
6.0 Bluff Creek Watershed

The Bluff Creek watershed is located at the western edge of the District, adjacent to the Riley Creek watershed (see Figure 5-6). The Bluff Creek watershed lies primarily within the city of Chanhassen and also within the city of Chaska. The watershed and creek are summarized in the Bluff Creek Fact Sheet included in this section. Information provided by District water resource fact sheets include (as applicable):

- Watershed physical characteristics
- Lake and creek physical characteristics
- Watershed land use
- Results of water quality and natural resource assessments
- Invasive species
- Water quality impairments

The most current version of the fact sheet is available from the District website at www.rpbcwd.org.

6.1 Bluff Creek Watershed Issues

Table 6-1 summarizes issues identified in the Bluff Creek watershed, organized according to the issue categories described in Section 2.3. These issues were identified through the District's public engagement and issue identification process (see Section 2.0) and through past District monitoring and studies. Recent District studies specific to the Bluff Creek watershed include:

- *Bluff Creek – Creek Restoration Action Strategy* (Barr Engineering Co. & Riley Purgatory Bluff Creek Watershed District, November 2015)
- *Bluff Creek Watershed Total Maximum Daily Load Implementation Plan* (Barr Engineering Co., 2013)
- *Engineer's Report – Bluff Creek Stabilization and Fish Passage Upstream of Trunk Highway 101* (Barr Engineering Co., 2014)
- *Chanhassen High School Infrastructure Alternatives- Reuse System* (Barr Engineering Co., 2016)
- *Bluff Creek Stream Stabilization Assessment – Reach BT3A and B5B* (Barr Engineering Co., 2017)

Table 6-1 Bluff Creek Watershed Stakeholder Identified Issues and Opportunities

Water Resource Issue Category (see Section 2.3.6)	Specific Issues in the Bluff Creek Watershed	Opportunities to Address Issues
Water Quality (Pollution)	<ul style="list-style-type: none"> • Water quality monitoring • Water quality assessment criteria 	<ul style="list-style-type: none"> • Cost share programs
Water Quality (Habitat)	<ul style="list-style-type: none"> • Invasive species along Bluff Creek 	<ul style="list-style-type: none"> • Volunteer monitoring and management
Water Quality (Erosion)	<ul style="list-style-type: none"> • Areas of severe streambank erosion 	<ul style="list-style-type: none"> • Landowner best management practices
Groundwater	<ul style="list-style-type: none"> • Groundwater-surface water connection • Impact of development on groundwater • Groundwater sustainability 	<ul style="list-style-type: none"> • None identified in workshop
Water Quantity	<ul style="list-style-type: none"> • Impact of development on streamflow in Bluff Creek 	<ul style="list-style-type: none"> • None identified in workshop
<p>Note: Issues above are based on comments received at the Bluff Creek stakeholder meeting, A complete list of stakeholder comments is included in Appendix A.</p>		

6.2 Bluff Creek Watershed Programs and Projects

Many of the issues present in the Bluff Creek watershed are directly or indirectly addressed through consistent implementation of District-wide programs including the District’s permitting and education programs (see Section 9.0). Over the past several years, the District has begun implementing several capital improvement projects within the watershed to address water quality, water quantity, and other issues. Watershed and creek BMPs as well as other management strategies are needed to improve and protect the water resources within the watershed. Proposed projects the District may implement within the Bluff Creek watershed are listed in Table 6-2; additional details on selecting projects are provided in the District’s overall implementation program (see Sections 9.1 and 9.2). Proposed projects within the Bluff Creek watershed are shown in Figure 6-1. The BMPs listed in Table 6-2 are intended to be a guide rather than a prioritization list. Additional data collection, future study efforts and innovation could result in revisions to those shown or additional BMPs being added.

