

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

LCCMR ID: 048-B

Project Title: Arsenic Occurrence in Private Well Water

Category: B. Water Resources

Total Project Budget: \$ \$86,540

Proposed Project Time Period for the Funding Requested: 2 yrs, July 2011 - June 2013

Other Non-State Funds: \$ 0

Summary:

Private wells must be tested for arsenic, a human carcinogen, at the time of construction. This project will retest selected wells to determine whether arsenic levels change over time.

Name: Michael Convery

Sponsoring Organization: Department of Health

Address: 625 Robert St N, Box 64975
Saint Paul MN 55164-0975

Telephone Number: 651-201-4586

Email: michael.convery@state.mn.us

Web Address: www.health.state.mn.us/divs/eh/wells

Location

Region: Statewide

Ecological Section: I (222M), Lake Agassiz, Aspen Parklands (223N), Red River Valley (251A), North Central Glaciated Plains (251B)

County Name: Statewide

City / Township: Statewide

_____ 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: Arsenic Occurrence in Private Well Water

I. PROJECT STATEMENT

Arsenic occurs widely in Minnesota groundwater. Approximately half of all wells contain detectable arsenic, and about 10% of wells exceed the drinking water standard (“Maximum Contaminant Level”) of 10 micrograms per liter (ug/L). Since August 4, 2008, Minnesota Rules, Chapter 4725, have required persons constructing new potable water supply wells, usually licensed well contractors, to have a water sample tested for arsenic by a state-certified laboratory. Sampling of private wells, thereafter, is the responsibility of the well owner, and many wells will never be tested again. Long-term exposure to arsenic at levels exceeding 100 ug/L can cause a variety of health problems, including diabetes, circulatory diseases, neurological effects, and cancer.

Because the very act of drilling a new well can alter the geochemistry around a well intake, it is possible that arsenic levels from some newly-constructed wells may not always be representative of long-term arsenic levels produced by those wells.

Under this project, the Minnesota Department of Health (MDH) will sample 120 private water-supply wells constructed since August, 2008, but older than six months, and compare arsenic results with samples collected by well contractors when the wells were drilled. Four specific regions of the state have been identified for study, and 30 wells from each region will be evaluated. If significant disagreement between the initial and longer-term test results is found in a significant number of cases, further research will be proposed to characterize the extent, scope, and possible cause(s) of the differences, and modifications to the current testing or well construction requirements may be proposed.

II. DESCRIPTION OF PROJECT ACTIVITIES

Activity 1: Well Sampling for Arsenic Testing

Budget: \$ 80,240

MDH Well Program staff will identify 30 candidate wells within each of the four defined regions of the state, 10 wells having been initially found to contain no detectable arsenic, 10 wells having results between the detection limit and 10 ug/L, and 10 wells having results exceeding 10 ug/L (if available).

MDH staff will meet with each cooperating well owner, collect some basic background data, sample the well water for arsenic, and provide information pertaining to arsenic in drinking water to the owner. Duplicate samples will be collected from 40 of the wells (10 per region) to ascertain any differences between laboratory-preserved samples (current practice) and field-preserved samples. Samples will be shipped to the MDH Public Health Laboratory within 48 hours, and the laboratory will then analyze each sample using a certified analytical method.

When test results are received, MDH staff will review each result, and provide a copy to each respective well owner. If significant disagreement is found between the contractor-collected sample result and the MDH-collected sample result, MDH will re-sample that well to confirm. If arsenic levels are found to exceed 10 ug/L, MDH staff will discuss treatment and other options for reducing exposure with the well owner.

Activity 2: Data Analysis and Report Preparation**Budget: \$6,300**

After all sample results are received, the project manager or an assigned staff hydrologist will analyze the data, summarize the results, and prepare the report of the study. If the study indicates that more information is needed to investigate inconclusive findings, a detailed recommendation for additional research will be included in the report.

Outcome	Completion Date
1. Final Report regarding the reliability of initial arsenic testing results in predicting long-term arsenic levels in well water.	6/30/13
2. Confirmation that standard sample preservation methods are acceptable, or evidence that changes may be needed.	6/30/13

III. PROJECT STRATEGY**A. Project Team/Partners**

The entire project will be carried out by existing staff of the MDH Well Management Program and the MDH Public Health Laboratory. Field activities will be conducted by Well Program Hydrologists and Well Standards Representatives (advanced level inspectors). Analyses will be performed by Public Health Laboratory Environmental Chemists.

B. Timeline Requirements

The entire project will be completed within 24 months. Because Well Program staff have other high-priority duties, including complaint responses and emergency responses, project activities will be performed as events allow. It is possible that the entire 24 months may not be needed to complete the project, and in that event, the final report will be completed sooner.

