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January 12, 2021

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January 12, 2021

RE: National Pollutant Discharge Elimination System/State Disposal System Permits, Water Quality Standards, and Municipalities

Dear Committee Chairs and Ranking Minority Members:

Please find attached the 2020 National Pollutant Discharge Elimination System/State Disposal System Permits, Water Quality Standards, and Municipalities, written and submitted by the Minnesota Pollution Control Agency. This report is being submitted pursuant to Laws of Minnesota 2015, First Special Session chapter 150, article 4, section 101. This law changed the language of Minn. Stat. § 115.44, subd. 9. This report presents the Municipal Wastewater Division activities in permitting, standards development, outreach, and innovative approaches.

If you have any questions regarding this report, please call Greta Gauthier at 651.757.2031, or Dana Vanderbosch, at 651.757.2601.

Sincerely,



Greta Gauthier
Assistant Commissioner for Legislative and Intergovernmental Relations
Commissioner's Office

GG/DV:cbg

Enclosure



REPORT TO THE
LEGISLATURE

JANUARY 2021

NPDES/SDS permits, water quality standards, and municipalities

Year 2020 activities to implement water quality standard and classification requirements into National Pollutant Discharge Elimination System/State Disposal System permits held by municipalities.



Legislative charge

This report fulfills the requirement of Laws of Minnesota 2015, First Special Session chapter 150, article 4, section 101. This law changed the language of Minn. Stat. § 115.44, subd. 9.

The agency shall report on the activities the previous calendar year to implement standard and classification requirements into National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) permits held by municipalities. This includes:

- A summary of permits issued or reissued, including any changes to effluent limits due to water quality standards adopted or revised during the previous permit term.
- Highlights of innovative approaches implemented by the agency and municipalities to develop and achieve permit requirements in a cost-effective manner.
- A summary of standards development and water quality rulemaking activities over the previous calendar year, including economic analyses.
- A summary of standards development and water quality rulemaking activities anticipated for the next three years, including economic analyses.
- A process and timeframe for municipalities to provide input to the agency regarding their needs based on information provided.
- A list of anticipated permit initiatives in the next calendar year that may impact municipalities.
- The agency's plan for involving municipalities throughout the planning and decision-making process, including opportunities for input and public comment from municipalities on rulemaking initiatives prior to preparation of Statements of Need and Reasonableness (SONAR).

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Minnesota Pollution Control Agency

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This report is available in alternative formats upon request, and online at www.pca.state.mn.us.

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Foreword

This report includes a description of activities that occurred during the previous calendar year to implement water quality standard and classification requirements into National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) permits held by municipalities.

The purpose of this report is to share information with municipalities about permitting-related activities that have occurred over the past year and that are anticipated for the near future, to:

1. Foster awareness of and engagement in Minnesota Pollution Control Agency (MPCA) initiatives that may affect municipalities.
2. Promote coordination and dialogue between the MPCA and municipalities on permitting and water quality improvement efforts.

The MPCA wants to extend a thank you to all Minnesota cities for their efforts to keep Minnesota's waters safe and clean for future generations. This hard work is fundamental in improving our water quality and providing safe and clean water to the citizens of Minnesota.

Acronyms

ALJ	Administrative Law Judge
Chl- <i>a</i>	Chlorophyll- <i>a</i>
CWP	Clean Water Partnership
CWSRF	Clean Water State Revolving Fund
EPA	U.S. Environmental Protection Agency
IJC	International Joint Commission
IRRB	International Red River Board
MDA	Minnesota Department of Agriculture
MDNR	Minnesota Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
NPDES	National Pollutant Discharge Elimination System
PFA	Public Facilities Authority
PFAS	Per- and polyfluoroalkyl substances
PFOS	Perfluorooctane sulfonate
RRBC	Red River Basin Commission
SAR	sodium adsorption ratio
SDS	State Disposal System
SONAR	Statement of Need and Reasonableness
TMDL	Total Maximum Daily Load
TP	Total Phosphorous
TSD	Technical Support Document
U of M	University of Minnesota
WQBEL	Water Quality Based Effluent Limit(s)
WQS	Water Quality Standard(s)
WWTF	Wastewater Treatment Facility
WWTP	Wastewater Treatment Plant

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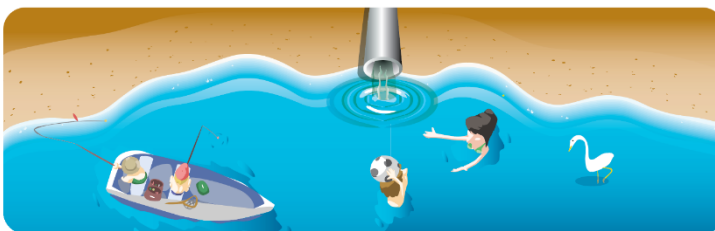
Municipal wastewater permits and new effluent limits

This section includes a summary of permits issued or reissued during the previous calendar year, including any changes to permit limits (i.e. effluent limits) due to water quality standards (WQS) adopted or revised during the previous permit term.

