

**Environment and Natural Resources Trust Fund  
2018 Request for Proposals (RFP)**

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**Project Title:**

**ENRTF ID: 064-B**

Unregulated Contaminants: Addressing Gaps in Drinking Water Protection

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**Category:** B. Water Resources

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**Total Project Budget:** \$ 2,107,920

**Proposed Project Time Period for the Funding Requested:** 4.5 years, July 2018 to December 2021

**Summary:**

This project will characterize unregulated drinking water contaminants at wells and intakes (which pump from groundwater, lakes, rivers), and to examine if they persist after standard public water system treatment.

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**Name:** Stephen Robertson

**Sponsoring Organization:** Minnesota Department of Health

**Address:** 625 Robert Street N  
Saint Paul MN 55164-0975

**Telephone Number:** (651) 201-4648

**Email** steve.robertson@state.mn.us

**Web Address** http://www.health.state.mn.us/

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**Location**

**Region:** Statewide

**County Name:** Statewide

**City / Township:**

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**Alternate Text for Visual:**

This page contain a series of three graphics: 1) the first is a combination of narrative text repeating some of the language from the narrative proposal as well as a graph showing that iopamidol, 5-methylbenzotriazole, sertraline, and amitriptyline occurred in more than 75%, 40%, 40%, respectively, of surface water sampling locations in a 2017 MPCA study, 2) the second uses graphics to communicate the small number of regulated contaminants relative to the number of chemicals in use as well as the numbers of people relying on public water systems vs private wells, and 3) the third indicates that standard treatment for surface water is more complex than typical treatment for groundwater and private wells.

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



**PROJECT TITLE: Unregulated contaminants: addressing gaps in drinking water protection**

**I. PROJECT STATEMENT**

Unregulated contaminants are one of the 21<sup>st</sup> century threats to drinking water for which existing resources and regulatory approaches are insufficient. There is increasing data and information that groundwater and surface water resources used for drinking water supply contain a number of chemicals from a variety of sources. Industrial and municipal wastewater effluent is known to contain pharmaceuticals, personal care products and other endocrine-active substances, while runoff and infiltration from agricultural lands often contain various types of pesticides. Additionally, natural events like algal blooms can produce cyanotoxins that are acutely toxic to human health. This proposal aims to characterize the water quality of drinking water sources in Minnesota more fully than has been done previously and to evaluate the degree to which contaminants present in raw source water may persist to finished drinking water.

The Minnesota Department of Health (MDH) monitors all public water systems (approximately 7000 statewide) for conformance with federal water quality standards. EPA has established about 100 water quality standards for drinking water. Federal regulation requires that these standards are met in finished water – the product that a public water system delivers to its customers. A key shortcoming with this approach is that there are thousands of chemicals in use in modern society for which little or no monitoring of drinking water is done because there are neither federal standards (and thus no regulatory mandate) nor resources to test for them at drinking water sources. Some of our agency partners (MPCA, MDA, USGS, EPA) have conducted monitoring of lakes, rivers or ambient groundwater to better understand water quality conditions, but none of these efforts are focused on drinking water sources. Knowledge about source water quality at the intake or well provides information critical to protecting public health.

The goals of this project are to increase drinking water source monitoring capacity, collect targeted water quality data, and enhance existing efforts in the areas of source water protection, water treatment, and the management of unregulated contaminants in drinking water sources. Currently, the lack of data to drive these efforts undermines the integrity of future drinking water protection efforts. As a result, achieving project goals pertaining to drinking water source characterization will provide data and knowledge that state and local officials can use to prioritize future interventions in a way that minimizes risk and maximizes public health benefit.

**II. PROJECT ACTIVITIES AND OUTCOMES**

**Activity 1:** *Develop monitoring networks and sampling plans*

**Budget: \$80,150**

Analyze previous monitoring efforts, develop monitoring networks for predefined sets of threat categories, create monitoring plan.

<b>Outcome</b>	<b>Completion Date</b>
<i>1. Establish monitoring networks of public water system wells and intakes targeted to setting: agricultural, septic, surface water</i>	<i>January 2019</i>
<i>2. Develop sampling plan detailing unregulated contaminant parameter lists, monitoring frequency, sampling sites derived from previous ambient monitoring work</i>	<i>March 2019</i>



**Environment and Natural Resources Trust Fund (ENRTF)**

**2018 Main Proposal**

**Project Title: Unregulated contaminants: addressing gaps in drinking water protection**

**Activity 2:** *Execute drinking water source sampling and analysis projects.*

**Budget: \$1,872,620**

This work will involve the collection and analysis of samples from the monitoring networks derived from representative subsets of the over 10,000 drinking water sources statewide.