Table 6-2. Proposed Projects in the Bluff Creek Watershed

Source of Identified Project	City	Major Watershed	Resource	Project	Project Description	Goal Index ¹	Sustainability Index ¹	Volume Management Index ¹	Pollutant Management ¹	Stabilization ¹	Habitat Restoration ¹	Partnership ¹	Education ¹	Watershed Benefit ¹	Total Benefit Score ¹	Planning Level Estimated 30 year Cost ²	Funding Partner Opportunity
RPBCWD	Chanhassen	Bluff Creek	Bluff Creek	BT3A	Creek Restoration and Stabilization	3	7	1	1	7	5	7	5	7	43	\$280,000	
RPBCWD	Chanhassen	Bluff Creek	Bluff Creek	BT3	Creek Restoration and Stabilization along SW Branch, excludes BT3A	3	7	1	1	7	5	7	1	7	39	\$683,000	
RPBCWD	Chanhassen	Bluff Creek	Bluff Creek	B4	Creek Restoration and Stabilization	3	7	1	1	5	5	1	7	7	37	\$566,000	
RPBCWD	Chanhassen	Bluff Creek	Bluff Creek	B5	Creek Restoration and Stabilization	3	7	1	1	7	7	1	3	7	37	\$614,000	
RPBCWD	Chanhassen	Bluff Creek	Bluff Creek	BT1	Creek Restoration and Stabilization	3	7	1	1	5	7	1	3	7	35	\$507,000	
RPBCWD	Eden Prairie	Bluff Creek	Bluff Creek	BT2	Creek Restoration and Stabilization	3	7	1	1	5	3	1	3	7	31	\$991,000	
RPBCWD	Chanhassen	Bluff Creek	Bluff Creek	B3	Creek Restoration and Stabilization	3	7	1	1	7	7	1	7	5	39	\$1,475,000	
Chanhassen	Chanhassen	Bluff Creek	Bluff Creek	Wetland Resto.	Wetland Restoration and Flood Mitigation @ 101 and Pioneer Trail	3	7	3	1	1	7	7	3	3	35	\$350,000	
RPBCWD	Chanhassen	Bluff Creek	Bluff Creek	B2	Creek Stabilization	3	7	1	1	5	5	1	7	3	33	\$792,000	
Chanhassen	Chanhassen	Bluff Creek	Bluff Creek	Chan HS Ruse	Chanhassen High School Stormwater Reuse	3	5	3	1	1	1	7	7	3	31	\$384,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	15	Ravine Stabilization & Runoff Controls	3	5	3	1	7	1	3	3	3	29	\$520,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	18	Ravine Stabilization & Runoff Controls	3	5	3	1	7	1	3	3	3	29	\$520,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	6	Ravine Stabilization & Runoff Controls	3	5	3	1	7	1	3	3	3	29	\$300,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	10	Ravine Stabilization & Runoff Controls	3	5	3	1	7	1	3	3	3	29	\$220,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	7	Ravine Stabilization & Runoff Controls	3	5	3	1	7	1	3	3	3	29	\$370,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	2	Ravine Stabilization & Runoff Controls	3	5	3	1	7	1	3	3	3	29	\$400,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	12	Ravine Stabilization & Runoff Controls	3	5	3	1	7	1	3	3	3	29	\$350,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	1	Bank Repair/Culvert Restoration	3	5	1	1	7	1	3	3	3	27	\$280,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	14	Slope Stabilization	3	5	1	1	7	1	3	3	3	27	\$460,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	3	Ravine Stabilization & Runoff Controls	3	5	3	1	5	1	3	3	3	27	\$240,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	4	Ravine Stabilization & Runoff Controls	3	5	3	1	5	1	3	3	3	27	\$290,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	20	Bank Stabilization	3	5	1	1	5	1	3	3	3	25	\$20,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	11	Slope Stabilization	3	5	1	1	5	1	3	3	3	25	\$290,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	13	Ravine Stabilization	3	5	1	1	5	1	3	3	3	25	\$20,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	16	Slope Stabilization	3	5	1	1	5	1	3	3	3	25	\$400,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	17	Ravine Stabilization	3	5	1	1	5	1	3	3	3	25	\$50,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	19	Ravine Stabilization	3	5	1	1	5	1	3	3	3	25	\$30,000	

