 SNAKE RIVER NEAR PINE CITY, MN

LOCATION.--Lat 45°50'30", long 92°56'00", in $SE^1/_4NW^1/_4$ sec. 26, T. 39 N., R. 21 W., Pine County, Hydrologic Unit 07030004, on left bank at site of former powerplant and dam, 0.5 mi downstream from Cross Lake and 1.5 mi northeast of Pine City.

DRAINAGE AREA.--958 mi^2.

PERIOD OF RECORD.--June 1913 to September 1917, July 1951 to Sept. 1981, Oct. 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 919.00 ft above mean sea level. June 25, 1913, to Sept. 30, 1917, nonrecording gage at site 500 ft downstream at different datum. July 1 to Oct. 28, 1951, nonrecording gage at present site and datum.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	300	592	378	211	131	e160	2580	1470	570	143	226	3800
2	278	561	391	e200	132	e170	2500	1300	535	131	209	3510
3	284	538	392	e190	134	184	2460	1140	505	136	203	3090
4	302	501	383	e180	e140	176	2340	1030	469	143	207	2640
5	304	468	372	e180	e150	174	2240	932	453	223	192	2250
6	298	448	342	186	e150	174	2190	843	519	330	241	1910
7	385	423	322	188	e150	172	2090	770	538	399	397	1560
8	449	413	315	176	e150	169	1950	711	598	515	599	1310
9	480	393	312	187	e150	177	1760	760	658	585	728	1100
10	495	373	302	178	e170	181	1620	833	753	593	787	942
11	509	356	295	158	e160	188	1520	965	847	562	886	818
12	510	341	279	154	e150	254	1530	1070	899	542	978	726
13	487	351	264	156	e140	537	1500	1160	925	500	1040	653
14	455	391	256	151	e150	578	1500	1270	903	452	1090	558
15	418	359	250	155	e170	771	1560	1350	843	403	1050	505
16	452	350	250	158	e170	1060	1680	1530	765	389	1010	503
17	513	354	251	168	e180	1360	1750	1640	691	362	946	457
18	623	429	248	173	e190	1710	1870	1710	610	314	869	436
19	776	379	240	183	193	2080	2100	1720	529	290	850	415
20	889	368	237	184	190	2660	2250	1670	460	298	763	389
21	999	463	234	169	186	3440	2450	1500	396	271	702	362
22	1090	457	233	165	186	3820	2620	1340	341	263	640	343
23	1140	429	227	173	179	3760	2750	1180	296	246	586	317
24	1090	455	228	162	179	3620	2810	1030	267	244	638	321
25	1020	460	228	157	179	3390	2750	917	228	227	842	326
26	960	417	221	154	179	3120	2600	808	204	216	1290	324
27	889	408	221	147	172	3000	2380	709	194	210	1950	315
28	831	388	220	141	172	2810	2150	719	187	236	2610	309
29	782	359	210	138	---	2680	1900	704	182	234	3270	315
30	710	368	215	140	---	2670	1670	662	170	247	3750	386
31	648	---	214	135	---	2640	---	613	---	250	3920	---
TOTAL	19366	12592	8530	5197	4582	47885	63070	34056	15535	9954	33469	30890
MEAN	625	420	275	168	164	1545	2102	1099	518	321	1080	1030
MAX	1140	592	392	211	193	3820	2810	1720	925	593	3920	3800
MIN	278	341	210	135	131	160	1500	613	170	131	192	309
AC-FT	38410	24980	16920	10310	9090	94980	125100	67550	30810	19740	66390	61270
CFSM	.65	.44	.29	.17	.17	1.61	2.19	1.15	.54	.34	1.13	1.07
IN.	.75	.49	.33	.20	.18	1.86	2.45	1.32	.60	.39	1.30	1.20

e Estimated.

ST. CROIX RIVER BASIN

05338500 SNAKE RIVER NEAR PINE CITY, MN--Continued

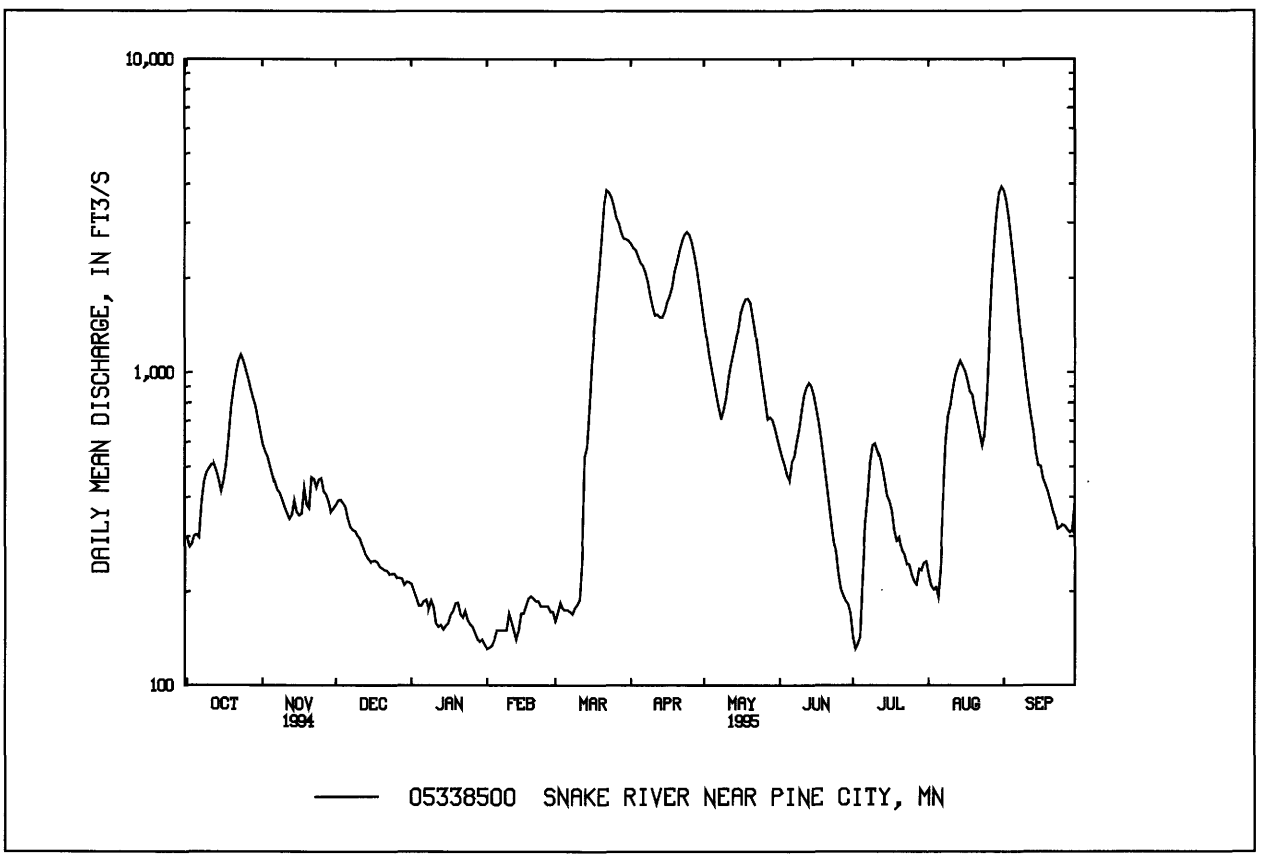
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	411	399	210	127	125	478	1983	1164	848	737	341	323
MAX	3130	2310	837	343	549	2658	4975	2726	2775	3400	2018	1201
(WY)	1969	1972	1978	1966	1966	1966	1965	1979	1967	1952	1972	1951
MIN	47.1	59.9	36.1	29.3	33.4	61.5	172	206	193	100	34.9	37.8
(WY)	1977	1977	1977	1977	1977	1965	1959	1977	1992	1961	1976	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1913 - 1995	
ANNUAL TOTAL	224545		285126			
ANNUAL MEAN	615		781		591[a]	
HIGHEST ANNUAL MEAN					1223	1972
LOWEST ANNUAL MEAN					177	1959
HIGHEST DAILY MEAN	3520	May 3	3920	Aug 31	14200	Jul 27 1972
LOWEST DAILY MEAN	114	Feb 19	131	Feb 1	26	Aug 29 1976
ANNUAL SEVEN-DAY MINIMUM	116	Feb 18	136	Jan 29	28	Jan 21 1977
INSTANTANEOUS PEAK FLOW			3950	Aug 31	14300	Jul 27 1972
INSTANTANEOUS PEAK STAGE			6.60	Aug 31	10.38	Jul 27 1972
INSTANTANEOUS LOW FLOW			122	Feb 1	5.5[b]	Oct 1 1964
ANNUAL RUNOFF (AC-FT)	445400		565500		428300	
ANNUAL RUNOFF (CFSM)	.64		.82		.62	
ANNUAL RUNOFF (INCHES)	8.72		11.07		8.38	
10 PERCENT EXCEEDS	1610		2120		1470	
50 PERCENT EXCEEDS	350		429		220	
90 PERCENT EXCEEDS	137		170		74	

a Median of annual mean discharges is 529 ft^3/s.

b Result of dam rehabilitation.



ST. CROIX RIVER BASIN

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI

LOCATION.--Lat 45°24'25", long 92°38'49", in 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 downstream from powerplant of Northern States Power Co., in St. Croix Falls, and at mile 52.2.

DRAINAGE AREA.--6,240 mi².

PERIOD OF RECORD.--January 1902 to current year. Prior to January 1910, monthly discharge only, published in WSP 1308. Prior to October 1939, published as "near St. Croix Falls."

REVISED RECORDS.--WSP 1115: 1929. WDR WI-82-1: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 689.94 ft above mean sea level. Prior to July 1905, gage heights and discharge measurements were used by Loweth and Wolff, consulting engineers of St. Paul, Minn., to determine the flow. July 1905 to February 1940, records were computed from power generation at the St. Croix Falls Powerplant. February 1940 to Sept. 30, 1979, water- stage recorder at site 300 ft downstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Diurnal fluctuation caused by St. Croix Falls Powerplant 1,500 ft upstream. Data-collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4980	4890	3540	2950	2390	2490	12900	8720	5850	2310	2850	14500
2	4810	4730	3890	3160	2400	2200	12300	8060	5500	2050	2870	12400
3	4890	4700	4080	2610	2420	2200	11800	7660	5160	2450	2510	10600
4	4900	4390	4230	2240	2580	2300	11600	7290	5280	2560	2970	9650
5	4490	4080	4460	2490	2320	2380	11000	6810	5020	3560	2990	8950
6	4260	4290	3180	2170	2140	2220	10100	6050	5150	4280	3120	8450
7	4870	4030	2890	2490	2190	2070	9300	6410	5880	4410	4980	7620
8	5000	4040	2750	2630	2120	2330	8790	5660	5400	4450	8280	7030
9	5330	4050	2890	2410	2140	2370	8810	5950	5590	4200	7800	6050
10	5120	3890	3200	2440	2260	2240	7610	6400	5500	4190	6600	5270
11	5290	3720	2750	2590	2230	2300	7390	8830	5990	3960	5680	5020
12	4900	3760	2910	2530	1930	2900	7340	9860	7010	4260	6970	4620
13	4780	3910	3420	2740	2000	4580	7880	9710	6790	4480	7190	4320
14	4450	4110	3110	2270	2020	7210	9860	10200	6440	4280	7300	4270
15	4130	4210	3170	2800	2070	8700	10100	12100	5840	4070	7400	4060
16	4120	4050	3490	2710	2010	10400	10400	15000	5140	3780	7340	3810
17	4440	4070	3510	2820	2300	12300	10400	14600	4800	3660	6010	3880
18	5200	3990	3330	2810	2000	14800	11000	12800	4480	3590	6390	3990
19	5690	3780	3550	2720	2090	16400	12200	10700	4120	3820	5810	3790
20	7110	3470	3630	2750	1970	20800	13600	9820	3670	3340	5830	3430
21	6870	4510	3440	2610	2140	23600	14600	8580	3180	3560	5410	3840
22	6940	4230	3510	2700	2120	22800	15300	7670	3210	4220	5340	3330
23	6870	4840	3520	2380	2200	18900	15100	7240	2980	4090	4860	3320
24	6920	4780	3570	2590	2210	17400	14500	6770	2880	3650	5360	2910
25	7250	4760	3430	2490	2320	15800	14100	5960	2320	3630	7980	3860
26	6560	4150	3180	2390	2210	14100	13000	5420	3020	3370	12300	2490
27	6210	3620	3370	2290	2100	13600	12000	5120	2530	3370	16400	3240
28	6330	3380	3320	2370	2310	13800	11000	5490	2600	3540	19700	3010
29	5430	3330	3310	2320	---	13700	10200	5920	2630	3420	19800	3150
30	5620	3400	3570	2650	---	13800	9380	5750	2820	2800	18400	3630
31	4980	---	3040	2350	---	13400	---	5670	---	3150	16600	---
TOTAL	168740	123160	105240	79470	61190	304090	333560	252220	136780	112500	243040	164490
MEAN	5443	4105	3395	2564	2185	9809	11120	8136	4559	3629	7840	5483
MAX	7250	4890	4460	3160	2580	23600	15300	15000	7010	4480	19800	14500
MIN	4120	3330	2750	2170	1930	2070	7340	5120	2320	2050	2510	2490
CFSM.	87	.66	.54	.41	.35	1.57	1.78	1.30	.73	.58	1.26	.88
IN.	1.01	.73	.63	.47	.36	1.81	1.99	1.50	.82	.67	1.45	.98

e Estimated.

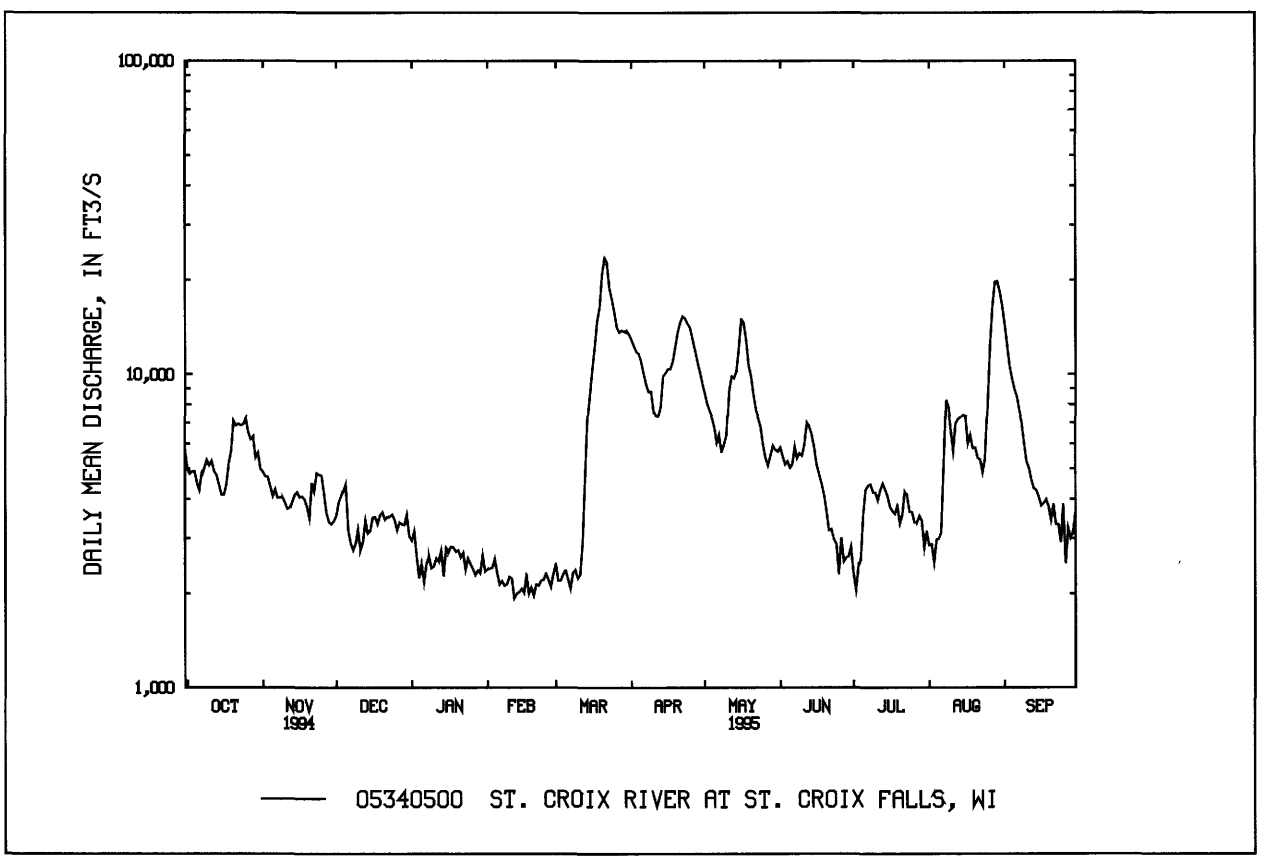
ST. CROIX RIVER BASIN

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1902 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3663	3414	2515	2126	2089	4234	10130	7462	5707	4108	2855	3402
MAX	14270	11910	5821	4279	6021	14420	22320	21840	19510	17260	9777	14590
(WY)	1969	1972	1984	1984	1984	1945	1952	1950	1944	1952	1955	1941
MIN	1380	1342	1287	1157	1257	1538	2212	2430	1481	1014	839	1152
(WY)	1933	1911	1911	1911	1913	1912	1902	1934	1934	1934	1934	1933

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1902 - 1995	
ANNUAL TOTAL	1862630		2084480			
ANNUAL MEAN	5103		5711		4317	
HIGHEST ANNUAL MEAN					8569	1986
LOWEST ANNUAL MEAN					1754	1934
HIGHEST DAILY MEAN	21200	Apr 30	23600	Mar 21	53900	May 8 1950
LOWEST DAILY MEAN	2020	Aug 21	1930	Feb 12	75	Jul 17 1910
ANNUAL SEVEN-DAY MINIMUM	2250	Aug 20	2050	Feb 12	754	Jul 29 1934
INSTANTANEOUS PEAK FLOW			31200	Mar 21	54900	May 8 1950
INSTANTANEOUS PEAK STAGE			14.60	Mar 21	25.19	May 8 1950
ANNUAL RUNOFF (CFSM)	.82		.92		.69	
ANNUAL RUNOFF (INCHES)	11.10		12.43		9.40	
10 PERCENT EXCEEDS	9190		12100		9070	
50 PERCENT EXCEEDS	3890		4230		2740	
90 PERCENT EXCEEDS	2510		2320		1560	



MISSISSIPPI RIVER MAIN STEM

05344500 MISSISSIPPI RIVER AT PRESCOTT, WI

LOCATION.--Lat 44°44'45", long 92°48'00", in sec.9, T.26 N., R.20 W., Pierce County, Hydrologic Unit 07040001,on left bank at Prescott, 200 ft downstream from St. Croix River, 300 ft south of Chicago, Burlington & Quincy Railroad bridge, 800 ft south of bridge on U.S. Highway 10, and at mile 811.4 upstream from Ohio River.

DRAINAGE AREA.--44,800 mi², approximately.

PERIOD OF RECORD.--June 1928 to current year.

REVISED RECORDS.--WSP 1508: 1941. WRD MN-74: 1973.

GAGE.--Water-stage recorder. Datum of gage is 649.50 ft above sea level. Prior to Aug. 2, 1932, nonrecording gage at railroad bridge 300 ft upstream at following datums: June 3, 1928, to Sept. 30, 1929, 19.27 ft higher; Oct. 1, 1929, to Sept. 30, 1930, 17.68 ft higher; Oct. 1, 1930, to Aug. 1, 1932, 19.28 ft higher. Aug. 2, 1932, to Oct. 30, 1938, water-stage recorder at present site at datum 19.28 ft higher; Nov. 1, 1938, to Sept. 7, 1971, water-stage recorder at present site at datum 50.00 ft lower.

REMARKS.--Records good except those for estimated daily discharge, which are fair. Some regulation by reservoirs, navigation dams, and powerplants at low and medium stages. Discharges below a stage of 26.7 ft. are computed by routing flows from the Mississippi River at St. Paul (05331000) and St. Croix River at St. Croix Falls, WI (05340500).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21300	26300	e14300	e14200	e10100	e9270	58000	61000	35300	21300	27500	33900
2	20100	25500	14200	e13300	e10300	e8310	58200	59200	34700	21200	27500	32800
3	18900	24800	15600	e13000	e10100	e8520	57600	56100	34600	21600	27500	31500
4	18400	24100	e16500	e12300	e10300	e9530	56500	53500	34300	22100	26900	29900
5	18200	23100	e17000	e9860	e10200	e9100	56200	51300	33900	22100	26300	28400
6	18400	22300	e17400	e10400	e9550	e9280	55800	48100	34500	23000	25600	26400
7	19100	22000	e16000	e10200	e9330	e8800	53600	45700	36200	25900	25200	25500
8	20600	21400	e14200	e11000	e9540	e8010	51700	44200	36100	25100	25400	24000
9	22800	20800	e13700	e11300	e9180	e8520	47800	42100	35400	25800	26300	23400
10	24300	20600	14200	e11000	e9790	e8880	44100	41600	35700	26400	27700	22000
11	24100	19600	13800	e10900	e10300	e9010	41800	41300	36100	27500	28500	21100
12	24300	19300	12900	e11300	e7660	e9170	40900	41800	36800	27800	29400	20000
13	24000	19100	e11900	e12000	e7970	e10100	39900	42600	37500	28300	32200	18800
14	23000	19000	e12500	e12600	e8740	e12300	38900	44400	37600	29100	33300	18000
15	22200	18900	e12700	e11600	e8940	e18600	39500	44400	37200	28800	32400	17300
16	21400	18800	e12200	e12000	e9110	e25500	40800	47000	36200	28400	31800	16100
17	20000	18500	e13600	e11800	e9190	32100	42600	51100	35000	28600	30700	15600
18	20500	18100	e14500	e12500	e9260	35800	44700	53300	33200	28300	28700	15600
19	23000	18000	e14600	e12100	e9380	42300	47400	53800	31200	27900	27800	15300
20	26300	17900	e13800	e11500	e9320	48600	50300	54100	29000	28300	27000	14500
21	30500	17700	e13500	e11100	e9300	53400	54800	53500	27100	28100	25700	13800
22	32100	18100	e14000	e11000	e9160	58800	58000	52500	25100	28200	24200	14500
23	32100	18400	e14800	e11300	e9110	59400	60900	51300	24300	28700	23700	13300
24	32800	18400	e15100	e10300	e9470	56700	62900	49800	22900	28900	22500	13200
25	33800	18800	e15400	e10200	e9440	54000	63900	47700	21400	29300	21900	12600
26	34000	18900	e15100	e10400	e9250	52400	64800	44300	20000	29300	24200	13200
27	32600	18200	e14600	e10900	e8950	51900	64900	42000	20100	28800	25000	12300
28	31100	e17200	e14800	e10500	e8830	54700	64700	42000	18900	28700	28600	12800
29	30300	e16700	e14900	e10400	---	57000	64000	40600	19500	28700	31700	12100
30	28500	e15700	e14900	e10400	---	57600	62700	38200	20100	27600	33500	12300
31	27800	---	e14300	e10500	---	58000	---	36600	---	27500	34400	---
TOTAL	776500	596200	447000	351860	261770	945600	1587900	1475100	919900	831300	863100	580200
MEAN	25050	19870	14420	11350	9349	30500	52930	47580	30660	26820	27840	19340
MAX	34000	26300	17400	14200	10300	59400	64900	61000	37600	29300	34400	33900
MIN	18200	15700	11900	9860	7660	8010	38900	36600	18900	21200	21900	12100
AC-FT	1540000	1183000	886600	697900	519200	1876000	3150000	2926000	1825000	1649000	1712000	1151000
CFSM	.56	.44	.32	.25	.21	.68	1.18	1.06	.68	.60	.62	.43
IN.	.64	.50	.37	.29	.22	.79	1.32	1.22	.76	.69	.72	.48

e Estimated.

MISSISSIPPI RIVER MAIN STEM

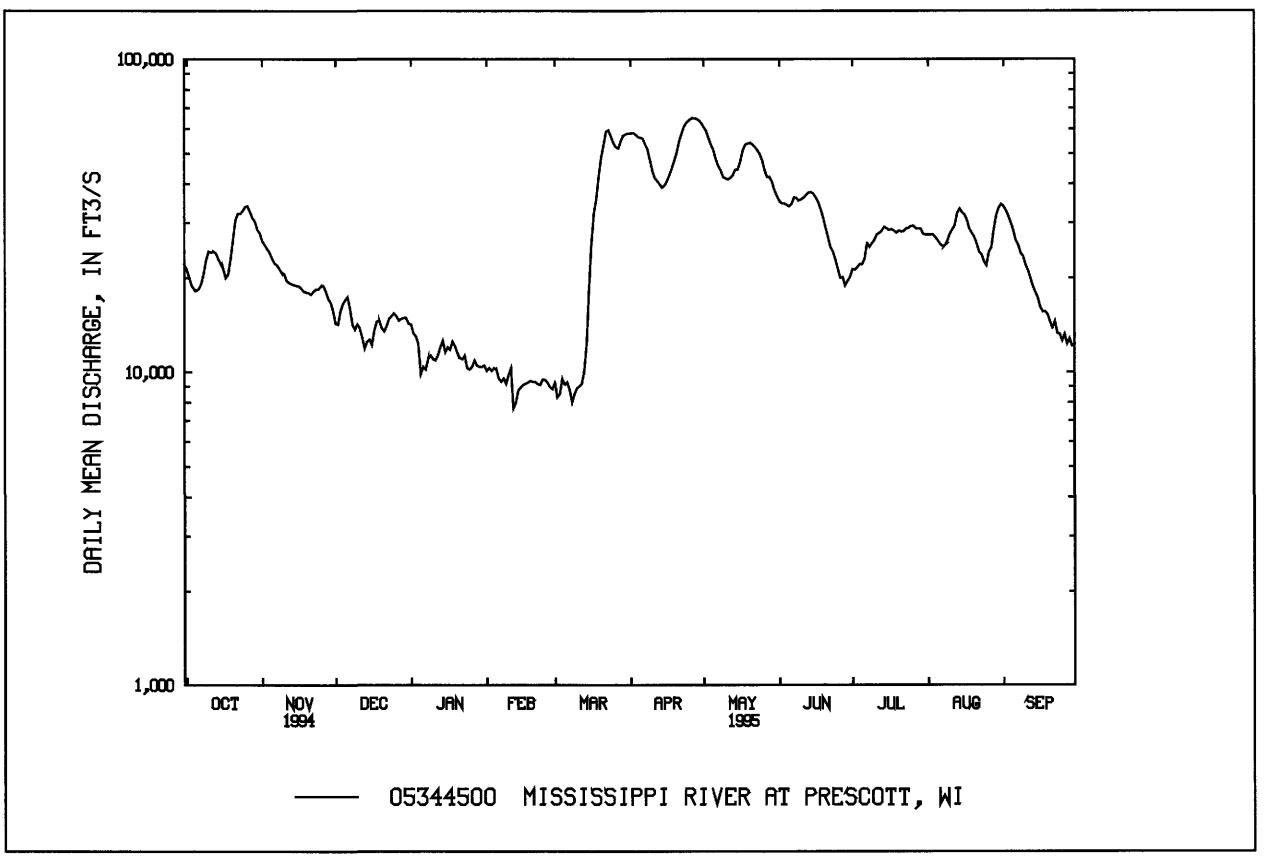
05344500 MISSISSIPPI RIVER AT PRESCOTT, WI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	13330	12900	9714	8117	7982	17100	40120	31830	25700	20160	13230	12920
MAX	49740	40360	21460	16060	21390	55010	117600	90100	69890	87420	48350	45950
(WY)	1987	1972	1983	1983	1966	1983	1965	1986	1993	1993	1993	1986
MIN	3526	3874	3379	3153	3519	4369	7215	6304	4185	3197	2366	3002
(WY)	1933	1977	1934	1935	1934	1934	1931	1931	1934	1934	1934	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1928 - 1995	
ANNUAL TOTAL	9260800		9636430			
ANNUAL MEAN	25370		26400		17800[a]	
HIGHEST ANNUAL MEAN					38540	1986
LOWEST ANNUAL MEAN					4367	1934
HIGHEST DAILY MEAN	72700	May 4	64900	Apr 27	226000	Apr 18 1965
LOWEST DAILY MEAN	10600	Feb 9	7660	Feb 12	1380	Jul 13 1940
ANNUAL SEVEN-DAY MINIMUM	11000	Feb 9	8700	Feb 12	2190	Aug 11 1936
INSTANTANEOUS PEAK FLOW			65000	Apr 26	228000	Apr 18 1965
INSTANTANEOUS PEAK STAGE			32.82	Apr 26	43.11	Apr 18 1965
ANNUAL RUNOFF (AC-FT)	18370000		19110000		12900000	
ANNUAL RUNOFF (CFSM)	.57		.59		.40	
ANNUAL RUNOFF (INCHES)	7.69		8.00		5.40	
10 PERCENT EXCEEDS	41100		52100		39000	
50 PERCENT EXCEEDS	23000		23400		11500	
90 PERCENT EXCEEDS	12900		10100		5010	

a Median of annual mean discharges if 17800 ft^3/s.



VERMILLION RIVER BASIN

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 west of Empire and 4 mi northeast of Farmington.

DRAINAGE AREA.--110 mi².

PERIOD OF RECORD.--May 1942 to June 1945 (no record during July, August, and September 1944), September 1969 to September 1973 (discharge measurements only), October 1973 to current year. Prior to October 1975 published as "near Empire City".

GAGE.--Water-stage recorder. Datum of gage is 851.99 ft above mean sea level (levels by U.S. Army Corps of Engineers). April 12, 1942, to June 30, 1944, and October 1, 1944, to July 7, 1945, nonrecording gage at same site and present datum.

REMARKS.--Records good. Some regulation at low-flow by sewage plant upstream.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1965, reached a stage of 7.5 ft, from information by local resident, discharge 6,200 ft³/s, from rating extended above 2,100 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 8	2000	261	5.54	Mar. 27	0700	229	5.28
Oct. 19	0230	374	6.04	Apr. 19	1830	210	5.11
Mar. 13	0200	*398	*6.12	June 8	0830	339	5.90

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	88	101	79	60	45	e43	126	100	109	94	62	52
2	85	101	82	e56	44	46	118	97	105	88	60	50
3	131	99	83	e55	44	44	113	95	100	82	57	47
4	192	97	82	e54	44	44	103	93	93	79	56	47
5	185	95	82	54	43	45	99	91	91	83	60	47
6	145	92	76	53	43	46	97	94	108	92	63	46
7	205	91	74	52	42	45	96	94	216	83	83	46
8	256	88	73	51	41	44	96	97	321	78	75	45
9	222	87	74	50	42	45	93	115	231	77	65	44
10	173	86	71	49	43	47	90	115	184	74	60	43
11	152	85	68	50	e42	82	98	106	193	71	59	43
12	140	83	69	50	e39	269	158	100	165	68	57	42
13	129	86	67	51	41	341	173	104	140	67	95	42
14	121	87	65	52	40	237	140	150	122	63	147	41
15	116	82	65	51	41	176	128	135	112	77	103	41
16	120	80	66	51	41	145	119	117	105	87	74	42
17	172	80	66	54	41	127	115	107	99	79	71	41
18	285	80	67	52	43	114	132	100	96	71	67	41
19	325	78	66	51	43	108	201	94	93	68	70	46
20	229	76	66	50	45	110	179	91	88	68	71	47
21	193	104	66	49	46	111	156	87	86	62	64	44
22	181	118	67	49	45	100	146	93	83	83	61	44
23	165	98	68	48	45	101	133	101	82	91	57	43
24	139	93	67	46	46	103	127	92	90	72	56	43
25	130	88	65	45	47	105	119	88	90	66	54	45
26	133	83	65	45	46	178	113	83	114	64	52	43
27	129	84	66	45	46	223	109	89	111	66	53	41
28	121	87	67	45	45	203	106	154	121	67	54	40
29	105	82	67	45	---	171	105	190	116	61	54	41
30	105	77	66	45	---	150	104	141	102	58	58	45
31	99	---	65	45	---	135	---	118	---	60	58	---
TOTAL	4971	2668	2170	1553	1213	3738	3692	3331	3766	2299	2076	1322
MEAN	160	88.9	70.0	50.1	43.3	121	123	107	126	74.2	67.0	44.1
MAX	325	118	83	60	47	341	201	190	321	94	147	52
MIN	85	76	65	45	39	43	90	83	82	58	52	40
AC-FT	9860	5290	4300	3080	2410	7410	7320	6610	7470	4560	4120	2620

e Estimated.

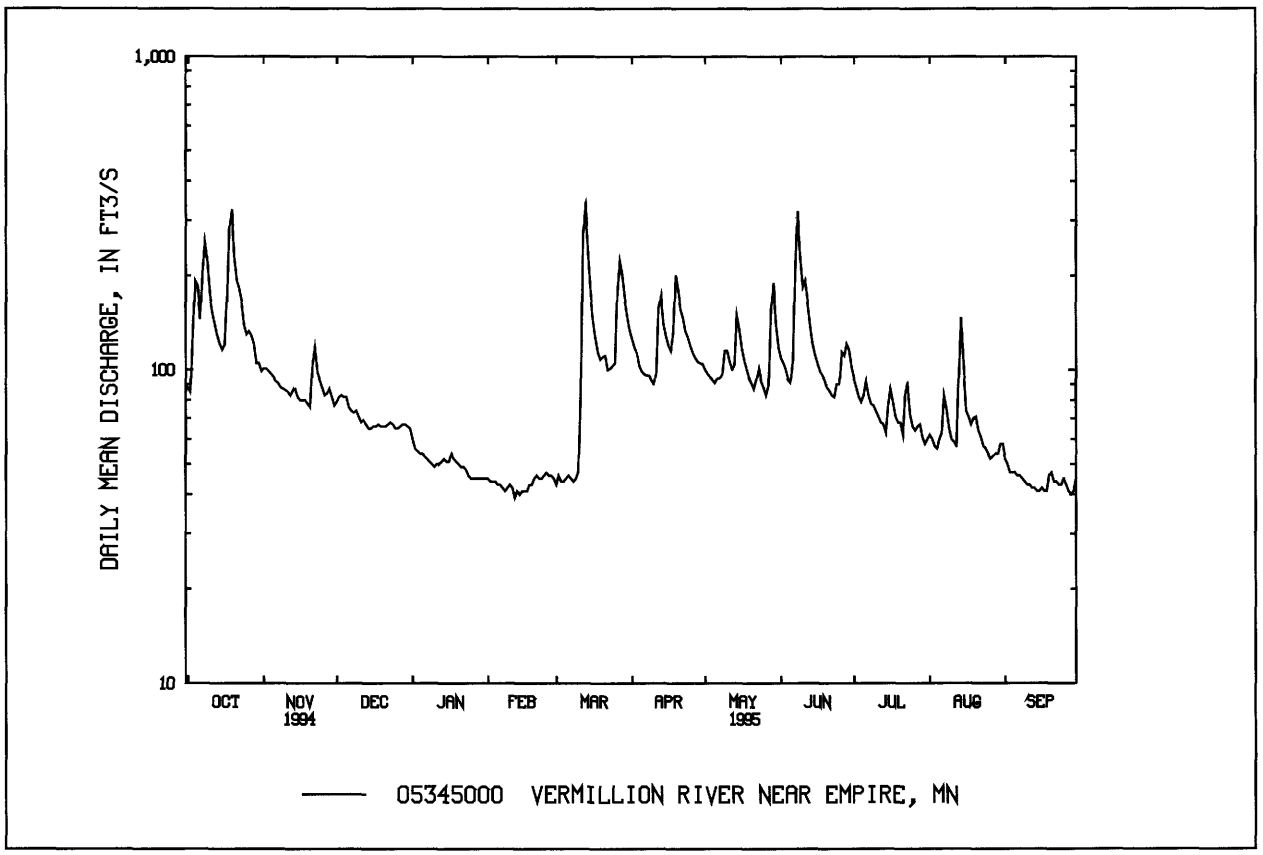
VERMILLION RIVER BASIN

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	52.1	46.4	37.4	29.3	33.3	97.7	98.3	87.9	85.9	59.3	49.8	64.5
MAX	160	133	79.5	52.6	85.2	199	244	223	290	203	180	310
(WY)	1995	1993	1993	1993	1984	1983	1983	1986	1993	1993	1993	1992
MIN	14.9	15.6	12.4	11.0	13.1	25.4	35.2	29.3	23.0	16.0	14.3	14.6
(WY)	1977	1977	1977	1977	1977	1975	1977	1977	1988	1988	1976	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1943 - 1995	
ANNUAL TOTAL	32225		32799			
ANNUAL MEAN	88.3		89.9		61.6	
HIGHEST ANNUAL MEAN					142	1993
LOWEST ANNUAL MEAN					23.6	1977
HIGHEST DAILY MEAN	740	Jun 6	341	Mar 13	2910	Sep 16 1992
LOWEST DAILY MEAN	36	Jan 24	39	Feb 12	8.4	Jan 15 1975
ANNUAL SEVEN-DAY MINIMUM	36	Jan 24	41	Feb 11	9.0	Jan 13 1975
INSTANTANEOUS PEAK FLOW			398	Mar 13	6570	Sep 16 1992
INSTANTANEOUS PEAK STAGE			6.12	Mar 13	10.00	Sep 16 1992
INSTANTANEOUS LOW FLOW			39	Feb 12	6.8	Aug 15 1992
ANNUAL RUNOFF (AC-FT)	63920		65060		44660	
10 PERCENT EXCEEDS	148		150		121	
50 PERCENT EXCEEDS	73		82		40	
90 PERCENT EXCEEDS	44		44		20	



CANNON RIVER BASIN

05353800 STRAIGHT RIVER NEAR FARIBAULT, MN

LOCATION.--Lat 44°15'29", long 93°13'51", in NW¼SE¼ sec.9, T.109 N., R.20 W., Rice County, Hydrologic Unit 07040002, on right bank 15 ft downstream from highway bridge, 2.8 mi upstream from Falls Creek and 3.2 mi southeast of Faribault.

DRAINAGE AREA.--442 mi².

PERIOD OF RECORD.--October 1965 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,034.58 ft above mean sea level.

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

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 08	1800	1520	6.96	Mar. 13	1300	*1640	*7.14

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	367	267	e186	95	e60	e59	530	547	607	280	234	90
2	352	261	e179	124	e61	e60	463	522	533	233	205	83
3	647	251	e172	135	e61	e61	424	490	468	201	182	78
4	868	232	e171	123	e52	e62	365	468	407	180	165	70
5	821	222	e163	e115	e51	e62	341	446	368	173	219	66
6	712	215	161	e109	e51	e61	330	417	398	176	276	81
7	1300	208	180	e102	e51	e53	306	396	529	152	386	76
8	1510	206	e170	e98	e49	e53	312	413	594	135	380	70
9	1450	201	e168	e92	e50	e66	316	483	555	124	299	65
10	1260	191	e162	e88	e52	e150	323	528	480	116	245	62
11	1030	188	161	e84	e50	359	345	513	421	111	216	59
12	801	187	e155	e83	e46	672	779	463	362	102	192	65
13	672	189	e151	e81	e45	978	998	499	325	98	187	63
14	595	191	e150	e80	e43	578	876	967	310	91	170	54
15	547	183	e150	e80	e43	502	745	1220	277	95	283	57
16	519	182	e150	e86	e43	456	637	1160	254	107	346	54
17	517	191	e148	e90	e45	358	584	934	233	95	414	47
18	563	189	e146	e84	e48	297	655	717	215	87	496	48
19	591	170	e143	e76	e54	257	976	597	200	117	389	106
20	556	166	e146	e73	e59	256	1160	523	188	133	280	95
21	505	228	e149	e72	e62	266	1270	464	178	124	232	102
22	464	215	e148	e69	e65	256	1370	429	167	160	199	90
23	426	210	e147	e67	e69	307	1370	455	160	122	177	83
24	391	218	e145	e65	e72	370	1330	450	151	107	160	82
25	366	201	e144	e64	e74	367	1140	401	145	98	146	92
26	344	189	e142	e63	e73	641	908	368	142	174	133	92
27	328	187	e141	e63	e69	1040	762	357	192	353	121	91
28	317	199	e140	e61	e62	1210	667	506	377	433	115	85
29	304	181	e138	e60	---	1040	605	778	404	552	116	76
30	280	176	167	e60	---	803	569	871	357	520	107	88
31	270	---	143	e60	---	633	---	748	---	328	97	---
TOTAL	19673	6094	4816	2602	1560	12333	21456	18130	9997	5777	7167	2270
MEAN	635	203	155	83.9	55.7	398	715	585	333	186	231	75.7
MAX	1510	267	186	135	74	1210	1370	1220	607	552	496	106
MIN	270	166	138	60	43	53	306	357	142	87	97	47
AC-FT	39020	12090	9550	5160	3090	24460	42560	35960	19830	11460	14220	4500
CFSM	1.44	.46	.35	.19	.13	.90	1.62	1.32	.75	.42	.52	.17
IN.	1.66	.51	.41	.22	.13	1.04	1.81	1.53	.84	.49	.60	.19

e Estimated.

CANNON RIVER BASIN

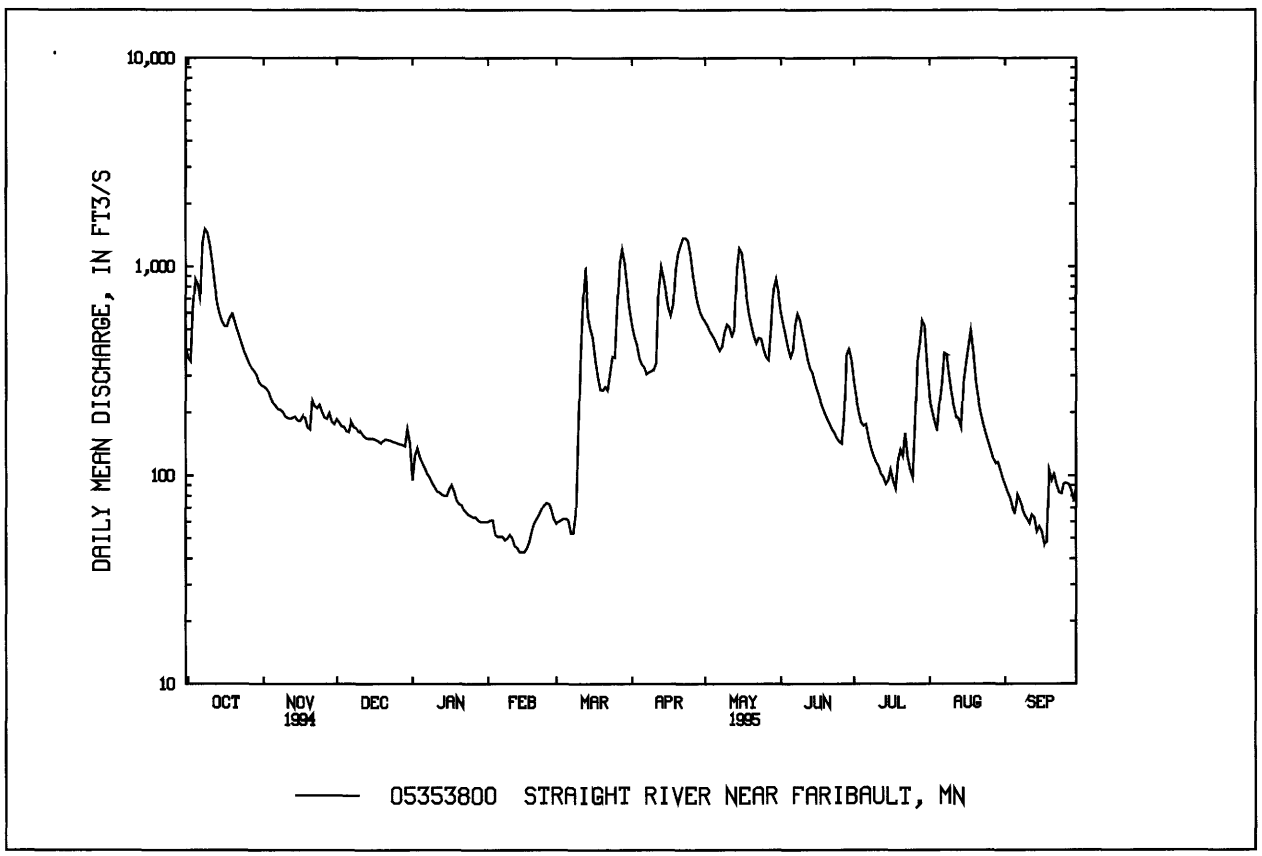
05353800 STRAIGHT RIVER NEAR FARIBAULT, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	231	194	120	68.6	112	524	623	435	368	295	220	177
MAX	831	595	336	167	837	1270	1912	1224	1399	1027	1136	645
(WY)	1969	1971	1983	1992	1984	1973	1993	1973	1993	1993	1979	1993
MIN	17.0	15.1	11.0	11.0	12.9	26.4	70.2	58.1	45.8	26.2	16.2	16.0
(WY)	1977	1977	1977	1977	1968	1968	1977	1976	1976	1988	1976	1976

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1966 - 1995	
ANNUAL TOTAL	117729		111875			
ANNUAL MEAN	323		307		281	
HIGHEST ANNUAL MEAN					754	1993
LOWEST ANNUAL MEAN					43.9	1977
HIGHEST DAILY MEAN	1560	Apr 27	1510	Oct 8	5410	May 2 1973
LOWEST DAILY MEAN	56	Feb 1	43a	Feb 14-16	11	Feb 18 1968
ANNUAL SEVEN-DAY MINIMUM	58	Jan 31	45	Feb 12	11	Feb 18 1968
INSTANTANEOUS PEAK FLOW			1640	Mar 13	6030	Jul 7 1990
INSTANTANEOUS PEAK STAGE			7.14	Mar 13	12.74	Mar 5 1974
INSTANTANEOUS LOW FLOW			43a	Feb 14-16	10	Mar 5 1974
ANNUAL RUNOFF (AC-FT)	233500		221900		203800	
ANNUAL RUNOFF (CFSM)	.73		.69		.64	
ANNUAL RUNOFF (INCHES)	9.91		9.42		8.65	
10 PERCENT EXCEEDS	682		672		705	
50 PERCENT EXCEEDS	215		189		120	
90 PERCENT EXCEEDS	70		62		29	

a Estimated, backwater from ice.



CANNON RIVER BASIN

05355200 CANNON RIVER AT WELCH, MN

LOCATION.--Lat 44°33'50", long 92°43'55", in NW¼SW¼ sec. 27, T. 113 N., R. 16 W., Goodhue County, on right bank 0.3 mile downstream from highway bridge at Welch and 1.8 miles upstream from Belle Creek.

DRAINAGE AREA.--1,320 mi², approximately.

PERIOD OF RECORD.--June 1909 to January 1914 (no winter records 1909-11), November 1930 to September 1971, October 1972 to Septmber 1987 (annual maximum only), October 1991 to current year.

REVISED RECORDS.--WSP 1308: 1912(M). WSP 1508: 1933. WSP 1914: 1960.

GAGE.--Water-stage recorder. Datum of gage is 699.16 ft above mean sea level. Prior to Nov. 11, 1930, nonrecording gage on highway bridge at site 0.3 mile upstream at datum 3.00 ft lower. Nov. 11, 1930, to Oct. 11, 1938, water-stage recorder at site 0.3 mile upstream at present datum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, 17.1 ft, present datum, in April 1888, from floodmark at mill about 2,400 ft upstream.

