

Table 1.LE. Le Sueur River Monitoring Station Information



Station Address: State Highway 66 Bridge, Mankato, MN 56001
County: Blue Earth
Major Basin: Minnesota River Basin
Watershed: Le Sueur River
Drainage Area: 1,100 square miles

Station Operators: Metropolitan Council Environmental Services
Minnesota Department of Agriculture (MDA)

Metropolitan Council Environmental Services Contact Information:

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Station Overview: MCES and MDA have conducted water quality monitoring of the Le Sueur River since 1999. The monitoring station is located near Mankato, Minnesota, 1.3 miles upstream from the river confluence with the Blue Earth River. The Le Sueur River flows north and west through mostly agricultural land in Freeborn, Waseca, and Blue Earth Counties.

MCES and MDA cooperatively operate this monitoring station, but partner with the USGS, which measures river flow at a station approximately one mile upstream from the MCES/MDA location. USGS has been monitoring flow at the upstream location, station

number 05320500, since 1939. USGS has also intermittently collected water quality samples at their station, in 1967-1969 and 1989-1993.

2001 Monitoring Year: Snowmelt began during the last week of March 2001. The Le Sueur River rose rapidly, with flow increasing from 1,400 cfs on April 1, 2001 to a peak daily average flow of 13,100 cfs on April 6, 2001. This was the fourth highest peak flow on record, compared to the highest recorded daily average flow of 24,700 cfs, with a stage of 22.10 feet, on April 8, 1965.

Runoff event-based composite sampling began at the end of March and continued until the end of April, as high water conditions persisted throughout most of this time period. Composite samples were collected again in May and June following a number of significant storm events. On June 14, a rainfall event of approximately 1.50 inches resulted in the last large runoff event of 2001. Greater rainfall amounts in the surrounding area generated runoff that resulted in a peak river flow very similar to that observed in early April.

Forty-two samples were collected for water quality analysis during 2001, including 18 composite samples and 24 grab samples. The MCES annual water quality monitoring plan includes 12 monthly baseflow (“non-event”) grab samples and approximately 10 to 15 flow-weighted composite samples collected during all runoff events in the open-water season (March-November). The 2001 sampling scheme met the goals of the MCES monitoring work plan.

Because of the high volumes of water in both the Minnesota and Blue Earth Rivers during the 2001 spring floods, the Le Sueur River experienced backwater conditions at the monitoring station in April. However, it was difficult to estimate exactly when and how long these conditions occurred. When in doubt, USGS data were used to generate valid flow measurements.



Samples collected from the Le Sueur River during a May 2001 storm event.

For additional stream monitoring information and monitoring methods regarding this site, see www.metrocouncil.org/environment/RiversLakes.