Table 6-2. Proposed Projects in the Bluff Creek Watershed

Source of Identified Project	City	Major Watershed	Resource	Project	Project Description	Goal Index ¹	Sustainability Index ¹	Volume Management Index ¹	Pollutant Management ¹	Stabilization ¹	Habitat Restoration ¹	Partnership ¹	Education ¹	Watershed Benefit ¹	Total Benefit Score ¹	Planning Level Estimated 30 year Cost ²	Funding Partner Opportunity
MPCA	Chanhassen	Bluff Creek	Bluff Creek	21	Ravine Stabilization	3	5	1	1	3	1	3	3	3	23	\$20,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	22	Ravine Stabilization	3	5	1	1	3	1	3	3	3	23	\$20,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	5	Ravine Stabilization	3	5	1	1	3	1	3	3	3	23	\$30,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	8	Ravine Stabilization	3	5	1	1	3	1	3	3	3	23	\$20,000	
MPCA	Chanhassen	Bluff Creek	Bluff Creek	9	Ravine Stabilization	3	5	1	1	3	1	3	3	3	23	\$20,000	
RPBCWD	Chanhassen	Bluff Creek	Bluff Creek	B1	Creek Stabilization	3	7	1	1	7	5	7	1	1	33	\$2,705,000	

¹See Section 4 for additional details about the RPBCWD prioritization methodology and associated descriptions for the variables used to assess multiple project benefits.

²Based on 2017 dollars

BLUFF CREEK WATERSHED PROPOSED PROJECTS

FIGURE DESCRIPTION

Watershed and creek BMPs as well as other management strategies are needed to improve and protect the water resources within the watershed. Based on studies completed since the 2011 3rd generation plan, the recommended phosphorus reduction management strategy to protect, enhance, and restore the health of the water resources in the RPBCWD are shown in this figure and included in this plan for potential implementation. The figure illustrates the distributed nature of recommended BMP locations. In general, the RPBCWD will follow an adaptive management approach to implement the various projects. The recommended BMPs are intended to be a guide rather than a prioritization list. Additional data collection, future study efforts and innovation could result in revisions to those shown or additional BMPs being added.

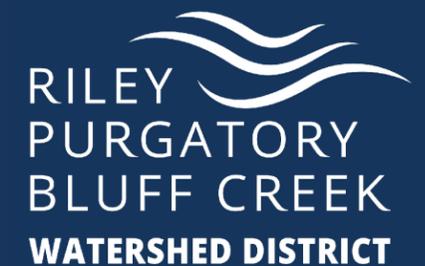
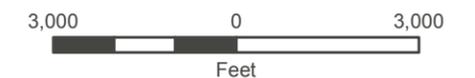
Other watershed-wide management strategies are also needed to improve and protect the resources (e.g. wetlands, lakes, and creeks) in the District, including:

- | | |
|--|--|
|  Watershed-wide volume reduction and detention |  Water quality/biological monitoring |
|  Carp management |  Educate and partner with residents, businesses, cities, and developers to maximize restoration and protect opportunities |
|  Aquatic invasive species management |  Promote cost-share opportunities and enhance education outreach |
|  Shoreline assessment and vegetation management | |

FIGURE 6-1

Recommended Best Management Practices

-  In Lake BMP
-  Watershed BMP
-  Creek Stabilization
-  Ravine Stabilization
-  Streams/Creeks
-  Lake/Pond
-  Wetlands
-  Hydrologic Boundary
-  District Legal Boundary
-  Municipalities



6.3 Opportunity Projects

The projects identified in Table 6-2 primarily focus on the reduction of phosphorus loading to the resources by implementing BMPs and streambank stabilization to address water quality goal WQual 1 and water quantity goal WQuan 2. Through the public input process, additional goals have been identified as important elements. These goals focus on habitat and ecology, other pollutants, groundwater, and best management practices that infiltrate, conserve groundwater, protect baseflow and reduce stormwater runoff. Other potential management techniques that address these goals can be identified in Table 6-3. These opportunity projects can be identified through additional data collection, future study efforts and innovation.

