

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN

LOCATION.--Lat 45°49'34", long 94°21'18", sec. 32, T. 39 N., R. 32 W., Morrison County, Hydrologic Unit 07010201, on left bank at upstream side of bridge on County Highway 26, 2.5 mi west of Royalton, and at mile 954 upstream from Ohio River.

DRAINAGE AREA.--11,600 mi² (approximately).

PERIOD OF RECORD.--March 1924 to Sept. 30, 1993, discharges obtained from Minnesota Power and adjusted to U.S. Geological Survey streamflow measurements; Oct. 1993 to Sept. 30, 2000, discharges flow-averaged between Mississippi River at Ft. Ripley (05261000) and Mississippi River at St. Cloud (05270700); Oct. 2000 to July, 2001, discharges obtained from Minnesota Power and adjusted to U.S. Geological Survey streamflow measurements; July 2001 to current year.

GAGE.--Water-stage recorder.

REMARKS.--Records good except those for estimated days, which are fair. Flow partly regulated by power plants and Winnibigoshish, Leech, Pokegama, Sandy, and Gull Lakes and by Pine River Reservoir.

COOPERATION.--Minnesota Power Co. in connection with a Federal Energy Regulatory Commission project.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1 | 2,960 | 4,930 | 3,560 | 3,510 | e2,410 | e1,930 | 3,780 | 4,900 | 4,920 | 12,400 | 3,990 | 1,720 |
| 2 | 2,990 | 5,170 | e3,200 | e3,550 | e2,450 | e1,940 | 3,410 | 4,790 | 4,850 | 11,200 | 3,750 | 1,700 |
| 3 | 2,780 | 4,900 | e3,300 | e3,750 | e2,450 | e1,950 | 3,920 | 4,630 | 4,520 | 11,600 | 3,730 | 1,750 |
| 4 | 3,300 | 4,880 | 3,460 | e3,700 | e2,450 | e1,970 | 3,660 | 3,870 | 4,560 | 12,500 | 3,830 | 1,880 |
| 5 | 3,880 | 4,580 | 3,530 | 3,410 | e2,450 | e1,960 | 2,900 | 4,370 | 4,420 | 11,700 | 3,820 | 1,730 |
| 6 | 4,410 | 4,790 | 3,190 | 3,370 | e2,430 | e1,930 | 3,280 | 4,590 | 4,180 | 10,800 | 3,760 | 1,590 |
| 7 | 5,290 | 4,740 | 3,720 | 3,400 | e2,440 | e1,930 | 3,720 | 4,630 | 3,970 | 10,600 | 3,620 | 1,840 |
| 8 | 5,740 | 4,550 | e3,600 | 3,410 | e2,420 | e1,930 | 3,450 | 5,300 | 4,140 | 10,200 | 3,600 | 2,320 |
| 9 | 6,420 | 4,440 | e3,400 | e3,420 | e2,420 | e1,930 | 3,510 | 5,700 | 4,510 | 9,550 | 3,370 | 1,750 |
| 10 | 5,400 | 4,550 | 3,710 | e3,490 | e2,390 | e1,930 | 3,380 | 7,170 | 4,330 | 9,440 | 3,160 | 1,660 |
| 11 | 5,820 | 4,690 | 3,880 | e3,440 | e2,340 | e1,930 | 3,280 | 8,910 | 5,210 | 9,770 | 3,010 | 1,670 |
| 12 | 7,410 | 4,760 | 3,630 | e3,300 | e2,300 | e1,930 | 3,250 | 8,960 | 5,160 | 9,990 | 2,740 | 1,980 |
| 13 | 5,860 | 4,580 | 4,020 | e3,180 | e2,270 | e1,990 | 2,760 | 9,020 | 5,310 | 10,100 | 2,930 | 2,060 |