1.

Water quality standards: setting the goal

We value healthy waters for fishing, swimming and wildlife. Standards are developed to attach measurable scientific metrics to these goals



A water quality standard is not the same thing as a permit requirement.



To determine a permit limit for a facility:

We evaluate *facility-specific factors* such as flow, discharge quality, and the timing of discharge to determine what, if any, limits are required to protect lakes and rivers according to the standards. It's a tailored approach.

2.

Permits: making it happen

An implementation of strategies to reach the clean water goal



Targeting
sources



Flexible
timelines



Financial
assistance



Variances

New water quality based effluent limits (WQBELs) may be assigned when a National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) permit is issued or reissued. From January through November 2020, the MPCA issued or reissued 158 NPDES/SDS wastewater permits. Of these, 68 were industrial permits with 57 of those receiving general permit coverage (including those covered under the MNG255000 Non-contact cooling water (NCCW)-Treated General Permit that was reissued on February 1, 2020). Ninety of the 158 NPDES/SDS permits were municipal permits, with 60 receiving coverage under the MNG585000 general pond permit. Six permits received new WQBELs due to a new

water quality standard being revised or adopted during the previous permit term (Table 1). All six of these permits received new phosphorus limits derived from river eutrophication standards (RES), which were adopted in 2015.

Table 1. Wastewater treatment facilities receiving new or modified phosphorus WQBELs in 2020 based on a water quality standard adopted over five years ago.

Facility
Amboy WWTP
Buffalo Lake WWTP
Lake Lillian WWTP
New Germany WWTP
Saint Michael WWTP
Stewart WWTP

Characterization of backlog

The municipal wastewater permit backlog is a numerical representation of the fluctuating permit expirations, issuances, and the delays and situational complexities driving each of these factors. In early 2020, the MPCA committed to improve it by focusing on issuing backlogged major permits.

On a quarterly basis, municipal permit writers account for the reasons behind each of their expired permits (i.e. resource deficiency, rulemaking, external delays, effluent limit reviews, applied for a variance, or internal delays). That information is then pulled into a Tableau report identifying the percent of expired permits for each major reason. We are able to adjust our backlog reduction strategy for the next year if we understand the reasons why we can't proceed with a permit. The backlog strategy also keys in on specific circumstances that need to be taken into consideration for every single permit. Those specific circumstances include:

- Whether the permitted facility is in or near an environmental justice (EJ) area (if so, these expired permits will be prioritized over others to ensure there are no disproportionate impacts between areas of EJ and others);
- If the permitted facility is discharging to an impaired water or if the discharge includes pollutants of concerns (i.e. phosphorus, nitrogen, total suspended solids [TSS], carbonaceous biological oxygen demand [CBOD], mercury, PFAS, and chloride);
- If the permitted facility is affected by revised or new federal regulations (i.e. effluent limit guidelines); or
- If the permitted facility is located within a watershed focused permitting approach.

As noted previously, for the year 2020, the MPCA's focus has been on the backlog of major permits. At the start of 2020, 40 out of the 76 municipal major permits (53%) were expired. The municipal wastewater program set an internal goal of improving the backlog to 42% by January 1, 2021.

The municipal permit writers identified 15 major permits they intended to final issue by the end of the 2020 calendar year. As of November 15, 2020:

- 4 have been final issued
- 1 is currently on public notice

- 1 is currently undergoing U.S. Environmental Protection Agency (EPA) review prior to public notice posting
- 4 are currently on or wrapping up the pre-public notice review
- 5 were not able to move forward for a variety of reasons mentioned earlier in this section
- The municipal backlog is currently at:
 - Total (minor and major permits) – 55% current/45% expired
 - Major permit backlog – 43% current/57% expired

Anticipated issuances through the end of December 2020:

- 5 of the identified 15 major permits will have been final issued

Pond general permit

Background:

The MNG58 Stabilization Pond General Permit expired August 31, 2015 and the reissuance of the MNG585 permit was delayed due to Minnesota's adoption of river eutrophication standards (approved by EPA in 2015) and the MPCA's subsequent review of phosphorus effluent limits on a watershed basis.

