

**Environment and Natural Resources Trust Fund
2009 Phase 2 Request for Proposals (RFP)**

LCCMR ID: 072-B4

Project Title: Improving Monitoring of Non-Agricultural Ground Water Contaminants

Total Project Budget: \$ \$413,000

Proposed Project Time Period for the Funding Requested: 3 year, July 1, 2009 to June 30, 2012

Other Non-State Funds: \$ \$0.00

Priority: B4. Deep Water Lakes

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Sponsoring Organization: MPCA

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Region:

County Name:

City / Township:

Statewide

Summary: This project will install 110 monitoring wells in key locations to address data gaps, eliminate biases and improve our understanding of urban/residential land use effects on ground-water quality.

Main Proposal: 1008-2-039-proposal-2009_LCCMR_GW_Monitoring_Proposal_template_rev.1.8.doc

Project Budget: 1008-2-039-budget-LCCMR_Proposal_Project Budget.xls

Qualifications: 1008-2-039-qualifications-LCCMR Project Manager Bio.doc

Map:

Letter of Resolution:

MAIN PROPOSAL

PROJECT TITLE: Improving Monitoring of Non-Agricultural Ground Water Contaminants

I. PROJECT STATEMENT

The Minnesota Pollution Control Agency (MPCA) has primary responsibility for monitoring non-agricultural contaminants in Minnesota's ground water. A recent analysis of the MPCA's ambient monitoring network identified gaps that affect our understanding of shallow ground water quality. The project will install additional shallow monitoring wells in key under-represented land use settings to address these gaps and thereby improve our understanding of the effects of non-agricultural land uses on ground water quality, including temporal trends.

II. DESCRIPTION OF PROJECT RESULTS

Ground water monitoring in Minnesota is a cooperative effort among the MPCA, the Minnesota Department of Agriculture (MDA) and the Minnesota Department of Health (MDH). The MPCA has primary responsibility for monitoring non-agricultural contaminants in ground-water susceptible to contamination. Sampled wells currently are randomly selected from a pool of existing wells in non-agricultural areas. A 2008 analysis of the current network identified gaps that affect the characterization of shallow ground water quality, including:

1. Reliance on existing wells has resulted in about one-half of the shallow monitoring wells being upgradient of petroleum product spill sites. Use of these wells has introduced a bias toward the presence of petroleum-related volatile organic compounds (VOCs) in the results, preventing the MPCA from drawing technically-sound conclusions about VOC contamination in the shallow ground water underlying urban areas.
2. A majority of the shallow monitoring wells are located in commercial and industrial settings. This results in a network that is under-representative of other important land use settings, such as sewered residential, unsewered residential, and undeveloped areas.
3. Relying on existing wells, which often are not owned by the MPCA, can lead to varying periods of records among the sites, confounding data interpretation. For example, from 2004-2007, five of the 39 wells sampled to determine VOC trends were sealed by the well owner or had access issues that prevented sample collection.

To address these gaps, the shallow monitoring well component of the network will be redesigned to discern the effect of four types of land use (sewered urban residential, unsewered urban residential, commercial/ industrial, and undeveloped) and the natural composition of the surficial aquifer on shallow ground-water quality. A total of 200 wells are needed to fully implement the redesigned network. A sufficient number of existing shallow wells are not available to implement this design, and funding is needed to install 150 wells. The well installation will occur in two phases due to logistical limits to the number of wells that can be installed each year. This proposal is for the first phase of well installation, which will involve installing and sampling 110 monitoring wells over three years, with the remaining 40 wells installed during a subsequent phase.

Result 1: Well Installation

Budget: \$ 413,000

Installation of wells for the MPCA's ambient ground water monitoring network in key under-represented areas will fill identified data gaps and substantially improve the understanding of the quality of shallow ground-water in non-agricultural areas of the state. Wells will be sited using a random-stratified statistical design. A total of 110 wells will be installed during the three-year project.

