



Capital Improvement Project



Figure 1. Photograph of Alimagnet Lake, courtesy of the City of Apple Valley

Alimagnet Lake, split between the Cities of Apple Valley and Burnsville, is an impaired water body due to excess phosphorus that results in algae blooms and poor water quality conditions for recreation. Significant efforts to date have focused primarily on reducing external phosphorus load sources, or outside sources that carry phosphorus to the lake. Now the focus has turned to internal phosphorus load, meaning phosphorus released in the lake from lake bottom sediment.

The Vermillion River Watershed Joint Powers Organization (VRWJPO) and the two cities conducted a feasibility study in 2023 on the potential effectiveness of aluminum sulfate, or alum, treatments in Alimagnet Lake. Application of alum is a well-established method for treating internal phosphorus loads in lakes. Alum chemically binds to phosphorus in the water column. This bonding creates large accumulations of heavier particulate material (floc), which sinks to the bottom and reduces phosphorus in the water column.

The study identified multiple areas of the lake listing priority areas for treatment, dosing recommendations, buffering estimates, locations for chemicals to be stored, barge entry points, and costs and pollutant reductions associated with the treatments. Since the study identified a method to successfully remove phosphorus from the lake, the VRWJPO applied for and received a Clean Water Fund competitive grant from the Minnesota Board of Water & Soil Resources (BWSR) to proceed with the treatments. Over time, the reduction of phosphorus could lead to the lake's removal from the state impaired waters list and enhance recreational opportunities associated with the lake.

Partners:

- VRWJPO
- City of Apple Valley
- City of Burnsville
- BWSR

Completion:

- One alum treatment in 2024, one in 2025 or 2026

Location:

- Apple Valley and Burnsville

Watershed:

- Vermillion River

Costs and Contributions (Estimated):

- VRWJPO: \$5,000 for In-Kind Grant administration/coordination; \$30,000 cash match for engineering/technical assistance.
- City of Apple Valley: Technical assistance
- City of Burnsville: Technical assistance
- BWSR: \$25,000 from competitive Clean Water Fund for engineering/technical assistance; \$262,000 from competitive Clean Water Fund for alum treatments

Benefits:

- Estimated to reduce phosphorus in Alimagnet Lake by 115 lbs. over 10 years, which would bring the in-lake concentrations to meet water quality standards. This could allow the lake to be de-listed from the Minnesota Impaired Waters List.
- Less phosphorus would reduce algae blooms, making this recreational lake more enjoyable for nearby residents and park users.



Figure 2. Algae bloom photograph, courtesy of the Minnesota Pollution Control Agency



Figure 3. Application of alum in a lake using a barge



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.