



Public Facilities Authority: Wastewater Infrastructure Programs

**2019
EVALUATION REPORT**

**Program Evaluation Division
OFFICE OF THE LEGISLATIVE AUDITOR
STATE OF MINNESOTA**

Program Evaluation Division

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Evaluation Staff

James Nobles, *Legislative Auditor*
Judy Randall, *Deputy Legislative Auditor*

Joel Alter
Caitlin Badger
Sarah Delacueva
Andrew Duncan
Scott Fusco
Will Harrison
Jody Hauer
David Kirchner
Carrie Meyerhoff
Ryan Moltz
Jessica Obidike
Jodi Munson Rodriguez
Laura Schwartz
Katherine Theisen
Jo Vos
Caitlin Zanoni

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January 2019

Members of the Legislative Audit Commission:

The Public Facilities Authority (PFA) administers programs that help local units of government finance wastewater, stormwater, and drinking water infrastructure. Our review focused on how well the agency has managed its four wastewater infrastructure programs. We also analyzed the extent to which PFA's current programs will be able to meet Minnesota communities' wastewater infrastructure needs going into the future.

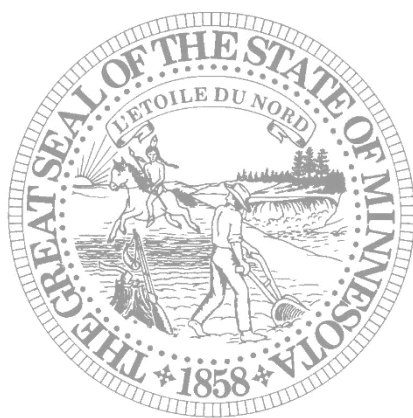
We found that PFA has successfully administered its wastewater infrastructure programs. The wastewater funding process—which PFA administers jointly with the Minnesota Pollution Control Agency—is thorough and appropriate. We also determined that, if current state and federal funding levels continue, PFA will be able to fund more than two-thirds of the state's estimated 20-year wastewater need of \$5 billion.

Our evaluation was conducted by Sarah Delacueva (project manager) and Ryan Moltz, with assistance from Ellen Dehmer. The Public Facilities Authority and the Minnesota Pollution Control Agency cooperated fully with our evaluation, and we thank them for their assistance.

Sincerely,

James Nobles
Legislative Auditor

Judy Randall
Deputy Legislative Auditor



Summary

Key Facts and Findings:

- The Public Facilities Authority (PFA) and the Minnesota Pollution Control Agency (MPCA) jointly administer the majority of the state's wastewater infrastructure programs. (p. 9)
- PFA manages the financial component of four grant and loan programs that help local units of government construct wastewater infrastructure. (pp. 12-20)
- Wastewater treatment facilities clean wastewater so that it can safely be returned to the environment. (p. 6)
- Clean Water State Revolving Fund loans make up the vast majority of the funding PFA has provided to support wastewater infrastructure. PFA offers these loans to local governments at or below market interest rates. (pp. 12, 14)
- PFA appears to be in full compliance with federal and state legal requirements governing wastewater infrastructure programs. (p. 25)
- Though lengthy, PFA's process for awarding wastewater infrastructure funding is thorough and appropriate. (pp. 20-24)
- State legal requirements with respect to minimum interest rates for Clean Water State Revolving Fund loans are unclear. (p. 30)
- PFA loans will save Minnesota communities a minimum of \$675 million in interest on wastewater infrastructure projects financed from fiscal years 1990 to 2018. PFA's lower interest rates, along with available grant funding, have resulted in reductions in per-household wastewater costs. (pp. 32-35)
- Due to inherent data-collection constraints, the state of Minnesota may not have a good understanding of the true extent of wastewater infrastructure needs. (p. 44)
- MPCA administers (1) the Project Priority List, which ranks near-term wastewater projects in line for PFA funding, and (2) the Wastewater Infrastructure Needs Survey (WINS), which collects information on long-term wastewater infrastructure needs. (pp. 46-49)
- The cost estimates reported through WINS and the Project Priority List were often higher than the final funding amounts, but the data sources cannot be compared easily. (pp. 49-50)
- If current state and federal funding trends continue for the next 20 years, PFA could satisfy more than two-thirds of Minnesota's estimated 20-year wastewater infrastructure needs. (p. 51)
- Some direct appropriations made by the Legislature have circumvented the state's established process for funding wastewater infrastructure. (p. 54)

Key Recommendations:

- The Legislature should clarify Minnesota statutes regarding minimum interest rates on Clean Water State Revolving Fund loans. (p. 31)
- MPCA should develop a method to link WINS data to Project Priority List data. (p. 50)
- The Legislature should exercise restraint when making direct appropriations for wastewater infrastructure projects. (p. 54)

The Public Facilities Authority (PFA) has done a good job administering wastewater infrastructure funding programs.

Wastewater treatment protects the environment and human health.

Report Summary

Wastewater is the used water resulting from everyday activities, such as washing dishes, doing laundry, showering, and flushing the toilet. Wastewater that is returned to the environment without being cleaned poses a threat to environmental and human health.

Wastewater treatment facilities clean wastewater so that it can be safely returned to the environment. Nearly 600 Minnesota cities, townships, and other communities operate wastewater treatment facilities large enough to require a state permit. Wastewater travels from homes and businesses to wastewater treatment facilities through community-owned sewer systems. Many facilities discharge water into rivers and lakes. Some smaller wastewater treatment facilities partially treat wastewater before discharging it into the ground or through spray irrigation, where the water is cleaned as it seeps through the soil.

There are a number of reasons that communities may build, rehabilitate, or replace wastewater treatment infrastructure (treatment facilities and sewer pipes). They may build new infrastructure if the community lacks a municipally operated treatment system or has outgrown its current system. Communities may also need to upgrade treatment processes to meet water quality standards or to rehabilitate aging infrastructure.

The Public Facilities Authority administers four programs that help communities finance wastewater infrastructure improvements.

Since 1990, the Public Facilities Authority (PFA) has awarded more than \$4.4 billion (in 2012-adjusted dollars) in loans and grants to help Minnesota

communities finance wastewater infrastructure construction projects.

The Clean Water State Revolving Fund allows PFA to make loans at or below market interest rates to communities for wastewater infrastructure improvements. The largest of the four programs, the revolving fund accounts for 88 percent of the dollars PFA awards. The fund is capitalized, in part, by federal grants and a required 20-percent state match.

The Water Infrastructure Fund (WIF) program provides grants to reduce the cost of wastewater infrastructure to households in the community. In order to qualify, the proposed wastewater infrastructure project must result in average annual per-household wastewater costs equal to at least 1.4 percent of the median household income. PFA awards WIF grants only to qualifying recipients of Clean Water State Revolving Fund loans or to communities financing their projects through the U.S. Department of Agriculture Rural Development office.

Point Source Implementation Grants (PSIG) provide funding for communities that must upgrade their wastewater treatment facilities to meet specific pollutant discharge requirements.

The Small Community Wastewater Treatment Program provides grants and loans to small communities without municipally owned wastewater treatment systems. Technical assistance grants fund engineering studies to help communities evaluate their options and decide whether a municipally owned treatment system is in their best interest. For communities that select a publicly owned option, PFA may award construction loans and grants to help complete the project.

PFA has successfully administered the state's wastewater infrastructure programs.

Stakeholders told us that PFA runs its programs “like a bank.” PFA is widely regarded as efficient, effective, and helpful. Among the stakeholders we spoke with—representing communities, environmental and conservation groups, legislative staff, and state and federal program partners—none had anything negative to say about PFA.

We conducted a file review to test PFA's compliance with multiple state requirements related to awarding wastewater infrastructure funding. PFA was in full compliance with the requirements we evaluated.

The U.S. Environmental Protection Agency (EPA) distributes the Clean Water State Revolving Fund federal funding to states. In its annual program reviews, EPA has stated that PFA meets all federal program requirements. In addition, EPA has highlighted Minnesota as an example of good management practices in its *SRF Fund Management Handbook*.¹

State law is unclear with respect to minimum interest rates on Clean Water State Revolving Fund Loans.

Minnesota statutes state that revolving fund loans must be made “at or below market interest rates, including interest-free loans.”² Minnesota rules, however, prohibit the interest rate from dropping below 1 percent.³

While we view this as a conflict, PFA contends that the agency satisfies the statutory requirement through revolving fund dollars it allocates to interest-free

loan programs in other state agencies. Regardless, we recommend that the Legislature clarify the statute. If it does not specifically want PFA to make interest-free loans, it could amend the statute to permit, but not require, such loans. If the Legislature wants interest-free loans to be an option, it could specify in statute the circumstances under which they should be available.

Minnesota communities have realized significant savings through PFA's wastewater infrastructure programs.

Through the Clean Water State Revolving Fund, PFA awards loans at or below market interest rates. While the specific rates have varied over time, PFA rates have been as much as 66 percent lower than the rates that a AAA-rated borrower would have received at market. For wastewater infrastructure projects that PFA financed from fiscal years 1990 to 2018, PFA loans will ultimately save Minnesota communities nearly \$700 million.

In addition to interest savings, PFA's grant funding also results in savings for communities. We compared the annual project costs that communities incurred with PFA loans and grants to what those costs would have been without PFA funding. For communities that received PFA funding in Fiscal Year 2018, average project costs were 43 percent lower than they would have been for the same project financed entirely with a market-rate loan. This translates into net average annual per-household wastewater costs 12 percent lower than they would have otherwise been.

PFA's wastewater infrastructure programs have resulted in significant savings for Minnesota communities.

¹ U.S. Environmental Protection Agency, *SRF Fund Management Handbook* (Washington, DC, 2018), 23 and 48.

² *Minnesota Statutes* 2018, 446A.07, subd. 7(b).

³ *Minnesota Rules*, 7380.0442, subp. 1(C), published electronically August 21, 2007.

If recent funding trends continue, PFA could fund 69 percent or more of Minnesota communities' wastewater infrastructure needs.

It may be impossible to accurately estimate long-term statewide wastewater infrastructure needs.

The Minnesota Pollution Control Agency (MPCA) maintains the Project Priority List, which catalogs the projects for which communities plan to seek PFA funding in the next five years. MPCA also conducts a biennial Wastewater Infrastructure Needs Survey (WINS), with which it estimates long-term statewide needs.

Both lists have limitations. The 2018 Project Priority List identified \$1.5 billion worth of wastewater projects slated for the next five years, but did not include projects for which the community does not plan to seek PFA funding.

Using WINS data, MPCA estimates that communities across Minnesota will have \$5 billion in wastewater infrastructure needs over 20 years. However, MPCA does not survey all communities that lack wastewater treatment facilities or that have facilities too small to require a state permit. Further, future wastewater infrastructure needs may be impossible to anticipate and difficult to estimate. Not all of the WINS respondents that submitted a project provided a cost estimate.

Preliminary cost estimates are often higher than the final costs for wastewater infrastructure projects. We found that for projects funded in Fiscal Year 2017, Project Priority List cost estimates, in aggregate, were much higher than the costs of the projects ultimately funded. Further, WINS estimates, overall, were higher than Project Priority List estimates for the same communities.

We were not able to successfully link specific projects in the WINS data to the corresponding Project Priority List data (let alone the final funded projects). We recommend that MPCA update the

WINS questionnaire to collect Project Priority List identification numbers when applicable. This would allow MPCA to better link the available data sources and determine the extent to which WINS cost estimates are correct.

Under the right circumstances, PFA could address more than two-thirds of Minnesota's estimated long-term wastewater infrastructure needs.

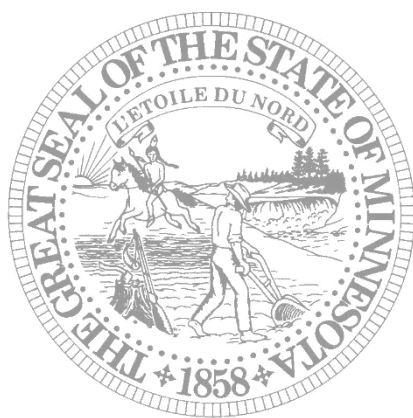
If state and federal support continue at current levels and if the agency maintains a strong credit rating on the state revolving fund, PFA will be able to loan almost \$2.5 billion from the fund over the next 20 years. In addition, we expect PFA to award roughly \$1 billion in grants from its other wastewater infrastructure programs during that time. At this funding level, PFA could finance nearly 70 percent of the estimated statewide need of \$5 billion identified through the WINS survey. The projects for which communities intend to apply for PFA funding amount to an estimated \$3.9 billion worth of wastewater infrastructure projects over 20 years. At current funding levels, PFA could finance 89 percent of the costs of these projects.

Our calculations related to PFA's funding capacity do not include direct appropriations that the Legislature makes to specific communities for wastewater infrastructure improvements. In 2017 and 2018, the Legislature made a total of 16 such appropriations, totaling \$27 million.

These awards circumvented PFA's established funding process; nearly half of the recipients would not have been eligible for awards from the state revolving fund given their low Project Priority List point totals. Since PFA and MPCA already have a comprehensive process for vetting funding recipients, we recommend that the Legislature exercise restraint when making direct appropriations for wastewater infrastructure projects.

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Chapter 1: Background

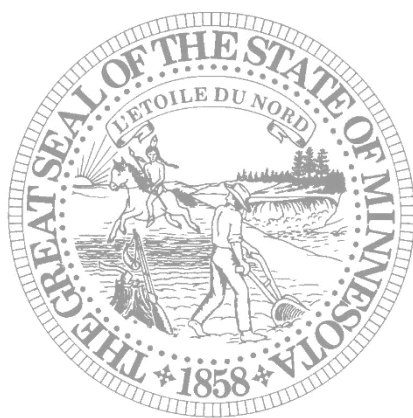
- 4 1.1 Wastewater treatment is a critical step in making water safe for human consumption.
- 7 1.2 Wastewater treatment is a multi-phase process.
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- 14 1.4 Between fiscal years 1990 and 2018, loans from the Clean Water State Revolving Fund accounted for more than 88 percent of the Public Facilities Authority's wastewater infrastructure funding.
- 15 1.5 Proceeds from the sale of revenue bonds have been the source of almost half of the Clean Water State Revolving Fund's revenues from 1989 to 2018.
- 16 1.6 Revenues flow into the Clean Water State Revolving Fund from various sources.
- 21 1.7 Communities must complete numerous steps when applying for wastewater infrastructure funding.

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- 26 2.1 The Public Facilities Authority must adhere to numerous federal requirements in its administration of the Clean Water State Revolving Fund loan program.
- 27 2.2 We determined that the Public Facilities Authority complied with the following state requirements.
- 35 2.3 Communities that received financing from the Public Facilities Authority have lower average annual wastewater costs than they otherwise would have had.

Chapter 3: Minnesota's Wastewater Infrastructure Needs

- 45 3.1 The Minnesota Pollution Control Agency's two methods of estimating wastewater infrastructure needs have limitations.
- 52 3.2 If current funding trends continue, the Public Facilities Authority will be able to distribute nearly \$3.4 billion in grants and loans over the next 20 years.



Introduction

In March 2018, the Legislative Audit Commission directed the Office of the Legislative Auditor (OLA) to evaluate the Public Facilities Authority's water treatment infrastructure programs. While the Public Facility Authority (PFA) has been funding various types of public infrastructure projects since Fiscal Year 1990, our office has never evaluated it.

The commission selected the broad topic of "water treatment infrastructure" with the understanding that OLA would scope the project to focus on either wastewater or drinking water programs. We selected wastewater based on our early conversations with legislators and the amount of activity related to wastewater we observed during the 2018 legislative session. As such, we focused our evaluation on PFA's four wastewater infrastructure funding programs: the Clean Water State Revolving Fund (loans), the Point Source Implementation Grants (PSIG) program, the Small Community Wastewater Treatment Program (loans and grants), and the Water Infrastructure Fund (grants).

In our evaluation, we addressed the following questions:

- **How well does the Public Facilities Authority administer the grants and loans that it awards for wastewater infrastructure improvements?**
- **What are the outcomes of the Public Facilities Authority's spending on wastewater infrastructure improvements, and to what extent does the state measure these outcomes?**
- **How do the state resources available for wastewater infrastructure improvements compare with the needs identified by local governments?**
- **How do other states finance wastewater infrastructure?**

To conduct this evaluation, we interviewed numerous stakeholders, including legislators, legislative staff, and staff from PFA and the Minnesota Pollution Control Agency (which also plays a role in administering wastewater infrastructure programs). We interviewed representatives of the U.S. Department of Agriculture Rural Development office, U.S. Environmental Protection Agency, Minnesota Rural Water Association, League of Minnesota Cities, Metro Cities, and Coalition of Greater Minnesota Cities, as well as several environmental and conservation organizations.

We visited three communities that had received PFA funding awards, and spoke with others, in order to learn about their experiences working with PFA. We also attended the Minnesota Rural Water Association's "Financing Your Community Projects" training session to observe how city officials learn about the options for wastewater infrastructure funding.

We reviewed state and federal laws related to wastewater infrastructure financing and conducted a file review to verify that PFA was satisfying legal requirements. We ultimately reviewed 102 files, representing all projects with loan or grant contracts executed in fiscal years 2017 and 2018. We also examined data from both PFA and the Minnesota Pollution Control Agency to analyze trends related to Minnesota's wastewater infrastructure needs, as well as those projects ultimately financed by PFA.

We limited the scope of our evaluation to PFA's wastewater infrastructure programs. We did not evaluate the agency's administration of drinking water or transportation funding. Some of the programs used to fund wastewater infrastructure improvements may also be used to fund stormwater projects. We did not, however, review stormwater projects or PFA activities specific to stormwater. Finally, while we describe the role it plays in administering wastewater infrastructure funding, we did not evaluate the activities of the Minnesota Pollution Control Agency.

This report is organized into three chapters. Chapter 1 provides overviews of wastewater treatment and PFA's four wastewater infrastructure financing programs. In Chapter 2, we evaluate PFA's performance in administering those programs. We also discuss the measurable outcomes that have resulted from PFA-funded wastewater construction projects. Chapter 3 examines Minnesota's statewide wastewater infrastructure needs, and includes our analysis of PFA's ability to meet communities' long-term needs with current levels of funding. There are a number of appendices at the end of the report, including a glossary, lists of the criteria used to rank different types of wastewater infrastructure projects, lists of wastewater infrastructure projects funded by PFA in recent years, and information about state-funded wastewater infrastructure programs in other states.

Chapter 1: Background

Every time we take a shower, wash dishes, do laundry, or flush a toilet, we create wastewater. Where that wastewater goes and how it is best processed are questions that communities across Minnesota grapple with every day. In this chapter, we begin by explaining why wastewater treatment is important for environmental and public health reasons. We go on to discuss the wastewater infrastructure funding programs—administered by the Public Facilities Authority—available to municipalities in Minnesota, as well as the process for obtaining wastewater infrastructure funding.

Throughout this chapter and this report, we use terms that may be unfamiliar to those who do not regularly concern themselves with wastewater treatment. The glossary at the end of this report explains many of these terms.

Wastewater Treatment Overview

Before we explain the Public Facilities Authority’s wastewater treatment programs, it is important to understand why wastewater treatment is necessary. In this section, we explain the benefits of treating wastewater, the process used to do so, and some of the factors that drive communities to upgrade their wastewater infrastructure.

Benefits of Wastewater Treatment

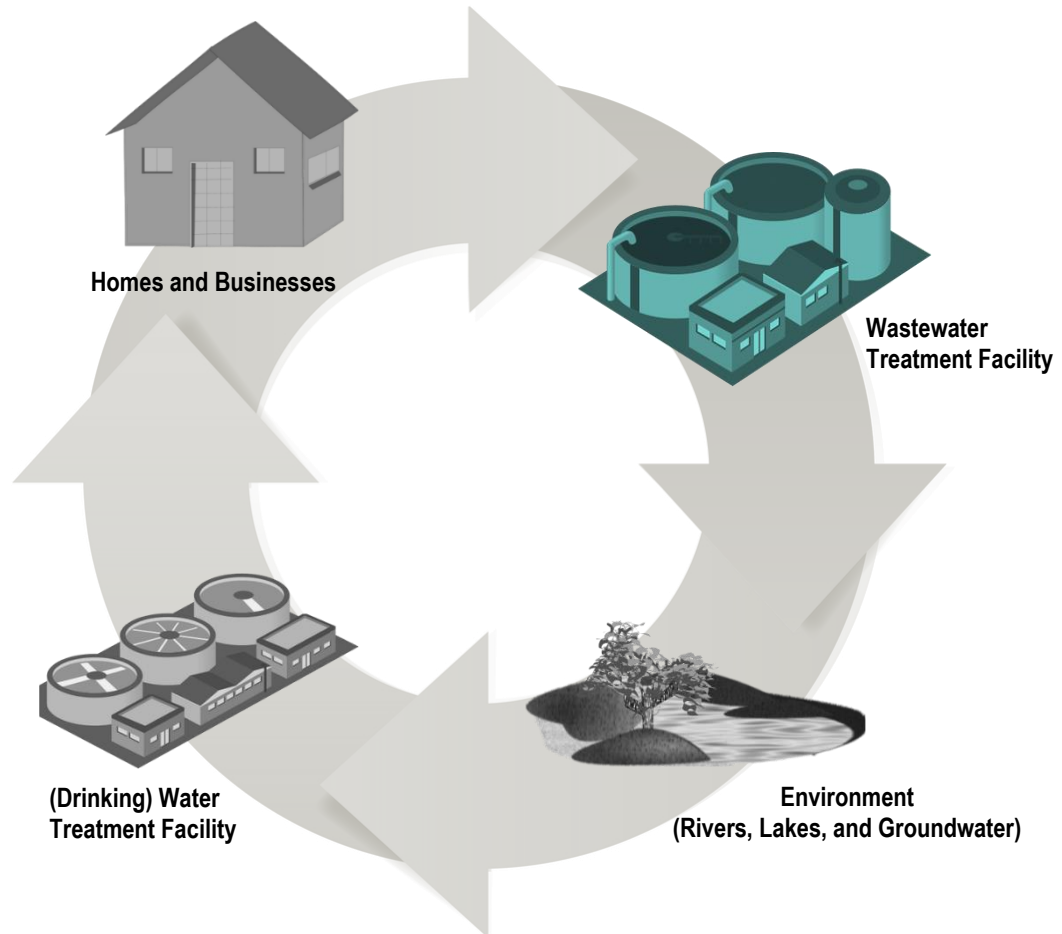
Wastewater treatment is part of a cycle of human water usage, demonstrated in Exhibit 1.1. In order for Minnesotans to have clean water to drink, cook with, and bathe in, we depend on municipalities to extract water from a surface water (river or lake) or groundwater source, treat it to remove pollutants, and pipe it into our homes. When we use water, we clean it—either through a municipally owned wastewater treatment facility or a home-based treatment system (septic system)—before discharging it back into the environment.¹

Wastewater that is insufficiently treated can harm the environment or have a detrimental effect on human health.

Decaying waste matter in water depletes the oxygen supply available to the plants and animals living there. The presence of excessive amounts of nutrients often found in wastewater, particularly phosphorous and nitrogen, can also lead to algae blooms that contribute to oxygen depletion. Many species of fish cannot survive in such conditions. Likewise, wastewater treatment is necessary to remove bacteria and toxins harmful to humans, as the receiving water bodies may be used as a source of drinking water or for recreational purposes, such as swimming and fishing. Humans can contract numerous diseases from ingesting contaminated water, including typhoid, cholera, and other bacterial or viral infections.

¹ Wastewater can reenter the environment in a number of ways. Depending on the location and the type of wastewater treatment system, treated water may be discharged into a river or lake, or into the ground, where it may filter down to the groundwater table. Treated wastewater may also be used to irrigate fields.

Exhibit 1.1: Wastewater treatment is a critical step in making water safe for human consumption.



NOTES: This is a simplified illustration of the way that we use and treat water in a continuous cycle. While the Public Facilities Authority provides funding both for wastewater and drinking water infrastructure improvements, we limited our evaluation to the agency's *wastewater* funding programs.

SOURCE: Office of the Legislative Auditor.

In order to protect the environment and human health, state law requires, albeit somewhat indirectly, that all wastewater be treated before it is returned to the environment. Minnesota rules require any dwelling or structure creating wastewater to treat it with an individual septic system, unless it is served by a municipal wastewater system that has been issued a

permit by the Minnesota Pollution Control Agency (MPCA).² (We refer to these as “permitted wastewater treatment facilities” throughout this report.) Statutes and rules require that counties (or cities and towns that choose to adopt their own septic system ordinances) enforce the rules related to individual septic systems.³

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**Minnesota communities
have permitted wastewater
treatment facilities.**

There is no explicit legal requirement for municipalities to provide wastewater treatment services, regardless of their size. Nearly 600 Minnesota cities, towns, and sanitary sewer districts, however, do provide wastewater treatment services for their residents through permitted wastewater treatment facilities.⁴ This makes practical sense given that (1) septic systems require more space than many city-dwelling residents have available on their properties, and

(2) the oversight responsibilities for the county would be overwhelming if all residents had individual septic systems.

Wastewater Treatment Processes

Broadly speaking, municipal wastewater treatment systems consist of two parts: a collection system and a treatment system. Collection systems are also known as sanitary sewer systems. They consist of a series of pipes running from individual buildings to larger pipes running under the streets. These larger pipes carry the wastewater from the individual buildings to a wastewater treatment facility.⁵ Sanitary sewer systems are distinct from storm sewers. When rain and snowmelt (known as “stormwater”) enter the storm sewers located on our city streets, they typically flow directly to rivers and streams without being treated at a wastewater treatment plant.⁶

² *Minnesota Rules*, 7080.1500, subp. 1, published electronically October 10, 2013. Minnesota rules and statutes commonly use the term “subsurface sewage treatment systems” to refer to wastewater treatment systems designed primarily for individual residences. We refer to these systems as “septic systems” for simplicity. Municipal wastewater treatment facilities that discharge into lakes or rivers receive permits under both the National Pollutant Discharge Elimination System (administered by MPCA on behalf of the U.S. Environmental Protection Agency) and Minnesota’s State Disposal System. Facilities that treat more than 10,000 gallons of water a day and discharge to soil or groundwater receive permits under only the State Disposal System.

³ *Minnesota Statutes* 2018, 115.55, subd. 2; and *Minnesota Rules*, 7080.1050, published electronically October 10, 2013.

⁴ A sanitary sewer district is a governmental subdivision of the state responsible for constructing, operating, maintaining, and improving the disposal of sewage for all of the municipalities within its corporate limits, for the purpose of preventing the pollution of public waters. In this report, we generally refer to the municipalities and government subdivisions that provide wastewater treatment as “communities.”

⁵ Communities often build wastewater treatment facilities on low ground so that gravity can help convey the wastewater to the facilities. In cases where wastewater needs to move upward to reach its destination, the collection system may also incorporate a series of lift stations to move water to a higher elevation where gravity can resume its work.

⁶ We did not include stormwater disposal within the scope of our evaluation. Unless otherwise specified, “sewer systems” refers to the sanitary sewers that convey used water from homes and businesses to a wastewater treatment facility.

Wastewater treatment facilities clean wastewater so that it can safely be returned to the environment.

Exhibit 1.2 illustrates the treatment processes wastewater undergoes at a typical wastewater treatment facility that discharges into a river or lake. Different facilities use different processes, but most follow the same general pattern. “Primary treatment” consists of physical processes that remove about 50 percent of the pollutants from the wastewater. During “secondary treatment,” wastewater is exposed to bacteria that eat the vast majority of the remaining pollutants. Most of the wastewater treatment facilities in the United States use both primary and secondary treatment methods. Some communities may also use “advanced treatment” methods to meet state water quality standards. There are many different advanced treatment methods; a community chooses its method based in part on what type of pollutant it needs to reduce in the facility’s discharge. Once all treatment processes are complete, the wastewater is disinfected to kill any remaining bacteria and viruses before being discharged into the environment.

