



Public Water Supply Systems 2017 Year in Review

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Executive Summary

Nearly 80 percent of Minnesotans receive their drinking water from public water supply systems while the others use private wells. The Minnesota Department of Health (MDH) assists nearly 7,000 public water supply systems by providing or overseeing water monitoring and assessment services, helping systems find and correct problems. MDH also helps systems plan for protection of the lakes, rivers, watersheds and underground aquifers from which we get our water. MDH has authority for these activities under the U. S. Environmental Protection Agency's Safe Drinking Water Act, and Minnesota statutes and rules.

Funding for these activities is provided by the Environmental Protection Agency, Minnesota's Safe Drinking Water (service connection) fee, and the Clean Water Fund, which was created by the 2008 Clean Water Land and Legacy constitutional amendment. In recent years these funding sources have been stretched thin due to flat federal funding and an outdated Safe Drinking Water fee. The funding constraints now threaten Minnesota's vital, proactive strategy that has ensured accurate monitoring, specialized engineering assistance and a statewide focus on prevention that has helped local systems remain in compliance with the Safe Drinking Water Act.

Overall, the safety of Minnesota's public water supply is very high. In 2017, more than 99 percent of Minnesotans drinking water from a community public supply received water that met all federal standards throughout the entire year. There are challenges, though, particularly for systems that serve fewer than 3,300 people. Eighty percent of the federal drinking water standards violations were for systems that serve 3,300 people or fewer.

"Noncommunity" public water supply systems are systems that serve people where they work, play or go to school. These systems had a somewhat lower level of compliance with the Safe Drinking Water Act standards compared to community public water systems, with 96.8 percent of noncommunity systems providing water throughout the year that met all federal standards. Systems with water quality problems remain an area of focus for assistance, particularly for compliance with the revised Total Coliform Rule.

Public water systems that use groundwater as a source of drinking water are required to protect their sources. Of the state's 925 community systems that use groundwater as their source, 532 have prepared and are implementing plans. These 532 systems serve 88 percent of Minnesotans who rely on public water supplies. We are just beginning to address source water protection for systems that rely on surface water from lakes or rivers. Funding was provided by the Minnesota Legislature in 2017 to begin assisting surface water systems to prepare protection plans.

EPA estimates that Minnesota must invest approximately \$7.5 billion over the next 20 years to upgrade community public drinking water systems to comply with the Safe Drinking Water Act. Through the Drinking Water Revolving Fund, a total of \$41.6 million in loans and grants was provided to municipal systems in 2017. While this is substantial, an average annual investment of \$370 million is needed over the next 20 years to meet the \$7.5 billion in drinking water infrastructure needs in Minnesota.

Program Overview

Minnesota currently has 6,737 public water supply systems. Of those systems, 968 are community systems—providing water to people in their homes or places of residence. Most of these community systems use groundwater from underground sources, tapped by wells, as their source of water. However, 24 of these systems (serving 43 cities), including the municipal systems that serve the state’s largest cities, use surface water drawn from lakes or rivers.

Of the state’s 968 community water systems, 731 are municipal systems, serving towns or cities. The rest of the community systems provide water to people in a variety of residential locations, including manufactured home parks, apartment buildings, housing subdivisions, colleges, hospitals, and correctional facilities.

Minnesota also has 5,769 public water supply systems that are “noncommunity” systems. Some of these noncommunity systems provide water to an ever-changing “transient” population at places such as restaurants, resorts, and highway rest stops. Other noncommunity systems may provide water to relatively stable population groups in nonresidential locations, such as schools, places of employment, and day-care facilities.

The Minnesota Department of Health (MDH) provides a variety of services and regulatory oversight for public water supply systems. Three basic strategies are used to safeguard the quality of our drinking water:

- **Prevention.** Preventing contamination of the source water used by public water supply systems—lakes, rivers, and water wells—is an important component of drinking water protection. This aspect of drinking water protection includes measures such as regulating land use, regulating the construction of water treatment facilities, and controlling potential sources of pollution.
- **Treatment.** Most community water supply systems use some form of treatment, so the water will be palatable and safe to drink. Many systems require routine disinfection as a safeguard against potential problems with bacteriological contamination. Groundwater systems are less likely to require disinfection, because wells that are properly constructed and are located in a non-vulnerable aquifer are less susceptible to surface contamination.
- **Monitoring.** Monitoring is the critical element of compliance activities under the Safe Drinking Water Act (SDWA). The SDWA requires public water supply systems to sample the drinking water they provide on a regular basis, submit the samples to a certified laboratory for analysis, and provide the results to MDH. To lessen the burden on water supply operators and to ensure timely review, most of the required samples are collected by field staff from MDH. The samples are tested for a broad range of potential contaminants. If unacceptable levels of contaminants are found, the water supply owner or operator is legally responsible for informing the people who use the water and for taking steps to eliminate potential health hazards.