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e980	e765	e713	e548	e315	e252	e1490	e1360	1130	799	682	524
2	e891	e730	e721	e536	e314	e253	e1380	e1300	1030	746	591	543
3	e928	e726	e720	e461	e316	e269	e1300	e1260	959	702	565	418
4	e1220	e693	e726	e415	e300	e272	e1230	e1200	846	510	520	416
5	e1490	e670	e725	e410	e295	e272	e1080	e1120	809	480	632	396
6	e1540	e649	e707	e400	e300	e264	e1080	e1050	780	532	739	435
7	e1600	e633	e687	e403	e316	e278	e1030	e1030	954	419	875	389
8	e1960	e641	e671	e405	e317	e282	e1010	e980	1340	500	899	404
9	e2270	e629	e671	e390	e305	e289	e971	e1030	1340	422	881	404
10	e2320	e625	e673	e380	e298	e300	e951	e1120	1270	415	797	394
11	e2190	e618	e671	e400	e233	e423	e965	e1100	1170	412	719	380
12	e1960	e616	e671	e402	e205	e892	e1100	e1110	1080	394	651	373
13	e1730	e621	e643	e410	e210	e1030	e1390	e1090	975	393	1080	373
14	e1570	e646	e619	e392	e205	e1070	e1590	e1220	871	378	1000	348
15	e1460	e629	e616	e381	e200	e1150	e1600	e1420	808	531	833	324
16	e1380	e618	e616	e371	e200	e1060	e1540	e1640	774	472	851	306
17	e1390	e616	e618	e387	e205	e931	e1500	e1670	748	436	982	279
18	e1430	e652	e622	e386	e211	e891	e1430	e1530	744	413	1070	275
19	e1430	e652	e622	e377	e212	e857	e1590	e1330	631	438	1180	424
20	e1430	e611	e618	e364	e211	e792	e1790	e1230	640	531	1070	369
21	e1390	e633	e610	e354	e215	e828	e1920	e1070	586	474	992	381
22	e1340	e699	e602	e340	e229	e935	e2040	e994	545	583	960	387
23	e1280	e741	e594	e330	e256	e984	e2150	e953	555	723	940	352
24	e1210	e731	e582	e336	e275	e1010	e2210	e934	592	613	855	392
25	e1160	e711	e577	e336	e294	e1050	e2200	e901	534	674	809	382
26	e1110	e678	e570	e337	e289	e1110	e2110	e836	504	736	737	385
27	e1060	e661	e565	e329	e285	e1280	e1870	e800	606	721	585	361
28	e1020	e680	e556	e323	e276	e1550	e1640	e867	558	904	623	364
29	e947	e682	e556	e317	---	e1760	e1510	e1010	939	814	670	353
30	e835	e676	e556	e312	---	e1770	e1420	e1150	879	900	694	382
31	e802	---	e555	e312	---	e1620	---	e1280	---	844	623	---
TOTAL	43323	19932	19653	11844	7287	25724	45087	35585	25197	17909	25105	11513
MEAN	1398	664	634	382	260	830	1503	1148	840	578	810	384
MAX	2320	765	726	548	317	1770	2210	1670	1340	904	1180	543
MIN	802	611	555	312	200	252	951	800	504	378	520	275
AC-FT	85930	39540	38980	23490	14450	51020	89430	70580	49980	35520	49800	22840
CFSM	1.06	.50	.48	.29	.20	.63	1.14	.87	.64	.44	.61	.29
IN.	1.22	.56	.55	.33	.21	.72	1.27	1.00	.71	.50	.71	.32

e Estimated.

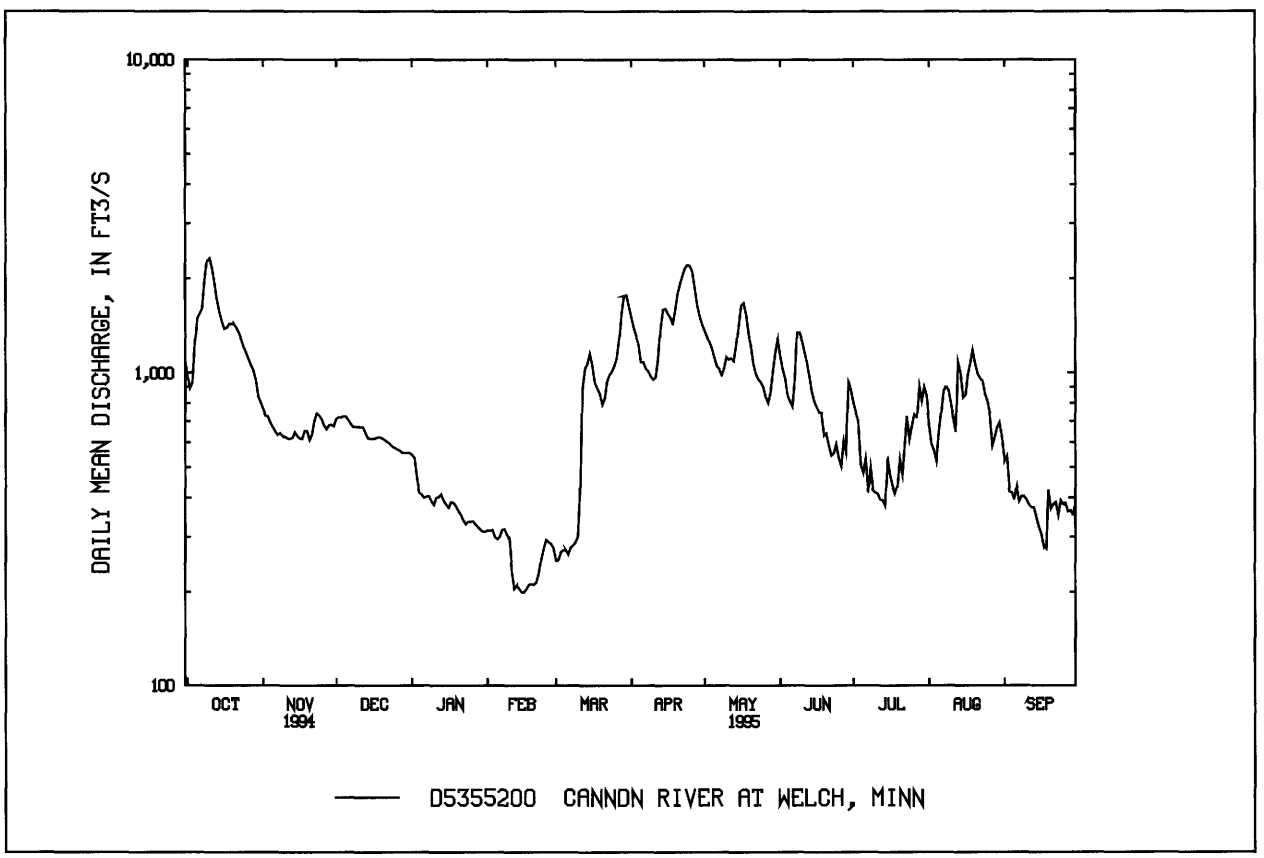
CANNON RIVER BASIN

05355200 CANNON RIVER AT WELCH, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	364	343	273	227	282	959	1304	723	741	529	402	365
MAX	1806	1708	1105	662	1141	2627	8240	2966	4144	3343	2951	1823
(WY)	1969	1971	1992	1992	1966	1992	1965	1944	1993	1993	1993	1993
MIN	65.5	78.8	75.0	76.9	110	149	145	84.9	80.0	71.2	78.1	72.8
(WY)	1934	1934	1938	1938	1913	1911	1911	1934	1934	1934	1936	1933

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1909 - 1995		
ANNUAL TOTAL	346470		288159				
ANNUAL MEAN	949		789		565		
HIGHEST ANNUAL MEAN					2132		1993
LOWEST ANNUAL MEAN					137		1934
HIGHEST DAILY MEAN	2870	May 1	2320	Oct 10	28700	Apr	8 1965
LOWEST DAILY MEAN	289	Aug 9	200	Feb 15-16	19	Jan	2 1950
ANNUAL SEVEN-DAY MINIMUM	306	Aug 3	205	Feb 12	42	Aug	12 1936
INSTANTANEOUS PEAK FLOW			2340	Oct 10	36100	Apr	8 1965
INSTANTANEOUS PEAK STAGE			5.81	Oct 10	14.01	Apr	8 1965
INSTANTANEOUS LOW FLOW			200	Feb 15	2.5	Jan	3 1950
ANNUAL RUNOFF (AC-FT)	687200		571600		409100		
ANNUAL RUNOFF (CFSM)	.72		.60		.43		
ANNUAL RUNOFF (INCHES)	9.76		8.12		5.81		
10 PERCENT EXCEEDS	1600		1430		1220		
50 PERCENT EXCEEDS	765		676		250		
90 PERCENT EXCEEDS	475		310		97		



ZUMBRO RIVER BASIN

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 downstream from 37th Street bridge, 0.2 mi upstream from sewer plant, and 2.0 mi downstream from Silver Lake Dam.

DRAINAGE AREA.--303 mi².

PERIOD OF RECORD.--March 1981 to current year.

GAGE.--Water-stage recorder. Datum of gage is 950.00 ft above mean sea level.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Slight regulation at times from Silver Lake.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 6, 1978, reached a stage of about 28.0 ft, on upstream side of bridge, discharge 30,500 ft³/s. This is the highest known stage since at least 1908.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Mar. 12	0430	*1160	*5.86	(No peaks above base discharge).			

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	156	120	107	69	61	59	312	276	276	261	111	69
2	169	119	113	79	61	60	284	264	262	227	103	65
3	194	119	112	72	60	60	268	252	242	208	98	62
4	247	119	112	70	52	62	243	242	222	185	100	61
5	275	119	110	62	52	62	228	237	209	190	155	61
6	243	116	102	61	51	62	225	222	206	174	137	65
7	253	111	94	61	53	54	218	215	294	156	117	65
8	245	112	110	61	49	53	217	227	253	142	110	62
9	232	110	109	61	50	55	217	230	246	138	104	61
10	208	105	80	61	52	78	215	223	226	127	98	59
11	196	106	83	61	54	279	252	212	214	123	95	56
12	188	100	94	63	47	1030	392	201	201	117	87	55
13	176	106	93	68	46	671	482	237	179	112	116	53
14	163	113	93	68	44	478	396	293	171	104	274	52
15	156	109	93	65	43	360	351	326	160	101	160	52
16	152	104	93	68	43	295	335	287	153	103	164	48
17	177	104	93	82	44	257	323	260	142	96	185	46
18	191	106	91	69	47	230	410	240	130	93	184	58
19	208	107	89	71	51	213	595	224	123	133	141	149
20	204	111	97	65	59	220	543	214	121	121	122	84
21	191	151	98	65	60	216	582	203	118	174	113	78
22	178	133	98	61	64	212	703	211	113	191	105	68
23	170	116	92	63	68	217	577	210	230	132	98	65
24	158	116	86	57	71	224	496	204	222	120	97	64
25	153	115	90	61	76	227	437	190	194	126	89	66
26	154	105	95	55	73	321	390	179	224	170	79	62
27	143	110	95	58	73	572	358	195	277	159	79	62
28	140	110	89	58	65	545	327	258	441	147	86	60
29	134	109	82	58	---	492	304	362	428	149	93	56
30	126	97	93	58	---	412	288	382	335	125	78	93
31	120	---	82	55	---	353	---	313	---	120	72	---
TOTAL	5700	3378	2968	1986	1569	8429	10968	7589	6612	4524	3650	1957
MEAN	184	113	95.7	64.1	56.0	272	366	245	220	146	118	65.2
MAX	275	151	113	82	76	1030	703	382	441	261	274	149
MIN	120	97	80	55	43	53	215	179	113	93	72	46
AC-FT	11310	6700	5890	3940	3110	16720	21760	15050	13110	8970	7240	3880
CFSM	.61	.37	.32	.21	.18	.90	1.21	.81	.73	.48	.39	.22

e Estimated.

ZUMBRO RIVER BASIN

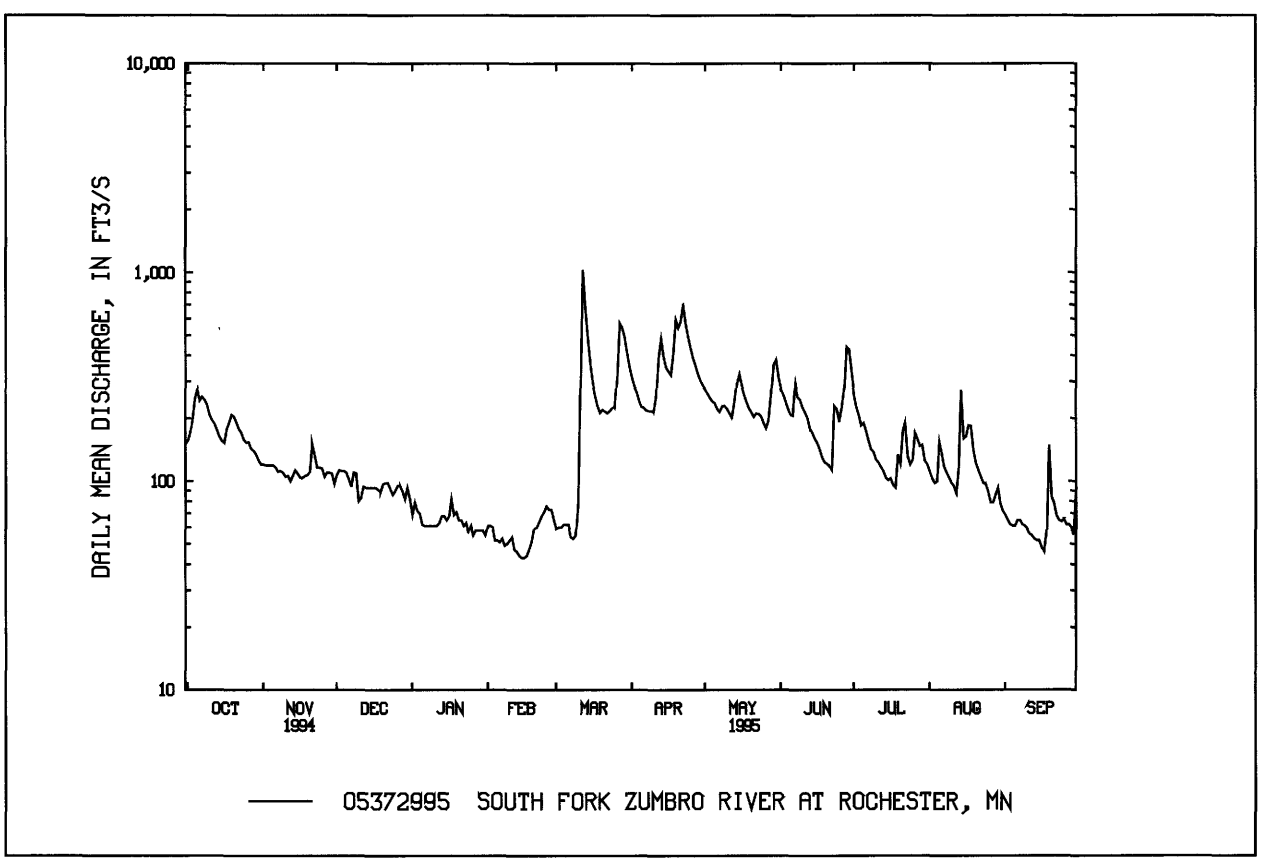
05372995 SOUTH FORK ZUMBRO RIVER AT ROCHESTER, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1981 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	175	157	132	81.1	125	385	417	321	229	227	167	195
MAX	824	338	358	167	454	760	1211	617	1014	663	501	1075
(WY)	1987	1992	1992	1983	1984	1983	1993	1991	1993	1993	1990	1986
MIN	20.0	24.5	21.0	22.5	23.8	165	106	88.3	49.0	23.2	24.6	31.5
(WY)	1990	1990	1990	1990	1990	1987	1981	1989	1989	1988	1988	1988

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1981 - 1995	
ANNUAL TOTAL	61519		59330			
ANNUAL MEAN	169		163		219	
HIGHEST ANNUAL MEAN					431	1993
LOWEST ANNUAL MEAN					87.3	1989
HIGHEST DAILY MEAN	1450	Mar 6	1030	Mar 12	7710	Sep 21 1986
LOWEST DAILY MEAN	62	Jul 3	43	Feb 15	12	Sep 12 1988
ANNUAL SEVEN-DAY MINIMUM	67	Jul 12	45	Feb 12	14	Sep 8 1988
INSTANTANEOUS PEAK FLOW			1160	Mar 12	10000	Sep 21 1986
INSTANTANEOUS PEAK STAGE			5.86	Mar 12	20.77	Sep 21 1986
INSTANTANEOUS LOW FLOW			43a	Feb 14	10b	Oct 23 1981
ANNUAL RUNOFF (AC-FT)	122000		117700		158900	
ANNUAL RUNOFF (CFSM)	.56		.54		.72	
10 PERCENT EXCEEDS	263		299		485	
50 PERCENT EXCEEDS	115		118		122	
90 PERCENT EXCEEDS	73		59		40	

a Also occurred Feb 15-17, and Mar 8.
b Result of regulation.



WHITEWATER RIVER BASIN

05376800 WHITEWATER RIVER NEAR BEAVER, MN

LOCATION.--Lat 44° 00'19", long 92 °00'19", in SW¼ SE¼ sec. 15, T. 108 N., R. 10 W., Winona County, Hydrologic Unit 07040003, on left bank at downstream side of bridge on County Road No. 30, 0.5 mi above mouth of Beaver Creek, and 4.7 mi north of Elba.

PERIOD OF RECORD.--May 1975 to September 1985, May 1991 to July 1993, October 1993 to current.

GAGE.--Water-stage recorder. Datum of gage is 692.01 ft above mean sea level. Prior to Oct. 1, 1976, at datum 2.00 ft higher.

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1939, 19,200 ft^3/s, June 21, 1974, gage height, 13.00 ft, present datum, determined by contracted opening measurement.

EXTREMES FOR CURRENT RECORD.--Peak discharge greater than base discharge of 2,000 ft^3/s and maximum (*).

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage heightt (ft)
Mar. 12	--	*2240	*7.65	(No other peak greater than base discharge)			

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e174	e164	e161	e125	e111	e136	e229	e205	195	172	141	136
2	e179	e163	e164	e113	e111	e137	e218	e200	191	164	140	135
3	e188	e163	e162	e112	e111	e137	e214	e192	183	160	139	134
4	e204	e163	e162	e112	e111	e138	e208	e188	175	160	139	133
5	e214	e164	e162	e112	e111	e138	e205	e185	170	172	142	131
6	e208	e162	e158	e112	e111	e135	e205	e180	173	170	142	134
7	e213	e160	e155	e112	e111	e132	e204	e180	186	159	142	133
8	e206	e161	e163	e112	e111	e131	e203	e178	314	155	141	132
9	e201	e160	e162	e112	e111	e133	e204	e176	247	154	140	131
10	e193	e159	e146	e112	e111	e149	e204	e176	230	151	140	130
11	e170	e159	e140	e112	e111	e450	e214	e176	219	150	138	130
12	e150	e156	e138	e114	e111	e1020	e249	e176	203	150	136	130
13	e145	e159	e138	e118	e111	e490	e267	185	191	149	163	130
14	e145	e162	e136	e120	e111	e300	e250	223	183	147	243	127
15	e152	e161	e136	e125	e111	e275	e242	205	175	148	192	127
16	e169	e158	e136	e120	e111	e250	e244	181	171	153	174	127
17	e179	e159	e134	e118	e111	e223	e233	175	166	151	214	126
18	e185	e160	e136	e116	e111	e206	e246	172	161	146	176	127
19	e191	e160	e136	e114	e112	e203	e278	169	157	154	160	149
20	e190	e162	e136	e112	e114	e205	e271	163	156	157	150	145
21	e189	e180	e138	e112	e118	e203	e279	162	155	150	146	135
22	e185	e172	e139	e112	e119	e203	e303	173	153	153	143	129
23	e183	e165	e140	e112	e122	e206	e289	168	153	152	141	124
24	e178	e166	e139	e112	e126	e210	e267	162	166	147	141	133
25	e176	e169	e138	e112	e128	e211	e255	161	162	145	139	130
26	e176	e160	e138	e112	e130	e235	e247	157	180	146	140	127
27	e172	e161	e138	e112	e146	e285	e236	164	185	146	141	125
28	e171	e162	e138	e112	e141	e278	e227	206	225	147	146	123
29	e169	e161	e134	e112	---	e267	e220	250	208	143	148	122
30	e167	e154	e132	e112	---	e257	e217	221	189	140	144	135
31	e164	---	e131	e112	---	e246	---	199	---	140	139	---
TOTAL	5586	4865	4466	3535	3254	7589	7128	5708	5622	4731	4720	3930
MEAN	180	162	144	114	116	245	238	184	187	153	152	131
MAX	214	180	164	125	146	1020	303	250	314	172	243	149
MIN	145	154	131	112	111	131	203	157	153	140	136	122
AC-FT	11080	9650	8860	7010	6450	15050	14140	11320	11150	9380	9360	7800
CFSM	.66	.60	.53	.42	.43	.90	.88	.68	.69	.56	.56	.48
IN.	.77	.67	.61	.49	.45	1.04	.98	.78	.77	.65	.65	.54

e Estimated.

WHITEWATER RIVER BASIN

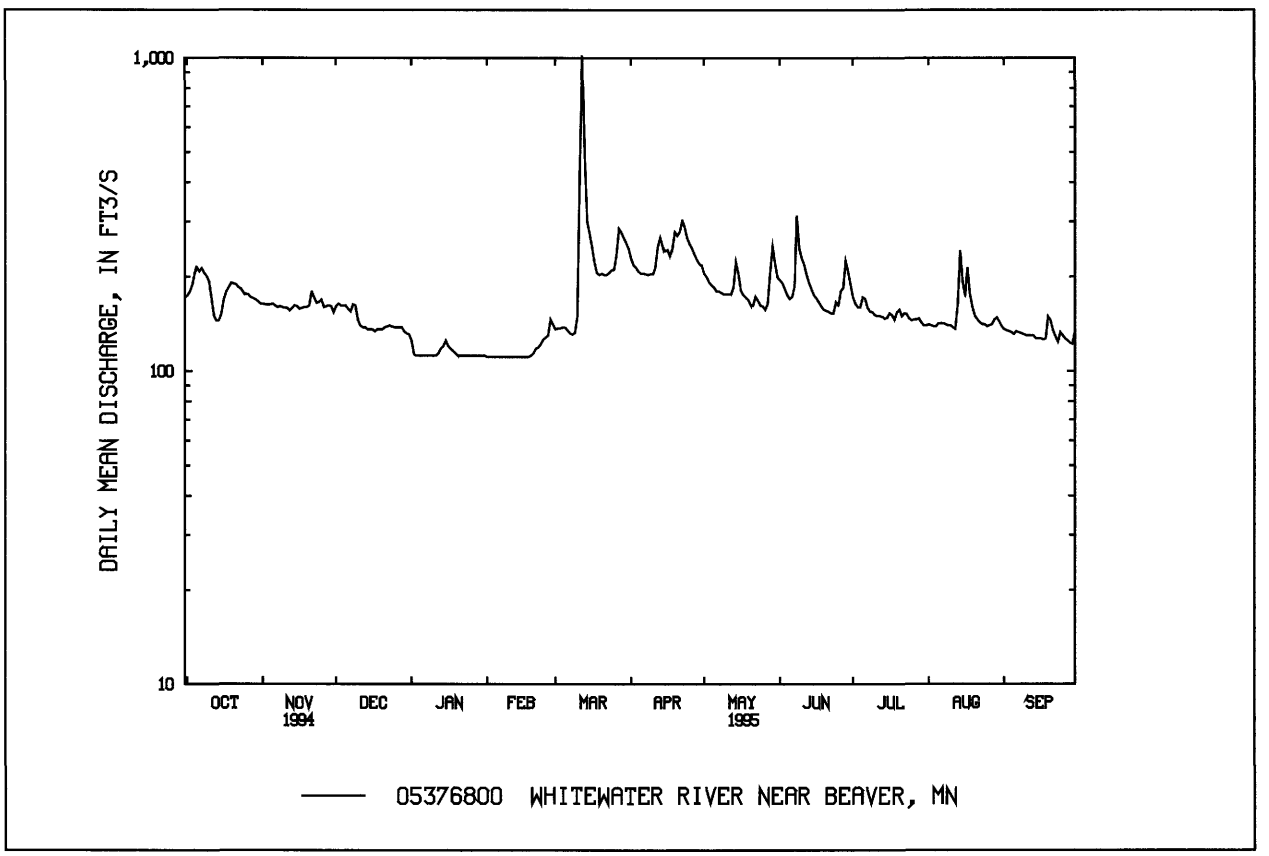
05376800 WHITEWATER RIVER NEAR BEAVER, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	142	157	142	126	145	261	200	184	174	227	148	144
MAX	223	288	235	188	236	512	282	255	240	973	205	230
(WY)	1994	1992	1992	1980	1985	1985	1992	1984	1980	1978	1979	1978
MIN	88.0	84.8	77.0	80.6	59.7	84.2	92.9	89.6	112	92.1	87.1	85.5
(WY)	1978	1978	1977	1978	1978	1978	1977	1977	1976	1977	1977	1977

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1975 - 1995	
ANNUAL TOTAL	69415		61134			
ANNUAL MEAN	190		167		168	
HIGHEST ANNUAL MEAN					203	1984
LOWEST ANNUAL MEAN					103	1977
HIGHEST DAILY MEAN	535	Apr 25	1020	Mar 12	8760	Jul 6 1978
LOWEST DAILY MEAN	131	Dec 31	111	Feb 1-18	53	Feb 20 1978
ANNUAL SEVEN-DAY MINIMUM	136	Dec 25	111	Feb 1	53	Feb 20 1978
INSTANTANEOUS PEAK FLOW			2240a	Mar 12	15400	Jul 6 1978
INSTANTANEOUS PEAK STAGE			7.65a	Mar 12	12.88	Jul 6 1978
ANNUAL RUNOFF (AC-FT)	137700		121300		121500	
ANNUAL RUNOFF (CFSM)	.70		.62		.62	
ANNUAL RUNOFF (INCHES)	9.53		8.39		8.41	
10 PERCENT EXCEEDS	249		224		238	
50 PERCENT EXCEEDS	172		158		145	
90 PERCENT EXCEEDS	145		112		93	

a From floodmark.



MISSISSIPPI RIVER MAIN STEM

05378500 MISSISSIPPI RIVER AT WINONA, MN

LOCATION.--Lat 44°03'21", long 91°38'16", in sec.23, T.107 N., R.7 W., Winona County, Hydrologic Unit 07040003, on right bank at Winona pumping station in Winona, 9.5 mi upstream from Trempealeau River, and at mile 725.7 upstream from the Ohio River.

DRAINAGE AREA.--59,200 mi^2, approximately.

PERIOD OF RECORD.--June 1928 to current year. Gage-height records collected in this vicinity since 1878 are contained in reports of Mississippi River Commission.

GAGE.--Water-stage recorder. Datum of gage is 639.64 ft above mean sea level. June 10,1928, to Apr. 15, 1931, nonrecording gage at site 800 ft upstream. Prior to Oct. 1, 1929, at datum 0.20 ft higher and Oct. 1, 1929, to Apr. 15, 1931, at datum 0.12 ft lower. Apr. 16, 1931, to Nov. 12, 1934, nonrecording gage at present site and datum. Since Mar. 31, 1937, auxiliary water-stage recorder 2.7 mi upstream at tailwater of navigation dam 5A.

REMARKS.-- Records good except those for estimated days, which are fair. Some regulation by reservoirs, navigation dams, and powerplants at low and medium stages. Flood flow not materially affected by artificial storage.

EXTREMES FOR PERIOD OF RECORD.--Minimum gage height, -3.38 ft, Aug. 31, 1934 (prior to dam construction in 1936); minimum gage height since 1938, after completion of dam, 1.95 ft, Jan. 27, 1944.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 18, 1880, reached an elevation of 657.14 ft, discharge, 172,000 ft^3/s, from information by U.S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40700	40700	25300	e16500	e14500	e13500	76800	81500	62800	29500	37400	57300
2	39900	38600	22600	e16000	e15500	e13200	76500	e80000	59800	29900	36600	60100
3	35000	37200	20500	e16000	e15000	e13000	75800	78300	58400	e31000	36000	59700
4	32200	37400	22300	e15500	e14500	e12500	75000	76900	55400	e32000	34800	55000
5	33800	36700	22300	e14000	e14000	e12200	74600	76200	49200	e32000	34300	51700
6	33800	36300	23700	e14500	e13500	e11700	72900	73400	50300	e33000	34500	48400
7	33300	32800	24800	e14500	e13000	e11400	71300	71000	52100	e33000	34600	45700
8	33000	30200	23800	e14500	e12500	e11000	71100	69700	51700	e34000	34800	41900
9	34000	31300	22400	e15000	e12000	e10800	70400	66700	51500	e34000	34600	39600
10	35400	31200	20300	e15000	e12000	11000	69300	64600	51500	e35000	35000	38100
11	36400	30100	17700	e15500	e12200	11100	66000	64500	51500	e35000	35600	34300
12	37400	28900	e16000	e16000	e12500	24000	63800	63500	51600	e36000	36300	31300
13	37300	28000	e15500	e17000	e13000	36800	63500	63200	51900	e36000	40100	30600
14	37300	27000	e15000	e17500	e13000	40300	63100	64400	52400	e36500	48900	29000
15	36500	26000	e14000	e18500	e13300	43400	61800	66100	52500	e37000	53500	25200
16	34800	26300	e15000	e19000	e13300	48100	62000	66400	52400	e37500	58500	24000
17	33300	26000	e16000	e19000	e13500	50900	63300	66300	52400	e38000	63400	23400
18	33200	24700	e17000	e19500	e13500	55400	64600	66700	51000	e38000	64600	22300
19	33600	25400	e17000	e20000	e14000	58800	64300	67700	47500	e37500	64400	21400
20	36400	26600	e17000	e20000	e14000	60800	64400	69200	e45000	37900	58900	22400
21	39700	26900	e17000	e19500	e14000	62000	66800	70800	e43000	38000	53100	e22000
22	41800	26800	e17000	e19000	e14000	64500	70400	71900	e41000	38500	51500	e21000
23	44100	26500	e17500	e18000	e14000	68600	74500	71400	e39000	38600	46000	e20000
24	46000	26800	e18000	e17000	e14000	72700	78400	70800	e38000	38500	41000	e19500
25	45600	28000	e18000	e16000	e14000	75500	82500	70200	e37000	38500	37900	e19000
26	45500	28000	e18000	e15500	e14000	78400	83400	69300	e35000	38600	36800	17800
27	45300	26800	e17500	e14500	e13500	80500	83700	67800	e34000	38700	38900	17600
28	45400	27500	e17500	e14500	e13500	80000	83600	65900	e32000	38500	41600	17800
29	45900	28900	e17500	e14500	---	78700	82900	65600	31700	38600	45600	18100
30	45400	27800	e17000	e14500	---	77900	82300	65500	31100	38900	49300	18500
31	43200	---	e17000	e14000	---	77400	---	64300	---	38100	53600	---
TOTAL	1195200	895400	580200	510500	379800	1366100	2159000	2149800	1412700	1116300	1372100	952700
MEAN	38550	29850	18720	16470	13560	44070	71970	69350	47090	36010	44260	31760
MAX	46000	40700	25300	20000	15500	80500	83700	81500	62800	38900	64600	60100
MIN	32200	24700	14000	14000	12000	10800	61800	63200	31100	29500	34300	17600
AC-FT	2371000	1776000	1151000	1013000	753300	2710000	4282000	4264000	2802000	2214000	2722000	1890000
CFSM	.65	.50	.32	.28	.23	.74	1.22	1.17	.80	.61	.75	.54

e Estimated.

MISSISSIPPI RIVER MAIN STEM

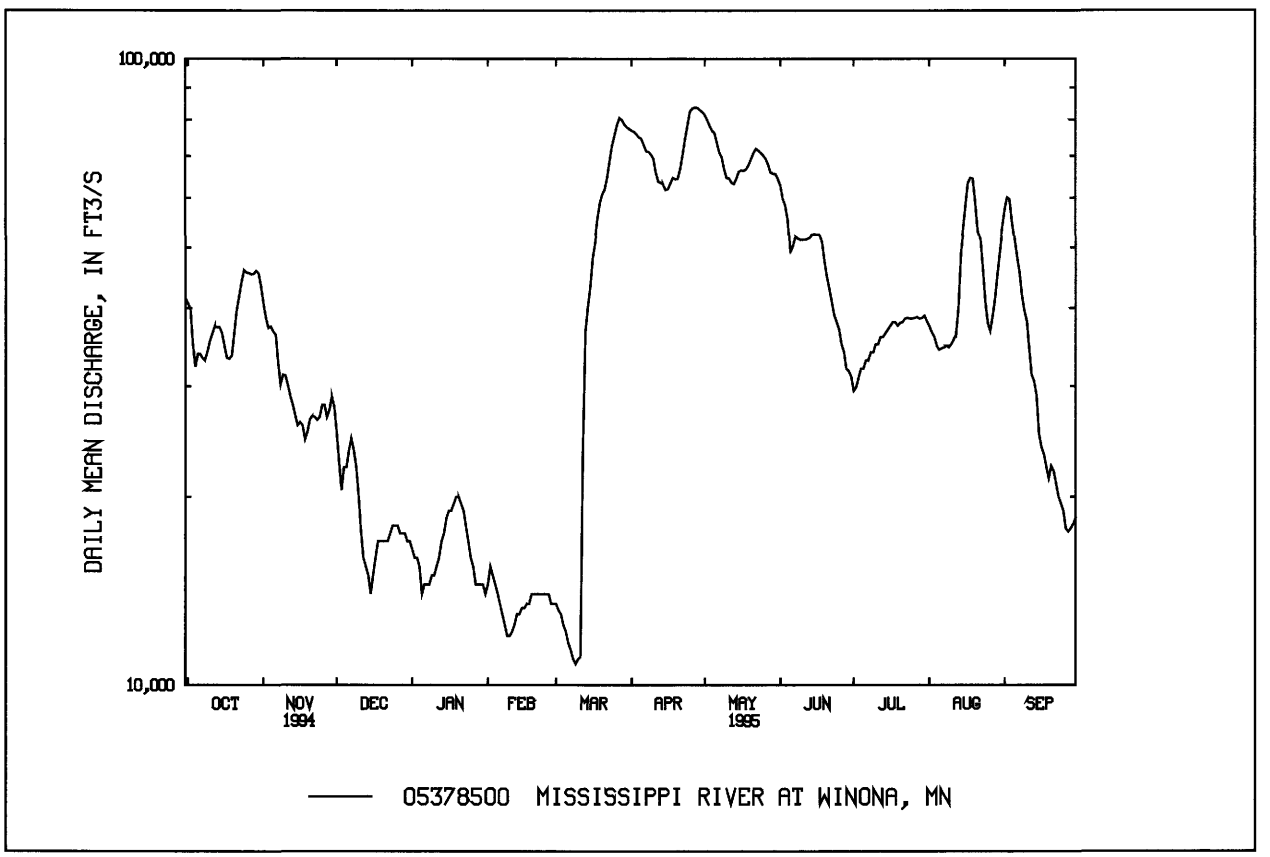
05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	22270	22280	17240	14910	15050	30140	59770	48160	39090	31120	21080	22450
MAX	85950	50040	40440	30480	35900	86420	152600	111500	100200	118800	67560	69490
(WY)	1987	1972	1992	1983	1984	1983	1965	1986	1993	1993	1993	1986
MIN	6774	7367	6286	6742	7874	9023	12810	11930	8450	7063	5391	6790
(WY)	1934	1934	1934	1940	1977	1934	1931	1931	1934	1934	1934	1933

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1928 - 1995	
ANNUAL TOTAL	13748200		14089800			
ANNUAL MEAN	37670		38600		28660	
HIGHEST ANNUAL MEAN					56850	1986
LOWEST ANNUAL MEAN					9742	1934
HIGHEST DAILY MEAN	106000	May 3	83700	Apr 27	264000	Apr 20 1965
LOWEST DAILY MEAN	4000	Dec 15	10800	Mar 9	2250	Dec 29 1933
ANNUAL SEVEN-DAY MINIMUM	15500	Dec 12	11300	Mar 5	3210	Dec 27 1933
INSTANTANEOUS PEAK FLOW			84100	Apr 27	268000	Apr 19 1965
INSTANTANEOUS PEAK STAGE			10.27	Apr 27	20.77a	Apr 19 1965
INSTANTANEOUS LOW FLOW			10800	Mar 9	1940b	Dec 12 1980
ANNUAL RUNOFF (AC-FT)	27270000		27950000		20760000	
ANNUAL RUNOFF (CFSM)	.64		.65		.48	
10 PERCENT EXCEEDS	62600		70400		59600	
50 PERCENT EXCEEDS	34800		36000		20400	
90 PERCENT EXCEEDS	20300		14000		9820	

a From floodmark.
b Result of ice jam.



MISSISSIPPI RIVER MAIN STEM

05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.-- Daily sediment, temperature, and specific conductance station, water years 1976 to 88. Periodic sediment station, water years 1989 to current.
REMARKS.-- Suspended-sediment samples with concentrations of 17 and 10 mg/L were collected at the sampling point. The other two samples were collected at three points in a river cross-section.

SUSPENDED-SEDIMENT CONCENTRATIONS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDI-MENT SUS-SPENDED MG/L (80154	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
APR				
14...	1145	63,600	22	63
14...	1300	--	17	--
AUG				
30...	1100	--	10	--
30...	1405	47,400	41	61

PARTICLE-SIZE DISTRIBUTION OF BED-MATERIAL SEDIMENT, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	NUMBER OF SAM-PLING POINTS (COUNT) (00063)	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)
APR										
14...	1145	3	0	0.1	1.7	38	92	100		
AUG										
30...	1405	3	0	0.1	3.1	46	87	95	98	100

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ROOT RIVER BASIN

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 north of Houston and 1.6 mi upstream from South Fork and 18.2 mi upstream from mouth.

DRAINAGE AREA.--1,270 mi², approximately.

PERIOD OF RECORD.--May 1909 to September 1917, May to November 1929, March 1930 to 1983, 1991 to current year. Operated as high-flow partial-record station October 1983 to September 1990. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 895: Drainage area. WSP 1508: 1911-12. WSP 1628: 1948(P).

GAGE.--Water-stage recorder. Datum of gage is 667.00 ft above mean sea level. May 28, 1909, to Sept. 30, 1917, nonrecording gage at site 1.3 mi downstream at different datum. May 4, 1929, to Sept. 27, 1933, nonrecording gage and Sept. 28, 1933 to June 26, 1980, recording gage at site 0.9 mi upstream at datum 671.86 ft.

REMARKS.--Records good except those for estimated daily discharges, which are fair to poor. Slight diurnal fluctuation at low flows caused by powerplants above station.

EXTREME FOR CURRENT YEAR.--Peak discharges above base of 5,000 ft³/s and maximum (*).

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
*Mar.12	0830	*6240	*11.13		(No other peaks above base.)		

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	789	696	651	e320	e560	559	1420	1470	1410	924	975	e840
2	767	689	638	e290	e585	536	1330	1420	1310	887	889	e800
3	787	688	658	e260	e555	579	1250	1360	1230	830	824	e740
4	793	685	660	e250	e540	577	1170	1320	1160	797	783	e730
5	797	676	660	e250	e490	578	1110	1270	1100	784	761	e710
6	887	664	660	e250	e490	561	1070	1230	1050	800	760	e700
7	900	656	660	e250	e505	546	1080	1190	1070	761	806	e695
8	869	655	653	e250	e480	503	1090	1160	1200	734	798	e680
9	840	652	656	e255	e480	512	1120	1200	1160	717	786	e670
10	837	630	657	e255	e480	570	1180	1210	1120	703	804	e660
11	821	625	592	e260	e450	1120	1290	1180	1070	686	768	e640
12	791	623	533	e270	e460	5120	1420	1150	1030	670	725	e635
13	771	623	e470	e280	e450	3990	1970	1050	982	660	703	e630
14	753	636	e430	e295	e430	2560	2390	1070	945	647	720	e625
15	746	637	e390	e290	e420	2070	2140	1200	910	629	747	e620
16	740	633	e380	e290	e419	1790	1920	1320	877	623	735	e615
17	745	632	e360	e320	e425	1480	1740	1270	846	623	729	e610
18	861	632	e355	e320	e450	1280	1680	1200	820	623	761	e605
19	860	620	e350	e310	e500	1160	1830	1150	795	625	744	e600
20	864	610	e350	e300	e560	1130	2360	1090	759	652	e780	e590
21	871	666	e350	e300	e590	1120	2320	1040	746	682	e779	e585
22	861	692	e355	e300	e630	1120	2340	1000	732	840	e745	e585
23	833	687	e360	e290	e665	1140	2590	1020	721	842	e738	e583
24	799	670	e360	e280	e710	1100	2350	1030	765	774	e725	e581
25	772	660	e360	e290	e725	1080	2160	992	875	714	e720	e580
26	753	660	e355	e300	719	1080	2000	952	842	795	e720	e580
27	745	665	e355	e360	665	1170	1860	929	803	881	e721	e575
28	738	685	e345	e390	636	1730	1720	973	799	1300	e719	e570
29	734	684	e340	e420	---	1800	1620	1100	815	1480	e720	e570
30	717	665	e335	e460	---	1680	1530	1430	884	1530	e725	e565
31	709	---	e330	e500	---	1550	---	1560	---	1110	e740	---
TOTAL	24750	19696	14608	9455	15069	41791	51050	36536	28826	25323	23650	19169
MEAN	798	657	471	305	538	1348	1702	1179	961	817	763	639
MAX	900	696	660	500	725	5120	2590	1560	1410	1530	975	840
MIN	709	610	330	250	419	503	1070	929	721	623	703	565
AC-FT	49090	39070	28970	18750	29890	82890	101300	72470	57180	50230	46910	38020
CFSM	.63	.52	.37	.24	.42	1.06	1.34	.93	.76	.64	.60	.50

e Estimated.

ROOT RIVER BASIN

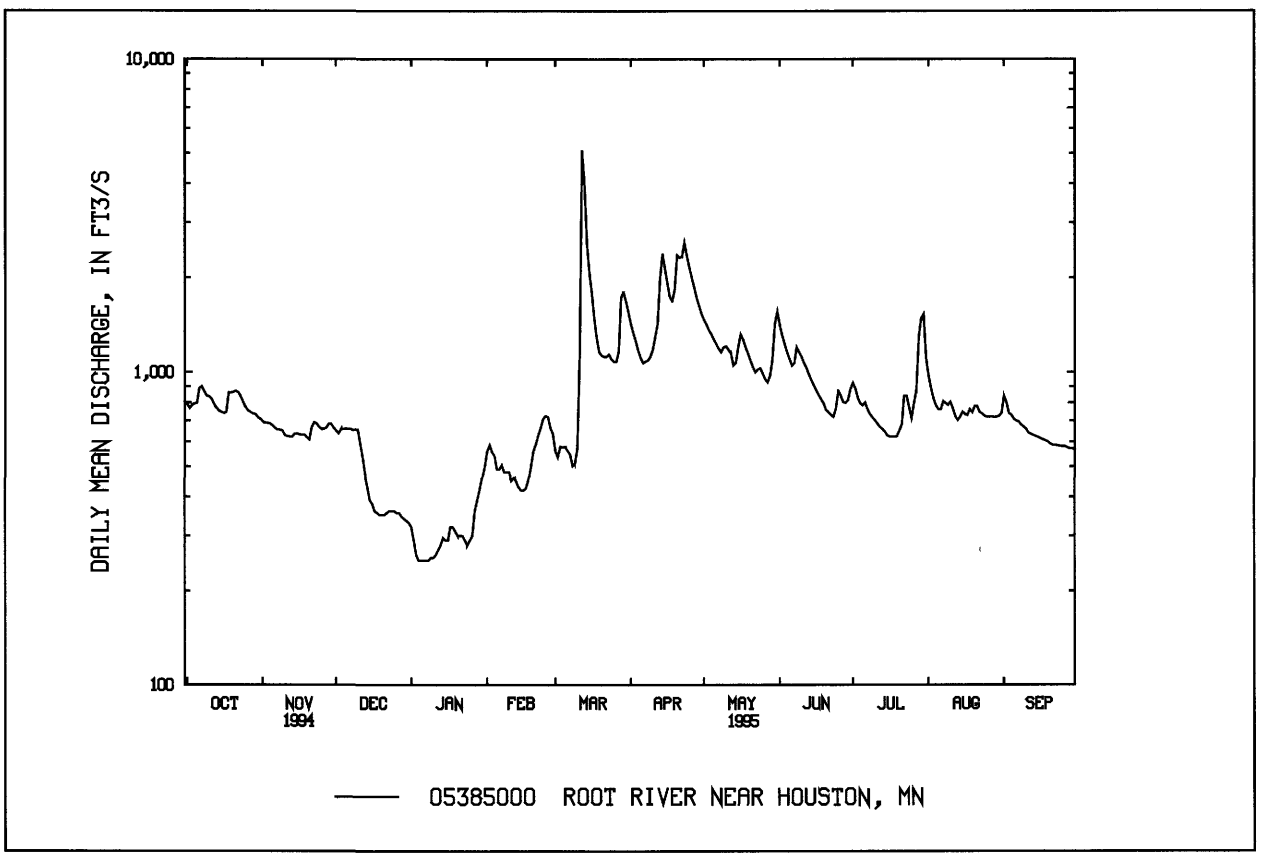
05385000 ROOT RIVER NEAR HOUSTON, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	512	511	428	408	480	1395	1190	823	883	778	640	566
MAX	1465	1494	1671	1152	1427	3512	4963	2440	2803	3252	2257	2105
(WY)	1974	1983	1992	1973	1966	1961	1965	1973	1974	1978	1993	1938
MIN	193	218	189	172	168	251	274	234	261	236	231	243
(WY)	1934	1934	1934	1959	1959	1931	1931	1934	1934	1964	1958	1933

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1910 - 1995	
ANNUAL TOTAL	316612		309923			
ANNUAL MEAN	867		849		724	
HIGHEST ANNUAL MEAN					1590	1993
LOWEST ANNUAL MEAN					294	1931
HIGHEST DAILY MEAN	4120	Mar 6	5120	Mar 12	31100	Apr 1 1952
LOWEST DAILY MEAN	330	Dec 31	250	Jan 4-8	82	Nov 28 1937
ANNUAL SEVEN-DAY MINIMUM	346	Dec 25	251	Jan 4	113	Dec 25 1933
INSTANTANEOUS PEAK FLOW			6240	Mar 12	37000	Apr 1 1952
INSTANTANEOUS PEAK STAGE			11.13	Mar 12	18.32a	Mar 2 1965
INSTANTANEOUS LOW FLOW			250	Jan 4	65b	Dec 26 1933
ANNUAL RUNOFF (AC-FT)	628000		614700		524600	
ANNUAL RUNOFF (CFSM)	.68		.67		.57	
10 PERCENT EXCEEDS	1230		1410		1280	
50 PERCENT EXCEEDS	776		725		456	
90 PERCENT EXCEEDS	546		355		260	

a Backwater from ice.
b Also occurred Feb. 25, 1935.



IOWA RIVER BASIN

05457000 CEDAR RIVER NEAR AUSTIN, MN

LOCATION.--Lat 43°38'11", long 92°58'26", in NE¼SE¼ sec.15, T.102 N., R.18 W., Mower County, Hydrologic Unit 07080201, on left bank 200 ft upstream from abandoned powerhouse, 500 ft downstream from highway bridge, 1.1 mi downstream from Turtle Creek, and 1.1 mi south of Austin.

DRAINAGE AREA.--425 mi².

PERIOD OF RECORD.--May 1909 to September 1914, October 1944 to current year.

REVISED RECORDS.--WSP 1145: 1945, 1948.

GAGE.--Water-stage recorder. Datum of gage is 1,162.10 ft above mean sea level. May 1909 to April 1912, nonrecording gage in tailwater of powerplant 200 ft downstream at datum 3.1 ft lower. May 1912 to September 1914, nonrecording gage on highway bridge 500 ft downstream at datum 1.1 ft lower.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 19	1430	*1830	*6.74		(No peak above base discharge).		

