

PROJECT TITLE: Wastewater Treatment Plant Optimization Pilot Program**I. PROJECT STATEMENT**

This proposal, if successful, will fund a pilot project to determine how, and by what means, wastewater treatment plants can be optimized, and the new effluent limitations met, without adding costly new infrastructure upgrades. Infrastructure upgrades should be the last resort when more restrictive effluent limitations are required to meet water quality standards. MPCA should support communities' efforts to optimize existing treatment processes where treatment can be modified or optimized to improve nutrient removal.

As the MPCA reviews municipal NPDES permits and completes watershed assessments, sometimes these actions result in more restrictive effluent limits for WWTPs. Municipal engineering consultants usually recommend adding new infrastructure, at significant cost to the municipality. This should always be the last resort. If WWTP optimization was a demonstrable success in Minnesota as a means to achieve new effluent limitations, then fewer cities may be required to take on the expense of adding infrastructure to their treatment process.

Wastewater Treatment Plant Optimization can:

- adjust or modify certain treatment processes and controls, detention times, aeration rates which makes the microorganisms (bugs) work harder and achieving significantly better treatment;
- demonstrate that infrastructure projects are often not needed to meet new phosphorous limits;
- improve operator knowledge of treatment process to allow more nimble response to existing effluent conditions;
- achieve cleaner Mississippi, Red River, Shellrock and Minnesota River watersheds at lower economic burden to municipalities.

II. PROJECT ACTIVITIES AND OUTCOMES

The outcome of this proposal will transfer knowledge through a final report that describes what wastewater treatment plant optimization is capable of achieving in a pilot project scenario. This will inform future programmatic decisions to place greater emphasis on operator technical support and also serve to transfer knowledge to municipal organizations that want to explore this means of achieving compliance.

Activities will include design and promotion of a kick-off seminar that will inform municipal wastewater operators and administrative officials about the concept of plant optimization, how it has worked in other situations and what it is capable of doing in Minnesota's climate. The kickoff seminar will establish a pool of interested facilities and operators from which the pilot program partners can select three to five participating facilities. These participating facilities will enter into an agreement under which program partners will conduct technical assistance and conduct optimization techniques to increase treatment without adding infrastructure..

Knowledge transfer begins when program partners will evaluate each plant's existing treatment process and make adjustments, through process control, operator training, and increasing or decreasing wastewater detention time, to achieve better treatment result. This is what optimization is, simply getting better treatment through existing infrastructure. The results of this data will be analyzed by a University of Minnesota Grad student and published. It will be shared with wastewater operators throughout the state as a resource.

Activity 1: Pilot Facility Selection**Budget: \$ 2,000**

Advertise for and conduct a seminar on what WWTP Optimization is, and why it may be a viable alternative to infrastructure improvements to meet nutrient effluent limitations. Select three to five candidate-WWTP's from seminar attendees to participate in pilot program.

Outcome	Completion Date
1. Provide a transfer of knowledge from experts to interested parties about optimization	07/15/2017
2. Generate interest of 3-5 possible pilot program candidates	07/15-20/2017

Activity 2: Transfer of knowledge**Budget: \$ 234,360**

Once the pool of participants from WWTP optimization seminar have been identified, they will need to enter into a memorandum of understanding that offers the program partners indemnification and clearly defines what is expected of each party. Technical assistance will commence with a site visit to the participating WWTP to understand the plants process, existing components, and general capability of both the facility and the operator. Additional instruction will likely occur at program partner facilities.

Outcome	Completion Date
1. MOU will be signed engaging the facility in pilot program. Expectations of each party are clearly understood.	08/15/2017
2. Site visits begin	08/15/2017
3. Program partners begin providing technical assistance to participating operators	08/15/2017
4. Evaluation of optimization activities. What worked and what did not. Why?	06/28/2018
5. Knowledge sharing	12/31/2018

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

Partners with MPCA: We intend to engage organizations that have experience in treatment of biological nutrient removal facilities in municipal wastestreams. Ideally, municipal organizations, such as St. Cloud that have real world experience in optimization, and organizations that focus on research such as University of Minnesota, will provide the technical assistance required. Four partners, with MPCA, will initiate the pilot project with a seminar describing what WWTP optimization involves and how it is accomplished. These include Tim LaPara, from University of Minnesota; Karl DeWahl, from MnTAP; staff at MCES and staff at St. Cloud Wastewater Treatment Plant.