For smaller communities, it may not make sense to construct a wastewater treatment facility as described above. As we discuss later in this chapter, communities typically pay for wastewater treatment infrastructure by raising sewer rates for their residents. Some areas with low population density simply cannot build wastewater infrastructure without imposing financial hardship on their community members. Even if a community does not have a central, municipally owned wastewater treatment facility, it is important that some form of wastewater treatment take place in order to protect the environment and human health. Residents may use individual septic systems, or the community may own and operate one or more cluster systems, which work as septic systems that collect and treat the wastewater from a group of nearby households. In both cases, wastewater collects in a tank where solids settle to the bottom. The systems release the liquid portion into the ground, where it is cleaned through natural processes as it filters through the soil.⁷

Factors Driving Wastewater Infrastructure Improvements

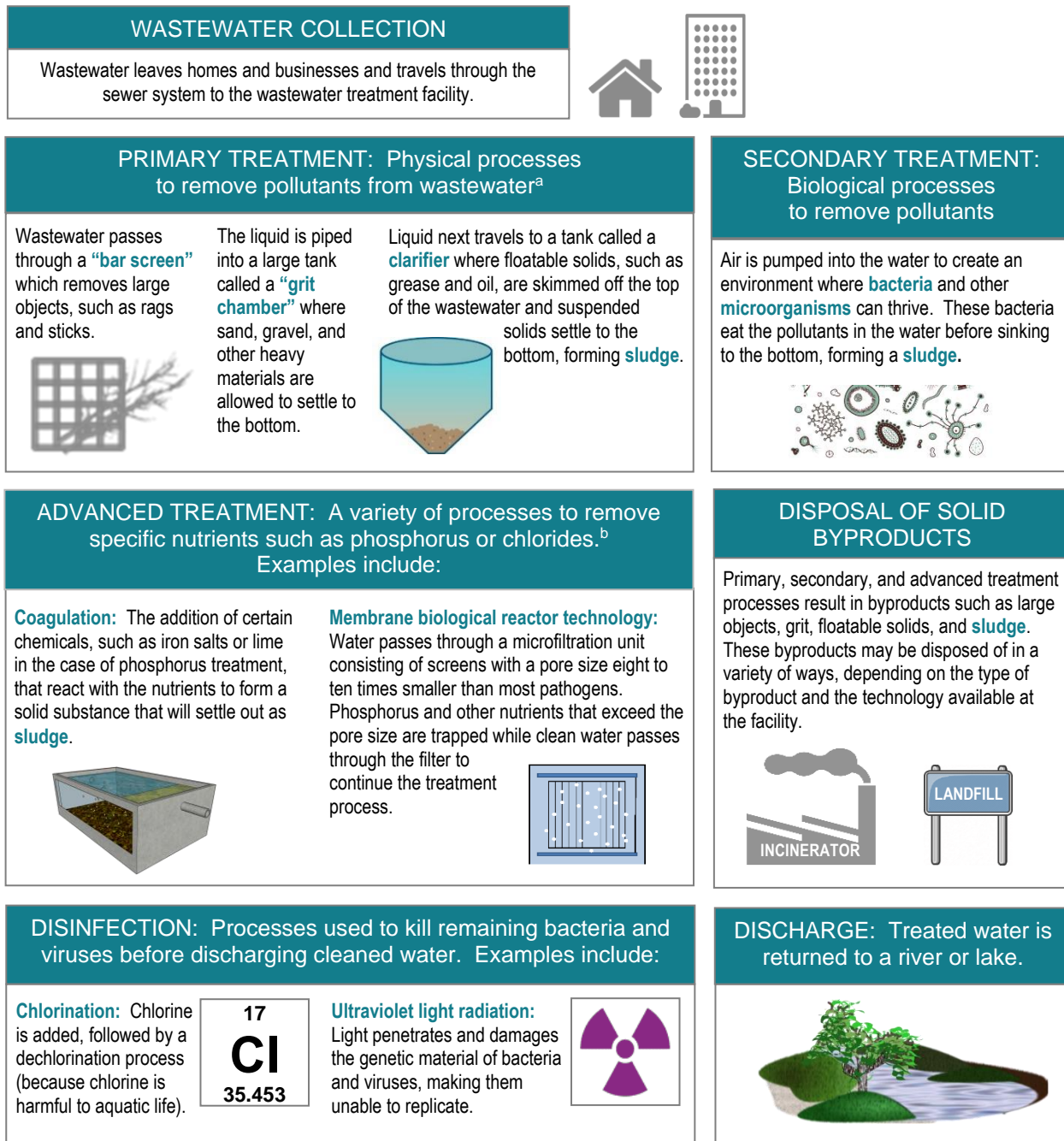
Minnesota communities have considerable wastewater infrastructure needs, driven by a number of factors. We expand upon these drivers below, and we discuss Minnesota’s wastewater infrastructure needs in greater detail in Chapter 3.

Aging infrastructure, community expansion, and water quality standards all play a role in determining what types of wastewater construction projects communities undertake.

Many Minnesota communities built their wastewater treatment systems during the 1970s and may need to replace or upgrade aging infrastructure. The major structural components of a wastewater treatment facility generally have a useful life of about 40 years, and when a

⁷ Soil naturally cleans water in a few different ways. As water seeps through the soil, some pollutants get caught in the small pores of the soil. Additionally, most soil particles have a light chemical charge that attracts and captures certain chemicals. Finally, microorganisms living in soil may capture and use pollutants. By the time water reaches the groundwater table, it is often clean enough for human consumption.

Exhibit 1.2: Wastewater treatment is a multi-phase process.



NOTES: This exhibit is intended only as an example of a typical treatment process for a wastewater treatment facility that discharges to a river or lake. Wastewater treatment facilities use different technologies and may employ these or other processes in different combinations. "Sludge" is defined as solid waste materials that settle out in the wastewater treatment process.

^a Some sources further divide these activities into "preliminary treatment" (bar screen and grit chamber) and "primary treatment" (clarifier).

^b All permitted wastewater treatment facilities that discharge to a river or lake are required to do some form of primary and secondary treatment. A municipality typically invests in advanced treatment if its permit requires it to reduce the amount of specific nutrients in its discharge.

SOURCE: Office of the Legislative Auditor.

facility gets too old, its effectiveness declines, requiring the community to upgrade certain components, or even replace the facility entirely. The pipes that make up wastewater collection systems can last up to 80 years but may develop cracks as they age. The cracks allow groundwater and stormwater to seep into the pipes increasing the flow of water to the treatment facility. At best, this is inefficient; in more serious cases, the extra water may cause the pipes to exceed their capacity, resulting in sewer backups during times of high groundwater or heavy rainfall.⁸ When communities grow in population, the increase in wastewater producers may also tax the capacity of the community's original wastewater infrastructure, necessitating collection system expansion and/or treatment facility upgrades.

Communities may need to upgrade their wastewater treatment facilities due to water quality standards for the river or lake into which the facility discharges. The Minnesota Pollution Control Agency (MPCA) monitors rivers and streams and deems water bodies in poor health "impaired." The agency develops a pollution-reduction plan, known as total maximum daily load (TMDL), for impaired water bodies. If a wastewater treatment facility discharges into an impaired water, the TMDL may prescribe a reduction in the amounts of certain pollutants that the facility is allowed to discharge. MPCA enforces the TMDL through its permitting process, requiring certain facilities to upgrade their processes to reduce or eliminate the pollutants in question.⁹ Phosphorus is the most common nutrient that wastewater treatment facilities must reduce, though they may also need to treat water for chlorides, nitrogen, or mercury, among others.

Even communities without municipally owned wastewater systems may have wastewater infrastructure needs. The fact that a community lacks centralized wastewater treatment is not inherently a problem; if all residents and businesses have functioning septic systems, then wastewater will not endanger the environment or human health. However, if enough septic systems within the community are failing or noncompliant, the community may choose to explore a municipally owned treatment option, such as a small wastewater treatment facility or one or more cluster systems. Alternatively, the community could build a sewer system to connect to a facility in a neighboring community. The Minnesota Pollution Control Agency estimates that there are 1,200 such "unsewered" communities in Minnesota, amounting to more than half a million homes and businesses in the state that dispose of wastewater using septic systems.¹⁰

Wastewater Infrastructure Funding Overview

In this section, we explain the history of federal and state programs for financing wastewater infrastructure. We then discuss the roles of the two state agencies most involved with funding wastewater infrastructure: MPCA and the Public Facilities Authority (PFA). Finally, we describe PFA's four wastewater financing programs.

⁸ This phenomenon is part of an issue known as "inflow and infiltration," defined in the glossary.

⁹ In instances where the cost of an upgrade would be prohibitive for a community, MPCA can work with the community in a number of ways. The tools that MPCA uses most often are variances and schedules of compliance. A variance allows a community that cannot afford a facility upgrade to temporarily continue discharging at achievable levels, until it can afford construction. MPCA establishes a schedule of compliance when a community can afford to take the necessary steps to meet its permit limit but needs time to complete the project.

¹⁰ Minnesota Pollution Control Agency, *Citizen's guide to wastewater*, <https://www.pca.state.mn.us/water/citizens-guide-wastewater>, accessed October 15, 2018.

Funding History

In 1969, the Cuyahoga River in Ohio was so polluted that it caught on fire. Partly as a response to that dramatic event, Congress passed the Clean Water Act in 1972 with the goal of improving water quality. The federal government began providing grants to states for the purpose of constructing wastewater treatment facilities. Those grants covered 75 percent of project costs.¹¹ In Minnesota, state matching funds covered a further 15 percent, leaving municipalities to pay only 10 percent of the cost of building a wastewater treatment facility.¹² Much of Minnesota's wastewater infrastructure was constructed under this financial arrangement in the 1970s and 1980s.

Over time, the federal government found this level of contributions to be unsustainable. Congress reduced federal grants to 55 percent of project costs, effective in Federal Fiscal Year 1985.¹³ In Minnesota, state grants remained capped at 15 percent of project costs, thereby raising municipalities' project costs to 30 percent.¹⁴ In 1987, Congress established the Clean Water State Revolving Fund program to make loans at or below market interest rates to municipalities.¹⁵ That same year, the Minnesota Legislature established PFA to administer the revolving loan fund.¹⁶ PFA made the first loans from the fund in State Fiscal Year 1990. Since then, PFA has provided approximately \$4.4 billion (in 2012-adjusted dollars) in loans and grants for wastewater infrastructure projects.

Responsible Agencies

Several state agencies are involved with funding wastewater infrastructure projects, but two share most of the responsibility.

The Minnesota Pollution Control Agency and the Public Facilities Authority share responsibility for administering Minnesota's wastewater infrastructure programs.

Broadly speaking, MPCA's role is to conduct a technical review of potential wastewater infrastructure projects and rank them on a set of objective criteria. PFA's role is to fund projects in the order in which they appear on MPCA's ranked list.

Our evaluation focused on PFA's administration of Minnesota wastewater infrastructure funding; we did not evaluate MPCA's activities. However, we discuss the roles of both agencies in order to provide a complete overview of the funding process, which begins with MPCA.

¹¹ Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500, October 18, 1972.

¹² *Laws of Minnesota* 1973, chapter 423, sec. 8.

¹³ Municipal Wastewater Treatment Construction Grant Amendments of 1981, Public Law 97-117, December 29, 1981.

¹⁴ *Laws of Minnesota* 1984, chapter 597, sec. 47.

¹⁵ Water Quality Act of 1987, Public Law 100-4, February 4, 1987.

¹⁶ *Laws of Minnesota* 1987, chapter 386, art. 3, secs. 18-26, codified as *Minnesota Statutes* 2018, Chapter 446A.

Minnesota Pollution Control Agency

In order to receive funding from PFA, communities must first seek placement on a ranked list, known as the Project Priority List, which is maintained by MPCA. The agency accepts applications and ranks the applicants based on objective criteria, such as the age of the community's existing wastewater treatment facility and whether the facility is discharging into an impaired water. Each criterion is worth a given number of points, the total of which PFA uses to determine which projects to fund.¹⁷ Later in the process, MPCA reviews and approves communities' final construction plans. We discuss these steps in greater detail in the final section of this chapter.

In addition to its role in establishing the priority list, MPCA is indirectly involved in wastewater infrastructure funding in two ways. First, MPCA establishes water quality standards and monitors the state's waters to determine whether they are impaired. It issues permits to wastewater treatment facilities that discharge into rivers or lakes and sets discharge limits for certain pollutants based on those water quality standards. MPCA reviews permits and revises discharge limits, as needed, every five years. When MPCA sets a new discharge limit for a permitted facility, the community may need to upgrade its wastewater treatment facility in order to meet the new limit. Second, MPCA conducts a biennial Wastewater Infrastructure Needs Survey, which catalogs wastewater infrastructure needs and their estimated costs across the state. We discuss this survey, the estimates derived from it, and how it relates to the Project Priority List in Chapter 3.

Public Facilities Authority

PFA is governed by a board consisting of six state commissioners representing the departments of Agriculture, Employment and Economic Development, Health, Management and Budget, and Transportation, as well as MPCA. PFA has ten staff: an executive director, a program coordinator, a financial officer, an accounting officer, an administrative assistant, and five loan officers.

PFA administers programs that help local units of government construct wastewater, stormwater, drinking water, and transportation infrastructure projects. PFA provides wastewater infrastructure funding through several programs, discussed below, for projects that have been ranked by MPCA on the Project Priority List. The agency finances only the publicly owned portions of wastewater systems.¹⁸ Projects receiving PFA funds may involve rehabilitation, replacement, or upgrades to wastewater infrastructure.¹⁹

¹⁷ These criteria and their associated points are defined in *Minnesota Rules*, 7077.0117 and 7077.0118, published electronically July 9, 2014. See Appendix A for complete lists of criteria for projects (1) involving facilities with existing permits and (2) in "unsewered" areas.

¹⁸ Publicly owned systems include the sewer pipes and treatment facilities owned by cities, townships, counties, or regional entities. Individual septic systems and industrial wastewater systems are privately owned.

¹⁹ "Rehabilitation" refers to fixing something, rather than replacing it completely. Rehabilitation encompasses smaller repairs, as well as larger renewal efforts designed to increase the useful life of a component.

Other State Agencies

Two other state agencies, the departments of Employment and Economic Development (DEED) and Iron Range Resources and Rehabilitation also provide limited funding for wastewater infrastructure.

- DEED provides infrastructure funding through two programs: the Small Cities Development Program and the Greater Minnesota Public Infrastructure Grant Program. The Small Cities program provides grants of up to \$600,000 to cities with fewer than 50,000 residents and to counties with fewer than 200,000 residents. The Public Infrastructure program, available to cities and counties outside the seven-county metropolitan area, provides grants of up to 50 percent of the capital costs, up to \$2 million, of certain infrastructure projects.²⁰ Eligible projects—which can include, but are not limited to, wastewater infrastructure projects—must be designed to expand or retain jobs, increase the area’s tax base, or expand or create new economic development.
- The Department of Iron Range Resources and Rehabilitation provides funds through its Development Infrastructure Grant Program for cities, townships, and tribal units of government in the area served by the department.²¹ Funded projects must be designed to support economic development and prepare communities for future growth. Such projects can include, but are not limited to, wastewater infrastructure projects.

Both departments tend to award wastewater infrastructure funding in combination with PFA funding, rather than financing such projects on their own. For example, a recent wastewater infrastructure project in the city of Gilbert in Saint Louis County received financing totaling approximately \$12.1 million. Most of those funds, \$11.7 million, came from PFA. The city also received a grant from Iron Range Resources and Rehabilitation in the amount of \$250,000.²² As a second example, the city of Dalton in Otter Tail County received more than \$3.5 million in wastewater infrastructure funding, including a DEED Small Cities grant in the amount of \$585,000.²³

Although the Metropolitan Council does not provide funding for wastewater infrastructure projects to other units of government, it is a large provider of wastewater services. The council’s Environmental Services division operates eight wastewater treatment facilities and provides wastewater services to 2.6 million people living in 109 communities in the seven-county metropolitan area. The council is also PFA’s largest recipient of funds. Between fiscal years 1990 and 2018, the council received almost \$2 billion (in 2012-adjusted dollars) in revolving fund loans from PFA. This amount constitutes approximately half of all revolving fund loans awarded during the time period. In addition to receiving funds from PFA, the Metropolitan Council also funds wastewater infrastructure projects with its own revenues.

²⁰ The seven-county metropolitan area includes all or part of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties.

²¹ Iron Range Resources and Rehabilitation serves an approximately 13,000-square-mile region in northeastern Minnesota known as the “taconite assistance area.” See *Minnesota Statutes* 2018, 273.1341.

²² The remainder of Gilbert’s funding (\$100,000) came from the federal Community Development Block Grants program administered by Saint Louis County.

²³ The bulk of Dalton’s funding (\$2.5 million) came in the form of grants and loans from the U.S. Department of Agriculture. PFA financed the remaining \$387,000 through a Water Infrastructure Fund grant (discussed in the next section).

Wastewater Funding

In this section, we first discuss Minnesota's major programs for funding wastewater infrastructure. Later, we compare Minnesota's wastewater funding strategies with those of other states.

Key Programs in Minnesota

Typically, communities must increase sewer fees in order to pay for the construction and ongoing operation and maintenance costs of wastewater infrastructure. The methods used to raise the required revenues vary from one community to the next. For example, when the city of Blue Earth obtained a loan to rehabilitate its wastewater treatment facility in Fiscal Year 2018, it pledged to raise the required revenue through a sewer utility rate increase that would be reflected in residents' monthly sewer bills.²⁴ Oronoco Township also raised its sewer utility rates to pay for a Fiscal Year 2017 loan used to construct a collection system and small treatment system for its Cedar Beach subdivision. However, the township works with Olmsted County to collect these revenues twice per year through the property tax collection system rather than through monthly sewer bills.²⁵

PFA's programs are designed to make the cost of wastewater improvements more affordable to the residents served by these facilities. The authority administers four key wastewater programs, which we compare side-by-side in Exhibit 1.3. All cities in Minnesota, regardless of size or location, can qualify for loans at or below market interest rates.²⁶ PFA may also award supplemental grants to communities and projects that meet certain eligibility criteria.

Clean Water State Revolving Fund loans have made up the vast majority of the Public Facilities Authority's wastewater infrastructure funding.

From Fiscal Year 1990 to Fiscal Year 2018, PFA awarded \$3.9 billion (in 2012-adjusted dollars) in loans from the revolving fund at or below market interest rates to Minnesota communities. Most of PFA's other programs were implemented in the 2000s and have been used to distribute far fewer funds. Exhibit 1.4 shows the breakdown of PFA funding by program since the agency's inception. As shown in the exhibit, WIF grants have made up the largest share of PFA's awarded funds among the non-revolving-fund programs.

Looking only at more recently funded projects, loans from the revolving fund remain the largest proportion of funds awarded by PFA. However, PSIG grants are now the second largest of PFA's programs, as shown in Exhibit 1.3. The agency awarded more than \$39 million in PSIG grants to eight communities in Fiscal Year 2018.²⁷

²⁴ At the time of the loan application in 2017, Blue Earth residents paid a base rate of \$18.89 per month, plus an additional charge based on gallons of water used. The city expected to increase that base rate by 9 percent for each of the next three years, so that by 2020, residents would be paying a minimum of \$24.46 per month.

²⁵ Olmsted County's property tax bills for system users show two line items related to the wastewater treatment system: one for the construction loan and one for operations and maintenance. The county also assesses a \$25 fee for each system user once per year.

²⁶ PFA determines market interest rates using Thomson Reuters' Municipal Market Data yield curves. These indices represent analysts' daily opinion of the valuation of state general obligation bonds.

²⁷ For a listing of all projects funded by PFA in fiscal years 2017 and 2018, see Appendix B.

Exhibit 1.3: The Public Facilities Authority funds wastewater infrastructure improvements using four programs.

	Clean Water State Revolving Fund	Water Infrastructure Fund (WIF)	Point Source Implementation Grants (PSIG)	Small Community Wastewater Treatment Program
Type of funding	Loans	Grants	Grants	Loans and grants
Primary source of funding ^a	PFA revenue bond proceeds, revolving fund loan repayments, interest earnings, federal grants, and state match from general obligation bonds	General obligation bonds	Clean Water Legacy Fund	Clean Water Legacy Fund
Eligible infrastructure types	Collection and treatment	Collection and treatment	Treatment only	Collection and treatment
Purpose of funding	To address aging infrastructure, water quality standards, or community expansion	To rehabilitate or build new infrastructure necessitated by aging or water quality standards (not system expansion), for communities that demonstrate financial need	To meet state water quality standards	To replace noncomplying or nonexistent septic systems with new publicly owned wastewater infrastructure
Maximum funding amount per project	No maximum loan amount	\$5 million (but not more than \$20,000 per sewer connection)	\$7 million	Technical assistance grants: \$60,000 (but not more than \$1,000 per household plus \$20,000) Construction grants and loans: \$2 million total
Restrictions on funding	Loans must be made at or below market interest rates	Grants must match either (1) a revolving fund loan, or (2) USDA loans and grants	Can cover up to 80 percent of PSIG-eligible expenses	Loans are issued at 1 percent interest rate
Amount awarded in Fiscal Year 2018 ^b	\$46.7 million	\$10.4 million	\$39.1 million	\$167,700
Number of recipients in Fiscal Year 2018 ^c	9	9	8	4

NOTES: "USDA" is U.S. Department of Agriculture. Public entities—such as cities, counties, townships, and sanitary sewer districts—are eligible for funding from the Public Facilities Authority (PFA) to construct publicly owned wastewater infrastructure. In order to receive funding, a community must first put its project on the Project Priority List maintained by the Minnesota Pollution Control Agency.

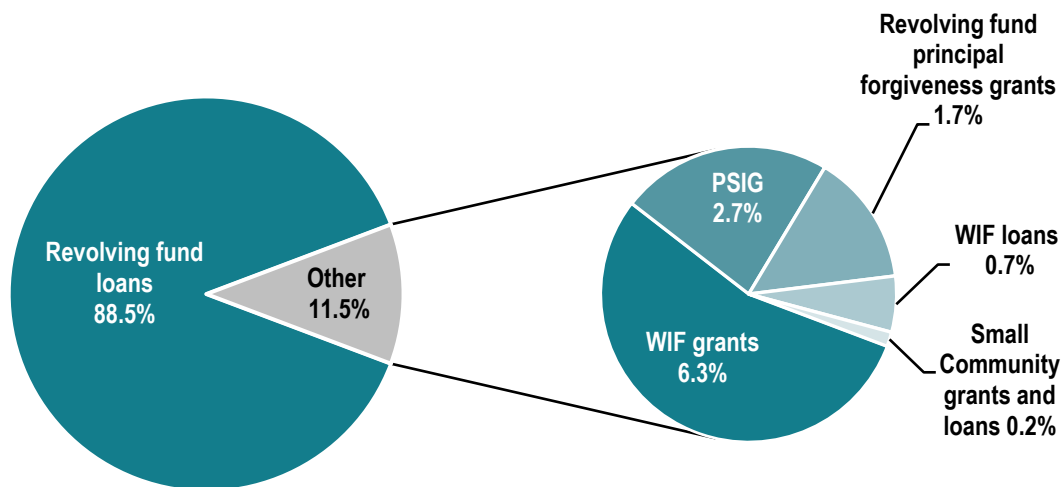
^a We detail Clean Water State Revolving Fund revenues in Exhibit 1.5. We expand on recent program revenue sources for all programs in Chapter 3.

^b PFA awarded a smaller-than-usual amount of revolving fund dollars in Fiscal Year 2018 because it did not execute an agreement with its largest borrower, Metropolitan Council Environmental Services, in that year. Over the past 28 years, awards to the Metropolitan Council have accounted for approximately half of all revolving fund loans by amount. In addition, PFA awarded only technical assistance grants from the Small Community program during Fiscal Year 2018.

^c In Fiscal Year 2018, the Public Facilities Authority awarded funding to 22 communities, some of which received funding through more than one program.

SOURCE: Office of the Legislative Auditor.

Exhibit 1.4: Between fiscal years 1990 and 2018, loans from the Clean Water State Revolving Fund accounted for more than 88 percent of the Public Facilities Authority’s wastewater infrastructure funding.



NOTES: “Revolving fund” is the Clean Water State Revolving Fund. PFA has awarded revolving fund loans for wastewater infrastructure projects since Fiscal Year 1990, and principal forgiveness grants since Fiscal Year 2009. “WIF” is the Water Infrastructure Fund. WIF grants have been available since Fiscal Year 1996; WIF loans were available only from Fiscal Year 2002 to Fiscal Year 2010. “PSIG” is the Point Source Implementation Grants program; its predecessor programs began in Fiscal Year 2007. The Small Community Wastewater Treatment program has been available since Fiscal Year 2007. Percentages are based on dollar amounts that have been adjusted for inflation using the state and local government consumption expenditures and gross investments chained price index. That index uses 2012 dollars as its base.

SOURCE: Office of the Legislative Auditor, analysis of Public Facilities Authority data.

Clean Water State Revolving Fund

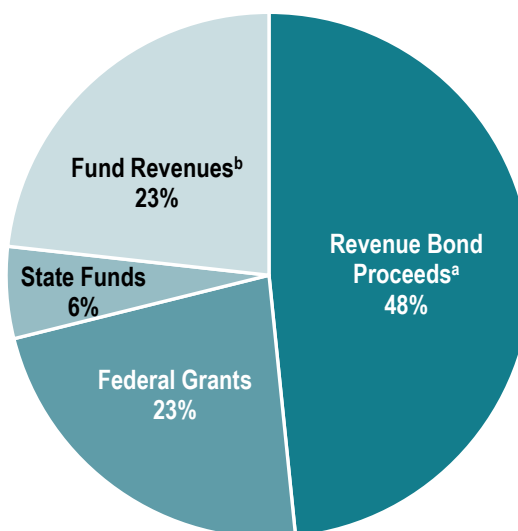
PFA’s largest program for financing wastewater infrastructure is the Clean Water State Revolving Fund. The fund currently has assets (loans receivable plus cash and investments) of approximately \$1.6 billion. PFA manages those assets to ensure that the fund will provide a permanent source of capital for making at or below market-rate loans to fund construction of municipally owned wastewater treatment systems.²⁸ The revolving fund receives capital in the form of federal capitalization grants from the U.S. Environmental Protection Agency (EPA), a required 20 percent state match to EPA grants, and the proceeds of PFA revenue bonds.²⁹ The fund is considered “revolving” because community repayments of principal and interest are also dedicated to the fund. After PFA pays the debt services on its bonds, it uses these earnings to make additional Clean Water State Revolving Fund loans.

²⁸ Loans may fund the rehabilitation, upgrade, or new construction of wastewater treatment facilities or collection systems. PFA also uses the revolving loan fund to make loans for stormwater infrastructure projects and to fund certain pollution-reduction programs at other state agencies. We did not evaluate these uses of the revolving fund.

²⁹ 33 U.S. Code, sec. 1382(b)(2), accessed September 26, 2018. Minnesota uses general obligation bonds to fund its required state match. In Federal Fiscal Year 2018, the state’s combined EPA capitalization grant and state match totaled approximately \$29.5 million.