Figure 1.LE. Le Sueur River Monitoring Station Location and Watershed

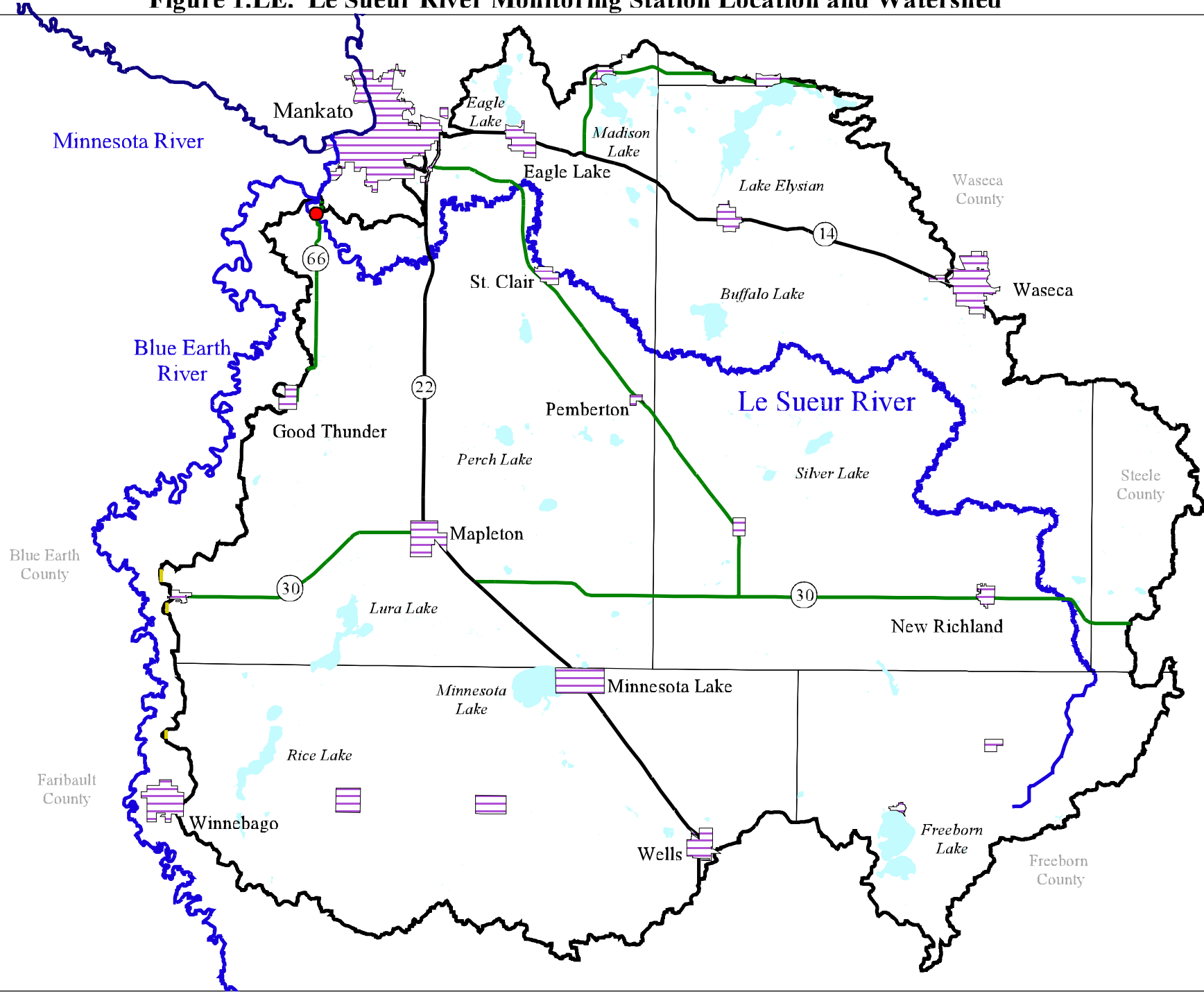


Figure 2.LE. Le Sueur River 2001 Hydrograph with Rainfall and Sampling Information

