



# **Minnesota Drinking Water Annual Report for 2023**

**STATUS OF PUBLIC DRINKING WATER SYSTEMS AND  
STRATEGIC INITIATIVES**

**May 2024**

## **Minnesota Drinking Water Annual Report for 2023**

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## Executive Summary

Maintaining an adequate supply of safe drinking water requires attention, investment, and responses to new and ongoing challenges. Sustainable water resources are critical to personal and public health as well as our economy. Protecting water sources, treating water, and testing water after it is treated are part of the multi-barrier approach to assuring an adequate supply of water that is safe to drink.

Communication is also a critical component in this process. Each year since 1995, the Minnesota Department of Health (MDH) has provided citizens and the United States Environmental Protection Agency (EPA) with a report on the status of public drinking water in Minnesota. This report provides both an assessment of how well public water systems are doing at meeting the standards set in the federal Safe Drinking Water Act and insights about current challenges faced by public water suppliers. In addition, community water systems issue reports (called Consumer Confidence Reports) to their residents each year.

The 2023 monitoring results summarized in this report demonstrate the success of Minnesota's efforts to protect its drinking water. Nearly 98 percent of Minnesotans drinking water from a community public water system received water that met all federal health-based standards throughout the year.

The monitoring results information in this report includes only contaminants that were regulated in 2023. It does not include per- and polyfluoroalkyl (PFAS), for which a new regulation was released in April 2024. Affected water systems in Minnesota have been installing treatment and pursuing other remedies, and the Minnesota Department of Health is well-positioned to continue tackling this issue after more than 20 years of attention and assistance to public water suppliers. More information on PFAS is in the Strategic Initiatives section on page 12.

MDH also supports private well users on topics including water quality and testing, well construction and sealing, and laws and regulations. While not addressed in the scope of this report, more information on private wells can be found on the MDH webpage, [Wells and Borings \(https://www.health.state.mn.us/communities/environment/water/wells/index.html\)](https://www.health.state.mn.us/communities/environment/water/wells/index.html).

Protecting and supplying safe water depends on many organizations and individuals. While MDH administers and enforces the provisions of the federal Safe Drinking Water Act on behalf of the EPA, we rely on our partners including the state's 6,616 public water systems, as well as others in areas ranging from government to industry to non-profit organizations who take an active role and contribute to this quest.

These partners include everyone, including individual Minnesotans. Everyone plays a part in ensuring safe water. As always, our aim with this report is to provide Minnesotans with a clearer picture of what is done to protect the quality of their drinking water and the success of the efforts to do so.



## 50 Years of the Federal Safe Drinking Water Act

December 16, 2024, marks the 50<sup>th</sup> anniversary of the federal Safe Drinking Water Act (SDWA) being signed into law by President Gerald Ford.

The landmark legislation marked the first time a national program of regulations and standards was established to include all public water supplies in the United States.

The Act directed the U. S. Environmental Protection Agency (EPA) to develop health-based standards for a number of contaminants—both naturally occurring and those that result from human and animal activity—that may be found in drinking water supplies. The Act affects all water systems that serve water to the public (in general, to more than 25 people on a regular basis) in the United States in addition to all U. S. territories and commonwealths as well as tribal reservations. It does not apply to private wells or bottled water.

Minnesota already had strong regulations in place to protect drinking water, including rules requiring submission and approval of plans for public water supplies, a state plumbing code and prohibitions of cross connections between potable and non-potable water supplies, training and licensing of water operators, and annual inspections of public water supplies in the state. SDWA extended these safeguards and more across the country.

Walter Mondale, a member of Congress in 1974, said the Act “helped get people’s attention, and a lot more progress was made as a result.

“Water and air don’t respect state boundaries. Minnesota was probably the best in the country, but many states were not doing a good job. Americans could be sure of safe drinking water, and the ‘74 Act that we passed was designed to use the power of the federal government to provide leadership and funding to help states do the job.”

Former Minnesota governor Al Quie, also in Congress at the time, said, “Water travels across state lines, and to leave it to each state, then how horrible it would be if Minnesota, for instance, would not have pure water . . . That’s our responsibility as citizens of this nation.”

Mondale and Quie made these comments for a video produced by MDH in 2014 for the SDWA 40<sup>th</sup> anniversary. The video was updated for the 50<sup>th</sup> anniversary and is available on-line:

[Safe Drinking Water Act 50<sup>th</sup> Anniversary \(YouTube\)](#).

