

**Environment and Natural Resources Trust Fund
2011-2012 Request for Proposals (RFP)**

LCCMR ID: 059-B

Project Title: Lake Minnetonka Water Quality Treatment System

Category: B. Water Resources

Total Project Budget: \$ \$800,000

Proposed Project Time Period for the Funding Requested: 3 yrs, July 2011 - June 2014

Other Non-State Funds: \$ 50,000

Summary:

This replicative project takes water from Lake Minnetonka and Six Mile Marsh, improves its quality through a flocculation phosphorus removal treatment system, and returns clean water back to Halstead Bay.

Name: Peter Willenbring

Sponsoring Organization: City of Minnetrista

Address: 7701 County Rd 110W
Minnetrista MN 55364

Telephone Number: 952-241-2522

Email: brothstein@ci.minnetrista.mn.us

Web Address: www.ci.minnetrista.mn.us

Location

Region: Metro

Ecological Section: Minnesota and NE Iowa Morainal (222M)

County Name: Hennepin

City / Township:

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ Employment	_____ TOTAL _____%

2011-2012 MAIN PROPOSAL

PROJECT TITLE: Lake Minnetonka Water Quality Treatment System

I. PROJECT STATEMENT

Lake Minnetonka is the largest lake in the Twin Cities metro area and thousands of people enjoy it as a natural and recreational amenity every year. Unfortunately, it is an impaired water for phosphorus, and Halstead Bay received one of the two lowest lake grades of all the bays of the lake (according the 2008 MCWD lake grades study). This project is crucial to the immediate improvement and continued enjoyment of Halstead Bay and Lake Minnetonka for fishing, swimming, boating, and other recreational uses.

Using a process similar to that used to treat drinking water, the proposed project will take water from Halstead Bay, improve its quality through the use of a flocculation phosphorus removal treatment system that will remove both soluble and insoluble phosphorus, and return the clean water back into the lake. Specifically, the treatment process consists of pumping and mixing untreated water with aluminum sulfate, providing time for the aluminum to react with the phosphorus to form an insoluble flocculate, Aluminum Phosphate, providing a tank or pond that can collect and store the settled flocculate, and discharging the treated water that has been stripped of phosphorus back to the lake. Implementation of this project will result in the removal of almost 50% of the external phosphorus loading directed to the bay from the water flowing from Six Mile Marsh into the bay, and drastically improve the quality of the water in Halstead Bay within a few years following the onset of the system operation.

This project not only serves to implement an engineering design that broadly reduces internal and external phosphorus loads in Halstead Bay, but also serves as a demonstration project that can serve as a model to improve water quality in other bays in Lake Minnetonka as well as other Minnesota Lakes.

II. DESCRIPTION OF PROJECT ACTIVITIES

Activity 1: Design, construct, and operate flocculation treatment system to improve the quality of water in Halstead Bay. **Budget:** \$ 550,000 (plus \$100,000 match)

1. Complete design for Flocculation treatment system capable of removing 50% of the external phosphorus load currently directed to Halstead Bay. Complete design by November of 2011. See attached schematic for generalized design. This is estimated to create one engineering job for one year. (\$90,000)
2. Receive bids and construct system on park property on Kings Point Road (and surrounding areas) in the City of Minnetrista. This project is estimated to create eight construction jobs during the duration of construction and installation. Complete construction and begin operation in late summer, 2012. (\$460,000)
3. Operate system in future years for up to 7 months per year, beginning in 2013. City of Minnetrista will operate system that will include pumping water from streams tributary to lake from Six Mile Marsh subwatershed and Halstead Bay subwatershed, and internal loading from the lake during the spring, summer and fall, strip water of phosphorus, and return treated water to the lake. Up to 100 lbs of phosphorus will be removed annually as part of operation of this system. This is estimated to create one public works job. Cost for annual operation is estimated at \$80,000.
4. Provide an annual report outlining benefits, costs, and other considerations related to using this technology in this location, along with information on it's applicability for use in other applications. (\$20,000-in-kind)

Lake Minnetonka Water Quality Treatment System

Outcome	Completion Date
1. Reduce internal phosphorus loading into Halstead Bay, improving the water quality and the recreational and natural value of Lake Minnetonka.	full scale operation May 2013
2. Increase the lake grade of Halstead Bay to a B (currently a D)	By 2015

Activity 2: Design and construct intake system from Six Mile Marsh and Halstead Bay to project location. **Budget:** \$ 250,000

Outcome	Completion Date
1. Reduce phosphorus loading into Halstead Bay from areas in Minnetrista by over 50%, and remove up to 100lbs annually.	full scale operation May 2013
2. Increase the lake grade of Halstead Bay to a B (currently a D)	By 2015

Activity 3: Produce a replicable model of water quality treatment to be employed by other cities, counties, watershed districts, and other water agencies **Budget:** \$ 0

Outcome	Completion Date
Based on the experience of operating this type of system in this location, provide information to the public on the suitability of using this system in other applications.	Annually beginning year end, 2013.