Benefits and efficiencies of MNG585:

A general permit covers multiple facilities with similar operations and types of discharges. When general permits are a feasible option, issuing a general permit allows for faster and more efficient permitting compared to issuing individual permits. To receive coverage under the general permit, a facility requests coverage, and if determined eligible by the MPCA, receives a Notice of Coverage (NOC).

A NOC includes a description and map of the location of the facility and discharge, antidegradation language, facility specific limits and monitoring requirements, and additional requirements applicable to the facility.

- Permittee pays a lower annual permit fee
- MPCA issues one permit
- NOCs are issued in batches to eligible facilities as phosphorus effluent limit reviews are completed
- Facilities continue to have coverage under their existing NPDES permit until a NOC is issued with coverage under MNG585 or an individual permit

What's happened in the last year+ with the MNG585 Stabilization Pond General permit

- 12/01/2018 MNG585 Stabilization Pond General permit final issued
- 12/26/2018 86 NOCs final issued for Batch 1 (34 with new phosphorus limits, all 34 can meet the new limits)
- 01/14/2020 MNG585 permit modified to change phosphorus limit type (change allows operators to discharge at optimal times for the highest quality effluent)
- 02/14/2020 60 NOCs final issued for Batch 2
- 11/02/2020 Public notice ends for 25 NOCs for Batch 3
- Approximately 43 facilities remain eligible and NOCs will be issued in smaller batches as they are ready

The expired MNG58 Stabilization Pond General Permit covered 190 facilities. The MNG585 Stabilization Pond General Permit issued December 2018 has coverage at this time for 171 facilities.

Variance update

Communicating with municipal permittees about the unique permitting issues presented by chloride has been a major effort since 2018. In 2017, a Chloride Working Group was assembled to develop and recommend permitting options that MPCA could implement. Upon their recommendations, MPCA developed a process by which public data are used to determine if a community is eligible for a variance based on the cost of either: 1.) updating a WWTP or 2.) constructing a centralized softening system for drinking water and removing home water softeners. MPCA has found that many communities are eligible for a variance based on economic hardship because costs to comply with the chloride limit would exceed 2% Median Household Income (MHI).

Two chloride variances have been granted by MPCA and approved by EPA. The NPDES permit for the City of Avon was final issued with a chloride variance in April 2020. Alexandria Lakes Area Sanitary District (ALASD) received approval from EPA on October 28, 2020, and the permit was final issued on November 15, 2020.

Eight chloride variance applications are currently pending. MPCA is working closely with EPA in order to help facilitate EPA review and approval of these variances. As each municipality's system is unique, we work with them individually to arrive at a solution cooperatively. It has also been MPCA's practice to invite representatives from Minnesota Department of Health (MDH) to share their expertise on drinking water systems. The pending variance requests include:

- City of Altura WWTP
- City of Madison WWTP
- City of Sacred Heart WWTP
- Tri-City Sewer District (Cities of Wells, Easton, Minnesota Lake)
- Glacial Lakes Sanitary Sewer and Water District
- City of Lester Prairie WWTP
- City of Mayer WWTP
- Meadows of Whisper Creek WWTP
- City of Worthington WWTP

MPCA has also received and is evaluating two facilities for a mercury variance, based on cost. These cities discharge to the Lake Superior Basin. Therefore, variances will be limited to five years (the term of the permit).

- City of Grand Marais
- City of Silver Bay

Summary of water quality standards development

Amendments to class 3 and 4 water quality standards

The MPCA is proposing amendments to its Class 3 and 4 water quality standards. The intent to modify the Class 3 and 4 standards was published in the state register on December 14, 2020. There will be an administrative law judge hearing on February 4th. Barring legal challenge, it is expected that the revised standards will be finalized in the middle of 2021.

Class 3 standards govern water quality for industrial use and Class 4 standards govern agricultural and wildlife usage. More than 150 municipal wastewater treatment plants (WWTP) and some industrial plants that discharge treated wastewater are impacted by the current standards. The current standards contain narrative statements of what the quality of the waters should be, and numeric thresholds for a variety of pollutants.

