

# Upper Mississippi River Total Suspended Solids TMDL Final Report



Prepared by:  
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Executive summary

The Mississippi River reach from the confluence with the Swan River to the confluence with the Crow Wing River is approximately 147 miles in length. The reach drains 7.053 square miles and flows through three HUC 10s: the City of Palisade – Mississippi River, City of Aitkin – Mississippi River, and the City of Brainerd – Mississippi River. This reach was listed as impaired for Turbidity / TSS concerns. A TMDL study was conducted to address those impairments.

Three turbidity/TSS impairments on the mainstem of the Upper Mississippi River located between Grand Rapids and Brainerd were addressed in this study. The impairments are listed in the table below:

Affected Use: Pollutant/Stressor	AUID	Stream Name	Location/Reach Description	Designated Use Class	Listing Year	Impairment Addressed by:
<i>Aquatic Life:</i> TSS	07010103-708	Mississippi River	Swan River to Willow River	2Bg, 3C	2016	<b>TSS TMDL</b>
<i>Aquatic Life:</i> Turbidity	07010104-655	Mississippi River	Willow River to Pine River	2Bg, 3C	1998*	<b>TSS TMDL</b>
<i>Aquatic Life:</i> TSS	07010104-656	Mississippi River	Pine River to Crow Wing River	2Bg, 3C	2016	<b>TSS TMDL</b>

The TMDL study completed through this effort was approved in September of 2020. Several partners cooperated on this effort including: Emmons & Oliver Resources, Inc, Crow Wing Soil and Water Conservation District, Morrison Soil and Water Conservation District, Aitkin County Soil and Water Conservation District, and the Minnesota Pollution Control Agency. Partners worked to develop the following needed TSS reductions.

Impaired Reach (AUID)	Existing Load Monitoring Station(s)	90 <sup>th</sup> Percentile Concentration (mg/L)	TSS Standard 90 <sup>th</sup> Percentile Concentration (mg/L)	TSS Reductions needed to meet TMDL (%)
<b>Mississippi River, Swan River to Willow River</b> (07010103-708)	S003-663	39	15	<b>62%</b>
<b>Mississippi River, Willow River to Pine River</b> (07010104-655)	S002-010 & S000-152	37	15	<b>59%</b>
<b>Mississippi River, Pine River to Crow Wing River</b> (07010104-656)	S000-570 & S007-337	20	15	<b>25%</b>

Public participation was a key component of this effort. Local partners worked to provide citizens with the opportunity to assess the study results and leverage the capacity for the local community to engage in the process of watershed management. It is through this outreach that partners and local stakeholders will be able to adopt restoration practices that meet the goals of this TMDL.

## Body of main report

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### **Section I – Work plan review**

This project began on March 19, 2019. A work plan with the goal of developing a Total Maximum Daily Load (TMDL) study that addressed the total suspended solids / turbidity impairments of the Mississippi River from the Swan River in Aitkin County to the Crow Wing River in Crow Wing County was prepared. During the implementation of this project, two change orders were made to the project workplan. The first Change Order (8/8/19) updated the project timeline to adjust for lags in scheduling. It also added the Hydrologist 3 to the staff partnering on this project. The second Change Order (7/30/20) updated timelines as the project neared completion. Additional hours were shifted to the project consultant budget to allow for a presentation at the public meeting held in August 2020. The MPCA Project Manager changed in July, 2020 due to staff leaving for another position.

The project workplan consists of three objectives. These objectives are summarized below.

**Objective 1: TMDL Planning and Development:** Staff from EOR, the Project Consultant, was responsible for Characterization of the Watershed, Source Assessment, Load Allocation and Reductions, and Report Development. The Consultant and Local Partner Team cooperated to review and revise the draft TMDL. The final TMDL document was completed and includes Load Duration Curves, Load Allocations, and Reduction Tables. Comments from the public were incorporated into the report.

**Objective 2: Public Participation and TMDL Review:** Local project partners shared information on the TMDL with the public. Opportunities for citizen involvement were sought and created where appropriate. Two public meetings were hosted:

- MS4 Partner Meeting, December 2019. Representatives from the cities of Brainerd and Baxter were invited to a meeting where results of the TMDL were shared. Wasteload Allocations, MS4 Permit Requirements, and Stormwater Best Management Practices were discussed.
- Question and Answer Session, August 2020. A one hour webex session was hosted to share the methodology and results of the TMDL study. Representatives from the Minnesota Pollution Control Agency and EOR presented information. Local partners from the Soil and Water Conservation Districts were available to assist with questions.