III. PROJECT STRATEGY

A. Project Team/Partners

Partners to receive dollars from grant:

Contractor to construct the system, based on public bidding process

Contractor to excavate and install intake system, based on public bidding process

Pete Willenbring, Vice President, WSB and Associates

In-Kind Contributors:

City of Minnetrista, public works staff

City of Minnetrista, planning staff

Other non-funding supporters:

Minnehaha Creek Watershed District

Lake Minnetonka Conservation District

Lake Minnetonka Association

B. Timeline Requirements

November 2011 -Complete design and acquisition work

Spring 2012 - Open bids for construction of system

Early Summer 2012 -Complete construction of intake and flocculation system

Late Summer 2012 -Begin operation of intake and flocculation system

Spring 2013 -full scale operation of system

Summer 2015 -significant measurable decreases of the amount of phosphorus in Halstead Bay

C. Long-Term Strategy and Future Funding Needs

This project, as designed here, is proposed to be a self-standing project that significantly reduces the phosphorus impairment in Halstead Bay of Lake Minnetonka. However, once the project is operational, it can be expanded or re-located to increase its phosphorus reduction capability or draw from additional water bodies and serve as pre-treatment into the lake. This is an innovative strategy for significantly improving water bodies, which is hoped to be replicated across the state.

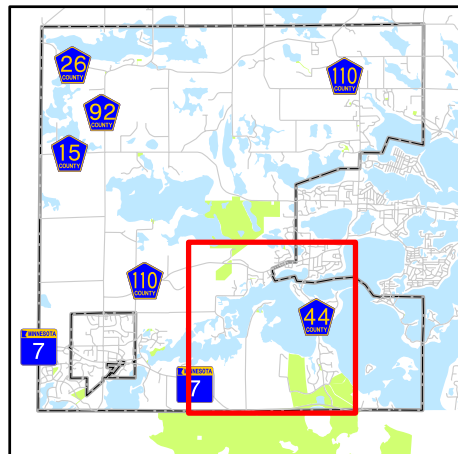
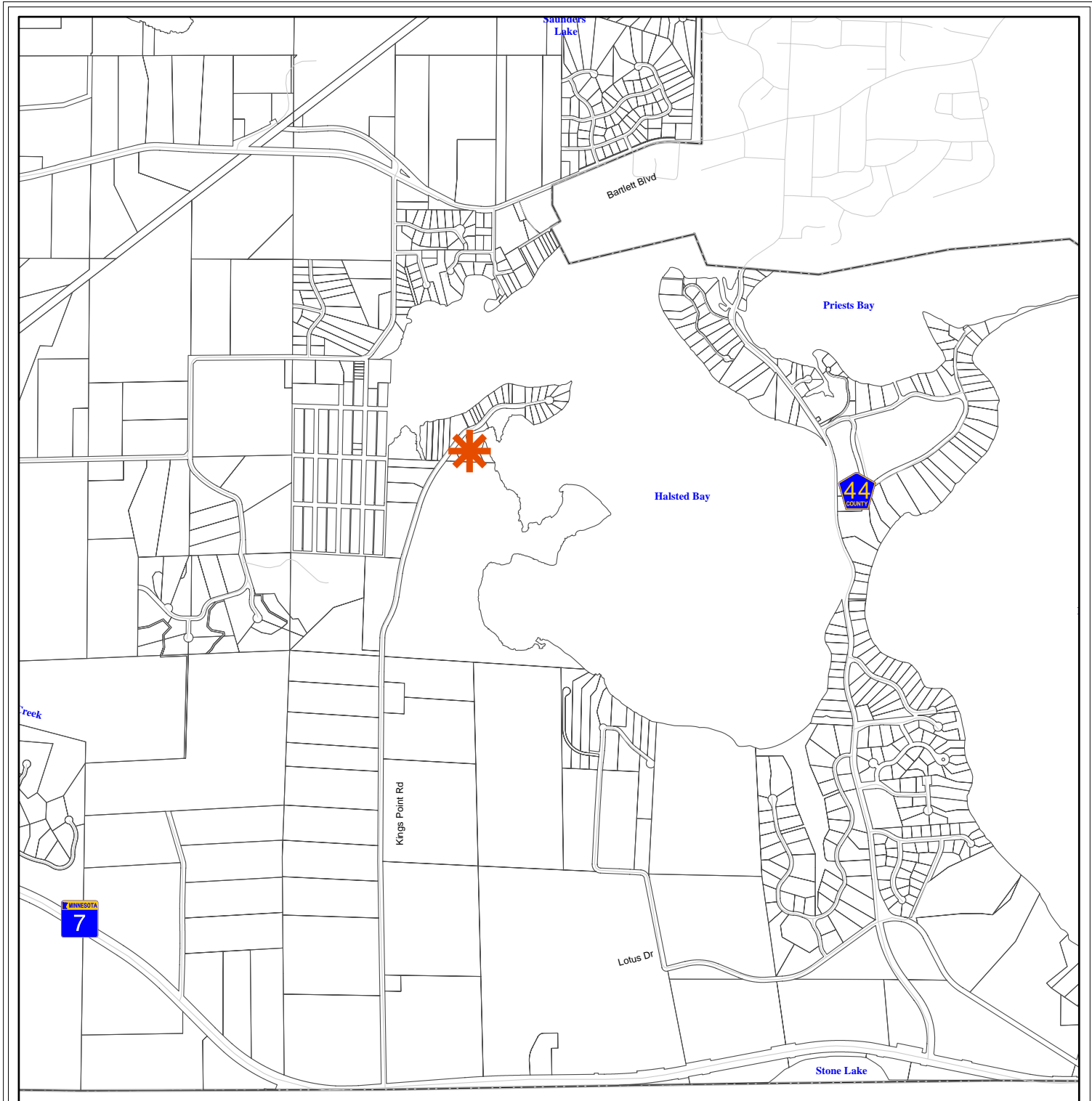
2011-2012 Detailed Project Budget
Lake Minnetonka Water Quality Treatment System

