



# LOWER MINNESOTA RIVER WATERSHED DISTRICT

## Executive Summary for Action

Lower Minnesota River Watershed District Board of Managers Meeting

Wednesday June 19, 2019

### **Agenda Item**

#### **Item 5. A. - Freshwater Society Cost Share**

#### **Prepared By**

Linda Loomis, Administrator

#### **Summary**

Dr. Carrie Jennings of Freshwater has submitted a cost share application to the LMRWD. The cost share would fund a project that will look at sediment from an emerging contaminant perspective. The proposal would sample nonylphenol and its ethoxylates in addition to triclosan in the sediment cores that were collected in the LMRWD. Triclosan has a known date of appearance and would provide another age marker in the cores.

Nonylphenol is used in detergents, clothing, food wrap, etc. and has known toxicity in aquatic environments. It does not easily biodegrade, which bodes well for sediment testing.

Triclosan concentration should be declining after the FDA ban effective September 2017. It is a highly toxic chemical which does easily biodegrade in anaerobic conditions.

The majority of the work on the project would be done by Robert McManus, an intern working at Freshwater and supervised by Dr. Jennings. Mr. McManus will be present at the meeting to present the project and answer any question the Board may have.

In addition to testing samples from Rice Lake and Coleman Lake, new samples will be taken at the confluence of the Mississippi and Minnesota Rivers, at the outfall from the Pigs Eye Wastewater Treatment Plant and from River lake, downstream of Pigs Eye. Freshwater intends to approach the Ramsey/Washington Watershed District and the Lower Mississippi River Water Management Organization for additional funds.

The application for Cost Share is attached.

#### **Attachments**

Completed 2019 Cost Share application

#### **Recommended Action**

Motion to approve 2019 Cost Share application from Freshwater



**Application type (check one)**  Homeowner  Non-profit - 501(c)(3)  School  
 Business or corporation  Public agency or local government unit

**Project type (check all that apply)**  Raingarden  Vegetated Swale  Infiltration Basin  
 Wetland restoration  Lake/creek/wetland buffer  Conservation practice  
 Shoreline/bank stabilization  Pervious hard surface  
 Other Quantification of Nonylphenol in Lake Sediment

### Applicant Information

Name of Organization or Individual Applying for Grant (to be named as Grantee):

Freshwater

Address (street, city and ZIP code):

2424 Territorial Road, Suite B. St. Paul, MN 55114.

Phone: 651-313-5800 Email address: freshwater@freshwater.org

### Primary Contact (if different from above)

Name of Organization or Individual Applying for Grant (to be named as Grantee):

Dr. Carrie Jennings

Address (street, city and ZIP code):

2424 Territorial Road, Suite B. St. Paul, MN 55114

Phone: 612-718-1415 Email address: cjennings@freshwater.org

### Project location

Address (street, city and ZIP code):

Pre-existing cores taken in the Lower Minnesota River Watershed from Rice Lake (Lat. 44°48'50.76"N Long.93°30'55.80"W), and Colman Lake (Lat. 44°47'28.32"N Long.93°20'21.48"W ) will be sampled. Samples will be compared with those from new cores taken downstream of the confluence with the Mississippi and the wastewater treatment plant in Pig's Eye lake (Lat. 44°55'5.04"N Long. 93° 1'38.47"W) and River Lake (Lat. 44°48'21.96"N Long. 93° 1'5.16"W).

Property Identification Number (PID)

-

Property Owners:

-

## Project Summary

Title Quantifying Nonylphenol, its Ethoxylates' Chemical History in the Twin Cities' Urban Watershed using Lake Sediment Cores.

Total Project Cost ~\$21,000 Grant amount requested \$10,000

Estimated start date June 17<sup>th</sup>, 2019 Estimated completion date June, 2020

Is project tributary to a water body?  No, water remains on site  Yes, indirectly  Yes, directly adjacent

### Project description:

Nonylphenol and its ethoxylates are part of a broader chemical family of alkylphenols which are implemented in a large diversity of applications ranging from industrial surfactants to “down the drain” products such as laundry detergents and dish soap. There is growing concern about these chemicals due to their slow rate of anaerobic environmental degradation, potential for high levels of bioaccumulation, and endocrine disrupting properties which pose potential threats to Minnesota’s at-risk populations and aquatic ecosystems. In this study, we aim to collect and analyze lake cores from the lakes alongside the Mississippi river, within the Twin Cities’ urban watershed, in order to quantify the history of these contaminant concentrations. We plan to sample cores from Pig’s Eye Lake and analyze pre-existing ones for River Lake, which are both located downstream of St. Paul’s Metro Plant wastewater treatment plant. We will then compare their chemical compositions to pre-existing cores located upstream of the Metro Plant in Snelling and Rice Lake.

Is this work required as part of a permit?  No  Yes

(If yes; describe how the project provides water quality treatment beyond permit requirement on a separate page.)

