

**Environment and Natural Resources Trust Fund  
2019 Request for Proposals (RFP)**

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**Project Title:**

**ENRTF ID: 097-B**

Reducing Nitrate Harm in the Red River Basin

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**Category:** B. Water Resources

**Sub-Category:**

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**Total Project Budget: \$** 225,749

**Proposed Project Time Period for the Funding Requested:** June 30, 2022 (3 yrs)

**Summary:**

RRB subsurface drainage has increased along with toxic surface water nitrate concentrations. BMPs using 2-stage ditches, cattail harvest applied back to fields will reduce water quality impacts, improve soil health.

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**Name:** Julie Goehring

**Sponsoring Organization:** Red River Basin Commission

**Title:** Project Manager

**Department:** \_\_\_\_\_

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Fargo ND 58102

**Telephone Number:** (701) 356-3183

**Email** leah@redriverbasincommission.org

**Web Address** www.redriverbasincommission.org

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**Location**

**Region:** Northwest

**County Name:** Statewide

**City / Township:**

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**Alternate Text for Visual:**

Two-stage ditch design

<input type="checkbox"/>	Funding Priorities	<input type="checkbox"/>	Multiple Benefits	<input type="checkbox"/>	Outcomes	<input type="checkbox"/>	Knowledge Base	
<input type="checkbox"/>	Extent of Impact	<input type="checkbox"/>	Innovation	<input type="checkbox"/>	Scientific/Tech Basis	<input type="checkbox"/>	Urgency	
<input type="checkbox"/>	Capacity Readiness	<input type="checkbox"/>	Leverage	<input type="checkbox"/>		TOTAL	<input type="checkbox"/>	%
<input type="checkbox"/> If under \$200,000, waive presentation?								



**PROJECT TITLE: Reducing Nitrate Harm in the Red River Basin (RRB)**

**I. PROJECT STATEMENT:**

Identifying and pursuing new, innovative practices to reducing nitrogen and phosphorus in our waterways is imperative to ensure drinkable, fishable and swimmable waters for future generations. Ditch design and management can mitigate high nitrate. By identifying subsurface drainage systems in the Red River Basin for MN that pose the greatest threat to aquatic life and significant nutrient contributions, we can select locations that will provide the biggest bang for our buck.

RRB subsurface drainage is increasing along with a concordant increase in surface water nitrate concentration. Nitrate > than 10-mg/L is toxic to aquatic life. This project will inventory the MN location and density of subsurface drainage systems and measure the threat to aquatic life using MPCA biological monitoring protocols to determine the risk of macroinvertebrate impairment. Currently, there are few impairments, but (Lundeen, MPCA) believes that can change with increasing nitrate. Adjacent ditch infrastructure will be assessed for re-design into a Two Stage Ditch (TSD) for multiple water quality and quantity benefits. Recent research conducted by Magner & others show nitrate reductions from subsurface outlets. Outcomes include: assessment of 20 selected drainage systems from south to north for aquatic risk, as described above, and mitigation TSD plans for defined “at risk” systems identified in this study.

**II. PROJECT ACTIVITIES AND OUTCOMES:**

**Activity 1:** Inventory the location and density of subsurface drainage systems in the RRB or MN and select 20 systems for detailed physical, chemical and biological assessment. High subsurface density that leads to high in-channel nitrate concentrations will be the driving selection criteria for selecting sites.

**ENRTF BUDGET: \$72,874**

<b>Outcome: 20 drainage systems selected for study</b>	<b>Completion Date</b>
1. <i>Examine existing data to select 20 systems</i>	12/2019
2. <i>Design data collection protocol</i>	4/2020
3. <i>Implement data collection</i>	12/2021

**Activity 2:** Measure the threat to aquatic life using MPCA biological monitoring protocols to determine the risk of macroinvertebrate impairment that could lead to 303(d) impaired waters listing. This is how MN is now defining water quality!

**ENRTF BUDGET: \$72,875**

<b>Outcome: Defined macroinvertebrate index biological integrity (MIBI) for 20 study sites</b>	<b>Completion Date</b>
1. <i>Examine existing MIBI data for the RRB</i>	12/2019
2. <i>Collect data as per defined protocol</i>	10/2021
3. <i>Analyse data and prepare an “At Risk” report</i>	12/2021



**Environment and Natural Resources Trust Fund (ENRTF)  
2019 Main Proposal Template**

**Activity 3:** Assess drainage network for open channel re-design into a Two Stage Ditch (TSD). Prepare 5-7 ditch re-design plans for multiple water quality, quantity and soil health benefits. (These funds will not be used to implement the plans)

**ENRTF BUDGET: \$80,000**

<b>Outcome: Planning document and guidance for implementing TSD</b>	<b>Completion Date</b>
1. Obtain drainage information from watershed districts	12/2019
2. Collect field measurements of study site channel geometry	8/2021
3. Prepare a planning document and construction guidance report	6/2022

**III. PROJECT PARTNERS:**

**A. Partners receiving ENRTF funding**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>	<b>Role</b>
Joe Magner	Professor	UMN-BBE	Principle Investigator

**B. Partners NOT receiving ENRTF funding**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>	<b>Role</b>

**IV. LONG-TERM- IMPLEMENTATION AND FUNDING:** Each respective watershed district would be asked to implement the TSD plan to prevent nitrate harm to aquatic life.