As alluded to previously, PFA has the authority to sell revenue bonds, which it did most recently in 2016.³⁰ As shown in Exhibit 1.5, the proceeds from selling such bonds have been the largest source of revenue for the revolving fund since it began in 1989. The exhibit includes all revenues since PFA's inception because the agency makes loans from the entire pool of capital. The repayment of those loans, and other assets in the fund, serve as the security for the agency's revenue bonds, which PFA sells to further capitalize the fund. Exhibit 1.6 shows the flow of revenues into and out of the Clean Water State Revolving Fund.

Exhibit 1.5: Proceeds from the sale of revenue bonds have been the source of almost half of the Clean Water State Revolving Fund's revenues from 1989 to 2018.



NOTE: The exhibit is based on all funds received between July 1, 1989, and May 8, 2018, which total approximately \$3.5 billion, not adjusted for inflation.

^a *Minnesota Statutes* 2018, 446A.12, provides that the Public Facilities Authority may issue revenue bonds, a type of municipal bond used to finance income-producing projects. This segment of the pie represents the cash received from selling the bonds at market.

^b Fund revenues include investment interest, loan repayments, and payments from certain interest-subsidized federal bonds.

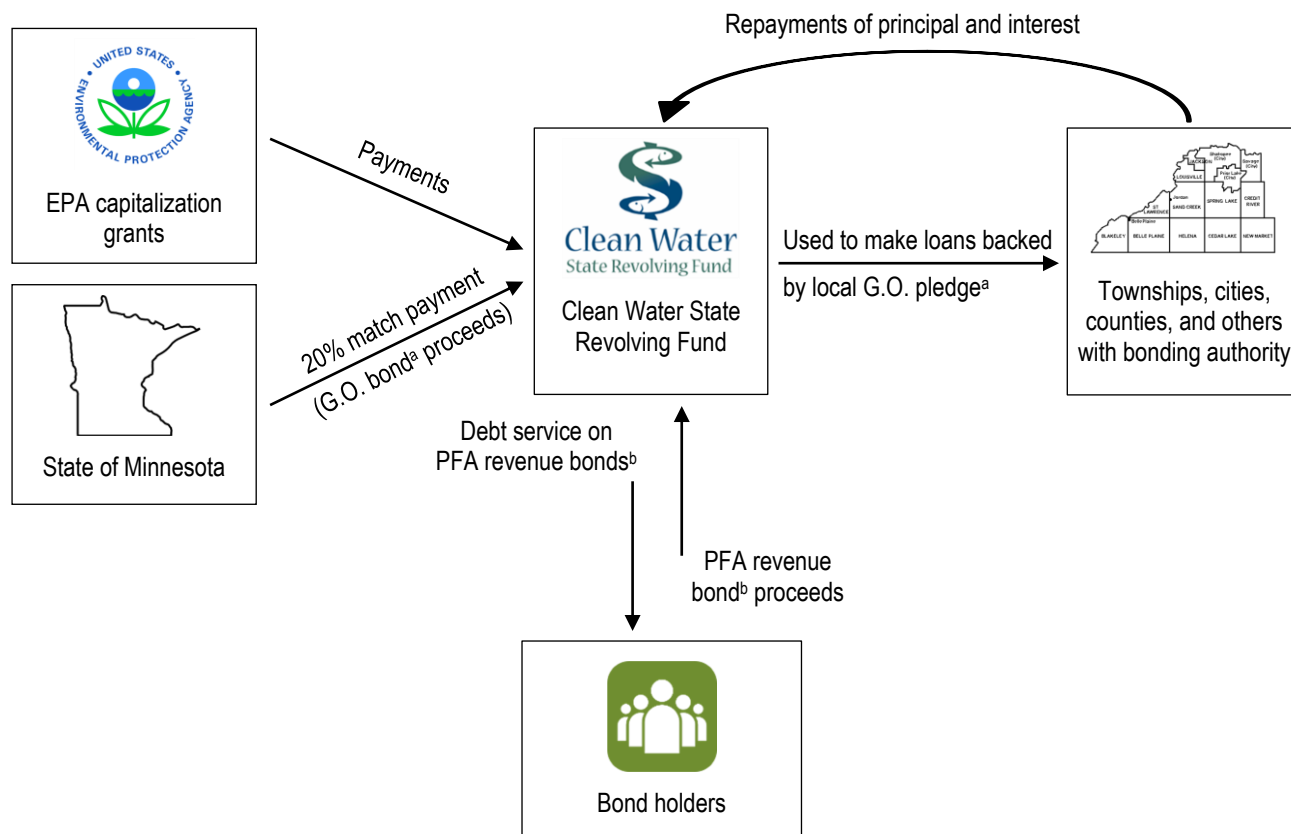
SOURCE: Office of the Legislative Auditor, analysis of Public Facilities Authority data.

Federal statutes require PFA to manage the Clean Water State Revolving Fund so that its balance is available “in perpetuity” as a source of low-interest financing for Minnesota communities.³¹ PFA has developed a financial model to estimate the sustainable annual

³⁰ Unlike general obligation bonds, which are backed by the “full faith and credit” of the issuing government, revenue bonds are backed only by a dedicated revenue stream—in this case, the repayment, with interest, of loans into the revolving fund. General obligation bonds, by contrast, may be paid back by any method the issuing entity has for raising revenues.

³¹ 33 *U.S. Code*, sec. 1382(b)(11), accessed September 26, 2018.

Exhibit 1.6: Revenues flow into the Clean Water State Revolving Fund from various sources.



NOTES: "EPA" is the U.S. Environmental Protection Agency. This figure does not show all revenues or expenditures from the Clean Water State Revolving Fund. For example, the Public Facilities Authority (PFA) makes some payments from the fund to other state agencies for administrative costs and to fund other water-quality loan programs. "G.O. bonds" are general obligation bonds. The state of Minnesota uses general obligation bond proceeds to fund its capital improvement appropriations, often referred to as a "bonding bill."

^a A general obligation bond is backed by the "full faith and credit" of the issuing government. That is, the government pledges to use any means available to it to repay bond holders, including levying taxes, if necessary.

^b A revenue bond is not backed by the full faith and credit of the issuing entity; rather, it is backed only by a dedicated revenue stream. In the case of PFA, the dedicated revenue stream is the repayment of loans, with interest, into the Clean Water State Revolving Fund.

SOURCE: Office of the Legislative Auditor.

lending capacity of the fund under various scenarios.³² Under current conditions, the Clean Water State Revolving Fund would have an average lending capacity of \$95 million per year (assuming it received no further federal or state funding). PFA can make annual loans at higher levels; however, without continued federal and state support, lending beyond the sustainable capacity in a given year would reduce PFA's lending capacity in future years.

³² The model takes into consideration expectations of future federal capitalization grants and state matches, market interest rate levels, PFA's interest-rate discount, and loan demand.

Unlike PFA's other programs for financing wastewater infrastructure, Minnesota statutes do not limit the size of revolving fund loans. However, only units of government with the power to levy taxes and issue a general obligation bond are eligible borrowers from the revolving fund.³³ During PFA's underwriting process, the authority confirms that communities have a dedicated funding source to repay the loan and to pay for ongoing operations and maintenance of the infrastructure. They may require a community to increase revenues as a condition of receiving the loan.

Since 2009, federal law has authorized using a portion of the federal capitalization grants given to the Clean Water State Revolving Fund to further subsidize certain borrowers receiving new loans at or below market rates.³⁴ PFA meets this requirement by providing partial principal forgiveness on revolving fund loans to borrowers that meet either or both of two sets of criteria: financial need and "green project reserve."



Principal forgiveness based on **financial need** criteria

Purpose: Reduce a community's average annual wastewater infrastructure costs

Qualifying amount: 80 percent of the cost needed to reduce average annual wastewater costs to 1.4 percent of community's median household income

Maximum amount: Lesser of \$5 million total or \$20,000 per sewer connection



Principal forgiveness based on **green project reserve** criteria

Purpose: Reward environmentally innovative activities, such as green infrastructure and water or energy efficiency

Qualifying amount: 25 percent of eligible costs, as determined by the Minnesota Pollution Control Agency

Maximum amount: \$1 million

Text box icons courtesy of Marek Polakovic and Felipe Flórez of the Noun Project.

A wastewater infrastructure project may qualify for principal forgiveness under either or both sets of criteria. For example, in 2018, Detroit Lakes received a total of \$33.4 million in PFA funding to renovate its wastewater treatment plant, including a Clean Water Revolving Fund loan of \$16.3 million. The award package included a principal forgiveness grant of \$1,729,709 based on the financial need criteria, and a principal forgiveness grant of \$507,191 based on the green project reserve criteria. The project received a total of \$2,236,900 in principal forgiveness.

Water Infrastructure Fund

The Water Infrastructure Fund (WIF) provides grants for wastewater and drinking water infrastructure to communities that demonstrate financial need. The program is funded by

³³ *Minnesota Statutes* 2018, 444.075, subd. 2, authorizes cities, towns, and counties to issue general obligation bonds for wastewater facilities. *Minnesota Statutes* 2018, 115.61, authorizes the same for sanitary sewer districts. Other entities without bonding authority, such as joint powers boards not expressly given such authority by their constitutive governmental units, may not borrow directly from PFA. Such an entity could apply for loan funding, but it would designate one of its member cities, for example, to serve as the project's fiscal agent.

³⁴ The American Recovery and Reinvestment Act of 2009, Public Law 111-5, February 17, 2009. The law allows for additional subsidization in the form of principal forgiveness, negative interest rate loans, or grants.

state general obligation bond proceeds. During the 2018 session, the Legislature provided additional funding through appropriation bonds, which we discuss in greater detail in Chapter 3.

WIF grants may be used to pay for the construction of new wastewater infrastructure or to rehabilitate existing infrastructure. However, the grants can only be used to meet existing wastewater infrastructure needs; they cannot be used to fund expansion projects to meet needs based on expected future population growth. WIF grants cannot stand alone; they must be combined with loans from other sources—either the Clean Water State Revolving Fund or the U.S. Department of Agriculture (USDA) Rural Development office.

- For wastewater projects supported by a loan from the **Clean Water State Revolving Fund**, WIF grants are available to cover 80 percent of project costs needed to bring the community’s average annual residential wastewater system cost down to 1.4 percent of median household income.³⁵ The maximum amount of WIF funding a project may receive is the lesser of \$5 million total or \$20,000 per sewer connection. These are the same requirements as those for principal forgiveness grants based on financial need, mentioned in the previous section.
- For wastewater projects supported by a loan from **USDA Rural Development**, WIF grants are available to cover 65 percent of the grant need as determined by USDA. USDA provides grant funding for the remaining grant need. As with WIF grants matched to revolving fund loans, the maximum grant size is the lesser of \$5 million total or \$20,000 per sewer connection.

State statutes require WIF recipients to save for their wastewater system’s eventual rehabilitation, expansion, or replacement by annually depositing \$0.50 per 1,000 gallons of flow, up to the amount of the grant received, into a dedicated fund.³⁶ The requirement continues so long as the associated loan is outstanding. PFA loans can have terms of 20 or 30 years; USDA loans can have terms as long as 40 years.

Point Source Implementation Grants

The Point Source Implementation Grants (PSIG) program provides funding for advanced treatment methods needed to achieve stringent discharge standards for nutrients, such as phosphorus. The grants cover 80 percent of the cost needed to treat wastewater to a standard more stringent than allowed by the facility’s previous permit, up to \$7 million. As part of the application process, MPCA and a community’s consulting engineer examine each component of a project to determine which costs relate to the treatment upgrade and which relate to aging infrastructure, expansion, or some other need. PSIG funds can pay only for the treatment upgrade portion of a wastewater construction project.

PSIG must be paired with some other funding source, given that PSIG covers only 80 percent of costs associated with advanced treatment upgrades. The remaining 20 percent plus any nonqualifying components of a project can come from local, state, or federal funding sources, including other PFA programs. Since Fiscal Year 2010, PSIG and its

³⁵ “Average annual residential wastewater system cost” includes the total costs associated with operating and maintaining the wastewater system, as well as the community’s existing wastewater debt service and debt service on the eligible project costs.

³⁶ *Minnesota Statutes* 2018, 446A.072, subd. 12. This requirement also applies to recipients of Clean Water State Revolving Fund principal forgiveness based on financial need.

predecessor programs have been funded by the Clean Water Legacy Fund.³⁷ Recently, the Legislature has significantly increased funding to the PSIG program through general obligation bonds and appropriation bonds, which we discuss in greater detail in Chapter 3.

Projects with PSIG funding are specifically designed to help a community meet permit limits for the discharge of specific pollutants. As such, they have measureable water quality outcomes, such as reduction in the amount of phosphorus discharged. We discuss these outcomes in Chapter 2.

Small Community Wastewater Treatment Program

Many small communities in Minnesota do not have municipal wastewater treatment systems. The Small Community Wastewater Treatment Program exists to help those communities decide whether a municipal wastewater treatment system is a viable option for them and, if so, to construct such a system. Typically, an eligible community first receives a technical assistance grant from PFA. This grant may not exceed the lesser of \$60,000 total or \$1,000 per household plus \$20,000. The grant pays for an engineering study, known as a community assessment report, to evaluate a community's options for a wastewater treatment system. If the community determines, based on this report, that a municipally owned treatment system, such as a cluster system, is appropriate, the community may apply for construction funds.³⁸

PFA awards Small Community construction loans and grants up to \$2 million. Construction funds may include grant funding if the community meets the same financial need criteria as those established for the WIF program. However, grants may constitute no more than 80 percent of construction funds. Communities that receive Small Community grants for construction projects receive the balance of the required funding (up to \$2 million total) in the form of 20-year loans. Small Community grants and loans are not awarded in combination with Clean Water State Revolving Fund loans. The Small Community program was designed to reduce costs and administrative burdens (as compared with the revolving loan fund) for very small communities that need to address failing septic systems. In rare instances, communities may receive PSIG in combination with a Small Community award.³⁹

Like PSIG, the Small Community program is supported by the Clean Water Legacy Fund. PFA has decreased the amount it requests for the Small Community program from the Legislature in recent years. According to PFA staff, many Minnesota communities that would benefit from establishing a municipal wastewater system have already done so. There are currently many Minnesota communities without centralized wastewater treatment systems, amounting to more than one-half million homes and businesses using individual

³⁷ In 2008, Minnesota voters approved the Clean Water, Land, and Legacy Amendment to the Minnesota Constitution, authorizing a 25-year increase in the state's sales-use tax to be used for purposes specified by the amendment. *Minnesota Constitution*, art. XI, sec. 15. One-third of the proceeds go to the Clean Water Legacy Fund to restore, protect, and enhance water quality. Prior to 2013, there were two other PFA programs—the Total Maximum Daily Load Grant program and the Phosphorus Reduction Grant program—that were eventually combined to form PSIG. Those two programs were funded with general obligation bonds before Legacy funding became available.

³⁸ As mentioned earlier in this chapter, a municipally owned wastewater treatment system may not be the best option for all small communities. Some communities decide, based on the community assessment report, to focus on replacing individual septic systems. PFA does not provide funding for such projects.

³⁹ The most common reason this scenario would occur is if a water body in the community has a total maximum daily load (TMDL) addressing fecal coliform bacteria.

septic systems. It is not clear, however, how many of the remaining “unsewered” communities in the state would be better served by a municipal system.

Wastewater Funding in Other States

Minnesota is not unique in having wastewater infrastructure needs. Communities across the nation need to repair or replace aging wastewater collection and treatment systems. Each state has its own version of the Clean Water State Revolving Fund, supported in part through capitalization grants from the federal government and a 20 percent state match. We reviewed the wastewater funding programs used by all 50 states and learned that, in addition to revolving funds, all states also make use of other federal grants and federal loans, such as those offered through USDA Rural Development (discussed previously in conjunction with WIF grants).⁴⁰

Just over one-half of U.S. states, including Minnesota, administer state-funded grant or loan programs specifically designed to support wastewater infrastructure.

We discussed Minnesota’s wastewater grant and loan programs in detail in the previous section. Not all states, however, make similar investments in wastewater infrastructure. Twenty-seven states, including Minnesota, have grant and/or loan programs specifically dedicated to water infrastructure projects—either wastewater specifically or both wastewater and drinking water. Of these, nine states offer both loans and grants to support water infrastructure, while ten states offer only grants and eight states offer only loans. An additional seven states do not offer water-specific funding, but have state-funded grants or loans that may fund wastewater infrastructure among many other possible uses, such as the construction or improvement of roads, bridges, and public buildings. Appendix C shows which states offer state-funded grants or loans to support wastewater infrastructure projects.

Wastewater Infrastructure Funding Process

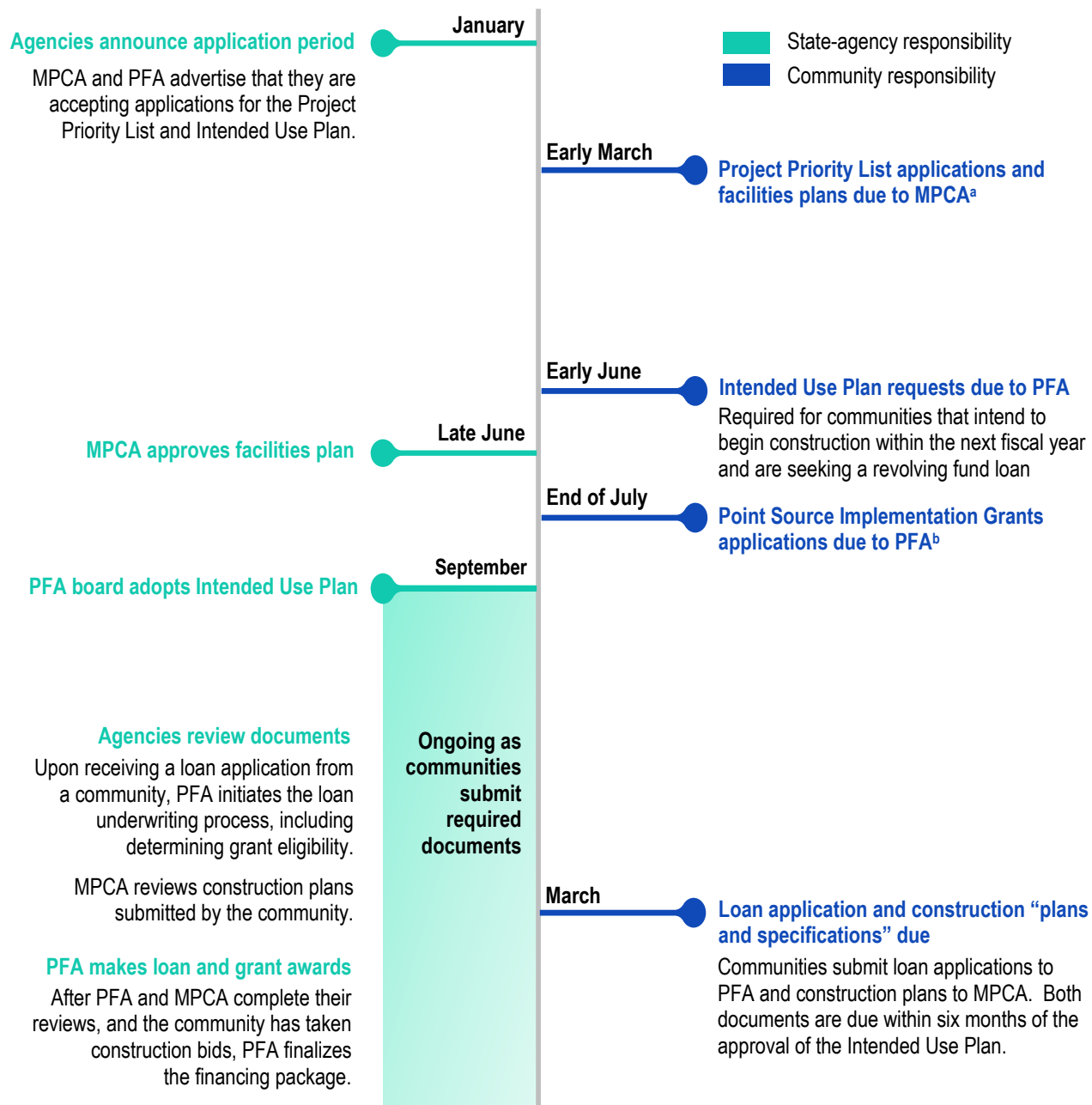
The process of obtaining wastewater infrastructure funding in Minnesota involves two agencies and multiple deadlines over many months.

Obtaining wastewater infrastructure funding from the Public Facilities Authority is a lengthy process.

Before receiving funding, communities must submit a number of applications and other documents to either MPCA or PFA. We illustrate the timing of these requirements in Exhibit 1.7 and describe them in greater detail below.

⁴⁰ We analyzed matrices listing wastewater infrastructure funding sources compiled in 2018 by the Environmental Finance Center Network, a network of mostly university-based member organizations interested in sustainable environmental solutions. In addition to USDA Rural Development funding, other popular federal programs include the Community Development Block Grant program (funded by the U.S. Department of Housing and Urban Development and administered by states), as well as two programs administered by the U.S. Economic Development Administration.

Exhibit 1.7: Communities must complete numerous steps when applying for wastewater infrastructure funding.



NOTES: "MPCA" is Minnesota Pollution Control Agency. "PFA" is Public Facilities Authority.

^a While MPCA accepts late submissions for the Project Priority List, the date is firm for communities that intend to request placement on the Intended Use Plan for the current funding cycle. Communities that do not request placement on the Intended Use Plan do not have to submit facilities plans.

^b Communities must also submit a separate application for Small Community Wastewater Treatment Program funds, but they may do so at any time.

SOURCE: Office of the Legislative Auditor.

- **Project Priority List application.** As we discussed earlier in this chapter, communities submit an application to MPCA. The agency ranks projects and assigns priority points according to objective criteria, forming the Project Priority List.⁴¹ To apply to be on the list, communities fill out a basic application, as well as portions of one of three scoring worksheets, depending on what type of project they wish to complete. The worksheets are for (1) existing-facility improvements, (2) “unsewered” areas, and (3) stormwater. The 2018 Project Priority List contained 302 projects: 234 existing-facility improvements, 56 projects in “unsewered” areas, and 12 stormwater projects.⁴² Projects that score highly on the Project Priority List are, in general, facilities that are at least 20 years old and that are failing to meet pollutant discharge limits established in their permits. A project may stay on the list for up to five years without reapplying.

The Project Priority List application is not a loan or grant application. Communities that wish to apply for any PFA program must be listed on the Project Priority List before they can apply for specific loans or grants.

- **Facilities plan.** Communities that intend to move forward with their construction projects within the next year using loan funding must submit a facilities plan to MPCA for approval. This plan must be completed by an engineer and include all information necessary to systematically evaluate the wastewater treatment alternatives available to a community. Before a community adopts a facilities plan, Minnesota rules require that it hold at least one public hearing for the purpose of presenting to interested community members information about the alternatives discussed, the proposed site location, and the estimated charges to residents associated with the project. Communities submit the facilities plan to MPCA along with the Project Priority List application by the first Friday in March.

Minimum points necessary to receive a revolving fund loan, by year of Intended Use Plan

Fiscal Year	Points
2007	45
2008	40
2009	45
2009, Amendment 1	35*
2010-2014	45
2015-2016	38
2017	No new projects selected; only carryover projects funded
2018-2019	40

* PFA substantially lowered the minimum number of points needed from the initial 2009 level due to the unforeseen availability of federal funds from the American Recovery and Reinvestment Act.

- **Intended Use Plan.** Communities submit a letter to PFA requesting placement on the agency’s Intended Use Plan if (1) their projects are construction ready and (2) the community is seeking a Clean Water State Revolving Fund loan. PFA staff told us that it is important that a community official sign the request letter. The agency wants to know that a community truly wants to pursue a project (as opposed to the contracted engineers who were likely involved during the previous step). PFA puts communities on its Intended Use Plan according to their rank order from the Project Priority List. Based on the fund’s sustainable lending capacity and loan demand, PFA establishes a “fundable range”—a point threshold above which it commits to award loan funding—for the Intended Use Plan. Communities with projects within the fundable range are eligible to apply for and receive loans if the projects are certified by MPCA by the end of the fiscal year. The box to the left shows the recent history of the fundable range. Since Fiscal Year 2018, the fundable range has been 40 priority

⁴¹ As mentioned previously, ranking criteria are defined in *Minnesota Rules*, 7077.0117 and 7077.0118, published electronically July 9, 2014. See Appendix A. MPCA staff told us that, given the objective nature of the criteria, most communities can determine their approximate point totals before they apply for placement on the list.

⁴² Stormwater projects are beyond the scope of this evaluation. We mention them only to note that they are listed on the same Project Priority List as wastewater projects.

points; projects are eligible for the Intended Use Plan if they receive at least 40 points on the Project Priority List. Communities must submit to PFA their request for inclusion in the plan by the first Friday in June.⁴³

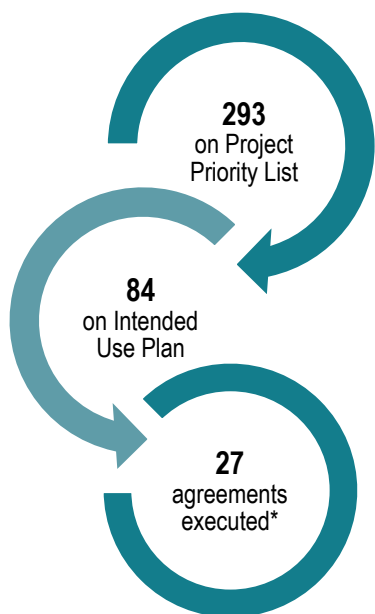
- **PSIG and Small Community Wastewater Treatment Program supplementary applications.** Communities that wish to take advantage of either program must submit the appropriate application to PFA. As required by state statutes, PFA accepts PSIG applications during the month of July.⁴⁴ Communities may submit Small Community applications whenever they are ready to move forward with a project. There is no supplementary application for WIF grants or principal forgiveness based on the financial need criteria. PFA runs financial need calculations on all loan applications and will provide WIF grant funding to all eligible communities as long as funds are available.
- **Loan application.** Communities that are listed on the Intended Use Plan and wish to receive a loan at or below market interest rates through the revolving loan fund must submit a completed loan application to PFA. Communities have six months to do so from the time the PFA board adopts the final Intended Use Plan.
- **Plans and specifications.** Communities submit their final construction plans to MPCA for technical approval. They must submit these plans within six months of the adoption of the Intended Use Plan.
- **Contract execution.** Once MPCA certifies a project's plans and specifications and PFA reviews and approves a community's loan application, the community takes construction bids for the project. Only then does PFA enter into a loan agreement with the community.

Exhibit 1.7 shows that the entire funding process is likely to take at least a year, from the Project Priority List deadline in early March to the loan application/construction plan deadline in March of the following year. The process, can, however, take much longer. The one-year time frame is a likely scenario for a community that intends to start construction in the near future and that has the resources to move efficiently through the process. Other communities spend years on the Project Priority List before requesting placement on the Intended Use Plan.

⁴³ Although all projects seeking PFA funds must be on the Project Priority List, communities do not request placement on the Intended Use Plan unless they are seeking revolving fund loans.

⁴⁴ *Minnesota Statutes* 2018, 446A.073, subd. 3.

In Fiscal Year 2017, relatively few potential wastewater projects ultimately received funding.



* In a given year, PFA makes only one loan to Metropolitan Council Environmental Services (MCES), which MCES uses to fund multiple projects on a cash-flow basis. The 2017 Project Priority List and Intended Use Plan counts above each include 15 MCES entries, each of which aligns with a specific collection system, a wastewater treatment facility or a large project area within a facility. MCES further divides some of those projects into multiple subprojects. MCES used its 2017 loan award to fund portions of 38 distinct projects or subprojects.

