

Lower Minnesota River Model Project

Installation and operation of a continuous-record stream-flow gaging station at Minnesota River mile 3.5

A cooperative project between the U.S. Geological Survey and
Metropolitan Council Environmental Services

Dates: October 1, 2002 – March 31, 2007

Cooperator: Metropolitan Council Environmental Services (MCES)

Project Chief: Thomas Winterstein

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A. PROBLEM

The proposed water-quality model of the Lower Minnesota River requires accurate discharge information at the upstream and downstream ends of the modeled reach. Discharge information at the upstream end is provided by the continuous-record stream-flow gaging station near Jordan, Minnesota. There is no gaging station near the mouth of the river, which is the downstream end of the modeled reach.

B. OBJECTIVE AND SCOPE

The objective is to install and operate a continuous-record stream-flow gaging station on the Minnesota River at river mile 3.5 where a long-term MCES monitoring station is located.

C. RELEVANCE AND BENEFITS

The completion of this task benefits the Lower Minnesota River Project by providing information needed for the proposed water-quality model of the Lower Minnesota River. The data will also be used in other tasks of the Lower Minnesota River Project including budgetary analyses of sediment and nutrients.

D. CONTINUOUS-RECORD STREAM-FLOW GAGING STATION

1. Location of gaging station.

The gaging station will be located at the long-term water-quality site maintained by the Metropolitan Council Environmental Services at river mile 3.5 in Fort Snelling State Park (Figure 1).



Figure 1. Location of gaging station

2. Description of gaging station

The gaging station will be a continuously-operated stage-velocity gaging station. The river velocity at the site will be measured with a side-scanning ADVM (acoustic doppler velocity meter). An index-velocity relationship relating measured discharge to measured river velocity will be constructed by measuring river discharge. The index-velocity relationship will be used with stage to calculate discharge from the measured river velocity.

The gaging station will contain, in addition to the ADVM, a rain gage and a satellite transmitter to transmit the recorded data to the Minnesota District Office of the USGS. The following data will be collected: river-velocity data (including direction of flow), river-water temperature, river stage, and rainfall amounts.

E. PUBLICATION OF DATA

The data collected at the gaging station will be transmitted via satellite or telephone telemetry to the U.S. Geological Survey (USGS) office in Mounds View, Minnesota. The data and the calculated discharge will be made available through the USGS real-time National Water-Information System (NWIS) web site about 6 hours after being collected. The calculated discharge data will be published in the USGS annual data report, which is available as a PDF file from the USGS website. Water temperature, stage, and rainfall data will be available by internet retrieval but will not be published in the annual data report.

Data collected at the gaging station that shows reverse flow from the Mississippi River into the Minnesota River will be sent to MCES in a letter at least semi-annually or when requested by MCES. The data will include: river discharge, flow direction, and flow velocity.