Table 6-3 Opportunity Projects in the Bluff Creek Watershed

Topic	Sub-topic	Goal	Most Applicable Strategies	Examples of Projects
Habitat & ecology	Habitat protection & establishment	WQual 1. Protect, manage, and restore water quality of District lakes and creeks to maintain designated uses.	WQual S3. The District encourages cities and developers to seek opportunities to incorporate habitat protection or enhancement into development and redevelopment projects.	Riparian Habitat Restoration
		WQual 2. Preserve and enhance the quantity, as well as the function and value of wetlands.		Wetland enhancement and restoration
	Buffers & bioengineering	WQual 3. Preserve and enhance habitat important to fish, waterfowl, and other wildlife.	WQual S7. The District will promote the use of natural materials and bioengineering for the maintenance and restoration of shorelines and streambanks where appropriate.	Green Corridor Expansion
				In-stream hydrologic improvements
	aquatic invasive species		WQual S11. The District recognizes the multiple benefits of vegetated buffers and promotes the use of vegetated buffers around all waterbodies.	Aquatic plant management
				Carp management activities
		WQual S4. The District will implement measures to manage carp populations in District-managed waterbodies.	Enhance regulatory program	
		WQual S9. The District will partner with other entities to minimize the spread and reduce the adverse ecological impacts of aquatic invasive species.		

Topic	Sub-topic	Goal	Most Applicable Strategies	Examples of Projects
Erosion	Erosion & sediment pollution	<p>WQual 1. Protect, manage, and restore water quality of District lakes and creeks to maintain designated uses.</p> <p>WQual 2. Preserve and enhance the quantity, as well as the function and value of wetlands.</p> <p>WQual 3. Preserve and enhance habitat important to fish, waterfowl, and other wildlife.</p>	<p>WQual S1. The District seeks to minimize the negative impacts of erosion and sedimentation through the District's regulatory, education and outreach, and incentive programs.</p> <p>WQual S2. The District will inventory and address areas within the watershed with existing erosion issues and/or areas at high risk for erosion by implementing the District's capital improvement, incentive and regulatory programs</p>	<p>Wetland and streambank protection and restoration (e.g., buffers and stabilization efforts)</p> <p>Rainfall abstraction (e.g., rain gardens, reuse, and permeable pavements)</p> <p>Enhance regulatory program</p>
Pollution	Chloride pollution		<p>WQual S12. The District will assist and cooperate with cities, MPCA, MDNR, MnDOT, other watershed and other stakeholders in implementing projects or other management actions based on the Minnesota Pollution Control Agency's Twin Cities Metro Chloride TMDL.</p>	<p>Municipal cost-share projects</p>
	Non-point source pollution	<p>WQual 1. Protect, manage, and restore water quality of District lakes and creeks to maintain designated uses.</p> <p>WQual 2. Preserve and enhance the quantity, as well as the function and value of wetlands.</p> <p>WQual 3. Preserve and enhance habitat important to fish, waterfowl, and other wildlife.</p>	<p>WQual S13. The District will continue to minimize pollutant loading to water resources through implementation of the District's capital improvement, regulatory, education and outreach, and incentive programs.</p> <p>WQual S14. The District will continue to identify opportunities and actions to protect, restore, and enhance District-managed resources.</p>	<p>Watershed BMPs (e.g., iron enhanced sand, ponds, etc.)</p> <p>Rainfall abstraction (e.g., rain gardens, reuse, and permeable pavements)</p> <p>Enhance regulatory program</p>
	Emerging topics		<p>WQual S15. The District will cooperate with other entities to investigate treatment effectiveness of emerging practices.</p> <p>WQual S16. The District will work with the state agencies and local governmental units to identify emerging pollutants of concern.</p>	<p>Demonstration and pilot-scale water quality treatment projects</p>