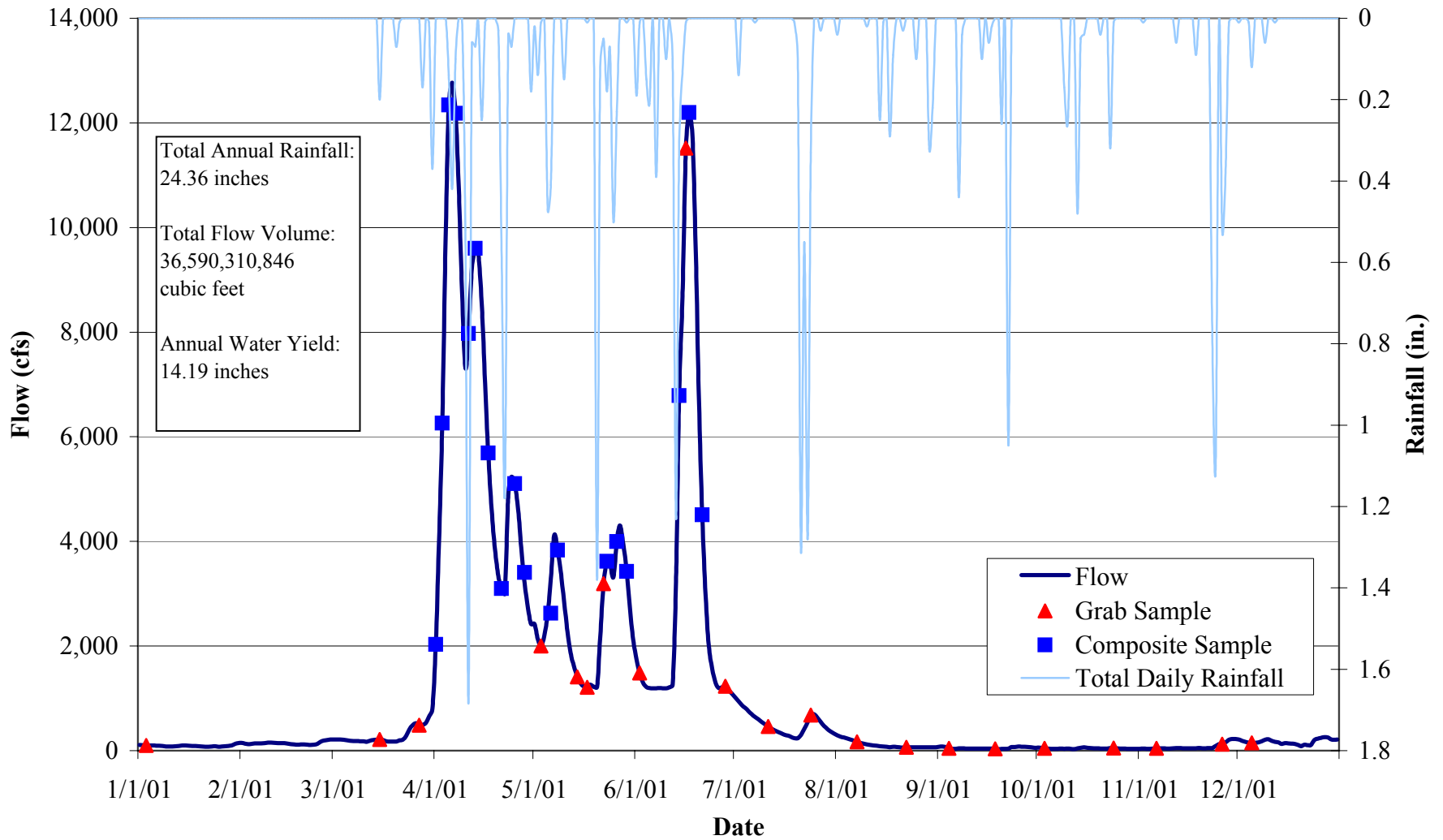


Table 2.LE. Le Sueur River 2001 Water Chemistry Information

| Variable | N | Mean | Median | Minimum | Maximum | 25% | 75% | STD |
|-----------------------------------|----|------|--------|---------|---------|------|-------|------|
| Chloride, mg/L | 38 | 21 | 15 | 7 | 62 | 13 | 28 | 14 |
| Hardness, mg/L | 40 | 250 | 261 | 118 | 400 | 218 | 280 | 58 |
| Cadmium, ug/L | 27 | 0.1 | 0.1 | 0.1 | 0.4 | 0.1 | 0.2 | 0.1 |
| Chromium, ug/L | 27 | 3.5 | 3.2 | 0.5 | 16.3 | 0.5 | 5.2 | 3.4 |
| Copper, ug/L | 27 | 7.7 | 6.0 | 3.0 | 21.3 | 3.6 | 8.7 | 5.6 |
| Lead, ug/L | 27 | 3.3 | 3.0 | 0.5 | 14.4 | 0.5 | 4.5 | 3.3 |
| Nickel, ug/L | 27 | 8.3 | 7.5 | 3.8 | 23.9 | 5.3 | 10.0 | 4.5 |
| Zinc, ug/L | 27 | 19.0 | 17.0 | 1.0 | 82.0 | 3.0 | 27.0 | 19.0 |
| Nitrogen, Total Kjeldahl, mg/L | 41 | 1.50 | 1.40 | 0.40 | 4.50 | 0.90 | 1.90 | 0.90 |
| Nitrogen, Total Nitrate, mg/L | 42 | 8.19 | 9.70 | 0.05 | 16.20 | 5.00 | 11.46 | 4.71 |
| Phosphorus, Total, mg/L | 41 | 0.39 | 0.31 | 0.01 | 1.50 | 0.12 | 0.47 | 0.34 |
| Phosphorus, Total Dissolved, mg/L | 41 | 0.17 | 0.15 | 0.01 | 1.00 | 0.07 | 0.25 | 0.17 |
| Solids, Total Suspended, mg/L | 42 | 231 | 172 | 2 | 1110 | 22 | 291 | 264 |
| Solids, Volatile Suspended, mg/L | 42 | 20 | 17 | 2 | 78 | 5 | 31 | 19 |
| Turbidity, NTU | 41 | 69 | 40 | 2 | 310 | 12 | 98 | 76 |
| Transparency Tube, cm | 15 | 37 | 39 | 6 | 60 | 18 | 59 | 20 |