## A Current Profile of Minnesota’s Drinking Water Protection Program

MDH began as the Minnesota State Board of Health in 1872, largely because of waterborne and foodborne diseases. Typhoid fever, a waterborne disease, was taking a significant toll on lives at this time.

Advances in protecting water were rapid; the results were dramatic. By the early 1900s, treatment and disinfection of drinking water resulted in the virtual elimination of waterborne diseases such as cholera, typhoid, dysentery, and hepatitis A.

More than a century later the importance of safe and sufficient water remains as strong as ever, and the challenges toward achieving this goal emerge in new and different manners.

The passage of the federal Safe Drinking Water Act in 1974 established a national program of regulations and standards covering all public water systems in the United States.

Since 1974, the EPA has been responsible for regulating the nation’s public water supply systems, under the federal Safe Drinking Water Act. However, almost all states, including Minnesota, have assumed responsibility for enforcing the act within their own borders. Minnesota became one of the first states to achieve primacy, and to begin regulating public water supply systems at the state level, in 1976.

The definition of “public water system” in the Safe Drinking Water Act is broad. To be considered “public,” a water supply system must have its own water source and provide water to 25 or more people or have 15 or more service connections.

Minnesota currently has 6,616 public water systems. Of those systems, 965 are community systems, which provide 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, 42 of these systems, including the municipal systems that serve the state’s largest cities, use surface water drawn from lakes or rivers.

Of the state’s 965 community water systems, 730 are municipal systems, serving towns or cities. The rest of the community systems provide water to people in various residential locations, including manufactured home parks, apartment buildings, housing subdivisions, and correctional facilities.

The rest of the state’s 5,651 public water systems 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. These facilities are considered nontransient noncommunity public water systems.

## The Major Elements of Drinking Water Protection

Three basic strategies are used to safeguard the quality of our drinking water: prevention, treatment, and monitoring.

### 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 managing land use, regulating the construction of water treatment facilities, and controlling potential sources of pollution.

Engineers review plans for all aspects of public water supply – wells and intakes, treatment and storage facilities, and distribution systems – to ensure compliance. All water operators in Minnesota must be licensed, and MDH is heavily involved in training water operators to allow them to keep their certification.

### Source Water Protection

Source Water Protection plans identify the land area that supplies water, assess the vulnerability of that area to contamination, and identify actions to reduce the risk of threats. MDH requires source water protection planning for all community and noncommunity water systems that use groundwater. The Source Water Protection Program has long been engaged in planning for community water systems using groundwater.

MDH is expanding the source water program to provide more support to systems that use surface water. Planning for systems that use surface water is voluntary. MDH and community water systems (CWSs) have completed several Source Water Assessments and Surface Water Intake Protection plans. Progress is accelerating, as several communities are currently preparing these plans with MDH and outside contractors.

### Assessing Vulnerability to Contamination

Source water protection activities and monitoring requirements for individual public water systems depend partly on how vulnerable the system is to contamination. MDH does vulnerability assessments of water supply systems, considering a number of factors. For groundwater systems, these include well construction, geologic setting, water quality, and well use. High vulnerability conditions lead to more aggressive sampling, monitoring, inspection, and other actions than low vulnerability conditions require.

In general, groundwater systems tend to be less vulnerable to certain types of contamination than surface water systems. Water tends to be naturally filtered as it moves downward through the earth, making its way from the surface to the underground aquifers tapped by water wells. That process can remove certain surface contaminants, including bacteria and parasites such as *Cryptosporidium*. For that reason, many groundwater systems do not routinely include disinfection as part of their normal water treatment procedures.

## Treatment

Most community water systems use some form of treatment so the water will be palatable and safe to drink. Many systems require routine disinfection to safeguard against potential problems with bacteriological contamination. Groundwater systems are less likely to require disinfection, because properly constructed wells located in a non-vulnerable aquifer are less susceptible to surface contamination. Surface water systems must provide more extensive treatment, including filtration and disinfection, as surface water supplies can be more susceptible to contamination.

MDH reviews plans for proposed treatment systems to help ensure that they function as intended. MDH staff also provide field and technical assistance – as well as training opportunities – to public water system operators which aids in the ongoing operation and maintenance of treatment and other water system components.

## Monitoring

Monitoring is a critical element of compliance activities under the SDWA. Under provisions of the Act, public water systems are required to sample treated water regularly and submit the samples for analysis to the MDH lab or other MDH-accredited labs. 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.