**V. TIME LINE REQUIREMENTS:** Study design would occur in 2019, field data collection in 2020 and 2021. The final report would be prepared in 2022.

**VI. SEE ADDITIONAL PROPOSAL COMPONENTS:**

- A. Proposal Budget Spreadsheet** (see attached)
- B. Visual Component or Map**
- C. Parcel List Spreadsheet** (NA)
- D. Acquisition, Easements, and Restoration Requirements** (NA)
- E. Research Addendum** (not required at proposal stage)
- F. Project Manager Qualifications and Organization Description** (see attached)
- G. Letter or Resolution**
- H. Certified Audit or 990 Tax Information**

## 2018 Detailed Project Budget

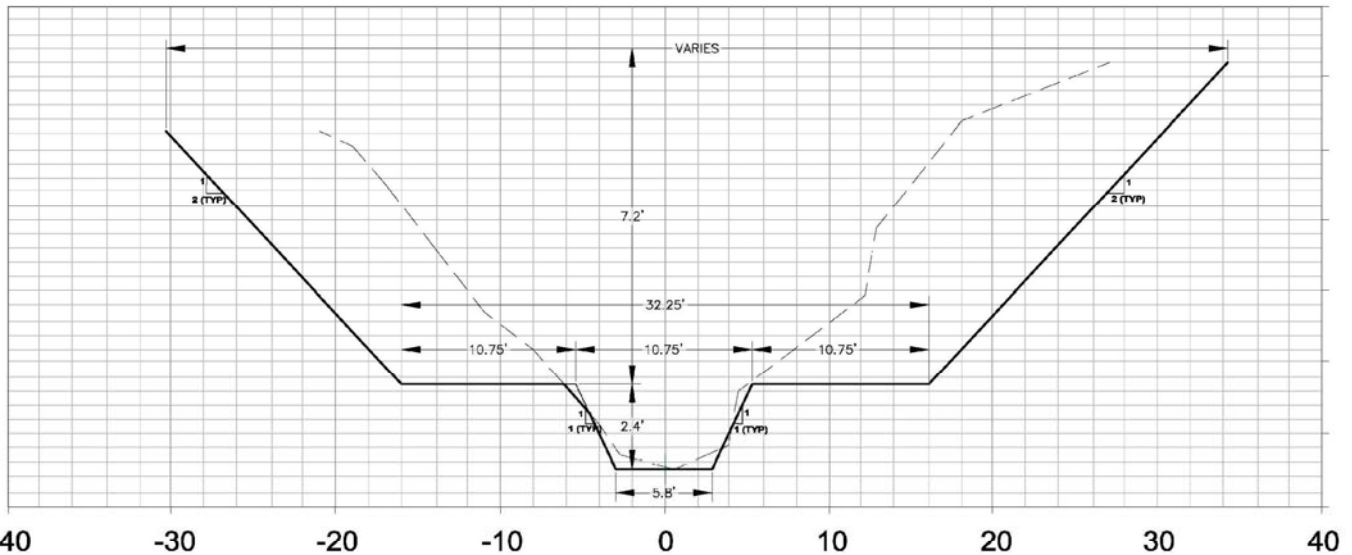
**Project Title:** *[Insert "Project Title" here]*