| 14 | 5,730 | 4,600 | 3,910 | e3,080 | e2,250 | e2,030 | 3,220 | 8,860 | 5,300 | 10,000 | 2,740 | 2,050 |
| 15 | 6,490 | 4,520 | 3,840 | e3,030 | e2,100 | e2,050 | 2,960 | 8,140 | 4,510 | 9,890 | 2,710 | 2,010 |
| 16 | 6,110 | 4,220 | e3,590 | e2,940 | e2,050 | e2,170 | 4,020 | 7,530 | 4,250 | 9,310 | 2,730 | 1,930 |
| 17 | 6,150 | 3,870 | e3,500 | e2,840 | e2,200 | e2,480 | 5,670 | 7,490 | 4,420 | 9,060 | 2,580 | 1,850 |
| 18 | 5,990 | 4,370 | e3,580 | e2,770 | e2,350 | e2,730 | 5,090 | 6,790 | 4,390 | 8,410 | 2,350 | 1,990 |
| 19 | 5,440 | 4,280 | e3,660 | e2,700 | e2,400 | e2,850 | 6,490 | 7,680 | 4,120 | 7,920 | 2,220 | 2,160 |
| 20 | 5,800 | 4,680 | e3,590 | e2,650 | e2,400 | e3,040 | 7,350 | 7,890 | 3,820 | 7,240 | 2,120 | 1,730 |
| 21 | 5,770 | 4,720 | e3,650 | e2,570 | e2,350 | e3,140 | 8,630 | 8,140 | 3,540 | 6,800 | 2,110 | 1,980 |
| 22 | 5,780 | 4,500 | e3,500 | e2,530 | e2,200 | 3,400 | 8,540 | 8,420 | 3,580 | 6,740 | 2,040 | 1,970 |
| 23 | 5,510 | 4,250 | e3,300 | e2,500 | e2,150 | 3,350 | 8,840 | 8,280 | 7,170 | 6,040 | 1,900 | 1,950 |
| 24 | 5,460 | 3,840 | e3,500 | e2,470 | e2,100 | 3,670 | 8,490 | 7,760 | 9,830 | 5,430 | 1,870 | 1,950 |
| 25 | 5,430 | 3,850 | e3,800 | e2,450 | e2,010 | 4,310 | 7,780 | 7,510 | 11,600 | 5,250 | 2,020 | 1,920 |
| 26 | 5,040 | 3,480 | e3,600 | e2,410 | e1,970 | 4,230 | 7,330 | 7,140 | 12,600 | 5,140 | 2,000 | 1,900 |
| 27 | 5,050 | 3,110 | e3,550 | e2,380 | e1,950 | 4,130 | 6,860 | 6,530 | 13,200 | 4,680 | 1,840 | 1,880 |
| 28 | 5,040 | 2,930 | 3,500 | e2,380 | e1,930 | 3,820 | 6,420 | 6,250 | 13,700 | 4,490 | 1,730 | 1,870 |
| 29 | 5,170 | 3,480 | 3,520 | e2,380 | --- | 3,710 | 5,910 | 6,070 | 14,300 | 4,380 | 1,880 | 1,790 |
| 30 | 5,330 | 3,690 | e3,550 | e2,380 | --- | 3,440 | 5,260 | 5,630 | 13,300 | 4,230 | 1,920 | 1,700 |
| 31 | 5,130 | --- | e3,440 | e2,380 | --- | 3,440 | --- | 5,450 | --- | 3,880 | 1,820 | --- |
| TOTAL | 162,680 | 129,950 | 110,780 | 91,770 | 63,630 | 83,240 | 153,160 | 208,400 | 193,710 | 258,740 | 83,890 | 56,280 |
| MEAN | 5,248 | 4,332 | 3,574 | 2,960 | 2,272 | 2,685 | 5,105 | 6,723 | 6,457 | 8,346 | 2,706 | 1,876 |
| MAX | 7,410 | 5,170 | 4,020 | 3,750 | 2,450 | 4,310 | 8,840 | 9,020 | 14,300 | 12,500 | 3,990 | 2,320 |
| MIN | 2,780 | 2,930 | 3,190 | 2,380 | 1,930 | 1,930 | 2,760 | 3,870 | 3,540 | 3,880 | 1,730 | 1,590 |
| AC-FT | 322,700 | 257,800 | 219,700 | 182,000 | 126,200 | 165,100 | 303,800 | 413,400 | 384,200 | 513,200 | 166,400 | 111,600 |
| CFSM | 0.45 | 0.37 | 0.31 | 0.26 | 0.20 | 0.23 | 0.44 | 0.58 | 0.56 | 0.72 | 0.23 | 0.16 |
| IN. | 0.52 | 0.42 | 0.36 | 0.29 | 0.20 | 0.27 | 0.49 | 0.67 | 0.62 | 0.83 | 0.27 | 0.18 |