Under the provisions of the SDWA, the individual public water system is responsible for taking water samples and submitting them to certified laboratories for analysis. To provide for comprehensive surveillance, lessen the burden on water supply operators, promote compliance, and help ensure consistent approaches, most of the required samples in Minnesota are collected by field staff from MDH. As a result, Minnesota's public water systems have one of the best records in the nation regarding compliance with these sampling and testing requirements.

The next sections of this report provide detail on what is monitored at public water systems in Minnesota and the results of this statewide monitoring in 2023.

## Monitoring: What We Test For – and Why

Minnesota's public water systems are tested for different types of contaminants. The reasons for testing – and how often the testing is done – depend on contaminant type and other factors. The type of contaminant also determines what actions will be taken if unacceptable levels are found in the water.

The major types of contaminants we test for include:

**Pesticides and Industrial Contaminants.** Minnesota’s water supply systems are routinely tested for more than 100 pesticides and industrial contaminants, including synthetic organic compounds (SOCs) and volatile organic compounds (VOCs). Systems may be tested anywhere from four times a year to once every six years, depending on the specific chemical and the system’s vulnerability to contamination (see **Assessing Vulnerability to Contamination** above). Some systems may not need to do any testing for a particular contaminant. A formal use waiver is sometimes granted, specifically exempting a water supply system from testing for a particular contaminant, if that chemical or pesticide is not used in the immediate area.

The EPA has developed legal standards known as maximum contaminant levels (MCLs) for 60 of the more common pesticides and industrial contaminants found in drinking water. In addition, advisory standards have been developed for the other pesticides and industrial contaminants, and those are used in a similar way as the MCLs in assessing test results.

Any time a public water system exceeds the MCL for one of these contaminants, the water supply operator, with the assistance of MDH, must notify the people who use the water. Appropriate steps are then taken to reduce or eliminate the contamination.

In some cases, the MCL or advisory standard is calculated to prevent immediate or short-term health effects. However, these standards are often designed to reduce the long-term risk of developing cancer or other chronic health conditions. They are calculated very conservatively. If the concern is long-term health effects, the standards are calculated to keep the risk of illness at levels most people would regard as negligible – even if they drink the water every day, over an entire 70-year lifetime.

**Bacterial Contamination.** Public water systems serving more than 1,000 people are tested one or more times per month for coliform bacteria. Smaller systems are tested four times a year or annually under certain conditions. The coliform test is used as a general indicator of water quality in the system, regarding potential microbial contamination. If the coliform test is negative, it is an indication that the system is adequately protected against contamination from other types of disease-causing organisms. However, if coliform bacteria are found in the water, it is assumed that the system may be compromised, and steps are taken to protect the people who use the water.

Total coliform bacteria (without the detection of *E. coli*) are generally not harmful. In these cases, the system will identify the source of the contamination, correct the problem, and thoroughly disinfect its system. The public will also be notified of the situation; however, unless unusual circumstances exist to cause particular concern about the safety of the water, a boil water notice would not be issued as it would be if *E. coli* were found.

**Nitrate/Nitrite.** All public water systems in Minnesota are tested at least once a year for nitrate. This chemical may occur naturally in the environment but that can also enter the water from fertilizer run-off, decaying plant and animal wastes, and sewage. Nitrate is a health concern primarily for infants under the age of six months. This is because the infant’s digestive system can convert the nitrate to nitrite, which can interfere with the ability of the infant’s blood to carry oxygen. The result is a serious illness known as methemoglobinemia, or “blue

baby syndrome.” Methemoglobinemia can be fatal if nitrate levels in the water are high enough and the illness isn’t treated properly.

The MCL for nitrate in drinking water is 10 parts per million (ppm). If a public water system exceeds the standard, the people who use the water are notified and advised not to use the water for mixing infant formula or other uses that might result in the consumption of the water by infants under six months of age. The advisory is kept in place until steps can be taken to reduce nitrate levels in the water. Possible remedial measures include treating the water to remove the nitrate or drilling a new water well.

Older children and adults are generally not at risk from drinking nitrate-contaminated water. In fact, the average adult consumes about 20-25 milligrams of nitrate per day in food, primarily from vegetables. Because of changes that occur after six months of age, the digestive tract no longer converts nitrate into nitrite. However, some adults – including people with low stomach acidity and people with certain blood disorders – may still be at risk for nitrate-induced methemoglobinemia.

**Inorganic Chemicals.** Community and nontransient noncommunity water systems in Minnesota are tested for 13 other inorganic chemicals in addition to nitrate. If past results don’t indicate the presence of inorganic chemicals, testing is usually done once every nine years; otherwise it may be done as often as once a year. The list includes antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, sulfate, and thallium. In some cases, these chemicals may be naturally present in the groundwater. If a water supply system were to exceed the MCL for one of these chemicals, the people who use the water would be notified, and appropriate steps would be taken to reduce levels of these chemicals in the water.