Table 3.LE. Le Sueur River 2001 Annual Loading Information* for Suspended Solids and Nutrients

| Variable | Annual Load (tons) | Annual Yield (lbs/acre) | Annual Normalized Yield (lbs/acre/in of water) | Flow Weighted Mean Concentration (mg/L) |
|---------------------------------------|--------------------|-------------------------|--|---|
| Solids, Total Suspended | 397,145 | 1,118 | 79 | 348 |
| Phosphorus, Total | 681.13 | 1.92 | 0.14 | 0.60 |
| Phosphorus, Total Dissolved | 283.88 | 0.80 | 0.06 | 0.25 |
| Nitrogen, Total Nitrate+Total Nitrite | 11,356.35 | 31.97 | 2.25 | 9.95 |

* 2001 Annual Loading Information is provisional and may be subject to minor revisions.

Table 4.LE. Le Sueur River 2001 Macroinvertebrate Monitoring Results and Metrics

Monitoring Date 10/29/01

| Class | Order | Family | Common Name | Life Stage | Organism Count |
|--------------|---------------|------------------|---------------------------|-------------------|-----------------------|
| Insecta | Diptera | Chironomidae | Midges | Larvae | 5 |
| Insecta | Diptera | Simuliidae | Black Flies | Larvae | 1 |
| Insecta | Diptera | Tipulidae | Crane Flies | Larvae | 3 |
| Insecta | Ephemeroptera | Baetidae | Small Minnow Mayflies | Larvae | 4 |
| Insecta | Ephemeroptera | Heptageniidae | Flatheaded Mayflies | Larvae | 45 |
| Insecta | Ephemeroptera | Leptophlebiidae | Pronggills | Larvae | 3 |
| Insecta | Odonata | Gomphidae | Clubtails | Larvae | 1 |
| Insecta | Plecoptera | Perlidae | Comon Stoneflies | Larvae | 2 |
| Insecta | Plecoptera | Perlodidae | Perlodidae | Larvae | 9 |
| Insecta | Plecoptera | Pteronarcyidae | Giant Stoneflies | Larvae | 2 |
| Insecta | Plecoptera | Taeniopterygidae | Taeniopterygid Broadbacks | Larvae | 2 |
| Insecta | Trichoptera | Hydropsychidae | Common Netspinners | Larvae | 108 |

Macroinvertebrate Taxa Metrics

| | |
|----------------------|------|
| Total Taxa | 12 |
| EPT Taxa | 8 |
| % EPT Taxa | 67 |
| Diptera Taxa | 3 |
| % Diptera Taxa | 25 |
| Mean Tolerance Value | 3.00 |

Macroinvertebrate Organism Metrics

| | |
|----------------------------|-----|
| Total Organisms | 185 |
| EPT Individuals | 175 |
| % EPT Individuals | 95 |
| Diptera Individuals | 9 |
| % Diptera Individuals | 5 |
| Chironomidae Individuals | 5 |
| % Chironomidae Individuals | 3 |

Water Quality

Degree of Organic Pollution

| | | | |
|--------------------------------|------|-----------|-----------------------------------|
| Hilsenhoff Biotic Index | 3.83 | Very Good | Possible slight organic pollution |
|--------------------------------|------|-----------|-----------------------------------|