Class 3: chloride, hardness, pH

Class 4A (irrigation): bicarbonate, boron, pH, specific conductance, total dissolved salts, sodium, and radioactive materials

Class 4B (livestock and wildlife drinking): pH, total salinity

Applying modern science to the standards will provide a more nuanced, localized approach to protecting water quality. In addition, the revised standards will allow for flexibility in creating permits, reduce wastewater permitting delays, and avoid wastewater treatment costs that do not provide environmental benefits. The amended standards are the result of years of engagement and input from community partners across the state. MPCA received thousands of comments expressing concerns about the amended standards' potential impact on agriculture, industry, and wildlife.

The MPCA is proposing several changes within each use classification:

Class 3. The MPCA is proposing to consolidate the three subclasses into one standard. In addition, the numeric standards will be removed while the narrative standard will be retained and updated. Finally, the amended standards will provide clarity around implementation of the narrative standards in discharge permits, including a robust approach that is based on specific site conditions and focuses on water hardness.

Class 4. For Class 4A (irrigation), many of the numeric standards will be removed while the narrative standard will be retained and updated. The amended standards will provide clarity around implementation of the narrative standards in discharge permits, including a robust approach that is based on specific site conditions and focuses on water hardness. For Class 4B (livestock and wildlife drinking), the salinity standard is revised based on current science and common water quality indicators. In addition, there is a sulfate and nitrate standard that will protect livestock and wildlife.

Rock River site-specific standard

The City of Luverne will benefit from a site-specific water quality standard for salinity in the Rock River, downstream from the city's WWTP. The new standard more accurately reflects what is needed to ensure the water can be used for cropland irrigation. As a Class 4A irrigation water, the Rock River must be able to support crop production without damage or adverse effects.

The new standard addresses two parameters in the water: specific conductance and sodium. The Class 4A sodium value has been replaced with a numeric standard for sodium adsorption ratio (SAR). According to current research, protecting soil health from excess SAR also protects plants from direct sodium toxicity. The change may also contribute to Luverne's capacity for industrial development.

Minnesota rule allows site-specific standards to be developed when local

circumstances support a modification to statewide standards. The standards would apply to about 16 miles of the Rock River from Luverne to the Iowa border. The city is completing a \$14 million wastewater treatment upgrade to significantly improve the quality of the water it discharges.

Figure 1. Image of the Rock River as it flows through Luverne, MN.



PFOS site specific criteria

In October 2020, MPCA announced that several waterbodies in the Twin Cities now have new, protective water and fish consumption values for perfluorooctane sulfonate (PFOS), one of the most studied per- and polyfluoroalkyl substances (PFAS). PFOS is known to accumulate to levels of concern in fish, and could be transferred to humans when consumed, potentially causing adverse health effects. The new values, called site-specific water quality criteria, are one tool the MPCA uses to protect human health and the environment.

The targeted waters are Lake Elmo and connected waterbodies in an area of Washington County called the Project 1007 system, Bde Maka Ska, and Pool 2 of the Mississippi River. Along with MPCA's protective values, the Minnesota Department of Health extended "do not eat" fish consumption advice to some lakes and streams in Project 1007. These waters include Raleigh Creek, Eagle Point Lake, Horseshoe Lake, and Tartan Pond.

The value for fish tissue is a maximum 0.37 nanograms PFOS per gram of fish tissue, and the value for ambient water is a maximum 0.05 nanograms per liter. The goal of these new values is to reduce the levels of PFOS in water, which should eliminate the need for additional protections like fish consumption

advisories. Wastewater permittees that discharge to these waters may receive additional monitoring conditions or even effluent limits in upcoming permits. MPCA continues to consider future additional needs for water quality standards related to PFAS.

Outreach

Red River Basin Water Quality Offset Group

The Red River Basin Water Quality Offset Group is facilitated by the Red River Basin Commission and includes representatives from the MPCA (municipal wastewater and watershed programs); the cities of Breckenridge, Thief River Falls, Moorhead, Warroad, and Roseau; the Minnesota Department of Agriculture; the Ecosystems Market Consortium; General Mills; and an engineering consultant from Houston Engineering.