Two handouts / press releases were also completed and shared with a goal of providing information to the public. These were shared through a variety of methods including local newspapers, website, facebook, and email messages,

- Upper Mississippi River TSS TMDL Fact Sheet. Information on the TMDL Report, past monitoring efforts, sources of sediment, and best management practices was shared.
- Making The Mississippi Muddy was an article that explained sources of sediment to the Mississippi and the effect of aquatic life.

**Objective 3: Overall Project Administration:** Reports and invoices were submitted in a timely manner. The Aitkin County SWCD was responsible for this activity, with input and assistance from other project partners.

### **Section II – Grant results**

A TMDL Study was completed and a report generated that addresses total suspended solids / turbidity impairments of the Mississippi River (Swan River to Crow Wing River). This report is available on the Minnesota Pollution Control Agency website at <https://www.pca.state.mn.us/water/watersheds/mississippi-river-grand-rapids>.

Documents produced during the contract period focused on sharing the findings of the TMDL study. The following documents were used in outreach efforts:

- Our Upper Mississippi River - Large River and Basin Restoration and Protection Strategies (Handout developed by the MPCA, used for outreach with local partners) <https://www.pca.state.mn.us/sites/default/files/wq-ws4-38b.pdf>
- Upper Mississippi River TSS TMDL fact sheet (Handout developed by the MPCA. Used for outreach with local partners) <https://www.pca.state.mn.us/water/watersheds/mississippi-river-grand-rapids>
- Upper Mississippi River Total Suspended Solids TMDL Report – Question and Answer Session Invitation

and Recorded Session. <https://www.pca.state.mn.us/water/watersheds/mississippi-river-grand-rapids>

- Making the Mississippi Muddy News Release. <https://aitkincountyswcd.wordpress.com/2020/09/25/making-the-mississippi-muddy/>

Stakeholder involvement and public participation provided an opportunity to assess and leverage the capacity of the local community to engage in the process of watershed management. When the TMDL study began in 2019 the favored method of sharing information was through public meetings. Information was shared at meetings of the Aitkin County Water Planning Task Force, the Big Sandy Area Lakes Watershed Management Project, MS4s including Brainerd and Baxter, and the Aitkin County Lakes and Rivers Association. Local newspapers were also asked to share news releases. With the onset of the Covid 19 pandemic in March 2020, outreach strategies had to change. Social media and electronic means of connecting with the public were used, including Facebook, websites, Webex, and email messaging. These proved to be a good alternative method of sharing information.

The results of the TMDL Study were shared via a Webex meeting on August 18, 2020. The meeting was publicized through Facebook and Websites, as well as emails. Sixteen people participated in the Webex meeting.

Protection efforts that will benefit the Mississippi have been ongoing by project partners. The Mississippi Headwaters Board is currently working to establish Conservation Easements on critical areas of the Mississippi River. Shorelines will be protected from future development and subdivision as they are enrolled in this program. This TMDL report provides support for protecting these parcels of land. In addition to this effort, watershed partners have been working together for several years. A year long civic engagement cohort was completed by many partners in the watershed. This has had many long ranging benefits through building relationships and understanding between partners.

The impaired reach of the Mississippi included in this study is also within the Upper Mississippi River - Grand Rapids WRAP and the Mississippi River - Brainerd WRAP. planning areas. Both of these studies outlined strategies that will protect and restore water quality. Plans are to implement these strategies and make improvements to water quality in this area. In addition, both watersheds will be cooperating to complete the One Watershed One Plan process in the next few years.

**Section III – Final Expenditures**

The budget from the project workplan is shown below. There were two Change Orders processed during the contract period. Funding was shifted to allow more time for technical staff from the project consultant, EOR.