C. Long-Term Strategy and Future Funding Needs

At this time, there are no specific plans for future work. If this study suggests that arsenic levels often stabilize slightly higher or lower than initial levels, MDH may simply modify our current recommendations to well owners on when to re-sample for arsenic.

There is currently no evidence suggesting that arsenic levels found at the time of well construction should differ dramatically from long-term arsenic levels, under geochemical conditions found in Minnesota. However, if this study should suggest otherwise, a second project may be proposed to further evaluate those findings.

2011-2012 Detailed Project Budget

IV. TOTAL TRUST FUND REQUEST BUDGET

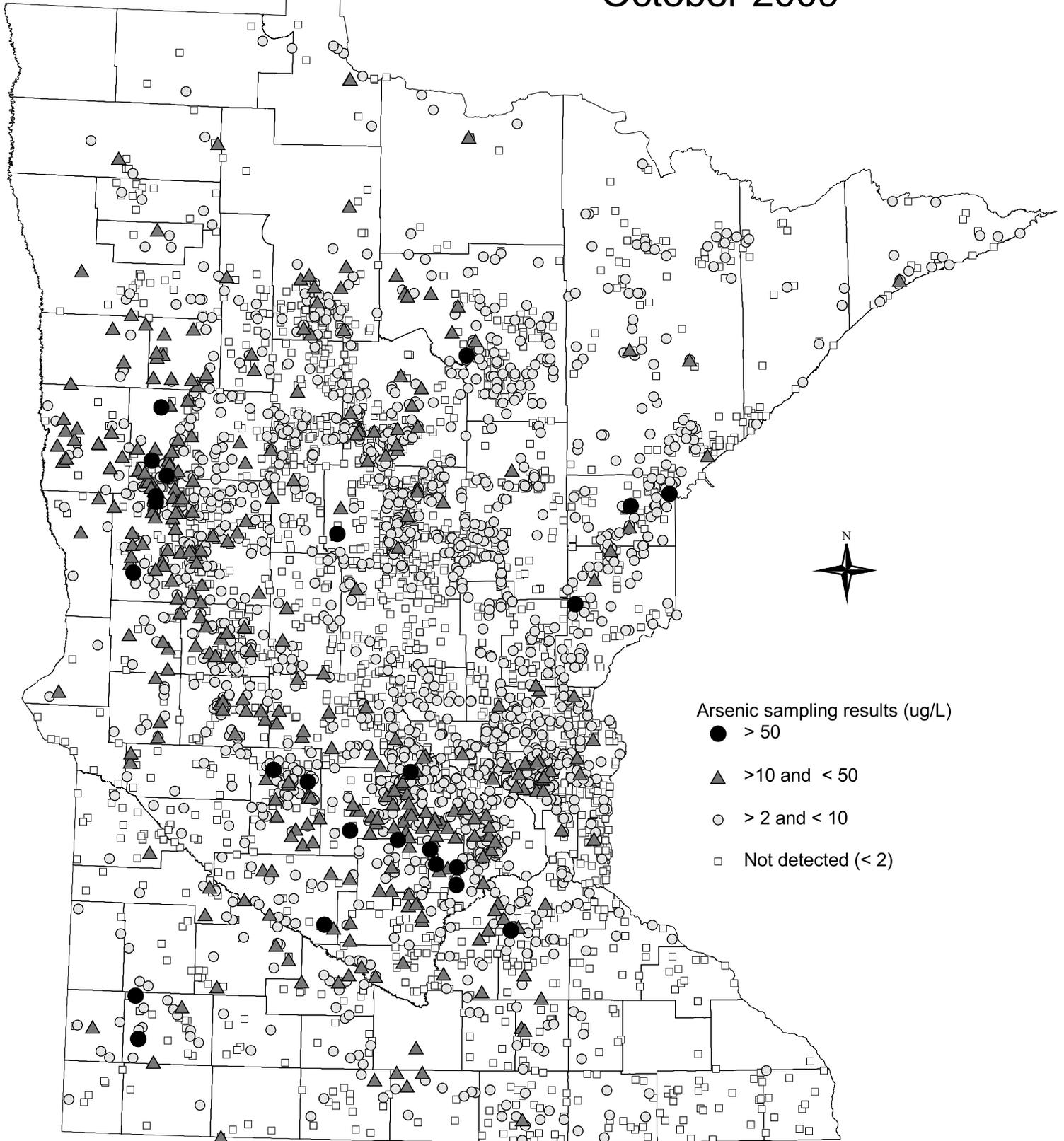
2 years

<u>BUDGET ITEM</u>	<u>AMOUNT</u>																
Personnel: <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;"></td> <td style="text-align: center;">Total Hours</td> <td style="text-align: center;">Salary</td> <td style="text-align: center;">Benefits</td> </tr> <tr> <td>Hydrologist Supervisor (Project Mgr.)</td> <td style="text-align: center;">120</td> <td style="text-align: center;">5,298</td> <td style="text-align: center;">1,676</td> </tr> <tr> <td>Regional Hydrologist Supervisors</td> <td style="text-align: center;">60</td> <td style="text-align: center;">2,741</td> <td style="text-align: center;">862</td> </tr> <tr> <td>Field Hydrologists/Well Representatives</td> <td style="text-align: center;">800</td> <td style="text-align: center;">29,515</td> <td style="text-align: center;">10,570</td> </tr> </table> <p>Due to the current housing depression, both the Well Management program revenue and the staff workload have been reduced, so this project can be accomplished with existing permanent staff.</p>		Total Hours	Salary	Benefits	Hydrologist Supervisor (Project Mgr.)	120	5,298	1,676	Regional Hydrologist Supervisors	60	2,741	862	Field Hydrologists/Well Representatives	800	29,515	10,570	\$50,665
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Contracts: While not a formal contract, a separate project code will be create with the MDH Public Health Lab to analyze 200 water samples for arsenic, at a cost of \$29 per analysis: <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">120 Initial samples</td> <td style="width: 35%;"></td> <td style="text-align: center;">3,480</td> <td></td> </tr> <tr> <td>40 Follow-up samples</td> <td></td> <td></td> <td style="text-align: center;">1,160</td> </tr> <tr> <td>40 Duplicates with field preservation</td> <td></td> <td></td> <td style="text-align: center;">1,160</td> </tr> </table>	120 Initial samples		3,480		40 Follow-up samples			1,160	40 Duplicates with field preservation			1,160	\$5,800				