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	225	202	164	115	86	94	461	411	650	364	296	118
2	238	198	163	e130	86	94	395	386	566	291	257	112
3	294	196	167	e115	86	92	373	363	483	254	232	108
4	607	189	167	e110	79	86	313	344	415	227	254	103
5	611	183	167	e97	e77	86	303	326	379	228	412	101
6	512	177	137	e97	e77	87	295	308	369	212	487	104
7	749	169	165	e97	77	82	292	297	367	189	428	106
8	1110	171	170	e97	80	83	315	300	349	173	362	102
9	850	169	162	e97	76	83	458	341	323	165	308	99
10	616	162	150	e97	78	90	485	351	321	155	270	94
11	489	157	138	e97	e84	243	510	328	301	147	241	94
12	412	156	154	e98	e77	1050	1280	306	279	139	218	94
13	335	157	138	e102	e70	940	1470	362	259	135	195	95
14	306	164	132	106	e68	654	1130	1130	243	127	205	88
15	305	155	133	105	e66	532	850	1100	228	167	279	84
16	301	149	137	98	e67	397	705	809	216	138	314	86
17	326	144	136	111	e72	326	672	634	206	131	545	82
18	452	157	135	104	77	282	820	512	193	125	480	83
19	512	145	147	105	86	251	1690	434	185	143	359	141
20	449	149	134	100	116	259	1480	386	177	159	274	123
21	391	183	135	96	133	285	1510	342	170	183	233	114
22	353	173	140	97	137	267	1730	350	163	180	205	105
23	322	159	141	e90	139	261	1390	339	155	161	187	98
24	296	176	136	e88	133	286	1070	317	149	149	169	101
25	276	165	133	88	134	302	864	296	147	145	154	102
26	260	156	133	92	127	937	719	280	156	237	146	101
27	245	160	137	86	117	1400	620	288	236	699	139	99
28	236	150	140	85	98	1120	536	655	608	1630	136	95
29	228	145	134	84	---	892	479	1250	882	1090	137	97
30	217	162	138	84	---	703	445	1060	556	546	129	123
31	208	---	133	86	---	560	---	816	---	369	123	---
TOTAL	12731	4978	4496	3054	2603	12824	23660	15421	9731	9058	8174	3052
MEAN	411	166	145	98.5	93.0	414	789	497	324	292	264	102
MAX	1110	202	170	130	139	1400	1730	1250	882	1630	545	141
MIN	208	144	132	84	66	82	292	280	147	125	123	82
AC-FT	25250	9870	8920	6060	5160	25440	46930	30590	19300	17970	16210	6050
CFSM	.97	.39	.34	.23	.22	.97	1.86	1.17	.76	.69	.62	.24
IN.	1.11	.44	.39	.27	.23	1.12	2.07	1.35	.85	.79	.72	.27

e Estimated.

IOWA RIVER BASIN

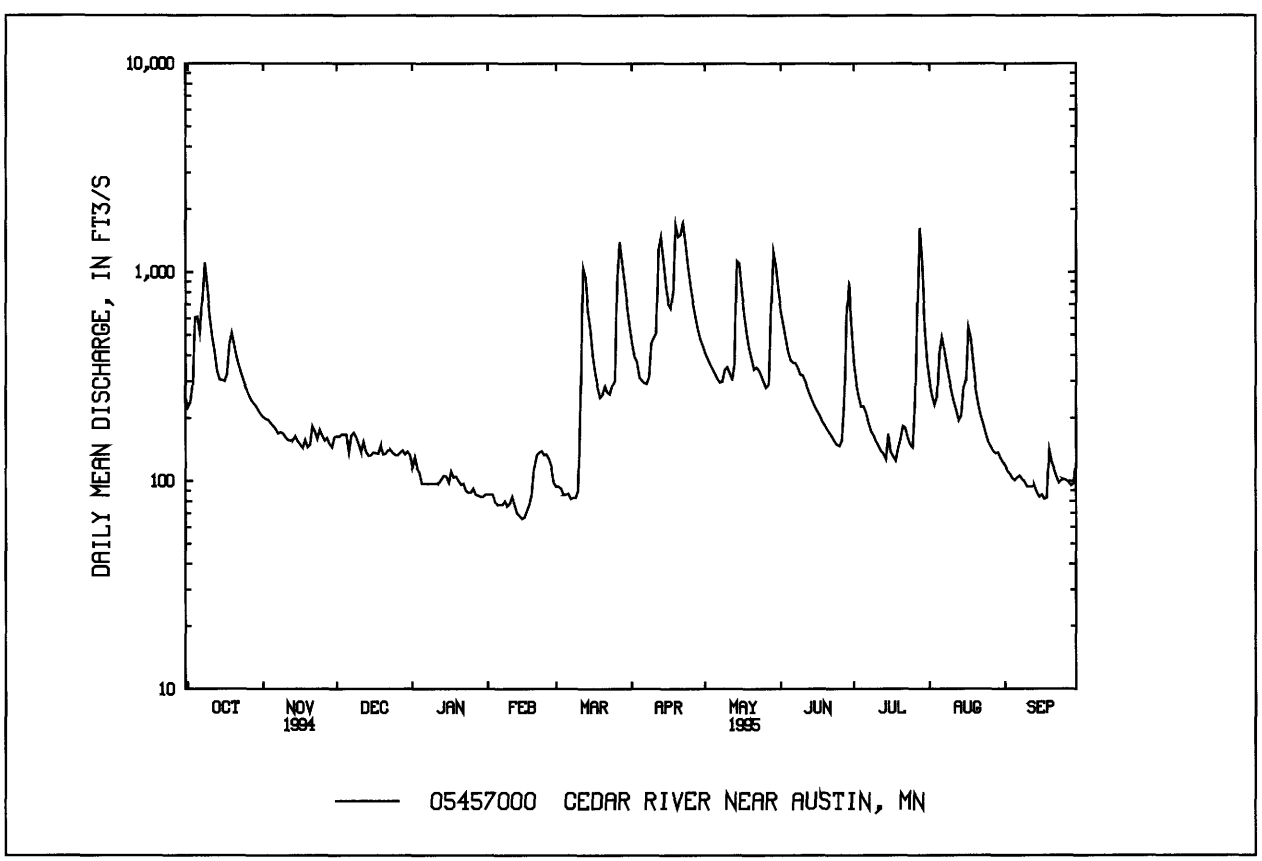
05457000 CEDAR RIVER NEAR AUSTIN, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	165	158	106	74.1	102	473	512	301	279	246	186	151
MAX	884	997	431	261	701	1428	2011	1222	1624	1456	1720	734
(WY)	1974	1910	1992	1973	1984	1973	1993	1991	1993	1978	1993	1993
MIN	37.3	35.7	26.6	26.5	25.0	53.3	52.9	67.9	48.9	22.6	32.3	30.9
(WY)	1959	1959	1913	1913	1913	1968	1911	1910	1950	1911	1948	1911

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1909 - 1995	
ANNUAL TOTAL	99192		109782			
ANNUAL MEAN	272		301		230[a]	
HIGHEST ANNUAL MEAN					824	1993
LOWEST ANNUAL MEAN					58.1	1977
HIGHEST DAILY MEAN	2110	Jul 20	1730	Apr 22	8720	Mar 29 1962
LOWEST DAILY MEAN	87	Feb 16	66[b]	Feb 15	.00[c]	Jan 15 1911
ANNUAL SEVEN-DAY MINIMUM	89	Feb 11	71	Feb 12	13	Sep 1 1912
INSTANTANEOUS PEAK FLOW			1830	Apr 19	12400	Jul 17 1978
INSTANTANEOUS PEAK STAGE			6.74	Apr 19	20.35[d]	Jul 17 1978
INSTANTANEOUS LOW FLOW			53[e]	Feb 4		
ANNUAL RUNOFF (AC-FT)	196700		217800		166600	
ANNUAL RUNOFF (CFSM)	.64		.71		.54	
ANNUAL RUNOFF (INCHES)	8.68		9.61		7.35	
10 PERCENT EXCEEDS	479		654		478	
50 PERCENT EXCEEDS	182		176		92	
90 PERCENT EXCEEDS	111		88		44	

a Median of annual mean discharges is 212 ft^3/s.
b Estimated, backwater from ice.
c Occurred on several days in 1911.
d From floodmark in well.
e Result of freezup.



DES MOINES RIVER BASIN

05476000 DES MOINES RIVER AT JACKSON, MN

LOCATION.--Lat 43°37'10", long 94°59'10", in SE¼SW¼ sec.24, T.102 N., R.35 W., Jackson County, Hydrologic Unit 07100001, on right bank in storage room of city powerplant in Jackson.

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

PERIOD OF RECORD.--May 1909 to December 1913, August 1930 to current year (winter record incomplete prior to 1936). Published as Des Moines River near Jackson, 1930-35, as West Fork Des Moines River near Jackson, 1936-44, and as West Fork Des Moines River at Jackson, 1945-69.

REVISED RECORDS.--WSP 1115: 1942. WSP 1175: Drainage area. WSP 1238: 1950. WSP 1308: 1938(M).

GAGE.--Water-stage recorder. Datum of gage is 1,287.75 ft above mean sea level. May 31, 1909, to Dec. 20, 1913, nonrecording gage at site 0.6 mi downstream at datum 0.99 ft lower. Aug. 22, 1930, to Sept. 30, 1944, nonrecording gage at site 7 mi upstream at datum 17.10 ft higher. Oct. 1, 1944, to Oct. 26, 1949, nonrecording gage at site 600 ft upstream at datum 10.64 ft higher. Oct. 27, 1949, to Dec. 15, 1965, water-stage recorder 200 ft downstream at present datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Regulation at times by Yankton, Long, Shetek, and Heron Lakes.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 900 ft³/s and maximum (*)

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 1	2100	2060	9.57	June 14	0500	2340	10.09
Apr. 25	--	e3500	--	July 9	2300	1100	7.12
May 15	2400	*3610	*12.58	July 31	0600	1480	8.08
June 3	1100	2450	10.33	Aug. 6	0500	1320	7.68 .

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	146	319	240	e160	60	85	2040	e2850	2310	938	1330	352
2	153	335	278	e155	61	72	2030	e2770	2400	892	1220	356
3	191	585	276	e150	62	86	1940	e2680	2440	855	1080	336
4	222	543	262	e141	71	84	1770	e2600	2380	834	984	321
5	231	478	153	e138	71	78	1590	e2500	2290	853	971	307
6	246	367	115	131	57	77	1480	e2400	2220	850	1210	298
7	291	358	127	e129	59	85	1410	e2300	2280	867	1200	215
8	339	366	221	e123	53	77	1380	e2280	2160	958	1070	178
9	291	345	219	116	51	69	1400	e2230	1910	1080	813	157
10	280	322	224	111	51	86	1380	e2200	1820	1090	877	151
11	310	342	207	105	e45	368	1410	e2210	1750	1010	883	134
12	319	398	162	106	e41	634	1580	2210	1640	921	820	146
13	298	354	171	105	e38	699	1730	2560	1560	837	730	143
14	267	349	156	101	e36	701	1840	3030	1840	776	666	128
15	249	302	146	98	35	714	1900	3460	1870	869	614	116
16	302	273	145	94	35	739	1940	3470	1690	847	570	93
17	423	287	143	94	33	741	2010	3280	1550	778	543	75
18	445	317	145	95	33	626	2200	3210	1400	709	517	74
19	437	278	145	91	38	553	2520	3180	1370	746	496	122
20	402	215	141	78	65	537	2820	3080	1230	843	e480	112
21	401	297	139	83	64	496	3050	2880	1090	817	e470	109
22	468	282	149	77	85	487	3180	2640	1040	789	e440	103
23	469	170	149	66	81	512	e3400	2440	1140	813	e425	94
24	430	209	155	72	72	489	e3450	2240	1150	843	e410	91
25	401	281	157	70	77	582	e3500	2070	1040	985	e395	90
26	373	265	154	67	79	1170	e3400	1950	993	1220	e375	91
27	373	211	160	66	81	1510	e3250	1880	1080	1270	e360	87
28	387	142	169	65	87	1700	e3150	2080	1160	1330	e325	80
29	381	122	174	65	---	1850	e3050	2190	1090	1380	e355	80
30	336	148	171	64	---	1930	e2950	2250	1010	1370	382	121
31	319	---	168	62	---	1990	---	2240	---	1400	393	---
TOTAL	10180	9260	5421	3078	1621	19827	68750	79360	48903	29770	21404	4760
MEAN	328	309	175	99.3	57.9	640	2292	2560	1630	960	690	159
MAX	469	585	278	160	87	1990	3500	3470	2440	1400	1330	356
MIN	146	122	115	62	33	69	1380	1880	993	709	325	74
AC-FT	20190	18370	10750	6110	3220	39330	136400	157400	97000	59050	42450	9440
CFSM	.27	.25	.14	.08	.05	.52	1.88	2.10	1.34	.79	.57	.13
IN.	.31	.28	.17	.09	.05	.60	2.10	2.42	1.49	.91	.65	.15

e Estimated.

DES MOINES RIVER BASIN

05476000 DES MOINES RIVER AT JACKSON, MN--Continued

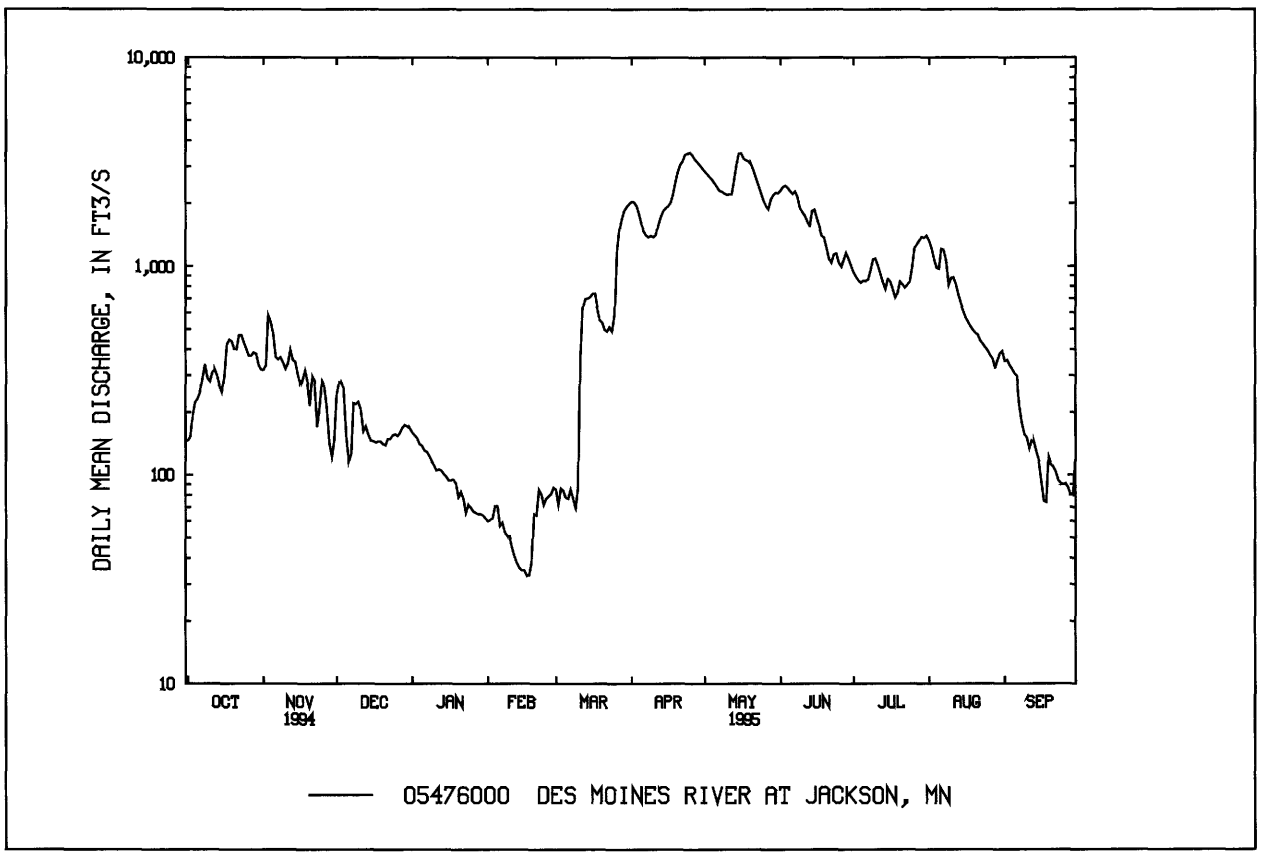
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	161	164	96.4	45.9	65.6	457	1032	639	611	528	231	183
MAX	1724	1833	792	298	504	2250	6045	3923	4892	6018	2192	2243
(WY)	1987	1980	1980	1980	1983	1983	1969	1993	1993	1993	1993	1942
MIN	.000	.000	.000	.000	.000	11.8	9.37	2.59	3.76	1.04	.13	.000
(WY)	1956	1956	1956	1956	1936	1959	1959	1934	1931	1931	1955	1931

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1930 - 1995	
ANNUAL TOTAL	295570		302334			
ANNUAL MEAN	810		828		373[a]	
HIGHEST ANNUAL MEAN					2098	1993
LOWEST ANNUAL MEAN					15.1	1956
HIGHEST DAILY MEAN	2920	Jun 28	3500	Apr 25	15500	Apr 11 1969
LOWEST DAILY MEAN	88	Feb 15	33	Feb 17	.00[b]	Jul 19 1931
ANNUAL SEVEN-DAY MINIMUM	93	Feb 11	35	Feb 13	.00	Jul 19 1931
INSTANTANEOUS PEAK FLOW			3610	May 15	15700	Apr 11 1969
INSTANTANEOUS PEAK STAGE			12.58	May 15	19.45	Apr 11 1969
INSTANTANEOUS LOW FLOW			31	Feb 18	.00	Jul 19 1931
ANNUAL RUNOFF (AC-FT)	586300		599700		270400	
ANNUAL RUNOFF (CFSM)	.66		.68		.31	
ANNUAL RUNOFF (INCHES)	9.01		9.22		4.16	
10 PERCENT EXCEEDS	2040		2280		1000	
50 PERCENT EXCEEDS	518		382		80	
90 PERCENT EXCEEDS	133		77		2.8	

a Median of annual mean discharges is 249 ft^3/s.

b Many days, several years.



WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1968-69, 1973-76, 1978, 1983, 1989-90, 1994-95.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	AMETRYN WATER, DISS, REC, (UG/L) (38401)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)
MAY												
28...	1340	2170	763	8.0	13.0	0.050	5.90	0.070	<0.010	<0.05	0.28	0.05

DATE	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	DEISO-PROPYL ATRAZIN WATER, DISS, REC (UG/L) (04038)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	PRO-METRYN, WATER, DISS, REC (UG/L) (04036)	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	PROP-AZINE WATER DISS REC (UG/L) (38535)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)
MAY											
28...	0.16	0.08	0.11	0.38	0.22	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

High-Flow Partial-Record Stations

and

Miscellaneous Sites

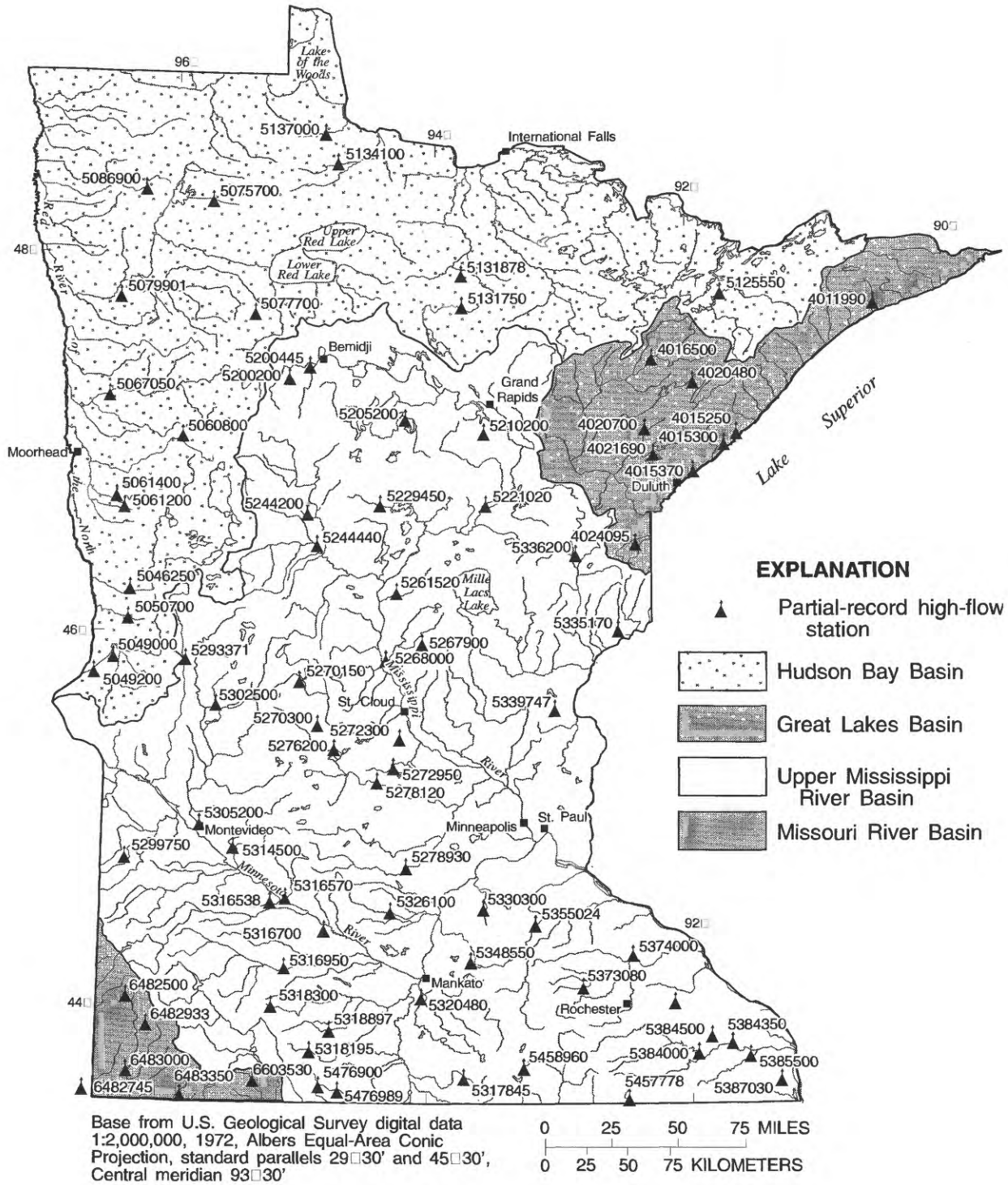


Figure 9.--Location of high-flow partial-record stations.

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at high-flow partial-record stations are presented in a table of annual maximum stage and discharge. Discharge measurements made at miscellaneous sites for both low flows and high flows are given in a second table.

HIGH-FLOW PARTIAL-RECORD STATIONS

The following table contains annual maximum discharges for high-flow(crest-stage) partial-record stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at high-flow sites during water year 1995

Station No.	Station Name	Location	Drainage area (mi^2)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
04011990	Cascade River near Grand Marais, MN	Lat 47°47'24", long 90°31'35", in $SE^1/_4$, sec. 1, T. 61 N., R. 2 W., Cook County, Hydrologic Unit 04010101, at bridge on Forest Road 45, 6.6 miles upstream from mouth, 9.5 miles west of Grand Marais.	--	1985-95	5-14-95	10.58	442
04015250	Silver Creek tributary near Two Harbors, MN	Lat 47°04'40", long 91°36'49", in $SW^1/_4NE^1/_4$ sec. 16, T. 53 N.,R. 10 W., Lake County, Hydrologic Unit 04010102, at culvert on County Highway 3,1.0 mile upstream from mouth, 4.5 miles northeast of Two Harbors.	3.72	1965-95	8-25-95	a6.86	475
04015300	Little Stewart River near Two Harbors, MN	Lat 47°03'52", long 91°40'03",in $SE^1/_4NE^1/_4$ sec. 24, T. 53 N.,R. 11 W., Lake County, Hydrologic Unit 04010102, at culvert on County Highway 2,2.0 miles upstream from mouth, 2.7 miles north of Two Harbors.	5.54	1960-95	8-25-95	b11.10	235
04015370	Talmadge River at Duluth, MN	Lat 46°53'20", long 91°55'21",in $SE^1/_4NE^1/_4$ sec.24, T.51 N.,R.13 W., St. Louis County,Hydrologic Unit 04010102, at culvert on U.S. Highway 61, 0.6 mile upstream from mouth, 0.5 mile northeast of Duluth city limits.	5.79	1964-95	5-13-95	15.00	295
04016500	St Louis River near Aurora, MN	Lat 47°29'30", long 92°14'20",in $NW^1/_4SW^1/_4$ sec.22, T.58 N.,R.15 W., St. Louis County, Hydrologic Unit 04010201, at bridge on County Highway 100, 0.8 mile downstream from Partridge River and 1.5 mile south of Aurora.	290	1942-87#, 1988-95	5-16-95	2.98	669
04020480	North Branch Whiteface River near Fairbanks, MN	Lat 47°22'20", long 91°56'28", in $NW^1/_4NW^1/_4$ sec. 1, T. 56 N., R. 13 W., St. Louis County, Hydrologic Unit 04010201, at culvert on County Highway 16, 2 miles upstream from the mouth of Jenkins Creek, 0.7 mile west of Fairbanks.	17.1	1979-95	7-5-95	11.51	73

Annual maximum discharge at high-flow sites during water year 1995

Station No.	Station Name	Location	Drainage area (mi^2)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
04020700	Bug Creek at Shaw, MN	Lat 47°06'40", long 92°21'03", in $SW^1/_4SE^1/_4$ sec. 34, T. 54 N., R. 16 W., St. Louis County, Hydrologic Unit 04010201, at culverts on County Road 15 at Shaw, 7.5 miles upstream from mouth.	24.0	1979-95	7-5-95	14.14	360
04021690	Cloquet River near Toimi, MN	Lat 47°21'00", long 91°39'30", in $NE^1/_4SW^1/_4$ sec. 7, T. 56 N., R. 10 W., Lake County, Hydrologic Unit 04010202, at bridge on County Highway 2, 5.8 miles southeast of Toimi, 23 miles north of Two Harbors.	--	1986-95	7-4-95	6.79	555
04024095	Nemadji River near Holyoke, MN	Lat 46°31'04", long 92°23'22", in $NE^1/_4NE^1/_4$ sec. 32, T. 47 N., R. 16 W, Carlton County, Hydrologic Unit 04010301, at bridge on State Highway 23, 3.5 miles north of Holyoke, 7 miles south of Wrenshall.	118	1972-95	3-19-95	c11.34	1200
05046250	Ottertail River near Foxhome, MN	Lat 46°12'48", long 96°18'24", in $SW^1/_4SW^1/_4$ sec. 26, T. 132 N., R. 45 W., Wilkin County, Hydrologic Unit 09020103, at bridge on County Road 19, 4 miles south of Foxhome., 10.8 miles below Orwell Dam.	--	1990-95	3-21-95	bd15.9	1300
05049000	Mustinka River above Wheaton, MN	Lat 45°49'15", long 96°29'25", in $SW^1/_4$ sec. 8, T. 127 N., R. 46 W., Traverse County, Hydrologic Unit 09020102, at bridge on U.S. Highway 75, 1 mile upstream from Chicago, Milwaukee and St. Paul railroad bridge, 0.5 mile north of Wheaton, about 8 miles above Lake Traverse.	834	1915-24#, 1930-58#, 1985-95	3-14-95	c19.30	5100
05049200	Eighteenmile Creek near Wheaton, MN	Lat 45°47'18", long 96°31'52", in $NW^1/_4$ $NW^1/_4$ sec. 25, T. 127 N., R. 47 W., Traverse County, Hydrologic Unit 09020102, at culvert on County Highway 7, 1.4 miles upstream from mouth, 2.0 miles southwest of Wheaton.	68.5	1965-95	3-13-95	c13.79	920
05050700	Rabbit River near Nashua, MN	Lat 46°04'30", long 96°18'24", in $SE^1/_4$ $NE^1/_4$ sec. 15, T. 130 N., R. 45 W., Wilkin County, Hydrologic Unit 09020101, at bridge on County Road 19, 2.6 miles north of Nashua, 4.8 miles upstream from mouth of South Fork Rabbit River.	56.1	1979-95	3-14-95	ab13.70	765
05060800	Buffalo River near Callaway, MN	Lat 47°01'17", long 95°54'43", in $SW^1/_4SW^1/_4$ sec. 17, T. 141 N., R. 41 W., Becker County, Hydrologic Unit 09020106, at culvert on U.S. Highway 59, 2.7 miles north of Callaway.	94.5	1960-95	3-18-95	c15.87	382

Annual maximum discharge at high-flow sites during water year 1995

Station No.	Station Name	Location	Drainage area (mi^2)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
05061200	Whiskey Creek at Barnesville, MN	Lat 46°39'35", long 96°25'54", in $SE^1/_4SW^1/_4$ sec. 20, T. 137 N., R. 45 W., Clay County, Hydrologic Unit 09020106, at culvert on State Highway 34, 0.7 mile upstream from Blue Eagle Lake, 1.0 mile northeast of Barnesville.	25.3	1961-64, 1965-66#, 1967-95	3-15-95	a5.65	260
05061400	Spring Creek above Downer, MN	Lat 46°44'37", long 96°25'12", in $NW^1/_4NW^1/_4$ sec. 30, T. 138 N., R. 45 W., Clay County, Hydrologic Unit 09020106, at culvert on county road, 3.1 miles east of Downer.	5.81	1961-95	3-13-95	7.12	47
05067050	Marsh River Ditch near Ada, MN	Lat 47°17'46", long 96°26'09", in $NE^1/_4NE^1/_4$ sec. 13, T. 144 N., R 46 W., Norman County, Hydrologic Unit 09020108, at bridge on County Highway 24, 3.5 miles southeast of Ada.	--	1985-95	3-15-95	b13.39	78
05075700	Mud River near Grygla, MN	Lat 48°19'31", long 95°44'35", in $NE^1/_4NE^1/_4$ sec. 23, T. 156 N., R. 40 W., Hydrologic Unit 09020304, Marshall County, at bridge on State Highway 89, 6 miles west of Grygla.	170	1979-95	3-27-95	c14.79	450
05077700	Ruffy Brook near Gonvick, MN	Lat 47°44'50", long 95°24'45", in $SE^1/_4SE^1/_4$ sec. 5, T. 149 N., R. 37 W., Clearwater County, Hydrologic Unit 09020305, at culvert on County Highway 67, 4.0 miles upstream from mouth, 4.8 miles east of Gonvick.	45.2	1960-78#, 1979-85, 1986#, 1987-95	3-13-95	c6.10	200
05079901	Burnham Creek near Crookston, MN	Lat 47°43'59", long 96°39'52", in $SE^1/_4SW^1/_4$ sec. 10, T. 149 N., R. 47 W., Polk County, Hydrologic Unit 09020303, at triple box culvert on U.S. Highway 75, 0.75 mile northeast of Girard, 3 miles southwest of Crookston, 7 miles above mouth.	d111	1986-95	3-27-95	18.25.	1260
05086900	Middle River near Newfolden, MN	Lat 48°22'04", long 96°16'47", in $NE^1/_4NE^1/_4$ sec. 3, T. 156 N., R. 44 W., Marshall County, Hydrologic Unit 09020309, at bridge on township road, 2.0 miles northeast of Newfolden.	91.1	1979-95	3-16-95	e15.50	340
05125550	Stony River near Babbitt, MN	Lat 47°41'36", long 91°45'38", in $SW^1/_4SW^1/_4$ sec.8, T.60 N., R.11 W., Lake County, Hydrologic Unit 09030001, in Superior National Forest, at bridge on Forest Road 424, 4.7 miles upstream from mouth, 8.5 miles southeast of Babbitt.	219	1975-80#, 1986-95	7-5-95	5.84	780
05131750	Big Fork River near Bigfork, MN	Lat 47°44'56", long 93°46'31",in $SW^1/_4NE^1/_4$ sec.27, T.61 N.,R.27 W., Itasca County, Hydrologic Unit 09030006, at bridge on State Highway 6, 5.5 miles west of Bigfork.	602	1973-95	4-15-95	b11.77	1210

Annual maximum discharge at high-flow sites during water year 1995

Station No.	Station Name	Location	Drainage area (mi^2)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
05131878	Bowerman Brook near Craigville,MN	Lat 47°55'29", long 93°45'34",in NE¼NW¼ sec.26, T.63 N.,R.27 W., Koochiching County, Hydrologic Unit 09030006, at culvert on State Highway 6,2.4 miles upstream from mouth.7.0 miles west of Craigville.	25.0	1979-95	3-16-95	c12.42	108
05134100	North Branch Rapid River near Baudette, MN	Lat 48°31'56", long 94°38'50",in NW¼SW¼ sec.4, T.158 N., R.31 W., Lake of the Woods County, Hydrologic Unit 09030007, at bridge on County Highway 1, 12.7 miles southwest of Baudette.	d180	1986-95	4-23-95	7.97	450
05137000	Winter Road River near Baudette, MN	Lat 48°42'39", long 94°41'52",in NW¼NE¼ sec.1, T.160 N., R.32 W., Lake of the Woods County, Hydrologic Unit 09030008, at bridge on State Highway 11, 4.5 miles west of Baudette, 1.8 miles east of Pitt, 5 miles upstream of mouth.	d145	1986-95	4-14-95	11.22	675
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, at culvert on Stumphges Rapids Trail approximately 0.5 mile west of Hubbard County Road 3, 3 miles north of Becida, 1.5 miles upstream from mouth.	41.4	1979-95	3-16-95	c12.83	65
05200445	Mississippi River at Bemidji, MN	Lat 46°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, 1.4 miles southwest of intersection of State.Highway 197 and County Highway 7 in Bemidji.	400	1973-87, 1988-89#, 1990-95	3-20-95	c12.21	668
05205200	Boy River near Remer, MN	Lat 47°04'51", long 94°05'54", in SE¼SE¼ sec.28 T.142 N.,R.27 W., Cass County, Hydrologic Unit 07010102, at bridge on County Highway 53, 1.9 miles upstream from Boy Lake and 9 miles northwest of Remer.	310	1986-95	3-18-95	b11.07	600
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	1961-95	7-4-95	e6.50	54
05221020	Willow River below Palisade, MN	Lat 46°42'36", long 93°33'21", in NW¼NE¼ sec.30, T.49 N., R.25 W., Aitkin County, Hydrologic Unit 07010103, at bridge on County Highway 3, 3.2 miles west of Palisade.	44	1972-95	3-20-95	12.29	1470

Annual maximum discharge at high-flow sites during water year 1995

Station No.	Station Name	Location	Drainage area (mi^2)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
05229450	Pine River near Pine River, MN	Lat 48°41'39", long 94°22'11",in NE¼SE¼ sec.8, T.137 N.,R.29 W., Cass County, Hydrologic Unit 07010105, at bridge 2.3 miles southeast of Pine River,on U.S. Highway 371, 4.9 miles upstream of upper Whitefish Lake.	277	1986-95	3-18-95	bc4.36	500
05244200	Cat River near Nimrod, MN	Lat 46°37'49", long 94°55'51", in SW¼SW¼ sec.36, T.137 N.,R.34 W., Wadena County, Hydrologic Unit 07010106, at bridge on State Highway 227, 2.5 miles west of Nimrod, 3.0 miles upstream from mouth.	49.2	1961-95	3-16-95	bc7.01	223
05244440	Leaf River near Aldrich, MN	Lat 46°27'25", long 94°50'29", in SW¼SW¼ sec.34, T.135 N.,R.33 W., Wadena County, Hydrologic Unit 07010107, at bridge on County Highway 29, 3.3 miles upstream from mouth, 7.0 miles northeast of Aldrich.	860	1972-95	3-19-95	c14.34	2100
05261520	Nokasippi River near Fort Ripley, MN	Lat 46°12'02", long 94°19'03" in NE¼NE¼ sec. 24,T.43 N., R.32 W., Crow Wing County, Hydrologic Unit 07010104, at bridge on County Highway 2, 3 miles northeast of Fort Ripley.	178	1967-70+, 1974+, 1976+, 1986-95	3-17-95	13.46	760
05267900	Hillman Creek near Pierz, MN	Lat 45°58'27", long 94°04'21",in NE¼SE¼ sec.9, T.40 N.,R.30 W., Morrison County,Hydrologic Unit 07010201, at bridge on county highway, 1.1 miles upstream from mouth,1.5 miles east of Pierz.	46.7	1964-95	8-26-95	b13.03	225
05268000	Platte River at Royalton, MN	Lat 45°50'43", long 94°17'40",in SE¼NW¼ sec.26, T.39 N.,R.32 W., Morrison County, Hydrologic Unit 07010201, at bridge on County Highway 27, 0.6 mile north of Royalton, 6.6 miles upstream from mouth.	335	1929-36, 1972-95	3-17-95	b12.30	2050
05270150	Ashley Creek near Sauk Centre, MN	Lat 45°46'46", long 94°58'52",in NW¼SE¼ sec.29, T.127 N.,R.34 W., Todd County, Hydrologic Unit 07010202, at bridge on County Highway 11, 3 miles north of Sauk Centre.	113	1963-70+, 1974+, 1976+, 1986-88, 1989#, 1990-95	3-15-95	15.79	490
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, 2.7 miles upstream from mouth.	7.06	1960-95	3-14-95	f10.41	142
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, 3.3 miles upstream from mouth.	46.7	1964-95	3-15-95	13.99	540

Annual maximum discharge at high-flow sites during water year 1995

Station No.	Station Name	Location	Drainage area (mi^2)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
05272950	Clearwater River near South Haven, MN	Lat 45°16'45", long 94°15'04", in NE¼NW¼ sec.19, T.121 N., R.28 W., Wright County, Hydrologic Unit 07010203, at culvert 3.4 miles southeast of Kimball, 0.25 mile downstream of Scott Lake Outlet, 2.0 miles southeast of South Haven.	--	1985-95	3-15-95	15.15	322
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	1973-95	3-17-95	7.56	1680
05278120	North Fork Crow River near Kingston, MN	Lat 45°12'13", long 94°23'16", in SW¼SE¼ sec.13, T. 120 N.,R. 30 W., Meeker County, Hydrologic Unit 07010204, at bridge on State Highway 24, 3.7 miles west of Kingston, 3.9 miles east of Forest City.	--	1986-95	3-17-95	16.13	3050
05278930	Buffalo Creek near Glencoe, MN	Lat 44°45'50", long 94°05'27",in SW¼SW¼ sec. 16, T. 115 N.,R. 27 W., McLeod County, Hydrologic Unit 07010205,at bridge on County Highway 1, 2.6 mi east of Glencoe.	374	1972, 1973-80#, 1991-95	3-29-95	6.84	1060
05293371	Pomme de terre River near Elbow Lake, MN	Lat 46°57'47", long 95°53'07",in SE¼SW¼ sec. 19, T. 129 N., R. 41 W., Grant County, Hydrologic Unit 07020002, at bridge on County Road 47, 4 miles southeast of Elbow Lake, 2.5 miles south of the outlet of Pomme de Terre Lake.	340	1986-95	3-16-95	a4.74	206
05299750	Florida Creek near Burr, MN	Lat 44°49'00", long 96°25'10",in SE¼SE¼ sec. 29, T. 115 N., R.46 W., Yellow Medicine County Hydrologic Unit 07020003, at culvert on County Road 15, 3.0 miles west of Burr, 7.6 miles northwest of Canby.	77.3	1982, 1983-84#, 1991-95	4-19-95	19.73	760
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 culvert on State Highway 28, 4.4 miles west of Starbuck.	69.6	1979-95	3-30-95	13.28	270
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, 2.0 miles north of Montevideo.	15.8	1959-95	3-27-95	14.23	98

Annual maximum discharge at high-flow sites during water year 1995

Station No.	Station Name	Location	Drainage area (mi^2)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
05314500	Hawk Creek near Maynard, MN	Lat 44°52'10", long 95°28'58", in $SW^1/_4NW^1/_4$ sec. 7, T. 116 N., R.38 W., at Renville and Chippewa County line, Hydrologic Unit 07020004, at bridge on State Highway 23, 3.0 miles southwest of Maynard.	474	1949-54#, 1981-95	7-5-95	ab14.62	1100
05316538	Ramsey Creek near Redwood Falls, MN	Lat 44°33'08", long 95°10'38", in $SE^1/_4NE^1/_4$ sec. 33, T. 113 N., R.36 W., Redwood County, Hydrologic Unit 07020006 at bridge on township road 2.3 miles northeast of KLGR radio towers, on west side of Redwood Falls.	--	1991-93, 1995	5-14-95	22.72	500
05316570	Beaver Creek at Beaver Falls, MN	Lat 44°35'03", long 95°02'49", in $NE^1/_4NW^1/_4$ sec. 22, T. 113 N., R.35 W., Renville County, Hydrologic Unit 07020004, at bridge on County Highway 2 in Beaver Falls, 2.2 miles upstream from mouth, 3.8 miles northwest of Morton.	194	1972-95	5-14-95	a9.53	550
05316700	Spring Creek near Sleepy Eye, MN	Lat 44°24'12", long 94°44'41",in $NE^1/_4SE^1/_4$ sec. 24, T. 111 N., R. 33 W., Brown County, Hydrologic Unit 07020007, at culvert on county highway, 4.3 miles upstream from mouth, 7.5 miles north of Sleepy Eye.	31.3	1959-95	4-18-95	10.86	155
05316950	Cottonwood River near Springfield, MN	Lat 44°12'12", long 95°02'53", on line between secs. 33 and 34, T.109 N., R.35 W.,Brown County, Hydrologic Unit 07020008, at bridge on County Highway 2, 1.3 miles downstream from Mound Creek, 1.0 mile upstream from Coal Mine Creek, 3.5 miles southwest of Springfield.	773	1973-95	4-19-95	a23.84	3400
05317845	East Branch Blue Earth River near Walters, MN	Lat 43°37'58", long 93°42'28",in $SE^1/_4SE^1/_4$ sec. 16, T.102 N., R.24 W., Faribault County,Hydrologic Unit 07020009, at culvert on State Highway 22, 2.5 miles northwest of Walters.	30.2	1979-95	6-27-95	15.45	290
05318195	Elm Creek near Trimont, MN	Lat 43°45'27", long 94°50'30", in $NW^1/_4NW^1/_4$ sec. 5, T. 103 N., R. 33 W., Martin County, Hydrologic Unit 07020009, at bridge on County Road 103, 12.5 miles northeast of Jackson, 5 miles west of Trimont.	--	1991-95	5-16-95	b20.54	490
05318300	Watonwan River near Delft, MN	Lat 43°59'55", long 95°07'11", in $NE^1/_4SE^1/_4$ sec. 11, T. 106 N. R.36 W., Cottonwood County, Hydrologic Unit 07020010, at culvert on U.S. Highway 71, 1.7 miles northwest of Delft.	13.5	1960-95	4-12-95	16.31	175

Annual maximum discharge at high-flow sites during water year 1995

Station No.	Station Name	Location	Drainage area (mi^2)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
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 bridge on township road, 2.6 miles north of Ormsby, 5.0 miles upstream from Willow Creek.	107	1979-95	4-12-95	13.50	510
05320480	Maple River near Rapidan, MN	Lat 44°03'54", long 94°01'32", in SW¼ 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, 3.3 miles upstream from mouth.	338	1972-95	7-28-95	10.04	1750
05326100	Middle Branch Rush River near Gaylord, MN	Lat 44°30'27", long 94°15'00", in SW¼NW¼ sec. 18, T. 112 N., R. 28 W., Sibley County, Hydrologic Unit 07020012, at bridge on township road, 3.0 miles southwest of Gaylord, 10.5 miles upstream from the main branch of Rush River.	68.5	1979-95	3-27-95	b13.55	450
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	1960-95	3-25-95	9.88	153
05335170	Crooked Creek near Hinckley, MN	Lat 46°00'42", long 92°31'45", in NE¼NE¼ sec.30, T.41 N., R. 17 W., Pine County, Hydrologic Unit 07030001, at culvert on State Highway 48, 2.7 miles upstream from mouth, 8 miles south of Duxbury, 19 miles east of Hinckley.	93	1966-70+, 1974-76+, 1979-80+, 1986-95	8-26-95	14.28	1140
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, 2.4 miles south of Kettle River.	27.5	1960-70#, 1971-95	8-26-95	6.32	515
05339747	Goose Creek at Harris, MN	Lat 45°35'11", long 92°58'39", in SW¼SW¼ sec.21, T.36 N., R.21 W., Chisago County, Hydrologic Unit 07030005, at culverts on County Highway 9, 0.15 mile east of County Highway 30 in Harris, 8 miles above mouth.	d60	1986-95	8-26-95	6.88	237
05348550	Cannon River below Sabre Lake near Kilkenny, MN	Lat 44°17'50", long 93°37'44", in NE¼NE¼ sec.31, T. 110 N., R.23 W., LeSueur County, Hydrologic Unit 07040002, at bridge on township road, 0.25 mile downstream of Sabre Lake, 3 miles southeast of Kilkenny.	--	1985-95	8-17-95	12.64	272

Annual maximum discharge at high-flow sites during water year 1995

Station No.	Station Name	Location	Drainage area (mi^2)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
05355024	Cannon River at Northfield, MN	Lat 44°27'19", long 93°09'46", in NE1/4NE1/4 sec.1, T.111 N., R.20 W., Rice County, Hydrologic Unit 07040002, at Fifth Street bridge in Northfield.	934	1980-95	6-8-95	902.34	1800
05373080	Milliken Creek near Concord, MN	Lat 44°07'13", long 92°49'08", in NW1/4NW1/4 sec.36, T. 108 N., R.17 W., Dodge County, Hydrologic Unit 07040004, at bridge on County Road 9, 8.0 miles upstream from mouth, 2.1 miles southeast of Concord.	22.2	1979-95	4-18-95	11.10	147
05374000	Zumbro River at Zumbro Falls, MN	Lat 44°17'12", long 92°25'56", in sec.36, T.110 N., R.14 W., Wabasha County, Hydrologic Unit 07040004, in Zumbro Falls, 1,000 ft downstream from Cold Creek, 0.7 mi upstream from bridge on U.S. Highway 63, and 6.3 mi downstream from North Fork.	d1,130	1909-17#, 1929-80#, 1990-95	3-12-95	11.09	3670
05376110	Middle Fork Whitewater River near State Park Group Camp near St. Charles, MN	Lat 44°03'21", long 92°03'13", in SW1/4 sec.20, T.107 N., R.10 W., Olmsted County, Hydrologic Unit 07040003, at wooden bridge near Group Camp in Whitewater State Park.	--	1986-95	3-12-95	66.02	†
05384000	Root River near Lanesboro, MN	Lat 43°44'58", long 91°58'43", in sec. 1, T.103 N., R.10 W., Fillmore County, Hydrologic Unit 07040008, 0.5 mi upstream from highway bridge, 1.2 mi upstream from South Branch, and 2.5 mi northeast of Lanesboro.	615	1910-17#, 1940-85#, 1986, 1987-90#, 1991-95	3-12-95	7.27	4300
05384350	Root River at Rushford, MN	Lat 43°48'11", long 91°45'10", in NE1/4NE1/4 sec.23, T.104 N., R.8 W., Fillmore County, Hydrologic Unit 07040008, at U.S. Highway 16 bridge on south side of Rushford.	--	1985-95	3-12-95	--	g5800
05384500	Rush Creek near Rushford, MN	Lat 43°50'00", long 91°46'40", in SW1/4 SW1/4 sec. 3, T.104 N., R.8 W., Fillmore County, Hydrologic Unit 07040008, at bridge, 1.5 miles northwest of Rushford, 3.0 miles upstream from mouth.	129	1942-79#, 1980-95	3-12-95	6.95	2580
05385500	South Fork Root River near Houston, MN	Lat 43°44'19", long 91°33'50", in NE1/4SW1/4 sec.9, T.103 N., R.6 W., Houston County, Hydrologic Unit 07040008, at bridge on State Highway 76, 0.5 mile upstream from Badger Creek, 1.5 mile south of Houston.	275	1953-83#, 1985-95	3-12-95	8.22	1880
05387030	Crooked Creek at Freeburg, MN	Lat 43°36'37", long 91°21'39", in SW1/4NE1/4 sec.30, T.102 N., R.4 W., Houston County, Hydrologic Unit 07060001, at bridge on State Highway 249 at Freeburg.6.5 miles upstream from mouth.	44.2	1979-95	3-12-95	9.81	276

Annual maximum discharge at high-flow sites during water year 1995

Station No.	Station Name	Location	Drainage area (mi^2)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
05457778	Little Cedar River near Johnsburg, MN	Lat 43°30'52", long 92°45'19", in $NW^1/_4NE^1/_4$ sec.33, T.101 N.,R.16 W., Mower County, Hydrologic Unit 07080201, at bridge on County Road 6, 1 mile northeast of Johnsburg, 1 mile north of Minnesota-Iowa border.	46	1986-95	4-21-95	b10.52	430
05458960	Bancroft Creek at Bancroft, MN	Lat 43°42'09", long 93°21'23", in $SW^1/_4SE^1/_4$ sec.21, T.103 N., R.21 W., Freeborn County, Hydrologic Unit 07080202, at bridge on County Road 14, 1.6 miles northeast of Fountain Lake, 1 mile north of Interstate 90.	29.1	1985+, 1986-95	4-21-95	4.13	160
05476900	Fourmile Creek near Dunnell, MN	Lat 43°34'57", long 94°46'26", in $SW^1/_4NW^1/_4$ sec.2, T.101 N., R.33 W., Martin County, Hydrologic Unit 07100003, at bridge on State Highway 4, 0.6 mile upstream from mouth, 1.6 miles north of Dunnell.	14.0	1960-95	4-13-95	ab11.20	81
05476989	East Fork Des Moines River near Ceylon, MN	Lat 43°33'53", long 94°39'15", in $NW^1/_4SW^1/_4$ sec.11, T.101 N., R,32 W., Martin County, Hydrologic Unit 07010003, at bridge on County Road 23, 2.4 miles northwest of Ceylon.	154	1986-95	4-20-95	b17.62	500
06482500	Pipestone Creek near Pipestone, MN	Lat 44°04'54", long 96°18'27", in $SE^1/_4SE^1/_4$ sec.12, T.107 N., R.46 W., Pipestone County, Hydrologic Unit 10170203, at bridge on U.S. Highway 75, 5.5 miles north of Pipestone.	--	1991-95	4-19-95	17.67	420
06482745	Beaver Creek at Valley Springs, S.D.	Lat 43°35'10", long 96°28'20", in $NW^1/_4NW^1/_4$ sec.3, T.101 N., R.47 W., Minnehaha County, South Dakota, Hydrologic Unit 10170203, at bridge on County Road 103 (Valley Drive), 1 mile west of South Dakota-Minnesota border, 2.5 miles south of Interstate 90.	104	1986-95	3-26-95	20.69	980
06482933	Chanarambi Creek near Edgerton, MN	Lat 43°53'59", long 96°03'39", in $NW^1/_4SW^1/_4$ sec.18, T.105 N., R.43 W., Murray County, Hydrologic Unit 10170204, at bridge on township road, 3.8 miles northeast of Edgerton, 7.4 miles upstream from mouth.	56.1	1979-95	3-25-95	14.12	430
06483000	Rock River at Luverne, MN	Lat 43°39'15", long 96°12'03", in $SW^1/_4NE^1/_4$ 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#, 1972-95	4-19-95	8.70	3550

Annual maximum discharge at high-flow sites during water year 1995

Station No.	Station Name	Location	Drainage area (mi^2)	Period of Record	Annual Maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
06483350	Little Rock River near Rushmore, MN	Lat 43°32'36", long 95°48'58", in $NE^1/_4NE^1/_4$ sec. 24, T. 101 N., R, 42 W., Nobles County, Hydrologic Unit 10170204, at bridge #4967, on County Road 6, 1.5 miles west of Ransom, 5.1 miles south of Rushmore.	--	1991-95	3-26-95	ab23.59	210
06603530	Little Sioux River near Spafford, MN	Lat 43°36'08", long 95°15'27", in $NE^1/_4NE^1/_4$ sec. 34, T. 102 N., R. 37 W., Jackson County, Hydrologic Unit 10230003, at bridge on county highway, 1.6 miles downstream from Jackson County ditch No. 11, 5.8 miles east of Spafford.	41.1	1962-95	3-26-95	a8.92	225

+ Operated as low flow site.
# Operated as a continuous-record gaging station.
† Discharge not determined.
a Affected by shifting control.
b Not annual maximum gage height.
c Backwater from ice.
d Approximate.
e Backwater from aquatic growth or debris.
f Peak stage at downstream side of road.
g Discharge estimated.

