Pomme de Terre River TMDL Project for Turbidity

Water Quality/Impaired Waters #7.18a • January 2009

A segment of the Pomme de Terre River in western Minnesota was listed in 2002 by the Minnesota Pollution Control Agency as being impaired for turbidity. A Total Maximum Daily Load (TMDL) report documenting the impairment is being developed in 2009, followed by an implementation plan in 2010 to begin work on reducing turbidity. The segment is located in the lower portion from Muddy Creek to Marsh Lake.

A TMDL study calculates the maximum amount of a pollutant a water body can receive (known as the "loading capacity") without violating water quality standards. The TMDL process identifies all sources of pollutants causing impairments and allocates reductions necessary to meet the water quality standard.

Watershed Description

The Pomme de Terre River Watershed is located in the upper Minnesota River Basin. It covers nearly 560,000 acres or about 875 square miles. It originates in southern Otter Tail County and flows about 106 miles south, discharging into Marsh Lake on the Minnesota River.

Land-use is dominated by agricultural cropping and animal production. Sixty-six percent of the entire watershed is cultivated land; in the impaired segment, 84 percent is cultivated. The Watershed Project is governed by a joint powers board consisting of one county commissioner and one Soil and Water Conservation District representative from each of the six counties in the watershed: Otter Tail, Douglas, Grant, Stevens, Swift and Big Stone.

Turbidity Description

Turbidity is caused by particles suspended or dissolved in water that scatter light making the water appear cloudy or murky. Particulate matter can include sediment – especially clay and silt, fine organic and inorganic matter, soluble colored organic compounds, algae, and other microscopic organisms.

High turbidity can significantly reduce the aesthetic quality of lakes and streams, having a harmful impact on recreation and tourism. It can increase the cost of water treatment for drinking and food processing. It can harm fish and other aquatic life by reducing food supplies, degrading spawning beds, and affecting gill function.

Turbidity is measured using specialized optical equipment in a laboratory or in the field. A light is directed through a water sample, and the amount of light scattered is

Turbidity in water is caused by suspended and dissolved matter such as clay, silt, organic matter, algae and color.

Citizen involvement, education and outreach, and pollution prevention are key components of all TMDL implementation plans.

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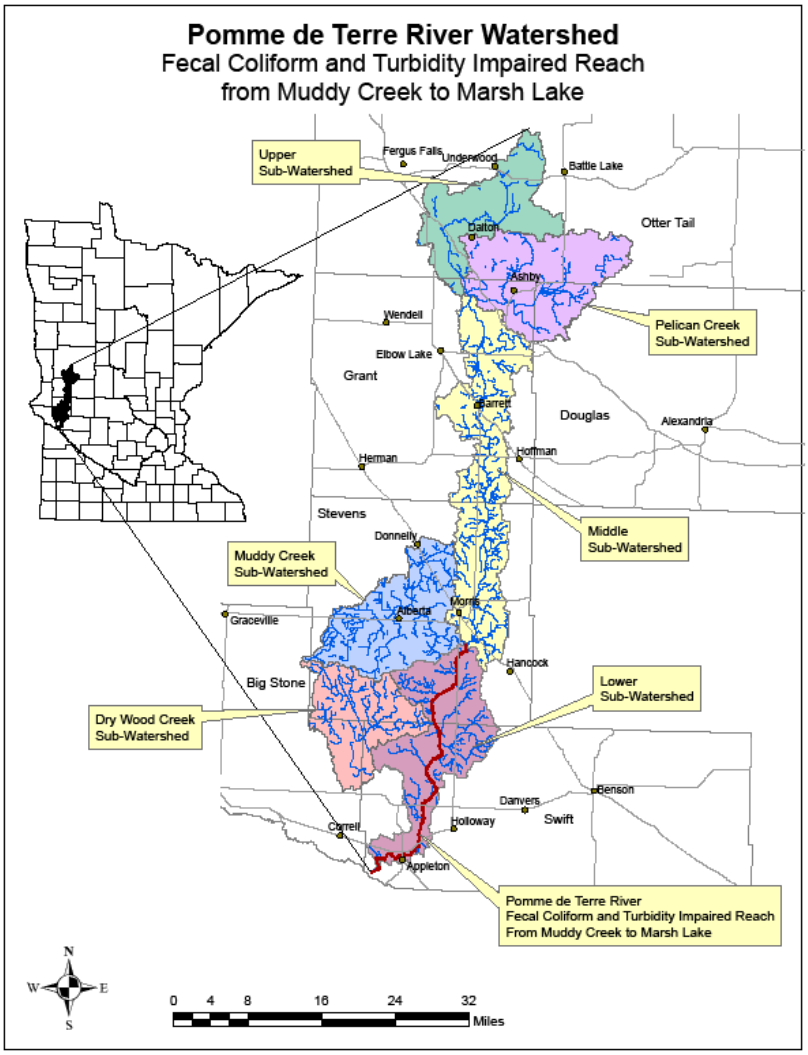
measured. The unit of measurement is called a Nephelometric Turbidity Unit (NTU). Sediment often tops the list of substances or pollutants causing turbidity. Algae that grow with nutrients entering the stream through leaf decomposition or other naturally occurring decomposition processes, or from manure and commercial fertilizers, can also be a source of turbidity. The turbidity water quality goal for the Pomme de Terre River is 25 NTU or lower.

Watershed Monitoring

Since 1997, 57 percent of all turbidity readings have exceeded the 25 NTU standard. In 2008, the highest turbidity reading ever recorded since monitoring began there in 1971 occurred at the Appleton monitoring station: 220 NTU, and also the highest ever recorded Total Suspended Solids (TSS) reading: 400 mg/L. In the Pomme de Terre, 52 mg/L is the TSS equivalent to the turbidity standard of 25 NTU. Since 1997, 67% of all TSS readings have exceeded the 52 mg/L TSS surrogate standard. The highest average turbidity and TSS readings occur in June, also the highest rainfall month. During an average year, from April through September, more than 11,000 tons of suspended solids are transported down the river.



Turbidity solutions

Land use practices that reduce the amount of sediment and nutrients entering lakes and streams are necessary to reduce turbidity. Riparian (streambank, lakeshore) buffers, streambank stabilization, water storage, surface tile intake buffers or replacements, and crop residue management, all help reduce sediment transport. On farmland conservation tillage and increased crop diversity including pasture can reduce sediment loss considerably. Crop nutrient management plans help keep nitrogen and phosphorus out of waters, as do improvements in private and public wastewater treatment systems. In cities and developing areas, stormwater management and construction erosion control help prevent sediment runoff.

A TMDL implementation plan will be developed in 2010. The plan will provide a strategy for implementation of practical management measures needed to meet the turbidity water quality standard. Citizen involvement, education and outreach, and pollution prevention are key components of all TMDL implementation plans.

For more information

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More information is available on the Web at: http://www.pca.state.mn.us/water/tmdl/project-pommedeterre-turbidity.html.
General information on TMDLs can be found on the Web at: www.pca.state.mn.us/water/tmdl/ and www.epa.gov/owow/tmdl/