Deliverable

Completion Date

1. 110 monitoring wells, including well logs

6/30/2012

Result 2: Well Monitoring**Budget: \$1,051,700 (in-kind)**

Sampling of existing wells will continue during the project, and sampling of new wells will commence following installation, as part of the MPCA's routine ambient ground water monitoring network. Each year, the MPCA will collect water samples from at least 100 wells and have them analyzed for nitrate, VOCs and chloride concentrations. Staff will also collect field measurements such as alkalinity, dissolved oxygen, pH, water temperature, and water level. At the end of each monitoring season, MPCA staff will interpret the data and document the results.

Deliverable**Completion Date**

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Data report listing sampling results from each sampling year 2. Annual monitoring summary | <p>12/31/2010, 12/31/2011, 12/31/2012
3/31/2010, 3/31/2011, 3/31/2012</p> |
|---|---|

III. PROJECT STRATEGY AND TIMELINE**A. Project Partners**

The MDA and MDH work cooperatively with the MPCA to monitor Minnesota's ground-water quality, an approach which was clarified in a 2004 Memorandum of Agreement (MOA). All data collected by the MPCA is made available to MDA, MDH, or any other party requesting the information.

Project Team:

- Shannon Lotthammer, Project Manager (MPCA)
- Steve Thompson, Sharon Kroening, Project technical leads (MPCA)

B. Project Impact

The project will substantially improve monitoring of water-quality conditions of shallow ground water in non-agricultural parts of the state. Shifting the network to a random-stratified design based on land use/cover and aquifer composition will allow the MPCA to discern the effect these have on water-quality conditions. Information on land-use impacts on ground-water quality is needed by the MPCA to proactively issue permits, set policy, and establish environmental priorities. Using wells owned and installed by the MPCA for ground-water monitoring also will result in longer-term records, improving the MPCA's ability to determine water-quality trends. Finally, an established network of shallow wells in different land uses could be used in the future to evaluate the effects of best management practices or investigate the fate of emerging contaminants.

C. Time

The requested funds will be used for well installation by a licensed driller under contract to the MPCA during fiscal years 2010-2012, and a student worker who will assist in preparing site access agreements and well construction permits. It was assumed each well would cost \$3,000, on average, to install, and costs would increase by five percent each fiscal year. All costs for project coordination, sample analysis and field expenses will be covered by the MPCA as an in-kind project contribution.

D. Long-Term Strategy

This project will address identified gaps in the ambient ground-water monitoring network currently operated by the MPCA. Understanding ambient ground-water quality is a stated goal of the MPCA, as indicated in its Strategic Plan (Goal W.1. Assess the condition of Minnesota's ground-water systems). Additional funding will be needed to complete the second phase of the project to install the remaining 40 new wells required for the refined network. The MPCA has a long-term commitment to ambient ground-water-quality monitoring, and has funded the current monitoring network since 2004, including staff salaries and all expenses associated with sample collection such as laboratory analytical, supply, equipment, and travel costs.

Project Budget

INSTRUCTIONS AND TEMPLATE (1 PAGE LIMIT)

(One page limit, single-sided, 10 pt. font minimum Retain the bold text and remove all instructions typed in italics. Add or delete rows as is necessary. If a category is not applicable you may write "N/A", leave it blank, or delete the row.)

IV. TOTAL PROJECT REQUEST BUDGET

BUDGET ITEM <i>(See list of Eligible & Non-Eligible Costs, p. 17)</i>	AMOUNT	% FTE
Personnel: <i>Student worker to assist in obtaining access to sites and processing paperwork</i>	\$ 38,000	100%
Contracts: <i>Contract to a professional well driller(s) to install 110 monitoring wells, approximately 20-feet deep</i>	\$ 331,000	
Other: <i>Well construction and maintenance fees</i>	\$ 44,000	
	\$ -	
TOTAL PROJECT BUDGET REQUEST TO LCCMR	\$ 413,000	