Miscellaneous Sites

DISCHARGE AT MISCELLANEOUS SITES - 1995 WATER YEAR

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 (*).

Stream	Tributary to	Location	Drainage area (mi^2)	Period of record	Date	Discharge (ft^3/s)
		Red River of the North Basin				
Otter Tail River 05030140	Red River of the North	Lat 46°40'20", long 95°39'56", in $SW^1/_4SW^1/_4$ sec. 18, T. 137 N., R. 39 W., Otter Tail County, Hydrologic Unit 09020103, at trunk highway 10 bridge, 1.2 miles northwest of Luce, MN	331	1967-71, 1973-74, 1976-77, 1994-95	8-01-95	74
Otter Tail River 05030150	Red River of the North	Lat 46°38'34", long 95°36'15", in $NW^1/_4NW^1/_4$ sec. 34, T. 137 N., R. 39 W., Otter Tail County, Hydrologic Unit 09020103, at bridge on township road, 2.5 mile southeast of Luce, MN.	-	1994-95	4-21-95 6-06-95 7-11-95 8-21-95	256 165 96 50
Little Pine Lake outlet 05030181	Otter Tail River	Lat 46°37'36", long 95°32'23", in $NW^1/_4NE^1/_4$ sec. 1, T. 136 N., R. 39 W., Otter Tail County, Hydrologic Unit 09020103, at bridge on State Highway 8, at outlet to Little Pine Lake, 3 miles northeast of Perham, MN.	-	1933, 1964-66 1970, 1973-74, 1976-77, 1995	4-20-95 6-06-95 7-11-95 8-08-95	269 195 100 69
Toad River 05030270	Big Pine Lake	Lat 46°28'39", long 95°30'37",in $SE^1/_4SW^1/_4$ sec. 29, T. 137 N., R. 38 W., Otter Tail County, Hydrologic Unit 09020103, at culvert on State Highway 8 at northwest end of Big Pine Lake, 4.0 miles northeast of Perham, MN.	-	1995	3-14-95 3-15-95 3-20-95 3-29-95 4-13-95 5-17-95 6-06-95 7-05-95 7-11-95 8-07-95 8-25-95	83 120 212 132 77 89 39 60 58 *11 31
Big Pine Lake outlet 05030290	Otter Tail River	Lat 46°35'31", long 95°30'12", in $NE^1/_4SW^1/_4$ sec. 17, T.136 N., R. 38 W., Otter Tail County, Hydrologic Unit 09020103, at Dam at outlet to Big Pine Lake, 3 miles east of Perham, MN.	-	1995	4-20-95 6-05-95 7-11-95 8-25-95	416 255 181 131
		Lake of the Woods Basin				
Big Fork River	Rainy River	Lat 47°50'26", long 93°30'12", in $NE^1/_4NW^1/_4$ sec. 26, T. 62 N, R. 25 W., Itasca County, Hydrologic Unit 09030006, at bridge on trunk highway 1, 6.3 miles east of Effie, 0.9 mile south of Busties Lake.	-	1995	3-23-95 10-06-95	896 1690
		Crow River Basin				
North Fork Crow River 05276005	Crow River	Lat 45°22'38", long 94° 47'00", in SW1/4, NW1/4, sec 13, T. 122 N., R. 33 W., Kandiyohi County, Hydrologic Unit 07010204, at bridge on County Highway (CSAH) 6, 2.5 miles west of Paynesville, MN.	-	1995	7-12-95	171

"See footnotes at end of the table."

DISCHARGE AT MISCELLANEOUS SITES - 1995 WATER YEAR

Stream	Tributary to	Location	Drainage area (mi^2)	Period of record	Date	Discharge (ft^3/s)
		Mississippi River Main Stem				
Mississippi River 05288920	Gulf of Mexico	Lat 44°58'46", long 93°14'50", in $SE^1/_4SE^1/_4$ sec. 23, T. 29 N., R. 24 W., Hennepin County, Hydrologic Unit 09010206, at lower St.Anthony Falls lock and dam in Minneapolis at River mile 853.3 upstream from Ohio River. Discharge measurements made at Hennepin and Franklin Ave. bridges are included.	19,700	1912, 1938-39, 1941,43, 1953-54,57, 1963-85, 1990-95	5-16-95	20,500
Shingle Creek 05288710	Mississippi River	Lat 45°02'18", long 93°12'47", in $SW^1/_4SW^1/_4$, sec. 12, T. 118 N., R. 21 W., Hennepin County, Hydrologic Unit 07010206, at foot bridge over Shingle Creek, near intersection of Emerson Ave. N., and 46th Ave. N., in Minneapolis, MN.	-	1995	7-18-95	21
		Minnesota River Basin				
Center Creek 05318170	Blue Earth River	Lat 43°40'22", long 94°27'44", in $NW^1/_4NW^1/_4$ sec. 5, T. 102 N., R. 30 W., Martin County, Hydrologic Unit 07020009, at bridge on County Highway 143, in Fairmont, MN.	-	1969, 1971, 1995	9-14-95	*1.52
Le Sueur River 05320070	Blue Earth River	Lat 44°00'52", long 93°31'38", in $NE^1/_4SE^1/_4$ sec. 1, T. 106 N., R. 23 W., Waseca County, Hydrologic Unit 07020011, at bridge on County Highway 4, 0.2 mile east of Wilton, MN.	a155	1968-69, 1976, 1980, 1995	7-12-95 8-11-95	*64 231
Cobb River 05320330	Le Sueur River	Lat 44°02'50", long 94°00'00", in $SE^1/_4NW^1/_4$ sec. 30,T. 107 N., R. 26 W., Blue Earth County, Hydrologic Unit 07020011, at bridge on County Highway 16, 4.5 miles northeast of Good Thunder, MN.	305	1968-70, 1975-76, 1995	7-12-95 8-11-95	173 1460
County Ditch 6 05320120	Le Sueur River	Lat 44°04'27", long 93°46'05", in $NW^1/_4SW^1/_4$ sec. 18, T., 107 N., R., 24 W., at R. 24 W., Waseca County, Hydrologic Unit 07020011, at culverts on County Road 14, 3.5 miles southwest of of Janesville, MN.	-	1995	b7-12-95 8-11-95	*20 116
Little Cobb River 05320270	Cobb River	Lat 43°59'48", long 93°54'30", in $SE^1/_4SE^1/_4$ sec. 11, T. 106 N., R. 26 W., Blue Earth County, Hydrologic Unit 07070011, at culvert on County Road 16, 5.0 miles northeast of Mapleton, 2.5 miles east of Beauford, MN	-	1987-88, 1995	7-12-95 7-15-95 8-02-95 8-11-95	*76 111 432 639
Cobb River tributary 05320300	Cobb River	Lat 44°01'05", long 93°57'30", in $SW^1/_4NE^1/_4$ sec. 4, T. 106 N., R. 26 W., Blue Earth County, Hydrologic Unit 07070011, at culvert on State Highway 22, 6.3 miles north of Mapleton, MN.	7.25	c1959-85, 1995	10-27-94 11-02-94 11-09-94 d3-07-95 3-15-95 3-22-95 3-26-95 3-30-95 4-05-95	*3.8 *3.1 *1.6 *0.11 *4.9 *1.6 42 11 *3.5
Nine Mile Creek 05330902	Minnesota River	Lat 44°48'26", long 93°18'05", in $SE^1/_4$ $SW^1/_4$ sec. 21, T.27 N., R. 21W., Hennepin County, Hydrologic Unit 07010206, 1600 ft below bridge over 106th St . in Bloomington, MN.	-	1995	7-18-95	53

"See footnotes at end of the table."

Stream	Tributary to	Location	Drainage area (mi^2)	Period of record	Date	Discharge (ft^3/s)
		St. Croix River Basin				
Kettle River 05336180	St. Croix River	Lat 46°29'03", long 93°53'19", in $NE^1/_4$ $SE^1/_4$, sec 8, T. 46 N., R. 20 W., Carlton County, Hydrologic Unit 07030003, at bridge on County State-aid Highway (CSAH) 12, 0.5 mile west of Kettle River, MN.	-	1995	8-1-95	23
		Des Moines River Basin				
Okabena Creek 05474895	Jack Creek	Lat 43°40'27", long 95°26'58", in $NW^1/_4NW^1/_4$ sec. 6, T. 102 N., R. 38 W., Jackson County, Hydrologic Unit 07100001, at bridge on County Road 14, 1 mile south of Brewster, MN.	-	1995	3-23-95 3-28-95 4-17-95 6-26-95 7-10-95	17 70 52 23 *14
Elk Creek 05474900	Okabena Creek	Lat 43°40'43", long 95°27'10", in $NE^1/_4SE^1/_4$ sec. 36, T. 103 N., R. 39 W., Nobles County, Hydrologic Unit 07100001, at bridge on County Road 1, 0.9 mile south of Brewster, MN.	-	1995	3-23-95 3-28-95 4-17-95 7-5-95 7-10-95	*11 168 131 *34 *20
Okabena River 05474915	South Heron Lake	Lat 43°44'10", long 95°20'06", in $NW^1/_4SW^1/_4$ sec. 7, T. 103 N., R. 37 W., Jackson County, Hydrologic Unit 07100001, at bridge on township road, 0.5 mile west of Okabena, MN.	-	e1995	6-9-95	184
Jack Creek 05474945	Heron Lake	Lat 43°47'26", long 95°35'14", in $NE^1/_4NW^1/_4$ sec. 25, T. 104 N. R. 40 W., Nobles County, Hydrologic Unit 070100001, at bridge on township road, 5.5 miles southwest of Kinbrae, MN.	-	1995	3-23-95 3-29-95 4-18-95 7-6-95	*7.9 144 170 *26
North Branch Jack Creek 05474950	Jack Creek	Lat 43°48'01", long 95°34'21", in $SE^1/_4NE^1/_4$ sec. 24, T. 104 N., R. 40 W., Nobles County, Hydrologic Unit 07100001, at bridge on township road, 4.5 miles southwest of Kinbrae, MN.	-	1995	3-23-95 3-29-95 4-18-95	9.1 209 218
East Graham Lake Outlet 05474965	Jack Creek	Lat 43°48'09", long 95°28'19", in $NW^1/_4NW^1/_4$ sec. 24, T. 104 N., R. 39 W., Nobles County, Hydrologic Unit 07100001, at bridge on County Road 1, 1.2 miles south of Kinbrae, MN.	-	1995,	3-23-95 3-29-95 4-17-95 7-05-95 7-10-95	*5.3 80 82 *15 *8.8
Jack Creek 05474975	Heron Lake	Lat 43°46'34", long 95°20'08", in $SW^1/_4SW^1/_4$ sec. 30, T. 104 N. R. 37 W., Jackson County, Hydrologic Unit 07100001, at bridge on township road, 0.8 mile southwest of Heron Lake, MN.	-	e1995	6-9-95 7-10-95	210 *22
Heron Lake tributary 4346110951407	Heron Lake	Lat 43°46'19", long 95°14'07", in $SW^1/_4NW^1/_4$ sec. 36, T. 104 N.R. 37 W., Jackson County, Hydroogic Unit 07100001, at bridge on County Road 24, 4.5 miles southeast of Heron Lake, MN.	-	1995	3-28-95	*6.4
Heron Lake tributary 4347040951407	Heron Lake	Lat 43°47'04", long 95°14'07", in $SW^1/_4NW^1/_4$ sec. 25, T. 104 N. R. 37 W., Jackson County, Hydrologic Unit 07100001, at bridge on County Road 24, 4.5 miles east of Heron Lake, MN.	-	1995	3-28-95	*12
Heron Lake Outlet 05474990	Des Moines River	Lat 43°48'03", long 95°16'31", in $SE^1/_4NE^1/_4$ sec. 21, T. 104 N., R. 37 W., Jackson County, Hydrologic Unit 07100001, at bridge on township road, 2.0 miles east of Heron Lake, MN.	-	1995	3-29-95	440

a approximately., b stream measured 0.5 mile upstream, c operated as a high-flow partial record station., d total ice cover,
e operated by DNR as a continuous record gaging station.

Water Quality of Partial-Record Stations

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

Water-quality partial-record stations are particular sites where chemical-quality, biological and (or) sediment data are collected systematically over a period of years for use in hydrologic analyses. Letter E indicates estimated value. Letter K indicates non-ideal colony count.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05030140- OTTER TAIL RIVER NORTHWEST OF LUCE, MN
(National Water Quality Assessment Station),

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)
AUG 01...	1100	21.5	26.0	106	74	341	338	9.0	8.5	8.2

DATE	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKALINITY LAB (MG/L AS CACO3) (90410)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS TOTAL (MG/L AS P) (00665)
AUG 01...	170	183	6	194	<0.015	<0.010	0.50	0.60	0.140	0.020

DATE	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C) (00689)	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)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)
AUG 01...	<0.010	<0.010	8.7	0.60	33	22	4.7	1.2	3.1	1.8

DATE	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SAMPLE PURPOSE CODE (71999)	SAMPLING METHOD, CODES (82398)	SEDIMENT, SUSPENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
AUG 01...	0.10	14	79	26	208	15.00	10	2	100

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

463948095382001 - OTTER TAIL RIVER NORTH EAST OF LUCE, MN
(National Water Quality Assessment Station)

DATE	TIME	DIS-CHARGE, IN TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CUBIC FEET PER SECOND (00060)	CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	
AUG 01...	1345	23.5	E75	328	328	15.3	8.9	8.6	175	178	20	174

DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)
AUG 01...	<0.015	<0.010	0.50	0.40	0.130	<0.010	<0.010	<0.010	33	20	4.3	1.0

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SAMPLE PURPOSE CODE (71999)	SAM-PLING METHOD, CODES (82398)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
AUG 01...	3.2	2.2	0.10	14	97	17	211	15.00	10	1	100

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05030181 OTTER TAIL R AT LITTLE PINE LAKE OTLT NR PERHAM MN (LAT 46 37 36N LONG 095 32 23W)

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)
MAR 1995							
15...	1100	--	397	7.8	3.0	--	--
28...	1400	--	412	8.0	3.5	--	--
APR							
13...	0950	--	390	8.1	2.0	--	--
MAY							
03...	0915	--	588	8.0	9.0	--	--
17...	1100	--	417	8.5	11.0	--	--
31...	1600	--	374	8.7	21.0	--	--
JUN							
14...	1000	--	364	8.7	20.0	--	--
JUL							
05...	1020	--	353	8.4	21.0	--	--
12...	1020	--	331	8.7	24.0	--	--
26...	1102	--	310	8.8	21.0	--	--
AUG							
09...	1015	--	323	8.6	22.0	--	--
23...	1010	--	321	8.5	22.0	--	--
SEP							
07...	1020	--	312	8.2	20.0	--	--
20...	1020	--	325	8.1	14.0	--	--

DATE	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
MAR 1995						
15...	<0.010	0.310	0.030	0.008	<0.010	2
28...	<0.010	0.330	0.100	0.012	<0.010	4
APR						
13...	0.020	0.200	0.020	0.022	<0.010	2
MAY						
03...	<0.010	0.170	<0.015	0.022	0.010	3
17...	<0.010	0.080	<0.015	0.012	<0.010	4
31...	<0.010	<0.050	0.030	0.019	<0.010	--
JUN						
14...	<0.010	<0.050	0.020	0.011	<0.010	--
JUL						
05...	<0.010	<0.050	0.020	0.013	<0.010	--
12...	<0.010	<0.050	0.020	0.017	<0.010	--
26...	<0.010	<0.050	<0.015	0.022	<0.010	--
AUG						
09...	<0.010	<0.050	0.020	0.018	<0.010	--
23...	<0.010	<0.050	<0.015	0.019	<0.010	--
SEP						
07...	<0.010	<0.050	0.040	0.023	<0.010	--
20...	<0.010	<0.050	<0.015	0.027	<0.010	--

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05030270 TOAD RIVER AT BIG PINE LK INLET NR PERHAM, MN (LAT 46 28 39N LONG 095 30 37W)

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)
MAR 1995							
14...	1315	83	354	7.5	1.0	--	--
15...	1630	120	263	7.8	1.5	--	--
20...	1140	212	305	7.8	4.0	--	--
28...	1445	--	401	8.0	5.0	--	--
APR							
03...	1330	--	370	8.0	5.0	--	--
13...	1035	--	438	8.2	4.0	--	--
19...	0950	--	438	8.1	4.0	--	--
MAY							
03...	1030	--	950	7.9	10.0	--	--
10...	1430	--	417	8.3	15.0	--	--
17...	1010	--	449	8.2	11.0	--	--
24...	1030	--	--	--	--	--	--
31...	1635	--	481	8.6	22.0	--	--
JUN							
07...	1240	--	524	8.3	18.5	--	--
14...	0920	--	471	8.2	21.0	--	--
20...	0925	--	465	8.3	23.0	--	--
28...	0925	--	631	8.3	20.0	--	--
JUL							
05...	0945	--	380	7.9	20.0	--	--
06...	1430	--	413	8.3	20.0	729	9.8
12...	1000	--	503	8.1	21.0	--	--
19...	0920	--	422	8.1	20.0	--	--
26...	1125	--	438	8.5	20.0	--	--
AUG							
02...	1120	--	428	8.5	21.0	--	--
09...	0955	--	374	8.2	21.0	--	--
16...	1000	--	353	7.9	22.0	--	--
23...	0950	--	428	8.1	21.0	--	--
29...	0910	--	396	7.5	20.0	--	--
SEP							
07...	1040	--	428	7.7	17.0	--	--
12...	1040	--	385	7.7	18.0	--	--
20...	0955	--	444	7.9	10.0	--	--
26...	0935	--	438	6.9	10.0	--	--

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05030270 TOAD RIVER AT BIG PINE LK INLET NR PERHAM, MN (LAT 46 28 39N LONG 095 30 37W)

DATE	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
MAR 1995						
14...	0.030	1.00	0.740	0.140	0.100	46
15...	0.030	0.600	0.750	0.160	0.120	50
20...	0.020	0.420	0.310	0.170	0.060	25
28...	0.010	0.190	0.170	0.029	0.020	19
APR						
03...	0.010	0.160	0.060	0.063	<0.010	15
13...	0.020	0.130	0.040	0.040	<0.010	10
19...	0.010	0.080	0.060	0.012	<0.010	15
MAY						
03...	<0.010	0.110	0.080	0.035	0.020	23
10...	<0.010	<0.050	0.030	0.063	0.010	20
17...	<0.010	<0.050	0.030	0.043	0.020	20
24...	<0.010	<0.050	0.030	0.050	0.010	--
31...	<0.010	<0.050	0.020	0.050	0.020	--
JUN						
07...	0.030	0.180	0.110	0.066	0.030	--
14...	0.020	0.160	0.070	0.062	0.030	--
20...	0.020	0.210	0.060	0.071	0.050	--
28...	0.020	0.160	0.040	0.075	0.030	--
JUL						
05...	<0.010	0.060	0.060	0.088	0.030	--
06...	0.010	0.200	0.030	0.092	0.040	--
12...	0.010	<0.050	0.040	0.093	0.040	--
19...	0.020	0.130	0.100	0.083	0.040	--
26...	0.010	0.110	<0.015	0.073	0.040	--
AUG						
02...	0.010	0.190	0.030	0.065	0.040	--
09...	0.030	0.300	0.060	0.076	0.050	--
16...	0.020	0.330	0.070	0.079	0.050	--
23...	<0.010	0.260	0.030	0.081	0.050	--
29...	<0.010	0.050	0.040	0.140	0.040	--
SEP						
07...	<0.010	0.070	0.220	0.150	0.070	--
12...	0.010	0.150	0.150	0.095	0.050	--
20...	0.040	0.480	0.140	0.063	0.040	--
26...	0.020	0.380	0.050	0.039	0.020	--

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

463740095305101 - BIG PINE LAKE - SITE 1 - NEAR PERHAM, MN

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	TEMPERATURE WATER (DEG C) (00010)	TRANSPARENCY (SECCHI DISK) (M) (00078)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)
AUG									
09...	0930	3.00	23.0	--	330	7.9	8.4	0.020	<0.010
09...	0931	0.50	23.0	5.50	331	8.1	8.4	--	--
09...	0932	1.00	23.0	--	330	8.0	8.4	--	--
09...	0933	2.00	23.0	--	329	8.0	8.4	--	--
09...	0934	3.00	23.0	--	330	7.9	8.4	--	--
09...	0935	4.00	23.0	--	331	7.9	8.4	--	--
09...	0936	10.0	23.0	--	333	7.8	8.4	--	--
09...	0937	15.0	23.0	--	332	7.9	8.4	--	--
09...	0938	20.0	23.0	--	334	7.9	8.3	--	--
09...	0939	23.0	23.0	--	334	7.7	8.3	--	--

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	SIMAZINE, WATER, DISS, REC (UG/L) (04035)	PROMETRYN, WATER, DISS, REC (UG/L) (04036)	PROMETON, WATER, DISS, REC (UG/L) (04037)	DEISOPROPYL ATRAZIN WATER, DISS, REC (UG/L) (04038)	DEETHYL ATRAZINE, WATER, DISS, REC (UG/L) (04040)	CYANAZINE, WATER, DISS, REC (UG/L) (04041)
AUG									
09...	<0.050	0.019	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.200

DATE	AMETRYN WATER, DISS, REC, (UG/L) (38401)	PROPAZINE WATER DISS REC (UG/L) (38535)	METOLACHLOR WATER DISSOLV (UG/L) (39415)	ATRAZINE, WATER, DISS, REC (UG/L) (39632)	ALACHLOR, WATER, DISS, REC, (UG/L) (46342)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70954)	DEPTH AT SAMPLE LOCATION, TOTAL (FEET) (81903)	METRIBUZIN SENCOR WATER DISSOLV (UG/L) (82630)
AUG									
09...	<0.050	<0.050	<0.050	<0.050	<0.050	7.80	0.300	24.0	<0.050

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

463529095274601 - BIG PINE LAKE - SITE 3 - NEAR PERHAM, MN

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	TEMPERATURE WATER (DEG C) (00010)	TRANSPARENCY (SECCHI DISK) (M) (00078)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)
AUG								
09...	1600	3.00	23.5	--	335	8.4	8.4	0.040
09...	1601	0.50	23.5	5.50	334	8.4	8.4	--
09...	1602	3.00	23.5	--	335	8.4	8.4	--
09...	1603	8.00	23.5	--	334	8.3	8.4	--
09...	1604	12.0	23.0	--	335	8.1	8.3	--
09...	1605	15.0	23.0	--	335	8.0	8.3	--
09...	1606	16.0	23.0	--	335	7.8	8.3	--

DATE	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70954)	DEPTH AT SAMPLE LOCATION, TOTAL (FEET) (81903)
AUG							
09...	<0.010	<0.050	0.018	<0.010	7.10	0.400	18.0

463547095283801 - BIG PINE LAKE - SITE 2 - NEAR PERHAM, MN

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	TEMPERATURE WATER (DEG C) (00010)	TRANSPARENCY (SECCHI DISK) (M) (00078)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)
AUG							
09...	1415	3.00	23.0	--	335	7.9	8.4
09...	1416	0.50	23.0	5.50	336	7.9	8.4
09...	1417	3.00	23.0	--	335	7.9	8.4
09...	1418	8.00	23.0	--	335	7.7	8.3
09...	1419	13.0	23.0	--	335	7.5	8.3
09...	1420	18.0	22.5	--	336	7.2	8.3
09...	1421	28.0	22.5	--	336	7.0	8.2
09...	1422	28.0	22.5	--	336	7.0	8.2
09...	1423	33.0	22.5	--	337	6.8	8.2
09...	1424	38.0	22.5	--	337	6.7	8.2
09...	1425	43.0	22.5	--	337	6.5	8.2
09...	1426	45.0	22.5	--	338	6.4	8.2
09...	1427	47.0	22.5	--	337	6.5	8.2
09...	1428	50.0	22.5	--	338	6.3	8.2
09...	1429	51.0	22.5	--	338	6.2	8.2
09...	1430	53.0	22.0	--	347	3.5	7.8

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	DEPTH AT SAMPLE LOCATION, TOTAL (FEET) (81903)
AUG						
09...	0.030	<0.010	<0.050	0.021	<0.010	54.0
09...	0.080	<0.010	<0.050	0.021	<0.010	

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

463641095293901 - BIG PINE LAKE - SITE 7 - NEAR PERHAM, MN

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	TEMPERATURE WATER (DEG C) (00010)	TRANSPARENCY (SECCHI DISK) (M) (00078)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)
AUG							
09...	1045	65.0	16.0	--	421	0.1	7.3
09...	1050	52.0	22.0	--	350	1.5	7.7
09...	1055	3.00	23.0	--	332	8.0	8.5
09...	1056	0.50	23.0	5.40	332	8.3	8.5
09...	1057	3.00	23.0	--	332	8.0	8.5
09...	1058	10.0	23.0	--	333	7.7	8.4
09...	1059	15.0	23.0	--	333	7.8	8.4
09...	1100	20.0	23.0	--	333	7.8	8.4
09...	1101	25.0	23.0	--	333	7.7	8.4
09...	1102	30.0	23.0	--	334	7.5	8.3
09...	1103	35.0	23.0	--	334	7.4	8.3
09...	1104	40.0	23.0	--	333	7.4	8.3
09...	1105	45.0	22.5	--	334	7.3	8.3
09...	1106	47.0	22.5	--	334	6.6	8.3
09...	1107	50.0	22.0	--	340	4.9	8.1
09...	1108	52.0	22.0	--	350	1.5	7.7
09...	1109	55.0	21.5	--	352	0.3	7.6
09...	1110	60.0	16.5	--	419	0.1	7.3

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	DEPTH AT SAMPLE LOCATION, TOTAL (FEET) (81903)
AUG						
09...	1.50	<0.010	<0.050	0.037	0.020	65.0
09...	0.150	<0.010	<0.050	0.019	<0.010	65.0
09...	0.020	<0.010	<0.050	0.022	<0.010	65.0

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05030290 OTTER TAIL RIVER AT BIG PINE LK OUTLET NR PERHAM (LAT 46 35 31N LONG 095 30 13W)

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)
MAR 1995							
16...	0715	--	396	8.0	2.5	--	--
28...	1630	--	347	8.1	6.0	--	--
APR							
13...	1130	--	358	8.3	5.0	--	--
MAY							
10...	1525	--	331	8.6	16.0	--	--
24...	1115	--	--	--	--	--	--
JUN							
07...	1200	--	396	8.3	18.0	--	--
20...	1000	--	412	8.5	24.0	--	--
28...	1000	--	417	8.2	25.0	--	--
JUL							
19...	1005	--	312	8.6	23.0	--	--
AUG							
02...	1200	--	317	8.7	22.0	--	--
16...	1030	--	291	8.4	23.0	--	--
29...	0935	--	312	8.2	21.0	--	--
SEP							
12...	1100	--	299	8.0	18.0	--	--
26...	1005	--	312	8.1	13.0	--	--

DATE	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
MAR 1995						
16...	<0.010	0.150	0.140	0.018	<0.010	7
28...	0.020	0.300	0.190	0.031	0.020	3
APR						
13...	0.030	0.110	0.030	0.028	<0.010	3
MAY						
10...	<0.010	0.080	0.030	0.025	<0.010	8
24...	<0.010	<0.050	0.030	0.021	<0.010	--
JUN						
07...	<0.010	<0.050	0.030	0.022	<0.010	--
20...	<0.010	<0.050	0.040	0.012	<0.010	--
28...	0.010	<0.050	0.040	0.017	<0.010	--
JUL						
19...	<0.010	<0.050	0.030	0.020	<0.010	--
AUG						
02...	<0.010	0.120	0.020	0.017	<0.010	--
16...	<0.010	<0.050	0.060	0.022	<0.010	--
29...	<0.010	<0.050	0.040	0.005	<0.010	--
SEP						
12...	<0.010	<0.050	<0.015	0.020	<0.010	--
26...	<0.010	<0.050	0.020	0.020	0.020	--

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

463807095323701 - LITTLE PINE LAKE - SITE 5 - NEAR PERHAM, MN

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	TEMPERATURE WATER (DEG C) (00010)	TRANSPARENCY (SECCHI DISK) (M) (00078)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)
AUG									
10...	0915	3.00	23.0	--	321	8.8	8.5	<0.015	<0.010
10...	0916	0.50	23.0	5.50	322	8.8	8.5	--	--
10...	0917	3.00	23.0	--	321	8.8	8.5	--	--
10...	0918	8.00	22.5	--	322	8.7	8.5	--	--
10...	0919	13.0	22.5	--	323	8.3	8.4	--	--
10...	0920	18.0	22.5	--	324	8.2	8.4	--	--
10...	0921	23.0	22.5	--	324	7.8	8.4	--	--
10...	0922	25.0	21.5	--	338	3.0	8.0	--	--
10...	0923	27.0	20.0	--	348	0.4	7.5	--	--
10...	0924	28.0	20.0	--	349	0.6	7.5	--	--
10...	0925	30.0	19.0	--	353	0.1	7.5	--	--
10...	0926	35.0	16.5	--	375	0.1	7.4	--	--
10...	0927	40.0	15.0	--	384	0.1	7.4	--	--
10...	0928	45.0	14.0	--	391	0.1	7.3	--	--
10...	0929	50.0	13.5	--	390	0.1	7.3	--	--
10...	0930	55.0	13.5	--	394	0.0	7.3	--	--
10...	0931	60.0	13.0	--	398	0.0	7.2	--	--
10...	0932	65.0	12.5	--	398	0.0	7.2	--	--
10...	0945	35.0	16.5	--	375	0.1	7.4	0.160	<0.010

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	SIMAZINE, WATER, DISS, REC (UG/L) (04035)	PROMETRYN, WATER, DISS, REC (UG/L) (04036)	PROMETON, WATER, DISS, REC (UG/L) (04037)	DEISOPROPYL ATRAZIN WATER, DISS, REC (UG/L) (04038)	DEETHYL ATRAZINE, WATER, DISS, REC (UG/L) (04040)	CYANAZINE, WATER, DISS, REC (UG/L) (04041)
AUG									
10...	<0.050	0.021	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.200

DATE	AMETRYN WATER, DISS, REC, (UG/L) (38401)	PROPAZINE WATER DISS REC (UG/L) (38535)	METOLACHLOR WATER DISSOLV (UG/L) (39415)	ATRAZINE, WATER, DISS, REC (UG/L) (39632)	ALACHLOR, WATER, DISS, REC, (UG/L) (46342)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70954)	DEPTH AT SAMPLE LOCATION, TOTAL (FEET) (81903)	METRIBUZIN SENCOR WATER DISSOLV (UG/L) (82630)
AUG									
10...	<0.050	<0.050	<0.050	<0.050	<0.050	11.0	0.200	68.0	<0.050

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05053800 RED RIVER OF THE NORTH ABOVE FARGO, ND
(National Water Quality Assessment Program)

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
NOV											
03...	1000	--	303	872	8.5	739	2.5	5.5	--	--	390
JAN											
30...	1130	415	--	528	7.9	736	-9.0	0.0	13.3	94	260
MAR											
19...	0800	7720	--	302	7.6	739	4.5	0.5	10.3	74	130
MAY											
11...	0600	--	2880	745	8.2	740	15.0	11.0	8.2	77	330
JUN											
06...	1245	2560	--	848	7.9	730	--	--	6.6	--	380
JUL											
06...	0830	2300	--	400	8.0	740	--	19.0	6.6	74	150
26...	0840	1150	--	888	8.2	740	22.0	24.5	6.7	83	370
AUG											
15...	0730	408	--	711	8.4	740	13.5	20.0	6.0	68	280
26...	0900	--	406	745	8.2	748	22.0	23.0	6.8	80	300
SEP											
07...	0830	--	378	596	8.4	751	12.5	21.5	6.3	72	260

DATE	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
NOV											
03...	242	--	75	50	38	17	0.8	8.4	279	E13	210
JAN											
30...	235	--	47	34	15	11	0.4	5.3	287	0	35
MAR											
19...	--	97	29	14	11	15	0.4	7.3	--	--	52
MAY											
11...	147	--	64	41	26	14	0.6	7.2	179	0	200
JUN											
06...	--	194	71	48	30	15	0.7	7.7	--	--	230
JUL											
06...	105	--	31	18	12	14	0.4	4.9	128	0	65
26...	227	--	71	46	43	20	1	13	277	0	200
AUG											
15...	237	--	51	36	31	18	0.8	21	289	0	93
26...	210	--	54	40	34	18	0.9	23	234	10	110
SEP											
07...	214	--	48	33	20	14	0.5	6.3	261	0	81

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05053800 RED RIVER OF THE NORTH ABOVE FARGO, ND--Continued

DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NITRATE DISSOLVED (MG/L AS N) (00618)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)
NOV											
03...	19	0.20	13	551	596	0.81	488	<0.010	--	-	<0.050
JAN											
30...	13	0.20	18	310	337	0.46	378	0.010	0.190	0.200	0.200
MAR											
19...	8.1	0.20	12	207	217	0.30	4520	0.120	2.88	3.00	3.00
MAY											
11...	15	0.20	5.3	451	500	0.68	3890	0.040	0.780	0.820	0.820
JUN											
06...	16	0.20	8.7	530	599	0.81	4140	0.040	0.450	0.490	0.490
JUL											
06...	7.4	0.20	12	224	252	0.34	1560	0.060	2.24	2.30	2.30
26...	21	0.20	22	555	618	0.84	1920	0.020	0.420	0.440	0.440
AUG											
15...	24	0.20	19	421	455	0.62	501	0.020	0.730	0.750	0.750
26...	28	0.30	16	433	471	0.64	516	0.020	0.620	0.640	0.640
SEP											
07...	14	0.20	19	350	377	0.51	385	<0.010	--	--	<0.050

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N) (00607)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN, TOTAL (MG/L AS N) (00600)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)
NOV											
03...	<0.015	1.1	--	1.1	0.80	1.1	0.090	0.030	0.010	11	13
JAN											
30...	0.160	0.64	0.54	0.80	0.70	1.0	0.020	0.030	0.020	16	11
MAR											
19...	0.360	1.4	0.84	1.8	1.2	4.8	0.510	0.280	0.260	110	130
MAY											
11...	0.100	1.1	0.80	1.2	0.90	2.0	0.110	0.040	0.030	10	2
JUN											
06...	0.040	1.1	0.86	1.1	0.90	1.6	0.210	0.100	0.110	5	3
JUL											
06...	0.060	1.1	0.54	1.2	0.60	3.5	0.370	0.150	0.160	23	1
26...	0.110	1.1	0.79	1.2	0.90	1.6	0.260	0.180	0.190	7	4
AUG											
15...	0.050	1.7	0.95	1.7	1.0	2.5	0.170	0.060	0.070	5	4
26...	0.030	1.6	1.1	1.6	1.1	2.2	0.170	0.060	0.050	3	2
SEP											
07...	0.040	0.86	0.56	0.90	0.60	0.90	0.130	0.060	0.050	4	<1

DATE	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C) (00689)	BENZENE TOTAL (UG/L) (34030)	BENZENE N-BUTYL WATER UNFLTRD REC (UG/L) (77342)	BENZENE N-PROPY WATER UNFLTRD REC (UG/L) (77224)	BENZENE O-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34536)	BENZENE SEC BUTYL-WATER UNFLTRD REC (UG/L) (77350)	BENZENE TERT-BUTYL-WATER UNFLTRD REC (UG/L) (77353)	BENZENE 1,3-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34566)	BENZENE 1,4-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34571)	BENZENE 1,2,4-TRI-CHLORO-WAT UNF REC (UG/L) (34551)
NOV											
03...	11	1.9	--	--	--	--	--	--	--	--	--
JAN											
30...	--	--	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200
MAR											
19...	8.7	>6.3	--	--	--	--	--	--	--	--	--
MAY											
11...	9.7	0.20	--	--	--	--	--	--	--	--	--
JUN											
06...	11	--	--	--	--	--	--	--	--	--	--
JUL											
06...	6.5	4.4	--	--	--	--	--	--	--	--	--
26...	12	1.6	--	--	--	--	--	--	--	--	--
AUG											
15...	11	1.8	--	--	--	--	--	--	--	--	--
26...	10	2.0	--	--	--	--	--	--	--	--	--
SEP											
07...	8.2	1.7	--	--	--	--	--	--	--	--	--

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05053800 RED RIVER OF THE NORTH ABOVE FARGO, ND--Continued

DATE	BENZENE 124-TRI METHYL UNFILT RECOVER (UG/L) (77222)	BROMO-BENZENE WATER, WHOLE, TOTAL (UG/L) (81555)	BROMO-FORM TOTAL (UG/L) (32104)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L) (32102)	CHLORO-BENZENE TOTAL (UG/L) (34301)	CHLORO-DI-BROMO-METHANE TOTAL (UG/L) (32105)	CHLORO-ETHANE TOTAL (UG/L) (34311)	CHLORO-FORM TOTAL (UG/L) (32106)	CIS-1,2-DI-CHLORO-ETHENE WATER TOTAL (UG/L) (77093)	CIS 1,3-DI-CHLORO-PROPENE TOTAL (UG/L) (34704)	DI-BROMO-METHANE WATER WHOLE RECOVER (UG/L) (30217)
JAN 30...	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200

DATE	DIBROMO CHLORO-PROPANE WATER WHOLE TOT.REC (UG/L) (82625)	1,2-DIBROMO ETHANE WATER WHOLE TOTAL (UG/L) (77651)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L) (32101)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L) (34668)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L) (34496)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L) (32103)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L) (34501)	1,2-DI-CHLORO-PROPANE TOTAL (UG/L) (34541)	1,1-DI CHLORO-PRO-PENE, WAT, WH TOTAL (UG/L) (77168)	2,2-DI CHLORO-PRO-PANE WAT, WH TOTAL (UG/L) (77170)	ETHANE, 1112-TETRA-CHLORO-WAT UNF REC (UG/L) (77562)
JAN 30...	<1.00	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200

DATE	ETHANE, 1,1,2,2 TETRA-CHLORO-WAT UNF REC (UG/L) (34516)	ETHYL-BENZENE TOTAL (UG/L) (34371)	FREON-113 WATER UNFLTRD REC (UG/L) (77652)	HEXA-CHLORO-BUT-ADIENE TOTAL (UG/L) (39702)	ISO-PROPYL-BENZENE WATER WHOLE REC (UG/L) (77223)	METHANE BROMO CHLORO-WAT UNFLTRD REC (UG/L) (77297)	METHYL-BROMIDE TOTAL (UG/L) (34413)	METHYL-CHLO-RIDE TOTAL (UG/L) (34418)	METHYL-ENE CHLO-RIDE TOTAL (UG/L) (34423)	METHYL TERT-BUTYL ETHER WAT UNF REC (UG/L) (78032)	O-CHLORO-TOLUENE WATER WHOLE TOTAL (UG/L) (77275)
JAN 30...	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200

DATE	P-ISO-PROPYL-TOLUENE WATER WHOLE REC (UG/L) (77356)	STYRENE TOTAL (UG/L) (77128)	TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L) (34475)	TOLUENE TOTAL (UG/L) (34010)	TOLUENE P-CHLOR WATER UNFLTRD REC (UG/L) (77277)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L) (34699)	1,2-TRANSDI CHLORO-ETHENE TOTAL (UG/L) (34546)	1,2,3-TRI-CHLORO BENZENE WAT, WH REC (UG/L) (77613)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L) (34506)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L) (34511)
JAN 30...	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05075300- RED LAKE RIVER ABV THIEF R. AT THIEF R. FALLS
(National Water Quality Assessment Station)

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH WATER WHOLE OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	ALKA-LINITY WAT DIS LAB (STAND-ARD UNITS) (00403)	ALKA-LINITY TOT IT FIELD MG/L AS CACO3 (39086)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
JUL 17...	1200	664	310	314	8.2	8.2	7.8	137	147	0	167	0.030

DATE	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
JUL 17...	<0.010	0.70	0.80	<0.050	0.020	<0.010	0.010	15	1.0	40	15

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SAMPLE PURPOSE CODE (71999)	SAM-PLING METHOD, CODES (82398)
JUL 17...	3.1	2.1	1.7	15	<0.10	11	31	6	208	15.00	10

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05076200- THIEF RIVER AT THIEF RIVER FALLS, MN
(National Water Quality Assessment Station)

DATE	TEMPERATURE TIME (DEG C) (00010)	TEMPERATURE WATER (DEG C) (00020)	BAROMETRIC PRESSURE (MM AIR HG) (00025)	DISCHARGE, INST. CUBIC FEET OF SECOND (00061)	SPECIFIC CONDUCTPER (US/CM) (00095)	SPECIFIC CONDUCTANCE ANCE (US/CM) (90095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)
JUL 17...	0915	19.0	20.0	737	41	593	593	3.6	7.87.5

DATE	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKALINITY LAB (MG/L AS CACO3) (90410)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)
JUL 17...	152	159	0	185	0.160	0.020	1.6	1.8	0.120

DATE	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C) (00689)	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)
JUL 17...	0.110	0.080	0.080	25	1.0	73	30	4.3	5.5

DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SAMPLE PURPOSE CODE (71999)	SAMPLING METHOD, CODES (82398)
JUL 17...	4.0	150	0.20	17	60	410	444	15.00	10

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05102490 RED RIVER OF THE NORTH AT PEMBINA, ND
(National Water Quality Assessment Program)

PERIOD OF RECORD.--Water year 1994 to September 1995 (discontinued)..

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)
NOV												
09...	1015	--	5120	863	8.2	739	5.0	4.0	13.9	110	360	248
APR												
07...	0645	38300	--	574	8.0	742	1.0	1.0	12.2	88	240	136
MAY												
25...	1145	--	14300	968	8.2	755	20.0	14.0	9.0	88	400	--
JUN												
14...	0830	--	6290	873	8.4	743	24.5	21.0	7.9	91	370	213
JUL												
20...	0900	--	9850	673	8.3	743	22.0	24.0	6.0	74	290	170
AUG												
07...	0915	--	4270	759	8.2	745	26.0	25.0	7.0	87	320	217
29...	0955	--	3570	711	8.2	--	25.0	--	--	--	290	208

DATE	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	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)
NOV												
09...	--	80	40	52	23	1	9.2	302	0	170	29	0.20
APR												
07...	--	58	24	20	15	0.6	9.1	166	0	100	19	0.20
MAY												
25...	238	87	45	49	21	1	8.5	--	--	220	35	0.20
JUN												
14...	--	80	41	43	20	1	8.6	260	0	190	26	0.30
JUL												
20...	--	66	31	29	17	0.7	7.7	207	0	120	23	0.20
AUG												
07...	--	70	35	36	19	0.9	8.4	265	0	130	26	0.20
29...	--	65	30	40	23	1	8.7	254	0	120	24	0.20

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)
NOV											
09...	19	550	591	0.80	8170	0.010	0.290	0.300	0.300	0.040	1.1
APR											
07...	17	349	386	0.52	39900	0.090	4.21	4.30	4.30	0.160	1.1
MAY											
25...	11	601	661	0.90	25600	0.010	0.450	0.460	0.460	0.030	0.97
JUN											
14...	13	533	584	0.79	9920	<0.010	--	0.540	0.540	<0.015	1.0
JUL											
20...	20	403	446	0.61	11900	<0.010	--	0.840	0.840	0.020	0.88
AUG											
07...	21	459	507	0.69	5850	<0.010	--	0.260	0.260	<0.015	1.0
29...	17	431	467	0.64	4500	<0.010	--	0.280	0.280	<0.015	1.2

DATE	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N) (00607)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)
NOV											
09...	0.76	1.1	0.80	1.4	0.260	0.130	0.120	24	2	12	1.9
APR											
07...	0.84	1.3	1.0	5.6	0.260	0.190	0.170	20	7	--	--
MAY											
25...	0.77	1.0	0.80	1.5	0.150	0.060	0.070	4	4	14	1.8
JUN											
14...	--	1.0	0.80	1.5	0.190	0.140	0.120	4	2	11	3.1
JUL											
20...	0.78	0.90	0.80	1.7	0.200	0.150	0.190	7	<1	11	2.9
AUG											
07...	--	1.0	0.90	1.3	0.190	0.140	0.150	7	2	13	1.9
29...	--	1.2	0.70	1.5	0.300	0.110	0.090	4	2	10	2.3

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SPETEMBER 1995.