Even once PFA lists a project on the Intended Use Plan, projects may be delayed or put on hold for a variety of reasons. PFA staff told us that historically, less than one-half of projects in the fundable range on the Intended Use Plan proceed all the way to construction within the fiscal year. For example, the 2017 Intended Use Plan included projects with estimated loan needs of almost \$334 million, despite the fact that PFA's sustainable lending capacity was \$94 million. If a community submits a complete loan application and receives MPCA certification by the end of the fiscal year, PFA automatically carries the project over to the next Intended Use Plan. The box at left shows how the numbers of projects on the Project Priority List and Intended Use Plan compare to the number of agreements actually executed during Fiscal Year 2017.

Chapter 2: Administration of State Wastewater Infrastructure Programs

When the state spends as much on a program as it does on wastewater, it is reasonable to evaluate the administration of the program and determine whether it is having its intended effects. In this chapter, we evaluate the Public Facilities Authority's performance with respect to its administration of wastewater infrastructure programs. We also discuss the financial and environmental outcomes of the agency's wastewater infrastructure funding.

Public Facilities Authority's Performance

As we have discussed elsewhere in this report, the Public Facilities Authority (PFA) finances new construction, rehabilitation, replacement, and upgrades of municipal wastewater treatment facilities and sewer systems. PFA uses the Minnesota Pollution Control Agency's (MPCA) priority rankings to determine the order in which to fund those projects that are ready to begin construction. For communities that choose to pursue funding, PFA reviews grant and loan applications and community finances to ensure that the community is capable of meeting its financial obligations. Once PFA awards funding to a community, it must monitor the projects, audit their reimbursement requests, and disburse funds as appropriate. Federal and state regulations guide many of these activities.

The Public Facilities Authority appears to be fully in compliance with federal and state legal requirements related to wastewater infrastructure programs.

We reviewed recent federal program audits of PFA, as well as PFA's project files and policies, to evaluate the agency with respect to a number of federal and state requirements. We focused our review on requirements related to selecting projects and approving them for funding. We did not evaluate PFA's activities related to disbursing funds and monitoring projects after the agency awarded funding. Based on our review, we have no significant concerns about PFA's administration of wastewater infrastructure programs.

Federal Requirements

Since PFA distributes large amounts of federal money through the Clean Water State Revolving Fund loan program, it is subject to a number of federal requirements. Exhibit 2.1 lists a selection of the requirements with which PFA must comply. The U.S. Environmental Protection Agency (EPA) administers the revolving loan program at the federal level and conducts annual "program evaluation reports" of states to ensure that they are meeting federal program requirements. In its most recent review of Minnesota, EPA's cover letter stated that "the Minnesota [State Revolving Fund] programs continued to successfully achieve key program goals.... The [performance evaluation report] contains no recommendations and requires no follow-up."¹ The report then went point by point through the program requirements it tested as part of its review, stating repeatedly that Minnesota had met requirements or satisfied its goals.

¹ Deborah C. Baltazar, Chief, State and Tribal Programs Branch, U.S. Environmental Protection Agency, cover letter for *State Revolving Fund Fiscal Year 2017 Annual Review Program Evaluation Report for Minnesota*, May 24, 2018.

Exhibit 2.1: The Public Facilities Authority must adhere to numerous federal requirements in its administration of the Clean Water State Revolving Fund loan program.

The Public Facilities Authority *may*:

- Use federal capitalization grants to make loans at or below market interest rates, including interest-free loans, at terms not to exceed the lesser of 30 years or the useful life of the project.

The Public Facilities Authority *must*:

- Use generally accepted government accounting standards to establish fiscal controls and accounting procedures.
- Submit to the U.S. Environmental Protection Agency an annual report on the actual use of the funds.
- Establish, maintain, invest, and credit the fund with repayments, such that the fund balance will be available in perpetuity.
- Prepare an Intended Use Plan, identifying proposed uses of the state revolving fund and describing how those uses support the goals of the fund.
- Use the revolving fund to support projects that:
 - Make good faith efforts to encourage the participation of small businesses and businesses owned by women and minorities when awarding construction, supply, and professional service contracts.
 - Pay all laborers wages not less than the prevailing wage for the same type of work as determined by the U.S. Secretary of Labor in accordance with the Davis-Bacon Act.
 - Use iron and steel produced in the United States.
 - Are on the state's Project Priority List.

NOTE: This exhibit lists some, though not all, federal requirements to which PFA must adhere.

SOURCES: 33 U.S. Code, sec. 1382, accessed September 26, 2018; 33 U.S. Code, sec. 1383, accessed October 15, 2018; 33 U.S. Code, sec. 1388, accessed October 26, 2018; 40 U.S. Code, sec. 3142, accessed October 26, 2018; 42 U.S. Code, sec. 4370d, accessed November 1, 2018; and 40 CFR, secs. 35.3135 and 35.3150 (2011).

In addition to the EPA review, PFA contracts with an independent auditor to evaluate its compliance with major federal programs (the Clean Water State Revolving Fund and the Drinking Water State Revolving Fund). In reports relating to fiscal years 2017 and 2018, PFA's independent audit firm found PFA to be in full compliance with all requirements that "could have a direct and material effect on each of its major federal programs."² The auditors found no material weaknesses or serious deficiencies with PFA's internal control over financial reporting or its major programs.

State Requirements

We conducted a file review in which we examined all project files (102 files, covering all four wastewater funding programs) for communities with contracts executed during fiscal years 2017 and 2018. As we reviewed the files, we looked for evidence that PFA was in compliance with Minnesota statutes and rules related to selecting projects and approving them for funding. Exhibit 2.2 lists a selection of the requirements that we evaluated as part of our file review.

² RSM, *Minnesota Public Facilities Authority (a Component Unit of the State of Minnesota) Compliance Report June 30, 2017* (Minneapolis, 2017), 6; and RSM, *Minnesota Public Facilities Authority (a Component Unit of the State of Minnesota) Compliance Report June 30, 2018* (Minneapolis, 2018), 6.

Exhibit 2.2: We determined that the Public Facilities Authority complied with the following state requirements:

Clean Water State Revolving Fund

- The Public Facilities Authority (PFA) will place on the Intended Use Plan communities that are on the Project Priority List and have submitted a written request for Intended Use Plan placement that includes a project cost estimate and schedule.
- PFA shall award loans for projects certified by the Minnesota Pollution Control Agency (MPCA).
- Principal forgiveness grants related to green infrastructure shall not exceed a maximum of \$1 million.
- PFA shall apply appropriate interest rate discounts based on the population and median household income of the community applying for the loan.

Point Source Implementation Grants (PSIG)

- PFA shall award grants up to a maximum of \$7 million.
- PFA shall award grants to projects meeting one of four criteria related to water quality standards.^a
- PFA must make a grant only after a community has submitted as-bid costs for the project.
- PFA must make a grant only after MPCA has certified the grant-eligible portion of the project.
- PFA must make a grant only after it has determined that the community has the additional financing to complete the portion of the project not covered by PSIG.

Small Community Wastewater Treatment Program

- PFA must award grants and loans only to projects on the Project Priority List.
- PFA must award construction grants and loans to projects certified by MPCA.
- PFA shall award construction grants and loans for no more than \$2 million.
- PFA shall make construction loans at an interest rate of 1 percent.
- PFA shall award technical assistance grants for no more than \$60,000.

Water Infrastructure Fund (WIF)

- PFA may provide grant funding for no more than \$5 million total or \$20,000 per existing sewer connection.
- For a WIF grant matched to a Clean Water State Revolving Fund loan, PFA may provide assistance based on affordability criteria.
- For a WIF grant matched to funding from the U.S. Department of Agriculture Rural Development office, PFA may provide no more than 65 percent of the eligible grant need.

NOTE: We conducted a file review of all projects with agreements executed in fiscal years 2017 and 2018 (102 files) and found the Public Facilities Authority to be in full compliance with the above requirements.

^a *Minnesota Statutes* 2018, 446A.073, subd. 1, states that to be eligible for PSIG, infrastructure improvements must be made necessary by (1) a wasteload reduction prescribed under a total maximum daily load (TMDL) plan, (2) a phosphorus concentration limit incorporated into a permit issued by MPCA, (3) any other water quality-based effluent limit incorporated into a permit issued by MPCA, or (4) a total nitrogen concentration limit.

SOURCES: *Minnesota Statutes* 2018, 446A.07, 446A.072, 446A.073, and 446A.075; and *Minnesota Rules*, 7380.0442, published electronically August 21, 2007.

Our file review yielded no significant concerns with PFA's administration of wastewater funding. We found that PFA collected and maintained in its files evidence of virtually all of the information it is legally required to collect from funding applicants. We verified that the amounts of grants and loans awarded were always within the legal limits and that PFA considered the correct information when calculating interest rates on loans.

In addition to project files, we reviewed a number of PFA's documents to verify that the agency complies with state and federal law. We determined that the application materials that communities use to apply for PFA programs meet statutory requirements. Similarly, we reviewed PFA's Intended Use Plans and found that they contain all information required by statute. We reviewed the calculations that PFA uses to determine the amount of grant funding for which a project is eligible; we consider these calculations sound and in compliance with state legal requirements. We conducted a review of PFA's internal policy manual and again, we found no significant deviations from legal requirements. We noted that some sections of the manual were still under development as of May 2018, but these sections, dealing with topics like credit enhancement and loan restructuring, were not a focus of this evaluation.

Funding Process

In Chapter 1, we described the process by which communities apply for PFA funding. The process is lengthy and incorporates many steps: Project Priority List application and facilities plan submission (to MPCA), request to PFA for placement on the Intended Use Plan, loan and grant applications (to PFA), and submission of construction plans and specifications (to MPCA).

The process the Public Facilities Authority uses to award wastewater infrastructure funding is thorough and appropriate.

Although the process communities must navigate to receive PFA funding is lengthy, each step plays an important role. The Project Priority List application allows MPCA to rank projects using objective criteria to identify communities with the greatest wastewater infrastructure needs. The facilities plan demonstrates that the community's engineer has evaluated different wastewater treatment alternatives. Communities also must hold at least one community meeting to discuss the proposed project before adopting the facilities plan. MPCA's approval of the facilities plan indicates that the agency agrees that the selected approach will meet legal requirements for protecting the environment and water quality. When communities request placement on the Intended Use Plan, they show that the community (rather than just an engineer) supports the project and that it intends to move forward within the fiscal year.

Within six months of the PFA board adopting the Intended Use Plan, communities must submit their loan applications to PFA and their final construction plans to MPCA. PFA and MPCA's respective reviews of these documents are critical steps in ensuring that the state of Minnesota is making a good investment in wastewater infrastructure. PFA does a rigorous financial review to ensure that the community has a plan for and the ability to repay the loan it receives from the agency, as well as ongoing operations and maintenance for the life of the project. When it certifies construction plans and specifications, MPCA verifies that the project as designed will meet applicable state and federal requirements.

While some stakeholders we spoke with said that small communities are intimidated by the PFA-funding process, other community officials told us that the process is not particularly difficult to navigate. We heard that some cities rely heavily on hired consulting engineers. We were told, however, that a city designing a wastewater treatment facility would need to

hire an engineer, regardless of the application process.³ One community representative told us that while it takes some time to complete, he would not expect to receive large loan and grant awards without going through such a rigorous process.

Certain parts of the funding process are federal requirements. In order to distribute Clean Water State Revolving Fund dollars, states must prioritize projects (which Minnesota does through the Project Priority List) and submit to EPA an Intended Use Plan.⁴ PFA requires that all projects it funds be ranked on the Project Priority List, even if the communities are not seeking a revolving fund loan. PFA staff explained that working from a single list makes the process “more straightforward.”⁵ One stakeholder representing multiple Minnesota cities told us that the single Project Priority List has made the process easier to navigate for communities.

Stakeholder Impressions

During our evaluation, we spoke with numerous stakeholders, including legislators, legislative staff, communities receiving PFA funding, and several environmental and conservation organizations. We spoke with representatives of other organizations that provide wastewater funding and that may have occasion to work with PFA, such as EPA and the U.S. Department of Agriculture Rural Development office. We also interviewed representatives of three organizations representing Minnesota cities: the Coalition of Greater Minnesota Cities, the League of Minnesota Cities, and Metro Cities.

Stakeholders reported that the Public Facilities Authority does a good job administering its programs, particularly with respect to communication.

During the course of our interviews, we heard that PFA runs its programs “like a bank,” and that stakeholders regard it as efficient and effective. Stakeholders repeatedly told us that PFA is helpful and responsive. Legislative staff and community representatives told us that PFA administrators and staff do a good job responding to questions. Some stakeholders characterized PFA’s funding process and program activities as “transparent,” while others lauded PFA for clearly communicating its funding needs in a way that is useful to legislators. We heard, as well, that the wastewater infrastructure funding process can be confusing, but that PFA is good at guiding communities through the different steps.

None of the stakeholders we interviewed said anything negative about PFA. In fact, legislative staff, as well as the staff of two different organizations representing Minnesota cities, made a point of comparing PFA favorably with other agencies that distribute grant funds or participate in water management. They said that while they do occasionally hear negative comments from their constituents about other agencies and the way they administer programs, none could recall hearing any complaints about PFA. One referred to PFA as his “non-maintenance agency.”

³ *Minnesota Rules*, 7077.0272, subp. 1, published electronically July 9, 2014, and *Minnesota Rules*, 7077.0274, subp. 2, published electronically October 2, 2007, require a professional engineer to sign off on the facilities plan and the plans and specifications, both of which are technical documents submitted to MPCA.

⁴ 33 *U.S. Code*, sec. 1383(g), accessed October 15, 2018; and 40 *CFR*, sec. 35.3150 (2011).

⁵ PFA staff told us that some states, in contrast, maintain separate lists for their various wastewater infrastructure funding programs.

In its *SRF Fund Management Handbook*, EPA highlighted 14 different states, using them as good examples of different Clean Water State Revolving Fund management practices.⁶ The report uses Minnesota’s revolving fund program to illustrate two points, related to programmatic lending and cash-flow modeling.⁷ EPA emphasizes cash-flow modeling as a critical component of the administration of a successful Clean Water State Revolving Fund.⁸ New York is the only other state that EPA highlighted twice. An EPA staff person we spoke with said that PFA has “a good handle” on the management of the Clean Water State Revolving Fund program, and that it consistently meets and exceeds expectations. He said that the good relationship that PFA has with its partner agencies (MPCA and the Minnesota Department of Health) gives the state a lot of expertise that it has used to develop an effective program.

Unclear State Laws

Through our review of the state laws governing PFA’s wastewater infrastructure programs, we identified one area of possible conflict between statutes and rules.

State legal requirements with respect to minimum interest rates for Clean Water State Revolving Fund loans are unclear.

Minnesota Statutes 2018, 446A.07, subd. 7(b) Loans *must* be made at or below market interest rates, *including interest-free loans*, for terms not to exceed those allowed under the Federal Water Pollution Control Act. [Emphasis added.]

Minnesota Rules, 7380.0442, subp. 1(C) In no case may the interest rate on a loan be less than one percent.

Minnesota Statutes 2018, 446A.07, subd. 7, lists conditions with which PFA must comply when making loans from the Clean Water State Revolving Fund. The box at left shows the text of Minnesota statutes and rules governing the interest rates that PFA may charge communities receiving revolving fund loans. Minnesota statutes suggest that interest-free loans must be an option for Minnesota communities, while rules prevent interest rates from dropping below 1 percent.

PFA staff told us that offering interest-free loans would imperil their ability to comply with the federal requirement that they manage the revolving loan fund so that its balance is available “in perpetuity.”⁹ They said that communities must repay loans with interest in order to maintain the fund. PFA staff said that if the agency made interest-free loans to some communities, it would be forced to raise rates for other communities in order to maintain the health of the fund.

⁶ U.S. Environmental Protection Agency, *SRF Fund Management Handbook* (Washington, DC, 2018).

⁷ *Ibid.*, 23 and 48. Programmatic lending is the way that PFA funds its largest borrower, the Metropolitan Council. When using programmatic lending, a state awards a single large revolving fund loan to a large borrower with many eligible projects. The borrower uses the funds for portions of many projects and can be flexible with the funding in the event that a funded project stalls. Cash-flow modeling allows states to determine their maximum revolving fund lending capacity. When modeling, states incorporate several components—such as knowledge of the projects that are ready to proceed, disbursement and repayment assumptions, capitalization grant assumptions, assumptions about interest rates and loan terms, among other things—to determine the maximum lending capacity under different conditions.

⁸ *Ibid.*, 46.

⁹ 33 U.S. Code, sec. 1382(b)(11), accessed September 26, 2018.

PFA staff also told us that the state statutory language was adopted at the fund's inception, and that it was meant to mirror federal law. Indeed, the state and federal laws employ similar language.¹⁰ The federal language, however, is permissive; the opening clause "except as otherwise limited by state law" indicates that states can set their own limitations on loans. The EPA staff person we spoke with confirmed that states are not required to offer interest-free loans. Minnesota's statute, however, suggests that interest-free loans must be available.

When we discussed this apparent conflict with PFA administrators, they explained that they had a different interpretation of the statute. PFA distributes about 3 percent of Clean Water State Revolving Fund dollars to other state agencies to support certain loan programs related to water quality.¹¹ PFA staff told us that they satisfy the statutory requirement to offer interest-free loans because these other state agencies use the Clean Water State Revolving Fund dollars to administer interest-free loan programs.

We are not convinced that the loan programs at other agencies satisfy the statutory requirement for PFA to make interest-free loans from the Clean Water State Revolving Fund. However, because the legal requirements are not clear, we cannot say that PFA is not in compliance with the law.

RECOMMENDATION

The Legislature should clarify *Minnesota Statutes* 2018, 446A.07, subd. 7(b), regarding the minimum interest rates on Clean Water State Revolving Fund loans.

As described above, the requirement regarding minimum interest rates on Clean Water State Revolving Fund loans is unclear. We suggest that the Legislature clarify the requirement in one of two ways.

- **Option 1:** If the Legislature does not have specific intentions regarding interest-free loans, it could amend *Minnesota Statutes* 2018, 446A.07, subd. 7(b), to say "Loans must be made at or below market interest rates, including and may include interest-free loans, for terms not to exceed those allowed under the Federal Water Pollution Control Act." This would eliminate the apparent conflict and allow PFA to continue managing the Clean Water State Revolving Fund in a manner that PFA staff believe will safeguard the fund balance in perpetuity.
- **Option 2:** If the Legislature wants interest-free loans to be available to certain recipients of revolving fund money, the Legislature could specify for whom and under what circumstances interest-free loans should be made available. For example, the Legislature could specify that certain programs at other agencies may or must include interest-free loans. As another example, it could require that

¹⁰ 33 U.S. Code, sec. 1383(d), accessed October 15, 2018, reads, in part: "Except as otherwise limited by State law, a water pollution control revolving fund of a State under this section may be used only...to make loans, on the condition that...such loans are made at or below market interest rates, including interest free loans, at terms not to exceed the lesser of 30 years and the projected useful life (as determined by the State) of the project to be financed with the proceeds of the loan...."

¹¹ PFA allocates money to the Department of Agriculture, the Department of Employment and Economic Development, and MPCA for loan programs related to water quality.

interest-free loans be made available to communities meeting specific criteria or specific types of projects funded through PFA's wastewater infrastructure programs.

We do not make a recommendation as to which option the Legislature should choose when clarifying this statute. We acknowledge that the balance of the revolving loan fund must be maintained in perpetuity, but we also note that some states—operating under that same federal requirement—provide interest-free loans. New York, for example, has established “hardship eligibility” criteria allowing qualifying projects in qualifying municipalities to receive long-term, interest-free financing. In making a decision, the Legislature should consider PFA's obligations under federal law as well as how Minnesota's other wastewater financing programs—particularly the Water Infrastructure Fund, Point Source Implementation Grants, and Clean Water State Revolving Fund principal forgiveness grants based on financial need—may provide some of the same benefits as interest-free loans.

Outcomes of State Wastewater Infrastructure Funding

Legislators and stakeholders are understandably interested in the outcomes of state spending, including its spending on wastewater infrastructure. In this section, we discuss two different types of outcomes: financial and environmental.

Financial Outcomes

We evaluated two financial outcomes that result from PFA funding of wastewater infrastructure projects: (1) project-level savings associated with PFA's loan and grant awards, and (2) net per-household wastewater cost savings resulting from PFA financing.

Project-Level Savings

One advantage for communities that borrow funds from PFA is that they typically obtain loans with interest rates lower than what the community could have obtained by selling general obligation bonds at market.

Minnesota communities will save a minimum of \$675 million in interest on wastewater infrastructure loans received from the Public Facilities Authority between fiscal years 1990 and 2018.

Nearly \$700 million in interest savings is a conservative estimate that assumes all borrowers have the highest credit rating (AAA).¹² Some borrowers, like the Metropolitan Council, have AAA ratings. However, most of PFA's borrowers either have lower credit ratings or do not have a rating at all from one of the rating agencies. These communities would have received even higher interest rates in the bond market than assumed for this analysis. Moreover, PFA's borrowers realize other savings not figured into this estimate because they

¹² PFA calculates estimated savings for a given loan using the market rate from Thomson Reuters' Municipal Market Monitor database for the date the loan was executed. The \$675 million estimate represents the combined savings over the lives of all Clean Water State Revolving Fund and Small Community Wastewater Treatment Program loans awarded between fiscal years 1990 and 2018.

do not have to pay certain fees that they would pay in the marketplace.¹³ Finally, the \$675 million estimate does not include savings realized due to principal forgiveness on loans, or other grant funding that reduced the amount of loans a community required.

Communities realized the largest savings from Clean Water State Revolving Fund loans in Fiscal Year 2007, when the average PFA interest rate on funded projects was 66 percent lower than the average estimated market interest rate (1.374 percent compared to 4.099 percent). For the nine Clean Water State Revolving Fund loans executed in Fiscal Year 2018, the average interest rate was

1.075 percent; the estimated average market rate for those loans would have been 2.401 percent, 1.33 percentage points higher than the interest rate on the average PFA loan. Combined, these communities will save \$5.8 million over the lives of their loans. This comes to an average savings of approximately \$648,000 per community for wastewater infrastructure projects over the lives of their loans (or median savings of \$238,900).

**Communities receiving revolving
fund loans in Fiscal Year 2018 will
realize an estimated**

\$5.8 million

**in interest savings over the lives of
their loans.**

Small, unsewered communities can also realize interest savings when they borrow from PFA through the Small Community Wastewater Treatment Program. PFA has made 13 loans through the Small Community program to help small communities build publicly owned wastewater treatment systems. Each of these loans had a 1 percent interest rate, while market rates ranged from 1.570 to 4.220 percent. These small communities will realize a total of \$337,600 in interest savings over the lives of their loans.

Interest savings represent only one of the benefits of PFA financing. As we discussed in Chapter 1, communities and projects meeting certain eligibility requirements may also receive various types of grant funding through the agency's four wastewater infrastructure programs. We estimated the total annual savings that communities would realize per project for the nine communities that received Clean Water State Revolving Fund loans in Fiscal Year 2018.

For projects funded in Fiscal Year 2018, annual project costs were an average of 43 percent lower with Public Facility Authority financing than they would have been with market-rate loans.

The extent of the savings varied widely, depending on the size of the Clean Water State Revolving Fund loan, the PFA and market interest rates, and the amount of additional grant funding the community received. The city of Mantorville, for example, received a Clean Water State Revolving Fund loan in the amount of \$469,000, along with a Point Source Implementation Grant of nearly \$1.9 million, to improve its sewer system and connect it to a nearby facility. The city will save 83 percent thanks to its PFA award package. On the other end of the spectrum, the city of Blue Earth will save just 9 percent annually on a \$7.7 million wastewater treatment project financed solely with a Clean Water State Revolving Fund loan.

¹³ Selling bonds in the marketplace can entail paying fees to several participants, including bond counsel, a financial advisor, an underwriter, a bond registrar, and one or more of the rating agencies.

Net Per-Household Wastewater Costs

We also analyzed the savings that an individual household would realize as a result of PFA financing. Per-household wastewater costs, however, incorporate more than just the community's annual payments on the new construction loan. To determine a community's net annual wastewater costs, we added the community's annual debt service—both on its new PFA loan and its *existing* wastewater-related debt—to the annual operations and

Formula for calculating per-household average annual wastewater costs

$$\frac{\text{Debt service (existing + new debt)} + \text{O\&M}}{\text{Equivalent residential units}}$$

maintenance costs (O&M) associated with the wastewater infrastructure.¹⁴ We then divided the total annual wastewater costs by the community's equivalent residential units.¹⁵ This metric allows for apples-to-apples comparisons of system costs across communities, regardless of how they pay for wastewater infrastructure.¹⁶

We then compared the actual per-household wastewater costs with PFA financing to the per-household costs the community would have faced had it financed its entire project with a market-rate loan. This entailed using the formula described above, but adjusting the annual debt service on the new PFA loan in two ways: (1) increasing the loan amount to include the amount of any PFA grant awards, and (2) calculating annual costs using the market interest rate rather than PFA's at-or-below-market rate.

In Fiscal Year 2018, per-household annual wastewater costs were an average of 12 percent lower with Public Facility Authority financing than they would have been with market-rate loans.

PFA funding can only reduce the cost of the new project. Since communities (and their residents) must also pay for existing wastewater debt and the ongoing operation and maintenance of the system, the total per-household wastewater cost savings are not as dramatic as the project-level savings presented above. Exhibit 2.3 lists the nine communities that received Clean Water State Revolving Fund loans in Fiscal Year 2018.¹⁷ For each, it shows the annual per-household cost of wastewater service both with (1) PFA loans and grants (if applicable), and (2) an estimated market-rate loan in the amount of PFA's total funding award. The per-household savings resulting from PFA financing depend on the size of the loan, the amount of the community's existing wastewater debt, the annual operations and maintenance costs, and whether the community received additional grant funding. The savings vary widely among communities. The residents of Mantorville, discussed above, will save an average estimated \$349 annually on the cost of wastewater service (29 percent). Osakis, on the other hand, received a Clean Water State Revolving Fund loan in the amount of \$654,000, but with no additional grant funding. Its residents will save \$11 annually on their wastewater bills (3 percent) as a result of the community's below-market interest rate.

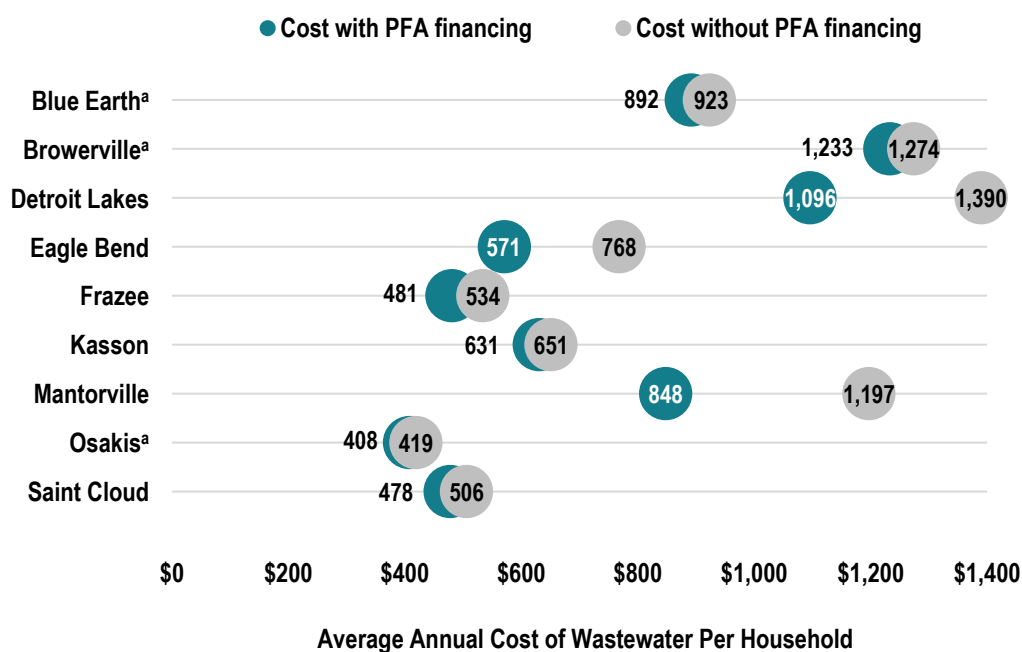
¹⁴ We calculated the debt service on the new loan using PFA's at-or-below-market interest rate.