Minnesota’s public water supply operators have one of the best records in the nation regarding compliance with these requirements.

Compliance with the Safe Drinking Water Act

Detections of contaminants in public water supplies at levels above the Safe Drinking Water Act standards called Maximum Contaminant Levels (MCLs) must be reported to the public, and public water supply systems must take steps to provide water with contaminant levels below the MCLs. The number and type of violations of the Safe Drinking Water Act MCLs are listed below. All community public water supply systems (CPWS) are also required to provide their consumers with an annual Consumer Confidence Report (CCR) that describes compliance with the Safe Drinking Water Act. Noncommunity public water supply systems (NCPWS) are not required to provide a CCR but are required to notify consumers if contaminants pose a health risk.

In total, 71 community public water supply systems had one violation each in 2017; three had two.

Contaminants	Number of MCL Violations of CPWS tested	Percent of systems in compliance with MCLs all year	Status	Number of MCL Violations of NCPWS tested	Percent of systems in compliance with MCLs all year	Status
Pesticides and Industrial Contaminants	0 of 968	100	No violations	1 of 486 nontransient noncommunity systems	99.9	No violations
Bacteriological	22 of 968	97.7	Disinfected system, fixed source of bacteria, retested, no further violations	187 of 5,769 noncommunity systems (transient and nontransient)	96.8	Disinfected system, fixed source of bacteria, retested, repeat if still a problem
Nitrate/Nitrite	1 of 968	99.9	Notified consumers, discontinued use of well to resolve violation	7 of 5,769 noncommunity systems (transient and nontransient)	99.9	Notified consumers, provided bottled water, working to resolve
Arsenic	7 of 968		Notified consumers, working on treatment options	3 of 486 nontransient systems	99.4	Notified consumers, working on treatment options
Radium 226 & 228	9 of 731 municipal	98.8	Notified consumers, working on treatment options	Not regulated		---
Gross alpha emitters	2 of 731 municipal	99.7	Notified consumers, working on treatment options	Not regulated		---
Inorganic chemicals	0 of 961	100	No violations	0 of 486 nontransient systems	100	No violations
Disinfection byproducts	0 of 961	100	No violations, all resolved issue	0 of 486 nontransient systems	100	No violations

Contaminants	Number of MCL Violations of CPWS tested	Percent of systems in compliance with MCLs all year	Status	Number of MCL Violations of NCPWS tested	Percent of systems in compliance with MCLs all year	Status
Lead	6 of 968		Working to resolve, public education program	4 of 486 nontransient systems	99.2	Working to resolve, public education program
Copper	23 of 968		Working to resolve, public education program	10 of 486 nontransient systems	97.9	Working to resolve, public education program
Total number of systems with one or more violations	74 of 968					

Compliance with Source Water Protection

In Minnesota, 925 community public water supply systems use groundwater as a drinking water source, and are required to prepare and implement plans for protection of their groundwater sources. Of these systems, 532 have prepared plans or have plans in development to date. Eighty-eight (88) percent of the 2.5 million people served by systems that use groundwater are served by systems that have “wellhead protection plans.”

Twenty-four (24) community systems that serve 43 cities use surface waters such as rivers and lakes as their source, serving roughly 1.5 million people. The 2017 Minnesota Legislature approved funding to begin work with systems using surface water sources to develop source water protection plans. This is a voluntary program, and three systems that use the Mississippi River have prepared and are updating plans (Minneapolis, St. Paul, and St. Cloud).

Roughly 9,000 acres of the 1.2 million acres in Drinking Water Supply Management Areas (the land surface that drains to water supply wells) are in permanent protection.

Infrastructure Investment and Needs

Drinking Water Revolving Fund (DWRF)

The DWRF provides below-market-rate loans to public water systems for capital improvements needed to achieve or maintain compliance with the federal Safe Drinking Water Act.