<b>Outcome</b>	<b>Completion Date</b>
<i>1. Coupled source water/finished water data sets are established for unregulated contaminants</i>	<i>October 2020</i>
<i>2. Compile, assess, evaluate monitoring results</i>	<i>March 2021</i>

**Activity 3:** *Vulnerability/Feasibility study of specific drinking water threats (data analysis, reporting)*

**Budget: \$155,150**

The monitoring and inventory results will be evaluated relative to risk. For example, unregulated contaminants of concern (i.e., those identified in the drinking water source monitoring) will be evaluated as to efficacy of contaminant source management, existing treatment approaches, as well as health-based guidance.

<b>Outcome</b>	<b>Completion Date</b>
<i>1. Vulnerability/feasibility study of specific drinking water threats</i>	<i>September 2021</i>
<i>2. Develop strategies to extend this work beyond the site specific conditions of the systems included in the study</i>	<i>December 2021</i>

**III. PROJECT STRATEGY**

**A. Project Team/Partners**

The project will be led by Dr. Dan Symonik, assistant manager of the Drinking Water Protection section of the Minnesota Department of Health and Steve Robertson, Source Water Protection Unit supervisor at the Minnesota Department of Health. The project will support several temporary staff positions including a project coordinator, two field sampling technicians, and seasonal student workers. The project will require subcontracting to an environmental consulting firm, or the USGS for certain activities. All work will be coordinated with state and local partners.

**B. Project Impact and Long-Term Strategy**

This project is designed to identify existing water quality conditions relative to unregulated contaminants. Knowledge about which contaminants in drinking water sources elude standard water treatment methods will help to set priorities of other drinking water protection efforts. For example, the outcomes of this work will be used to inform work efforts involving source water protection, development of health based guidance, drinking water treatment, as well as other means of managing unregulated contaminants in drinking water sources. Additionally, the results of this work will help to facilitate interagency coordination and cooperation to prioritize and target drinking water protection efforts. Our intent is to use the project to leverage other funding partners to support ongoing and permanent drinking water source characterization efforts. Lastly, the laboratory analytical techniques required for the work described in this proposal are, at present, cost-prohibitive to carry out routinely. Accordingly, this study will include the development of strategies (e.g., indicator parameter lists, simplified analytical protocols, use of new technology) that could be used in general practice by MDH, public water systems and other stakeholders to evaluate risks relative to unregulated contaminants.

**C. Timeline Requirements**

The project will commence in July 2018 and conclude in December 2021.

## 2018 Detailed Project Budget

**Project Title: Unregulated contaminants: addressing gaps in drinking water protection**

*INSTRUCTIONS AND TEMPLATE (1 PAGE LIMIT)*

*Attach budget, in MS-EXCEL format, to your "2018 LCCMR Proposal Submission Form".*

*(1-page limit, single-sided, 10 pt. font minimum. Retain bold text and DELETE all instructions typed in italics. ADD OR DELETE ROWS AS NECESSARY. If budget item row is not applicable put "N/A" or delete it. All of "Other Funds" section must be filled out.)*

### IV. TOTAL ENRTF REQUEST BUDGET: Four years (FY2018 - FY2021)

<b>BUDGET ITEM</b> (See "Guidance on Allowable Expenses", p. 13)	<b>AMOUNT</b>
<b>Personnel:</b>	
Project manager/coordinator (76% salary, 24% fringe, 1 FTE at 75% for 4 years)	\$ 314,400
Unclassified sampling technicians (76% salary, 24% fringe, 2 FTE at 100% for two years)	\$ 209,600
<b>Professional/Technical/Service Contracts:</b>	
Private analytical laboratory (pharmaceuticals, personal care products, other)	\$ 972,000
Private analytical laboratory (pesticides)	\$ 158,400
MDH public health laboratory (selected water quality parameters, specialized analyses)	\$ 270,720
Engineering consultant (RFP selection) to analyze study results, and conduct risk assessment regarding treatment approaches.	\$ 150,000
<b>Equipment/Tools/Supplies:</b>	
Field analytical equipment and sampling supplies	\$ 14,500
<b>Acquisition (Fee Title or Permanent Easements):</b>	NA
<b>Travel:</b>	
Mileage, subsistence for field sampling staff	\$ 18,300
<b>Additional Budget Items:</b>	NA
<b>TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =</b>	<b>\$ 2,107,920</b>

### V. OTHER FUNDS (This entire section must be filled out. Do not delete rows. Indicate "N/A" if row is not applicable.)