¹⁵ Equivalent residential units are, generally, households. Communities convert nonresidential wastewater users—such as businesses—into equivalent residential units when they submit a loan application to PFA.

¹⁶ A community may rely on revenues from any number of sources to support wastewater infrastructure. These include sewer charges, general tax levies, special assessments, operating reserves, revenues from a significant wastewater contributor (such as a large business), or payments from another municipality connected to the collection system.

¹⁷ PFA has compiled per-household wastewater cost data for only those projects that received Clean Water State Revolving Fund loans. It has not compiled said data for loans executed prior to Fiscal Year 2018.

Exhibit 2.3: Communities that received financing from the Public Facilities Authority have lower net average annual wastewater costs than they otherwise would have had.



NOTES: "PFA" is Public Facilities Authority. This exhibit shows the average annual per-household cost of wastewater in the nine communities that received a Clean Water State Revolving Fund loan from PFA in Fiscal Year 2018. We calculated the average annual per-household cost for recipients of PFA financing by summing the following for each community: (1) annual debt service on existing wastewater loans, (2) annual debt service on the new revolving fund loan (using PFA's interest rate), and (3) the annual estimated new operations and maintenance costs associated with the new loan. We then divided that number by the community's "equivalent residential units" (generally, households). To estimate per-household costs without PFA financing, we used the same formula but increased the amount of the new loan by the amount of grant funding received and calculated the annual debt service using the market interest rate. The savings reflected in the exhibit are conservative estimates because they assume that the community has a AAA credit rating, which most PFA borrowers do not have.

^a In Fiscal Year 2018, these communities received only Clean Water State Revolving Fund loans from PFA; the other communities shown received both loans and grants.

SOURCE: Office of the Legislative Auditor, analysis of Public Facilities Authority data.

Environmental and Health Outcomes

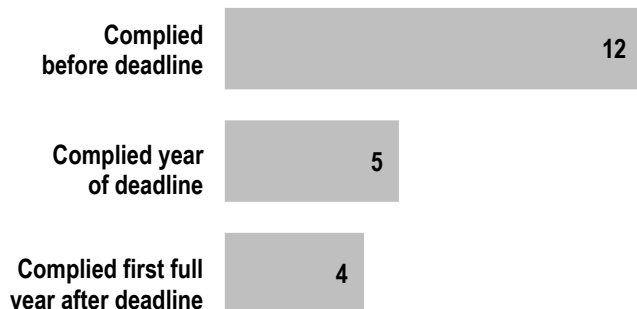
As we established in Chapter 1, the purpose of wastewater treatment infrastructure is ultimately to protect water quality. It is no simple matter, however, to measure the environmental impact of certain types of wastewater infrastructure projects. For example, it is important to repair or replace aging sewer pipes, because a catastrophic failure of those pipes could result in raw sewage spilling into water bodies or seeping into groundwater supplies, endangering the environment and human health. Such projects, however, are preventive and do not result in any observable environmental outcomes; the desired outcome is simply that a pipe does not fail when it might otherwise have done so. As we have discussed elsewhere in this report, the majority of projects PFA funds are related to aging infrastructure.

Phosphorus Reduction

While the outcomes of upgrading aging infrastructure are difficult to measure, communities *can* demonstrate water quality improvements in the case of advanced treatment projects funded through the Point Source Implementation Grants (PSIG) program. In order to be eligible for PSIG funding, a project must be designed to help meet the facility’s permit limits related to the discharge of specific pollutants, such as phosphorus and nitrogen. The nutrient-specific limits MPCA assigns are designed to either (1) preserve the health of the river or lake receiving the discharge (if the water body is currently healthy), or (2) improve water quality (if the receiving water body has been classified as “impaired”).¹⁸

All Point Source Implementation Grant projects meant to reduce phosphorus discharges by 2017 have successfully done so.

All communities receiving PSIG funding in fiscal years 2010 through 2016 to help address a phosphorus limit achieved the necessary phosphorus reductions by the year after their compliance deadline.



Phosphorus is the nutrient most commonly addressed by PSIG projects.¹⁹ We examined MPCA data showing the 21 communities that used PSIG funding for wastewater treatment facility improvements designed to comply with a phosphorus permit limit by 2017. PFA awarded the grant funding for these projects in fiscal years 2010 through 2016. For each community, we determined whether its annual phosphorus discharge dropped below the limit in its permit within one calendar year of its target compliance date.²⁰ As shown in the box at left, more than one-half of the facilities began satisfying their phosphorus permit requirements before their compliance deadline. MPCA staff told us that if a wastewater treatment facility is meeting its permit

limits, the water body receiving the discharge from the facility will be protected from negative impacts from that facility into the future.

While some of the communities in the MPCA data needed only modest phosphorus discharge reductions to meet their permit limits, others required and achieved much larger nutrient reductions through their PFA-funded wastewater infrastructure projects. For example, MPCA gave the Faribault wastewater treatment facility a permit limit allowing it to discharge 21,321 pounds of phosphorus per year, with a compliance date of January 2012. For several years prior to the limit taking effect, Faribault’s annual phosphorus discharge exceeded—and sometimes even doubled—this target. Faribault’s Fiscal Year 2010 funding award from PFA helped it substantially decrease its phosphorus

¹⁸ As we explained in Chapter 1, MPCA reviews facility permits every five years. When the agency reviews a permit, it revises the discharge limits for various pollutants. Since the limits depend, in part, on the health of the water body receiving the facility’s discharge, the discharge limits for a given pollutant vary from one facility to the next.

¹⁹ Phosphorus is a naturally occurring nutrient that is essential for plants, animals, and human life. Too much phosphorus, however, results in algae blooms in rivers and lakes. When water bodies experience excess algae growth, the water appears green and dirty and the algae depletes the oxygen in the water, killing the resident fish.

²⁰ We consider “complied first full year after deadline” to be on time because discharge reductions may not be evident until there is a full year of data to evaluate.

discharge to less than 6,000 pounds per year in 2012. To put this reduction in perspective, the addition of one pound of phosphorus to a river or lake can result in the growth of up to 500 pounds of algae. Algae blooms contribute to deoxygenation of the water, which is detrimental to many species of fish and other aquatic life.

While the ideal reduction in a specific pollutant varies from one water body to the next, state agencies that receive Clean Water Legacy funding have tried to quantify *statewide* pollutant reductions in their biennial *Clean Water Fund Performance Report*.²¹ The 2018 report revealed that since the start of the Clean Water Legacy Fund, the PSIG-funded projects have contributed to an estimated total statewide reduction of more than 135,000 pounds of phosphorus per year. Beyond the reported phosphorus reduction, the *Clean Water Fund Performance Report* stated that smaller numbers of wastewater infrastructure projects constructed with PSIG awards reduced facility discharges of mercury, nitrogen, or chloride.²² All of these pollutants, when present in sufficient quantities, may have detrimental effects on both the environment and human health.

Septic System Replacement

Construction projects funded through the Small Community Wastewater Treatment Program also have tangible outcomes because they replace failing individual septic systems in “unsewered” communities with functioning community-owned alternatives. Failing septic systems allow improperly treated wastewater to enter the environment, potentially contaminating groundwater or nearby lakes or streams.

The Small Community Wastewater Treatment Program supported the construction of 24 wastewater infrastructure projects in small communities without municipal wastewater treatment facilities from 2010 to 2018. These projects allowed the communities either to connect to existing municipal wastewater systems in neighboring communities or build their own community treatment systems. The Small Community program has resulted in the replacement of more than 1,000 failing septic systems in Minnesota, reducing their negative environmental and health impacts. While it is difficult to quantify the impact of replacing these noncompliant systems, we can presume that their replacement made those communities healthier.

²¹ Clean Water Fund Interagency Coordination Team, *Clean Water Fund Performance Report* (St. Paul, 2018), 24. The agencies contributing to this report include the Board of Water and Soil Resources; the departments of Agriculture, Health, and Natural Resources; the Metropolitan Council; MPCA; and PFA. As we discuss in Chapter 1, PSIG has traditionally been funded through the Clean Water Legacy Fund.

²² *Ibid.*, 23.



Chapter 3: Minnesota's Wastewater Infrastructure Needs

Wastewater is a concern of every community in Minnesota, regardless of its size or location. Many Minnesota communities have wastewater infrastructure needs, and legislators and other stakeholders are interested in quantifying those needs. In this chapter, we discuss the factors that drive Minnesota's need for wastewater infrastructure improvements. We go on to discuss how Minnesota agencies estimate wastewater infrastructure needs and why it may be impossible to do so with accuracy. Finally, we evaluated the state resources available to meet those estimated needs and determined that current levels of state and federal funding can address more than two-thirds of the cost of wastewater infrastructure projects that communities have planned for the next 20 years.

Factors Driving Wastewater Infrastructure Needs

Communities across the state have a variety of wastewater infrastructure needs, which result in construction projects of varying types and sizes. These projects may focus on either wastewater treatment facilities or collection systems (also known as sewer systems).

Treatment facility construction projects most often include repairing or improving an existing wastewater treatment facility. Communities with existing **collection systems** may periodically need to repair or replace deteriorating sewer pipes. Communities without existing wastewater systems may decide to construct new collection systems and treatment facilities. Alternatively, they may lay pipes to connect to a treatment system in a neighboring community.

Communities undertake wastewater improvement projects for a number of reasons. As we discussed in Chapter 1, the most common drivers are (1) aging infrastructure in need of rehabilitation or replacement, (2) the lack of existing wastewater infrastructure, (3) community growth, and (4) water quality standards.¹ To learn about wastewater infrastructure needs, their impacts, and how communities address them, we conducted site visits of three communities that have recently received Public Facilities Authority (PFA) funding. We visited Metropolitan Council Environmental Services (which included touring two wastewater treatment facilities and a construction site), as well as Oronoco Township and the city of Detroit Lakes. We describe these visits below as we discuss three of the most prevalent of those driving factors: aging infrastructure, lack of existing wastewater infrastructure, and water quality standards.

Aging Infrastructure

As we discussed in Chapter 1, the Minnesota Pollution Control Agency (MPCA) maintains the Project Priority List, which ranks projects for which communities intend to seek funding in the near future. We analyzed 11 years of Project Priority List data to understand communities' needs and how they have changed over time.

¹ "Rehabilitation" refers to fixing something, rather than replacing it completely. Rehabilitation encompasses smaller repairs, as well as larger renewal efforts designed to increase the useful life of a component.

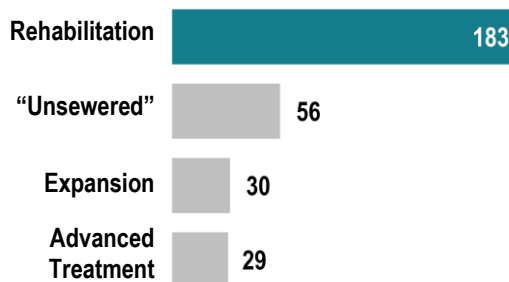
Rehabilitation of aging collection systems and treatment facilities accounts for the greatest portion of communities' wastewater infrastructure needs.

Nearly two-thirds of projects on the 2018 Project Priority List involved rehabilitating or repairing wastewater infrastructure. The box below shows the number of projects on the 2018 list that incorporate rehabilitation, along with the three other most prevalent categories. The second largest category of projects included developing treatment options in areas without municipal wastewater treatment systems (known as “unsewered” communities) or connecting those areas to other regional sewer systems. Smaller numbers of projects involved expanding or extending sewer systems or treatment facilities or modifying treatment facilities to address water quality issues (“advanced treatment”). Projects may fit in more than one category. For example, construction on a wastewater treatment facility could involve rehabilitating aging or failing portions of the facility, as well as adding new treatment processes to address water quality standards.

As we explained in Chapter 1, many communities across Minnesota and the nation built their wastewater treatment facilities in the 1970s, when the federal government was providing generous grant funding for such projects. As a result, a substantial number of Minnesota’s wastewater treatment facilities are failing or risk failure due to their age.²

The number of communities with rehabilitation needs has been increasing. Between 2008 and 2018, the percentage of projects on the Project Priority List related to rehabilitation increased from 40 percent to 63 percent of projects. In general, about three times as many projects involved rehabilitating sewer systems, as compared with wastewater treatment facilities. However, the need for both types of projects increased over the eleven-year period. The Metropolitan Council is in the midst of a number of rehabilitation projects, one of which we describe in the box on the next page.

The majority of entries on the 2018 Project Priority List include rehabilitation of aging infrastructure.



NOTE: There were 290 wastewater infrastructure projects on the list. Individual projects may have multiple goals and thus may be included in more than one category.

² MPCA reports that 20 percent of wastewater treatment facilities in greater Minnesota are more than 40 years old. Minnesota Pollution Control Agency, *Future wastewater infrastructure needs and capital costs: Fiscal Year 2018 Biennial Survey of Wastewater Collection and Treatment* (St. Paul, 2018), 16.

Site Visit: Metropolitan Council Environmental Services

Metropolitan Council Environmental Services (MCES) provides wastewater collection and treatment for 109 communities in the Twin Cities metropolitan area. MCES is the Public Facilities Authority's (PFA) largest borrower of Clean Water State Revolving Fund loans. In a given fiscal year, PFA awards a single loan to MCES, which it then uses to fund approved projects on a cash-flow basis. (For a complete list of projects for which MCES has received reimbursement from PFA in calendar years 2016 and 2017, see Exhibit B.2 in Appendix B.) Metropolitan Council's wastewater infrastructure consists of eight treatment facilities and more than 600 miles of sewer pipes. We interviewed MCES staff and visited two of the system's largest wastewater treatment facilities.

We also went out in the field to learn about one of several PFA-funded projects currently under construction. MCES prioritized the Beltline Sewer Rehabilitation Project because recent inspections had shown significant corrosion in the 30-year-old pipes used to convey wastewater from the east side of St. Paul and several surrounding communities to MCES's Metropolitan Wastewater Treatment Plant. Such corrosion, left unaddressed, might result in a collapsed pipe, disrupting sewer service and threatening the environment, as well as the health and safety of the 180,000 residents in the affected service area.

MCES opted to use "cured-in-place" pipe technology to repair the corroded pipes, which range in diameter from 66 to 72 inches. Through this process, a resin-impregnated liner is injected into the existing pipe structure. Steam or hot water is then forced through the pipe, which encourages the resin to harden, forming a smooth, fitted, and corrosion-resistant new pipe wall. The cured-in-place-pipe process reduces costs and neighborhood surface impacts relative to total pipe replacement. The Beltline construction project will rehabilitate 7,300 feet of sewer pipe in St. Paul at the cost of \$10.8 million.

When we visited the construction site, MCES was preparing the site by establishing a temporary conveyance system that would continue carrying wastewater through the area while the original pipes were being repaired. MCES expects the project to take nearly two years.



"Unsewered" Communities

Communities may apply for the Project Priority List even if they do not currently have a municipally owned wastewater treatment system. Such "unsewered" communities may attempt to address their wastewater treatment needs in a number of ways. They could, for example, build a wastewater treatment facility or extend a sewer system to connect to a treatment facility in a neighboring town. Some communities, such as Oronoco Township (described in the box on the next page), choose to build one or more small wastewater treatment systems to serve specific areas of the community. From 2008 to 2018, the percentage of projects on the Project Priority List related to "unsewered" communities decreased from 31 percent to 19 percent of projects.

Site Visit: Oronoco Township

We visited Oronoco Township, a southeastern Minnesota community of about 2,300 residents without a central, municipally owned wastewater treatment facility. Some township residents with waterfront property were endangering the health of the Zumbro River, either with failing or noncompliant private septic systems, or by discharging raw sewage directly into the river. The community used multiple awards from the Public Facilities Authority to plan and build community “mound systems” in two areas of town (serving more than 40 households). For both projects, Oronoco Township first received a technical assistance grant from the Small Community Wastewater Treatment Program. These grants allowed Oronoco Township to contract with an engineer to produce Community Assessment Reports evaluating the community’s wastewater treatment alternatives. After it used the technical assistance grant to complete the reports, Oronoco Township sought and received additional funding from PFA in the form of Small Community construction grants and loans, as well as Point Source Implementation Grants.

For both projects, Oronoco Township (1) hired an engineer to design the wastewater treatment system, and (2) selected a construction firm through a competitive bidding process. Both designs include grinder stations at each home to liquefy the sewage before it enters the system of pipes that will carry it to the treatment site. At the treatment site, septic tanks treat the sewage with anaerobic digestion (in which microorganisms break down waste in the absence of oxygen). The wastewater then flows to a mound of soil where it is further cleaned through aerobic processes as it filters through the soil.

Oronoco Township: King’s Park neighborhood (14 homes)

FY 2012	Small Community program technical assistance grant	\$ 24,000
FY 2014	Small Community program construction grants and loans	282,752
FY 2014	Point Source Implementation Grants	280,765

Oronoco Township: Cedar Beach neighborhood (28 homes)

FY 2014	Small Community program technical assistance grant	\$ 37,798
FY 2017	Small Community program construction grants and loans	539,852
FY 2017	Point Source Implementation Grants	<u>539,852</u>

Total (both projects): \$1,705,018^a

^a Numbers do not sum to the total due to rounding.

Water Quality Standards

Stakeholders are concerned that new phosphorus standards adopted by MPCA in 2014 are requiring communities to make costly upgrades to their wastewater treatment facilities.³

Prior to the adoption of the 2014 standards, some wastewater treatment facilities discharging into rivers did not have limits on the amount of phosphorus or other nutrients that their treated wastewater could contain.

Since the adoption of the standards, MPCA has assigned phosphorus limits, as needed, to river-discharging facilities that have come up for permit review.⁴ MPCA gives facilities that have been exceeding their new phosphorus limits deadlines for compliance. Some communities can reduce their phosphorus concentrations by treating their discharge with additional chemicals. For other communities, however, the only way to meet the new limits is to upgrade their wastewater treatment facilities by adding “advanced treatment” processes

³ In 2014, MPCA adopted “river eutrophication standards,” allowing the agency to better monitor, assess the health of, and set phosphorus discharge limits for rivers. The agency had previously approved similar standards for lakes in 2008. *Minnesota Rules*, 7050.0222, published electronically December 14, 2017.

⁴ MPCA reviews each wastewater treatment facility’s permit once every five years (for facilities that discharge into rivers or lakes). The agency may assign discharge limits for a number of different nutrients, depending on the needs of that water body. Facilities that are already meeting the discharge limits in their permits do not require facility upgrades.

designed to address a specific nutrient or pollutant. For discussion of one such project, see the box describing our site visit to Detroit Lakes.

When we examined Project Priority List data related to proposed projects with an advanced treatment component, we observed no clear trends. The data show only whether advanced treatment was one of the purposes of the project, not whether it was a driving factor. However, MPCA permitting data show that the number of communities that must upgrade their wastewater treatment facilities as a result of new phosphorus standards is small. MPCA reviewed the permits of 76 water-discharging facilities between October 2015 and March 2018. Of these, 54 percent did not receive a phosphorus discharge limit, likely because the receiving water was not impaired for phosphorus. Thirty-seven percent of facilities reviewed received a phosphorus limit, but were already meeting the limit or could do so easily enough that they did not need to undertake construction projects in response to the new permit. Only 9 percent (seven of the reviewed wastewater treatment facilities) required upgrades in order to meet their new phosphorus limits.

Site Visit: Detroit Lakes

We visited Detroit Lakes, a community of about 9,400 residents in northwestern Minnesota. During fall 2018, Detroit Lakes was in the process of upgrading its wastewater treatment facility to add “advanced treatment” functions. The Detroit Lakes facility discharges into an impaired lake, and the community received an unusually stringent phosphorus limit during the Minnesota Pollution Control Agency’s most recent permit review.

Detroit Lakes was renovating its wastewater treatment facility to incorporate a membrane biological reactor (MBR), which was the only technology the community found that would allow it to meet its stringent phosphorus limit without moving its discharge site or dramatically increasing the size of its facility. MBR is a microfiltration unit with pore sizes eight to ten times smaller than the size of most pathogens. These tiny filters catch phosphorus while allowing clean water through to continue the treatment process. The Public Facilities Authority (PFA) financed the \$33.4 million project through a combination of loans and grants, shown in the table below. The 2017 Legislature enacted language allowing PFA to award an unusually large Point Source Implementation Grant to Detroit Lakes.^a Rather than receiving the statutory maximum of \$7 million, Detroit Lakes was granted \$11.5 million towards the advanced treatment portion of the project.

Fiscal Year 2018 funding award package: Detroit Lakes

Clean Water State Revolving Fund loan	\$16,336,065
Clean Water State Revolving Fund principal forgiveness grants	2,236,900
Point Source Implementation Grants	11,532,914
Water Infrastructure Fund grant	<u>3,270,291</u>
Total:	\$33,376,170

^a *Laws of Minnesota 2017, First Special Session, chapter 8, art. 1, sec. 21, subd. 4.*

Estimating Statewide Wastewater Infrastructure Needs

One method of estimating Minnesota's wastewater infrastructure needs is through the Project Priority List. As we discussed in Chapter 1 and earlier in this chapter, MPCA maintains this ranked inventory of forthcoming wastewater infrastructure projects. Communities must first apply for placement on this list if they wish to request wastewater infrastructure funding from PFA in the near future (typically within five years).

A second method of estimating wastewater infrastructure needs is through the Wastewater Infrastructure Needs Survey (WINS). MPCA conducts this survey biennially and uses the results to report to the Legislature regarding wastewater treatment projects necessary to allow communities to meet existing and proposed water quality standards, as required by statute.⁵ MPCA conducted its most recent WINS in June 2017. The agency sent the WINS questionnaire to 845 communities and sanitary sewer districts, 85 percent of which responded with their projected wastewater infrastructure needs over the next 20 years.⁶

The state of Minnesota may not have a good understanding of the true extent of wastewater infrastructure needs.

While both the Project Priority List and WINS catalog potential wastewater construction projects, neither can provide definitive figures for the number and cost of Minnesota's wastewater infrastructure needs. Both sources, for example, may underestimate the communities that will need to add advanced treatment processes to their wastewater treatment facilities. As we discussed in the previous section, MPCA recently updated Minnesota's water quality standards and not all wastewater treatment facilities have had their five-year permit review. Once MPCA has reviewed all facilities with wastewater permits (referred to as "permitted wastewater treatment facilities"), the state will have more complete information regarding the number of communities that must upgrade their wastewater treatment facilities to meet water quality standards.

While imperfect, the Project Priority List and WINS are useful for providing two different views of the general scope of Minnesota's wastewater infrastructure needs. The Project Priority List shows the segment of potential projects for which communities anticipate moving forward in the near future. WINS allows communities to make their wastewater infrastructure needs known, even if construction is not imminent or if they do not intend to seek PFA funding. We compare the Project Priority List and WINS in Exhibit 3.1. We discuss each of these sources—and their limitations—in the subsequent sections.

⁵ *Minnesota Statutes* 2018, 115.03, subd. 9.

⁶ Communities include cities, towns, and other governmental subdivisions that provide wastewater services. A sanitary sewer district is a governmental subdivision of the state responsible for constructing, operating, maintaining, and improving the disposal of sewage for all of the municipalities within its corporate limits, for the purpose of preventing the pollution of public waters.

Exhibit 3.1: The Minnesota Pollution Control Agency's two methods of estimating wastewater infrastructure needs have limitations.

	Project Priority List	Wastewater Infrastructure Needs Survey (WINS)
Purpose	Communities that intend to seek wastewater infrastructure funding from the Public Facilities Authority (PFA) in the foreseeable future apply to the Minnesota Pollution Control Agency (MPCA) to be placed on this list.	Every two years, MPCA surveys more than 800 Minnesota communities, which report back on their projected wastewater infrastructure needs for the next 20 years.
Advantages	<p>Project Priority List applications are often accompanied by facilities plans, which are typically completed by contracted engineers. The costs estimated by engineers may be more reliable than an estimate the community could develop on its own.</p> <p>The Project Priority List includes proposed projects in unsewered communities.</p>	<p>The survey has had a high response rate in recent years (85 percent in 2017). It captures even those communities that do not intend to seek PFA funding.</p> <p>Survey respondents report estimated needs over the long term (20 years).</p>
Limitations	<p>The Project Priority List does not reflect communities that choose not to finance their projects through PFA. As such, it cannot be considered a complete inventory of the state's wastewater infrastructure needs.</p> <p>The Project Priority List reflects only near-term needs (those projects for which communities anticipate seeking funding within five years).</p>	<p>Data are self-reported by communities and cost estimates do not necessarily reflect the work of experienced engineers. Many communities list projects without an accompanying cost estimate.</p> <p>Long-term estimates (20-year horizon) may not be reliable.</p> <p>MPCA does not survey some small communities that lack wastewater infrastructure.</p>
Number of wastewater projects	290 on the Fiscal Year 2018 Project Priority List ^a	860 in near term (with construction beginning between 2018 and 2022)
Estimated cost of projects	\$1.5 billion	\$3.3 billion

^a MPCA's Project Priority List also includes stormwater projects for which communities plan to seek PFA funding. We excluded these projects, as stormwater projects were outside the scope of our evaluation.

SOURCE: Office of the Legislative Auditor.

Project Priority List

While not specifically designed to measure statewide need, the Project Priority List catalogs wastewater projects for which communities are considering moving forward in the near term with state funding. Communities must put their projects on the list in order to be eligible for funding through any of the PFA's four wastewater programs.⁷ The Fiscal Year 2018 list contained 290 wastewater infrastructure projects, with estimated costs of \$1.5 billion.⁸ Minnesota rules require that projects for which the community has not sought funding be removed from the Project Priority List after five years, unless the community renews its intention to begin construction.⁹ PFA staff told us that a "large majority" of projects move forward within five years.

**Communities plan to seek PFA
funding to address**

\$1.5 billion

**in wastewater infrastructure
needs over the next five years.**

The Project Priority List is not a definitive inventory of the state's near-term wastewater infrastructure needs.

We do not consider the Project Priority List a complete inventory of the state's near-term wastewater infrastructure needs because it does not include those projects for which the community does not intend to seek PFA funding. Some communities choose to fund certain wastewater infrastructure projects without PFA assistance. As we discussed in Chapter 1, the bulk of PFA financing is through the Clean Water State Revolving Fund loan program. PFA lends money through this program at or below market interest rates. For small projects, however, the costs may be too low to realize significant interest savings. Further, we were told that for these less expensive projects, the interest savings could be negated by labor costs resulting from federal and state requirements to pay workers a prevailing wage.¹⁰ Additionally, PFA funding may not be the best option for a community that needs to start a wastewater infrastructure project with little advanced notice; as we discussed in Chapter 1, the process for obtaining some types of PFA funding can take a year or longer. For these

⁷ As discussed in Chapter 1, PFA uses this list, and the rankings assigned by MPCA, to determine which wastewater infrastructure projects to finance.

⁸ The complete Project Priority List also included 12 stormwater projects. We did not study stormwater projects or their funding as part of this evaluation.