443213094590001 - LARSON LAKE - MIDLAKE - NEAR MORTON, MN

DATE	TIME	SAM-PLING DEPTH (FEET) (00003)	TEMPER-ATURE WATER (DEG C) (00010)	GAGE HEIGHT (FEET) (00065)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)
MAR										
02...	1400	3.50	2.5	--	--	21.0	--	7.5	0.070	0.020
SEP										
11...	1540	--	24.5	9.32	849	8.8	7.9	7.5	0.170	<0.010

DATE	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	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)
MAR										
02...	0.50	0.70	0.540	0.020	0.010	0.020	110	42	8.7	3.5
SEP										
11...	1.1	1.8	<0.050	0.620	0.160	0.130	82	50	18	5.1

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
MAR									
02...	13	85	0.30	14	84	400	544	868	383
SEP									
11...	14	130	0.30	24	16	1000	548	794	310

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	TIME	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	H-2 / H-1 STABLE ISOTOPE RATIO PER MIL (82082)	O-18 / O-16 STABLE ISOTOPE RATIO PER MIL (82085)	N15/N14 NO3 FRAC WATER FLTRD 0.45 U PER MIL (82690)
05320293 COBB RIVER TRIBUTARY NEAR BEAUFORD, MN (LAT 44 01 10N LONG 093 56 54W)												
APR 1995												
24...	1717	0.020	14.0	0.160	0.70	0.80	0.080	0.050	0.050	--	--	--
05320295 COBB RIVER TRIBUTARY BELOW BEAUFORD, MN (LAT 44 01 09N LONG 093 56 55W)												
APR 1995												
24...	1730	0.020	14.0	0.170	0.70	0.80	0.080	0.050	0.050	--	--	--

05320300 COBB RIVER TRIBUTARY NEAR MAPLETON, MN

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L) (00535)
OCT											
27...	1110	3.8	814	6.6	10.0	741	10.2	450	410	11	4
NOV											
02...	1140	3.1	799	6.9	10.0	736	13.1	2300	K1000	8	10
09...	1130	1.6	791	7.0	8.5	740	16.2	750	840	<1	3
16...	1110	2.6	795	6.8	5.0	740	16.1	370	410	7	7
22...	1100	3.8	796	8.1	2.5	742	15.9	K4100	780	7	6
MAR											
07...	1610	0.11	889	8.2	1.0	751	--	1200	260	7	4
15...	0915	4.9	496	7.6	2.5	744	--	1400	900	34	24
22...	0915	1.6	739	7.3	2.5	732	11.1	5700	810	13	5
26...	1215	42	417	7.8	--	--	--	--	--	450	70
30...	0845	11	682	7.1	2.5	743	12.3	350	240	38	7
APR											
04...	1545	--	--	--	--	--	--	--	--	--	--
05...	1530	5.9	770	7.8	8.5	730	12.6	180	4100	23	12
11...	1600	8.9	665	8.4	3.5	732	15.0	450	4500	152	24
18...	1230	13	720	8.0	4.5	715	14.0	330	3400	64	18
18...	1600	29	442	8.3	5.5	718	13.4	--	--	820	140
18...	1830	60	395	8.2	5.5	720	13.3	K2000	K22000	900	130
19...	1610	36	692	8.1	7.5	746	13.0	--	--	128	16
25...	1615	11	760	7.9	9.5	734	12.8	520	5100	12	6
MAY											
02...	1600	5.7	1240	7.6	13.0	739	13.6	56	180	5<1	
09...	1510	6.8	741	7.9	9.0	730	13.9	640	260	7	<1
13...	2010	20	648	7.2	9.5	735	10.4	--	--	41	9
14...	0830	18	690	7.1	7.5	741	10.5	--	--	13	7
18...	0815	6.8	751	7.9	9.0	736	12.1	290	730	4	<1
23...	1610	3.9	1010	7.2	15.0	742	12.5	53	K38	17	3
28...	1200	18	701	7.5	9.5	--	10.1	--	--	50	9
30...	1710	11	1060	8.1	15.5	745	13.5	450	280	12	6
JUN											
06...	1430	46	690	7.5	14.0	730	8.2	K7500	K8700	37	6
07...	1330	36	692	7.6	14.0	729	8.8	--	--	105	14
12...	1640	10	718	8.0	18.5	740	9.9	220	440	2912	
20...	1740	4.1	741	8.1	24.0	736	10.8	490	310	12	2
28...	1515	10	665	7.8	17.5	739	9.1	410	1800	13	3

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05320300- COBB RIVER TRIBUTARY NEAR MAPLETON, MN

DATE	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
27...	0.030	11.0	0.050	--	--	0.100	--	0.100	--	--
NOV										
02...	0.020	11.0	0.040	--	--	0.090	--	0.090	--	--
09...	0.030	11.0	0.020	--	--	0.080	--	0.070	--	--
16...	0.040	11.0	0.060	--	--	0.080	--	0.060	--	--
22...	0.040	9.60	0.060	--	--	0.090	--	0.090	--	--
MAR										
07...	0.240	6.20	1.60	--	--	0.280	--	0.210	10	--
15...	0.180	9.40	0.480	--	--	0.340	--	0.240	32	--
22...	0.040	9.20	0.130	--	--	0.100	--	0.090	--	--
26...	0.090	5.50	0.170	--	--	0.600	--	0.250	500	--
30...	0.030	12.0	0.090	--	--	0.080	--	0.070	133	--
APR										
04...	0.030	12.0	0.130	0.70	0.70	0.040	0.050	0.050	--	--
05...	0.030	12.0	0.430	--	--	0.150	--	0.150	56	--
11...	0.030	10.0	0.170	--	--	0.080	--	0.070	311	--
18...	0.020	11.0	0.130	--	--	0.070	--	0.060	121	--
18...	0.030	7.20	0.120	--	--	0.210	--	0.180	1160	--
18...	0.040	7.00	0.120	--	--	0.260	--	0.170	1050	98
19...	0.020	14.0	0.080	--	--	0.190	--	0.080	184	--
25...	0.030	13.0	0.200	--	--	0.050	--	0.060	84	--
MAY										
01...	0.040	12.0	0.050	0.60	--	--	0.050	0.040	--	--
02...	0.050	13.0	0.050	--	--	0.040	--	0.030	50	--
09...	0.040	13.0	0.070	--	--	0.050	--	0.050	91	--
13...	0.070	12.0	0.100	--	--	0.120	--	0.090	124	--
14...	0.040	12.0	0.080	--	--	0.080	--	0.060	57	--
18...	0.050	12.0	<0.015	--	--	0.010	--	0.020	12	--
23...	0.060	12.0	0.020	--	--	0.020	--	<0.010	95	--
28...	0.080	15.0	0.110	--	--	0.140	--	0.080	231	--
30...	0.040	6.90	0.030	--	--	0.060	--	0.030	161	--
JUN										
06...	0.070	17.0	0.080	--	--	0.140	--	0.140	349	--
07...	0.050	17.0	0.090	--	--	0.210	--	0.130	160	--
08...	0.040	16.0	0.070	0.90	--	--	0.080	0.080	--	--
12...	0.040	14.0	0.050	--	--	0.050	--	0.050	149	--
20...	0.070	14.0	0.060	--	--	0.040	--	0.050	63	--
28...	0.040	13.0	0.060	--	--	0.080	--	0.070	205	--

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05320300- COBB RIVER TRIBUTARY NEAR MAPLETON, MN

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
JUL									
06...	0915	7.0	719	7.9	14.0	736	10.9	220	440
12...	1715	4.1	752	7.9	29.0	738	10.1	430	610
15...	1010	84	429	7.4	18.0	737	6.0	--	--
15...	1545	62	514	7.5	18.5	736	6.0	--	--
16...	0645	41	554	7.6	17.5	737	6.7	--	--
17...	1745	31	576	7.3	20.5	737	7.6	3200	K11000
19...	1225	198	178	7.2	13.5	735	8.4	--	--
19...	1400	176	245	7.3	18.5	734	9.2	--	--
19...	1900	121	327	7.8	20.0	733	10.0	K6000	--
20...	0715	66	464	7.2	17.0	743	8.0	--	--
21...	0955	36	507	7.4	18.0	741	8.4	--	--
25...	1710	12	595	7.7	22.5	734	6.6	260	500
27...	1830	173	182	7.7	21.5	--	5.6	--	--
27...	1920	163	188	7.7	21.5	--	5.6	--	--
28...	1010	91	319	6.8	19.5	734	4.7	--	--
AUG									
02...	0910	13	561	8.1	18.5	746	9.0	170	770
06...	1215	111	304	7.3	19.5	734	7.1	--	--
06...	1945	92	355	7.2	21.5	734	7.9	5500	K33000
07...	0740	63	489	7.3	18.5	738	7.4	--	--
08...	0815	34	556	7.1	19.0	737	8.4	1200	K3700
14...	1810	8.9	602	8.0	20.5	742	7.9	170	1300
23...	1225	4.6	766	7.6	21.5	740	10.5	920	1500
31...	0925	2.2	710	7.9	18.5	740	8.2	K3000	K4300

DATE	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L) (00535)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
JUL								
06...	12	5	0.050	14.0	0.050	0.090	0.070	179
12...	9	6	0.090	14.0	0.040	0.070	0.060	136
15...	188	38	0.080	9.40	0.070	0.460	0.300	462
15...	164	34	0.060	11.0	0.070	0.410	0.250	295
16...	108	24	0.060	11.0	0.060	0.290	0.220	171
17...	76	28	0.040	9.80	0.060	0.320	0.230	88
19...	412	84	0.020	4.10	0.090	0.360	0.330	562
19...	372	64	0.020	4.10	0.080	0.380	0.300	466
19...	214	40	0.020	6.50	0.060	0.530	0.270	334
20...	172	34	0.030	9.30	0.070	0.280	0.250	295
21...	110	32	0.030	7.70	0.100	0.350	0.300	214
25...	32	11	0.220	7.70	0.120	0.320	0.310	--
27...	268	96	0.020	2.90	0.060	0.400	0.220	359
27...	256	76	0.020	3.10	0.040	0.360	0.220	360
28...	148	72	0.020	5.40	0.050	0.380	0.220	267
AUG								
02...	35	10	0.040	7.00	0.070	0.370	0.300	80
06...	196	48	0.040	4.10	<0.015	0.260	0.100	294
06...	264	48	0.010	5.70	0.020	0.250	0.220	354
07...	160	34	0.020	8.00	0.050	0.320	0.200	418
08...	66	18	0.030	8.20	0.060	0.240	0.210	71
14...	16	<1	0.070	6.50	0.160	0.590	0.410	68
23...	12	3	0.330	10.0	0.120	0.210	0.150	83
31...	26	4	0.470	8.70	1.30	0.410	0.340	526

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05322000 BLUE EARTH RIVER AT MOUTH AT MANKATO, MN (LAT 44 09 48N LONG 094 02 12W)

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	RESIDUE TOTAL, AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L) (00535)
MAR 1995								
08...	0915	810	8.5	1.0	756	--	3	3
14...	1145	471	7.1	1.5	738	--	85	14
21...	1215	667	7.5	5.0	738	13.3	103	20
29...	1515	657	7.9	4.0	748	14.0	328	40
APR								
06...	1145	698	8.2	5.5	742	12.9	107	19
12...	1415	712	8.3	3.0	735	14.8	168	21
19...	1345	725	8.1	6.5	746	14.1	214	22
26...	1430	710	8.2	9.5	741	12.1	170	18
MAY								
03...	1150	725	8.0	11.5	744	9.0	86	5
10...	0830	719	7.7	11.5	740	10.0	63	<1
17...	1445	710	8.2	12.5	738	11.8	151	17
24...	1420	1020	8.3	15.5	746	10.5	112	16
31...	1410	882	8.3	15.5	741	9.9	212	24
JUN								
07...	1145	609	7.9	19.5	733	8.2	668	84
13...	1400	665	8.4	17.5	743	9.3	134	34
21...	1230	719	8.3	26.5	744	8.5	78	14
28...	1045	584	8.0	20.5	739	8.9	250	30
JUL								
05...	1630	641	8.3	21.5	734	8.7	122	22
13...	1130	682	8.1	28.5	740	10.2	85	17
18...	1340	686	8.2	23.0	745	9.1	89	16
26...	1400	583	8.1	24.0	743	9.2	392	56
AUG								
01...	1520	658	8.2	23.0	747	7.9	186	28
07...	1450	563	8.1	22.5	742	9.1	378	42
15...	1410	663	8.5	20.0	743	8.3	112	18
25...	1430	623	8.5	27.0	739	9.9	41	8
30...	1645	603	8.4	27.5	737	10.6	51	4

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

05322000 BLUE EARTH RIVER AT MOUTH AT MANKATO, MN (LAT 44 09 48N LONG 094 02 12W)

DATE	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)
MAR 1995							
08...	0.030	3.60	0.100	0.100	0.060	0.800	<0.100
14...	0.040	3.20	0.330	0.280	0.210	14.0	<0.100
21...	0.050	6.40	0.280	0.150	0.090	15.0	0.300
29...	0.060	12.0	0.110	0.120	0.090	8.30	<0.100
APR							
06...	0.030	10.0	0.030	0.110	0.050	7.00	0.800
12...	0.020	11.0	0.040	0.050	0.050	10.0	0.400
19...	0.030	12.0	0.040	0.070	0.060	12.0	0.700
26...	0.020	12.0	0.020	0.140	0.030	18.0	0.600
MAY							
03...	0.020	11.0	<0.015	0.140	0.010	17.0	1.00
10...	0.020	10.0	0.020	0.110	0.030	22.0	0.800
17...	0.030	13.0	0.050	0.140	0.060	--	--
24...	0.020	9.70	0.020	0.060	0.020	17.0	0.700
31...	0.030	15.0	0.040	0.380	0.070	8.90	0.400
JUN							
07...	0.040	12.0	0.050	0.110	0.110	13.0	1.30
13...	0.030	12.0	0.030	0.090	0.070	8.40	0.700
21...	0.070	12.0	0.040	0.050	0.050	18.0	2.80
28...	0.030	11.0	0.040	0.130	0.100	18.0	3.00
JUL							
05...	0.020	12.0	0.020	0.150	0.080	15.0	2.20
13...	0.020	9.70	0.020	0.070	0.050	20.0	3.60
18...	0.020	8.40	0.040	0.090	0.110	11.0	1.60
26...	0.020	7.40	0.040	0.210	0.150	18.0	1.60
AUG							
01...	0.020	8.10	0.030	0.140	0.070	11.0	0.600
07...	0.020	7.70	<0.015	0.170	0.150	14.0	1.00
15...	0.020	6.70	0.070	0.160	0.110	--	--
25...	--	--	--	--	--	58.0	5.20
30...	0.020	2.60	0.030	0.050	0.020	55.0	4.60

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

444416093280200 - MYSTIC LAKE NEAR PRIOR LAKE, MN

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	BAROMETRIC PRESSURE (MM OF HG) (00025)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)
NOV 01...	1050	7.5	737	323	9.9	8.0	7.8	0	156	0.020	<0.010

DATE	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	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)	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)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)
NOV 01...	0.50	0.80	<0.050	0.040	<0.010	<0.010	39	14	8.1	5.2	20

DATE	SULFATE DISSOLVED (MG/L AS SO4) (00945)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	ALKALINITY LAB (MG/L AS CACO3) (90410)
NOV 01...	2.8	0.20	5.6	20	3	<1	360	128	197	340	142

06483000- ROCK RIVER AT LUVERNE, MN

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	AMETRYN WATER, DISS, REC, (UG/L) (38401)	ACETOCHLOR, WATER FLTRD REC (UG/L) (49260)	ALACHLOR, WATER, DISS, REC, (UG/L) (46342)
MAY 28...	1640	2000	557	8.1	11.0	0.090	6.10	0.070	0.080	<0.05	5.6	0.10

DATE	ATRAZINE, WATER, DISS, REC (UG/L) (39632)	DEETHYL ATRAZINE, WATER, DISS, REC (UG/L) (04040)	DEISOPROPYL ATRAZIN WATER, DISS, REC (UG/L) (04038)	CYANAZINE, WATER, DISS, REC (UG/L) (04041)	METOLACHLOR WATER DISSOLV (UG/L) (39415)	METRIBUZIN SENCOR WATER DISSOLV (UG/L) (82630)	PROMETON, WATER, DISS, REC (UG/L) (04037)	PROMETRYN, WATER, DISS, REC (UG/L) (04036)	PROPCHLOR, WATER, DISS, REC (UG/L) (04024)	PROPAZINE WATER DISS REC (UG/L) (38535)	SIMAZINE, WATER, DISS, REC (UG/L) (04035)
MAY 28...	1.2	0.17	0.10	2.1	11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

06483000- ROCK RIVER AT LUVERNE, MN

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	AMETRYN WATER, DISS, REC, (UG/L) (38401)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)
MAY												
28...	1640	2000	557	8.1	11.0	0.090	6.10	0.070	0.080	<0.05	5.6	0.10

DATE	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	DEISO-PROPYL ATRAZIN WATER, DISS, REC (UG/L) (04038)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	PRO-METRYN, WATER, DISS, REC (UG/L) (04036)	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	PROP-AZINE WATER DISS REC (UG/L) (38535)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)
MAY											
28...	1.2	0.17	0.10	2.1	11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Ground-Water Levels

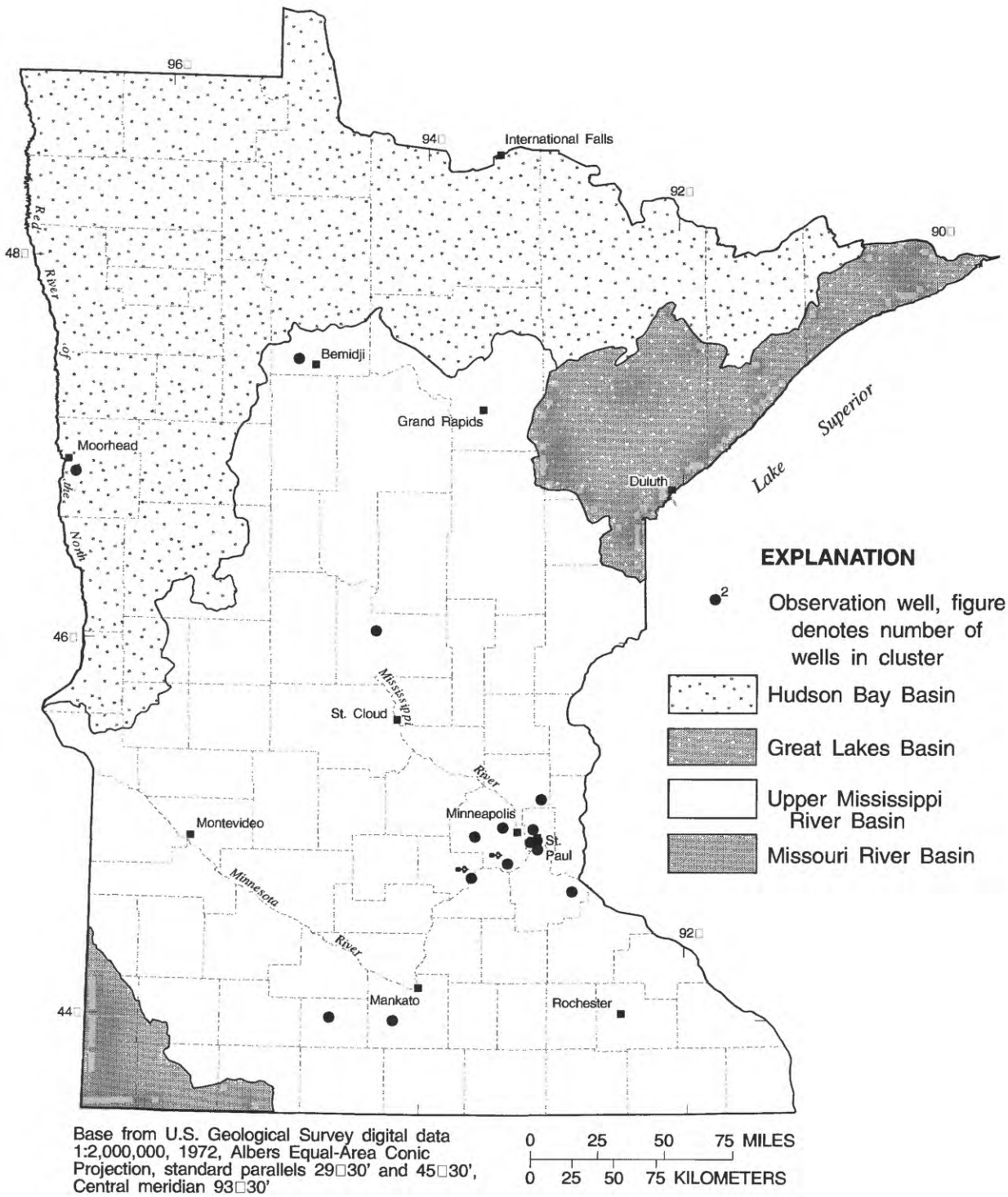


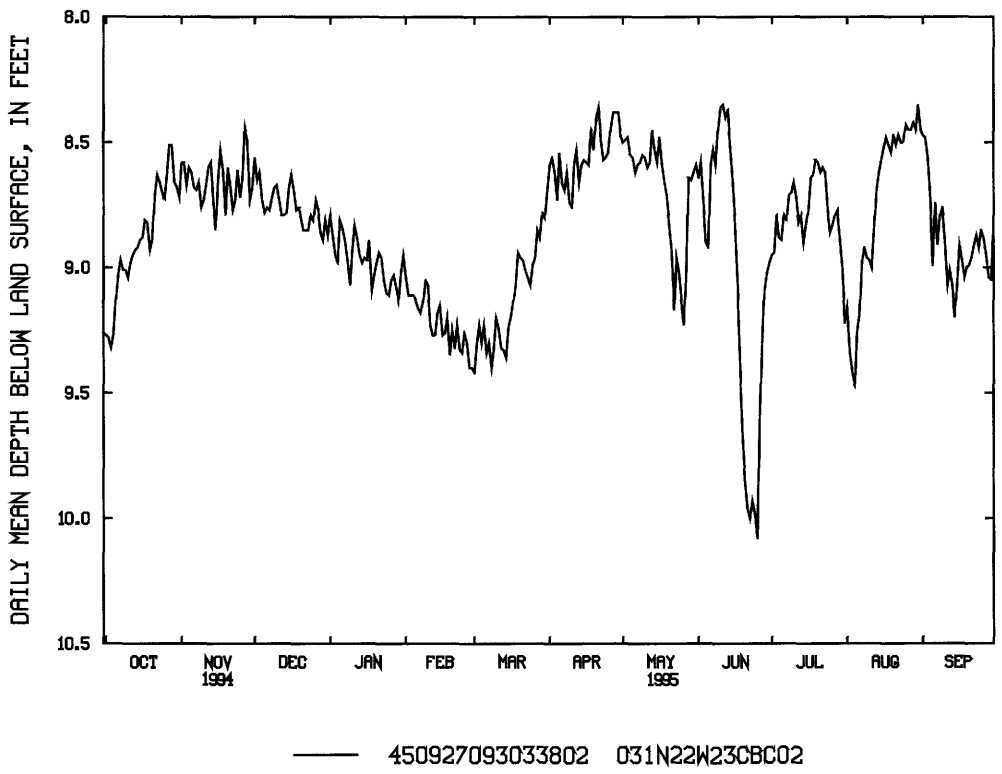
Figure 10.--Location of ground-water wells.

ANOKA COUNTY

450927093033802. Local number, 031N22W23CBC02.
LOCATION.--Lat 45°09'27", long 93°03'38", in $SW^1/_4NW^1/_4SW^1/_4$ sec.23, T.31 N., R.22 W., Hydrologic Unit 07010206, at the city of Centerville. Owner: U.S. Geological Survey.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled artesian observation well, diameter 6 in. to 95 ft, 2.5 in. to 267 ft, total depth 277 ft, screened 267 to 277 ft, screen diameter 2.4 in.
INSTRUMENTATION.--Digital recorder with one-hour punch cycle.
DATUM.--Land-surface datum is 901.6 ft above mean sea level. Measuring point: Top of recorder platform, 2.20 ft above land-surface datum.
REMARKS.--Water level affected by nearby flowing wells.
PERIOD OF RECORD.--February 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.50 ft below land-surface datum, July 8, 1993; lowest, 18.57 ft below land-surface datum, Oct. 2, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	9.23	8.68	8.84	8.91	9.18	9.34	8.65	8.63	9.02	8.96	9.37	9.04
10	9.07	8.80	8.80	9.00	9.23	9.26	8.81	8.60	8.41	8.75	9.05	9.06
15	8.93	8.87	8.75	9.04	9.31	9.33	8.65	8.65	8.74	8.95	8.66	9.19
20	9.00	8.75	8.90	9.01	9.39	9.02	8.49	8.85	10.03	8.64	8.57	9.02
25	8.74	8.75	8.85	9.17	9.32	9.07	8.56	9.28	10.22	8.88	8.46	8.94
EOM	8.77	8.74	8.93	9.02	9.44	8.78	8.53	8.64	9.05	9.25	8.49	8.95

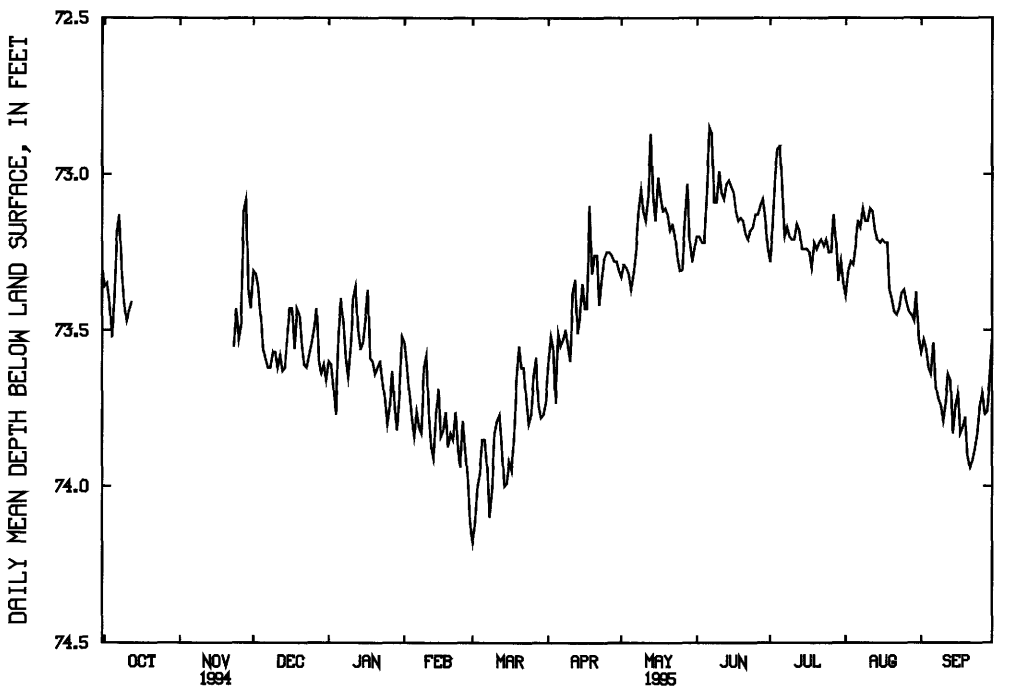


BLUE EARTH COUNTY

440050094102801. Local number, 106N28W03DBA01.
LOCATION.--Lat 44°00'50", long 94°10'28", in NE$^1/_4$NW$^1/_4$SE$^1/_4$ sec.3, T.106 N. R. 28 W., Hydrologic Unit 07020010, at Farmland Industries Ammonia Plant, 3.2 mi north of Vernon Center.
Owner: Farmland Industries.
AQUIFER.--Ironton-Galesville Sandstones of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled, unused artesian well, diameter 16 in., depth 390 ft, cased to 150 ft.
INSTRUMENTATION.--Digital recorder with one-hour punch cycle.
DATUM.--Land-surface datum is 1,005 ft above mean seal level. Measuring point: Top of recorder platform, 2.00 ft above land-surface datum.
PERIOD OF RECORD.--October 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 71.25 below land-surface datum, July 4, 1993; lowest, 76.73 ft below land-surface datum, Oct. 18, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	73.55	--	73.62	73.72	73.85	73.88	73.66	73.41	73.15	72.97	73.28	73.72
10	73.52	--	73.65	73.62	73.68	73.89	73.64	73.17	73.05	73.31	73.21	73.82
15	--	--	73.60	73.61	73.85	74.05	73.41	73.25	73.08	73.28	73.24	73.83
20	--	--	73.54	73.66	73.93	73.60	73.32	73.15	73.19	73.26	73.45	73.94
25	--	73.55	73.55	73.85	73.88	73.83	73.29	73.36	73.18	73.31	73.41	73.81
EOM	--	73.47	73.70	73.60	74.18	73.78	73.36	73.28	73.29	73.48	73.58	73.59

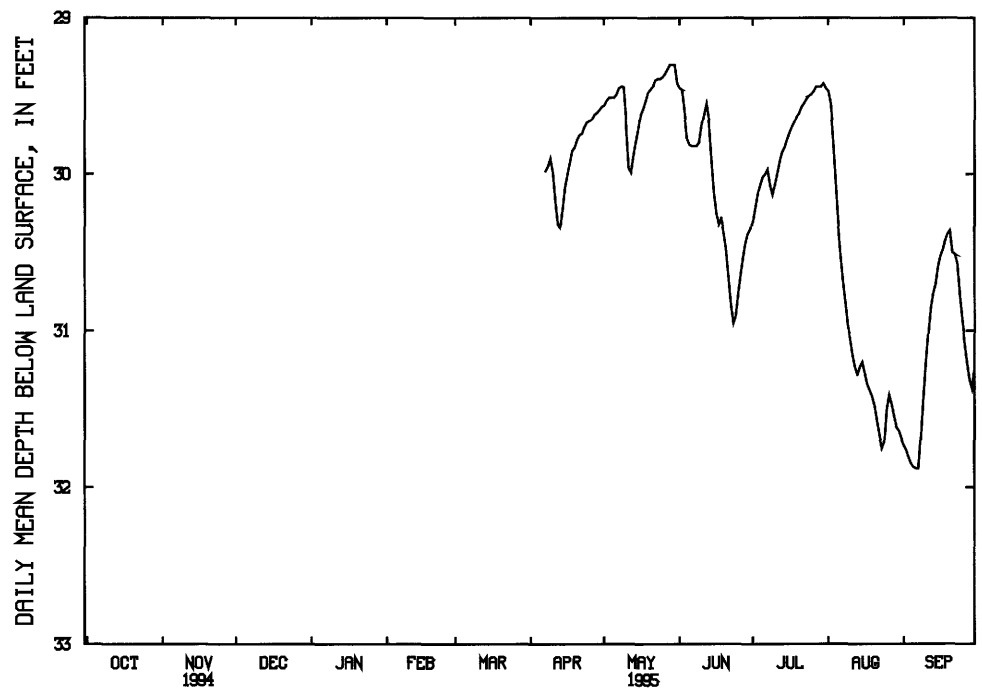


CLAY COUNTY

465237096383901. Local number, 139N47W05CDC01.
LOCATION.--Lat 46°52'37", long 96°38'39", in SW$^1/_4$SE$^1/_4$SW$^1/_4$ sec. 5, T.139 N., R.47 W., Hydrologic Unit 09020104, 2.4 mi east of Dilworth.
Owner: Steven Schroeder.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled water-table observation well, diameter 8 in., depth 131.4 ft, slotted 91 to 107 ft.
INSTRUMENTATION.--Digital recorder with 30-minute punch cycle, Apr. 6 - Sept. 30..
DATUM.--.Land-surface datum is 916.7 ft above mean sea level. Measuring point: Top of recorder platform, 3.60 ft above land-surface datum.
REMARKS.--Water level affected by pumping from nearby wells.
PERIOD OF RECORD.--January 1947 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 12.19 ft below land-surface datum, July 15, 1947; lowest, 32.94 ft below land-surface datum, Aug. 24, 19, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	--	--	--	--	--	--	--	29.51	29.82	30.05	30.41	31.88
10	--	--	--	--	--	--	30.09	29.85	29.75	30.11	31.11	31.32
15	--	--	--	--	--	--	30.15	29.75	30.18	29.80	31.23	30.65
20	--	--	--	--	--	--	29.81	29.46	30.55	29.62	31.53	30.41
25	--	--	--	--	--	--	29.66	29.38	30.82	29.50	31.61	30.99
EOM	--	--	--	--	--	--	29.59	29.45	30.37	29.46	31.72	31.33

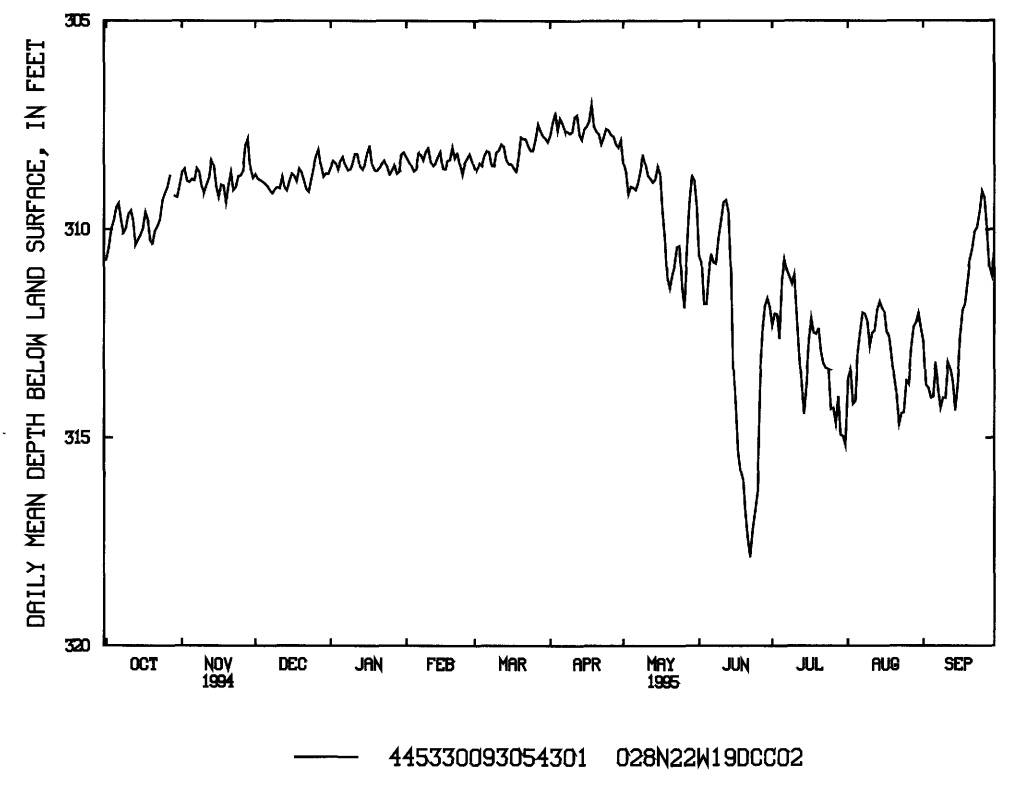


DAKOTA COUNTY

445330093054301. Local number, 028N22W19DCC02.
LOCATION.--Lat 44°53'30", long 93°05'43", in $SW^1/_4SW^1/_4SE^1/_4$ sec. 19, T.28 N., R. 22W., 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 artesian observation well, diameter 6 in., depth 539 ft, cased to 407 ft.
INSTRUMENTATION.--Digital recorder with 30-minute punch cycle.
DATUM.--Land-surface datum is 1,036.9 ft above mean sea level. Measuring point: Top of casing, 2.60 ft above land-surface datum.
REMARKS.--Water-level affected by regional pumping.
PERIOD OF RECORD.--January 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 307.730 ft below land-surface datum, Apr. 11, 1993; lowest, 328.0 ft below land-surface datum.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	309.67	308.91	309.01	308.56	308.64	308.41	307.54	309.32	311.43	311.75	313.31	314.56
10	309.87	309.15	309.09	308.57	308.26	308.27	307.83	308.68	310.19	311.54	312.98	314.80
15	310.20	309.28	308.99	308.57	308.49	308.49	307.77	308.70	314.07	314.23	312.23	314.41
20	310.45	309.28	308.77	308.74	308.25	307.96	307.67	312.14	317.44	313.03	313.87	310.99
25	309.19	308.76	308.62	308.76	308.54	308.16	307.72	311.84	317.63	314.53	313.84	309.35
EOM	309.11	308.85	308.73	308.45	308.49	307.97	307.94	310.09	312.22	315.71	312.72	310.94

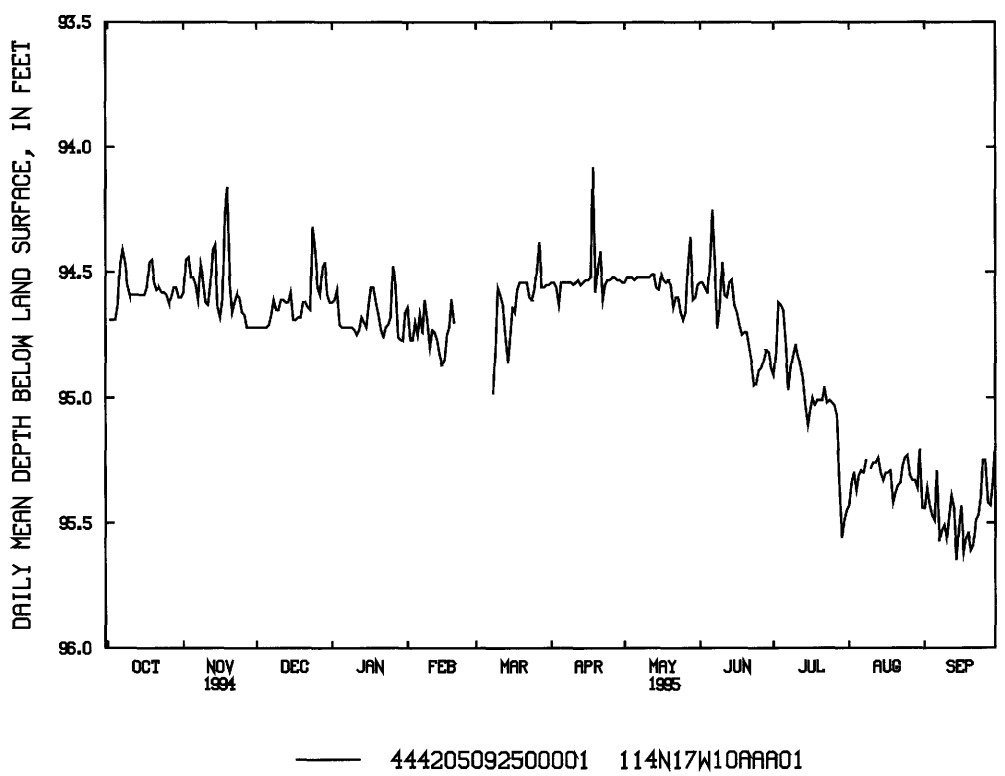


DAKOTA COUNTY--Continued

444205092500001. 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., depth 151 ft, depth of casing unknown.
INSTRUMENTATION.--Digital recorder with one-hour punch cycle.
DATUM.--Land-surface datum is 827 ft above mean sea level. Measuring point: Top of platform, 2.50 ft above land-surface datum.
PERIOD OF RECORD.--April 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 93.47 ft below land-surface datum, Sept. 30, 1993; lowest, 107.4 ft below land-surface datum, Mar. 12, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	94.69	94.52	94.72	94.72	94.79	--	94.55	94.54	94.55	94.67	95.36	95.53
10	94.59	94.64	94.67	94.74	94.81	94.58	94.58	94.52	94.60	94.85	95.30	95.60
15	94.59	94.69	94.68	94.72	94.88	94.84	94.54	94.61	94.66	95.17	95.35	95.66
20	94.57	94.66	94.67	94.72	94.72	94.54	94.60	94.59	94.77	95.03	95.43	95.62
25	94.61	94.66	94.48	94.75	--	94.64	94.53	94.70	94.89	95.04	95.27	95.33
EOM	94.60	94.72	94.62	94.77	--	94.55	94.54	94.56	94.90	95.48	95.48	95.24

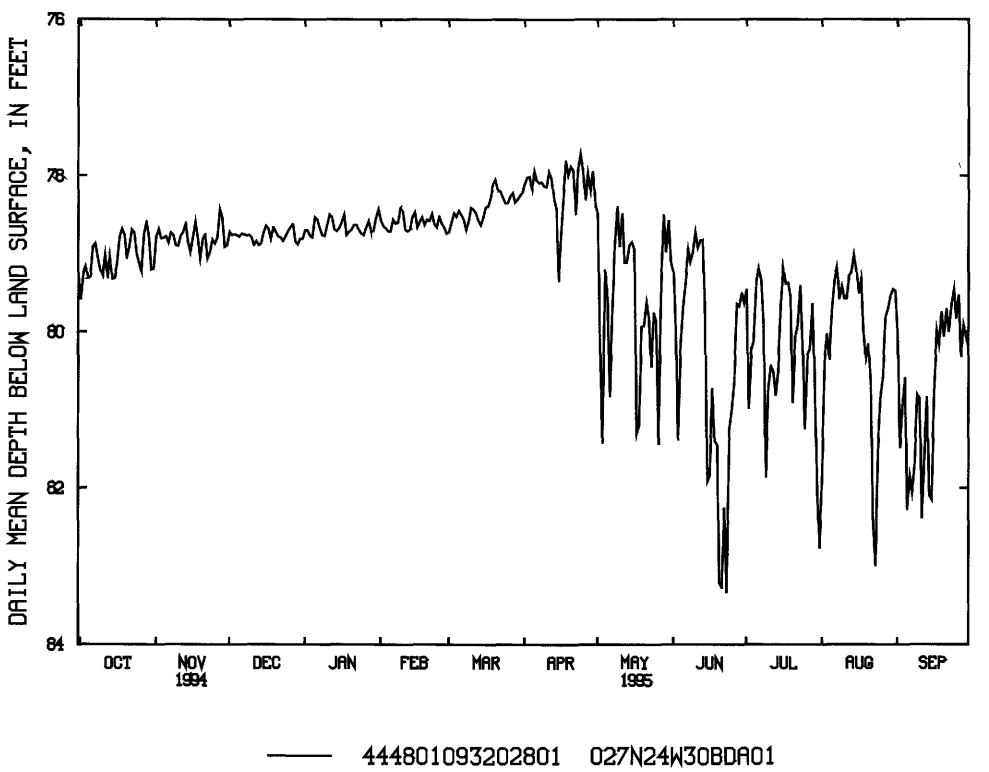


HENNEPIN COUNTY

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.to 137 ft, 8 in. to 269 ft, total depth 330 ft, cased to 269 ft.
INSTRUMENTATION.--Digital recorder with 30-minute punch cycle.
DATUM.--Land-surface datum is 815 ft above mean sea level. Measuring point: Top of recorder platform, 2.20 ft above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--March 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 63.05 ft below land-surface datum, Apr. 15, 1969; lowest, 84.86 ft below land-surface datum, July 1, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	79.72	78.84	78.80	78.69	78.74	78.50	78.09	80.73	79.94	79.72	80.13	82.90
10	79.61	78.95	78.91	78.71	78.62	78.44	78.19	79.21	79.33	81.40	80.16	81.44
15	79.58	79.03	78.84	78.72	78.68	78.63	79.52	79.13	82.39	80.09	79.81	83.31
20	79.37	79.00	78.80	78.72	78.68	78.14	77.98	80.03	83.60	81.83	80.68	80.32
25	79.63	78.88	78.73	78.78	78.60	78.41	78.60	80.78	81.49	81.90	81.17	80.10
EOM	79.64	78.95	78.87	78.53	78.77	78.25	78.89	79.37	80.00	83.11	79.62	80.45

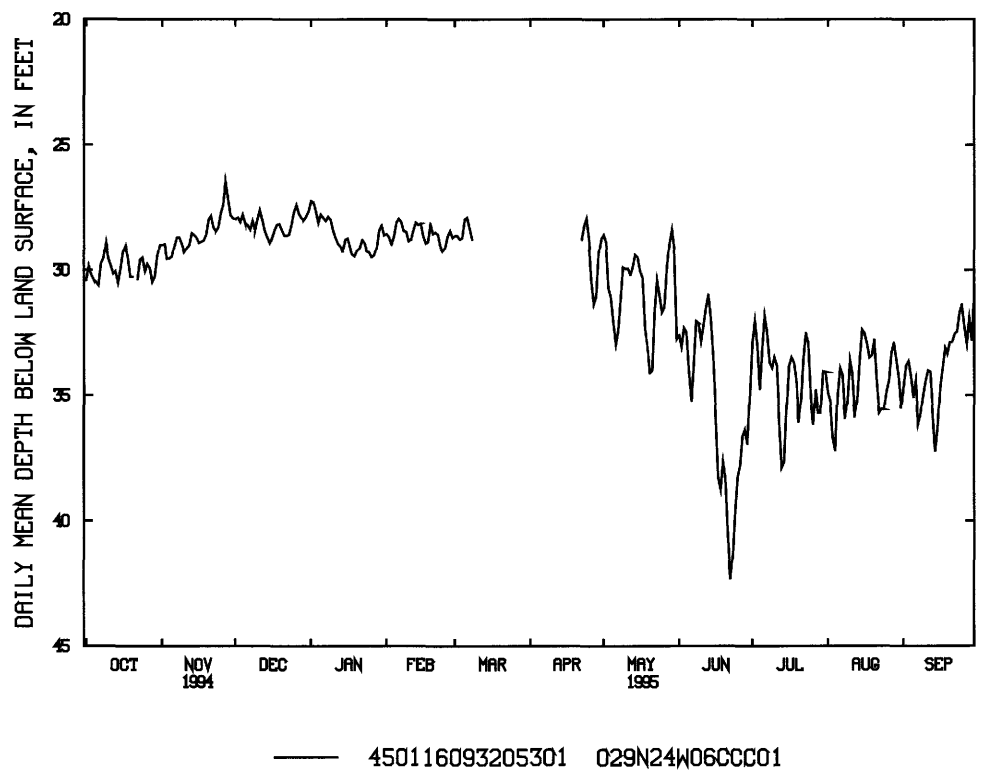


HENNEPIN COUNTY--Continued

450116093205301. Local number, 029N24W06CCC01.
LOCATION.--Lat 45°01'16", long 93°20'53", in $SW^1/_4SW^1/_4SW^1/_4$ sec.6, T.29 N., R.24 W., Hydrologic Unit 07010206, at the corner of 36th Avenue and Unity Avenue, North, Robbinsdale.
Owner: Minnesota Department of Transportation.
AQUIFER.--St. Peter Sandstone of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled, unused artesian well, diameter 5 in., depth 200 ft, cased to 152 ft.
INSTRUMENTATION.--Digital recorder with 30-minute punch cycle.
DATUM.--Land-surface datum is 870 ft above mean sea level. Measuring point: Top of casing, 3.50 ft above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--March 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 24.54 ft below land-surface datum, Dec. 28-29, 1975; lowest, 53.03 ft below land-surface datum, June 15, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT
5	31.12	30.26	29.18	28.84	28.82	29.00	--	33.63	36.03	34.77	35.54	37.40
10	30.10	30.10	28.43	29.23	29.81	--	--	30.21	33.62	34.62	34.32	35.42
15	30.39	29.24	29.85	29.38	28.69	--	--	30.46	34.69	36.37	32.77	39.28
20	30.73	28.79	28.87	29.86	29.64	--	--	34.89	39.88	37.17	32.99	34.00
25	30.47	28.43	28.21	30.10	30.06	--	29.68	32.44	40.03	36.89	35.39	32.09
EOM	30.10	28.86	28.03	29.49	29.35	--	29.26	34.67	37.15	34.53	36.89	31.69