Discussions during the Water Quality Offset Group meetings are not solely focused on the MPCA municipal permitting approach, but also on the perspectives of, and efforts to reduce, phosphorus releases to surface waters currently being taken by the different participating entities. Recent discussions have included agriculture initiatives either currently underway or on the horizon. One initiative being conducted with Minnesota crop production retailers involves tracking nutrient management at the retailer themselves rather than by asking individual farmers for information. Another initiative shared is a voluntary nutrient management plan tracking soil conditions and crop yields in an audit program. Additionally, there is a major research project with the University of Minnesota - Crookston Discovery Farms network and Manitoba, Canada researching phosphorus sources and transport from farm lands.

Clean Water Discussion Series

In 2018 in partnership with key stakeholders, the MPCA committed to hosting regular meetings to discuss opportunities and challenges to water quality goals and NPDES compliance. Clean Water Discussion Series members include:

- League of Minnesota Cities
- Coalition of Greater Minnesota Cities
- Minnesota Rural Water Association
- Minnesota Environmental Science and Economic Review Board
- Minnesota Association of Small Cities
- Minnesota Municipal Utilities Association
- Association of Metropolitan Municipalities
- Metropolitan Council Environmental Services
- MPCA Municipal Wastewater program leadership
- Public Facilities Authority

Among the topics the Clean Water Discussion Series has deliberated are:

- How the wastewater industry can attract and retain a future wastewater operator workforce in the small municipalities where they are desperately needed;
- Understanding the impacts of PFAS compounds in municipal wastewater treatment, and what regulation of PFAS in municipal NPDES permits fully means to the cities of Minnesota;

- Balancing both phosphorous and nitrogen in advanced wastewater treatment; and
- Flexible permitting approaches that achieve NPDES compliance.

The goals for the discussion series are to develop/build upon existing, strong professional relationships with city leadership and wastewater professionals, to recognize that there are many perspectives on clean water policy, and to develop opportunities for all perspectives to be shared and heard. In order to achieve these goals, the members of the group have agreed to listen and respect all the voices in the room, be authentic, and engage in active, constructive communication, even in times of disagreement. COVID-19 has necessitated virtual meetings rather than in-person meetings, which has created some challenges, but the group continues to engage remotely on important topics.

The team members set the agenda through a confidential ranked-choice survey process. This process results in a prioritized list of future agenda topics. This ranked choice process has resulted in a realization that when we are able to stop focusing solely on the areas of disagreement, we have much more in common and are able to make positive changes that benefit the majority at the optimal time.

In addition to large group meetings, small teams work on focus areas outside of the quarterly meeting. The smaller teams report to the larger group, often bringing recommendations for how to move forward with the topic in question. A few examples of small team efforts include wastewater operator workforce planning and resiliency, expanding the conditional certification requirements for operators, reestablishing the certification advisory board, and developing PFAS communication tools for cities to use with their residents.

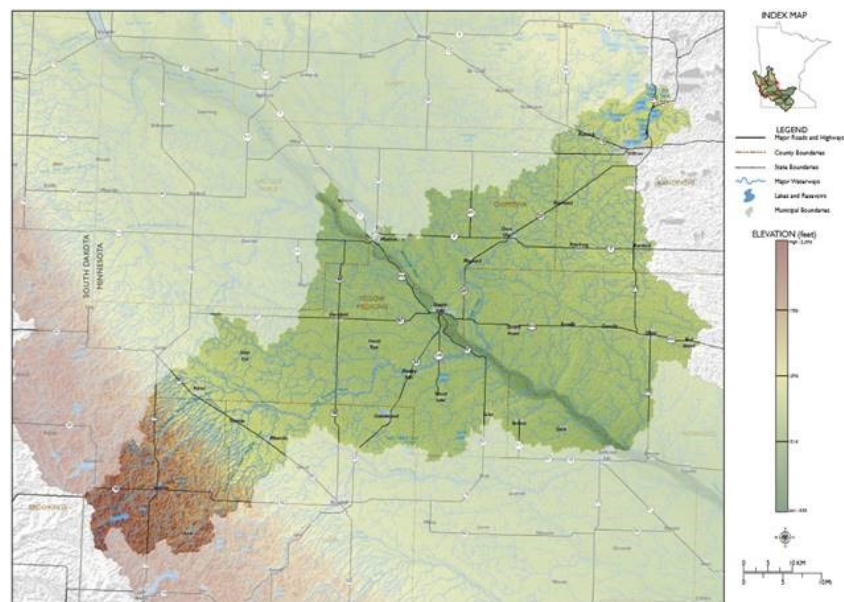
Yellow Medicine Watershed Meeting

MPCA has hosted several ‘watershed meetings’ to encourage conversation on how permit limits help us achieve water quality goals. At these meetings, MPCA provides information on the current water quality of lakes and streams in the watershed, and describes where limits are needed to restore polluted waters and protect high quality waters. These meetings have been very effective in engaging permittees in conversation about the need for new water quality based effluent limits. An example of such a meeting took place in the Yellow Medicine Watershed this past year.