Key statistics:

- Since 1998 Minnesota has funded 546 projects totaling approximately \$872 million.
- In fiscal year 2017,
 - \$41.6 million funded 21 projects, with \$841,000 in principal forgiveness.
 - These 21 projects consisted of one treatment plant and one new well designed to bring the water systems back into compliance with drinking water standards, one treatment plant upgrade, four treatment plants for iron and manganese removal, four storage projects, two replacement wells, seven watermain replacement projects and one project to replace water meters.
- The EPA assessment determined that the 20-year drinking water infrastructure need for Minnesota is more than \$7.5 billion, including:
 - Water transmission and distribution - \$4,416,000,000
 - Water Treatment: \$1,398,700,000
 - Storage: \$912,300,000
 - Source: \$582,900,000
 - Other (generators, pumps, meters, etc.): \$198,400,000

Program Resources

Activity	Budget	Percent of total
Public Water System Service Connection Fee	\$8,480,000	49.5
EPA Public Water Supply Supervision Grant	\$2,509,000	14.6
EPA Drinking Water Revolving Fund (DWRF) Public Water Supply Supervision Set-aside	\$1,582,000	9.2
EPA DWRF Source Water Protection Set-aside	\$1,582,000	9.2
DWRF Support – Administrative	\$633,080	3.8
EPA DWRF Technical Assistance Set-aside	\$316,540	1.9
Clean Water Fund Source Water Protection Planning and Grants	\$1,900,000	11.1
Clean Water Fund Groundwater Restoration and Protection Strategies	\$125,000	0.7
Total	\$17,127,620	100

2017 Challenges and Highlights

Challenges

The list of issues swirling around public water systems in 2017 and 2018 is daunting: public attention and concerns over the safety of public drinking water; EPA rule revisions and review; challenges with unregulated contaminants, including perfluoroalkyl substances, cyanotoxins, and *Legionella*; and infrastructure investment needs. Small systems that have challenges providing water that meets federal standards often have per capita costs significantly higher than large systems where economies of scale can result in lower costs. This results in inequities in costs for safe drinking water across the state. Perhaps at no time since the early days of the Safe Drinking Water Act have there been so many issues in play, and many go beyond our primary responsibilities under the Safe Drinking Water Act.

At the same time as demands for technical assistance and monitoring for unregulated contaminants are increasing, the funding mechanisms used to support these activities have failed to keep pace. If current trends continue, the MDH Drinking Water Program will not be able to continue to proactively monitor water quality, provide timely and specialized engineering support and prevent violations of the Safe Drinking Water Act. Instead, assistance efforts will need to be scaled down and a greater share of staff time will be spent following up on monitoring violations, with less time to prevent or address contamination.

Issues of Note for 2017

Lead remains a significant focus as expectations for protecting people from exposure to lead in drinking water continue to increase. MDH staff worked with public water supply systems to meet monitoring requirements, provide effective corrosion control to prevent dissolving of lead into drinking water, and provide information to the public when lead was detected. The Minnesota Legislature passed legislation in 2017 that requires public schools to have a plan for testing and reducing exposures to lead in drinking water, starting in July 2018.

Perfluoroalkyl substances contaminate a number of groundwater supplies in Minnesota, particularly in the area east of St. Paul. Recent changes in understanding of health risks from exposure to these chemicals resulted in a number of systems voluntarily taking action to protect consumers from exposure to these chemicals, such as installing more effective drinking water treatment systems, blending water from different sources, and taking contaminated wells out of use.

The development of more sensitive laboratory equipment has led to greater ability to detect contaminants at low levels in drinking water, and periodic surveys or investigations have found contaminants that are not regulated under the Safe Drinking Water Act in some communities. Communities where these contaminants have been found have responded with treatment or other means of managing the health risk, although that also stretches resources for dealing with regulated contaminants. Funding and communication about these issues, especially on health risks, is challenging.