⁹ *Minnesota Rules*, 7077.0115, subp. 6, published electronically July 9, 2014, states that a project shall be removed if it has been on the list for five years "without being certified to [PFA]." As we discussed in Chapter 1, MPCA's certification of projects is one of the final steps after a community has initiated the funding request process.

¹⁰ All Clean Water State Revolving Fund loans are subject to federal (Davis-Bacon) prevailing wage law, 40 *U.S. Code*, sec. 3142, accessed October 26, 2018, as well as *Minnesota Statutes* 2018, 177.41-177.43. Similarly, 33 *U.S. Code*, sec. 1388, accessed October 26, 2018, requires that, for projects supported with revolving fund loans, communities use iron and steel produced in the United States (unless the cost of the American products would increase the overall project cost by more than 25 percent). Some communities may prefer not to use revolving fund loans and to instead realize the cost savings associated with using imported iron and steel.

reasons, some communities may choose to pursue grant or loan funding from non-PFA sources, such as federal agencies or nongovernmental lenders.¹¹

The WINS survey (which we discuss further in the next section), illustrates the point that not all communities with wastewater infrastructure needs will choose to apply for the Project Priority List or PFA funding. When communities respond to the WINS questionnaire, they indicate whether the project in question is already on the Project Priority List, and if not, whether the community intends to add it to the list. When we analyzed WINS data, we found that two-thirds of the projects slated to begin within the next five years were, at that time, not listed on the Project Priority List. For 51 percent of all near-term projects identified through WINS, communities reported that they were not already on and did not intend to apply for future Project Priority List placement. These projects had total estimated project costs of \$817 million. This suggests that the Project Priority List underestimates the wastewater infrastructure needs that communities hope to address in the next five years.

Wastewater Infrastructure Needs Survey

WINS represents a good effort to catalog the state's immediate, medium-term, and long-term wastewater infrastructure needs. WINS casts a wider net than the Project Priority List, given that it includes communities that do not intend to apply for PFA funding for their wastewater projects. One should note, however, that “wastewater infrastructure needs” is not necessarily synonymous with “state-funding needs” because some projects are funded locally. It is not unusual, for example, for a city to replace sewer-system pipes a few blocks at a time without seeking funding from PFA.

In this section, we discuss WINS-based estimates of the state's long- and short-term needs. We also discuss some of the limitations of the WINS questionnaire and make a recommendation to link WINS data with the Project Priority List.

Long-Term Wastewater Infrastructure Needs

In its 2018 report to the Legislature, MPCA estimated that Minnesota communities will have nearly \$5 billion in wastewater infrastructure needs over the next 20 years.¹² Unfortunately, we cannot know whether this figure accurately represents the state's true need.

MPCA reports an estimated

\$5 billion

in wastewater infrastructure needs over the next 20 years.

¹¹ As we discussed in Chapter 1, communities can apply for funding from the U.S. Department of Agriculture, as well as other federal agencies. They can also seek loans from banks or nonprofit organizations that specialize in financing wastewater projects or infrastructure projects in rural areas, such as the Minnesota Rural Water Association and CoBank.

¹² Minnesota Pollution Control Agency, *Future wastewater infrastructure needs and capital costs*, 2. The agency developed the \$5 billion estimate using WINS data supplemented with data from the Project Priority List (in those cases where a project appeared on the Project Priority List, but not in the WINS data).

It may be impossible to accurately estimate long-term wastewater infrastructure needs.

As MPCA points out in its report, WINS does not capture some needs that will arise over the next 20 years because they may truly be impossible to anticipate.¹³ Sewer systems or treatment facilities may sustain damage during weather events or fail prematurely. In other cases, communities may fail to report even predictable wastewater infrastructure needs because they lack the resources to engage in comprehensive capital improvement planning. Even for those communities with the ability to plan for infrastructure improvements, it becomes more difficult to accurately estimate costs as the project start dates gets farther into the future.

The *number* of projects reported on WINS may be more accurate than the *cost estimates* associated with those projects. According to MPCA, the \$5 billion of wastewater infrastructure needs represents more than 1,050 distinct wastewater infrastructure projects. We have no reason to doubt the number of projects reported through WINS. The cost estimates for some of these projects, however, are suspect. Communities are not required to use a consulting engineer to develop the cost estimates they submit through WINS, and MPCA does not vet the dollar amounts that communities submit through the survey.¹⁴ Some communities may know of an upcoming project but be unable to develop a reasonable estimate using available city staff.¹⁵ Some communities may choose to guess when estimating project costs, which could either over- or underestimate the true costs. Other communities simply do not provide an estimate. In the 2017 WINS data, communities did not report cost estimates for 29 percent of all projects submitted. We expect that these projects do have costs, and that their costs would increase the total amount of long-term statewide need. However, we cannot definitively say that the costs of these projects would outweigh possibly inflated costs submitted by other communities.

Short-Term Wastewater Infrastructure Needs

We analyzed WINS data for those projects labeled as “current needs,” because we thought that communities might be able to provide better cost estimates for projects slated for construction within the next five years. According to 2017 WINS data, Minnesota communities plan to begin construction on 860 wastewater projects, totaling \$3.3 billion, between 2018 and 2022. Even in the near-term, however, 29 percent of projects lacked cost estimates, suggesting that \$3.3 billion may underestimate total current need.

MPCA reports an estimated
\$3.3 billion
in wastewater infrastructure
needs over the next five years.

Limitations of Survey Population

Beyond the possible reporting errors discussed above, we should note that some communities with potential public wastewater infrastructure needs may not have had the

¹³ Minnesota Pollution Control Agency, *Future wastewater infrastructure needs and capital costs*, 11.

¹⁴ MPCA does review the submitted data for outliers, such as numbers with misplaced decimal points, resulting in impossibly large cost estimates. MPCA staff remove these data from the survey results if they are not able to confirm the values with the communities.

¹⁵ Many small towns have only one or two staff people, who likely serve an administrative function. It would be highly unusual for such communities to have access to engineering expertise without contracting with an outside professional.

opportunity to respond to WINS. MPCA surveys communities with *permitted* municipally owned wastewater treatment facilities or collections systems that connect to a permitted facility in a neighboring town. MPCA does not issue permits for small wastewater treatment facilities (serving approximately 30 households or fewer) with land-based disposal.¹⁶ MPCA did not survey communities that owned and operated these smaller systems. Nor did the agency systematically survey communities where homeowners dispose of wastewater through private septic systems rather than municipally owned sewer and wastewater treatment systems. MPCA staff told us, however, that if they knew of a potential project in an “unsewered” area, they reached out to that community to complete the WINS survey.

As we discussed previously in this chapter, communities with very small or nonexistent wastewater treatment systems can certainly have wastewater infrastructure needs. While MPCA has not systematically reached out to all of these small communities, the agency has accounted for some of them when calculating its short- and long-term estimates of Minnesota’s wastewater infrastructure needs. As mentioned previously, MPCA staff send the WINS questionnaire to small “unsewered” communities with known wastewater needs. In addition, when preparing cost estimates for the agency’s biennial report to the Legislature, MPCA staff factored in projects from the Project Priority List that were not represented in WINS. In 2017, there were 121 such projects. According to MPCA staff, 40 of these projects were from communities that lacked permitted wastewater treatment facilities. Others were from communities that received, but did not respond to the WINS questionnaire. MPCA staff pointed out that capturing all small communities through the WINS survey would require additional resources for communities and MPCA alike; they said it is debatable whether such a change would significantly impact WINS statewide cost estimates. Given that at least some small community projects are captured through MPCA’s current efforts, we do not feel the need to recommend that MPCA expand its WINS survey to such communities at this time.

Cost Estimates

To gauge the accuracy of the cost estimates described above, we attempted to compare cost estimates across WINS, the Project Priority List, and the amounts eventually funded by PFA.

Preliminary cost estimates for wastewater construction projects are often higher than the final project costs.

For wastewater construction projects funded during Fiscal Year 2017, we matched the projects to their Project Priority List cost estimates.¹⁷ We found that among the Fiscal Year 2017 PFA-funded construction projects, the actual project costs were considerably lower than the costs estimated on the Project Priority List. During this period, PFA awarded \$77 million in grants and loans, compared with estimated Project Priority List costs of \$119 million for the same projects, a difference of about 54 percent in aggregate. For more

¹⁶ MPCA must issue permits to wastewater treatment facilities that (1) process flows of more than 10,000 gallons per day, or (2) discharge into surface waters (lakes or rivers). Some treatment facilities with smaller flows discharge treated water onto the land (where it is reused for irrigation purposes) or into the ground, where the water continues to be cleaned through natural environmental processes.

¹⁷ We did not match projects that received technical assistance grants from the Small Community Wastewater Treatment Program or Water Infrastructure Fund grants matched to loans from the U.S. Department of Agriculture. In both cases, the amount of funding awarded by PFA does not reflect the entire cost of the project, and may appropriately be quite different from the estimated total project cost in the Project Priority List.

than one-half of the funded projects, the Project Priority List estimate closely approximated the final funding amount. For some projects, however, the Project Priority List cost estimates were considerably greater.¹⁸

The WINS survey proved more difficult to match, both to the PFA funding amounts and the Project Priority List. None of the datasets share unique identifiers, and WINS survey responses often lack sufficient detail to allow manual matching to the other sources of data. Since we could not match Project Priority List and WINS-reported *projects* with confidence, we decided instead to analyze the total amount of needs each *community* reported through the respective sources.¹⁹ We found, however, the estimated costs of near-term projects reported through the WINS questionnaire were 48 percent higher than those on the Project Priority List. For more than half of the communities that appeared on both lists, the cost estimates were similar (a difference of no more than 10 percent). For 27 percent of the communities, however, the WINS estimates were significantly greater. The city of Waverly, for example, reported through WINS that it had a \$12 million project—to rehabilitate a specific portion of its wastewater collection system—on the Project Priority List. This same project on the published list, however, had an estimated cost of about \$2 million.

RECOMMENDATION

The Minnesota Pollution Control Agency should develop a method of linking Wastewater Infrastructure Needs Survey data to Project Priority List data.

Minnesota statutes require MPCA to report to the Legislature on wastewater construction projects needed to meet water quality standards, their estimated costs, and their ranks on the Project Priority List.²⁰ WINS is the tool that MPCA uses to create this required biennial report. In an effort to satisfy the requirement regarding project ranking, the agency includes a copy of the Project Priority List in its report. However, the inclusion of the list does not necessarily allow readers to determine the ranking of any particular project reported through WINS. MPCA could easily link the two datasets by adding a question to WINS requesting the Project Priority List identification number for projects that are already on the list. Not only would this allow MPCA to better fulfill its statutory reporting requirement, but it would give the agency a means to compare WINS and Project Priority List cost estimates. WINS is a valuable tool for projecting future wastewater needs, despite the limitations discussed in the foregoing sections. Linking WINS and Project Priority List data would also allow MPCA to compare WINS estimates with final PFA funding amounts. Tracking projects from WINS all the way through the funding award would give MPCA the means to identify systematic over- or underestimates in the costs reported through the WINS survey. This may allow MPCA to develop a more reliable estimate of statewide need. MPCA staff told us that they intend to make changes to the 2019 WINS survey instrument to improve comparisons between WINS and Project Priority List data.

¹⁸ We found the largest differences in two projects by the Western Lake Superior Sanitary District. PFA staff told us that these differences may reflect the fact that the district puts large projects on the Project Priority List, but sometimes completes them in phases using smaller PFA awards.

¹⁹ Communities received the WINS questionnaire in June 2017 and indicated on it whether their projects were already on the Project Priority List. We matched records for communities that responded in the affirmative to entries on the Fiscal Year 2017 Project Priority List, which would have been the most recently published list at the time communities completed the survey.

²⁰ *Minnesota Statutes* 2018, 115.03, subd. 9.

Resources Dedicated to Meeting Wastewater Infrastructure Needs

Earlier in this chapter, we reported that MPCA has used its WINS survey to estimate that Minnesota communities will have \$5 billion in wastewater infrastructure needs over the next 20 years. According to WINS data, communities intend to seek PFA funding for projects totaling about three-quarters of that amount, \$3.9 billion. In this section, we attempt to determine the extent to which Minnesota can meet those reported needs.²¹

Assumptions about Future Funding

Federal code requires PFA to manage the Clean Water State Revolving Fund such that its balance is available “in perpetuity.”²² In Chapter 1, we established that revolving fund loans make up the majority of the funding that PFA provides to communities. As a worst-case scenario, we determined how much PFA could award in loan funding over the next 20 years if the authority received *no future state or federal contributions* to its wastewater infrastructure programs. Given PFA’s existing assets and current market rates, the lending capacity of the revolving loan fund would be \$94 million per year in perpetuity.²³ While PFA’s other wastewater funding programs would cease to function, the revolving loan fund would still be able to finance \$1.88 billion in projects over the next 20 years—38 percent of Minnesota’s estimated \$5 billion wastewater infrastructure need and nearly half of the estimated cost of projects for which communities intend to seek PFA funding. Given the current bipartisan legislative support for PFA programs, we do not believe that an abrupt end to state wastewater funding is likely.

Over the next 20 years,
PFA could fund:

69 percent

of the state’s \$5 billion total
estimated wastewater
infrastructure needs.

89 percent

of the \$3.9 billion estimated
wastewater infrastructure needs
for which Minnesota communities
are likely to seek PFA funding.

If current state and federal funding trends continue for the next 20 years, the Public Facilities Authority could satisfy more than two-thirds of Minnesota’s wastewater infrastructure needs.

Based on recent trends in federal and state support of PFA’s wastewater infrastructure funding programs, we estimate that PFA will have the capacity to finance approximately \$3.4 billion in wastewater projects over the next 20 years. This represents 69 percent of the total statewide need that MPCA identified using WINS and 89 percent of the \$3.9 billion worth of projects for which communities expressed an intent to apply for the Project Priority List. Exhibit 3.2 explains the assumptions we used to develop our estimate of available funds.

²¹ In order to estimate the proportion of Minnesota’s estimated wastewater infrastructure needs that PFA will be able to meet, we assumed that (1) no additional needs would arise during the next 20 years beyond those already accounted for in WINS, (2) all projects would be financed solely through PFA programs, and (3) all traditional sources of PFA funding would continue at recent levels. While these assumptions are, perhaps, overly simplistic, they gave us a starting point from which to analyze the ability of PFA to meet long-term state wastewater infrastructure needs.

²² 33 U.S. Code, sec. 1382(b)(11), accessed September 26, 2018.

²³ PFA determines market interest rates using Thomson Reuters’ Municipal Market Data yield curves. These indices represent analysts’ daily opinion of the valuation of state general obligation bonds.

Exhibit 3.2: If current funding trends continue, the Public Facilities Authority will be able to distribute nearly \$3.4 billion in grants and loans over the next 20 years.

Program	Funding Source	Annual Funding Amount	Assumed to Continue	Total Over 20 Years (FY 2018-2037)
Clean Water State Revolving Fund	Federal capitalization grants with a 20 percent state match ^a	\$94,000,000–\$158,000,000 ^b	Yes	\$2,497,500,000
	Environment and Natural Resources Trust Fund appropriation bonds	\$6,000,000 in 2018 only	No ^c	0
Small Community Wastewater Treatment grants and loans	Clean Water Legacy Fund	\$187,500	Through 2034 ^d	\$3,187,500
Point Source Implementation Grants (PSIG)	Clean Water Legacy Fund	\$8,437,500	Through 2034 ^d	\$143,437,500
	General obligation bonds	\$16,868,500 ^e	Yes ^e	\$337,370,000
	Environment and Natural Resources Trust Fund appropriation bonds	\$38,348,000 in 2018 only	No ^c	0
Water Infrastructure Fund (WIF)	General obligation bonds	\$22,500,000	Yes	\$450,000,000
	Environment and Natural Resources Trust Fund appropriation bonds	\$14,652,000 in 2018 only	No ^c	0
Total				\$3,431,495,000

NOTES: “FY” is state fiscal years. Unless otherwise noted, the annual funding amounts represent the average annual amount appropriated from state fiscal years 2015 through 2018.

^a The Legislature typically matches federal funding using general obligation bonds. Exhibit 1.4 details all Clean Water State Revolving Fund revenues.

^b To determine the 20-year funding capacity of the Clean Water State Revolving Fund, we relied on a Public Facilities Authority (PFA) model showing that the amount available to lend would gradually increase every year, starting from \$94 million in Federal Fiscal Year 2018 and reaching \$158 million in Federal Fiscal Year 2037. The model assumed that federal and state support would continue at the Federal Fiscal Year 2018 level and that current market conditions would persist.

^c The 2018 session marked the first time the Legislature funded PFA wastewater programs through Environment and Natural Resources Trust Fund appropriation bonds. A group of several environmental and conservation groups have filed a legal challenge to this use of funds, and it is uncertain whether the funds will ultimately be available to support PFA wastewater projects. We do not expect the Environment and Natural Resources Trust Fund to become a regular funding source for wastewater infrastructure in Minnesota.

^d In 2008, Minnesota voters approved the Clean Water, Land, and Legacy Amendment to the Constitution, authorizing a 25-year increase in the state’s sales-use tax to be used for purposes specified by the amendment. Unless the amendment is reauthorized by voters, the last year of the resulting Clean Water Legacy funding will be 2034.

^e This represents an increase in PSIG funding over recent years and the first time that PSIG had been funded through general obligation bond proceeds, since the inception of the Clean Water Legacy Fund. The annual amount above equals the appropriation for the 2018-2019 biennium (\$33,737,000) divided by two.

SOURCE: Office of the Legislative Auditor.

The bulk of PFA's funding capacity lies in the Clean Water State Revolving Fund. PFA predicts that if federal and state support continue at Federal Fiscal Year 2018 levels, then the fund will achieve a base lending capacity of \$158 million by Federal Fiscal Year 2037. Over the 20-year period, the revolving fund will be able to loan almost \$2.5 billion to communities with wastewater infrastructure needs. These estimates assume that PFA maintains a strong credit rating on its revolving loan fund and continues to manage the fund responsibly.

Given current and recent funding amounts, we estimate that the state of Minnesota will contribute nearly \$1 billion in support of PFA's other wastewater programs over the next 20 years. Based on recent trends, we estimate that PFA will receive more than \$3 million for Small Community Wastewater Treatment grants and loans from the Clean Water Legacy Fund before the fund expires in 2034.²⁴ The Legislature has traditionally funded the Water Infrastructure Fund (WIF) with general obligation bond proceeds, and we estimate that PFA will receive about \$450 million for the program over the next 20 years.

Projecting Point Source Implementation Grants (PSIG) funding is somewhat more complicated. The Legislature has traditionally funded PSIG with Clean Water Legacy funds, and we anticipate that program will receive \$143 million in Legacy dollars before the fund ends. The 2017 Legislature, for the first time since the Legacy Amendment passed, appropriated general obligation bond proceeds to PFA for the PSIG program.²⁵ According to PFA's executive director, the \$34 million appropriation reflected the Legislature's recognition that communities needed a greater level of support to upgrade their wastewater treatment plants to meet new, more stringent water quality standards. PFA hopes general obligation bonding support of PSIG will continue, which could result in an additional \$337 million for the program over 20 years.

The 2018 Legislature provided funding to the PSIG, WIF, and state revolving fund programs through appropriation bonds paid for using the Environment and Natural Resources Trust Fund.²⁶ The appropriations totaled \$59 million, with the largest portion—more than \$38 million—going to the PSIG program. In October 2018, a group of several Minnesota environmental and conservation organizations filed suit against the state of Minnesota, alleging that the use of trust fund revenues to pay the debt service on appropriation bonds was unconstitutional and would ultimately be more expensive than funding them with general obligation bonds.²⁷ We do not anticipate that the Environment

²⁴ In 2008, Minnesota voters approved the Clean Water, Land, and Legacy Amendment to the Minnesota Constitution, authorizing a 25-year increase in the state's sales-use tax to be used for purposes specified by the amendment. *Minnesota Constitution*, art. XI, sec. 15. One-third of the proceeds go to the Clean Water Legacy Fund to restore, protect, and enhance water quality. Unless the amendment is reauthorized by voters, the last year of Legacy funding will be 2034.

²⁵ *Laws of Minnesota 2017*, First Special Session, chapter 8, art. 1, sec. 21, subd. 4.

²⁶ The Environment and Natural Resources Trust Fund was created as a result of a constitutional amendment approved by Minnesota voters in 1988. *Minnesota Constitution*, art. XI, sec. 14. Fund revenues are generated by the Minnesota State Lottery and may be appropriated for the purpose of preserving and protecting the state's air, water, wildlife, and other natural resources.

²⁷ See http://www.mncenter.org/uploads/7/9/3/5/79357940/enrtf_service_docs.pdf, accessed November 12, 2018. At the time of publication, the groups had not filed their Summons and Complaint in court. Minnesota allows lawsuits to begin without filing the initial documents in court. Minn. R. Civ. P. 3.01. For the case to move forward, the documents must be filed with the court within one year of serving the Summons and Complaint. Minn. R. Civ. P. 5.04. Minnesota Management and Budget—the agency coordinating the sale of trust fund appropriation bonds—will not conduct the bond sale and make funding available until the challenge is settled.

and Natural Resources Trust Fund will become an ongoing source of funding for PFA wastewater programs.

Some direct appropriations made by the Legislature have circumvented the state's established process for wastewater infrastructure funding.

When we calculated the amount we expect the state to spend on wastewater infrastructure improvements over the next 20 years, we did not incorporate direct appropriations the Legislature makes to support specific communities. The number and amount of such appropriations has varied, and it is unclear the extent to which such appropriations will continue. From 2009 to 2017, the Legislature made a total of six direct appropriations for wastewater infrastructure improvements. In 2017 and 2018, the numbers increased to eight direct appropriations per year, totaling \$27 million. It should be noted that while direct appropriations help some Minnesota communities meet their wastewater infrastructure needs, they also circumvent PFA's established process. Nearly half of the projects that received direct appropriations in 2017 and 2018 did not have sufficient priority points for PFA to consider them in the fundable range for Clean Water State Revolving Fund loans. One community received a direct appropriation of \$726,000, despite the fact that it was not even on the Project Priority List and therefore did not have priority points or a ranking.

RECOMMENDATION**The Legislature should exercise restraint when making direct appropriations for wastewater infrastructure projects.**

As we established in Chapter 2, the process for receiving funding through PFA programs is thorough and appropriate. While recipients of direct appropriations complete some steps of the process—submitting an application to PFA for financial review and submitting construction plans and specifications to MPCA—they do not have to undergo the initial planning steps built into the beginning of the established funding process. Communities that receive direct appropriations do not have to submit a facilities plan to MPCA. This plan, completed by an engineer, evaluates wastewater treatment alternatives in order to identify the solution that best meets the community's needs, which may or may not be a publicly owned wastewater treatment system. Communities must hold at least one public meeting to discuss the presented alternatives before adopting the facilities plan.

When the Legislature makes direct appropriations, it risks awarding funding to a community that has not completed the initial planning required by the established process. Without first completing a facilities plan, community representatives may decide to move forward with a design that does not suit the community's needs or which lacks public support. Furthermore, direct appropriations circumvent the state's established process and have, in the past, benefitted communities with low priority rankings. When the state directs funding to these projects, it may be at the expense of other projects with more priority points, and thus, greater wastewater infrastructure needs.

We recommend that the Legislature avoid making direct appropriations, and instead allow communities with the greatest needs to receive wastewater infrastructure funding through PFA's established process. To the extent that there is a compelling reason to fund a particular project—for example, a sewer pipe replacement that would coordinate with scheduled road construction, and end up saving the state money—the Legislature could

make the direct appropriation, but require the recipients to complete the same planning processes as other funding applicants. Communities should continue to have their construction plans vetted by MPCA and fiscal health evaluated by PFA.

Availability of Grant Funding

The 2017 Legislature increased the amount of grant funding for which individual communities were eligible. Previously, Minnesota statutes capped WIF grants at the lesser of \$15,000 per sewer connection or \$4 million total per project. The 2017 Legislature increased the limit to \$20,000 per sewer connection or \$5 million total per project.²⁸ Similarly, statutes originally limited PSIG awards to \$3 million per project, which could be used to cover only 50 percent of the PSIG-eligible costs; the 2017 Legislature increased the PSIG limit to \$7 million per project to cover up to 80 percent of PSIG-eligible costs.²⁹

Statutes require PFA to reserve PSIG funding for eligible wastewater infrastructure projects that MPCA has certified.³⁰ If there is not enough grant funding available for eligible projects in a given year, PFA places remaining projects that have received their MPCA certification on a carryover list. PFA makes grant awards to carryover projects in priority order when funds become available in the subsequent year, which may have the effect of delaying that year's newly certified projects. One effect of this system is that carryover projects may receive funding even if their ranks are lower than newer projects on the list. PFA staff explained that this is acceptable for PSIG projects in particular, because communities likely have compliance deadlines by which they need to meet a new permit limit. PFA's goal is to fund such projects as soon as they are ready to move forward.

The increased wastewater grant limits were originally proposed during the 2016 legislative session and had broad bipartisan support. Many in the wastewater infrastructure community were counting on the funding increases that year. The 2016 session, however, ended without a bonding bill. As a result, many communities that were poised to begin wastewater infrastructure construction in 2016 opted to wait a year for the increased funding to become available. For PSIG, the increase in the funding cap stimulated demand for the program. That demand, combined with the lack of project funding in 2016, has resulted in a backlog. It now effectively takes two years for communities to receive PSIG funding: one year to apply for the program and to obtain MPCA certification and a second year on the carryover list waiting for funds to become available.³¹

²⁸ *Laws of Minnesota* 2017, First Special Session, chapter 8, art. 2, sec. 15, codified as *Minnesota Statutes* 2018, 446A.072, subd. 5a.

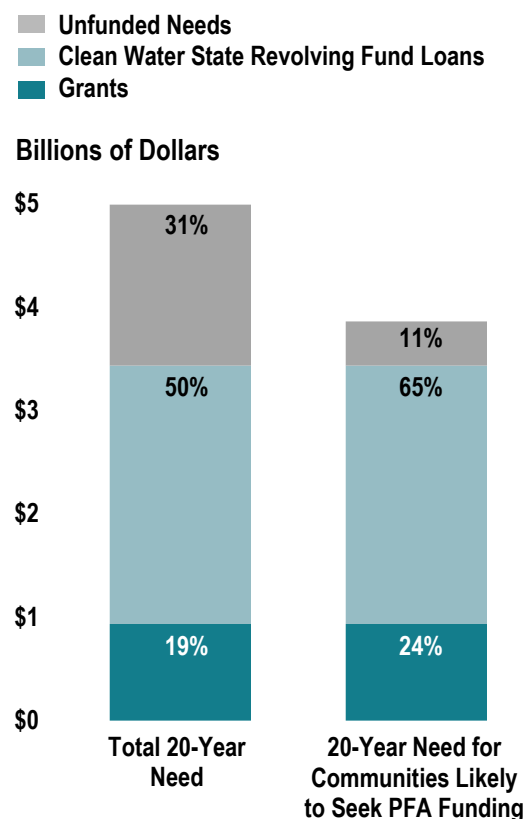
²⁹ *Laws of Minnesota* 2017, First Special Session, chapter 8, art. 2, sec. 16, codified as *Minnesota Statutes* 2018, 446A.073, subd. 1.

³⁰ *Minnesota Statutes* 2018, 446A.073, subd. 3. This "certification" refers to MPCA's approval of the community's final plans and specifications, submitted within six months of PFA's final adoption of the Intended Use Plan. For construction plans and specifications submitted by the March deadline, MPCA must complete its review and certification by the end of the fiscal year.