V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	Status
Other Non-State \$ Being Leveraged During Project Period: <i>What additional non-state cash \$ will be spent on the project during the funding</i>	\$ -	Secured or Pending
Other State \$ Being Spent During Project Period: <i>What additional state cash \$ (e.g. bonding, other grants) will be spent on the project during the</i>	\$ -	Secured or Pending
In-kind Services During Project Period:	\$ -	
Salary contributed by the MPCA for a full-time ambient ground water monitoring network coordinator, full-time ambient ground water monitoring network field coordinator, part-time database administrator, and summer field staff in fiscal years 2010-2012	\$ 826,200	
Funds contributed by the MPCA for laboratory analytical expenses for the monitoring network in fiscal years 2010-2012	\$ 170,000	
Funding contributed by the MPCA for sampling equipment and supplies for the monitoring network in fiscal years 2010-2012	\$ 33,000	
Funding contributed by the MPCA for travel associated with sample collection in fiscal years 2010-2012	\$ 22,500	
Past Spending: <i>List money spent or to be spent on this specific project, cash and/or in-kind, for 2-year timeframe prior to July 1, 2009</i>	\$ -	
Funds contributed by the MPCA to support ambient ground water-quality monitoring in state fiscal year 2009	\$ 332,100	
Funds contributed by the MPCA to support ambient ground water-quality monitoring in state fiscal year 2008	\$ 323,300	

PROJECT MANAGER QUALIFICATIONS

Present Position

Shannon Lotthammer is the Program Manager for the Water Monitoring Section of Environmental Analysis and Outcomes Division in the Minnesota Pollution Control Agency. The Water Monitoring Section is responsible for monitoring the condition of Minnesota's lakes, streams, wetlands and groundwater resources in cooperation with federal, state and local partners. Ms. Lotthammer has been with the Minnesota Pollution Control Agency for more than 10 years, in various positions ranging from program development, to watershed project management, to monitoring planning. She also spent 3 ½ years in local government as the administrator of the Prior Lake-Spring Lake Watershed District in Scott County, Minnesota.

Education

Bachelor of Science degree in Biology from the University of Minnesota-Duluth, 1991.
Master of Science degree in Ecology from the University of Minnesota-Twin Cities, 1994.