On September 15, 2020, MPCA staff collaborated on a virtual event focused on water quality within the Yellow Medicine River Watershed. Twenty-one people who work closely in the watershed – operators, engineers, local appointed officials – participated in the event.

Included in the agenda was a presentation on:

Figure 2. Overview of the Yellow Medicine River Watershed, with State of Minnesota inset.



- The Watershed Assessment Memo (a complete analysis of phosphorus effluent limits for all wastewater dischargers within the Yellow Medicine River Watershed);
- Associated effluent limitations proposed for all permittees within the watershed;
- Water quality trading and other flexible NPDES permit compliance options;
- Update on the Class 3 & 4 Rules amendment, chloride, and other Class 3 and 4 parameters;
- And financial assistance for public wastewater infrastructure.

MPCA conducted a follow-up survey to assess how well the information was received. Ninety percent said the information was presented at the right technical level, while 10% said it was not technical enough. Ten percent said the information they received will help them adequately plan for future wastewater needs, while 70% said it would probably help, and 20% said it might help them plan for future needs. Thirty percent said they will need to alter their facilities in some way to meet projected limits; while 30% said they will not need to, and 40% said they were unsure.

Water Quality Trading Review Team

In January 2020, MPCA convened a stakeholder group to discuss its current water quality trading practices. The primary objective was to develop a clear and comprehensive guidance document that permittees can use to evaluate flexible permitting options to reach compliance. The guidance document is intended to increase knowledge and adoption of water quality trading practices in the State of Minnesota. The team included professionals in the watershed, environment, stormwater, wastewater, engineering, and agriculture fields. The group met five times between January and June 2020. In addition to developing the guidance document, the team clarified some areas of ambiguity with our current water quality trading practices. To date, the guidance is almost complete, and a high-level overview is in development.

Both EPA and MPCA believe that water quality trading has potential to offer cost-effective alternatives for permittees to achieve water quality goals. It also has potential to accelerate the implementation of nonpoint source practices for water quality improvement.

Innovative approaches

Regulatory Flexibility during Covid-19

In March 2020, MPCA initiated a process to provide alternative approaches to permit compliance for wastewater permittees who were facing difficulty meeting specific permit requirements due to COVID-19. We called this process Regulatory Flexibility. To date, MPCA has received 10 requests for wastewater-related Regulatory Flexibility, approving six and rejecting four.

The requests for Regulatory Flexibility spanned the spectrum from a request for provisional certification of an operator to operate a specific mechanical facility (which was approved) to delaying monitoring and sampling requirements (some of which were not approved).

Permittees requesting Regulatory Flexibility were required to follow a process:

1. Requests should come from an individual party (company/county/individual) and identify the party requesting the flexibility by name and applicable permit number;
2. Requests should include a phone number(s) of the individual to contact regarding the request;

3. Request should state what specific statute/rule/permit condition from which the individual party is looking for regulatory relief;
4. Request should include the reasoning/rationale for the request (one paragraph summary on why the peacetime emergency makes the flexibility necessary and what actions the requestor took prior to the request to meet the requirement);
5. Request should include bulleted points of what measures will be taken to mitigate/minimize the potential environmental impacts (if any); and
6. Request should specify the time period that the request is for including the rationale.

Once received, a committee comprised of agency leaders determined the ability to provide flexibility and still remain compliant with the Clean Water Act.

For a complete record of Regulatory Flexibility requests received, please visit: <https://www.pca.state.mn.us/covid-19/covid-19-and-regulatory-flexibility>

In addition to developing a process to consider regulatory relief from various permit requirements, the MPCA has given temporary relief to operators to meet licensure requirements. Governor Walz' Peacetime Emergency Orders placed restrictions on public gatherings and directed all state employees who are able to telework to do so. MPCA necessarily canceled the annual Wastewater Operations Conference, where a majority of wastewater operators would have received training, testing, and certification for their licensure requirements. In the absence of training and certification events that operators have come to rely on, MPCA has administratively continued all licensure requirements until such time that testing could be safely conducted again. No licenses will lapse due to COVID-19 for lack of testing and certification hours.