## Project Details

**Checklist** To be considered complete the following must be included with the application.

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> location map           | <input checked="" type="checkbox"/> project timeline                             |
| <input type="checkbox"/> site plan & design schematic      | <input type="checkbox"/> proof of property ownership                             |
| <input type="checkbox"/> itemized budget or contractor bid | <input type="checkbox"/> plant list & planting plan (if project includes plants) |

## Description

Describe the current site conditions, as well as site history, and past management

Pig’s Eye Lake is currently a mostly undeveloped fluvial lake adjacent to the Mississippi river on the south side of St. Paul. The only real development directly on the shoreline include a grain/fertilizer facility, junk yard, and a cement company all located on the south end of the lake. The northern end of the lake is crossed by a railroad and the northwest side of the lake has the Metro Plant wastewater treatment plant (WWTP): it is not directly on the lake. Pig’s Eye lake is separated from the Mississippi by a thin strip of land, but the river and lake are connected at two points which allows some water exchange. The effluent from the WWTP is discharged into the Mississippi, just north of the lake, and when the river is up, water flows over the strip of land which further connects the lake and the river. This unique dynamic allows some of the effluent from the WWTP to enter into this lake and be captured in the sediment but still allows for continuous sedimentation. There are no preexisting cores of this lake to the best of our knowledge. Existing cores upstream of this lake will be used for comparison. The lakes are similar in their setting and are undeveloped fluvial lakes that are subject to annual flooding.

What are the project objectives and expected outcomes? Give any additional project details.

The goal of this study is to understand how the contaminants are spatially distributed throughout the watershed in relation to the wastewater treatment plant, assess if chemical concentrations are declining after the EPA initiated the voluntary phase out of the contaminant’s use beginning in 2010, and determine if stricter regulation would be beneficial to the Minnesotan ecosystem. We will only be extracting cores from Pig’s Eye Lake and we will just be sampling from the other cores that are stored by the National Lacustrine Core Facility (LacCore). The hope is for this to help reduce costs for coring while allowing us to analyze a broader range of lakes.

List other key participants and their roles (provide contact information for each partner and his/her expected contribution to the project)

Rob McManus – Co-project designer / Freshwater summer intern, 763-486-2642 [rmcmanus001@csbsju.edu](mailto:rmcmanus001@csbsju.edu)

Dr. Vania Stefanova, Lac Core stef014@umn.edu

Field assistants

Which cost share goals does the project support? (check all that apply)

improve watershed resources  Foster water resource stewardship

increase awareness of the vulnerability of watershed resources

increase familiarity with and acceptance of solutions to improve waters

How does the project support the goals you checked?

This project will quantify the levels of nonylphenol and its ethoxylates within the Twin Cities urban watershed. By publishing this information in the Freshwater newsletter, and potentially an academic journal, we will be able to communicate our findings to academic and public communities. We aim for this research to raise awareness to the amount of endocrine disrupting compounds, and other contaminants, being polluted into our waterways through the use of down the drain products and industrial applications. We hope this will empower communities to alter their purchasing habits to more sustainable products and support policies which seek to further reduce toxic, waterway contamination. Additionally, we want to spark further interest in continuing this research within academia to further quantify and understand current environmental concentrations as well as creating environmentally friendly chemical alternatives.

### Project Details (continued)

**Benefits** Estimate the project benefits in terms of restoration and/or **annual** pollution reduction. If you are working with a designer or contractor, they can provide these numbers. If you need help contact the district Administrator.

| Benefit            | Amount      |
|--------------------|-------------|
| Water captures     | NA gal/year |
| Water infiltrated  | NA gal/year |
| Phosphorus removed | NA lbs/year |
| Sediment removed   | NA lbs/year |
| Land restored      | NA sq. ft.  |

How will you share the project results with your community?

We will publish it in our Freshwater Newsletter, *Facets of Freshwater*, which we be accessible for all members and posted on the Freshwater website. We will reach out to the Star Tribune to ask if they would like to do a story. We will also deliver a public presentation of our results either at the MN Water Resources Conference or the MN Association of Watershed Districts' annual meeting. Finally, we also plan on writing a research article and publishing our results. This process will take longer than just this summer and would most likely spill into the fall and potentially spring of 2020.

Are there other projects that could be initiated as a result of this one?

Yes, the core we extract would be available for other studies of other contaminants of emerging concern. Additionally, we hope that this study initiates more research done within the scientific community on toxic contaminants within the Twin Cities watershed area.

## Evaluation

How will the project be monitored and evaluated?

The project will be evaluated by the statistical confidence in our chemical analysis and the level of accuracy we can obtain from dating the core to correlate dates with chemical concentrations. We will also assess the statistical significance of the spatial differences between the cores to determine how/if the WWTP impacts the deposition of nonylphenol and its ethoxylates in fluvial lake sediments.

## Maintenance agreement

I acknowledge that receipt of a grant is contingent upon agreeing to maintain the project for the number of years outlined in the cost share guidelines. \_\_\_\_ Yes

## Authorization

Name of landowner or responsible party \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Type or handwrite your answers on this form. Attached additional pages as needed

(For questions, contact Linda Loomis at [NaiadConsulting@gmail.com](mailto:NaiadConsulting@gmail.com) or call 763-545-4659.)

Mail the completed application to:

or Email to:

**Lower Minnesota River Watershed District**  
**c/o Linda Loomis, Administrator**  
**112 E. Fifth St., Suite 102**  
**Chaska, MN 55318**

**Linda Loomis, Administrator**  
**[naiadconsulting@gmail.com](mailto:naiadconsulting@gmail.com)**



## Quantification of Nonylphenol and its Ethoxylates in Lake Sediment