Topic	Sub-topic	Goal	Most Applicable Strategies	Examples of Projects
Groundwater	Groundwater conservation	Ground 1. Promote the sustainable management of groundwater resources.	Ground S1. The District will promote the conservation of groundwater resources through its education and outreach program and will work with cities to encourage conservation practices (e.g. water reuse)	Rainfall abstraction (e.g., rain gardens, reuse, and permeable pavements)
	Groundwater-surface water interactions		Ground S3. The District will work to increase the understanding of the interaction between groundwater resources and surface waters within the District and consider those interactions in future management decisions.	Larger scale infiltration practices in targeted locations
Water Quantity	Baseflow impacts	WQuan 1. Protect and enhance the ecological function of District floodplains to minimize adverse impacts. WQuan 2. Limit the impact of stormwater runoff on receiving waterbodies.	WQuan S2. The District will promote strategies that minimize baseflow impacts.	Larger scale infiltration practices in targeted locations
	Infiltration practices		WQuan S3. The District will continue to promote infiltration, where feasible, as a best management practice to reduce runoff volume, improve water quality, and promote aquifer recharge.	Rainfall abstraction practices (e.g., rain gardens, permeable pavements)
	Low impact development		WQuan S7. The District promotes/encourages cities and developers to implement Low Impact Development (LID) practices and will work with cities to reduce regulatory barriers to LID practices.	LID cost-share projects within municipalities Water reuse projects
	Conservation practices		WQuan S9. The District will work with cities and other stakeholders to encourage conservation practices (e.g. water reuse) to protect creeks, lakes and wetlands.	Stormwater retention and detention (e.g., ponds, filtration) Flood risk mitigation projects
	Flood risk reduction		WQuan S8. The District will develop and implement actions to reduce flood risk within the District	Enhance regulatory program

What's happening

WATERSHED MANAGEMENT PLAN



One of the most important projects the watershed worked on in 2017 was updating its Watershed Management Plan.

This watershed management plan (also called the 10-Year Plan) guides the District's actions for the next 10 years.



The community played an essential role by participating in a public engagement process. Close to 500 stakeholders engaged in this process, making their voices heard about their values for clean water. The graphic to the right highlights how the community contributed to the planning effort.



The draft plan was released for public review in late 2017. After comments are addressed, the District will submit a final plan for approval in 2018. Check our website for updates on the process: rpbcwd.org



Thank you! To everyone who shared their thoughts, ideas, hopes and concerns. We truly appreciate you being a part of this process.



YOU CAN HELP

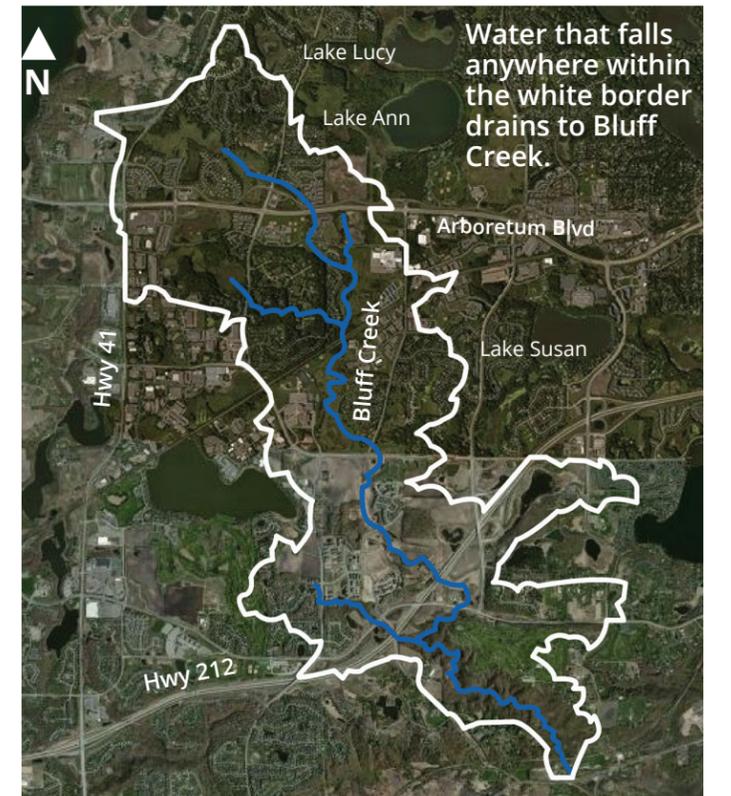
Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Bluff Creek.