Red River municipal permitting approach

The IRRB developed targets for phosphorus and nitrogen concentrations and loads in the Red River at the international border and at the rivers outlet to Lake Winnipeg. In late 2019, the International Red River Board (IRRB) presented proposed targets to the International Joint Commission (IJC). Also in late 2019, a representative of four cities in the Minnesota portion of the Basin requested a hearing before the IJC. The nature of this request was to discuss the proposed targets, concerns about the work used to develop the targets, and the potential needs for expensive upgrades to their wastewater treatment facilities as a result of the nutrient targets at the border. The IJC granted the hearing request and the hearing took place on January 16, 2020, in Grand Forks, ND. The IJC supported the recommendations of the IRRB and forwarded the recommendations to the respective governments for further action.

In 2016, the Red River Basin Commission (RRBC) received funding from the Minnesota Legislature to develop a Basin-wide nutrient reduction strategy. The RRBC completed development of the strategy and submitted a final report in 2018. In 2019, the RRBC held several meetings with key stakeholders to begin discussing implementation of the strategy. In early 2020, this effort was put on hold due to the COVID-19 pandemic. While it is still early in the process and the impacts brought on by COVID-19 are still being navigated, there is a commitment from both point and non-point sources to work together on the strategy.

The MPCA continues to work with some of the cities in the Basin to develop permits that both protect our surface waters and allow the flexibility needed to ensure successful implementation of the nutrient strategy developed through the RRBC process. Noticeable progress has been made with the development of an alternative permitting strategy for the participating facilities within in the Basin. This alternative permitting approach will enable the participating facilities to identify point and nonpoint

source phosphorus contributors within the Minnesota portion of the watershed, estimate or calculate known phosphorus loads from each source, and then identify an allocation of reduction for each contributor. The first of the five permits containing this alternative phosphorus approach is expected to be placed on public notice in the near future. The MPCA continues to work with the cities and the RRBC to ensure that these efforts address the cities' concerns while maintaining progress towards meeting nutrient goals for the Basin.

Study of mercury removal through different treatment technologies

An Environment and Natural Resources Trust Fund-funded study to evaluate mercury treatment technologies was initiated in 2018. This project is on schedule and is on the second year of research. The principal investigators are Dr. Nathan Johnson and Dr. Adrian Hanson, and they have hired two full-time graduate students to investigate ways to treat mercury to very low levels.

Researchers from the U of M - Duluth have visited more than thirteen municipal WWTPs to investigate how mercury is treated and have begun laboratory scale investigations of the detailed chemical-physical processes that govern low-level mercury removal.

The investigators have submitted preliminary results to present at local conferences. They expect to submit three manuscripts to peer-reviewed journals once investigations have finished.

Pilot program to optimize local mechanical and pond wastewater treatment plants

In 2018, the Environment and Natural Resources Trust Fund and the Legislative Committee on Minnesota Resources made possible a \$1.2 million project to determine if more advanced treatment for nutrients can be achieved through existing wastewater treatment infrastructure. MPCA has been working with project partners Minnesota Technical Assistance Program (MnTAP), and Minnesota Rural Water Association (MRWA), as well as Saint Cloud Resource Recovery Plant.

To date, this pilot effort has modeled the treatment process of 10 WWTPs, and 13 wastewater stabilization ponds. The project has modelled recommended operational changes and design modifications that, if implemented, would achieve significant nutrient reductions, as well as savings through energy efficiency and chemical costs.

The modelled annual savings to mechanical plants projects a cumulative reduction of:

- 3,590,700 kWh;
- 91,193 lbs. of phosphorus;
- 635,550 lbs. of total nitrogen; and
- \$859,890 of public funds.

The modelled annual savings to pond facilities projects a cumulative reduction of:

- 17,435 lbs. of nitrogen; and
- 20,612 lbs. of phosphorus.

A second facet of this project is making significant advancement in our understanding of the dynamics of the water columns in wastewater treatment ponds. The project partners have been collecting data on six wastewater treatment ponds – three with a high nutrient removal percentage, and three with low nutrient removal percentages – to document the changes in the respective water columns and microbial variations in the sludge. The study will measure changes in the anoxic and aerobic zones, pH, biological oxygen

demand, and phosphorus nitrogen levels at various depths in the ponds. These data will provide insight into why some facilities are able to remove nutrients to a high degree, while other similar-sized ponds are not. The information gathered has not fully been studied. But, when complete, the data should be useful to inform future studies seeking to understand the biology and water column dynamics. This is an example of positive coordination among researchers.