HENNEPIN COUNTY--Continued

445740093333001. Local number, 117N23W11BBD01.
LOCATION.--Lat 44°57'40", long 93°33'30", in SE$^1/_4$NW$^1/_4$NW$^1/_4$ sec.11, T.117 N., R.23 W., Hydrologic Unit 07010206, 2 mi southwest of Wayzata, at Lake Minnetonka.
Owner: Minnetonka Boat Works, Inc., Orono.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled artesian observation well, diameter 6 in., depth 437 ft, cased to 270 ft.
INSTRUMENTATION.--Graphic recorder with a one-inch = 5 days pen trace.
DATUM.--Land-surface datum is 930.8 ft above mean sea level. Measuring point: Floor of recorder platform, 3.30 ft above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--August 1942 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 14.05 ft below land-surface datum, Apr. 30, 1954; lowest, 44.77 ft below land-surface datum, June 28, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

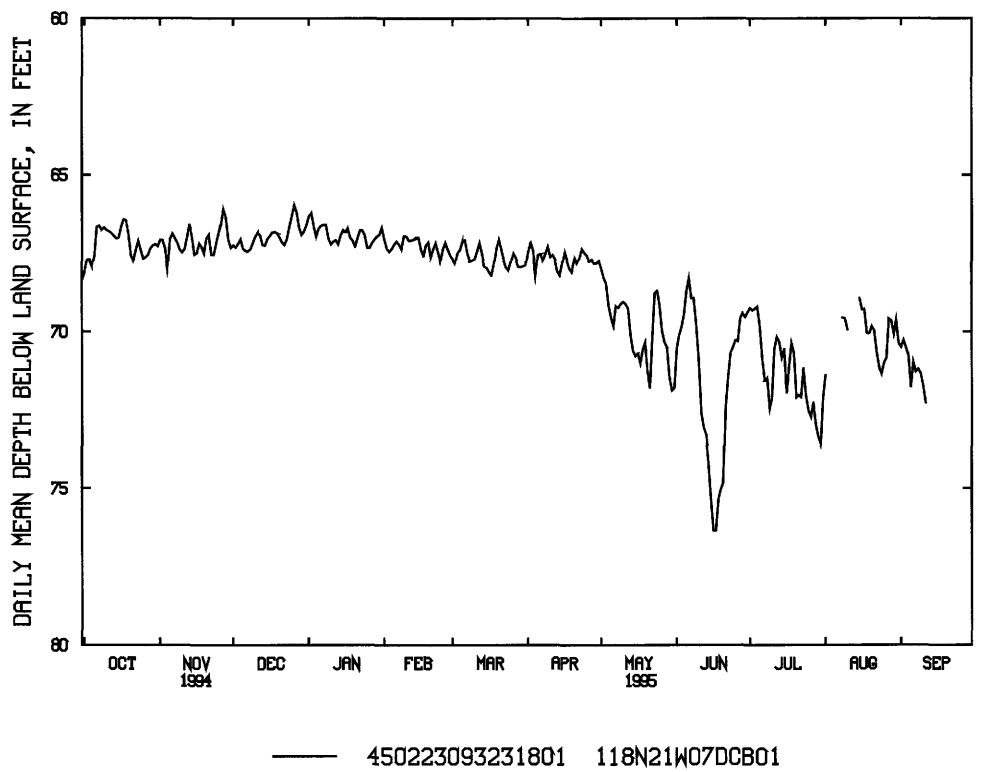
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	32.65	31.28	31.44	31.13	31.71	31.19	31.04	33.31	34.09	--	--	--
10	32.11	--	--	30.93	31.54	31.29	31.71	32.31	33.50	--	--	--
15	--	31.70	--	31.17	31.03	31.30	31.22	31.29	--	--	--	--
20	--	31.40	30.62	31.47	30.52	31.27	31.95	34.24	--	--	--	34.53
25	31.94	31.20	30.64	30.74	30.54	31.65	32.57	35.66	--	--	--	33.24
EOM	31.31	30.78	30.96	31.36	30.56	30.87	32.67	32.94	--	--	--	--

HENNEPIN COUNTY--Continued

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, by water tower at 47th Avenue North and Aquila Avenue.
Owner: City of New Hope.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled, unused artesian well, diameter 16 in., depth 422 ft, cased to 339 ft.
INSTRUMENTATION.--Digital recorder with a 30-minute punch cycle.
DATUM.--Land-surface datum is 933 ft above mean sea level. Measuring point: Top of recorder platform, 3.00 ft above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--October 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 60.46 ft below land-surface datum, Dec. 17, 1967; lowest, 77.56 ft below land-surface datum, July 11, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	67.81	67.52	67.71	67.32	67.87	67.77	67.94	70.11	69.14	70.27	--	72.21
10	66.91	68.00	67.46	67.69	67.40	68.06	68.07	69.46	71.69	72.96	70.10	72.06
15	67.18	67.94	67.48	67.32	67.78	68.45	68.39	70.84	76.19	70.85	69.48	--
20	68.14	67.76	67.37	67.60	68.08	67.53	67.80	72.29	75.71	72.79	70.32	--
25	68.02	67.43	66.90	67.73	68.07	68.51	67.69	69.51	70.45	72.64	71.37	--
EOM	67.57	67.73	67.16	67.19	68.10	68.45	67.87	75.22	69.62	72.80	70.52	--



MORRISON COUNTY

460444094212501. Local number, 130N29W08DCC01.
LOCATION.--Lat 46°04'44", long 94°21'25", in $SW^1/_4SW^1/_4SE^1/_4$ sec.8, T.130 N., R.29 W., Hydrologic Unit 07010104, at Camp Ripley.
Owner: Minnesota Army National Guard, Camp Ripley.
AQUIFER.--Surficial outwash sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled water-table observation well, diameter 2 in., depth 59 ft, screened 56 to 59 ft.
INSTRUMENTATION.--Monthly measurements by observer.
DATUM--Land-surface datum is 1,149.0 ft above mean sea level.. Measuring point: Top of casing, 2.10 ft above land-surface datum.
REMARKS.--Water levels used in monthly National Water Conditions Report.
PERIOD OF RECORD.--April 1949 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.35 ft below land-surface datum, July 28, 1972; lowest, 19.75 ft below land-surface datum, Aug. 4, 1961.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

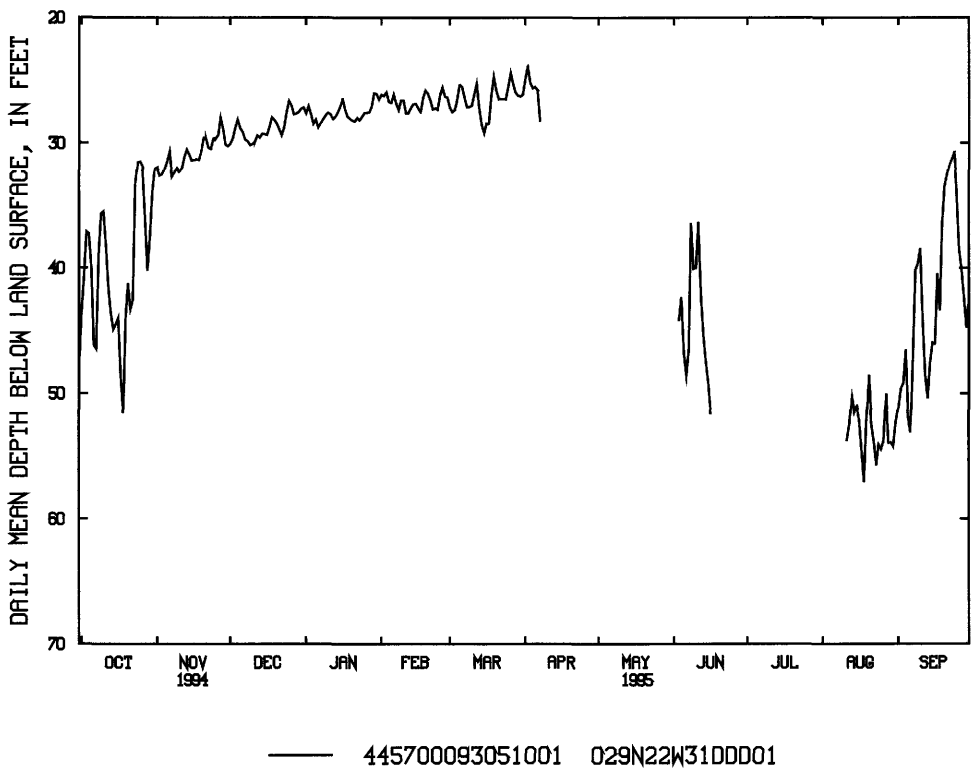
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 01	11.00	APR. 19	10.90	JUN 20	10.68	AUG 22	10.35
22	11.23	MAY 26	10.59	JUL 21	9.92	SEP 26	10.70
MAR 20	11.00						

RAMSEY COUNTY

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 E. 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 16 in. to 131 ft, 12 in. to 313 ft, depth 313 ft, cased to 151 ft.
INSTRUMENTATION.--Digital recorder with 15-minute punch cycle.
DATUM.--Land-surface datum is 750 ft above mean sea level. Measuring point: Top of recorder platform, 9.00 ft below land-surface datum.
REMARKS.--Water level affected by pumping of nearby wells.
PERIOD OF RECORD.--December 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 23.50 ft below land-surface datum, Apr. 3, 1995; lowest, 83.28 ft below land-surface datum, Aug. 4, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	46.46	32.59	29.96	29.16	27.76	26.06	26.82	--	53.90	--	--	56.91
10	37.85	33.87	30.76	28.84	28.22	28.56	--	--	42.92	--	57.17	41.53
15	47.04	32.54	30.27	28.18	28.04	30.69	--	--	53.89	--	55.71	50.10
20	45.73	30.42	29.96	29.31	27.87	27.50	--	--	--	--	51.87	35.77
25	32.91	30.60	27.77	28.24	27.91	26.31	--	--	--	--	58.31	38.56
EOM	34.18	31.21	27.88	27.97	27.14	27.49	--	--	--	--	56.15	46.36

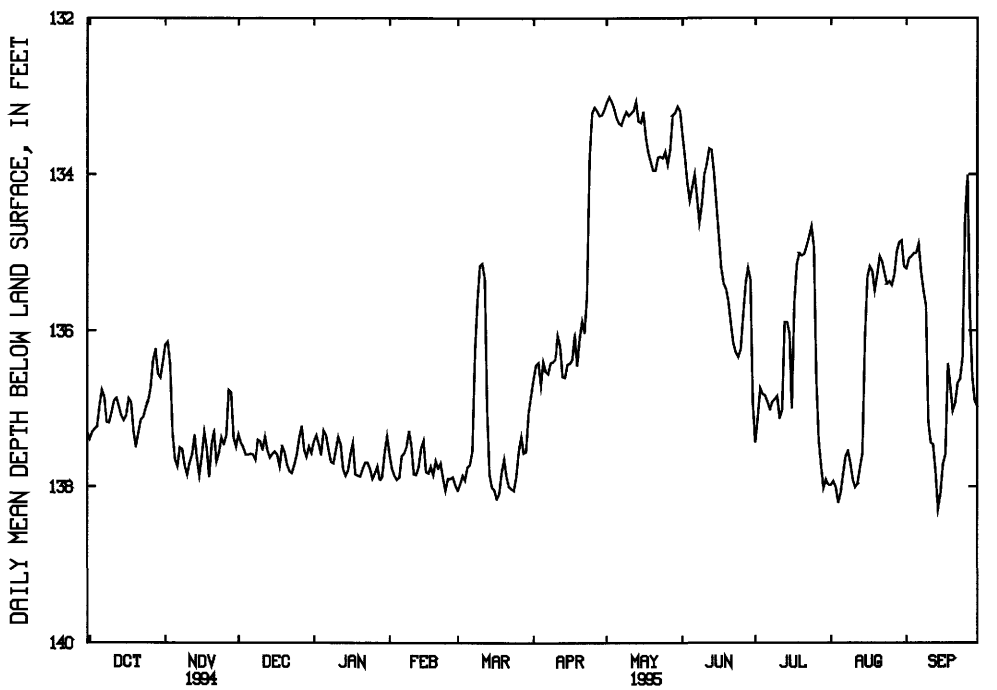


RAMSEY COUNTY--Continued

450238093082501. Local number, 030N23W35BDC01.
LOCATION.--Lat 45°02'38", long 93°08'25", in SW$^1/_4$SE$^1/_4$NW$^1/_4$ sec.35, T.30 N., R.23 W., Hydrologic Unit 07010206, southeast corner of Arbogast Street and Richmond Avenue.
Owner: City of Shoreview.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in., depth 510 ft, cased to 465 ft.
INSTRUMENTATION.--Digital recorder with 30-minute punch cycle.
DATUM.--Land-surface datum is 960 ft above mean sea level. Measuring point: Top of recorder platform, 1.50 ft above land-surface datum.
PERIOD OF RECORD.--April 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 129.26 ft below land-surface datum, Mar. 1, 1987; lowest, 146.01 ft below land-surface datum, July 28, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	137.14	137.73	137.64	137.50	137.93	137.84	136.61	133.35	134.27	136.87	138.20	135.09
10	137.13	137.87	137.59	137.65	137.76	135.32	136.44	133.30	134.18	136.96	137.99	137.50
15	137.20	137.91	137.67	137.89	137.76	138.06	136.55	133.43	134.59	135.65	137.06	138.33
20	137.52	137.79	137.71	137.90	137.87	137.78	136.38	133.99	135.76	135.08	135.47	137.07
25	136.95	137.49	137.67	137.97	137.96	138.06	133.37	133.79	136.34	135.68	135.41	135.71
EOM	136.51	137.54	137.60	137.48	138.04	136.93	133.24	133.30	137.37	138.04	135.24	137.00

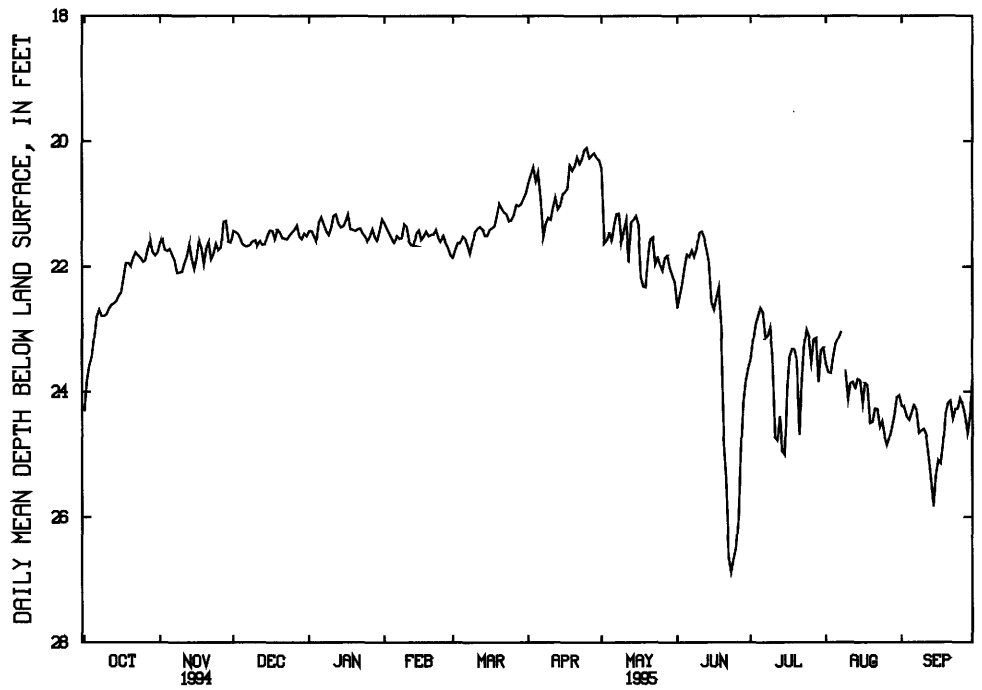


SCOTT COUNTY

444427093353902. Local number, 115N23W28BDD02.
LOCATION.--Lat 44°44'27", long 93°35'39", in SE$^1/_4$SE$^1/_4$NW$^1/_4$ sec.28, T.115 N., R.23 W., Hydrologic Unit 07020012, Merriam Junction.
Owner: Chicago and Northwestern Transportation Company.
AQUIFER.--Ironton-Galesville Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled artesian observation well, diameter 4 in., depth 355 ft, screened 350 to 355 ft.
INSTRUMENTATION.--Digital recorder with one-hour punch cycle.
DATUM.--Land-surface datum is 758 ft above mean sea level. Measuring point: Top of casing, 1.00 ft above land-surface datum.
PERIOD OF RECORD.--November 1984 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 19.59 ft below land-surface datum, Apr. 8, 1993; lowest, 45.28 ft below land-surface datum, July 29, 1991.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	23.33	21.81	21.74	21.51	21.63	21.56	20.64	21.74	21.96	22.66	23.30	24.57
10	22.81	22.12	21.70	21.45	21.49	21.48	21.26	21.59	21.60	24.37	24.23	24.76
15	22.51	22.08	21.61	21.41	21.59	21.52	20.89	21.32	22.90	25.27	24.29	25.69
20	22.03	21.91	21.54	21.45	21.59	21.12	20.51	22.17	24.90	24.27	24.62	24.27
25	21.94	21.76	21.46	21.60	21.57	21.27	20.23	22.10	26.52	23.53	24.99	24.36
EOM	21.82	21.66	21.54	21.28	21.85	20.85	20.30	22.61	23.73	23.38	24.20	24.08

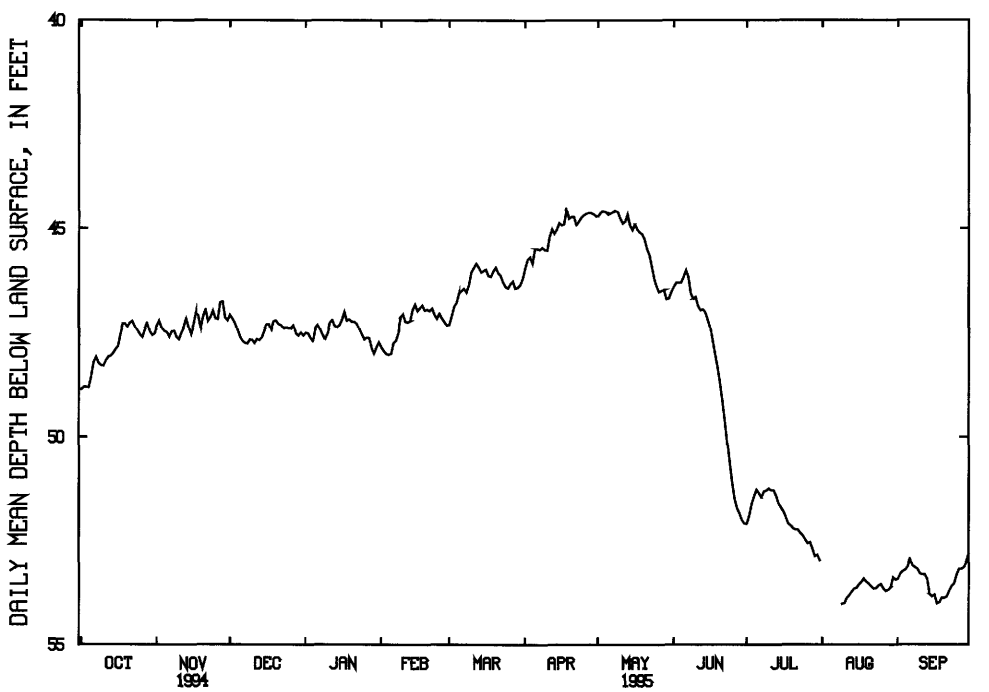


SCOTT COUNTY--Continued

444427093353903. Local number, 115N23W28BDD03.
LOCATION.--Lat 44°44'27", long 93°35'39", in SE$^1/_4$SE$^1/_4$NW$^1/_4$ sec.28, T.115 N., R.23 W., Hydrologic Unit 07020012, Merriam Junction.
Owner: Chicago and Northwestern Transportation Company.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled artesian observation well, diameter 4 in., depth 525 ft, screened 520 to 525 ft.
INSTRUMENTATION.--Digital recorder with one-hour punch cycle.
DATUM.--Land-surface datum is 758 ft above mean sea level. Measuring point: Top of casing, 1.00 ft above land-surface datum.
PERIOD OF RECORD.--November 1984 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 33.85 ft below land-surface datum, Mar. 8, 1985; lowest, 55.12 ft below land-surface datum, Aug. 1, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	48.74	47.56	47.70	47.62	48.05	46.65	45.73	44.69	46.25	51.32	--	53.19
10	48.37	47.70	47.81	47.62	47.17	46.17	45.59	44.86	46.79	51.29	54.03	53.32
15	47.95	47.58	47.58	47.40	47.02	46.08	44.95	45.12	47.25	51.74	53.67	53.89
20	47.41	47.34	47.31	47.25	47.09	46.02	44.79	45.36	48.88	52.24	53.57	53.90
25	47.62	47.22	47.42	47.71	47.14	46.48	44.73	46.47	51.31	52.51	53.60	53.46
EOM	47.57	47.24	47.61	47.82	47.36	46.31	44.74	46.60	52.13	53.04	53.45	52.90



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.--Drilled water-table observation well, diameter 2 in., depth 22 ft, screened 19 to 22 ft.
INSTRUMENTATION.--Monthly measurements by observer.
DATUM.--Land-surface datum is 1,056.2 ft above mean sea level. Measuring point: Top of casing, 4.80 ft above land-surface datum.
REMARKS.--Water levels used in monthly National Water Conditions Report.
PERIOD OF RECORD.--November 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.11 ft below land-surface datum, Apr. 27, 1969; lowest, 16.22 ft below land-surface datum, Mar. 7, 1990.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	960	JAN 28	10.34	APR. 19	9.62	JUL 13	9.52
NOV 21	10.01	FEB 27	10.62	MAY 12	9.43	SEP 11	9.88
DEC 27	10.01	MAR 16	10.46	JUN 14	9.15		

Quality Of

Ground Water

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

BELTRAMI COUNTY

STATION NUMBER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET) (72008)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)
472553094384500	08-22-95	1200	14.00	--	478	--	7.2	--	--	--
472816094541200	08-18-95	1100	15.50	--	911	--	7.2	--	--	--
472859094464000	08-22-95	1430	12.00	--	390	--	7.5	--	--	--
472919094540700	08-18-95	0900	30.00	--	1400	--	6.7	--	--	--
472940094531100	08-23-95	--	--	--	464	--	7.6	--	--	--
472940094531100	08-23-95	0900	--	--	--	--	--	--	--	--
472940094531100	08-23-95	1530	--	--	510	--	7.4	--	--	--
473236094505400	08-22-95	1530	21.50	--	--	--	--	--	--	--
473322094525800	08-17-95	1200	21.00	--	408	--	7.5	--	--	--
473410095073000	08-16-95	1230	16.00	--	453	--	7.5	--	--	--

BLUE EARTH COUNTY

440106093564901	04-25-95	1453	5.00	722	--	7.4	--	4.5	15.0	732
440106093564902	04-25-95	1512	7.00	793	--	7.1	--	4.5	15.0	732
440106093564903	04-25-95	1324	13.80	1090	--	7.4	--	6.5	15.0	733
440106093565001	04-25-95	1604	5.70	1110	--	6.9	--	4.0	14.5	732
440106093565003	04-25-95	1542	7.40	1270	--	6.9	--	4.0	14.5	732
440106093565003	04-25-95	1543	7.40	1270	--	6.9	--	4.0	--	732
440106093565004	04-25-95	1615	6.70	1800	--	6.7	--	5.0	14.0	732
440106093565101	04-26-95	0834	5.50	984	--	7.1	--	3.0	6.0	735
440106093565102	04-26-95	0848	7.00	1330	--	6.9	--	3.5	6.0	735
440106093565103	04-26-95	0814	7.80	1720	--	7.2	--	4.0	6.0	735
440106093565201	04-26-95	0930	5.50	912	--	6.9	--	4.0	6.5	735
440106093565202	04-26-95	0944	6.50	1220	--	6.8	--	4.5	6.5	735
440106093565203	04-26-95	0912	7.50	1380	--	6.8	--	4.0	6.0	735
440106093565203	04-26-95	0913	7.50	1380	--	6.8	--	4.0	--	735

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	OXYGEN, DIS-SOLVED (MG/L) (00300)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	RIDE, DIS-SOLVED (MG/L AS CL) (00940)
				BELTRAMI COUNTY					
472553094384500	08-22-95	--	69	18	4.9	1.6	254	5.5	5.8
472816094541200	08-18-95	--	100	23	60	2.8	339	24	91
472859094464000	08-22-95	--	59	12	5.4	0.80	205	1.3	5.1
472919094540700	08-18-95	--	200	66	26	2.5	851	0.60	5.8
472940094531100	08-23-95	--	61	11	23	1.0	205	8.1	29
472940094531100	08-23-95	--	78	16	3.7	1.2	277	1.7	1.7
473322094525800	08-17-95	--	61	16	2.0	1.3	212	12	0.90
473410095073000	08-16-95	--	65	17	4.9	1.4	221	6.8	10
				BLUE EARTH COUNTY					
440106093564901	04-25-95	2.1	--	--	--	--	--	--	--
440106093564902	04-25-95	0.8	--	--	--	--	--	--	--
440106093564903	04-25-95	2.8	--	--	--	--	--	--	--
440106093565001	04-25-95	2.3	--	--	--	--	--	--	--
440106093565003	04-25-95	1.2	--	--	--	--	--	--	--
440106093565003	04-25-95	1.2	--	--	--	--	--	--	--
440106093565004	04-25-95	2.5	--	--	--	--	--	--	--
440106093565101	04-26-95	4.1	--	--	--	--	--	--	--
440106093565102	04-26-95	1.6	--	--	--	--	--	--	--
440106093565103	04-26-95	2.4	--	--	--	--	--	--	--
440106093565201	04-26-95	5.3	--	--	--	--	--	--	--
440106093565202	04-26-95	8.3	--	--	--	--	--	--	--
440106093565203	04-26-95	1.3	--	--	--	--	--	--	--
440106093565203	04-26-95	1.3	--	--	--	--	--	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	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, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)
BELTRAMI COUNTY									
472553094384500	08-22-95	<0.10	19	296	--	--	--	--	--
472816094541200	08-18-95	<0.10	22	537	<0.010	--	<0.050	0.070	--
472859094464000	08-22-95	<0.10	19	222	<0.010	0.440	0.440	<0.015	--
472919094540700	08-18-95	<0.10	27	902	<0.010	--	<0.050	0.110	--
472940094531100	08-23-95	<0.10	15	274	--	--	--	--	--
472940094531100	08-23-95	<0.10	18	294	--	--	--	--	--
473322094525800	08-17-95	<0.10	23	239	<0.010	--	<0.050	<0.015	--
473410095073000	08-16-95	0.10	21	265	<0.010	1.50	1.50	0.020	--
BLUE EARTH COUNTY									
434657093372301	05-01-95	--	--	--	0.020	5.20	5.20	0.080	--
434657093372301	06-08-95	--	--	--	0.020	7.00	7.00	0.200	--
434657093372301	06-08-95	--	--	--	--	--	--	--	--
434704093325301	05-01-95	--	--	--	0.010	15.0	15.0	0.020	--
434704093325301	06-08-95	--	--	--	0.020	17.0	17.0	<0.015	--
435144093381501	05-01-95	--	--	--	0.020	15.0	15.0	<0.015	--
435144093381501	06-08-95	--	--	--	0.030	15.0	15.0	0.020	--
435211093492901	05-01-95	--	--	--	0.020	11.0	11.0	0.020	1.1
435211093492901	06-08-95	--	--	--	0.040	13.0	13.0	0.030	1.4
435659093494101	05-01-95	--	--	--	0.030	5.30	5.30	0.020	--
435659093494101	06-08-95	--	--	--	0.060	8.60	8.60	0.110	--
435749093554801	05-01-95	--	--	--	0.030	22.0	22.0	0.020	--
435749093554801	06-08-95	--	--	--	0.030	23.0	23.0	0.050	--
440106093564901	04-25-95	--	--	--	0.140	11.0	11.0	0.020	--
440106093564902	04-25-95	--	--	--	0.050	6.30	6.30	0.170	--
440106093564903	04-25-95	--	--	--	<0.010	0.480	0.480	0.830	--
440106093565001	04-25-95	--	--	--	0.010	7.40	7.40	0.020	--
440106093565003	04-25-95	--	--	--	0.040	1.20	1.20	0.210	--
440106093565003	04-25-95	--	--	--	0.040	1.20	1.20	0.210	--
440106093565004	04-25-95	--	--	--	<0.010	0.100	0.100	0.490	--
440106093565101	04-26-95	--	--	--	0.070	6.70	6.70	0.290	--
440106093565102	04-26-95	--	--	--	<0.010	1.90	1.90	0.040	--
440106093565103	04-26-95	--	--	--	<0.010	0.130	0.130	0.100	--
440106093565201	04-26-95	--	--	--	0.030	21.0	21.0	13.0	--
440106093565202	04-26-95	--	--	--	<0.010	4.50	4.50	0.070	--
440106093565203	04-26-95	--	--	--	<0.010	0.380	0.380	0.050	--
440106093565203	04-26-95	--	--	--	<0.010	0.330	0.330	0.040	--
440107093555001	04-04-95	--	--	--	0.030	0.410	0.410	0.020	--
440107093565901	04-03-95	--	--	--	<0.010	--	<0.050	0.540	--
440108093560201	04-04-95	--	--	--	<0.010	12.0	12.0	0.050	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BORON, DIS-SOLVED (UG/L AS B) (01020)
				BELTRAMI COUNTY					
472816094541200	08-18-95	<0.20	--	0.017	0.020	<10	<1	200	30
472859094464000	08-22-95	<0.20	--	0.059	0.050	--	--	--	--
472919094540700	08-18-95	0.40	--	0.087	0.061	<10	53	180	50
472940094531100	08-23-95	--	--	--	--	10	<1	31	20
472940094531100	08-23-95	--	--	--	--	<10	<1	41	20
473322094525800	08-17-95	<0.20	--	0.009	0.008	--	--	--	--
473410095073000	08-16-95	<0.20	--	0.026	0.020	--	--	--	--
				BLUE EARTH COUNTY					
434657093372301	05-01-95	1.0	--	<0.010	<0.010	--	--	--	--
434657093372301	06-08-95	1.2	--	<0.010	<0.010	--	--	--	--
434657093372301	06-08-95	--	--	--	--	--	--	--	--
434704093325301	05-01-95	0.40	--	<0.010	0.020	--	--	--	--
434704093325301	06-08-95	0.40	--	0.030	0.030	--	--	--	--
435144093381501	05-01-95	0.60	--	0.020	0.020	--	--	--	--
435144093381501	06-08-95	0.60	--	0.010	<0.010	--	--	--	--
435211093492901	05-01-95	0.60	0.050	<0.010	0.010	--	--	--	--
435211093492901	06-08-95	0.60	0.210	0.030	0.030	--	--	--	--
435659093494101	05-01-95	0.90	--	<0.010	0.020	--	--	--	--
435659093494101	06-08-95	1.3	--	0.070	0.060	--	--	--	--
435749093554801	05-01-95	0.50	--	0.100	0.020	--	--	--	--
435749093554801	06-08-95	1.0	--	0.140	0.140	--	--	--	--
440106093564901	04-25-95	0.80	--	0.130	0.120	--	--	--	--
440106093564902	04-25-95	0.70	--	0.050	0.050	--	--	--	--
440106093564903	04-25-95	1.4	--	0.070	0.080	--	--	--	--
440106093565001	04-25-95	0.50	--	0.110	0.100	--	--	--	--
440106093565003	04-25-95	1.3	--	0.060	0.060	--	--	--	--
440106093565003	04-25-95	1.2	--	0.050	0.050	--	--	--	--
440106093565004	04-25-95	1.3	--	0.030	0.050	--	--	--	--
440106093565101	04-26-95	1.3	--	0.100	0.110	--	--	--	--
440106093565102	04-26-95	0.60	--	0.070	0.070	--	--	--	--
440106093565103	04-26-95	0.60	--	0.060	0.070	--	--	--	--
440106093565201	04-26-95	14	--	0.880	0.860	--	--	--	--
440106093565202	04-26-95	0.80	--	0.140	0.120	--	--	--	--
440106093565203	04-26-95	0.90	--	0.090	0.070	--	--	--	--
440106093565203	04-26-95	0.80	--	0.060	0.070	--	--	--	--
440107093555001	04-04-95	<0.20	--	0.010	0.020	--	--	--	--
440107093565901	04-03-95	0.60	--	0.010	<0.010	--	--	--	--
440108093560201	04-04-95	0.50	--	0.030	0.030	--	--	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	MIUM, DIS-SOLVED (UG/L AS CR) (01030)	CHRO-IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	NESE, DIS-SOLVED (UG/L AS MN) (01056)	MANGA-MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SELE-CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
				BELTRAMI COUNTY					
472553094384500	08-22-95	--	--	--	--	--	--	--	7.0
472816094541200	08-18-95	<1.0	<1	2900	<1	250	<0.1	<1	5.4
472859094464000	08-22-95	--	--	--	--	--	--	--	0.50
472919094540700	08-18-95	<1.0	<1	29000	<1	770	<0.1	<1	14
472940094531100	08-23-95	<1.0	<1	3	<1	<1	<0.1	<1	2.2
472940094531100	08-23-95	<1.0	<1	87	<1	3	--	<1	2.8
473322094525800	08-17-95	--	--	--	--	--	--	--	1.9
473410095073000	08-16-95	--	--	--	--	--	--	--	1.6

QUALITY OF GROUND WATER

WATER-QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSIS OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME (	DEPTH OF WELL, TOTAL FEET) (72008)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WHOLE LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-PRES-SURE (MM OF HG) (00025)
BLUE EARTH COUNTY										
440110093564901	04-25-95	0837	4.90	682	--	7.5	--	3.5	7.0	734
440110093564902	04-25-95	0903	5.60	623	--	7.4	--	6.0	7.5	734
440110093564903	04-26-95	1003	6.60	1150	--	7.1	--	5.0	6.5	735
440110093565001	04-25-95	1008	4.50	700	--	7.2	--	3.0	9.5	734
440110093565003	04-25-95	0935	7.00	943	--	7.1	--	4.5	8.0	734
440110093565101	04-25-95	1106	5.50	877	--	6.9	--	4.0	12.0	734
440110093565102	04-25-95	1129	6.50	950	--	6.9	--	5.0	12.0	734
440110093565103	04-25-95	1042	7.20	1240	--	7.1	--	8.5	11.0	734
440110093565201	04-25-95	1211	5.60	700	--	6.9	--	7.0	12.5	733
440110093565202	04-25-95	1241	6.60	1830	--	6.9	--	6.5	12.5	733
440110093565202	04-25-95	1242	6.60	1830	--	6.9	--	6.5	--	733
440110093565203	04-25-95	1158	7.70	1220	--	6.7	--	5.0	12.0	733
CASS COUNTY										
472720095121800	08-17-95	1000	40.50	--	373	--	8.0	--	--	--

STATION NUMBER	DATE	OXYGEN, DIS-SOLVED (MG/L) (00300)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
BLUE EARTH COUNTY									
440110093564903	04-26-95	3.5	--	--	--	--	--	--	--
440110093565101	04-25-95	2.1	--	--	--	--	--	--	--
440110093565102	04-25-95	4.0	--	--	--	--	--	--	--
440110093565203	04-25-95	0.9	--	--	--	--	--	--	--
CASS COUNTY									
472720095121800	08-17-95	--	39	23	2.7	2.3	200	3.6	3.6

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-AMONIA + ORGANIC TOTAL (MG/L AS N) (00625)
				BLUE EARTH COUNTY					
440108093560202	04-04-95	--	--	--	0.020	14.0	14.0	0.140	--
440108093560203	04-04-95	--	--	--	0.010	15.0	15.0	0.020	--
440109093550201	04-03-95	--	--	--	0.030	10.0	10.0	0.440	--
440109093550201	05-02-95	--	--	--	0.020	12.0	12.0	0.350	--
440109093550201	06-08-95	--	--	--	0.040	17.0	17.0	0.170	--
440110093550201	04-03-95	--	--	--	<0.010	14.0	14.0	0.020	--
440110093550201	05-02-95	--	--	--	<0.010	14.0	14.0	<0.015	--
440110093550201	06-08-95	--	--	--	0.050	19.0	19.0	0.030	--
440110093564901	04-25-95	--	--	--	0.210	7.10	7.10	0.030	--
440110093564902	04-25-95	--	--	--	0.200	13.0	13.0	0.160	--
440110093564903	04-26-95	--	--	--	<0.010	0.100	0.100	0.350	--
440110093565001	04-25-95	--	--	--	0.150	12.0	12.0	0.090	--
440110093565003	04-25-95	--	--	--	<0.010	5.20	5.20	0.170	--
440110093565101	04-25-95	--	--	--	0.010	14.0	14.0	<0.015	--
440110093565102	04-25-95	--	--	--	0.030	10.0	10.0	<0.015	--
440110093565103	04-25-95	--	--	--	<0.010	1.10	1.10	0.110	--
440110093565201	04-25-95	--	--	--	<0.010	6.20	6.20	0.030	--
440110093565202	04-25-95	--	--	--	--	--	--	--	--
440110093565202	04-25-95	--	--	--	<0.010	18.0	18.0	<0.015	--
440110093565202	04-25-95	--	--	--	<0.010	17.0	17.0	0.030	--
440110093565203	04-25-95	--	--	--	0.030	6.00	6.00	0.020	--
440118093561001	04-04-95	--	--	--	0.030	14.0	14.0	0.310	--
440118093561001	05-02-95	--	--	--	0.090	15.0	15.0	0.270	--
440118093561001	06-08-95	--	--	--	0.020	16.0	16.0	0.070	--
440121093561601	05-02-95	--	--	--	<0.010	22.0	22.0	<0.015	--
440121093561601	06-08-95	--	--	--	<0.010	2.60	2.60	0.020	--
440122093561101	06-08-95	--	--	--	<0.010	14.0	14.0	<0.015	--
440131093562801	04-04-95	--	--	--	0.020	11.0	11.0	<0.015	--
440131093562801	05-02-95	--	--	--	<0.010	9.90	9.90	<0.015	--
440131093562801	06-08-95	--	--	--	<0.010	8.70	8.70	<0.015	--
440133093562701	04-04-95	--	--	--	0.020	15.0	15.0	<0.015	--
440133093562701	05-02-95	--	--	--	<0.010	15.0	15.0	<0.015	--
440133093562701	06-08-95	--	--	--	<0.010	16.0	16.0	0.020	--
440252094000101	05-01-95	--	--	--	0.030	10.0	10.0	<0.015	1.0
440252094000101	06-08-95	--	--	--	0.060	14.0	14.0	0.040	0.90
				CASS COUNTY					
472720095121800	08-17-95	<0.10	18	218	<0.010	1.30	1.30	0.160	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
				BLUE EARTH COUNTY					
440108093560202	04-04-95	0.40	--	0.040	0.040	--	--	--	--
440108093560203	04-04-95	0.20	--	<0.010	<0.010	--	--	--	--
440109093550201	04-03-95	1.2	--	0.090	0.080	--	--	--	--
440109093550201	05-02-95	1.0	--	0.080	0.070	--	--	--	--
440109093550201	06-08-95	1.7	--	0.110	0.100	--	--	--	--
440110093550201	04-03-95	0.40	--	0.020	0.020	--	--	--	--
440110093550201	05-02-95	0.30	--	0.040	0.020	--	--	--	--
440110093550201	06-08-95	0.40	--	0.070	0.040	--	--	--	--
440110093564901	04-25-95	1.3	--	0.140	0.140	--	--	--	--
440110093564902	04-25-95	2.0	--	0.130	0.100	--	--	--	--
440110093564903	04-26-95	1.4	--	0.050	0.050	--	--	--	--
440110093565001	04-25-95	1.4	--	0.150	0.150	--	--	--	--
440110093565003	04-25-95	1.0	--	0.010	0.030	--	--	--	--
440110093565101	04-25-95	1.2	--	0.130	0.130	--	--	--	--
440110093565102	04-25-95	0.90	--	0.080	0.090	--	--	--	--
440110093565103	04-25-95	1.1	--	0.050	0.050	--	--	--	--
440110093565201	04-25-95	0.80	--	0.160	0.160	--	--	--	--
440110093565202	04-25-95	--	--	--	--	--	--	--	--
440110093565202	04-25-95	1.2	--	0.150	0.150	--	--	--	--
440110093565202	04-25-95	1.2	--	0.150	0.150	--	--	--	--
440110093565203	04-25-95	0.80	--	0.080	0.090	--	--	--	--
440118093561001	04-04-95	0.70	--	0.110	0.110	--	--	--	--
440118093561001	05-02-95	0.60	--	0.100	0.090	--	--	--	--
440118093561001	06-08-95	0.60	--	0.100	0.080	--	--	--	--
440121093561601	05-02-95	0.20	--	<0.010	0.020	--	--	--	--
440121093561601	06-08-95	0.30	--	0.020	0.010	--	--	--	--
440122093561101	06-08-95	0.30	--	0.020	0.030	--	--	--	--
440131093562801	04-04-95	0.40	--	0.040	0.020	--	--	--	--
440131093562801	05-02-95	0.20	--	<0.010	0.020	--	--	--	--
440131093562801	06-08-95	0.30	--	0.020	0.030	--	--	--	--
440133093562701	04-04-95	0.30	--	0.010	<0.010	--	--	--	--
440133093562701	05-02-95	0.20	--	<0.010	0.010	--	--	--	--
440133093562701	06-08-95	<0.20	--	<0.010	0.010	--	--	--	--
440252094000101	05-01-95	0.50	0.050	<0.010	0.010	--	--	--	--
440252094000101	06-08-95	0.80	0.200	0.140	0.120	--	--	--	--
				CASS COUNTY					
472720095121800	08-17-95	1.0	--	0.022	<0.010	<1	19	<100	32

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	PUMP OR FLOW DEPTH OF WELL, TOTAL (FEET) (72008)	SPE-CIFIC PERIOD PRIOR TO SAM-PLING (MIN) (72004)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (00095)	PH WATER CON-DUCT-ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WHOLE LAB (STAND-ARD UNITS) (00403)
				GOODHUE COUNTY					
443631092372001	03-13-95	1630	--	70.00	21	551	--	7.4	--
443631092372001	05-17-95	1330	--	70.00	26	557	--	7.4	--
443631092372001	08-02-95	1540	--	70.00	14	565	--	7.3	--
443650092375601	05-19-95	1145	--	52.00	20	508	--	7.4	--
443650092375601	08-04-95	1200	--	52.00	18	561	--	7.5	--
443656092373901	05-19-95	1045	--	14.00	24	502	--	7.2	--
443656092373901	08-04-95	1015	--	14.00	14	627	--	7.2	--
443658092381201	05-17-95	1430	--	24.50	--	--	--	--	--
443722092390201	11-09-94	1420	--	--	25	348	358	7.7	7.8
443722092390201	03-09-95	1100	--	--	29	344	361	7.3	7.8
443722092390201	05-17-95	1500	--	--	20	345	--	7.8	--
443722092390201	08-02-95	1500	--	--	15	357	--	7.6	--
443727092385801	11-10-94	0940	--	--	20	356	371	7.9	7.7
443727092385801	03-09-95	0930	--	--	32	359	--	7.5	--
443741092394401	03-07-95	1015	--	--	28	436	452	7.7	7.6
443744092384401	05-19-95	1230	--	30.00	20	299	--	7.7	--
443744092384401	08-04-95	1300	--	30.00	19	262	--	7.8	--
443744092391701	03-07-95	1145	18.02	22.00	47	465	482	7.9	7.7
443744092391701	05-18-95	1100	--	22.00	20	470	--	7.6	--
443744092391701	08-02-95	0920	--	22.00	22	497	--	7.7	--
443745092381301	05-19-95	0945	--	32.30	25	439	--	7.6	--
443745092381301	08-04-95	1100	--	32.30	18	442	--	7.5	--
443745092390201	03-08-95	1130	--	500.00	28	646	653	7.3	7.5
443745092390201	08-01-95	1130	--	500.00	15	603	--	7.8	--
443746092383001	03-09-95	1330	14.28	18.00	24	352	367	7.3	7.8
443746092383001	05-18-95	1130	--	18.00	29	373	--	7.9	--
443746092383001	07-31-95	1700	--	18.00	22	347	--	6.9	--
443752092381501	05-18-95	1545	--	55.00	23	517	--	7.6	--
443752092381501	08-03-95	1000	--	55.00	18	536	--	7.2	--
443756092390901	03-07-95	1300	13.40	18.69	33	586	604	7.6	7.5
443756092390901	05-18-95	1000	--	18.69	22	525	--	7.4	--
443756092390901	07-31-95	1450	--	18.69	25	524	--	7.0	--
443808092384401	03-07-95	1530	11.90	17.00	30	367	378	6.3	6.3
443808092384401	05-24-95	0900	--	17.00	18	392	--	6.2	--
443808092384401	07-31-95	1620	--	17.00	24	470	--	6.1	--
443814092393901	03-09-95	1200	5.97	10.95	41	409	432	7.0	7.2
443814092393901	05-18-95	1400	--	10.95	25	413	--	7.1	--
443814092393901	07-31-95	1400	--	10.95	15	414	--	7.1	--
443814092395301	03-13-95	1530	10.70	15.24	33	663	687	7.2	6.8
443814092395301	05-18-95	1500	--	15.24	23	650	--	6.8	--
443814092395301	08-02-95	1020	--	15.24	22	608	--	6.8	--
443814092395301	08-02-95	1025	--	15.24	22	608	--	6.8	--
443814092395302	05-17-95	1600	--	85.00	30	461	471	7.6	7.6
443814092395302	08-02-95	1230	--	85.00	13	468	--	7.4	--
443830092390701	03-13-95	1030	6.86	12.00	37	380	406	7.5	7.6

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	OXID-ATION RED-UCTION POTEN-TIAL (MV) (00090)	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	FLOW RATE, INSTAN-TANEOUS (G/M) (00059)	OXYGEN, DIS-SOLVED (MG/L) (00300)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
				GOODHUE COUNTY					
443631092372001	03-13-95	70	11.5	--	--	--	0.1	--	--
443631092372001	05-17-95	64	11.5	19.0	--	--	0.1	--	--
443631092372001	08-02-95	--	13.0	29.0	741	--	0.0	--	--
443650092375601	05-19-95	289	15.5	--	742	--	0.1	--	--
443650092375601	08-04-95	--	15.0	--	746	--	0.1	--	--
443656092373901	05-19-95	283	20.5	22.0	742	--	0.0	--	--
443656092373901	08-04-95	--	23.0	--	--	--	0.1	--	--
443658092381201	05-17-95	--	--	--	--	--	--	--	--
443722092390201	11-09-94	325	10.5	--	--	--	8.2	49	16
443722092390201	03-09-95	343	10.0	0.0	--	--	8.0	47	14
443722092390201	05-17-95	263	10.5	20.0	739	--	8.0	--	--
443722092390201	08-02-95	--	11.5	29.0	742	--	8.5	--	--
443727092385801	11-10-94	336	11.5	--	--	--	10	49	16
443727092385801	03-09-95	375	9.5	0.0	--	--	9.8	--	--
443741092394401	03-07-95	261	11.5	22.0	--	--	5.7	56	18
443744092384401	05-19-95	286	10.5	29.0	741	--	11.6	--	--
443744092384401	08-04-95	--	10.5	--	745	--	11.5	--	--
443744092391701	03-07-95	129	10.0	0.0	--	--	9.5	58	19
443744092391701	05-18-95	317	9.5	20.0	742	--	1.0	--	--
443744092391701	08-02-95	--	12.0	19.0	745	1.0	9.8	--	--
443745092381301	05-19-95	300	11.5	21.0	743	--	0.1	--	--
443745092381301	08-04-95	--	11.5	--	747	--	0.1	--	--
443745092390201	03-08-95	61	11.5	-10.0	--	--	0.1	42	17
443745092390201	08-01-95	--	11.5	26.0	746	--	0.1	--	--
443746092383001	03-09-95	237	9.0	-2.0	--	--	10.5	48	12
443746092383001	05-18-95	295	9.0	20.0	742	--	11.5	--	--
443746092383001	07-31-95	--	11.5	19.0	745	1.0	11.3	--	--
443752092381501	05-18-95	90	11.5	23.0	740	--	0.4	--	--
443752092381501	08-03-95	--	12.5	26.0	742	--	2.7	--	--
443756092390901	03-07-95	139	9.0	0.0	--	--	9.0	81	26
443756092390901	05-18-95	327	9.5	19.0	742	--	8.4	--	--
443756092390901	07-31-95	--	12.0	22.0	744	1.0	9.0	--	--
443808092384401	03-07-95	232	7.5	0.0	--	--	5.9	47	14
443808092384401	05-24-95	369	8.5	--	750	--	6.1	--	--
443808092384401	07-31-95	--	12.0	20.0	745	1.0	4.0	--	--
443814092393901	03-09-95	268	6.0	-1.0	--	--	5.9	53	19
443814092393901	05-18-95	333	8.0	--	--	--	4.9	--	--
443814092393901	07-31-95	--	14.0	22.0	744	1.0	6.3	--	--
443814092395301	03-13-95	249	9.5	18.5	--	--	3.7	59	15
443814092395301	05-18-95	331	9.0	22.0	741	--	2.4	--	--
443814092395301	08-02-95	--	13.0	23.0	745	1.0	5.3	--	--
443814092395301	08-02-95	--	13.0	23.0	745	1.0	5.3	--	--
443814092395302	05-17-95	246	10.5	20.0	739	--	0.5	65	21
443814092395302	08-02-95	--	12.5	29.0	744	--	0.5	--	--
443830092390701	03-13-95	224	8.0	15.5	--	--	4.3	53	19