- Keep the curb clean**
Sweep up leaves, grass clippings and fertilizer from driveways and streets.
- Water with care**
Grass requires 1-inch of water per week: about one hour of sprinkling per week if it has not rained.
- Salt smart**
The salt we use to melt ice can pollute our lakes and creeks. Use salt sparingly and always shovel first.
- Reuse the rain**
Collect and reuse rainwater with a rain barrel.
- Build a raingarden**
Raingardens soak up water and filter out pollution. Visit our website for help.



In the photo above, Bluff Creek winds its way south, past Chanhassen High School. Bluff is about seven miles long, and unlike Purgatory and Riley Creeks, does not connect any lakes on its way to the Minnesota River. It does however connect many wetlands and you can explore almost its entire length on trails.

WATERSHED BOUNDARIES



Water that falls anywhere within the white border drains to Bluff Creek.

CHARACTERISTICS

Length	6.8 miles
Elevation change	232 ft
Watershed size	5.8 sq miles
# of cities in watershed	2
# of lakes connected	0
# of monitoring sites	5
# of parks	3
Impairment	Turbidity, Fish
Common fish	Brook Stickleback, Northern Fathead Minnow
Invasive species	Reed Canary Grass, Buckthorn

LAND USE in the Bluff Creek Watershed



Contact us
and find out how you can get involved

DISTRICT OFFICE
18681 Lake Drive East
Chanhassen, MN
55317

CONTACT INFO
952.607.6512
info@rpbcwd.org
rpbcwd.org

FIND US ON
instagram
facebook
twitter



How healthy is Bluff Creek?

Keeping Bluff Creek healthy requires several tools and strategies. Implementing projects to stabilize the stream banks and restore creek reaches is one important strategy. Cleaning and slowing rainwater runoff before it reaches the creek is another. But before either of these can be done, we need to understand how the creek is doing and where it needs the most help.

The watershed district has been monitoring Bluff Creek since the 1970s. Recently, the district developed a new tool to assess the creek: the Creek Restoration Action Strategy (CRAS). The CRAS uses water quality data, as well as information on erosion and habitat, to rank which creek sections are doing well, and which are doing the poorly. Below, the three major types of data used in the assessment are described. On the next page, a creek map shows the results from 2017.

Water quality

District staff take samples at five sites during summer. They gather data on nutrient levels (phosphorus), algae, sediment, pH, and dissolved oxygen. These data let us know how clean the water is, and whether it is healthy for plants, animals, and people.

Erosion

Every year, staff walk along sections of the creek. They note sites with erosion, the severity, and whether any structures like houses or bridges are in danger. Erosion is also a problem because sediment eroding into the creek is a pollutant.

Habitat

Creeks are important habitat for insects, plants, fish, birds, and other animals. When staff check for erosion, they also assess the habitat. Reaches receive a score based on the quality of habitat they provide, and whether it needs to be restored.

Dive deeper

Interested in learning more? Explore the following reports on our website.

Assessment

RPBCWD & BARR Engineering. 2017. Creek Restoration Action Strategy.

Implementation plan

BARR Engineering. 2013. Bluff Creek Watershed: Total Maximum Daily Load Implementation Plan.

Stormwater ponds

RPBCWD. 2013. Stormwater Pond Project.



2017 ASSESSMENT RESULTS

Each section of Bluff Creek is coded with one of five colors based on how healthy it is. Blue is the best and red the worst. The areas most in need of help are scattered throughout the whole length of the creek. The reach in the south-west corner is particularly degraded, and the district is working with its partners to investigate potential projects to improve it.

KEY	
best	Blue
good	Green
fair	Yellow
poor	Red
no score	Grey

Severe erosion was discovered along this reach of Bluff Creek.

Each year, Bluff Creek carries the average equivalent of



85 dump truck loads



of sediment into the **Minnesota River Valley**
[Metropolitan Council]