**PROJECT TITLE: Innovative Phosphorus Removal Solutions for 10,000 Clean Lakes**

**I. PROJECT STATEMENT**

Current options to remove excess, algae-producing phosphorus in lakes are costly, often exceeding $1 million per lake, and offer only temporary relief. Minnesota needs ***better lake management solutions***, ones that are ***more affordable, more effective, and longer-lasting***. However, research projects only test one idea at a time, making innovation slow, and miss out on exploring new ideas from the private sector and local governments.

THE PROBLEM: Minnesota is proudly known as the “Land of 10,000 Lakes” and offers beautiful vistas, abundant wildlife, spectacular fishing, and ample recreational opportunities within its bounty of lakes. However, the MPCA has found that about 40% of Minnesota’s lakes, rivers and streams that have been tested are not meeting state water quality standards, which brings that number down to “Land of 6,000 *Clean* Lakes”. Many of the lakes on the state’s 2018 impaired waters list have excess nutrients (e.g. ***phosphorus***) which can lead to harmful algae blooms, poor water quality, impaired aquatic recreation, and poor fishing & swimming conditions.

THE SOLUTION: One approach to accelerate a **10,000 Clean Lakes Solution** is to put the government in the role of venture capitalist. Typically, government agencies responsible for implementing solutions to impaired waters aren’t able or willing to take risks on new ideas. State grants are typically only able to test one new idea per funding round, providing slow results. A ***venture capitalist approach*** would focus less on implementing old, top-down solutions and would instead solicit, support, evaluate, and scale up innovative strategies by tapping into ideas developed by businesses, colleges, individuals, local government agencies, and non-profit institutions.

Venture capitalists typically have to invest in at least ten new businesses in order to find the few successful ones that make the return for the entire investment portfolio. Finding successful new businesses (or ideas) requires investment in many to find the big winners. The same strategy can be applied towards a 10,000 Clean Lakes Solution.

The **overall goal** of this project is to solicit excitement and opportunity in the private market to find a *more affordable, more effective, and longer-lasting* solution to excess phosphorus in our lakes. Currently, the best lake treatment for excess phosphorus is an Alum treatment which typically runs close to $1 Million per lake and only provides temporary relief to the problem which usually returns 10-15 years later. Minnesota needs a better option to treat in-lake phosphorus, and we can find a solution through a venture capitalist approach.

The **direct outcome** of this project will be to:

1. Solicit multiple approaches/proposals to address in-lake phosphorus in Minnesota’s lakes
2. Provide seed money to the top ten proposals for further development into complete concept plans.
3. Select the top three concept plans for further development into feasibility studies on three impaired lakes in Minnesota, ready for implementation.

**II. PROJECT ACTIVITIES AND OUTCOMES**

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| **Activity 1 Title: Solicit Proposals****Description:** *Solicit a minimum of twenty (20) proposals for new, innovative solutions to address in-lake phosphorus. Of these, ten will be selected for further development into concept plans (Activity 2).***ENRTF BUDGET: $2,000** |
| **Outcome** | **Completion Date** |
| *1. Develop and release a Request for Proposals to relevant engineering firms, businesses, colleges, local government agencies & non-profits with assistance from U of M consultant.* | *September 2020* |
| *2. Engineering and U of M consultant review of proposals to ensure sound practices, incorporation of engineering standards (as applicable), and practicability.* | *December 2020* |
| *3. Review proposals and use a competitive decision matrix to select top ten for further funding into concept plans as directed by a state-wide technical panel composed of representatives from watershed organizations, DNR & BWSR staff, university professors, Barr & EOR engineers, and other selected water resource professionals.*  | *December 2020* |

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| **Activity 2 Title: Develop Concept Plans****Description:** *Engage the top ten proposals for further development and funding into concept plans with estimated budgets and proposed phosphorus removals. Select the top three for further development (Activity 3).***ENRTF BUDGET: $102,000** |

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| **Outcome** | **Completion Date** |
| *1. Providing funding to top ten proposals to develop concept plans with estimated budgets and phosphorus removals. ($5k - $15k each, based on proposed budget)* | *April 2021* |
| *2. Engineering review of the ten completed concept plans to ensure sound practices, incorporation of engineering standards (as applicable), and practicability.* | *May 2021* |
| *3. Review ten concept plans and use a competitive decision matrix to select the top three concept plans for further development into feasibility studies as directed by a state-wide technical panel composed of representatives from watershed organizations, DNR & BWSR staff, university professors, Barr & EOR engineers, and other selected water resource professionals. The panel will also select three lakes in Minnesota for subject of the feasibility studies based on compatible site conditions, willing partners, and urgency.* | *May 2021* |

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| **Activity 3 Title: Complete Feasibility Studies****Description:** *Feasibility studies for innovative in-lake treatments will be completed for three impaired lakes in MN.***ENRTF BUDGET: $301,000** |

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| **Outcome** | **Completion Date** |
| *1. Engage in contracts with the three selected concept plans for further development to complete feasibility studies on selected study lakes.* | *February 2022* |
| *2. Engineering review of the three draft feasibility studies before finalized.* | *February 2022* |

**III. PROJECT PARTNERS AND COLLABORATORS:**

Capitol Region Watershed District

Ramsey-Washington Watershed District

Brian Huser, Associate Professor at Swedish University

Greg Wilson, Senior Water Resources Engineer at Barr

Tony Havranek, Senior Environmental Scientist at WSB

Emily Javens, Executive Director of MAWD

Keegan Lund, Aquatic Biologist at MnDNR

Melissa King, Board Conservationist at BWSR

**IV. LONG-TERM IMPLEMENTATION AND FUNDING:**

This project will result in three completed feasibility studies **ready for implementation**, potentially as Phase II projects for LCCMR in 2022. The ideas invested in and developed will provide ***long-lasting clean lake solutions*** for Minnesota that will provide benefits that span far beyond the life of the grant. Those ideas that are funded for concept plans but not feasibility studies could also be developed further into future LCCMR projects.