³¹ *Minnesota Statutes* 2018, 446A.072, subd. 3(d), requires that PFA also reserve WIF funds for certified projects. According to PFA's executive director, projects are often certified in one fiscal year but complete the bidding process in the next. Since PFA does not award funding until the project is bid, the agency uses a carryover list to track how much WIF funding is reserved for such projects.

The Public Facilities Authority's ability to finance existing wastewater infrastructure needs may be limited by available state grant funding.

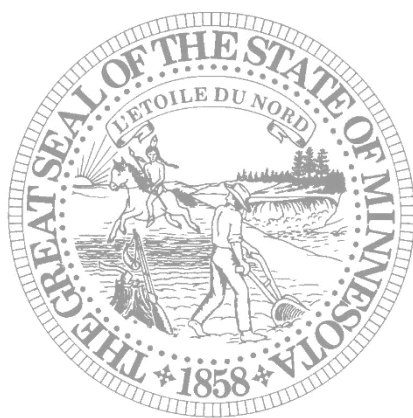
With its current resources, PFA can satisfy most of the 20-year wastewater needs of communities that intend to seek PFA funding.



In the 20-year funding scenario described in the previous section, PFA would be able to finance about \$3.4 billion of the state's wastewater infrastructure needs. This funding capacity, however, assumes that 73 percent of project costs would be financed through Clean Water State Revolving Fund loans. The box at left shows the portions of Minnesota's long-term need that can be met using grants and loans. PFA can reach this funding level only if a significant portion of communities are willing and able to accept loan-only funding awards. The events of the past few years, however, have demonstrated that many communities are willing to defer projects in hopes of receiving grant funding in a subsequent year. PFA staff pointed out that communities can best be encouraged to proceed with their projects in a timely fashion if they understand how grant eligibility is determined and if grant assistance provided by the state is consistent and reliable. However, if the number of communities requiring grant funding is too large, then PFA will be unable to meet the state's wastewater infrastructure needs regardless of how well funded the revolving loan fund is.

List of Recommendations

- The Legislature should clarify *Minnesota Statutes* 2018, 446A.07, subd. 7(b), regarding the minimum interest rates on Clean Water State Revolving Fund loans. (p. 31)
- The Minnesota Pollution Control Agency should develop a method of linking Wastewater Infrastructure Needs Survey data to Project Priority List data. (p. 50)
- The Legislature should exercise restraint when making direct appropriations for wastewater infrastructure projects. (p. 54)



Glossary of Terms

Advanced treatment: A variety of wastewater treatment processes used to reduce the amount of specific nutrients, such as phosphorus or chlorides, to levels not achievable with secondary treatment.

Average wet weather flow: The daily average flow for either the wettest 30 consecutive days or the wettest 180 consecutive days of a six-month period, depending on the type of facility.

Beneficial use: A use of discharge from a wastewater treatment facility that results in reducing or replacing the use of groundwater, surface water, or potable water. For a wastewater infrastructure project to receive beneficial-use points on the Project Priority List, the project component resulting in the beneficial use must account for at least 20 percent of the total eligible cost of the project. A project cannot receive these points if it also received points for land discharge.

Classification of waters of the state: Minnesota waters are classified according to one or more beneficial uses, including drinking water, aquatic life and recreational use, industrial consumption, agricultural and wildlife use, aesthetic and navigational use, and other uses.

Class 1 waters: Protected to meet drinking-water standards. All groundwater of the state belongs to this class.

Class 2 waters: Protected for aquatic life and recreation.

Class 2A waters: Protected for cold-water aquatic life and for aquatic recreation of all kinds, including bathing. Also protected as a source of drinking water.

Class 2B waters: Protected for cool- or warm-water aquatic life and for aquatic recreation of all kinds, including bathing. Not protected as a source of drinking water.

Class 2Bd waters: Protected for cool- or warm-water aquatic life and for aquatic recreation of all kinds, including bathing. Also protected as a source of drinking water.

Class 2C waters: The Minnesota Pollution Control Agency no longer uses this classification; an outdated reference to it remains in *Minnesota Rules*, 7077.0117, published electronically July 9, 2014.

Class 2D waters: Protected for aquatic and terrestrial species indigenous to wetlands, and their habitats. These waters are suitable for boating and other forms of aquatic recreation for which the wetland may be usable.

Class 7 waters: These are waters of the state that have limited resource value.

Clean Water Legacy Fund: Established in *Minnesota Constitution*, art. XI, sec. 15, this fund may be used “to protect, enhance, and restore water quality in lakes, rivers, and streams and to protect groundwater from degradation.”

Clean Water State Revolving Fund: Established in *Minnesota Statutes* 2018, 446A.07, and in 33 *U.S. Code*, sec. 1381, this fund is used primarily to provide at- or below-market-rate loans to communities to construct, rehabilitate, or upgrade wastewater infrastructure.

Denitrification: The reduction of nitrite to nitrogen gas. Denitrification is carried out in wastewater treatment tanks by bacteria under conditions lacking oxygen. The bacteria use the nitrate for energy, and in the process, release nitrogen gas. The nitrogen gas, a major constituent of air, is released into the atmosphere.

Dilution ratio: The average low flow of effluent from a facility divided by the lowest daily average flow of the receiving water measured for seven consecutive days with a once-in-ten-year recurrence interval (that is, a 10 percent probability that there will be a lower flow in any given year).

Effluent: The treated liquid that comes out of a wastewater treatment plant after completion of the treatment process.

Effluent discharge standards violation: Occurs when a wastewater treatment facility discharges effluent with a level of pollutants that is greater than allowed by its state-issued permit.

Endangered or threatened species: Such species are defined in state and federal rules. See *Minnesota Rules*, 6134.0200, published electronically October 8, 2013; 6134.0400, published electronically August 19, 2013; and 50 *CFR*, secs. 17.11-17.12 (2018).

Environment and Natural Resources Trust Fund: Established in *Minnesota Constitution*, art. XI, sec. 14, this fund may be used for the “protection, conservation, preservation, and enhancement of the state’s air, water, land, fish, wildlife, and other natural resources.”

Failing individual sewage treatment (septic) system: Systems are deemed to be failing if they are located within 500 feet of an outstanding resource value water or impaired water and either have one or more tanks that “obviously” leak below the designated operating depth or have the potential to immediately and adversely affect or threaten public health or safety.

Flow capacity: For treatment facilities, flow capacity is a comparison of hydraulic flow and organic loadings over the last 12 months to the facility’s permitted average wet weather flow. For collection facilities, actual measured peak hydraulic flows are compared to the documented hydraulic design peak instantaneous wet weather flow of the pipes.

Force main: A pipeline used to convey wastewater, under pressure, from a lower elevation to a higher elevation.

Gross alpha radium: Radioactive particles that must be removed from drinking water.

Groundwater: The zone beneath the ground surface saturated with water that has seeped down through soil and rock. Some individuals and many communities use groundwater (accessed through wells) as a source of drinking water.

Groundwater table: The upper level of the underground zone that is permanently saturated with water.

Hydraulic flow: The average wet weather flow that a municipal wastewater facility's permit allows it to receive, measured as millions of gallons per day.

Impaired water: A body of water that does not meet its designated beneficial use because of water quality standards violations.

Inflow and infiltration: Inflow occurs when clear water from illegal connections of sump pumps, downspouts, and foundation drains is channeled directly into sanitary sewer pipes. Infiltration occurs when groundwater seeps into sewer pipes via cracks or leaky joints. Together, they are often referred to as "I&I."

Influent: Water, wastewater, or other liquid flowing into a reservoir, basin, or treatment plant, or any unit thereof.

Interceptor: Large sewer line that collects the flows from smaller main and trunk sewers and carries them to the wastewater treatment plant.

Karstic geological characteristics: Found in southeastern Minnesota, karst is characterized by caves, sinkholes, and a lack of surface drainage. Groundwater in karstic regions is difficult to protect from activities on the surface.

Lake: An enclosed basin filled or partially filled with standing fresh water with a maximum depth greater than 15 feet.

Land discharge: The use of treated wastewater effluent in certain land applications, such as spray irrigation or on-land disposal.

National Pollutant Discharge Elimination System: A program established by the federal Clean Water Act that requires all facilities discharging wastewater into waters of the United States to obtain a permit issued by the U.S. Environmental Protection Agency (EPA) or a state agency authorized by the EPA. In Minnesota, the authorized state agency is the Minnesota Pollution Control Agency.

Nitrates: Nitrogen combined with three atoms of oxygen. The primary form of oxidized nitrogen found in groundwater.

Organic loading: The average Carbonaceous 5-Day Biochemical Oxygen Demand mass that a municipal wastewater treatment facility's permit allows it to receive, measured in pounds per day or kilograms per day.

Outstanding resource value water (ORVW): Waters protected for their special characteristics such as exceptional recreational, cultural, aesthetic, or scientific value. Includes Lake Superior, portions of the Mississippi River, and waters within the Boundary Waters Canoe Area Wilderness, among others.

Peak instantaneous wet weather flow: The peak instantaneous flow during the day at a time when the groundwater is high and a 25-year one hour storm event is occurring.

Permit: A National Pollutant Discharge Elimination System or State Disposal System permit establishes the terms and conditions that must be met when a wastewater treatment facility discharges a specified pollutant into a surface or groundwater of the state.

Permit variance: A temporary change in a water quality standard for a specific pollutant and its relevant criteria, allowing deviation from meeting a water quality-based effluent limit for a particular discharger of effluent.

Permitted facility: A wastewater facility that has a permit to discharge effluent through either the National Pollutant Discharge Elimination System or the State Disposal System.

Potable water: Water that has been treated to a standard so that it is safe for human consumption as drinking water or as part of food preparation.

Primary treatment: The initial stage of wastewater treatment that removes floating material and material that easily sinks to the bottom when water is allowed to stand.

Repeated failures: When a wastewater treatment or collection facility has experienced bypasses, overflows, or surcharges during two or more storm events within a 12-month period when operating at less than peak instantaneous wet weather flow.

Reservoir: A body of water in a natural or artificial basin or watercourse where the outlet or flow is artificially controlled by a structure such as a dam.

Secondary treatment: The second stage in most wastewater treatment systems in which bacteria consume the organic matter in wastewater. Federal regulations define secondary treatment as meeting minimum removal standards for biochemical oxygen demand, total suspended solids, and pH in the effluents discharged from municipal wastewater treatment facilities.

Septic system: A wastewater system designed primarily for individual residences. It uses a septic tank to provide sedimentation, sludge digestion, and sludge storage, and a soil-absorption system or drainfield to provide final dispersal and treatment of the liquid effluent.

Setback requirements: The minimum distance required between the treatment and dispersal of sewage from septic systems and other features, such as water supply wells, buried water lines, or property lines.

Sewer main: A principal pipe in a system that collects sewage.

Stabilization pond: A method of primary and secondary treatment in which wastewater is retained in a pond or series of ponds and treated over a period of several weeks or more without the use of mechanical processes.

State Disposal System permit: A type of permit required for disposal of wastewater to locations other than surface waters, including subsurface disposal and on-land disposal, for systems with a hydraulic flow averaging at least 10,000 gallons per day.

Surface water: Water that collects on the surface of the earth, such as lakes, rivers, and wetlands.

Total maximum daily load (TMDL): The maximum amount of a pollutant a body of water can receive without violating water quality standards, and an allocation of that amount to the sources of that pollutant (for example, wastewater treatment facilities, industrial sources, and stormwater runoff).

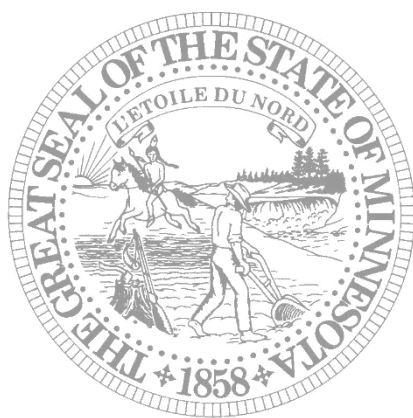
Unsewered area: An area that is not served by a centralized wastewater collection system.

Wastewater collection system: The part of a wastewater system that collects and transports wastewater, including sewers, lift stations, conveyance systems, interceptors, temporary storage basins, and related facilities.

Wastewater treatment facility: The part of a wastewater system that is designed to treat, stabilize, or dispose of wastewater.

Water quality standards: State-defined standards that are intended to protect water bodies for their designated beneficial use.

Wetlands: Those areas that are inundated or saturated by surface water or groundwater at a frequency and duration that allow it to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, bogs, and similar areas. Constructed wetlands designed for wastewater treatment are not waters of the state.



Priority Points for Wastewater Infrastructure Projects

APPENDIX A

As we discuss in Chapter 1, the Minnesota Pollution Control Agency (MPCA) assigns points to proposed wastewater infrastructure projects when a community applies for placement on the Project Priority List. MPCA awards points based on a set of objective criteria that are delineated in state administrative rules.

The following exhibits list those criteria and their associated points for proposed wastewater projects involving facilities that have an existing permit through the National Pollutant Discharge Elimination System or the State Disposal System (Exhibit A.1) and proposed wastewater projects involving facilities in areas without a municipally owned wastewater collection system, known as “unsewered” areas (Exhibit A.2). The criteria use several technical terms, which we define in the Glossary of Terms.

Exhibit A.1: Points for Wastewater Infrastructure Projects, Facilities with Existing Permits

Criteria	Points Awarded
Project will result in Minnesota Pollution Control Agency-approved beneficial use of wastewater that reduces or replaces the use of groundwater , surface water , or potable water	30
Existing facility is at least 20 years old	20
Existing or new facility will limit land discharge of nitrates	20
Project replaces or rehabilitates either (1) stabilization ponds located above karstic geological characteristics or (2) facilities where the wastewater discharge point is close to groundwater	20
Project helps meet a total maximum daily load for receiving water	20
Existing facility has excessive infiltration or inflow	15
Existing facility discharges into surface water other than a lake or reservoir (points based on dilution ratio)	Up to 15 ^a
Existing facility has effluent limits more stringent than achievable with secondary treatment	10
Existing facility has experienced repeated failures during storm events in the last year	10
Discharge standards for existing facility are more stringent due to a modified or reissued permit , a discontinued permit variance , or requirement to accommodate increased hydraulic flow or organic loading capacity	10
Existing facility discharges into surface water (points based on classification of water)	Up to 7 ^b
Existing facility has an effluent discharge violation	5
Existing facility discharges into outstanding resource value water (ORVW) or impaired water	5
If discharging into ORVW or impaired water, existing facility is currently in violation of effluent discharge standards	5
If discharging into ORVW or impaired water, existing facility has experienced repeated failures	5
Existing facility discharges into surface water fewer than 25 miles from a downstream potable water intake	5
Existing facility discharges into surface water that supports an endangered or threatened species	5
Existing facility operates at 85 percent or greater of hydraulic flow or organic loading capacity	5
Project will implement corrective measures for a water quality problem identified in certain kinds of studies ^c	5
Project will produce any amount of new or expanded discharge into ORVW, impaired water, or a lake; or more than 200,000 gallons per day into wetlands or Class 2A waters	-5

NOTES: **Bolded** terms are defined in the Glossary of Terms. The above criteria apply to proposed wastewater projects involving facilities with an existing National Pollutant Discharge Elimination System or State Disposal System permit. See Exhibit A.2 for the criteria that apply to proposed wastewater projects in unsewered areas. Since Fiscal Year 2018, projects need at least 40 points to be eligible for revolving fund loans from the Public Facilities Authority.

^a The number of points is equal to 15 times the dilution ratio for that facility. Dilution ratios are between zero and one.

^b The number of points is based on the classification of the receiving water. Class 2A water results in 7 points; classes 1 and 2Bd result in 5 points; classes 2B, 2C (no longer used by MPCA), and 2D result in 3 points; and class 7 results in 1 point.

^c Eligible studies include Clean Water Partnership projects pursuant to *Minnesota Rules*, Chapter 7076, published electronically March 20, 2013; impaired water studies; U.S. Environmental Protection Agency-approved watershed restoration action strategies pursuant to 33 *U.S. Code*, sec. 1329, accessed November 27, 2018; or an equivalent of any of these studies.

SOURCE: *Minnesota Rules*, 7077.0117, published electronically July 9, 2014.

Exhibit A.2: Points for Wastewater Infrastructure Projects, “Unsewered” Areas

Criteria	Points Awarded
Existing septic systems discharge in a way that poses a threat to public health or safety ^a	Formula ^b
Existing septic systems discharge in way that fails to protect groundwater	Formula ^c
Existing septic systems are not in compliance with a setback requirement	Formula ^d
Project will result in Minnesota Pollution Control Agency-approved beneficial use of wastewater that reduces or replaces the use of groundwater, surface water , or potable water	30
Density of septic discharges within proposed project service area	Up to 30 ^e
Project will result in new land discharge of treated effluent to meet permit requirements for denitrification	20
Project helps meet a total maximum daily load for receiving water	20
Existing septic systems are in the proximity of outstanding resource value water (ORVW) or impaired water	5
Failing sewer systems are in the proximity of ORVW or impaired water	5
Project implements corrective measures for a water quality problem identified in certain kinds of studies ^f	5
Project will produce any amount of new or expanded discharge into ORVW, impaired water, or lake ; or new or expanded discharge of more than 200,000 gallons per day into wetlands or Class 2A waters	-5

NOTES: **Bolded** terms are defined in the Glossary of Terms. The above criteria apply to proposed wastewater projects in areas not served by a municipal wastewater collection system, which are sometimes referred to as “unsewered” areas. See Exhibit A.1 for the criteria that apply to proposed wastewater projects involving facilities with an existing permit. The Public Facilities Authority awards Small Community Wastewater Treatment Program grants and loans based on the projects’ rankings on the Project Priority List. The relevant administrative rule refers to “individual sewage treatment systems or other systems that collect and discharge wastewater.” For simplicity, we refer to these as “septic systems.” In such systems, wastewater collects in a tank where solids settle to the bottom. The systems release treated liquid into the ground, where it is cleaned through natural processes as it filters through the soil.

^a “Discharge” in this exhibit refers to wastewater flowing through septic systems and entering the environment.

^b These points equal 45 times the ratio of the number of existing structures with septic systems that pose a threat to public health or safety to the total number of existing structures with septic systems within the proposed project service area.

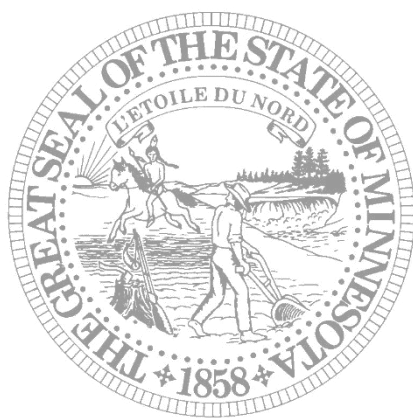
^c These points equal 15 times the ratio of the number of existing structures (not already counted above in footnote b) with septic systems that “obviously” leak below their designated operating depth to the total number of existing structures with septic systems within the proposed project service area.

^d These points equal 5 times the ratio of the number of existing structures with septic systems that do not conform to setback requirements (and that were not already counted above in footnotes b or c) to the total number of existing structures with septic systems within the proposed project service area.

^e Density is the number of structures with septic systems within the proposed project service area divided by the number of acres in the maximum impact zone for the project. Points are assigned as follows: 0 points for densities less than 0.25; 10 points for densities from 0.25 to 0.50; 20 points for densities greater than 0.50 to 1.0; and 30 points for densities greater than 1.0.

^f Eligible studies include Clean Water Partnership projects pursuant to *Minnesota Rules*, Chapter 7076, published electronically March 20, 2013; impaired water studies; U.S. Environmental Protection Agency-approved watershed restoration action strategies pursuant to 33 *U.S. Code*, sec. 1329, accessed November 27, 2018; or an equivalent of any of these studies.

SOURCE: *Minnesota Rules*, 7077.0118, published electronically July 9, 2014.



Recent Public Facilities Authority-Funded Projects

APPENDIX B

In this appendix, we provide information on the geographic distribution of wastewater infrastructure projects that received funding from the Public Facilities Authority (PFA). During our evaluation, we spoke with one stakeholder who raised concerns about the equity of the distribution of PFA's funds between the Twin Cities metropolitan area and Greater Minnesota. We found that for calendar years 2016 to 2017, municipalities in Greater Minnesota received about 36 percent more in PFA funding than the metropolitan area. Communities in the seven-county metropolitan area received approximately \$72 million in funding from PFA; the rest of Minnesota received approximately \$99 million.¹

The exhibits in this appendix include the following:

- A list of projects that received PFA wastewater infrastructure funding in fiscal years 2017 to 2018, excluding projects done by Metropolitan Council Environmental Services (Exhibit B.1).
- A list of Metropolitan Council Environmental Services wastewater infrastructure projects that received reimbursement from PFA during calendar years 2016 and 2017 (Exhibit B.2).
- A map of recipients of PFA wastewater infrastructure funding in fiscal years 2017 and 2018 (Exhibit B.3).

¹ The seven-county metropolitan area includes all or part of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties.

Exhibit B.1: Wastewater Projects Financed by the Public Facilities Authority in Fiscal Years 2017 and 2018, Excluding Metropolitan Council Environmental Services Projects

Recipient	Description	Priority Points	Public Facilities Authority Funding	
			Program	Amount
Afton	Construction of a new wastewater treatment and collection system for the Downtown Village area	66	SRF (loan) SRF PF (grant) PSIG (grant)	\$ 1,194,959 398,320 5,742,716
Aitkin	Sanitary sewer, lift station, and force main improvements to bypass the Blackrock lift station	44	SRF (loan)	826,952
Blue Earth (city)	Wastewater treatment plant improvements	57	SRF (loan)	7,691,210
Browerville	Sanitary sewer replacement along Gillis Avenue South	49	SRF (loan)	1,385,546
Central Iron Range Sanitary Sewer District	The addition of a new 5-million-gallons-per-day tertiary filter building, modifications to the existing secondary effluent lift station, and construction of a new storage building and associated site work	86	SRF (loan) PSIG (grant)	1,310,192 3,720,434
Clarissa	Wastewater collection system replacement of all vitrified clay pipe and related manholes	58	WIF-RD (grant)	600,000
Cuyuna	Sewer collection system rehabilitation	63	WIF-RD (grant)	577,000
Dalton	Treatment and sewer system improvements	60	WIF-RD (grant)	387,000
Detroit Lakes	Rehabilitation of the city's existing wastewater treatment system and construction of a new advanced system to treat phosphorous	83	SRF (loan) SRF PF (grant) WIF-CW (grant) PSIG (grant)	16,336,065 2,236,900 3,270,291 11,532,914 ^a
Eagle Bend	Phase 2 sanitary sewer improvements throughout the city	57	SRF (loan) WIF-CW (grant)	495,843 884,686
East Grand Forks	Construction of a new lift station, an equalization basin, and interconnect force main required to convey the city's wastewater to the Grand Forks, North Dakota, wastewater treatment plant for treatment and discharge	46	SRF (loan)	6,933,456
Echo	Replacement of underground sewer pipes throughout the city	51	WIF-RD (grant)	1,365,000
Fillmore County	Evaluation of septic options for the Cherry Grove area	75	SC-TA (grant)	37,000
Frazee	Sewer collection system improvements along Maple Avenue	40	SRF (loan) WIF-CW (grant)	120,262 334,805
Grove City	Construction of a new three-cell stabilization pond system, force main, and demolition of existing facility	61	WIF-RD (grant) PSIG (grant)	3,129,515 380,485
Hallock	Sanitary sewer rehabilitation	53	SRF (loan)	511,338
Heron Lake	Construction of a new influent lift station and rehabilitation of the existing wastewater stabilization pond system	38	SRF (loan)	1,492,453
Jackson (city)	Extension of the sanitary sewer system to eliminate noncompliant septic systems	71	SRF (loan) WIF-CW (grant) PSIG (grant)	300,169 147,100 1,789,077

Continued next page.

Exhibit B.1: Wastewater Projects Financed by the Public Facilities Authority in Fiscal Years 2017 and 2018, Excluding Metropolitan Council Environmental Services Projects (continued)

Recipient	Description	Priority Points	Public Facilities Authority Funding	
			Program	Amount
Kabetogama Township	Construction of a publicly owned subsurface sewage treatment and collection system for the Puck's Point Subordinate Service District	53	PSIG (grant) SC-Con (mix)	\$ 1,864,929 1,373,095
Kasson	Wastewater treatment plant improvements to update processes and accommodate flows from nearby Mantorville	56	SRF (loan) PSIG (grant)	2,843,535 489,494
Kelliher	Sewer collection rehabilitation	38	WIF-RD (grant)	109,000
Lansing Township	Evaluation of septic treatment options for the St. Michael's area	75	SC-TA (grant)	35,485
Lincoln Pipestone Rural Water	Elimination of chloride discharge at the Holland water treatment plant by constructing a new waterline with an inline booster pumping station	68	PSIG (grant)	4,708,002
Mantorville	Lift station and force main to direct the city's wastewater to the city of Kasson for treatment	49	SRF (loan) PSIG (grant)	468,834 1,875,338
Maynard	Sewer collection system rehabilitation	68	WIF-RD (grant)	2,118,000
Minneota	Rehabilitation of the Adams Street sewer collection system and replacement of sewer mains	88	SRF (loan) PSIG (grant)	285,516 1,142,066
Morris ^b	Construction of a new water treatment plant with supporting infrastructure	53	PSIG (grant)	7,000,000
Nobles County	Updating its community assessment report in conjunction with testing soil borings and creating new conceptual layouts and initial sewer ordinances	68	SC-TA (grant)	11,700
Oronoco Township (FY 2017)	Construction of sanitary sewer collection and treatment for Cedar Beach area	72	PSIG (grant) SC-Con (mix)	539,852 539,852
Oronoco Township (FY 2018)	Evaluation of sanitary sewer options for the Sunset Bay area	38	SC-TA (grant)	36,000
Osakis (FY 2017)	Rehabilitation of collection system	53	SRF (loan)	525,048
Osakis (FY 2018)	Sanitary sewer rehabilitation work	53	SRF (loan)	653,961
Ostrander	Sewer improvements, phase 1	49	WIF-RD (grant)	284,000
Pipestone (city) (FY 2017)	Replacement and rehabilitation of sewer mains along Trunk Highway 30 using open-cut construction techniques	78	SRF (loan)	1,061,741
Pipestone (city) (FY 2018) ^b	Construction of a new water treatment plant and supporting infrastructure to address gross alpha radium	68	PSIG (grant)	7,000,000
Randolph	Evaluation of soil-based alternatives for long-term wastewater infrastructure focusing on the 47 properties in noncompliance	46	SC-TA (grant)	60,000

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Exhibit B.1: Wastewater Projects Financed by the Public Facilities Authority in Fiscal Years 2017 and 2018, Excluding Metropolitan Council Environmental Services Projects (continued)

Recipient	Description	Priority Points	Public Facilities Authority Funding	
			Program	Amount
Saint Cloud (FY 2017)	Rehabilitation work at main lift station	46	SRF (loan)	\$ 4,062,885
Saint Cloud (FY 2018)	Nutrient recovery and reuse project to make biosolids improvements to reduce the discharge of phosphorus	46	SRF (loan)	16,712,029
			PSIG (grant)	6,642,539
Saint Francis	Construction of an expanded, upgraded wastewater treatment facility consisting of activated sludge with tertiary filters to address a permit phosphorus limit	44	SRF (loan)	16,010,544
			WIF-CW (grant)	1,972,371
			PSIG (grant)	7,000,000
Saint Louis County	Small community wastewater treatment program technical assistance grant for the Sand Lake area	35	SC-TA (grant)	60,000
Tintah	Facilitate the proper design, installation, and management of a proposed onsite wastewater system	25	SC-TA (grant)	54,000
Walker	Rehabilitation of collection system	55	SRF (loan)	2,713,023
			SRF PF (grant)	592,767
Warren	Sanitary sewer rehabilitation	58	SRF (loan)	374,693
Western Lake Superior Sanitary District	Phase 4, rehabilitation of Scanlon interceptor	91	SRF (loan)	3,216,871
			SRF PF (grant)	1,747,437
Western Lake Superior Sanitary District	Headworks screw pump improvements and Wrenshall pump station improvements	56	SRF (loan)	1,786,599
Willmar	Replacement of Westwood Court lift station and construction of a new force main	66	SRF (loan)	1,046,528
Winsted	Wastewater treatment facility improvements	33	PSIG (grant)	4,214,853
Zumbro Township	Evaluation of sanitary sewer options for the Ryan's Bay area	47	SC-TA (grant)	60,000

NOTES: "SRF" is the Clean Water State Revolving Fund. "SRF PF" is a principal forgiveness grant from the revolving fund. "PSIG" is a Point Source Implementation Grant. "WIF-CW" is a Water Infrastructure Fund grant matched to a loan from the state revolving fund. "WIF-RD" is a Water Infrastructure Fund grant matched to a loan from the U.S. Department of Agriculture's Rural Development office; this exhibit does not include loans from Rural Development. "SC-TA" is a technical assistance grant from the Small Community Wastewater Treatment Program. "SC-Con" is a construction loan or grant from the Small Community Wastewater Treatment Program. "FY" is fiscal year. See Exhibit B.2 for a list of wastewater projects by Metropolitan Council Environmental Services that have received funding from the Public Facilities Authority (PFA) in recent years. See Exhibit B.3 for a map of recipients. Project descriptions are from PFA. We lightly edited them for readability (for example, replacing abbreviations of "LS" with "lift station"), but we did not otherwise modify their content.