The University of Minnesota's Department of Civil, Environmental, and Geo- Engineering will be a key partner, as will the University's MnTAP program. We will engage a graduate-level student to analyze and compile the results in a final report. Additionally, staff from St. Cloud WWTP and MCES will also be available to provide optimization assistance.

B. Project Impact and Long-Term Strategy

The long-term strategy is to understand how plant optimization activities and techniques work in an upper Midwestern climate. The pilot program will inform future decisions about funding technical assistance programs that can be more cost effective than funding major infrastructure projects to meet new effluent limitations.

C. Timeline Requirements

The timeline proposed will be able to demonstrate the effectiveness of WWTP optimization activities within six months of program funding. Monitoring, data evaluation complete by December 2018.

2018 Detailed Project Budget

ATTACHMENT #8

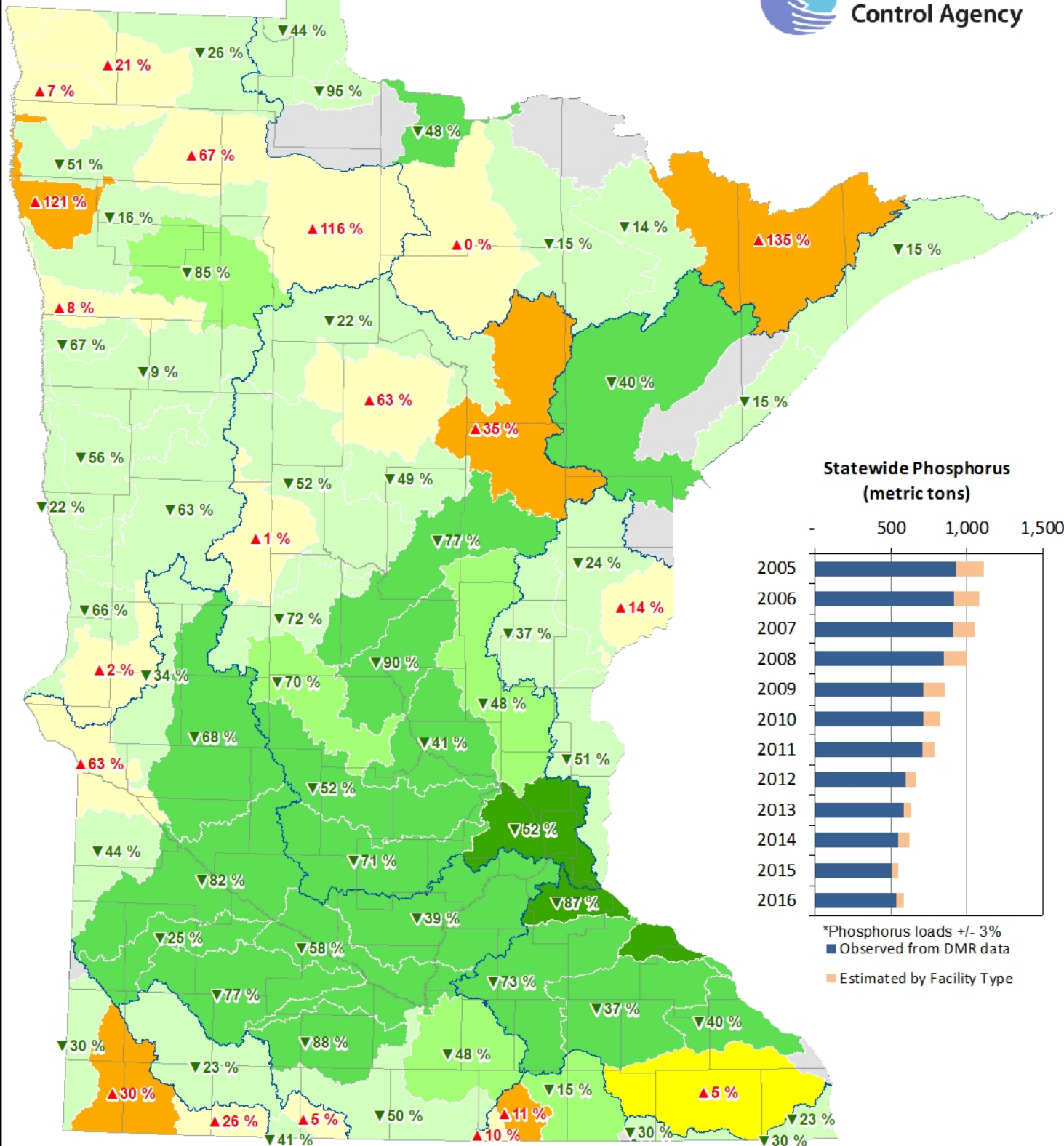
Project Title: *Wastewater Treatment Plant Optimization Pilot Program*