2017 Highlights

- In 2017, the source water protection efforts of MDH received a boost in the form of an increased appropriation from the Clean Water Fund. The purpose of the additional funding is to enhance the program framework as well as the resources available to provide technical and financial assistance to surface water-based public water systems for their source water protection activities. Prior to this support from the Clean Water Fund, the bulk of the source water protection work in Minnesota has been directed towards groundwater systems. While only 24 of the 968 community public water systems draw directly from a surface water resource for drinking water supply, those 24 systems serve more than one million residents.
- The Community Public Water Supply (CPWS) Unit has been actively working with CPWS systems to manage water quality issues and contaminants not regulated under the SDWA. Assistance includes evaluating needs and options for treatment and communications and providing information about health risks.
- Recent changes in rules for monitoring for total coliform bacteria resulted in MDH staff doing a significant amount of additional work with noncommunity public water systems where coliform bacteria are detected to "find and fix" problems that may be causing contamination. These efforts provide additional public health protection for consumers. In addition, the revisions also changed requirements for systems that operate seasonally as they start up in the spring. All seasonal systems were successful in meeting the requirements.
- Opportunities to meet with the public about drinking water protection included the Governor's 2017 Water Summit, Town Hall meetings for the 25 Percent by 2025 Initiative, *We Are Water* exhibit in cooperation with the Minnesota Humanities Center and the Smithsonian Institution, the State Fair EcoExperience, and the H2O for Life poster contest.
- Public drinking water reports of note for 2017:
 - A multi-agency project with input from the University of Minnesota and stakeholders provides recommendations for advancing water reuse in Minnesota. Find the report at our website at http://www.health.state.mn.us/divs/eh/water/dwp_cwl/reuse/index.html
 - A report on the results of sampling of 108 public water supply wells for a number of pesticides and degradates was posted on the World Wide Web in January 2017 at: <http://www.mda.state.mn.us/~media/Files/chemicals/maace/2015reconpestiwells.pdf>

Conclusion

Minnesota public water supply systems continue to provide drinking water that meets federal drinking water standards of the SDWA at virtually all times. When there are contamination events, the public is notified to help them avoid risks to their health. This remains a top priority for MDH and for public water suppliers. Dealing with drinking water contaminants that aren't regulated as part of the Safe Drinking Water Act is a challenge faced by more and more public water supply systems. Communicating about risk and financing solutions to contamination are part of that challenge.

The EPA infrastructure needs assessment and demand for infrastructure loans demonstrate ongoing need for investment in drinking water treatment plants and distribution systems. These are critical infrastructure, as a safe drinking water supply is fundamental to healthy and prosperous citizens, communities, and businesses. Disparities in residents' costs for treatment systems is an increasing concern, especially in some of greater Minnesota's smaller towns, as rates for drinking water can be more than twice as high in some communities.

Efforts to protect sources of drinking water continue to move forward, although relatively few acres of land are protected via established source water protection measures across Minnesota.

Appendix

The summary includes results for both community and noncommunity public water systems in Minnesota in 2017. Public water supply systems include all systems that serve 25 or more people on a regular basis, or that have 15 or more service connections. There are 6,737 such systems in Minnesota, including:

- 968 community systems, which provide water to consumers in their places of residence, including 731 municipal systems.
- 5,769 noncommunity systems, which provide drinking water in settings like factories, schools, restaurants, and highway rest stops.

A report that lists all violations of the Safe Drinking Water Act in Minnesota for calendar year 2017 is available from the Drinking Water Protection Section, Minnesota Department of Health, Box 64975, St. Paul, MN 55164-0975, 651-201-4700, health.drinkingwater@state.mn.us.

Individual water systems produce an annual report listing contaminants that were detected, even in trace amounts, during the previous calendar year. Please contact the individual water system if you would like a copy of this report.

Partners

We acknowledge the many citizens, professionals, organizations, and agencies that work to protect and restore our water resources and provide safe drinking water to Minnesota citizens. Some areas in Minnesota have aquifers so pristine that at this time they require no treatment to provide safe drinking water. However, our ground and surface waters can be contaminated both by natural processes and by our human activities, and demand for water keeps increasing across Minnesota. It is because of the work of these people as individuals and as members of businesses, organizations, and government agencies that anywhere in Minnesota, citizens can feel confident that the drinking water provided by public water supplies meets all federal drinking water standards.

Our thanks to:

Minnesota Rural Water Association
American Water Works Association and its Minnesota Section
Local government staff including counties, townships, and municipalities
Nonmunicipal public water system staff and operators
Landowners
Business and industry owners
Food, beverage, and lodging facilities owners and staff
Manufactured housing development operators
Schools and churches
Treatment and correctional Facilities
Board of Water and Soil Resources
Minnesota Pollution Control Agency
Minnesota Department of Natural Resources
Minnesota Department of Agriculture

Metropolitan Council
Environmental Quality Board
Clean Water Council
Public Facilities Authority
Elkay
H2O for Life
U. S. and Minnesota Geological Survey
Minnesota Ground Water Association
Minnesota Water Well Association
Suburban Utility Superintendents Association
Water Resource Programs at Vermilion Community College, St. Cloud Technical and Community College, and the University of Minnesota
Association of State Drinking Water Administrators
U. S. Environmental Protection Agency
Safe Drinking Water Is Everyone's Job