



Minnesota  
Pollution  
Control  
Agency

# Lower Cannon River

## Total Maximum Daily Load for Turbidity

Water Quality, Impaired Waters 9-04a • October 2006

**T**he Lower Cannon River, from the Lake Byllesby Dam near Cannon Falls to its confluence with the Vermillion and Mississippi Rivers near Red Wing, includes two reaches, or segments, that are listed as impaired under Section 303(d) of the Federal Clean Water Act. They include the reach between the Pine Creek and Belle Creek tributaries, and a short stretch at the Cannon's mouth. The listings are based on violations of Minnesota's water-quality standard for turbidity (a measure of the water's "cloudiness"), which indicates the river is not adequately supporting a healthy community of fish and other aquatic life.

This fact sheet provides details on a cleanup process called a Total Maximum Daily Load (TMDL, see below) addressing these impairments.

### TMDL Background

Impaired waters are those that do not meet water-quality standards established to protect their designated uses such as recreation, fishing, irrigation, and support of wildlife. Examples of pollutants or conditions that may place a lake or stream on the impaired waters list include nutrients, bacteria, sediment, high turbidity, low dissolved oxygen, and bioaccumulative toxins such as mercury and PCBs. Waters are sometimes impaired by multiple pollutants.

For each impaired water, federal law requires that states determine an acceptable Total Maximum Daily Load (TMDL) for the relevant pollutant(s). This total acceptable load is then allocated among all the sources of the pollutant, and reductions

necessary to restore the water to required standards are identified. This information serves as the basis for an implementation (cleanup) plan.

A draft TMDL report addressing the turbidity impairments of the Lower Cannon River has been prepared collaboratively by the Cannon River Watershed Partnership and the Minnesota Pollution Control Agency.

### The problem

Excessive turbidity is typically caused by sediment, algae, or other substances suspended in the water. Moderate to high levels of turbidity interfere with the ability of some aquatic life to navigate and feed. The sedimentation often associated with turbidity degrades aquatic habitat. High turbidity for sustained periods may have toxic effects on aquatic life. In addition to the impacts on fish and other aquatic organisms, recreational users find turbid waters less desirable.

### Assessment and implementation

Uncontrolled soil erosion and runoff from farm fields and cities deliver large amounts of turbidity-causing sediments to streams and rivers. The erosion of stream banks and streambeds contributes additional sediments. While a certain amount of stream-channel erosion is natural, land uses such as agricultural drainage and the addition of impervious surfaces (pavement and roofs) in urban areas can cause higher flows that increase erosive force. Algae,

which occurs naturally in lakes and streams but sometimes becomes excessive due to elevated phosphorus levels, also contributes to turbidity.

In the Lower Cannon River, turbidity levels are typically greatest during periods of high runoff from the landscape and high flows in the river. These conditions occur most frequently from April through June. Based on extensive data analyzed in the report, turbidity appears to increase significantly from the middle of the Lower Cannon near Welch to its confluence with the Vermillion and Mississippi Rivers. Because Lake Byllesby traps a substantial amount of sediment upstream, it appears that lower tributaries add sediment and increase turbidity as the Lower Cannon moves toward its mouth. Reductions in total suspended solids (TSS) loads necessary to meet the water-quality standard for turbidity are estimated at up to 49 and 82 percent, respectively, for the Pine-Belle reach and the confluence reach.

A detailed implementation plan will be developed following completion and approval of this TMDL report. Cleanup of the impaired reaches will be a complex undertaking involving a mix of regulation, education and incentives, and may be expected to take a number of years. Funding to address these needs will be sought

from federal and state sources, including the recently passed Minnesota Clean Water Legacy Act.

## Public involvement

The public and specific stakeholders were involved in, and informed about, the TMDL project in several ways including:

- A TMDL technical committee
- Several advisory committee meetings
- Newsletters
- Public meetings
- A display at the August, 2005 Cannon River Festival.

## For more information

The complete report for the Lower Cannon River Turbidity TMDL is available on the MPCA Web site at <http://www.pca.state.mn.us/water/tmdl/index.html#drafttmdl>. For questions, comments and requests for additional information, contact:  
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