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 2003, BY WATER YEAR (WY)

| | | | | | | | | | | | | |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| MEAN | 4,200 | 4,069 | 3,201 | 2,808 | 2,688 | 3,882 | 9,312 | 8,735 | 6,545 | 5,083 | 3,747 | 3,569 |
| MAX | 12,930 | 14,640 | 7,297 | 5,713 | 5,480 | 12,290 | 25,430 | 24,600 | 18,160 | 15,250 | 15,230 | 12,940 |
| (WY) | (1966) | (1972) | (1997) | (1966) | (1997) | (1966) | (1997) | (1950) | (1965) | (1993) | (1953) | (1986) |
| MIN | 632 | 618 | 627 | 534 | 758 | 968 | 1,924 | 1,663 | 1,071 | 648 | 449 | 535 |
| (WY) | (1937) | (1937) | (1935) | (1935) | (1937) | (1940) | (1931) | (1977) | (1988) | (1988) | (1934) | (1934) |

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN—Continued

| SUMMARY STATISTICS | FOR 2002 CALENDAR YEAR | | FOR 2003 WATER YEAR | | WATER YEARS 1924 - 2003 | |
|--------------------------|------------------------|--------|---------------------|--------|-------------------------|--------------|
| ANNUAL TOTAL | 1,990,870 | | 1,596,230 | | | |
| ANNUAL MEAN | 5,454 | | 4,373 | | 4,846 | |
| HIGHEST ANNUAL MEAN | | | | | 9,555 1966 | |
| LOWEST ANNUAL MEAN | | | | | 1,213 1934 | |
| HIGHEST DAILY MEAN | 16,900 | Jul 12 | 14,300 | Jun 29 | 38,200 | Apr 8, 1997 |
| LOWEST DAILY MEAN | 2,360 | Jun 17 | 1,590 | Sep 6 | 254 | Nov 25, 1936 |
| ANNUAL SEVEN-DAY MINIMUM | 2,610 | Jun 12 | 1,740 | Aug 31 | 358 | Sep 3, 1936 |
| MAXIMUM PEAK FLOW | | | a14,500 Jun 29 | | | |
| MAXIMUM PEAK STAGE | | | a13.01 Jun 29 | | | |
| INSTANTANEOUS LOW FLOW | | | b1,520 Sep 30 | | | |
| ANNUAL RUNOFF (AC-FT) | 3,949,000 | | 3,166,000 | | 3,511,000 | |
| ANNUAL RUNOFF (CFSM) | 0.47 | | 0.38 | | 0.42 | |
| ANNUAL RUNOFF (INCHES) | 6.38 | | 5.12 | | 5.68 | |
| 10 PERCENT EXCEEDS | 9,670 | | 8,140 | | 9,860 | |
| 50 PERCENT EXCEEDS | 4,600 | | 3,660 | | 3,560 | |
| 90 PERCENT EXCEEDS | 3,200 | | 1,950 | | 1,350 | |

- a Due in part to regulation.
- b Due to regulation.
- e Estimated.

