



Burnsville: Alimagnet Lake Iron-Enhanced Sand Filter



New Filter Helps Improve Water Quality

Alimagnet Lake, a nutrient-impaired water, receives too much phosphorus from the surrounding watershed. An iron-enhanced sand filter directly next to a City stormwater pond allows for a portion of the phosphorus load to the lake to be captured and treated, helping to improve water quality.

A project completed cooperatively by:

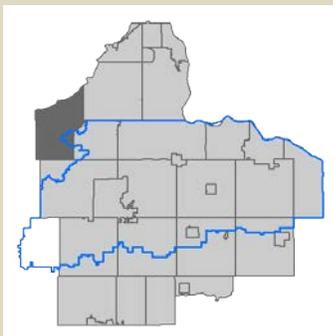
- City of Burnsville
- Vermillion River Watershed Joint Powers Organization
- Clean Water Fund Grant

Just as applying fertilizer to gardens helps plants grow, nutrients flowing into lakes and rivers feed the growth of algae. Water bodies require some nutrients to be healthy, but too much can be harmful. Lakes with a surplus of nutrients can become polluted by excessive amounts of algae, reducing or eliminating their use for swimming or fishing.

Iron-enhanced sand filters are a relatively new technology. The filters are proving to be effective at removing large amounts of phosphorus compared to other more commonly used practices. Traditional water quality practices have focused on treating particulate-bound phosphorus, which addresses only a portion of the total phosphorus load. Iron filings mixed with sand allow for the treatment of both dissolved phosphorus and particulate-bound phosphorus.

Phosphorus is a nutrient of concern in Alimagnet Lake in Burnsville, as it exceeds the State's water quality standard for the nutrient.

Location



City of Burnsville, Minn.
Stormwater Pond LA2-A north of
McAndrews Road and west of
County Road 11

The City of Burnsville and the Vermillion River Watershed Joint Powers Organization (VRWJPO) identified one portion of the watershed draining to the lake that was contributing a large amount of phosphorus to and developed a project that would help address the issue. An area directly next to a stormwater pond, which drains to Alimagnet Lake, was retrofitted with an iron-enhanced sand filter.

The project will help to reduce phosphorus loads in Alimagnet Lake, which will result in improved water quality in the lake, and in waters that lake drains to, such as East Lake in Lakeville.



This iron-enhanced sand filter incorporates sand mixed with iron. The iron removes dissolved phosphorus from stormwater while the sand removes particulate-bound phosphorus, helping to improve nutrient impaired waters.



Vermillion River Watershed Joint Powers Organization

14955 Galaxie Avenue
 Apple Valley, MN 55124
www.vermillionriverwatershed.org
VRWJPO@co.dakota.mn.us
 952-891-7000

The Vermillion River is a vital natural resource that is important to public health and recreation, as well as to preserving unique wildlife habitats. It flows from New Market Township in Scott County, through residential and agricultural areas in central Dakota County, and cascades into a 100-foot ravine before it enters the Mississippi River near the Cities of Hastings and Red Wing, Minnesota. Throughout its journey, the river reflects urban and rural life within its 335-square-mile watershed.

Problem:

- Too much phosphorus is draining to Alimagnet Lake
- Excess phosphorus is leading to algae blooms and problematic water quality conditions for the lake
- Alimagnet Lake is impaired for excess nutrients, (doesn't meet the State water quality standard), which requires actions to address the pollutant source(s)
- Downstream in Lakeville, East Lake is impaired for excess nutrients

Actions:

- An iron-enhanced sand filter was constructed to remove particulate-bound and dissolved phosphorus from one of the primary sources of phosphorus in the watershed draining to the lake

Benefits:

- Reduces phosphorus load by 26 lbs./year in Alimagnet Lake
- Reduction in phosphorus aids in meeting water quality standards and removing the lakes from the impaired waters list
- Assists in phosphorus reduction goals for East Lake, downstream in Lakeville
- Restores and protects water resources for public use

Costs and contributions:

- Vermillion River Watershed: \$29,454 cash and engineering match
- City of Burnsville: \$40,280 cash and engineering match, construction administration and oversight.
- Clean Water Fund: \$93,899 grant



A grant from the Clean Water Fund, one of four funds established by the Clean Water, Land & Legacy Amendment, supported this project. [Clean Water Stories](#) can be found on the Minnesota Board of Water and Soil Resources website.