**IV. TOTAL ENRTF REQUEST BUDGET** *[Insert # of years for project] years*

<b>BUDGET ITEM</b> <i>(See "Guidance on Allowable Expenses", p. 13)</i>	<b>AMOUNT</b>
<b>Personnel:</b> Julie Goehring, Red River Basin Commission, Project Coordinator (\$2,500 per year for 3 years) <i>Julie will coordinate the project at RRBC and also the coordination with partners in the RRB. She will be responsible for project reporting and will assist with supervision of the graduate research assistant.</i>	\$7,500.00
<b>Fringe:</b> Estimated, Julie Goehring (\$838 per year for 3 years)	\$2,513.00
<b>Personnel:</b> Joe Magner, University of Minnesota, Research Professor (\$7,000 per year for 3 years) <i>Dr. Magner will be responsible for supervising the Graduate Research Assistant and undergrads and Consulting Biologist. He will also work closely with the project team, and stakeholders to help identify study sites.</i>	\$21,000.00
<b>Fringe:</b> Dr. Magner (\$2,345 per year for 3 years)	\$7,035.00
<b>Personnel:</b> Undergrad Assistants, University of Minnesota, TBD (\$6,000 per year for 3 years) <i>Undergrads will collect field data during the summer to build data bases needed to complete activities. (No fringe for undergrads)</i>	\$18,000.00
<b>Personnel:</b> Graduate Research Assistant, University of Minnesota, TBD (\$16,380 per year for 3 years) <i>The graduate research assistant will be responsible for gathering and analyzing data to meet Activity Objectives.</i>	\$49,140.00
<b>Fringe:</b> Graduate Research Assistant: Tuition (\$15,070 per year for 3 years) \$37,875 Graduate Research Assistant: (\$2,457 per year for 3 years) \$7,371	\$45,246.00
<b>Professional/Technical/Service Contracts:</b> MIBI Consultant (Sub-Contract) (\$10,000 per year for 3 years) <i>The MIBI consultant will be responsible for macroinvertebrate collection, sending samples to lab, and coordinating MIBI score calculation with MPCA. MIBI data analysis. and reporting</i>	\$ 30,000
<b>Professional/Technical/Service Contracts:</b> MIBI Lab (\$12,000 per year for years 1 and 2) <i>Macroinvertebrate samples will be sent to a lab for identification to the level required by MPCA. Cost includes shipping.</i>	\$ 24,000
<b>Equipment/Tools/Supplies:</b> <i>Equipment includes dip nets, sondes, collection bottles, ethanol preservative (\$5,000 per year for 3 years)</i>	\$ 15,000
<b>Travel:</b> <i>We estimate we will need to make approximately 10 trips per year to the area for data collection. At 0.535 per mile for 300 miles per trip and 30 total trips in the 3 years of the project will require \$4,815 for transportation and 3 rooms x 5 day x \$100/night (0.535 x 300 x 30)</i>	\$ 6,315
<b>Additional Budget Items:</b> <i>In this column, list any additional budget items that do not fit above categories. List by item(s) or item type(s) and explain how number was determined One row per type/category.</i>	\$ -
<b>TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =</b>	<b>\$225,749.00</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>	na	<i>Indicate: Secured or Pending</i>
<b>Other State \$ To Be Applied To Project During Project Period:</b>	na	<i>Indicate: Secured or Pending</i>
<b>In-kind Services To Be Applied To Project During Project Period:</b>	na	<i>Indicate: Secured or Pending</i>
<b>Past and Current ENRTF Appropriation:</b> Nutrient Capture Through Water Management and Biomass Harvesting (2014 to current)	\$ 300,000	\$77,135
<b>Past and Current ENRTF Appropriation:</b> Regional Aquatic Invasive Species (AIS) Prevention Project (2014 to 2016)	\$ 219,000	\$19,580
<b>Other Funding History:</b> <i>Indicate funding secured but to be expended prior to July 1, 2018, for activities directly relevant to this specific funding request. State specific source(s) of funds and dollar amount.</i>	na	



TYPICAL CROSS SECTION

NOTE:  
SEED AND MULCH ALL DISTURBED AREAS  
IN ACCORDANCE WITH SPECIFICATIONS

Two-Stage Ditch Design version 2.0

Dan Mecklenburg, Ohio Department of Natural Resources  
Andy Ward, Ohio State University

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  PRINT NAME: SIGNATURE: DATE:	ENGINEERING SECTION Name: A.H. [Signature] Title: [Signature] Date: [Signature]	MINNESOTA BOARD OF WATER & SOIL RESOURCES  <b>MULLENBACK DITCH TWO-STAGE DITCH</b>  Project No. [Signature] Date: [Signature]	
	License # [Signature]	City: [Signature] State: [Signature] County: [Signature]	Plan No. [Signature] of [Signature]

### **Project Manager Qualifications**

#### **Julie Goehring – Public Relations/Communications**

Julie Goehring, Communications Coordinator, has spent the past 30 years working on Red River Basin land and water issues. Her duties include developing, maintaining, and implementing communication/education and outreach programs for the Red River Basin Commission. She also serves as a liaison between the Board, other water and natural resource management entities and local stakeholders in the Red River Basin to enhance coordination and communication. Julie currently is serving her second term as a citizen representative on the Minnesota Environmental Quality Board. She has a B.S. in Mass Communications, Print Journalism, from Minnesota State University—Moorhead.

### **Organization Description**

The RRBC is a charitable, not-for-profit organization designed to help facilitate a cooperative approach to water management within the Basin and is a well-established forum for identifying, developing, and implementing solutions to cross-boundary issues.

The RRBC is led by 41 directors representing the diversity of this multi-jurisdictional Basin and is comprised of local, state, provincial, and First Nation government representation, the environmental community, and at-large members. It maintains offices in Moorhead, MN, and Winnipeg, MB, and is dedicated to innovation in the management of the Red River Basin's water resources.