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	ALKA-LINITY WAT WH TOT IT FIELD MG/L AS CACO3 (00419)	C SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	HLO-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)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)
				GOODHUE COUNTY					
443631092372001	03-13-95	--	219	--	--	--	--	<0.010	0.070
443631092372001	05-17-95	--	--	--	--	--	--	<0.010	--
443631092372001	08-02-95	--	--	--	--	--	--	<0.010	--
443650092375601	05-19-95	--	--	--	--	--	--	<0.010	--
443650092375601	08-04-95	--	--	--	--	--	--	<0.010	0.090
443656092373901	05-19-95	--	--	--	--	--	--	<0.010	--
443656092373901	08-04-95	--	--	--	--	--	--	0.030	0.700
443658092381201	05-17-95	--	--	--	--	--	--	--	--
443722092390201	11-09-94	3.4	--	21	6.4	<0.10	22	--	3.60
443722092390201	03-09-95	3.2	140	19	5.9	<0.10	21	<0.010	3.70
443722092390201	05-17-95	--	--	--	--	--	--	<0.010	3.60
443722092390201	08-02-95	--	--	--	--	--	--	<0.010	4.00
443727092385801	11-10-94	3.7	--	17	9.8	<0.10	20	--	5.70
443727092385801	03-09-95	--	139	--	--	--	--	<0.010	10.0
443741092394401	03-07-95	4.9	142	20	17	<0.10	20	<0.010	8.20
443744092384401	05-19-95	--	--	--	--	--	--	<0.010	2.50
443744092384401	08-04-95	--	--	--	--	--	--	<0.010	1.60
443744092391701	03-07-95	5.4	153	11	47	<0.10	18	<0.010	2.40
443744092391701	05-18-95	--	--	--	--	--	--	<0.010	3.00
443744092391701	08-02-95	--	--	--	--	--	--	<0.010	2.30
443745092381301	05-19-95	--	--	--	--	--	--	<0.010	--
443745092381301	08-04-95	--	--	--	--	--	--	<0.010	0.090
443745092390201	03-08-95	62	186	20	77	0.20	9.8	<0.010	--
443745092390201	08-01-95	--	--	--	--	--	--	<0.010	0.130
443746092383001	03-09-95	2.4	104	9.6	5.5	0.10	18	<0.010	16.0
443746092383001	05-18-95	--	--	--	--	--	--	<0.010	14.0
443746092383001	07-31-95	--	--	--	--	--	--	<0.010	12.0
443752092381501	05-18-95	--	--	--	--	--	--	<0.010	--
443752092381501	08-03-95	--	--	--	--	--	--	<0.010	0.090
443756092390901	03-07-95	4.4	248	22	7.2	<0.10	19	<0.010	9.90
443756092390901	05-18-95	--	--	--	--	--	--	<0.010	6.70
443756092390901	07-31-95	--	--	--	--	--	--	<0.010	7.30
443808092384401	03-07-95	3.8	124	21	9.0	<0.10	17	<0.010	7.30
443808092384401	05-24-95	--	--	--	--	--	--	--	--
443808092384401	07-31-95	--	--	--	--	--	--	<0.010	5.70
443814092393901	03-09-95	3.9	152	42	7.7	<0.10	8.4	<0.010	3.70
443814092393901	05-18-95	--	--	--	--	--	--	<0.010	3.30
443814092393901	07-31-95	--	--	--	--	--	--	<0.010	2.40
443814092395301	03-13-95	50	143	34	40	<0.10	20	<0.010	26.0
443814092395301	05-18-95	--	--	--	--	--	--	<0.010	23.0
443814092395301	08-02-95	--	--	--	--	--	--	<0.010	25.0
443814092395301	08-02-95	--	--	--	--	--	--	<0.010	24.0
443814092395302	05-17-95	3.6	198	31	8.8	<0.10	22	<0.010	1.20
443814092395302	08-02-95	--	--	--	--	--	--	<0.010	1.40
443830092390701	03-13-95	4.6	180	23	3.5	<0.10	11	<0.010	0.470

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	TRITIUM TOTAL (PCI/L) (07000)
				GOODHUE COUNTY					
443631092372001	03-13-95	0.070	1.60	1.9	--	0.020	--	--	220
443631092372001	05-17-95	<0.050	1.70	1.8	--	0.030	--	--	210
443631092372001	08-02-95	<0.050	1.60	1.8	--	0.020	--	--	130
443650092375601	05-19-95	<0.050	0.020	<0.20	--	0.020	--	--	230
443650092375601	08-04-95	0.090	0.020	<0.20	--	0.020	--	--	220
443656092373901	05-19-95	<0.050	0.160	0.40	--	0.160	--	--	38
443656092373901	08-04-95	0.700	0.410	0.60	--	0.200	--	--	41
443658092381201	05-17-95	--	--	--	--	--	--	--	50
443722092390201	11-09-94	3.60	<0.015	<0.20	0.020	--	4	<1	170
443722092390201	03-09-95	3.70	<0.015	<0.20	--	0.030	3	1	150
443722092390201	05-17-95	3.60	<0.015	<0.20	--	0.030	--	--	140
443722092390201	08-02-95	4.00	<0.015	<0.20	--	0.030	--	--	130
443727092385801	11-10-94	5.70	<0.015	<0.20	0.010	--	<3	<1	120
443727092385801	03-09-95	10.0	0.020	<0.20	--	0.020	--	--	110
443741092394401	03-07-95	8.20	<0.015	<0.20	--	0.020	<3	<1	67
443744092384401	05-19-95	2.50	<0.015	<0.20	--	0.050	--	--	48
443744092384401	08-04-95	1.60	<0.015	<0.20	--	0.030	--	--	37
443744092391701	03-07-95	2.40	<0.015	<0.20	--	0.010	37	2	35
443744092391701	05-18-95	3.00	<0.015	<0.20	--	0.020	--	--	31
443744092391701	08-02-95	2.30	<0.015	<0.20	--	0.020	--	--	34
443745092381301	05-19-95	<0.050	0.020	<0.20	--	0.030	--	--	46
443745092381301	08-04-95	0.090	0.030	<0.20	--	0.020	--	--	40
443745092390201	03-08-95	<0.050	0.180	<0.20	--	<0.010	370	57	--
443745092390201	08-01-95	0.130	0.170	<0.20	--	<0.010	--	--	<2.6
443746092383001	03-09-95	16.0	<0.015	<0.20	--	0.060	19	1	42
443746092383001	05-18-95	14.0	<0.015	<0.20	--	0.060	--	--	40
443746092383001	07-31-95	12.0	<0.015	<0.20	--	0.060	--	--	38
443752092381501	05-18-95	<0.050	0.040	0.30	--	<0.010	--	--	34
443752092381501	08-03-95	0.090	0.030	<0.20	--	<0.010	--	--	39
443756092390901	03-07-95	9.90	<0.015	<0.20	--	<0.010	29	2	--
443756092390901	05-18-95	6.70	<0.015	<0.20	--	<0.010	--	--	30
443756092390901	07-31-95	7.30	<0.015	<0.20	--	<0.010	--	--	35
443808092384401	03-07-95	7.30	<0.015	<0.20	--	0.020	27	5	--
443808092384401	05-24-95	--	--	--	--	--	--	--	38
443808092384401	07-31-95	5.70	<0.015	<0.20	--	0.020	--	--	32
443814092393901	03-09-95	3.70	<0.015	<0.20	--	0.030	17	<1	--
443814092393901	05-18-95	3.30	<0.015	<0.20	--	0.020	--	--	37
443814092393901	07-31-95	2.40	<0.015	<0.20	--	0.030	--	--	27
443814092395301	03-13-95	26.0	<0.015	0.20	--	0.030	48	3	85
443814092395301	05-18-95	23.0	<0.015	<0.20	--	0.030	--	--	66
443814092395301	08-02-95	25.0	<0.015	<0.20	--	0.040	--	--	65
443814092395301	08-02-95	24.0	<0.015	<0.20	--	0.040	--	--	70
443814092395302	05-17-95	1.20	<0.015	<0.20	--	0.010	<3	<1	150
443814092395302	08-02-95	1.40	<0.015	<0.20	--	0.020	--	--	140
443830092390701	03-13-95	0.470	<0.015	<0.20	--	<0.010	25	1	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	DEPTH OF WELL, TOTAL (FEET) (72008)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN) (72004)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)
				GOODHUE COUNTY					
443830092390701	05-24-95	0947	--	12.00	21	421	--	7.3	--
443830092390701	07-31-95	1100	--	12.00	30	424	--	7.2	--
443834092390301	03-08-95	1430	5.50	11.00	47	524	551	7.1	7.5
443834092390301	05-18-95	1630	--	11.00	28	541	553	7.4	7.4
443834092390301	07-31-95	1150	--	11.00	15	565	--	7.1	--
443839092394001	03-13-95	1130	6.22	11.00	50	433	462	7.2	7.4
443839092394901	03-08-95	1315	8.40	13.42	26	435	457	7.3	7.7
443839092394901	05-24-95	--	--	13.42	22	457	--	7.4	--
443839092394901	07-31-95	1230	--	13.42	21	457	--	7.1	--
				OTTER TAIL COUNTY					
460838095141801	04-27-95	1200	--	--	25	753	--	7.0	--
460900095150001	05-09-95	1830	--	18.00	--	638	--	7.3	--
460913095221201	05-09-95	1600	--	--	--	676	--	7.2	--
461100095170701	05-09-95	1730	--	--	--	769	--	7.3	--
461237095161301	05-09-95	1430	--	--	--	671	--	6.8	--
461238095205501	04-26-95	1710	--	--	19	595	--	7.4	--
461255095373001	04-20-95	1530	--	45.00	25	439	--	7.3	--
461315095122901	04-27-95	1500	--	--	30	524	--	7.3	--
461319095415501	05-10-95	1100	--	32.00	--	583	--	7.3	--
461326095084801	04-27-95	1400	--	28.00	24	788	--	6.9	--
461415095183701	04-26-95	1555	--	--	25	523	--	7.3	--
461612095113601	04-25-95	1645	--	--	20	647	--	7.3	--
461732095373901	04-20-95	1430	--	34.70	25	502	--	7.3	--
461826095411501	04-20-95	1030	--	--	21	362	--	7.7	--
461855095435101	05-31-95	1000	--	--	--	402	--	8.1	--
461930095373000	04-20-95	1120	--	38.00	30	510	--	7.6	--
462024095352201	04-20-95	1220	--	42.00	--	441	--	7.6	--
462030095195601	04-26-95	1445	--	14.34	33	512	--	7.3	--
462044095453101	05-10-95	1215	--	--	--	--	--	--	--
462044095453101	05-10-95	1215	--	--	--	567	--	7.3	--
462057095404801	04-18-95	1720	--	--	28	592	--	7.4	--
462130095103301	04-25-95	1730	--	--	18	578	--	7.1	--
462320095463001	05-10-95	1645	--	70.00	--	763	--	7.1	--
462353095322801	04-18-95	1530	--	--	26	458	--	7.5	--
462454095352201	04-20-95	0940	--	--	26	889	--	7.1	--
462530095343301	04-18-95	1630	--	--	22	584	--	7.4	--
462530095482001	05-10-95	1530	--	23.00	--	513	--	7.2	--
462531095415701	05-10-95	1730	--	37.00	--	532	--	7.6	--
462531095415701	05-10-95	1735	--	37.00	--	--	--	--	--
462538095525701	04-19-95	1630	--	43.00	20	262	--	8.5	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	OXID-ATION RED-UCTION POTEN-TIAL (MV) (00090)	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	FLOW RATE, INSTAN-TANEOUS (G/M) (00059)	OXYGEN, DIS-SOLVED (MG/L) (00300)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
				GOODHUE COUNTY					
443830092390701	05-24-95	317	8.0	--	750	--	6.3	--	--
443830092390701	07-31-95	--	13.0	28.0	744	0.5	5.7	--	--
443834092390301	03-08-95	-56	5.5	-4.0	--	--	0.1	63	23
443834092390301	05-18-95	139	6.5	22.0	740	--	0.0	68	26
443834092390301	07-31-95	--	13.5	23.0	744	--	0.1	--	--
443839092394001	03-13-95	200	6.5	17.0	--	--	1.2	61	22
443839092394901	03-08-95	222	6.5	-10.0	--	--	2.7	57	20
443839092394901	05-24-95	306	8.0	--	--	--	4.5	--	--
443839092394901	07-31-95	--	12.0	24.0	744	0.5	5.0	--	--
				OTTER TAIL COUNTY					
460838095141801	04-27-95	--	9.0	8.0	--	1.0	1.0	--	--
460900095150001	05-09-95	--	6.5	--	--	--	--	--	--
460913095221201	05-09-95	--	8.5	--	--	--	--	--	--
461100095170701	05-09-95	--	6.0	--	--	--	--	--	--
461237095161301	05-09-95	--	11.0	--	--	--	--	--	--
461238095205501	04-26-95	266	8.0	--	--	1.5	7.9	--	--
461255095373001	04-20-95	75	9.0	13.0	--	--	0.0	--	--
461315095122901	04-27-95	230	8.0	8.0	724	--	8.3	--	--
461319095415501	05-10-95	--	8.5	--	--	--	--	--	--
461326095084801	04-27-95	0.9	5.0	8.0	724	--	0.3	--	--
461415095183701	04-26-95	43	8.0	--	--	--	0.0	--	--
461612095113601	04-25-95	--	9.0	--	--	1.1	5.5	--	--
461732095373901	04-20-95	310	8.5	15.0	--	--	9.1	--	--
461826095411501	04-20-95	125	11.5	7.0	--	--	0.0	--	--
461855095435101	05-31-95	--	8.5	--	--	--	1.0	--	--
461930095373000	04-20-95	-8	8.5	9.0	--	--	0.0	--	--
462024095352201	04-20-95	25	8.5	12.0	--	--	0.3	--	--
462030095195601	04-26-95	249	5.0	10.0	725	--	6.3	--	--
462044095453101	05-10-95	--	--	--	--	--	--	--	--
462044095453101	05-10-95	--	8.0	--	--	--	--	--	--
462057095404801	04-18-95	64	12.0	--	--	--	0.0	--	--
462130095103301	04-25-95	--	8.5	--	--	--	0.1	--	--
462320095463001	05-10-95	--	8.5	--	--	--	--	--	--
462353095322801	04-18-95	236	12.0	5.0	--	--	3.9	--	--
462454095352201	04-20-95	258	8.0	6.0	--	--	1.4	--	--
462530095343301	04-18-95	122	9.0	7.0	--	--	0.0	--	--
462530095482001	05-10-95	--	8.0	--	--	--	--	--	--
462531095415701	05-10-95	--	7.5	--	--	--	3.4	--	--
462531095415701	05-10-95	--	--	--	--	--	--	--	--
462538095525701	04-19-95	-99	9.5	14.0	--	--	0.4	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	ALKA-LINITY SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	WAT WH TOT IT FIELD MG/L AS CACO3 (00419)	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)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)
				GOODHUE COUNTY					
443830092390701	05-24-95	--	--	--	--	--	--	--	--
443830092390701	07-31-95	--	--	--	--	--	--	<0.010	0.320
443834092390301	03-08-95	15	239	37	11	0.20	13	<0.010	--
443834092390301	05-18-95	13	254	28	11	0.10	14	<0.010	--
443834092390301	07-31-95	--	--	--	--	--	--	<0.010	0.080
443839092394001	03-13-95	3.5	219	18	2.0	0.10	11	0.020	1.90
443839092394901	03-08-95	6.9	204	16	5.9	<0.10	14	<0.010	2.00
443839092394901	05-24-95	--	--	--	--	--	--	--	--
443839092394901	07-31-95	--	--	--	--	--	--	<0.010	2.80
				OTTER TAIL COUNTY					
460838095141801	04-27-95	--	--	--	25	--	--	<0.010	19.0
460900095150001	05-09-95	--	--	--	20	--	--	<0.010	13.0
460913095221201	05-09-95	--	--	--	15	--	--	<0.010	13.0
461100095170701	05-09-95	--	--	--	4.4	--	--	0.040	7.70
461237095161301	05-09-95	--	--	--	5.2	--	--	<0.010	0.050
461238095205501	04-26-95	--	--	--	13	--	--	<0.010	20.0
461255095373001	04-20-95	--	--	--	6.6	--	--	<0.010	--
461315095122901	04-27-95	--	--	--	6.0	--	--	<0.010	8.90
461319095415501	05-10-95	--	--	--	5.5	--	--	<0.010	1.10
461326095084801	04-27-95	--	--	--	27	--	--	<0.010	--
461415095183701	04-26-95	--	--	--	0.90	--	--	<0.010	--
461612095113601	04-25-95	--	--	--	16	--	--	<0.010	18.0
461732095373901	04-20-95	--	--	--	10	--	--	<0.010	5.70
461826095411501	04-20-95	--	--	--	4.7	--	--	<0.010	--
461855095435101	05-31-95	--	--	--	5.2	--	--	<0.010	--
461930095373000	04-20-95	--	--	--	0.60	--	--	<0.010	--
462024095352201	04-20-95	--	--	--	1.0	--	--	<0.010	--
462030095195601	04-26-95	--	--	--	5.4	--	--	<0.010	8.00
462044095453101	05-10-95	--	--	--	--	--	--	--	--
462044095453101	05-10-95	--	--	--	12	--	--	<0.010	8.10
462057095404801	04-18-95	--	--	--	8.4	--	--	0.010	--
462130095103301	04-25-95	--	--	--	3.9	--	--	<0.010	4.50
462320095463001	05-10-95	--	--	--	--	--	--	<0.010	--
462353095322801	04-18-95	--	--	--	3.3	--	--	<0.010	4.70
462454095352201	04-20-95	--	--	--	82	--	--	<0.010	1.80
462530095343301	04-18-95	--	--	--	19	--	--	0.050	3.10
462530095482001	05-10-95	--	--	--	7.3	--	--	<0.010	15.0
462531095415701	05-10-95	--	--	--	13	--	--	<0.010	18.0
462531095415701	05-10-95	--	--	--	13	--	--	<0.010	18.0
462538095525701	04-19-95	--	--	--	5.3	--	--	0.040	0.460

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	TRITIUM TOTAL (PCI/L) (07000)
			GOODHUE COUNTY					
443830092390701	05-24-95	--	--	--	--	--	--	31
443830092390701	07-31-95	0.320	<0.015	<0.20	<0.010	--	--	35
443834092390301	03-08-95	<0.050	0.220	0.30	<0.010	79	1700	--
443834092390301	05-18-95	<0.050	0.200	0.30	<0.010	59	1700	13
443834092390301	07-31-95	0.080	0.210	0.30	<0.010	--	--	28
443839092394001	03-13-95	1.90	0.020	<0.20	<0.010	22	1	--
443839092394901	03-08-95	2.00	<0.015	<0.20	<0.010	19	1	--
443839092394901	05-24-95	--	--	--	--	--	--	<31
443839092394901	07-31-95	2.80	<0.015	<0.20	<0.010	--	--	34
			OTTER TAIL COUNTY					
460838095141801	04-27-95	19.0	<0.015	--	<0.010	--	--	--
460900095150001	05-09-95	13.0	<0.015	--	<0.010	--	--	--
460913095221201	05-09-95	13.0	<0.015	--	0.010	--	--	--
461100095170701	05-09-95	7.70	0.020	--	0.850	--	--	--
461237095161301	05-09-95	0.050	0.110	--	<0.010	--	--	--
461238095205501	04-26-95	20.0	<0.015	--	0.010	--	--	--
461255095373001	04-20-95	<0.050	0.400	--	0.040	--	--	--
461315095122901	04-27-95	8.90	<0.015	--	<0.010	--	--	--
461319095415501	05-10-95	1.10	<0.015	--	<0.010	--	--	--
461326095084801	04-27-95	<0.050	0.840	--	0.040	--	--	--
461415095183701	04-26-95	<0.050	0.400	--	0.020	--	--	--
461612095113601	04-25-95	18.0	<0.015	--	<0.010	--	--	--
461732095373901	04-20-95	5.70	<0.015	--	<0.010	--	--	--
461826095411501	04-20-95	<0.050	0.030	--	0.050	--	--	--
461855095435101	05-31-95	<0.050	0.110	--	0.010	--	--	--
461930095373000	04-20-95	<0.050	1.10	--	0.230	--	--	--
462024095352201	04-20-95	<0.050	0.070	--	<0.010	--	--	--
462030095195601	04-26-95	8.00	<0.015	--	<0.010	--	--	--
462044095453101	05-10-95	--	--	--	--	--	--	--
462044095453101	05-10-95	8.10	<0.015	--	<0.010	--	--	--
462057095404801	04-18-95	<0.050	0.130	--	0.010	--	--	--
462130095103301	04-25-95	4.50	<0.015	--	<0.010	--	--	--
462320095463001	05-10-95	<0.050	0.200	--	0.020	--	--	--
462353095322801	04-18-95	4.70	<0.015	--	<0.010	--	--	--
462454095352201	04-20-95	1.80	<0.015	--	<0.010	--	--	--
462530095343301	04-18-95	3.10	0.020	--	0.020	--	--	--
462530095482001	05-10-95	15.0	<0.015	--	0.010	--	--	--
462531095415701	05-10-95	18.0	<0.015	--	0.080	--	--	--
462531095415701	05-10-95	18.0	0.020	--	0.080	--	--	--
462538095525701	04-19-95	0.460	1.10	--	<0.010	--	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	DEPTH OF WELL, TOTAL (FEET) (72008)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN) (72004)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	OXIDATION REDUCTION POTENTIAL (MV) (00090)
				OTTER TAIL COUNTY						
462600095540000	04-19-95	1515	--	80.00	27	1800	--	6.6	--	293
462625095112001	04-17-95	1645	--	20.00	20	778	--	7.4	--	264
462700095322001	04-18-95	1130	--	52.50	25	894	--	7.3	--	-15
462710095351501	04-18-95	1015	--	25.00	19	661	--	7.3	--	311
462715095323001	04-18-95	1330	--	60.00	33	621	--	7.2	--	43
462721095102101	04-17-95	1520	--	--	20	539	--	7.1	--	41
462840095353901	04-14-95	0845	10.26	13.10	20	195	--	7.7	--	--
463049095453501	05-30-95	1630	--	--	--	--	--	--	--	--
463140095344601	04-13-95	1430	26.97	41.00	27	861	--	7.0	--	--
463143095415101	05-11-95	1130	--	--	--	--	--	--	--	--
463235095304501	04-12-95	1700	13.63	13.50	23	443	--	7.4	--	--
463320095254501	04-18-95	0900	--	20.00	25	659	--	6.8	--	129
463450095382001	04-25-95	1000	--	90.00	30	792	--	7.2	--	--
463532095322401	04-11-95	1000	19.17	30.00	40	493	--	7.9	--	--
463532095322401	04-26-95	1200	--	30.00	31	1550	--	7.3	--	--
463533095350701	04-19-95	1150	--	--	31	499	--	7.4	--	267
463534095331201	04-11-95	1200	24.47	32.00	40	407	--	7.6	--	--
463535095360001	04-19-95	1050	--	30.00	17	593	--	7.2	--	168
463536095350801	04-10-95	1800	--	32.70	40	432	--	7.8	--	298
463554095355301	04-12-95	1045	27.03	33.80	25	507	--	7.5	--	--
463554095355301	04-12-95	1055	27.03	33.80	25	507	--	7.5	--	--
463556095392101	04-19-95	0900	--	--	29	549	--	7.4	--	322
463601095373001	04-24-95	1745	--	25.00	18	497	--	7.2	--	--
463602095355901	04-19-95	1020	--	80.00	20	457	--	7.5	--	63
463604095375901	04-24-95	1800	--	91.00	15	587	--	7.2	--	--
463632095312901	08-10-95	1645	--	1.00	--	534	--	7.5	--	--
463653095311001	08-10-95	1350	--	1.00	--	625	--	7.3	--	--
463700095360000	04-19-95	1345	--	90.00	20	503	--	7.3	--	170
463700095360000	04-19-95	1350	--	90.00	20	503	--	7.3	--	170
463711095322901	08-08-95	1500	--	1.00	--	599	--	7.1	--	--
463824095304801	08-10-95	1515	--	1.00	--	739	--	7.0	--	--
463857095333901	08-08-95	1640	--	1.00	--	632	--	7.0	--	--
463900095360000	05-11-95	0945	--	68.00	--	651	--	7.2	--	--
				REDWOOD COUNTY						
443114094585801	09-11-95	1430	--	142.00	18	1260	1190	7.0	7.2	--
443130094590201	07-19-95	1200	--	132.00	--	1300	805	7.1	7.5	--
443146094594601	07-19-95	0900	--	300.00	--	--	918	--	8.4	--
443146094594601	07-19-95	0900	--	300.00	--	902	918	7.8	8.4	--
443158094585301	07-18-95	1330	--	17.50	--	699	719	7.1	7.4	--
443210094590003	07-19-95	1700	--	10.00	--	E683	713	7.0	7.3	--
443211094590001	07-19-95	1720	--	8.50	--	715	743	6.5	7.2	--
443213094592801	07-18-95	1500	--	23.00	--	730	762	7.4	7.4	--
443221095005801	09-11-95	1800	3.61	11.60	12	466	494	7.5	7.6	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	FLOW RATE, INSTANTANEOUS (G/M) (00059)	OXYGEN, DISSOLVED (MG/L) (00300)	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)
				OTTER TAIL COUNTY						
462600095540000	04-19-95	8.0	12.0	--	--	3.8	--	--	--	--
462625095112001	04-17-95	10.0	9.0	--	--	8.3	--	--	--	--
462700095322001	04-18-95	7.5	--	--	--	0.1	--	--	--	--
462710095351501	04-18-95	9.5	--	--	--	3.9	--	--	--	--
462715095323001	04-18-95	8.0	5.0	--	--	0.1	--	--	--	--
462721095102101	04-17-95	7.0	9.0	--	--	0.1	--	--	--	--
462840095353901	04-14-95	6.0	--	--	0.6	9.2	--	--	--	--
463049095453501	05-30-95	--	--	--	--	--	--	--	--	--
463140095344601	04-13-95	9.5	--	--	0.3	7.4	--	--	--	--
463143095415101	05-11-95	--	--	--	--	--	--	--	--	--
463235095304501	04-12-95	7.0	--	--	1.1	9.8	--	--	--	--
463320095254501	04-18-95	8.0	--	--	--	0.1	--	--	--	--
463450095382001	04-25-95	7.0	--	--	1.2	5.6	--	--	--	--
463532095322401	04-11-95	7.5	--	--	1.2	7.0	--	--	--	--
463532095322401	04-26-95	7.5	8.0	727	--	7.4	--	--	--	--
463533095350701	04-19-95	11.0	9.0	--	--	4.5	--	--	--	--
463534095331201	04-11-95	10.0	--	--	1.2	9.4	--	--	--	--
463535095360001	04-19-95	11.0	8.0	--	--	13.4	--	--	--	--
463536095350801	04-10-95	10.5	--	--	0.3	12.2	--	--	--	--
463554095355301	04-12-95	8.5	--	--	1.0	9.6	--	--	--	--
463554095355301	04-12-95	8.5	--	--	1.0	9.6	--	--	--	--
463556095392101	04-19-95	9.0	6.0	--	--	5.2	--	--	--	--
463601095373001	04-24-95	9.5	9.0	--	1.0	0.1	--	--	--	--
463602095355901	04-19-95	8.5	7.0	--	--	0.0	--	--	--	--
463604095375901	04-24-95	7.5	--	--	--	0.2	--	--	--	--
463632095312901	08-10-95	--	--	--	--	--	--	--	--	--
463653095311001	08-10-95	--	--	--	--	--	--	--	--	--
463700095360000	04-19-95	8.0	10.0	--	--	0.0	--	--	--	--
463700095360000	04-19-95	8.0	10.0	--	--	0.0	--	--	--	--
463711095322901	08-08-95	--	--	--	--	--	--	--	--	--
463824095304801	08-10-95	--	--	--	--	--	--	--	--	--
463857095333901	08-08-95	--	--	--	--	--	--	--	--	--
463900095360000	05-11-95	7.5	--	--	--	0.0	--	--	--	--
				REDWOOD COUNTY						
443114094585801	09-11-95	9.0	24.0	740	--	0.6	150	53	54	4.7
443130094590201	07-19-95	16.0	--	--	--	8.4	160	57	56	4.6
443146094594601	07-19-95	--	--	--	--	--	5.0	2.2	190	2.3
443146094594601	07-19-95	12.5	--	--	--	1.2	5.0	2.2	190	2.3
443158094585301	07-18-95	11.0	--	--	--	3.9	92	32	3.0	2.1
443210094590003	07-19-95	12.0	--	--	--	1.2	98	31	13	2.2
443211094590001	07-19-95	13.0	--	--	--	0.2	110	30	10	1.8
443213094592801	07-18-95	12.5	--	--	--	--	100	35	9.5	3.1
443221095005801	09-11-95	16.5	21.0	738	--	0.4	53	24	5.4	5.9

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	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)	BROMIDE DISSOLVED (MG/L AS BR) (71870)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)
				OTTER TAIL COUNTY					
462600095540000	04-19-95	--	--	100	--	--	--	--	0.430
462625095112001	04-17-95	--	--	71	--	--	--	--	<0.010
462700095322001	04-18-95	--	--	37	--	--	--	--	0.070
462710095351501	04-18-95	--	--	11	--	--	--	--	<0.010
462715095323001	04-18-95	--	--	14	--	--	--	--	<0.010
462721095102101	04-17-95	--	--	7.9	--	--	--	--	<0.010
462840095353901	04-14-95	--	--	0.50	--	--	--	--	<0.010
463049095453501	05-30-95	--	--	1.1	--	--	--	--	<0.010
463140095344601	04-13-95	--	--	54	--	--	--	--	<0.010
463143095415101	05-11-95	--	--	21	--	--	--	--	<0.010
463235095304501	04-12-95	--	--	0.70	--	--	--	--	<0.010
463320095254501	04-18-95	--	--	24	--	--	--	--	<0.010
463450095382001	04-25-95	--	--	31	--	--	--	--	<0.010
463532095322401	04-11-95	--	--	32	--	--	--	--	<0.010
463532095322401	04-26-95	--	--	--	--	--	--	--	--
463533095350701	04-19-95	--	--	7.8	--	--	--	--	<0.010
463534095331201	04-11-95	--	--	7.3	--	--	--	--	<0.010
463535095360001	04-19-95	--	--	9.6	--	--	--	--	<0.010
463536095350801	04-10-95	--	--	2.1	--	--	--	--	<0.010
463554095355301	04-12-95	--	--	4.9	--	--	--	--	0.010
463554095355301	04-12-95	--	--	4.8	--	--	--	--	0.010
463556095392101	04-19-95	--	--	13	--	--	--	--	<0.010
463601095373001	04-24-95	--	--	16	--	--	--	--	<0.010
463602095355901	04-19-95	--	--	1.2	--	--	--	--	<0.010
463604095375901	04-24-95	--	--	36	--	--	--	--	<0.010
463632095312901	08-10-95	--	--	--	--	--	--	--	<0.010
463653095311001	08-10-95	--	--	--	--	--	--	--	<0.010
463700095360000	04-19-95	--	--	2.3	--	--	--	--	<0.010
463700095360000	04-19-95	--	--	--	--	--	--	--	--
463711095322901	08-08-95	--	--	--	--	--	--	--	<0.010
463824095304801	08-10-95	--	--	--	--	--	--	--	<0.010
463857095333901	08-08-95	--	--	--	--	--	--	--	<0.010
463900095360000	05-11-95	--	--	3.7	--	--	--	--	<0.010
				REDWOOD COUNTY					
443114094585801	09-11-95	408	340	2.4	0.40	0.060	25	916	<0.010
443130094590201	07-19-95	358	360	9.7	0.90	0.070	27	983	--
443146094594601	07-19-95	324	56	58	4.3	0.23	7.3	554	--
443146094594601	07-19-95	324	56	58	4.3	0.23	7.3	554	--
443158094585301	07-18-95	275	26	22	0.20	0.060	29	452	0.020
443210094590003	07-19-95	319	46	1.9	0.30	0.030	25	436	<0.010
443211094590001	07-19-95	374	46	1.8	0.30	0.050	28	463	<0.010
443213094592801	07-18-95	306	72	15	0.20	0.060	21	478	0.020
443221095005801	09-11-95	236	19	6.0	0.30	0.070	28	290	0.120

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)
				OTTER TAIL COUNTY					
462600095540000	04-19-95	76.0	76.0	0.310	--	--	<0.010	--	--
462625095112001	04-17-95	17.0	17.0	<0.015	--	--	<0.010	--	--
462700095322001	04-18-95	0.530	0.530	0.080	--	--	<0.010	--	--
462710095351501	04-18-95	17.0	17.0	<0.015	--	--	0.010	--	--
462715095323001	04-18-95	--	<0.050	0.230	--	--	<0.010	--	--
462721095102101	04-17-95	--	<0.050	0.670	--	--	0.030	--	--
462840095353901	04-14-95	2.50	2.50	0.020	--	--	0.020	--	--
463049095453501	05-30-95	--	<0.050	0.250	--	--	0.020	--	--
463140095344601	04-13-95	17.0	17.0	<0.015	--	--	<0.010	--	--
463143095415101	05-11-95	23.0	23.0	<0.015	--	--	0.010	--	--
463235095304501	04-12-95	7.30	7.30	<0.015	--	--	<0.010	--	--
463320095254501	04-18-95	--	<0.050	0.110	--	--	0.030	--	--
463450095382001	04-25-95	29.0	29.0	<0.015	--	--	0.010	--	--
463532095322401	04-11-95	4.60	4.60	<0.015	--	--	0.240	--	--
463532095322401	04-26-95	--	--	--	--	--	--	--	--
463533095350701	04-19-95	7.30	7.30	<0.015	--	--	<0.010	--	--
463534095331201	04-11-95	6.40	6.40	<0.015	--	--	0.010	--	--
463535095360001	04-19-95	--	<0.050	<0.015	--	--	<0.010	--	--
463536095350801	04-10-95	13.0	13.0	<0.015	--	--	<0.010	--	--
463554095355301	04-12-95	20.0	20.0	<0.015	--	--	<0.010	--	--
463554095355301	04-12-95	20.0	20.0	<0.015	--	--	<0.010	--	--
463556095392101	04-19-95	14.0	14.0	<0.015	--	--	0.050	--	--
463601095373001	04-24-95	--	<0.050	0.030	--	--	0.030	--	--
463602095355901	04-19-95	--	<0.050	0.110	--	--	<0.010	--	--
463604095375901	04-24-95	1.00	1.00	<0.015	--	--	0.050	--	--
463632095312901	08-10-95	--	<0.050	0.120	--	0.008	<0.010	--	--
463653095311001	08-10-95	--	<0.050	0.370	--	--	0.020	--	--
463700095360000	04-19-95	0.640	0.640	<0.015	--	--	<0.010	--	--
463700095360000	04-19-95	--	--	--	--	--	--	--	--
463711095322901	08-08-95	--	<0.050	11.0	--	--	0.070	--	--
463824095304801	08-10-95	--	<0.050	0.920	--	--	0.050	--	--
463857095333901	08-08-95	--	<0.050	0.710	--	--	0.050	--	--
463900095360000	05-11-95	0.080	0.080	1.60	--	--	0.020	--	--
				REDWOOD COUNTY					
443114094585801	09-11-95	--	<0.050	1.80	2.0	0.160	0.210	3500	150
443130094590201	07-19-95	--	--	--	--	--	--	<3	88
443146094594601	07-19-95	--	--	--	--	--	--	150	5
443146094594601	07-19-95	--	--	--	--	--	--	150	5
443158094585301	07-18-95	10.0	10.0	0.020	<0.20	<0.010	<0.010	<3	4
443210094590003	07-19-95	0.130	0.130	0.060	<0.20	0.020	0.020	6	5
443211094590001	07-19-95	--	<0.050	0.040	<0.20	0.010	0.030	<3	15
443213094592801	07-18-95	0.340	0.340	0.040	<0.20	<0.010	0.010	<3	790
443221095005801	09-11-95	0.860	0.860	0.040	<0.20	<0.010	<0.010	<3	35

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF INORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET) (72008)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
			ROCK COUNTY					
433145096213001	09-22-95	1050	249.00	2320	1930	6.8	7.2	240
433150096245201	09-21-95	1550	307.00	869	853	7.0	7.3	120
433345096172901	09-21-95	1405	398.00	3500	3050	6.8	7.1	440
433645096214401	09-22-95	1320	505.00	865	716	7.0	7.2	96
434122096152601	09-28-95	1500	510.00	600	600	7.4	7.3	70

STATION NUMBER	DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	LINITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	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)
433145096213001	09-22-95	92	94	9.8	--	309	850	10
433150096245201	09-21-95	32	30	6.2	--	316	170	5.4
433345096172901	09-21-95	190	120	14	--	326	1800	7.5
433645096214401	09-22-95	27	22	7.4	--	320	85	2.0
434122096152601	09-28-95	19	29	3.0	182	211	110	3.5

STATION NUMBER	DATE	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)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
433145096213001	09-22-95	0.20	35	1640	440	1400	580	<10
433150096245201	09-21-95	0.40	16	594	180	2700	250	10
433345096172901	09-21-95	0.10	27	3020	750	12000	520	40
433645096214401	09-22-95	0.40	24	460	170	1300	170	290
434122096152601	09-28-95	0.50	19	399	80	11	110	6500

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	ETHANE, 1112-TETRA-CHLORO-WAT UNF REC (UG/L) (77562)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L) (34506)	ETHANE, 1,1,2,2 TETRA-CHLORO-WAT UNF REC (UG/L) (34516)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L) (34511)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L) (34496)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L) (34501)	1,2,3-TRI-CHLOROBENZE WAT, WH REC (UG/L) (77613)	BENZENE 1,2,4DIBROMO TRI-ETHANE CHLOROWATER WAUNWHOLE REC (UG/L) (34551)	1,2-TOTAL (UG/L) (77651)
						BELTRAMI COUNTY					
472816094541200	08-18-95	1100	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
472919094540700	08-18-95	0900	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
472940094531100	08-23-95	--	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00

STATION NUMBER	DATE	BENZENE O-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34536)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L) (32103)	1,2-DI-CHLORO-PROPANE TOTAL (UG/L) (34541)	1,2-TRANSDI CHLORO-ETHENE TOTAL (UG/L) (34546)	BENZENE 1,3-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34566)	1,3-DI-CHLORO-PROPANE WAT. WH TOTAL (UG/L) (77173)	BENZENE 1,4-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34571)	123-TRI CHLORO-PROPANE WATER WHOLE TOTAL (UG/L) (77443)	2,2-DI CHLORO-PRO-PANE WAT, WH TOTAL (UG/L) (77170)	2-CHLORO-ETHYL-VINYL-ETHER TOTAL (UG/L) (34576)
472816094541200	08-18-95	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
472919094540700	08-18-95	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
72940094531100	08-23-95	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00

STATION NUMBER	DATE	BENZENE TOTAL (UG/L) (34030)	BROMO-BENZENE WATER, WHOLE, TOTAL (UG/L) (81555)	BROMO-FORM TOTAL (UG/L) (32104)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L) (32102)	CHLORO-BENZENE TOTAL (UG/L) (34301)	CHLORO-DI-BROMO-METHANE TOTAL (UG/L) (32105)	CHLORO-ETHANE TOTAL (UG/L) (34311)	CHLORO-FORM TOTAL (UG/L) (32106)	CIS 1,3-DI-CHLORO-PROPENE TOTAL (UG/L) (34704)	CIS-1,2-DI-CHLORO-ETHENE WATER TOTAL (UG/L) (77093)
472816094541200	08-18-95	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
472919094540700	08-18-95	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	32.0
472940094531100	08-23-95	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	DIBROMO CHLORO-PROPANE WATER WHOLE TOT.REC (UG/L) (82625)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L) (32101)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L) (34668)	ETHYL-BENZENE TOTAL (UG/L) (34371)	FREON-113 WATER UNFLTRD REC (UG/L) (77652)	HEXA-CHLORO-BUT-ADIENE TOTAL (UG/L) (39702)	BENZENE 135-TRI METHYL WATER UNFLTRD REC (UG/L) (77226)	METHYL-BROMIDE TOTAL (UG/L) (34413)	METHYL-CHLO-RIDE TOTAL (UG/L) (34418)	METHYL-ENE CHLO-RIDE TOTAL (UG/L) (34423)
BELTRAMI COUNTY											
472816094541200	08-18-95	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
472919094540700	08-18-95	<3.00	<3.00	6.30	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
472940094531100	08-23-95	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00

STATION NUMBER	DATE	BENZENE N-BUTYL WATER UNFLTRD REC (UG/L) (77342)	BENZENE N-PROPY WATER UNFLTRD REC (UG/L) (77224)	NAPHTH-ALENE TOTAL (UG/L) (34696)	O-CHLORO-TOLUENE WATER WHOLE TOTAL (UG/L) (77275)	TOLUENE P-CHLOR WATER UNFLTRD REC (UG/L) (77277)	P-ISO-PROPYL-TOLUENE WATER WHOLE REC (UG/L) (77356)	PHENOLS TOTAL (UG/L) (32730)	BENZENE 124-TRI METHYL UNFILT RECOVER (UG/L) (77222)	BENZENE SEC BUTYL-WATER UNFLTRD REC (UG/L) (77350)
472816094541200	08-18-95	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<1	<3.00	<3.00
472919094540700	08-18-95	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<1	<3.00	<3.00
472940094531100	08-23-95	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<1	<3.00	<3.00

STATION NUMBER	DATE	STYRENE TOTAL (UG/L) (77128)	BENZENE TERT-BUTYL-WATER UNFLTRD REC (UG/L) (77353)	TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L) (34475)	TOLUENE TOTAL (UG/L) (34010)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L) (34699)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L) (39180)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L) (34488)	VINYL CHLO-RIDE UNFLTRD TOTAL (UG/L) (39175)	XYLENE WATER REC (UG/L) (81551)
472816094541200	08-18-95	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<1.00	<3.00
472919094540700	08-18-95	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	1.90	<3.00
472940094531100	08-23-95	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<1.00	<3.00

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF ORGANIC CHEMICALS

STATION NUMBER	DATE	TIME	ALA-CHLOR TOTAL RECOVER (UG/L) (77825)	ATRA-ZINE AME-TRYNE TOTAL (UG/L) (82184)	WATER UNFLTRD REC (UG/L) (39630)	CARBOØ-IN xATER xHOLE RECOV-ERABLE (UG/L© (30245)	CYAN-AZINE TOTAL (UG/L) (81757)	CYCLO-ATE xATER xHOLE RECOV-ERABLE (UG/L) (30254)	DEETHYL ATRA-ZINE, WATER, WHOLE, TOTAL (UG/L) (75981)
CASS COUNTY									
472720095121800	08-17-95	1000	<0.100	<0.100	<0.100	<0.200	0.300	<0.100	<0.200

STATION NUMBER	DATE	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DIPHEN-AMID WATER WHOLE RECOV-ERABLE (UG/L) (30255)	HEXAZI-NONE WATER WHOLE RECOV-ERABLE (UG/L) (30264)	METOLA-CHLOR WATER WHOLE TOT.REC (UG/L) (82612)	METRI-BUZIN WATER WHOLE TOT.REC (UG/L) (82611)	PHENOLS TOTAL (UG/L) (32730)	PROME-TONE TOTAL (UG/L) (39056)	PROME-TRYNE TOTAL (UG/L) (39057)
472720095121800	08-17-95	<0.200	<0.100	0.200	<0.200	<0.100	<1	<0.200	<0.100

STATION NUMBER	DATE	PROPA-CHLOR WATER WHOLE RECOV. (UG/L) (30295)	PRO-PAZINE TOTAL (UG/L) (39024)	SIMA-ZINE TOTAL (UG/L) (39055)	SIME-TRYNE TOTAL (UG/L) (39054)	TER-BACIL WATER WHOLE RECOV. (UG/L) (30311)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)	VER-NOLATE WATER WHOLE RECOV. (UG/L) (30324)
472720095121800	08-17-95	<0.100	<0.100	<0.100	<0.100	<0.200	<0.100	<0.100

STATION NUMBER	DATE	TIME	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)
OTTER TAIL COUNTY										
461100095170701	05-09-95	1730	<0.050	1.80	<0.200	0.340	<0.050	<0.050	<0.050	<0.050
462130095103301	04-25-95	1730	<0.050	0.250	<0.200	0.150	<0.050	<0.050	<0.050	<0.050
462530095482001	05-10-95	1530	<0.050	0.130	<0.200	1.20	<0.050	<0.050	<0.050	<0.050

STATION NUMBER	DATE	TIME	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)
OTTER TAIL COUNTY										
462600095540000	04-19-95	1515	<0.050	2.20	<0.200	0.960	<0.050	<0.050	<0.050	<0.050
463532095322401	04-26-95	1200	<0.050	0.730	<0.200	1.90	<0.050	<0.050	<0.050	<0.050