<b>SOURCE OF FUNDS</b>	<b>AMOUNT</b>	<b>Status</b>
<b>Other Non-State \$ To Be Applied To Project During Project Period:</b>	\$ -	
Federal CWA, Section 106 Monitoring grant (\$10,000/year for 2 years of sampling)	\$ 20,000	<i>Pending</i>
<b>Other State \$ To Be Applied To Project During Project Period:</b>	NA	
<b>In-kind Services To Be Applied To Project During Project Period:</b>	\$ -	
Dan Symonik, MDH staff, 480 hours over project duration	\$ 13,200	<i>Secured</i>
Steve Robertson, MDH staff, 640 hours over project duration	\$ 35,200	<i>Secured</i>
Rich Soule, MDH staff, 640 hours over project duration	\$ 35,200	<i>Secured</i>
MDH Health Risk assessment staff research scientist, 360 hours	\$ 19,800	<i>Secured</i>
Mark Ferrey, MPCA research scientist, 144 hours over four years	\$ 7,920	<i>Secured</i>
Bill vanRyswyk, MDA hydrologist, 144 hours over four years	\$ 7,920	<i>Secured</i>
MDH PHL /MDA laboratory research analysis, as available		<i>pending</i>
<b>Past and Current ENRTF Appropriation:</b>	NA	
<b>Other Funding History:</b>	NA	

# Unregulated Contaminants

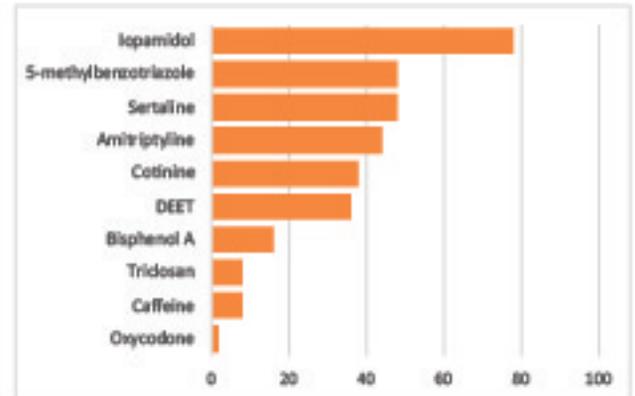
## Addressing Gaps in Drinking Water Protection

Unregulated contaminants in drinking water - often pharmaceuticals, personal care products, pesticides and other chemicals - have been found in up to 70% of Minnesota's rivers and streams.

These contaminants are not yet regulated in drinking water - meaning public utilities do not test or treat for them. Most of these come from human activity such as drug use, medical procedures, and agriculture.

We want to test drinking water at the source and at the tap - to characterize the current situation and to see if conventional treatment provides protection for unregulated contaminants.

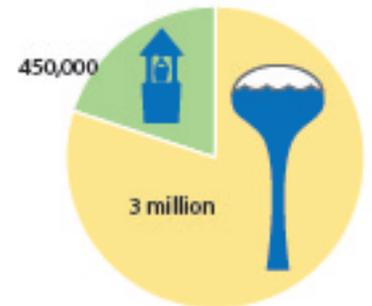
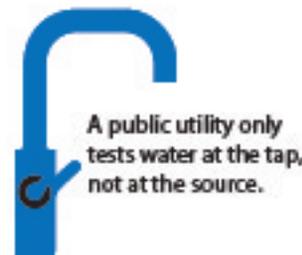
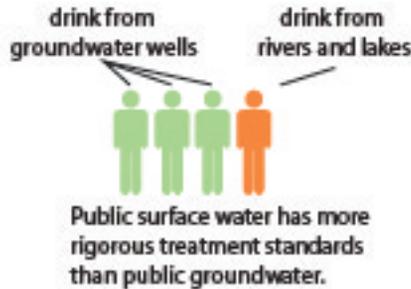
% of Detections of select Contaminants in Minnesota's Rivers and Streams (MPCA, 2017)



There are large gaps in rules about testing and treating drinking water.