Project Budget		Contract Budget	Total Expenditures	Budget Balance / Unspent Funds
<b>Personnel:</b>				
EOR Project Manager	62 74 hrs @ 137.52	\$ 8,526.24		
		\$ 10,176.48	\$9,420.12	\$ 756.36
EOR Hydrologist 2, Scientist 2	<del>408</del> 112 hrs @ 97.48	\$ 10,527.84		
		\$ 10,917.76	\$10,527.84	\$ 389.92
EOR GIS Scientist 1	26 hrs @ 78.29	\$ 2,030.34	\$2,030.34	\$ -
Aitkin SWCD Staff	160 hrs @ 55	\$ 8,755.00	\$4,950.00	\$ 3,805.00
Local Partner Team	<del>440</del> 100.3 hrs @ 55	\$ 6,050.00		
		\$ 5,518.30	\$1,017.50	\$ 4,500.80
<b>Additional Costs:</b>				
Mileage	Comm. Rate	<del>\$ 550.00</del>		
		\$ 140.36	\$140.36	\$ -
Materials & Meeting Supplies		<del>\$ 1,053.82</del>	\$0.00	\$ -
<b>TOTALS</b>		<b>\$ 37,538.24</b>	<b>\$28,086.16</b>	<b>\$ 9,452.08</b>

## Grant project summary

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Project Title: Upper Mississippi River Total Suspended Solids TMDL  
Organization (Grantee): Aitkin County Soil & Water Conservation District  
Project start date: March 19, 2019 Project end date: Sept. 30, 2020 Report submittal date: October 28, 2020  
Grantee contact name: Janet Smude Title: District Technician  
Address: 307 2<sup>nd</sup> Street NW, Room 216  
City: Aitkin State: Mn. Zip: 56431  
Phone number: (218) 927-7284 Fax: N/A Email: Smude.aitkinswcd@gmail.com  
Basin (Red, Minnesota, St. Croix, Upper Mississippi River Basin  
etc.) /Watershed & 8 digit HUC:: 07010103; 07010104 County: Aitkin, Crow Wing, Morrison

**Project type** (check one):

- Clean Water Partnership  
 Total Maximum Daily Load (TMDL)/Watershed Restoration or Protection Strategy (WRAPS) Development  
 319 Implementation  
 319 Demonstration, Education, Research  
 TMDL/WRAPS Implementation

## Grant funding

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Final grant amount: \$ 37,538.24 Final total project costs: \$ 28,086.16  
Matching funds: Final cash: \$ N/A Final in-kind: \$ N/A Final Loan: \$ N/A  
MPCA project manager: Bonnie Finnerty / Anna Bosch

## For TMDL/WRAPS development or TMDL/WRAPS implementation projects only

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Impaired reach name(s): Mississippi River – Swan River to Willow River; Willow River to Pine River; Pine River to Crow Wing River  
AUID or DNR Lake ID(s): 07010103-708; 07010104-655; 07010104-656  
Listed pollutant(s): TSS, Turbidity  
303(d) List scheduled start date: 1998 – Willow River to Pine River.  
2016 – Swan River to Willow River,  
Pine River to Crow Wing River Scheduled completion date: 2030

AUID = Assessment Unit ID

DNR = Minnesota Department of Natural Resources

## Executive summary of project

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### **Problem**

The Mississippi River between its confluences with the Swan River and Crow Wing River is impaired for Total Suspended Solids and Turbidity. These high levels of sediment affect the quality of aquatic life in the river and give the river a muddy appearance.

### **Waterbody improved**

A TMDL Study was completed for these reaches of the Mississippi. Source assessment of pollutants was completed in addition to TMDL Loads. The Report was shared with the public and reviewed by the Minnesota Pollution Control Agency and EPA. Strategies that will help to reduce the sediment load in the river were outlined.

### **Project highlights**

The main outcome of this project was the completion of a Total Maximum Daily Load Study that provides quantitative pollutant reduction and watershed management strategies to achieve water quality standards for the mainstem Mississippi River in the Mississippi River – Grand Rapids and Brainerd Watersheds. These strategies are easy to understand and adoptable by local units of government and other stakeholders.

### **Results**

Through completion of this TMDL Study strategies that will be implemented to improve water quality were identified. Having these available will make their implementation by local partners easier and more likely. Partnerships strengthened while working on this effort will also serve to increase the likelihood of meaningful changes that will benefit the health of the Mississippi River being made in the future.

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### **Partnerships / Project Partners**

Janet Smude, Aitkin County Soil & Water Conservation District. Contractor, Project Coordinator

Meghan Funke, Emmons & Oliver Resources, Inc. Subcontractor / Consultant Project Manager

Anna Bosch / Bonnie Finnerty, Minnesota Pollution Control Agency. Project Manager

Shannon Wettstein, Morrison Soil & Water Conservation District. Local Partner Team Member

Melissa Barrick, Crow Wing Soil & Water Conservation District. Local Partner Team Member

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**Pictures**