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF RADIOCHEMICAL

STATION NUMBER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET) (72008)	H-2 / H-1 STABLE ISOTOPE RATIO PER MIL (82082)	O-18 / O-16 STABLE ISOTOPE RATIO PER MIL (82085)	N15/N14 NO3 FRAC WATER FLTRD 0.45 U PER MIL (82690)	N15/N14 NH4 FRAC WATER FLTRD 0.45 U PER MIL (82691)
			BLUE EARTH COUNTY				
434657093372301	05-01-95	1235	--	-42.1	-5.66	7.7	--
434704093325301	05-01-95	1125	--	-53.3	-8.10	6.3	--
435144093381501	05-01-95	1315	--	-55.8	-8.30	7.6	--
435211093492901	05-01-95	1405	--	-52.6	-7.53	7.3	--
435659093494101	05-01-95	1450	--	-56.3	-8.06	11.6	--
435749093554801	05-01-95	1530	--	-57.2	-8.17	8.0	--
435749093554801	06-08-95	1440	--	-51.1	-7.75	6.4	--
440107093555001	04-04-95	1140	--	-61.2	-8.98	4.6	--
440107093565901	04-03-95	1830	--	--	--	--	5.0
440108093560201	04-04-95	0920	--	-53.5	-8.09	8.2	--
440108093560202	04-04-95	0930	--	-55.1	-8.19	8.6	--
440108093560203	04-04-95	1007	--	-54.0	-8.05	5.2	--
440109093550201	04-03-95	1631	--	-56.4	-8.35	12.9	--
440109093550201	05-02-95	0830	--	-54.1	-8.28	10.1	--
440110093550201	04-03-95	1700	--	-54.9	-8.39	8.3	--
440110093550201	05-02-95	0850	--	-53.6	-8.18	7.7	--
440118093561001	04-04-95	1515	--	-56.1	-8.32	11.4	--
440118093561001	05-02-95	1015	--	-54.6	-8.32	10.4	--
440118093561001	06-08-95	1540	--	-54.5	-8.03	8.7	--
440121093561601	05-02-95	0950	--	-52.6	-7.73	3.5	--
440121093561601	06-08-95	1650	--	-50.9	-7.53	4.4	--
440122093561101	06-08-95	1605	--	-53.8	-7.90	6.9	--
440131093562801	04-04-95	1410	--	-51.5	-7.66	9.4	--
440131093562801	05-02-95	0940	--	-52.7	-7.61	10.4	--
44013109356280	06-08-95	1640	--	-51.1	-7.51	11.0	--
440133093562701	04-04-95	1345	--	-51.5	-7.87	10.2	--
440133093562701	05-02-95	0925	--	-52.2	-7.82	9.5	--
440133093562701	06-08-95	1625	--	-54.1	-7.79	9.0	--
440252094000101	05-01-95	1700	--	-54.1	-7.85	8.3	--
440252094000101	06-08-95	1815	--	-49.4	-7.40	7.5	--
			SHERBURNE COUNTY				
453138093365901	03-02-95	1200	12.00	-73.6	-10.59	--	--
453138093365901	04-05-95	1200	12.00	-90.4	-12.74	--	--
453138093365901	05-04-95	1200	12.00	-77.1	-11.06	--	--
453138093365901	06-07-95	1200	12.00	-74.2	-10.59	--	--
453138093365901	07-06-95	1315	12.00	-76.9	-11.17	--	--
453138093365901	08-30-95	1200	12.00	-82.5	-11.93	--	--
453139093370001	10-12-94	1200	19.50	-74.3	-10.32	--	--
453139093370001	11-03-94	1200	19.50	-74.1	-10.28	--	--
453139093370001	12-06-94	1200	19.50	-72.8	-10.43	--	--
453139093370001	03-02-95	1200	19.50	-74.6	-10.44	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF RADIOCHEMICAL

STATION NUMBER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET) (72008)	H-2 / H-1 STABLE ISOTOPE RATIO PER MIL (82082)	O-18 / O-16 STABLE ISOTOPE RATIO PER MIL (82085)
		SHERBURNE COUNTY			
453139093370001	04-05-95	1200	19.50	-74.8	-10.57
453139093370001	05-04-95	1200	19.50	-75.3	-10.58
453139093370001	06-07-95	1200	19.50	-76.6	-10.89
453139093370001	07-06-95	1220	19.50	-78.7	-11.07
453139093370001	08-29-95	1200	19.50	-76.5	-10.63
453142093371401	10-06-94	1200	--	-63.2	-8.92
453142093371401	11-03-94	1200	--	-69.6	-9.81
453142093371401	12-06-94	1200	--	-79.2	-10.96
453142093371401	03-02-95	1200	--	-81.9	-11.48
453142093371401	04-05-95	1200	--	-74.5	-10.67
453142093371401	05-03-95	1200	--	-77.0	-11.04
453142093371401	06-07-95	1200	--	-76.0	-10.77
453142093371401	07-06-95	0945	--	-74.5	-10.27
453142093371401	08-29-95	1200	--	-69.2	-9.70
453142093371403	12-06-94	1200	10.58	-81.2	-11.08
453142093371404	12-06-94	1200	12.22	-72.0	-10.05
453142093371405	12-06-94	1200	13.86	-69.7	-9.92
453142093371406	12-06-94	1200	15.50	-65.6	-9.41
453142093371408	12-06-94	1200	18.69	-118.0	-15.62
453142093371409	12-06-94	1200	21.97	-68.2	-9.75
453142093371410	12-06-94	1200	28.53	-81.2	-11.69
453142093371411	12-06-94	1200	35.10	-68.8	-9.81
453142093371422	11-03-94	1200	--	-60.6	-8.64
453142093371423	10-12-94	1200	7.87	-80.5	-10.88
453142093371423	11-03-94	1200	7.87	-76.0	-10.14
453142093371427	10-12-94	1200	2.62	-46.8	-7.26
453142093371427	11-03-94	1200	2.62	-34.8	-5.93
453142093371427	12-07-94	1200	2.62	-36.6	-6.00
453142093371428	10-12-94	1200	5.91	-50.5	-7.29
453142093371428	12-07-94	1200	5.91	-46.0	-7.13
453142093371432	10-12-94	1200	--	-88.1	-11.54
453142093371432	11-03-94	1200	--	-78.3	-10.35
453142093371432	12-07-94	1200	--	-73.9	-9.63
453143093371101	10-06-94	1200	--	-80.9	-11.02
453143093371101	11-03-94	1200	--	-77.5	-10.53
453143093371101	12-06-94	1200	--	-72.0	-10.24
453143093371101	03-02-95	1200	--	-72.2	-10.26
453143093371101	04-05-95	1200	--	-70.8	-10.20
453143093371101	05-03-95	1200	--	-72.3	-10.19
453143093371101	06-07-95	1200	--	-74.8	-10.49
453143093371101	08-29-95	1200	--	-70.0	-9.94
453143093371103	12-06-94	1200	15.83	-73.8	-10.14
453143093371104	12-06-94	1200	17.47	-70.0	-9.75
453143093371105	12-06-94	1200	19.11	-81.4	-11.30
453143093371106	12-06-94	1200	20.75	-70.5	-9.99

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

ANALYSES OF RADIOCHEMICAL

STATION NUMBER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET) (72008)	H-2 / H-1 STABLE ISOTOPE RATIO PER MIL (82082)	O-18 / O-16 STABLE ISOTOPE RATIO PER MIL (82085)
		SHERBURNE COUNTY			
453143093371108	12-06-94	1200	24.38	-66.8	-9.81
453143093371109	12-06-94	1200	27.66	-67.0	-9.83
453143093371110	12-06-94	1200	34.22	-67.4	-9.80
453143093371111	12-06-94	1200	40.79	-67.1	-9.60
453143093371126	12-07-94	1200	--	-64.5	-8.80
453143093371127	10-12-94	1200	2.62	-59.7	-8.78
453143093371127	11-03-94	1200	2.62	-39.3	-6.35
453143093371127	12-07-94	1200	2.62	-40.6	-6.54
453143093371128	10-12-94	1200	5.91	-54.7	-7.57
453143093371128	11-03-94	1200	5.91	-55.6	-8.03
453143093371128	12-07-94	1200	5.91	-60.1	-8.60
453143093371129	10-12-94	1200	9.19	-81.7	-11.06
453143093371129	11-03-94	1200	9.19	-55.0	-7.68
453143093371131	10-12-94	1200	--	-60.5	-8.19
453143093371131	11-03-94	1200	--	-50.6	-7.33
453143093371131	12-07-94	1200	--	-51.4	-7.23
453143093371132	10-12-94	1200	--	-60.7	-8.69
453143093371132	11-03-94	1200	--	-53.0	-7.66
453148093371801	10-12-94	1200	--	-67.9	-9.65
453148093371801	11-03-94	1200	--	-69.3	-9.85
453148093371801	12-06-94	1200	--	-70.3	-10.19
453148093371801	03-02-95	1200	--	-76.6	-10.65
453148093371801	04-05-95	1200	--	-78.1	-11.05
453148093371801	05-03-95	1200	--	-78.7	-11.05
453148093371801	06-07-95	1200	--	-77.0	-11.01
453148093371801	07-06-95	1050	--	-80.2	-11.43
453148093371801	08-29-95	1200	--	-75.7	-10.77

Chemical Quality

Of Precipitation

CHEMICAL QUALITY OF PRECIPITATION

461458094295000 PRECIPITATION STATION AT CAMP RIPLEY, MN

WATER-QUALITY RECORDS

LOCATION.--Lat 46°14'58", long 94°29'50", in NE$^1/_4$ sec.18, T.132 N., R.30 W., Morrison County, Hydrologic Unit 07010104, approximately 500 ft southwest of the abandoned Gilgal Church and approximately 5 miles south of the town of Pillager.
PERIOD OF RECORD.--October 1983 to current year (weekly composite).
INSTRUMENTATION.--Samples are collected in a polyethylene bucket by an electrically operated wet/dry collector. A recording rain gage and a standard U.S. Weather Service bulk rain gage measure rainfall quantity.
REMARKS.--An observer collects only the wetfall bucket and services the rain gages weekly. If there is enough wetfall, specific conductance and pH are determined, with the remaining contents sent to the Illinois State Water Survey Laboratory for analysis.

CHEMICAL ANALYSIS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995
WEEKLY COMPOSITE

DATE	TIME	TOTAL PRECIP-ITATION FOR DEFINED PERIOD (IN) (00193)	SPEC. CONDUC-TANCE CK.SOL. ATM DEP WET TOT (US/CM) (83152)	SPEC. CONDUC-TANCE FIELD ATM DEP WET TOT (US/CM) (83154)	SPEC. CONDUC-TANCE LAB ATM DEP WET TOT (US/CM) (83156)	PH FIELD ATM DEP WET T (UNITS) (83106)	PH LAB ATM DEP WET T (UNITS) (83107)	CALCIUM ATM DEP WET DIS (MG/L) (82932)
OCT 04-11	1930	0.34	--	--	12.9	5.20	5.48	0.330
OCT 11-18	2030	--	--	--	11.3	4.70	4.75	0.030
OCT 18-25	1930	--	22.0	9.0	6.8	5.60	5.87	0.140
OCT 25-NOV 01	2000	0.0	--	--	--	--	--	--
NOV 01-08	2015	0.0	--	--	2.1	--	5.71	0.010
NOV 08-15	2030	0.22	23.0	29.3	31.4	5.70	6.68	0.710
NOV 15-22	2030	0.71	23.0	12.7	12.5	5.70	6.20	0.310
NOV 22-29	2045	0.73	21.8	18.7	4.3	4.80	5.13	0.050
NOV 29-DEC 06	2100	0.05	--	--	--	--	--	--
DEC 06-13	2230	0.15	22.5	10.9	9.8	4.60	4.78	0.060
DEC 13-20	2030	0.16	21.9	28.4	28.3	4.30	4.29	0.130
DEC 20-27	2130	0.0	--	--	--	--	--	--
DEC 27 1994-JAN 03 1995	1400	0.03	--	--	3.9	--	5.82	<0.050
JAN 03-10	2030	0.03	--	--	11.5	--	4.67	0.080
JAN 10-17	2030	0.81	22.6	12.5	11.6	4.80	4.72	0.100
JAN 17-24	1700	0.04	--	--	26.2	--	4.94	0.240
JAN 24-31	1900	0.0	--	--	1.5	--	5.54	<0.010
JAN 31-FEB 07	2045	0.01	--	--	8.7	--	5.28	0.260
FEB 07-14	2015	0.07	22.6	8.5	7.1	5.00	5.67	0.200
FEB 14-21	2030	0.42	22.5	9.7	10.4	4.70	4.71	0.100
FEB 21-28	2030	0.18	23.0	5.8	5.1	4.90	5.35	0.090
FEB 28-MAR 07	2045	0.77	22.4	8.5	9.0	4.70	4.78	0.090
MAR 07-14	2030	0.0	--	--	--	--	--	--
MAR 14-21	2030	0.39	22.8	18.2	14.7	4.90	5.25	0.140
MAR 21-28	2015	1.82	22.0	15.0	14.4	--	4.81	0.140

CHEMICAL QUALITY OF PRECIPITATION

461458094295000 PRECIPITATION STATION AT CAMP RIPLEY, MN

CHEMICAL ANALYSIS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

WEEKLY COMPOSITE--(Continued)

DATE	MAG-NESIUM ATM DEP WET DIS (MG/L) (83002)	SODIUM ATM DEP WET DIS (MG/L) (83138)	POTAS-SIUM ATM DEP WET DIS (MG/L) (83120)	SULFATE ATM DEP WET DIS AS SO4 (MG/L) (83160)	CHLO-RIDE ATM DEP WET DIS (MG/L) (82944)	NI-TROGEN NITRATE ATM DEP WET DIS AS NO3 (MG/L) (83071)	NI-TROGEN AMMON. ATM DEP WET DIS AS NH4 (MG/L) (83047)	PHOS-PHORUS ORTHO ATM DEP WET DIS AS PO4 (MG/L) (83111)
OCT 04-11	0.039	0.032	0.042	1.58	0.06	1.59	0.760	0.004
OCT 11-18	0.009	0.042	0.011	0.93	0.06	1.01	0.300	<0.003
OCT 18-25	0.032	0.053	0.032	0.77	0.07	0.77	0.520	<0.003
OCT 25-NOV 01	--	--	--	--	--	--	--	--
NOV 01-08	0.003	0.090	0.023	0.07	0.14	0.12	0.100	0.004
NOV 08-15	0.083	0.061	0.069	4.32	0.11	3.50	3.23	0.006
NOV 15-22	0.041	0.030	0.019	1.38	0.06	2.25	1.21	0.010
NOV 22-29	0.006	0.023	0.006	0.21	0.04	0.50	0.060	0.006
NOV 29-DEC 06	--	--	--	--	--	--	--	--
DEC 06-13	0.016	0.036	0.004	0.19	0.07	1.51	0.120	0.007
DEC 13-20	0.017	0.039	0.014	1.38	0.13	4.10	0.570	<0.003
DEC 20-27	--	--	--	--	--	--	--	--
DEC 27 1994-JAN 03 1995	0.024	0.100	0.018	0.18	<0.18	0.41	0.300	<0.018
JAN 03-10	0.015	0.041	<0.003	0.13	0.09	1.86	0.050	<0.003
JAN 10-17	0.009	0.030	0.009	0.83	0.04	1.35	0.250	<0.003
JAN 17-24	0.023	0.193	0.042	3.64	0.30	4.16	2.19	<0.003
JAN 24-31	<0.003	0.093	0.009	<0.03	0.13	0.09	0.070	<0.003
JAN 31-FEB 07	0.046	0.338	0.059	1.33	0.50	1.01	0.500	0.014
FEB 07-14	0.046	0.093	0.017	0.63	0.14	1.46	0.480	<0.003
FEB 14-21	0.017	0.047	0.004	0.23	0.08	1.70	0.090	<0.003
FEB 21-28	0.015	0.037	0.007	0.21	0.05	0.98	0.210	<0.003
FEB 28-MAR 07	0.010	0.031	0.003	0.16	0.04	1.49	0.120	<0.003
MAR 07-14	--	--	--	--	--	--	--	--
MAR 14-21	0.029	0.035	0.011	1.53	0.08	3.34	1.44	0.004
MAR 21-28	0.017	0.034	0.018	1.26	0.06	1.60	0.490	<0.003

CHEMICAL QUALITY OF PRECIPITATION

461458094295000 PRECIPITATION STATION AT CAMP RIPLEY, MN

CHEMICAL ANALYSIS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

WEEKLY COMPOSITE--(Continued)

DATE	TIME	TOTAL PRECIP-ITATION FOR DEFINED PERIOD (IN) (00193)	SPEC. CONDUC-TANCE CK.SOL. ATM DEP WET TOT (US/CM) (83152)	SPEC. CONDUC-TANCE FIELD ATM DEP WET TOT (US/CM) (83154)	SPEC. CONDUC-TANCE LAB ATM DEP WET TOT (US/CM) (83156)	PH FIELD ATM DEP WET T (UNITS) (83106)	PH LAB ATM DEP WET T (UNITS) (83107)	CALCIUM ATM DEP WET DIS (MG/L) (82932)
MAR 28-APR 04	2100	--	--	--	--	--	--	--
APR 04-11	1930	0.21	22.0	19.3	16.6	4.70	4.93	0.520
APR 11-18	1930	1.65	22.9	14.8	13.3	4.70	4.85	0.390
APR 18-25	2030	0.32	22.4	7.8	7.0	4.90	5.40	0.120
APR 25-MAY 02	1930	--	--	--	9.3	--	5.86	0.220
MAY 02-09	1930	1.40	22.4	8.6	8.9	4.90	5.10	0.180
MAY 09-16	1930	1.77	22.7	9.6	8.7	4.90	4.87	0.060
MAY 16-23	2000	0.05	22.5	26.5	23.9	5.50	7.06	1.75
MAY 23-30	1945	0.30	23.4	12.6	11.2	5.20	5.90	0.520
MAY 30-JUN 06	1915	0.45	21.9	12.2	9.8	4.80	4.90	0.070
JUN 06-13	1930	0.40	21.4	8.1	8.5	4.80	4.89	0.110
JUN 13-20	1930	0.0	--	--	3.8	--	5.16	0.040
JUN 20-27	1930	0.81	21.4	18.2	17.9	4.80	4.59	0.190
JUN 27-JUL 04	2030	1.90	21.9	7.3	8.1	5.40	5.87	0.260
JUL 04-11	1300	0.70	22.5	7.7	7.3	5.00	5.12	0.050
JUL 11-18	1930	0.85	21.9	18.7	15.7	6.00	6.52	0.430
JUL 18-25	1930	0.86	21.4	7.9	7.7	5.60	6.44	0.430
JUL 25-AUG 01	1930	0.68	22.4	10.1	9.7	4.80	5.12	0.260
AUG 01-08	1330	--	20.7	7.1	7.7	4.80	5.06	0.060
AUG 08-15	1930	0.87	21.9	10.5	10.2	5.10	5.87	0.430
AUG 15-22	1800	0.79	21.3	6.3	5.5	5.30	6.35	0.250
AUG 22-29	1400	1.78	21.6	9.5	9.7	4.80	4.94	0.130
AUG 29-SEP 05	1930	--	--	--	20.4	--	5.54	1.16
SEP 05-12	1930	0.10	21.3	15.2	14.7	4.80	6.07	1.03
SEP 12-19	1930	0.0	--	--	--	--	--	--

CHEMICAL QUALITY OF PRECIPITATION

461458094295000 PRECIPITATION STATION AT CAMP RIPLEY, MN

CHEMICAL ANALYSIS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

WEEKLY COMPOSITE--(Continued)

DATE	MAG-NESIUM ATM DEP WET DIS (MG/L) (83002)	SODIUM ATM DEP WET DIS (MG/L) (83138)	POTAS-SIUM ATM DEP WET DIS (MG/L) (83120)	SULFATE ATM DEP WET DIS AS SO4 (MG/L) (83160)	CHLO-RIDE ATM DEP WET DIS (MG/L) (82944)	NI-TROGEN NITRATE ATM DEP WET DIS AS NO3 (MG/L) (83071)	NI-TROGEN AMMON. ATM DEP WET DIS AS NH4 (MG/L) (83047)	PHOS-PHORUS ORTHO ATM DEP WET DIS AS PO4 (MG/L) (83111)
MAR 28-APR 04	--	--	--	--	--	--	--	--
APR 04-11	0.087	0.142	0.051	2.47	0.13	2.33	0.760	<0.003
APR 11-18	0.033	0.048	0.032	1.55	0.08	1.62	0.430	<0.003
APR 18-25	0.028	0.027	0.020	0.98	0.04	0.63	0.410	<0.003
APR 25-MAY 02	0.045	0.109	0.026	1.21	<0.10	1.18	0.730	<0.010
MAY 02-09	0.038	0.027	0.025	0.91	0.04	1.36	0.400	<0.003
MAY 09-16	0.011	0.016	0.005	0.78	<0.03	0.63	0.170	<0.003
MAY 16-23	0.432	0.062	0.162	1.39	0.09	2.62	1.46	<0.003
MAY 23-30	0.114	0.077	0.036	1.59	0.11	1.88	0.670	<0.003
MAY 30-JUN 06	0.011	0.021	0.009	0.77	0.04	1.14	0.390	0.009
JUN 06-13	0.016	0.062	0.012	0.56	0.07	0.94	0.210	<0.003
JUN 13-20	0.003	0.095	0.011	<0.03	0.09	0.28	0.180	<0.003
JUN 20-27	0.032	0.029	0.032	1.77	0.07	1.60	0.580	<0.003
JUN 27-JUL 04	0.040	0.021	0.035	0.76	0.05	1.34	0.630	<0.003
JUL 04-11	0.011	0.019	0.027	0.56	<0.03	1.11	0.380	0.005
JUL 11-18	0.053	0.108	0.173	1.39	0.16	2.03	1.42	<0.003
JUL 18-25	0.118	0.040	0.034	0.54	0.06	0.86	0.510	<0.003
JUL 25-AUG 01	0.037	0.051	0.036	0.87	0.08	1.58	0.520	<0.003
AUG 01-08	0.008	0.026	0.014	0.59	0.05	1.09	0.360	<0.003
AUG 08-15	0.064	0.071	0.028	1.19	0.09	1.94	0.700	<0.003
AUG 15-22	0.045	0.053	0.014	0.49	0.06	0.69	0.390	0.003
AUG 22-29	0.019	0.017	0.008	1.02	0.04	1.03	0.410	<0.003
AUG 29-SEP 05	0.258	0.410	0.328	2.89	0.55	2.89	0.760	<0.018
SEP 05-12	0.139	0.049	0.051	1.97	0.11	2.69	0.710	<0.003
SEP 12-19	--	--	--	--	--	--	--	--

CHEMICAL QUALITY OF PRECIPITATION

461458094295000 PRECIPITATION STATION AT CAMP RIPLEY, MN

CHEMICAL ANALYSIS, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

WEEKLY COMPOSITE--(Continued)

DATE	TIME	TOTAL PRECIP-ITATION FOR DEFINED PERIOD (IN) (00193)	SPEC. CONDUC-TANCE CK.SOL. ATM DEP WET TOT (US/CM) (83152)	SPEC. CONDUC-TANCE FIELD ATM DEP WET TOT (US/CM) (83154)	SPEC. CONDUC-TANCE LAB ATM DEP WET TOT (US/CM) (83156)	PH FIELD ATM DEP WET T (UNITS) (83106)	PH LAB ATM DEP WET T (UNITS) (83107)	CALCIUM ATM DEP WET DIS (MG/L) (82932)
SEP 19-26	1930	0.14	22.0	11.9	9.3	5.00	5.22	0.100
SEP 26-OCT 03	2000	7.35	21.5	3.2	4.1	4.90	5.18	0.020

DATE	MAG-NESIUM ATM DEP WET DIS (MG/L) (83002)	SODIUM ATM DEP WET DIS (MG/L) (83138)	POTAS-SIUM ATM DEP WET DIS (MG/L) (83120)	SULFATE ATM DEP WET DIS AS SO4 (MG/L) (83160)	CHLO-RIDE ATM DEP WET DIS (MG/L) (82944)	NI-TROGEN NITRATE ATM DEP WET DIS AS NO3 (MG/L) (83071)	NI-TROGEN AMMON. ATM DEP WET DIS AS NH4 (MG/L) (83047)	PHOS-PHORUS ORTHO ATM DEP WET DIS AS PO4 (MG/L) (83111)
SEP 19-26	0.018	0.057	0.013	0.99	0.07	1.37	0.660	<0.003
SEP 26-OCT 03	0.003	0.045	<0.003	0.26	0.04	0.28	0.100	<0.003

CHEMICAL QUALITY OF PRECIPITATION

445557093173001 - PRECIPITATION SAMPLE SITE NEAR LK HARRIET, MPLS., MN

LOCATION.--Lat 44°55'57", 93°17'30", Hennepin County, Hydrologic Unit 07010206.

PERIOD OF RECORD.--April to September 1995 (weekly composite).

INSTRUMENTATION.--Samples were collected using an electronically operated wet fall collector. Samples were composited in a refrigerated, glass, 10 liter bottle. A standard U.S. Weather Service bulk rain gage was used to measure rainfall quantity.

REMARKS.--The National Detection Limits (MDL) for pesticides analyzed under these methods were later found to be lower than those originally reported. The new MDL's are in the process of being installed. Letter E incidates estimated value.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

WEEKLY COMPOSITE

DATE	TIME	RAIN FALL ACCUM (IN) (00045)	SAMPLE VOLUME SCHED-ULE 2010 (ML) (99857)	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL-ATE, WATER, DISS, REC (UG/L) (04028)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER DISS REC (UG/L) (04095)	ALPHA BHC DIS-SOLVED (UG/L) (34253)
APR 11-18	1136	0.60	900	<0.015	<0.008	0.009	<0.008	E0.011	E0.012	<0.008	<0.047
APR 18-25	0722	1.00	877	<0.015	<0.008	<0.008	<0.008	<0.003	<0.013	<0.008	E0.006
MAY 02-09	0620	0.46	833	E0.010	<0.008	0.011	<0.008	E0.044	0.310	<0.008	<0.007
MAY 09-16	0634	0.81	892	0.120	<0.008	<0.008	<0.008	E0.011	0.022	<0.011	<0.007
MAY 16-23	0713	0.07	156	0.058	<0.008	<0.008	<0.008	E0.900	3.00	<0.008	<0.007
MAY 23-30	0653	2.00	1000	<0.015	<0.008	<0.008	<0.008	E0.006	E0.012	<0.008	<0.007
MAY 30-JUN 06	0706	1.10	952	0.028	<0.008	<0.008	<0.008	E0.059	0.073	<0.008	<0.007
JUN 06-13	1126	0.86	961	E0.012	<0.008	<0.008	<0.008	E0.042	0.015	<0.008	<0.007
JUN 20-27	0915	0.78	980	<0.007	<0.002	<0.005	<0.018	E0.024	0.032	<0.003	<0.002
JUN 27-JUL 05	0725	0.92	990	<0.007	<0.002	<0.005	<0.018	<0.002	<0.004	<0.003	<0.002
JUL 05-11	0919	0.30	561	<0.007	<0.002	<0.005	<0.018	E0.007	<0.004	<0.003	<0.002
JUL 11-18	1004	1.20	980	<0.007	<0.002	<0.005	<0.018	E0.004	<0.004	<0.003	<0.002
JUL 18-25	1012	0.11	300	<0.007	<0.002	<0.005	E0.009	<0.002	<0.004	<0.003	<0.002
JUL 25-AUG 01	1010	0.33	675	<0.007	<0.002	<0.005	<0.018	E0.013	<0.004	<0.003	<0.002
AUG 01-08	0735	2.26	943	<0.007	<0.002	<0.005	<0.018	<0.002	<0.004	<0.003	<0.002
AUG 08-15	0940	1.65	884	<0.007	<0.002	<0.005	<0.018	E0.061	<0.004	<0.003	<0.002
AUG 15-23	0945	0.38	529	<0.007	<0.002	<0.005	E0.007	E0.004	<0.004	<0.003	<0.002
AUG 23-29	1215	0.46	505	<0.007	<0.002	<0.005	<0.018	E0.010	<0.004	<0.003	<0.002
AUG 29-SEP 12	1028	0.02	64	<0.007	<0.002	<0.005	<0.018	E0.055	<0.004	<0.003	<0.002
SEP 12-19	0945	0.50	568	<0.007	<0.002	<0.005	<0.018	E0.044	<0.004	<0.003	<0.002

CHEMICAL QUALITY OF PRECIPITATION

445557093173001 - PRECIPITATION SAMPLE SITE NEAR LK HARRIET, MPLS., MN

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

WEEKLY COMPOSITE - (continued)

DATE	ATRA-CHLOR-P,P' DDE DISSOLV (UG/L) (34653)	ALA-DI-PYRIFOS DIS-SOLVED (UG/L) (38933)	ACETO-METO-LINDANE DIS-SOLVED (UG/L) (39341)	MALA-ELDRIN DIS-SOLVED (UG/L) (39381)	PARA-LACHLOR WATER DISSOLV (UG/L) (39415)	DI-THION, DIS-SOLVED (UG/L) (39532)	ZINE, THION, DIS-SOLVED (UG/L) (39542)	CHLOR, AZINON, DIS-SOLVED (UG/L) (39572)	CHLOR, WATER, DISS, REC (UG/L) (39632)	WATER, DISS, REC, (UG/L) (46342)	WATER FLTRD REC (UG/L) (49260)
APR 11-18	<0.010	<0.005	<0.011	<0.008	0.022	<0.014	<0.029	<0.008	0.140	E0.007	0.014
APR 18-25	<0.010	<0.005	<0.011	<0.008	0.010	<0.014	<0.022	<0.008	E0.008	<0.009	E0.005
MAY 02-09	<0.010	0.007	<0.011	<0.008	0.210	<0.014	<0.045	E0.007	0.410	0.150	0.450
MAY 09-16	<0.010	0.007	<0.011	<0.008	0.180	<0.014	<0.022	<0.008	0.068	0.230	0.620
MAY 16-23	<0.010	<0.005	<0.011	<0.008	0.930	<0.014	<0.022	<0.008	2.40	0.350	1.60
MAY 23-30	<0.010	E0.004	<0.011	<0.008	0.060	<0.014	<0.022	<0.008	0.046	0.073	0.046
MAY 30-JUN 06	<0.010	0.013	<0.011	<0.008	0.120	<0.014	<0.022	0.010	0.500	0.110	0.220
JUN 06-13	<0.010	0.006	<0.011	<0.008	0.090	<0.014	<0.022	E0.006	0.270	0.150	0.091
JUN 20-27	<0.006	<0.004	<0.004	<0.001	0.014	<0.005	0.039	<0.002	0.140	0.025	0.007
JUN 27-JUL 05	<0.006	<0.004	<0.004	<0.001	0.017	<0.005	0.013	0.035	0.093	0.023	<0.002
JUL 05-11	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	0.025	0.007	<0.002
JUL 11-18	<0.006	<0.004	<0.004	<0.001	<0.002	E0.003	<0.004	<0.002	0.035	<0.002	<0.002
JUL 18-25	<0.006	0.024	<0.004	<0.001	0.005	<0.005	<0.004	<0.002	0.023	0.007	<0.002
JUL 25-AUG 01	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	0.030	0.024	<0.002	<0.002
AUG 01-08	<0.006	<0.004	<0.004	<0.001	E0.003	<0.005	<0.004	0.009	0.005	<0.002	<0.002
AUG 08-15	<0.006	<0.004	<0.004	<0.001	<0.002	E0.003	<0.004	<0.002	0.220	<0.002	<0.002
AUG 15-23	<0.006	<0.004	<0.004	<0.001	0.009	<0.005	<0.004	0.008	<0.001	0.006	<0.002
AUG 23-29	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	0.025	<0.002	<0.002
AUG 29-SEP 12	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	0.064	<0.002	<0.002
SEP 12-19	<0.006	<0.004	<0.004	<0.001	<0.005	<0.005	<0.023	<0.002	0.099	<0.011	<0.002

CHEMICAL QUALITY OF PRECIPITATION

445557093173001 - PRECIPITATION SAMPLE SITE NEAR LK HARRIET, MPLS., MN

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

WEEKLY COMPOSITE - (continued)

DATE	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	T PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	ER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	PEB-EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)
APR 11-18	<0.012	<0.006	<0.012	<0.013	<0.011	<0.030	<0.039	<0.035	<0.005	<0.009	<0.015
APR 18-25	<0.012	<0.006	<0.012	<0.013	<0.011	<0.030	<0.039	<0.035	<0.005	<0.009	<0.015
MAY 02-09	<0.012	<0.006	E0.010	<0.013	<0.011	<0.030	<0.039	<0.035	0.130	<0.009	<0.015
MAY 09-16	<0.012	<0.006	E0.010	<0.013	<0.011	<0.030	<0.039	<0.035	0.099	<0.009	<0.015
MAY 16-23	<0.012	<0.006	<0.012	<0.013	<0.011	<0.030	<0.039	<0.035	0.110	<0.009	<0.015
MAY 23-30	<0.012	<0.006	E0.008	<0.013	<0.011	<0.030	<0.039	<0.035	0.024	<0.009	<0.015
MAY 30-JUN 06	<0.012	<0.006	<0.012	<0.013	<0.011	<0.030	<0.039	<0.035	0.033	<0.009	<0.015
JUN 06-13	<0.012	<0.006	<0.012	<0.013	<0.011	<0.030	<0.039	<0.035	<0.010	<0.009	<0.015
JUN 20-27	<0.004	<0.003	0.006	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
JUN 27-JUL 05	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	0.014	<0.004	<0.010
JUL 05-11	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
JUL 11-18	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
JUL 18-25	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
JUL 25-AUG 01	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
AUG 01-08	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
AUG 08-15	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	0.035	<0.002	<0.004	<0.010
AUG 15-23	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	0.006	<0.004	<0.010
AUG 23-29	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
AUG 29-SEP 12	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
SEP 12-19	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.016	<0.004	E0.009

CHEMICAL QUALITY OF PRECIPITATION

445557093173001 - PRECIPITATION SAMPLE SITE NEAR LK HARRIET, MPLS., MN

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

WEEKLY COMPOSITE - (continued)

DATE	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)
APR 11-18	<0.007	<0.012	<0.013	E0.033	<0.012	<0.009	<0.060	<0.008	E0.011	<0.046
APR 18-25	<0.007	<0.012	<0.013	<0.013	<0.012	<0.009	<0.060	<0.008	<0.016	<0.046
MAY 02-09	<0.007	<0.012	E0.011	<0.013	<0.012	<0.009	<0.060	<0.008	<0.016	<0.046
MAY 09-16	<0.007	<0.012	<0.013	<0.013	<0.012	<0.009	<0.060	<0.008	<0.016	<0.046
MAY 16-23	<0.007	<0.012	<0.013	<0.013	<0.012	<0.009	<0.060	<0.008	<0.016	<0.046
MAY 23-30	<0.007	<0.012	<0.013	<0.013	<0.012	<0.009	<0.060	<0.008	<0.016	<0.046
MAY 30-JUN 06	<0.007	<0.012	<0.013	<0.013	<0.012	<0.009	<0.060	<0.008	<0.016	<0.046
JUN 06-13	<0.007	<0.012	E0.009	<0.013	<0.012	<0.009	<0.060	<0.008	<0.016	<0.046
JUN 20-27	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	E0.015
JUN 27-JUL 05	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
JUL 05-11	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
JUL 11-18	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
JUL 18-25	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
JUL 25-AUG 01	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
AUG 01-08	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
AUG 08-15	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	E0.010
AUG 15-23	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
AUG 23-29	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
AUG 29-SEP 12	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
SEP 12-19	<0.004	<0.003	<0.002	<0.003	<0.013	<0.018	<0.017	<0.001	<0.004	<0.003

CHEMICAL QUALITY OF PRECIPITATION

445557093173001 - PRECIPITATION SAMPLE SITE NEAR LK HARRIET, MPLS., MN

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

WEEKLY COMPOSITE - (continued)

DATE	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN-PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	DIAZ-INON D10 SRG WAT FLT 0.7 U GF, REC PERCENT (91063)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT (91065)
APR 11-18	<0.008	E0.003	<0.018	<0.010	<0.006	<0.038	<0.016	100	105	100
APR 18-25	<0.008	0.005	<0.018	<0.010	<0.006	<0.038	<0.016	100	105	90.0
MAY 02-09	<0.008	0.005	0.240	<0.010	<0.006	<0.038	<0.016	100	103	100
MAY 09-16	<0.008	0.013	0.170	<0.010	<0.006	<0.038	<0.016	147	116	109
MAY 16-23	<0.008	0.009	0.250	<0.010	<0.006	<0.038	<0.016	136	118	100
MAY 23-30	<0.008	0.006	0.078	<0.010	<0.006	<0.038	<0.016	115	94.8	91.7
MAY 30-JUN 06	<0.008	E0.003	0.069	<0.010	<0.006	<0.038	<0.016	111	121	111
JUN 06-13	<0.008	0.005	0.062	<0.010	<0.006	E0.011	<0.016	137	112	111
JUN 20-27	<0.002	0.005	<0.004	<0.003	<0.013	<0.001	<0.005	123	131	114
JUN 27-JUL 05	<0.002	E0.003	<0.004	0.016	<0.013	<0.001	<0.005	89.0	113	99.7
JUL 05-11	<0.002	E0.004	<0.004	<0.003	<0.013	<0.001	<0.005	142	131	95.3
JUL 11-18	<0.002	E0.002	<0.004	<0.003	<0.013	<0.001	<0.005	109	96.7	67.7
JUL 18-25	<0.002	E0.003	<0.004	<0.003	<0.013	<0.001	<0.005	166	132	104
JUL 25-AUG 01	<0.002	E0.002	<0.004	<0.003	<0.013	<0.001	<0.005	117	109	81.5
AUG 01-08	<0.002	E0.002	<0.004	<0.003	<0.013	<0.001	<0.005	176	122	106
AUG 08-15	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	80.0	105	80.0
AUG 15-23	<0.002	E0.002	<0.004	<0.003	<0.013	<0.001	<0.005	200	137	100
AUG 23-29	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	100	122	80.0
AUG 29-SEP 12	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005	200	120	100
SEP 12-19	<0.002	E0.002	<0.004	<0.003	<0.013	<0.001	<0.005	200	190	100

CHEMICAL QUALITY OF PRECIPITATION

453136093365101 - PRECIPITATION SITE NEAR PRINCETON, MN

LOCATION.--Lat 44°55'5",Long 93°17'30",in NE1/4 sec 18,T35N.,R26W, Sherburne County, Hydrologic Unit 07010203.
PERIOD OF RECORD.-- April to September 1995 (weekly composite).
INSTRUMENTATION.-- Sample were collected using an electronically operated wet fall collector.
Samples were composited in a refridgerated, glass, 10 liter bottle.
A standard U.S. Weather Service bulk rain gage was used to measure rainfall quantity.
REMARKS.--The Method Detection Limits (MDL) for pesticides analyzed under these methods were later found to be lower than those originaly reported. The new MDL's are in the process of being installed.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

WEEKLY COMPOSITE

DATE	TIME	RAIN FALL ACCUM (IN) (00045)	SAMPLE VOLUME SCHED-ULE 2010 (ML) (99857)	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL-ATE, WATER, DISS, REC (UG/L) (04028)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER DISS REC (UG/L) (04095)	ALPHA BHC DIS-SOLVED (UG/L) (34253)
APR 11-18	1330	0.97	884	<0.015	<0.008	0.018	<0.008	E0.021	<0.019	<0.008	<0.017
APR 18-25	0949	1.02	892	<0.015	<0.008	<0.008	<0.008	<0.003	<0.013	<0.008	<0.007
MAY 04-09	1140	0.80	909	<0.015	<0.008	0.010	<0.008	E0.024	0.110	<0.008	<0.007
MAY 09-16	1031	0.56	740	0.029	<0.008	<0.008	<0.008	E0.019	0.200	<0.008	<0.007
MAY 16-23	0910	0.16	149	0.027	<0.008	<0.008	<0.008	E0.340	1.30	<0.008	<0.007
MAY 23-30	0905	0.74	961	<0.015	<0.008	<0.008	<0.008	E0.007	0.014	<0.008	<0.007
JUN 06-13	1310	0.92	952	E0.005	<0.008	<0.008	<0.008	E0.029	0.016	<0.008	<0.007
JUN 20-JUL 05	0906	0.65	877	0.007	<0.002	<0.005	<0.018	E0.046	0.038	<0.003	<0.002
JUL 05-11	1123	0.33	485	<0.007	<0.002	<0.005	<0.018	E0.006	<0.004	<0.003	<0.002
JUL 11-18	0810	1.03	980	<0.007	<0.002	<0.005	<0.018	E0.011	<0.004	<0.003	<0.002
JUL 18-25	1206	0.38	581	<0.007	<0.002	<0.005	E0.010	E0.015	<0.004	<0.003	<0.002
JUL 25-AUG 01	0806	1.10	980	<0.007	<0.002	<0.005	<0.018	E0.003	<0.004	<0.003	<0.002
AUG 01-08	1007	1.50	909	<0.007	<0.002	<0.005	<0.018	<0.002	<0.004	<0.003	<0.002
AUG 08-15	0740	1.35	892	<0.007	<0.002	<0.005	<0.018	E0.008	<0.004	<0.003	<0.002
AUG 15-23	0745	0.68	934	<0.007	<0.002	<0.005	<0.018	E0.006	<0.004	<0.003	<0.002
AUG 23-29	0730	2.65	943	<0.007	<0.002	<0.005	<0.018	E0.018	<0.004	<0.003	<0.002
SEP 05-19	1020	0.63	925	<0.007	<0.002	<0.005	<0.018	E0.007	<0.004	<0.003	<0.002

CHEMICAL QUALITY OF PRECIPITATION

453136093365101 - PRECIPITATION SITE NEAR PRINCETON, MN

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

WEEKLY COMPOSITE - (continued)

DATE	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	LINDANE DIS-SOLVED (UG/L) (39341)	DI-ELDRIN DIS-SOLVED (UG/L) (39381)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	MALA-THION, DIS-SOLVED (UG/L) (39532)	PARA-THION, DIS-SOLVED (UG/L) (39542)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)
APR 11-18	<0.010	0.008	<0.011	<0.008	0.073	<0.014	0.051	<0.008	0.200	0.024	0.062
APR 18-25	<0.010	<0.005	<0.011	<0.008	<0.009	<0.014	E0.019	<0.008	<0.017	<0.009	<0.009
MAY 04-09	<0.010	<0.005	<0.011	<0.008	0.140	<0.014	<0.040	0.014	0.220	0.081	0.210
MAY 09-16	<0.010	0.011	<0.011	<0.008	0.330	<0.014	<0.022	<0.008	0.230	0.200	0.360
MAY 16-23	<0.010	<0.005	<0.011	<0.008	0.420	<0.014	<0.022	<0.008	0.820	0.330	0.510
MAY 23-30	<0.010	<0.005	<0.011	<0.008	0.150	<0.014	<0.022	<0.008	0.110	0.110	0.066
JUN 06-13	<0.010	E0.003	<0.011	<0.008	0.140	<0.014	<0.023	<0.008	0.210	0.190	0.058
JUN 20-JUL 05	<0.006	<0.004	<0.004	<0.001	0.020	<0.005	<0.004	<0.002	0.130	0.019	<0.002
JUL 05-11	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	0.016	E0.004	<0.002
JUL 11-18	<0.006	<0.004	<0.004	<0.001	0.016	E0.002	<0.004	<0.002	0.036	0.016	<0.002
JUL 18-25	<0.006	<0.004	<0.004	<0.001	0.014	<0.005	<0.004	<0.002	0.057	0.017	0.005
JUL 25-AUG 01	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	0.010	<0.002	<0.002
AUG 01-08	<0.006	<0.004	<0.004	<0.001	E0.002	<0.005	<0.004	<0.002	<0.001	<0.002	<0.002
AUG 08-15	<0.006	<0.004	<0.004	<0.001	<0.002	<0.005	<0.004	<0.002	0.020	<0.002	<0.002
AUG 15-23	<0.006	<0.004	<0.004	<0.001	E0.003	<0.005	<0.004	<0.002	<0.001	<0.002	<0.002
AUG 23-29	<0.006	<0.004	<0.004	<0.001	<0.002	0.005	<0.004	<0.002	0.040	<0.002	<0.002
SEP 05-19	<0.006	<0.004	<0.004	<0.001	E0.003	<0.005	0.013	<0.002	<0.028	<0.007	<0.002

CHEMICAL QUALITY OF PRECIPITATION

453136093365101 - PRECIPITATION SITE NEAR PRINCETON, MN

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

WEEKLY COMPOSITE - (continued)

DATE	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)
APR 11-18	<0.012	<0.006	<0.012	<0.013	<0.011	<0.030	<0.039	<0.035	<0.005	<0.009	<0.015
APR 18-25	<0.012	<0.006	<0.012	<0.013	<0.011	<0.030	<0.039	<0.035	<0.005	<0.009	<0.015
MAY 04-09	<0.012	<0.006	<0.012	<0.013	<0.011	<0.030	<0.039	<0.035	0.048	<0.009	<0.015
MAY 09-16	<0.012	<0.006	<0.012	<0.013	<0.011	<0.030	<0.039	<0.035	0.086	<0.009	<0.015
MAY 16-23	<0.012	<0.006	<0.012	<0.013	<0.011	<0.030	<0.039	<0.035	0.093	<0.009	<0.015
MAY 23-30	<0.012	<0.006	<0.012	<0.013	<0.011	<0.030	<0.039	<0.035	0.022	<0.009	<0.015
JUN 06-13	<0.012	<0.006	E0.008	<0.013	<0.011	<0.030	<0.039	<0.035	0.026	<0.009	<0.015
JUN 20-JUL 05	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	0.011	<0.004	<0.010
JUL 05-11	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
JUL 11-18	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
JUL 18-25	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.006	<0.004	<0.010
JUL 25-AUG 01	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
AUG 01-08	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
AUG 08-15	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	E0.005	<0.002	<0.004	<0.010
AUG 15-23	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	0.006	<0.004	<0.010
AUG 23-29	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010
SEP 05-19	<0.004	<0.003	<0.002	<0.004	<0.002	<0.007	<0.002	<0.006	<0.005	<0.004	<0.010

CHEMICAL QUALITY OF PRECIPITATION

453136093365101 - PRECIPITATION SITE NEAR PRINCETON, MN

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

WEEKLY COMPOSITE - (continued)

DATE	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)
APR 11-18	<0.007	<0.012	<0.013	E0.035	<0.012	<0.009	<0.060	<0.008	0.021	<0.046
APR 18-25	<0.007	<0.012	<0.013	<0.013	<0.012	<0.009	<0.060	<0.008	<0.016	<0.046
MAY 04-09	<0.007	<0.012	<0.013	<0.013	<0.012	<0.009	<0.060	<0.008	<0.016	<0.046
MAY 09-16	0.011	<0.012	<0.013	<0.013	<0.012	<0.009	<0.060	<0.008	<0.016	<0.046
MAY 16-23	<0.007	<0.012	<0.013	<0.013	<0.012	<0.009	<0.060	<0.008	<0.016	<0.046
MAY 23-30	<0.007	<0.012	<0.013	<0.013	<0.012	<0.009	<0.060	<0.008	<0.016	<0.046
JUN 06-13	<0.007	<0.012	<0.013	<0.013	<0.012	<0.009	<0.060	<0.008	<0.016	<0.046
JUN 20-JUL 05	<0.004	<0.003	<0.002	E0.040	<0.013	<0.003	<0.017	<0.001	<0.004	E0.020
JUL 05-11	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
JUL 11-18	<0.004	<0.003	<0.002	E0.014	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
JUL 18-25	<0.004	<0.003	<0.002	E0.013	<0.013	<0.003	<0.017	<0.001	<0.004	E0.018
JUL 25-AUG 01	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
AUG 01-08	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
AUG 08-15	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
AUG 15-23	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
AUG 23-29	<0.004	<0.003	<0.002	<0.003	<0.013	<0.003	<0.017	<0.001	<0.004	<0.003
SEP 05-19	<0.004	<0.003	<0.002	<0.003	<0.013	<0.015	<0.017	<0.001	E0.004	<0.003

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
	Length	
inch (in.)	2.54×10^{1}	millimeter
	2.54×10^{-2}	meter
foot (ft)	3.048×10^{-1}	meter
mile (mi)	1.609×10^{0}	kilometer
	Area	
acre	4.047×10^{3}	square meter
	4.047×10^{-1}	square hectometer
	4.047×10^{-3}	square kilometer
square mile (mi^2)	2.590×10^{0}	square kilometer
	Volume	
gallon (gal)	3.785×10^{0}	liter
	3.785×10^{0}	cubic decimeter
	3.785×10^{-3}	cubic meter
million gallons (Mgal)	3.785×10^{3}	cubic meter
	3.785×10^{-3}	cubic hectometer
cubic foot (ft^3)	2.832×10^{1}	cubic decimeter
	2.832×10^{-2}	cubic meter
cubic-foot-per-second day [(ft^3/s) d]	2.447×10^{3}	cubic meter
	2.447×10^{-3}	cubic hectometer
acre-foot (acre-ft)	1.233×10^{3}	cubic meter
	1.233×10^{-3}	cubic hectometer
	1.233×10^{-6}	cubic kilometer
	Flow	
cubic foot per second (ft^3/s)	2.832×10^{1}	liter per second
	2.832×10^{1}	cubic decimeter per second
	2.832×10^{-2}	cubic meter per second
gallon per minute (gal/min)	6.309×10^{-2}	liter per second
	6.309×10^{-2}	cubic decimeter per second
	6.309×10^{-5}	cubic meter per second
million gallons per day (Mgal/d)	4.381×10^{1}	cubic decimeter per second
	4.381×10^{-2}	cubic meter per second
	Mass	
ton (short)	9.072×10^{-1}	megagram or metric ton

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

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