The project team continues to work with participating facilities to identify hurdles to implementation, and to determine if there remains a means to incorporate the recommended optimization activities. A final report on statewide wastewater optimization activities will be completed in June 2021, and made available to permittees that will receive a more restrictive WQBEL, as a guide to first-step solutions where more advanced treatment is required.

Figure 3. Frank Stuemke, with MRWA, takes water samples from the wastewater pond on Shafer, MN.



Clean Water Partnership Funds to meet water quality standards

The [Clean Water Partnership \(CWP\) loan program](#) is created to assist local units of government with addressing contributions to nonpoint source pollution. This revolving loan program was started from the EPA's Clean Water State Revolving Fund (CWSRF). Over the past 20 years, the revolution of the lent funds, interest earned, and occasional infusions of funds from the CWSRF allowed available funds to grow. The CWP funds were initially awarded to CWP grant recipients, which are no longer funded by the state legislature. CWP loans are now available to local government units on an open and continuous basis, with zero interest. CWP loans are awarded for a three- to four-year implementation period during which no repayment is required, followed by a 10-year repayment period.

While the CWP loan is exclusively for nonpoint source pollution, CWP funds can still assist cities and other municipalities address water quality concerns. Examples of projects that can help municipalities include addressing private, residential lateral pipes (to address inflow and infiltration), purchasing street sweeping equipment, or more efficient snow removal technology.

In fiscal year 2020, the City of Mounds View was awarded \$2 million in CWP loan funds to pass loans to their citizens for the inspection and repair of leaking sewer lateral lines and replacement of older water softeners. This will reduce water volume, decrease involuntary discharges from WWTFs, and decrease chloride. The City of Edgerton borrowed \$80,000 to purchase a new street sweeper, which will help to decrease loading total suspended solids, chloride, and nutrient pollution from stormwater into streams. The town of Thompson was awarded a loan for \$165,000 for new Sharq blades for a road grader, and they were allowed to pay for half of the cost of the road grader itself with the loan because it is used for snow removal during winter. Efficient snow removal reduces the need for chloride application to roads. All three of these projects are examples of how this program can help achieve clean water goals in an urban setting.

Non-native Phragmites and wastewater treatment facilities

In Minnesota, about 15 WWTFs are using non-native Phragmites as part of their wastewater treatment process. The non-native Phragmites help dewater the biosolids which in turn, reduces the volume of biosolids that needs to be managed. In 2013, non-native Phragmites was listed in Minnesota as a Restricted Noxious Weed. Recently, U of M research has shown that Phragmites can spread by seed, which was not previously thought to be the case. This raised concern that WWTFs were contributing to the spread of this invasive species in Minnesota.

The U of M, MDA, Minnesota Department of Natural Resources (MDNR), and MPCA have been working together on how to address the concern. After these entities initially met with the impacted WWTFs in March 2019, the MDA, MDNR, MPCA, U of M and the impacted WWTFs developed official guidance for transporting biosolids that potentially contain non-native Phragmites to approved biosolids land application sites. This guidance was then incorporated into the permits that MDA issues to transport biosolids containing non-native Phragmites, allowing land application activities to occur in accordance with the guidance and state land application regulations.

In December 2020, the Noxious Weed Advisory Committee (NWAC) will be voting to reclassify the non-native Phragmites from a Restricted Noxious Weed to a Prohibited Controlled Noxious Weed. The MDNR is also in the process of rulemaking to list non-native Phragmites as an aquatic invasive species.

At this time, MDA is recommending that NWAC include an exclusion for WWTF for this cycle to allow these facilities time to implement best management practices (BMPs) and evaluate options to discontinue the use of non-native Phragmites at their facilities. The MDA, MDNR, MPCA, U of M, and the impacted WWTFs met in November 2020 to continue to help cities understand what this reclassification means, what a listing by MDNR as an aquatic invasive species would mean for them, and identify next steps.

Municipal needs covered in this report and chances for input

The MPCA is hoping to receive comments from individuals or municipalities on this report which will be incorporated into the 2022 report. Please submit comments to Joel Peck, Municipal Liaison for the MPCA, at 651-757-2202 or joel.peck@state.mn.us.