IV. TOTAL ENRTF REQUEST BUDGET Two years

<u>BUDGET ITEM</u>	<u>AMOUNT</u>
Personnel:	na
Professional/Technical/Service Contracts: The amount proposed for contract amounts with MCES, St. Cloud WWTP, and MnTAP, includes two wastewater engineers at 160 hours each at a rate of \$185 per hour (\$59,200) through sole-source contract.	\$ 59,200
Professional/Technical/Service Contracts: Three experienced wastewater operators from MCES, St. Cloud WWTP, and MnTAP, at 320 hours each at a rate of \$125 per hour (\$60,000) through sole-source contract.	\$ 120,000
Professional/Technical/Service Contracts: ; and one graduate-level student at 25 percent apportionment for 940 hours at \$20 per hour, plus tuition, and fringe benefits (\$34,656).	\$ 34,656
Equipment/Tools/Supplies: Materials and consumables \$1,500; five Portable Spectrophotometers (5x\$3,270)	\$ 17,850
	na
Travel: Estimated 2000 miles at \$.535 per mile	\$ 1,070
Additional Budget Items: Expenses for an opening and closing seminar, estimated at \$3,584	\$ 3,584
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =	\$ 236,360

V. OTHER FUNDS

<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
Other Non-State \$ To Be Applied To Project During Project Period:	na	<i>Indicate: Secured or</i>
Other State \$ To Be Applied To Project During Project Period: Joel Peck, MPCA Municipal Liaison, project management and administration at 160 hours, or 8.3 percent of annual salary, and 8.3 percent of fringe benefits. The anticipated work requirement is 160 hours over the six-month period individual sum, list out the source of the funds, the amount, and indicate whether the funds are secured or pending approval.	\$ 9,448	<i>Secured</i>
In-kind Services To Be Applied To Project During Project Period:	na	<i>Indicate: Secured or</i>
Past and Current ENRTF Appropriation:	na	<i>Indicate: Unspent?</i>
Other Funding History:	na	



Decrease from 2005 to 2014-16 avg.(kg)

- 0 - 5,000
- 5,000 - 10,000
- 10,000 - 50,000
- >50,000

Increase from 2005 to 2014-16 avg.(kg)

- 1 - 500
- 501 - 1,000
- 1,001 - 3,000
- No WWTP Loads

**Statewide NPDES Permitted
 Wastewater Phosphorus
 Loading Change from
 2005 to 2014-16 Average**

Joel Peck, Municipal Liaison
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Municipal Liaison

This position exists to serve as the liaison for Municipal wastewater facilities that require interaction with the Minnesota Pollution Control Agency. This work includes building and fostering relationships with municipal administrators and wastewater professionals, providing outreach and education on the basis and need for new and proposed water quality regulations with potential to impact wastewater facilities, and specifically assisting municipal facilities to understand the impact of applicable rules and requirements of agency on financial and human resources. In particular, this position assists municipalities in implementing and participating in the water quality standards rulemaking process and navigating the NPDES/SDS permitting process. The position also provides direction on the public funding programs for water infrastructure projects.

Joel Peck's Professional History

Municipal Liaison
2015-present Minnesota Pollution Control Agency

City Administrator
2011-2015 St. Croix Falls, WI

City Administrator
2008-2011 Crosby, MN

Intern to Director of Member Service
2007-2008 League of Minnesota Cities

Administrative Assistant
2003-2007 Third Floor Documents Division, Office of the Chief Clerk of the Minnesota House of Representatives

Education

Masters of Science in Public Administration
2006 Hamline University

Bachelor of Arts in Journalism
2003 North Central University