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Travel: (Assumption: Two complete sampling events can be accomplished per day, including delivery of samples to the shipper. Total daily travel should average no more than 250 miles per 2 samples. Confirmation samples will often require a separate trip, probably averaging about 200 miles) <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">120 Initial samples X 125 miles at \$0.50/mi. =</td> <td style="width: 35%;"></td> <td></td> <td style="text-align: center;">7,500</td> </tr> <tr> <td>40 Follow-up/confirmation samples X 200 miles at \$0.50/mi. =</td> <td></td> <td></td> <td style="text-align: center;">4,000</td> </tr> </table>	120 Initial samples X 125 miles at \$0.50/mi. =			7,500	40 Follow-up/confirmation samples X 200 miles at \$0.50/mi. =			4,000	\$11,500								
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V. OTHER FUNDS

<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
Other Non-State \$ Being Applied to Project During Project Period:	\$0	
Other State \$ Being Applied to Project During Project Period:	\$0	
In-kind Services During Project Period:	\$0	
Remaining \$ from Current ENRTF Appropriation (if applicable):	\$0	
Funding History:	\$0	

Minnesota Department of Health Arsenic levels of selected wells October 2009



LCCMR 2011-12 Project Proposal

Project Title: Arsenic Occurrence in Private Well Water

Project Manager Qualifications:

Michael P. Convery, Supervisor, Operations Unit, Well Management Section, Minnesota Department of Health

Education

B.S. Geology/Geochemistry - State University of New York (1976)

M.S. Hydrogeology – University of Minnesota (1979)

Certified Professional Geologist (#6773)

Minnesota-licensed Professional Geologist (#3003)

Experience

1979-83 – Hydrologist, MDH Water Supply Section.

1983-92 – Hydrologist, MPCA Site Response.

1992-Present – Supervisor, Operations Unit, MDH Well Management Section

Organization Description

The Well Management Section, Division of Environmental Health, Minnesota Department of Health, protects the health of Minnesotans who drink well water, and protects the state's groundwater resources by assuring that wells and borings in Minnesota are properly sited, constructed, maintained, and ultimately sealed (closed) when their useful life is over. Approximately 70% of Minnesotans use well water, from either public or private wells, as their primary source of drinking water.

Primary Well Program functions include: establishing and enforcing rules for constructing, testing, and ultimate sealing (abandonment) of wells and borings; licensing well/boring contractors; administering permits and notifications to construct and seal wells and borings; inspecting the construction and sealing of wells and borings; following up on property transfers to assure that unused wells and borings are properly sealed, and; providing education, training, technical assistance, and information to well contractors, consultants, well owners, and others.