^a The maximum amount of Point Source Implementation Grants is normally \$7,000,000. See *Minnesota Statutes* 2018, 446A.073, subd. 1. However, the 2017 Legislature removed that limit specifically for the city of Detroit Lakes' project to reduce its phosphorus discharge. See *Laws of Minnesota* 2017, First Special Session, chapter 8, art. 1, sec. 21.

^b These projects in the cities of Morris and Pipestone are designed to address nutrients in discharged wastewater. However, in both cases, it was more cost effective to do so by treating the community's drinking water. Therefore, these projects received Point Source Implementation Grants but received loans from the Drinking Water State Revolving Fund (not shown in exhibit), rather than the Clean Water State Revolving Fund.

SOURCE: Office of the Legislative Auditor, analysis of Public Facilities Authority data.

Exhibit B.2: Metropolitan Council Environmental Services Wastewater Projects, Calendar Years 2016-2017

Project	Subproject	Description	Amount Reimbursed
Blue Lake Interceptor System Improvements	Mound Area Improvements	Design work for next two subprojects	\$ 475,359
	Mound Area Improvements – Lift Station L38	Reconstruction and rehabilitation of lift station L38 in the city of Mound	1,138,178
	Mound Area Improvements – Western Maintenance Facility	Refurbishment and rehabilitation of the Western Maintenance Facility in the city of Mound	6,888,849
	Mound Area Improvements – Lift Stations L39/L40	Construction of a new lift station L39 facility and abandonment of lift station L40 in the city of Mound	8,517,863
	Mound Area Improvements – Interceptor 6-MO-650	Reconstruction of interceptor 6-MO-650 in the city of Mound using reinforced plastic mortar pipe	17,351
	Wayzata Area Improvements	Rehabilitation of lift station L26 and construction of a new force main to generate system redundancy	457,575
	Wayzata Area Improvements – Rehabilitation of Lift Station L26	Reconfiguration of lift station piping to align with new dual force main and update to lift station facilities	707,467
	Excelsior Area Improvements	Facility improvements for lift stations L18, L19, L20, and L21 in the city of Excelsior	918,661
	Excelsior Area Improvements – Phase 2	Improvement and rehabilitation of lift station L19 and interceptor 7017	409,572
	Excelsior Area Lift Station Improvements	Lift station rehabilitation in the Excelsior area	2,551
Hopkins System Improvements		Project costs not associated with a specific subproject	\$ 256,633
	Contract B – St. Louis Park/Minneapolis Force Main	Construction of 6,325 feet of new 24" double-barrel force main in the cities of Minneapolis and St. Louis Park	592,400
	Contract C – Hopkins Force Main Improvements	Construction of 1,200 feet of new 18" double-barrel force main in the cities of St. Louis Park and Hopkins	13,766
	Contract D – Hopkins Lift Station	Construction of a new lift station L27 with a capacity of 4,400 gallons per minute in the city of Hopkins	3,325,674
Lift Station Improvements		Project costs not associated with a specific subproject	\$ 77,346
	Lift Station L7 Improvements	Construction of above-grade entrance facility and upgrades to lift station pumps and mechanical and electrical equipment in the city of Mahtomedi	285,345
	Lift Station L7 Force Main Improvements	Construction of 2 miles of 14" double-barrel force main to replace existing 12" pipe in the city of Mahtomedi	151,804
	Lift Station L30 Improvements	Upgrades to lift station pumps, piping, and electrical systems in the city of Crystal	2,200,439
Golden Valley Area Improvements		Project costs not associated with a specific subproject	\$ 43,837
	1-GV-461 Relief Lift Station and Phase 3 Force Main	Construction of a 5-million-gallons-per-day lift station L81 and completion of the 18" force main connecting to the city of St. Louis Park trunk sewer system	2,179,279

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Exhibit B.2: Metropolitan Council Environmental Services Wastewater Projects, Calendar Years 2016-2017 (continued)

Project	Subproject	Description	Amount Reimbursed
Metro Wastewater Treatment Plant (MWWTP) Rehabilitation and Facility Improvements		Project costs not associated with a specific subproject	\$ 193,356
	MWWTP East Pretreatment Improvements	Installation of 40 new grit tank covers, 10 new bar screen rake mechanisms, and 5 new air compressors, as well as other improvements for the East Pretreatment process	2,062,760
	Filtration and Incineration Building Number 1 Demolition	Demolition of Filtration and Incineration Building Number 1, which was built in the 1930s and previously decommissioned	431,897
	MWWTP HVAC Improvements – Phase 1	Upgrades to HVAC systems for the Compressor Floor, EPR2 1st Floor, ESE 1 Access 5, and ESE 3 Access 7	68,170
	MWWTP Flotation Thickener Renewal	Rehabilitation of 12 flotation thickeners and decommissioning of 4 flotation thickeners, as well as replacement of 2 WAS pumps, removal of obsolete equipment and processes, and HVAC improvements	3,719,790
	MWWTP Solids Processing Equipment and Systems Improvements	Improvements to processes and rehabilitation or replacement of equipment for the incineration system	1,137,900
	MWWTP Vactor Waste Receiving Facility – Phase 2	Improvements to the Vactor Waste Receiving Facility to resolve operational issues and inefficiencies	2,374,879
	MWWTP Double-Barrel Interceptor Improvements	Repairs to concrete and expansion joints and application of protective coating on the interior and exterior of the 10' x 9.5' 6,000 foot long double-barrel inlet to the treatment plant	94,131
	MWWTP Water System Improvements	Improvements to the city water, service water, and effluent water distribution systems throughout the plant	443,168
	MWWTP Water Systems Renewal and Improvements	Expansion of preceding project to add a reclaimed water distribution system and provide additional improvements to the city water, service water, and effluent water distribution systems	17,455
MWWTP Solids Improvements		Planning phase funding for future MWWTP solids processing improvement work	\$ 22,994
North Area Interceptor Rehabilitation		Planning phase funding for future interceptor rehabilitation work located in the North Service Area	\$ 16,110
Empire Plant Solids Improvements		Increase capacity of the primary digesters and add combined heat and power engine generators to provide supplemental power to the plant	\$ 765,150
Seneca Solids Processing Improvements		Planning phase funding for solids processing improvements at the Seneca Plant	\$2,092,317

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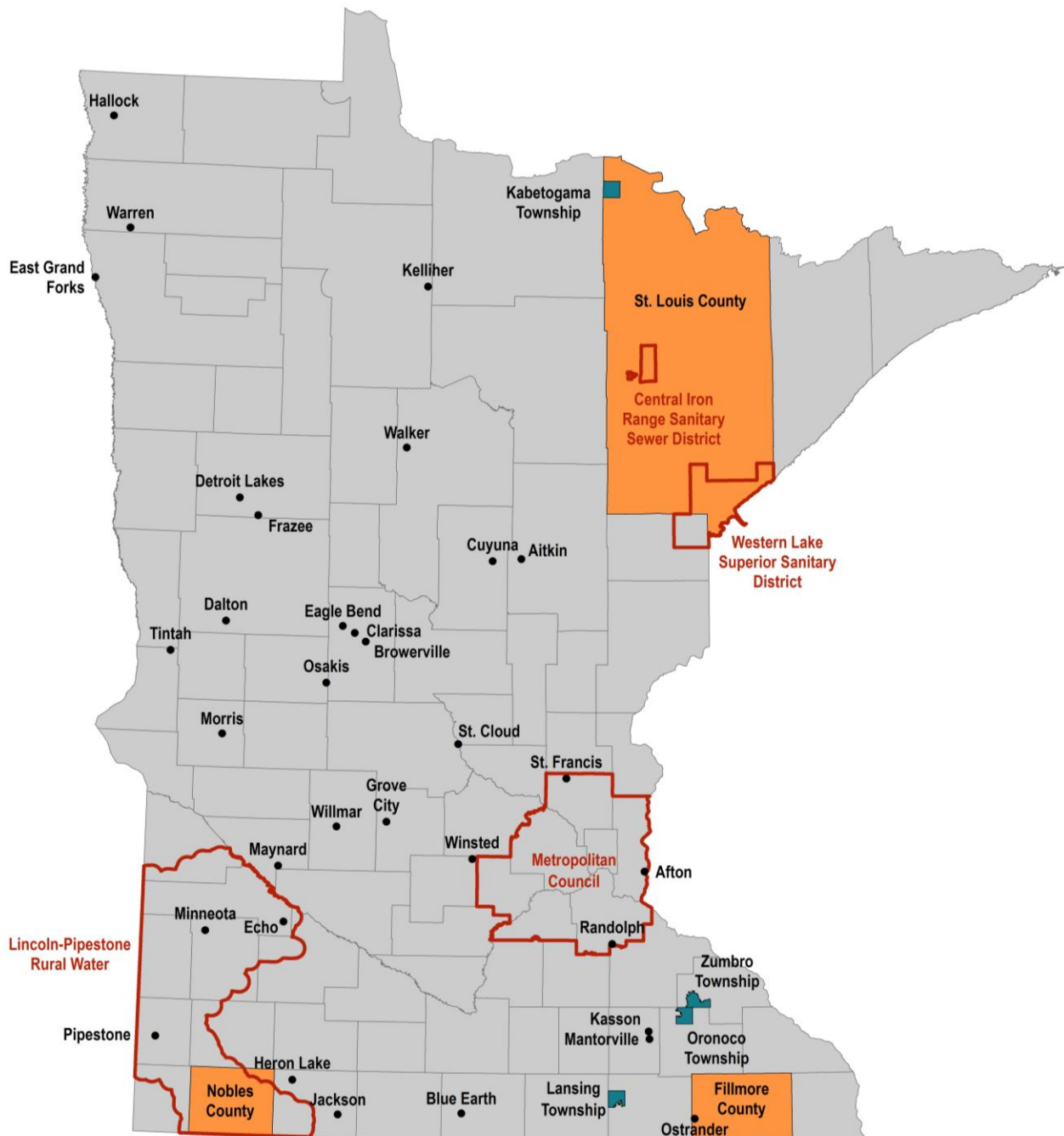
Exhibit B.2: Metropolitan Council Environmental Services Wastewater Projects, Calendar Years 2016-2017 (continued)

Project	Subproject	Description	Amount Reimbursed
Minneapolis Interceptor System Rehabilitation		Project costs not associated with a specific subproject	\$ 67,418
	Southwest Minneapolis Interceptor Rehabilitation	Reconstruction of interceptor 1-MN-342 in Southwest Minneapolis	59,957
	1-MN-341 Interceptor Rehabilitation	Rehabilitation using cured-in-place pipe of interceptor 1-MN-341 in Southwest Minneapolis, consisting of 10,500 linear feet of 33" to 60" pipe	382,259
	R06, R10, and R12 Regulator and Odor Control Improvements	Rehabilitation and improvements to three regulators and odor control facilities to maintain compliance with the NPDES permit for combined sewer overflows in the MCES collection system	5,232,978
	Minneapolis Interceptor 1-MN-344 Tunnel and Regulator R04	Rehabilitation of 1,000 feet of interceptor tunnel under Minnehaha Creek, as well as updates to regulator R04 and installation of odor control facilities at the regulator site	1,026,022
Seneca Interceptor System Rehabilitation		Project costs not associated with a specific subproject	\$ 1,097,396
	Seneca Area System Rehabilitation – Phase 3	Pipe replacement and reconstruction of interceptor 3-BV-39 in the city of Burnsville	4,851,370
St. Bonifacius Lift Station/Force Main Rehabilitation		Rehabilitation of lift station L24 and force main 7020 serving the city of St. Bonifacius and parts of Minnetrista	\$ 956,490
Waconia Lift Station/Force Main Rehabilitation		Planning/design phase funding for the replacement of two 6-mile-long force mains serving the city of Waconia – interceptors 7508 and 9204	\$ 247,454
TOTAL			\$56,021,372

NOTES: Data from Metropolitan Council Environmental Services (MCES) are not comparable with data on other PFA recipients because MCES receives one lump-sum loan per fiscal year from PFA that is distributed among various projects and subprojects. Data in this exhibit cover calendar years 2016-2017 and reflect only expenses reimbursed by PFA, rounded to the nearest dollar. Dollar amounts, therefore, do not necessarily reflect the total cost of the project. Some facilities have expenses, such as planning and design costs, that are not associated with a particular subproject; when that is the case, such expenses are reflected in the first row. The dollar amounts of individual projects do not sum to the total due to rounding. "NPDES" is National Pollutant Discharge Elimination System. Project descriptions are from MCES. We lightly edited them for readability (for example, replacing abbreviations of "LS" with "lift station"), but we did not otherwise modify their content.

SOURCE: Office of the Legislative Auditor, analysis of Metropolitan Council Environmental Services data.

Exhibit B.3: Cities, Townships, Counties, and Other Communities with Wastewater Infrastructure Projects Financed by the Public Facilities Authority, Fiscal Years 2017-2018



SOURCE: Office of the Legislative Auditor, analysis of data provided by Lincoln-Pipestone Rural Water, Minnesota Geospatial Commons, the Public Facilities Authority, and Western Lake Superior Sanitary District.

State-Funded Wastewater Infrastructure Programs in Other States

APPENDIX C

To learn more about how other states fund wastewater infrastructure improvements, we analyzed data listing wastewater funding sources compiled by the Environmental Finance Center Network in 2018.¹ The table in this appendix focuses on state-funded programs supporting wastewater infrastructure improvements. All states have a program equivalent to the Clean Water State Revolving Fund; these are not reflected in the table.²

- A checkmark in the **Wastewater-Specific Grants** column indicates that the state has at least one grant program specifically targeting wastewater infrastructure projects. Some of these programs also fund drinking water infrastructure.
- A checkmark in the **Wastewater-Specific Loans** column indicates that the state has at least one loan program specifically targeting wastewater infrastructure projects. Some of these programs also fund drinking water infrastructure.
- A checkmark in the **Public-Infrastructure Grants Supporting Wastewater** column indicates that the state supports wastewater through at least one broadly defined grant program. These grant programs fund wastewater infrastructure among many other things, such as the construction or improvement of roads, bridges, and public buildings.
- A checkmark in the **Public-Infrastructure Loans Supporting Wastewater** column indicates that the state supports wastewater through at least one broadly defined loan program. These loan programs fund wastewater infrastructure among many other things, such as the construction or improvement of roads, bridges, and public buildings.

¹ The Environmental Finance Center Network is a network of mostly university-based member organizations interested in environmental sustainability.

² In addition, all states reportedly use loan and grant programs administered by various federal agencies. These are also not reflected in the table.

Exhibit C.1: State-Funded Wastewater Programs

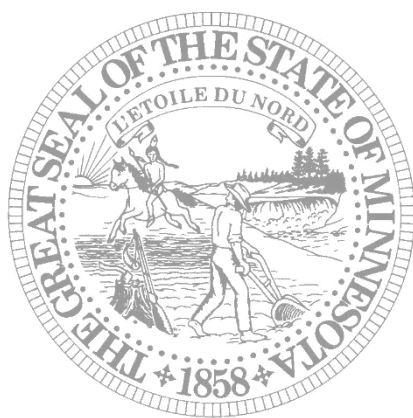
State	Wastewater-Specific Grants	Wastewater-Specific Loans	Public-Infrastructure Grants Supporting Wastewater	Public-Infrastructure Loans Supporting Wastewater
Alabama				
Alaska				
Arizona	✓			
Arkansas				
California	✓	✓		✓
Colorado	✓	✓		
Connecticut				
Delaware	✓			
Florida	✓			
Georgia		✓	✓	✓
Hawaii				
Idaho				
Illinois				
Indiana	✓			
Iowa				
Kansas				
Kentucky		✓		
Louisiana			✓	
Maine		✓		
Maryland	✓			
Massachusetts				
Michigan		✓		
Minnesota	✓	✓		
Mississippi			✓	✓
Missouri		✓		✓
Montana			✓	✓
Nebraska				
Nevada				
New Hampshire				✓
New Jersey	✓			

Continued next page.

Exhibit C.1: State-Funded Wastewater Programs (continued)

State	Wastewater-Specific Grants	Wastewater-Specific Loans	Public-Infrastructure Grants Supporting Wastewater	Public-Infrastructure Loans Supporting Wastewater
New Mexico	✓	✓	✓	✓
New York	✓		✓	
North Carolina	✓	✓		
North Dakota				
Ohio	✓	✓		
Oklahoma	✓	✓		
Oregon	✓	✓		
Pennsylvania			✓	
Rhode Island		✓		
South Carolina	✓			
South Dakota	✓	✓	✓	
Tennessee				
Texas		✓		✓
Utah			✓	✓
Vermont				
Virginia	✓			
Washington				✓
West Virginia		✓		
Wisconsin	✓			✓
Wyoming				

SOURCE: Office of the Legislative Auditor, analysis of Environmental Finance Centers Network data.



m1 MINNESOTA
PUBLIC FACILITIES AUTHORITY

January 16, 2019

James R. Nobles, Legislative Auditor
Office of the Legislative Auditor
Room 140 Centennial Office Building
658 Cedar Street
St. Paul, MN 55155

Dear Mr. Nobles:

Thank you for the opportunity to review and respond to the Office of the Legislative Auditor's evaluation report of the Public Facilities Authority's (PFA) wastewater infrastructure programs. We appreciate the time and attention your team dedicated to understanding the PFA and its loan and grant programs that help communities make improvements to their wastewater infrastructure systems.

As noted in the report, nearly 600 Minnesota communities own and operate wastewater collection and treatment systems which are essential to protect the environment and human health. Local governments face significant financial challenges to maintain these systems, including replacing and rehabilitating aging infrastructure and upgrading treatment processes to meet water quality standards. We are pleased that the report affirms that the PFA does a good job administering wastewater infrastructure funding programs, and that these programs have resulted in significant savings for Minnesota communities.

The report projects that, if current federal and state funding trends continue for the next 20 years, the PFA could meet more than two-thirds of Minnesota's wastewater infrastructure needs. The bulk of the funding will come from low interest loans provided through the Clean Water State Revolving Fund. Federal and state law require the PFA to manage the revolving fund so that it is available in perpetuity as a source of below-market rate financing to Minnesota communities. We consider the management of the revolving fund and its assets, currently \$1.6 billion, to be one of the PFA's most important responsibilities.

As described in the report, grants are also an important part of the state funding framework. PFA programs target grants based on affordability and to help communities upgrade treatment facilities to meet more stringent regulatory requirements. Grants can help communities proceed with high priority projects, but as noted in the report, the hope of future grants can also be a reason for communities to defer projects. To encourage communities to proceed with their projects in a timely manner, grant assistance must be predictable and consistent.

We commend the professionalism of your staff in conducting this evaluation. The process has been valuable in our efforts to ensure the PFA operates as effectively and efficiently as possible to help Minnesota communities and the State as a whole meet our future wastewater infrastructure needs.

Sincerely,

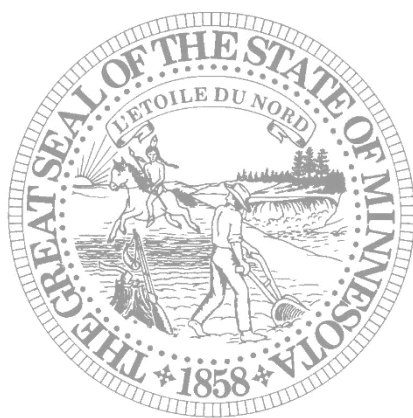


Jeff Freeman
Executive Director

Minnesota Public Facilities Authority

1st National Bank Building • 332 Minnesota St. • Suite W820 • Saint Paul, MN 55101-1378 • USA
651-259-7469 • 800-657-3858 TOLL FREE • 651-296-8833 FAX • mn.gov/pfa

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January 15, 2019

Ms. Judy Randall, Deputy Legislative Auditor
Office of the Legislative Auditor - Program Evaluation Division
Centennial Office Building, Room 140
658 Cedar Street
St. Paul, MN 55155-1603

RE: Public Facilities Authority Wastewater Treatment Infrastructure Programs Report

Dear Ms. Randall:

Thank you for the opportunity to review and respond to the Office of Legislative Auditor's (OLA) findings and recommendations resulting from a recent audit of the Public Facilities Authority's (PFA) wastewater infrastructure funding programs as well as the Minnesota Pollution Control Agency's (MPCA) role in jointly administering these programs. We are very proud of our partnership with PFA in providing a consistent and predictable process for these grants and loans to municipalities across the state.

We greatly appreciate the time and attention your audit team committed to understanding and evaluating the accessibility and adequacies of meeting the significant and growing financial needs of municipalities in replacing aged and deteriorated infrastructure and in meeting more stringent permit discharge limits. The audit report does an excellent job describing the purpose and importance of the various wastewater infrastructure grant and loan programs administered by the PFA and the role the MPCA plays in cataloging and collecting data on the planned projects.

Further, we appreciate the professional review conducted by the OLA staff and have written a response to one recommendation within your report.

OLA Recommendation #2: MPCA should develop a method to link WINS data to Project Priority List data.

Agency response: The MPCA agrees with this recommendation. We are in the process of updating the 2019 Wastewater Infrastructure Needs Survey (WINS) to meet this recommendation.

Implementation Date: March 15, 2019

Responsible Manager: Mark Schmitt, Director, Municipal Division

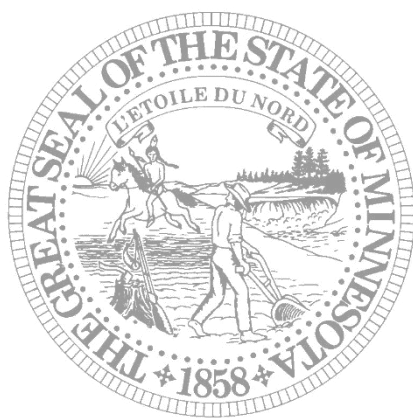
Thank you again for the opportunity to respond. If you have any questions, please feel free to contact Chief Financial Officer Joshua Bunker at 651-757-2781, or by email at Joshua.Bunker@state.mn.us.

Sincerely,



Laura Bishop
Commissioner

LB/BDP:map



Forthcoming OLA Evaluations

Debt Service Equalization for School Facilities
Economic Development and Housing Challenge Program
Minnesota State Arts Board Grant Administration
MnDOT Measures of Financial Effectiveness
Office of Minnesota Information Technology Services
(MNIT)

Recent OLA Evaluations

Agriculture

Agricultural Utilization Research Institute (AURI),
May 2016
Agricultural Commodity Councils, March 2014
“Green Acres” and Agricultural Land Preservation
Programs, February 2008
Pesticide Regulation, March 2006

Criminal Justice

Guardian ad Litem Program, March 2018
Mental Health Services in County Jails, March 2016
Health Services in State Correctional Facilities,
February 2014
Law Enforcement’s Use of State Databases, February
2013
Public Defender System, February 2010

Economic Development

Minnesota Investment Fund, February 2018
Minnesota Research Tax Credit, February 2017
Iron Range Resources and Rehabilitation Board (IRRRB),
March 2016
JOBZ Program, February 2008

Education, K-12 and Preschool

Early Childhood Programs, April 2018
Minnesota State High School League, April 2017
Standardized Student Testing, March 2017
Perpich Center for Arts Education, January 2017
Minnesota Teacher Licensure, March 2016
Special Education, February 2013

Education, Postsecondary

Preventive Maintenance for University of Minnesota
Buildings, June 2012
MnSCU System Office, February 2010
MnSCU Occupational Programs, March 2009

Energy

Renewable Energy Development Fund, October 2010
Biofuel Policies and Programs, April 2009
Energy Conservation Improvement Program,
January 2005

Environment and Natural Resources

Public Facilities Authority: Wastewater Infrastructure
Programs, January 2019
Clean Water Fund Outcomes, March 2017
Department of Natural Resources: Deer Population
Management, May 2016
Recycling and Waste Reduction, February 2015
DNR Forest Management, August 2014

Government Operations

Mineral Taxation, April 2015
Minnesota Board of Nursing: Complaint Resolution
Process, March 2015
Councils on Asian-Pacific Minnesotans, Black
Minnesotans, Chicano/Latino People, and Indian
Affairs, March 2014
Helping Communities Recover from Natural Disasters,
March 2012
Fiscal Notes, February 2012

Health

Office of Health Facility Complaints, March 2018
Minnesota Department of Health Oversight of HMO
Complaint Resolution, February 2016
Minnesota Health Insurance Exchange (MNsure),
February 2015
Financial Management of Health Care Programs,
February 2008

Human Services

Home- and Community-Based Services: Financial
Oversight, February 2017
Managed Care Organizations’ Administrative Expenses,
March 2015
Medical Assistance Payment Rates for Dental Services,
March 2013
State-Operated Human Services, February 2013
Child Protection Screening, February 2012
Civil Commitment of Sex Offenders, March 2011
Medical Nonemergency Transportation, February 2011

Housing and Local Government

Consolidation of Local Governments, April 2012

Jobs, Training, and Labor

State Protections for Meatpacking Workers, 2015
State Employee Union Fair Share Fee Calculations,
July 2013
Workforce Programs, February 2010
E-Verify, June 2009
Oversight of Workers’ Compensation, February 2009

Miscellaneous

Board of Animal Health’s Oversight of Deer and
Elk Farms, April 2018
Voter Registration, March 2018
Minnesota Film and TV Board, April 2015
The Legacy Amendment, November 2011
Public Libraries, March 2010
Economic Impact of Immigrants, May 2006

Transportation

MnDOT Highway Project Selection, March 2016
MnDOT Selection of Pavement Surface for Road
Preservation, March 2014
MnDOT Noise Barriers, October 2013
Governance of Transit in the Twin Cities Region,
January 2011
State Highways and Bridges, February 2008



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CENTENNIAL OFFICE BUILDING – SUITE 140
658 CEDAR STREET – SAINT PAUL, MN 55155