**The US**

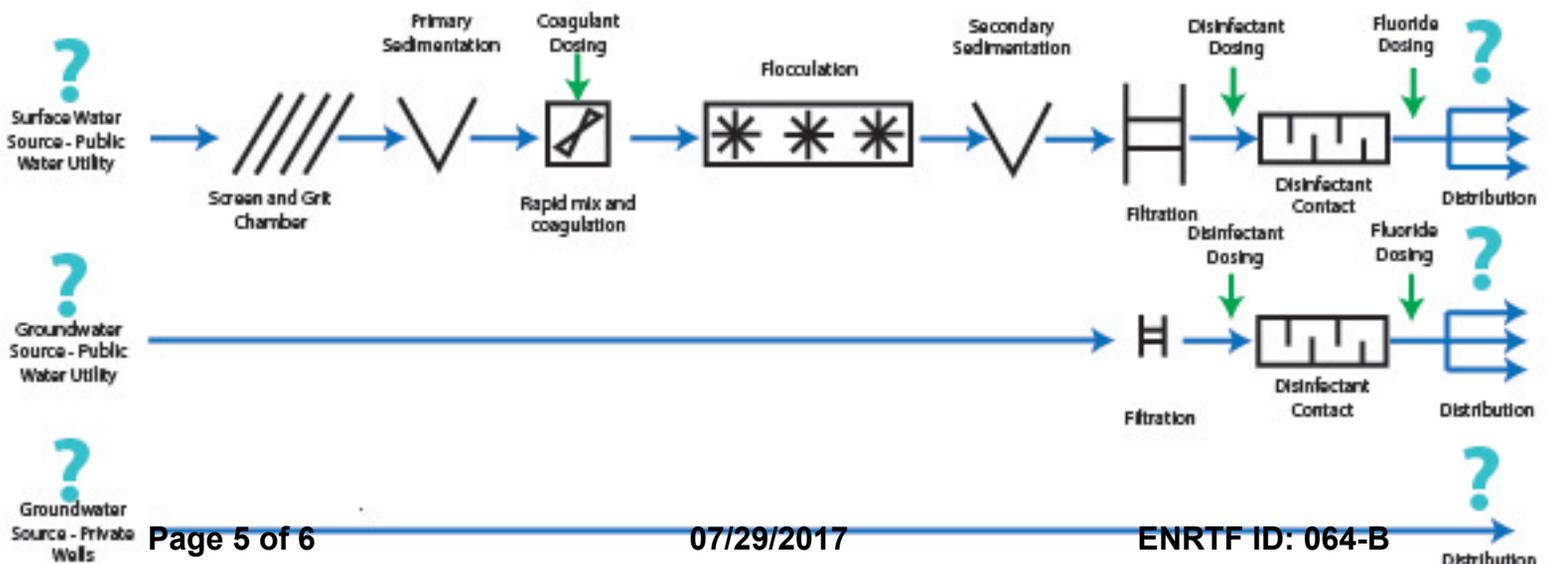
- makes or processes 84,000 chemicals
- regulates about 100 contaminants in public drinking water



Private well owners are advised to test and treat for 4 contaminants - although many do not.

A public utility regulates about 100 contaminants.

We don't know what unregulated contaminants are in the source water or if treatment in place for other concerns removes them.



### **Project Manager Qualifications**

**Stephen Robertson, Project Manager.** Steve Robertson is a professional geologist who supervises the Source Water Protection Program at the Minnesota Department of Health. He has bachelors and masters degrees in geology and has been working in the water resources arena since 1985. He started working on drinking water protection issues as a consultant in the early 1990s and continued in that role after moving to MDH in 1998. He has experience working with public water systems and other stakeholders on source water protection, including the use of investigative activities like monitoring to develop and inform solutions to address drinking water protection issues. His responsibilities as supervisor of the Source Water Protection program and in other work has provided him with background and expertise in managing work teams and budgets.

### **Organization description**

The Minnesota Department of Health is the authority in Minnesota responsible for administration of the federal Safe Drinking Water Act. In this capacity its principal partners at the local level are the community and non-community public water systems that provide drinking water to 80 percent of Minnesotans. MDH carries out this role and achieves regulatory compliance with an emphasis on providing technical assistance, education, training, financial assistance, and certification for operators. The mission of the MDH is to protect, maintain and improve the health of all Minnesotans.