IV. TOTAL TRUST FUND REQUEST BUDGET - 2 years (2011-2012)

BUDGET ITEM (See list of Eligible & Non-Eligible Costs, p. 13)	AMOUNT
Personnel:	
Project Manager, Pete Willenbring, V.P. WSB and Associates	\$ 25,000
Design Engineer, WSB and Associates	\$ 65,000
Contracts:	
Contractor to construct system, including materials and labor	\$ 460,000
Contractor to excavate and install intake system	\$ 250,000
Equipment/Tools/Supplies:	\$ -
Acquisition (Fee Title or Permanent Easements):	\$ -
Travel:	\$ -
Additional Budget Items:	\$ -
TOTAL ENVIRONMENT & NATURAL RESOURCES TRUST FUND \$ REQUEST	\$ 800,000

V. OTHER FUNDS - 3 years (2012-2014)

SOURCE OF FUNDS	AMOUNT	Status
Other Non-State \$ Being Applied to Project During Project Period: City of Minnetrista (cost of operation materials)	\$ 50,000	
Other State \$ Being Applied to Project During Project Period:	\$ -	
In-kind Services During Project Period: City of Minnetrista public works staff-maintenance and monitoring system City of Minnetrista planning staff-permit and location coordination	\$ 50,000	
Remaining \$ from Current ENRTF Appropriation (if applicable):	\$ -	
Funding History:	\$ -	






1 inch = 1,814 feet

Water Flocculation System



Legend

-  Roads
-  Parcels
-  City Boundary



Peter R. Willenbring, PE

Vice President/Water Resources Group Manager

Education: Bachelor of Science in Civil Engineering, University of Minnesota, 1980

Registration: Professional Engineer, Minnesota #15998

Memberships: American Society of Civil Engineers

American Water Resources Association

North American Lake Management Society

Pete is a registered professional engineer with 30 years of experience as a water resource engineering consultant working primarily on city, county, state, and federal projects that involve water resource engineering, management, design, or planning. During his career, he has developed or managed hundreds of water resource related projects or regulatory programs in most of the cities or watershed districts within the Twin Cities Metropolitan area. These projects have been typically related to storm sewer or open channel flow improvements, storm water impoundments, storm water treatment, and lake restoration.

Pete has also developed and implemented community-wide comprehensive storm water management plans for over 50 communities, watershed districts, or watershed management organizations within the State of Minnesota. He has also participated in the preparation of state rules regarding the development of these plans.

In regard to completing work virtually identical to that proposed in this grant application, over his career, he has completed preliminary or final design for over a dozen flocculation treatment systems similar to the one proposed for use in this grant application. He also has over 15 years experience operating, and monitoring the removal of phosphorus in systems he has previously designed and constructed, and has published a manual on how to use this process to remove phosphorus from surface water.

City of Minnetrista, Organization Description

The City of Minnetrista is located on the western edge of Hennepin County, along Lake Minnetonka. The City is characterized by our abundance of lakes, rolling topography, and unique recreational opportunities (two regional parks, a regional trail, and Lake Minnetonka). Our mission is that the City *“will deliver quality services in a cost-effective and innovative manner; and provide opportunities for a high quality of life while protecting natural resources and maintaining rural character.”* It is precisely in keeping with the City’s mission to apply for this grant opportunity. We are a small community with few resources to undertake innovative water quality techniques. However, the stakes are high, given our location on the most used recreational lake in the state. Given our location, we believe this project will be a highly visible, and easily replicable system to serve as a model for the future of water quality.