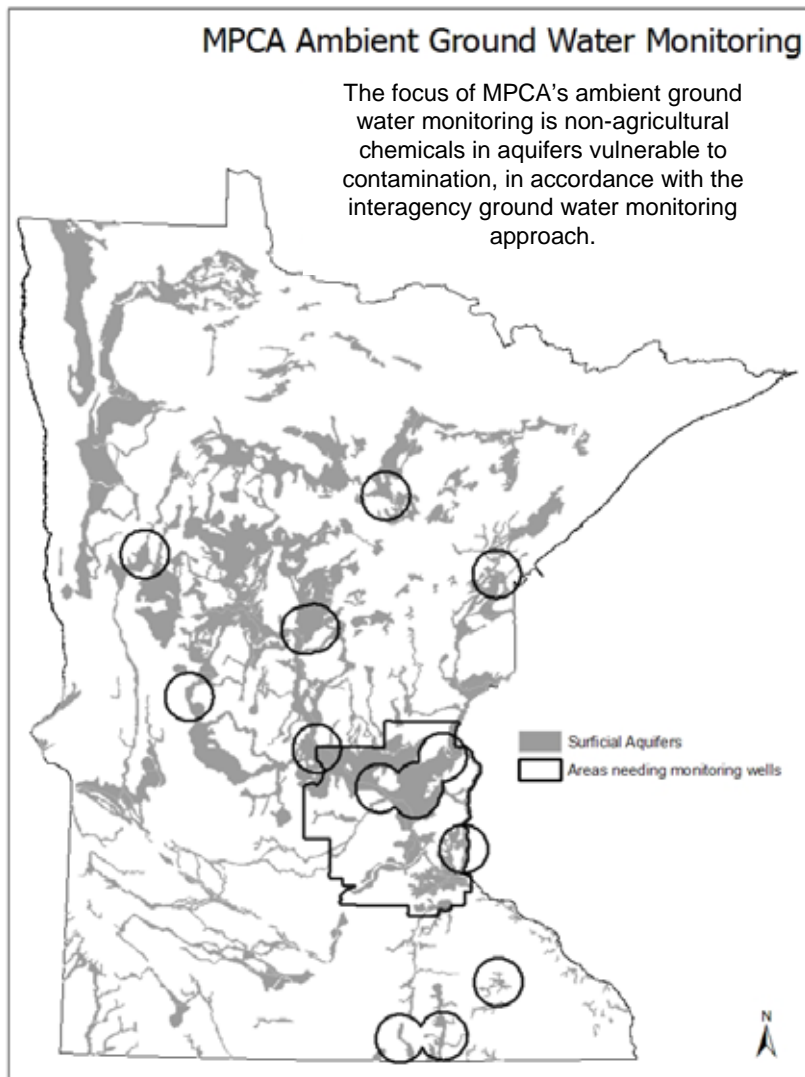
MOST RECENT LCCMR PROJECT

Ms. Lotthammer participated in the initial development of the successful project, Accelerating and Enhancing Surface water Monitoring for Lakes and Streams, 2003.

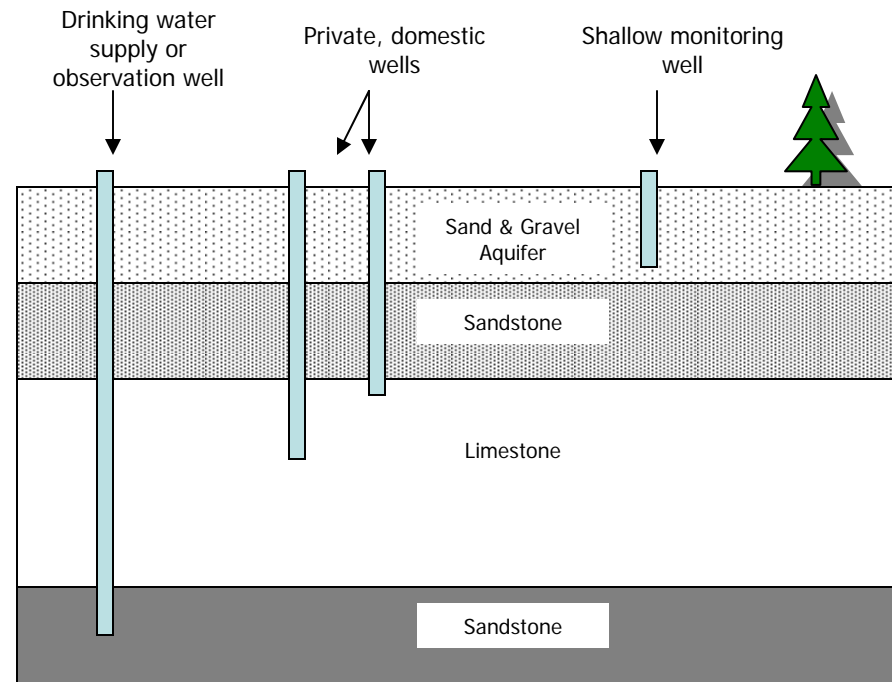
ORGANIZATION DESCRIPTION

The Minnesota Pollution Control Agency (MPCA) was established as a state agency in 1967 to protect the air, waters and land of Minnesota. The mission of the MPCA is to work with Minnesotans to protect, conserve and improve our environment and enhance our quality of life. To continue moving Minnesota toward environmental excellence, the MPCA monitors environmental quality, offers technical and financial assistance, and enforces environmental regulations.

Shallow wells in sand & gravel aquifers are first to show indications of contamination



Example Geologic Cross-section



*Not to scale