**Radioactive Elements.** Community water systems in Minnesota are also usually tested once every three years – or as often as once a year or even quarterly in some cases – for a list of radioactive elements. These radioactive elements, or radiochemicals, are present in the water from natural sources. If a system were to exceed the federal MCL for one of these radioactive elements, the people who use the water would be notified and steps would be taken to correct the problem.

**Disinfection By-products.** Disinfection rids drinking water of microbiological organisms, such as bacteria, viruses, and protozoa, that can cause and spread diseases. The most common disinfection method is the addition of chlorine to drinking water supplies. Chlorine is effective against waterborne bacteria and viruses in the source water; it also provides residual protection to inhibit microbial growth after the treated water enters the distribution system. This means it continues working to keep the water safe as it travels from the treatment plant to the consumer’s tap.

However, even though chlorine has been a lifesaver regarding drinking water, it also has the potential to form by-products that are known to produce harmful health effects. For example, chlorine can combine with organic materials in the raw water to create contaminants called trihalomethanes (THMs) and haloacetic acids (HAAs). Repeated exposure to elevated levels of these contaminants over a long period could increase a person’s risk of cancer.

The formation of disinfection by-products is a greater concern for water systems that contain organics or use surface water, such as rivers, lakes, and streams, as their source. Surface water sources are more likely to contain the organic materials that combine with chlorine to form THMs and HAAs.

All community and nontransient noncommunity water systems that add a disinfectant to the water must regularly test their treated water to determine if THMs and HAAs are present. If the THMs or HAAs exceed the limits set by the EPA, the water system must take action to correct the problem and must notify all residents served by the water system.

**Lead and Copper.** All community and nontransient public water systems are tested for lead and copper. In community water systems, the water is tested in a number of homes within each system to determine if it exceeded the federal “action level” of 15 parts per billion (ppb) for lead or 1,300 ppb for copper. If a system exceeds the action level for lead or copper in more than 10 percent of the locations tested, it is required to take corrective action and do further testing. Testing requirements – the number of samples taken and the testing frequency – are based on population, historical results, and if any changes in the source of the water or treatment have occurred.

Lead in drinking water is not an environmental contamination problem in the conventional sense. Water is almost never contaminated with lead at the source or when it first enters the distribution system. However, water can absorb lead from plumbing components used in individual homes. Possible sources of lead contamination include lead pipe, lead plumbing solder, and brass fixtures. Lead exposure is a potentially serious health concern, especially for young children. However, the water must usually be in contact with lead plumbing components for an extended period, usually by standing in the system overnight before it can absorb potentially hazardous levels of lead.

While most people are subject to lead exposure from a number of possible sources – and drinking water typically accounts for a relatively small proportion of a person’s total lead exposure – it is still a source of lead exposure to control and eliminate. Some Minnesota water supply systems address the issue by treating their water before it reaches a person’s home, making it less likely to absorb lead from plumbing. Removing lead sources, such as lead service lines, is also a meaningful way to reduce lead exposure. Accelerating efforts to remove lead service lines is discussed later in this report.

## Monitoring Results for Calendar Year 2023

This section provides a summary of results of monitoring performed in 2023. In the case of a violation, a water system must take corrective actions. These actions include public notification to inform affected residents of the situation and if there are any special precautions they should take. In all cases noted here, residents were advised directly by the water system at the time the violation occurred. All community water systems also communicate any violations in annual water quality reports (also called [Consumer Confidence Reports](https://www.health.state.mn.us/communities/environment/water/com/ccr.html) (<https://www.health.state.mn.us/communities/environment/water/com/ccr.html>)) each year.

### 2023 Monitoring Results for Community Public Water Systems (CPWS) and Noncommunity Public Water Systems (NPWS)

Contaminants	Number of CPWS subject to monitoring	Number of CPWS with violations or ALE <sup>1</sup> s	Population served by CPWS with violations or ALEs	Percent of CPWS meeting EPA standards	Number of NPWS monitored <sup>2</sup>	Number of NPWS with violations or ALEs	Population served by NPWS with violations or ALEs	Percent of NPWS meeting EPA standards
Pesticides and Industrial Contaminants	965	0	0	100.0%	473	0	0	100.0%
Bacteriological	965	0	0	100.0%	5,651	12	634	99.8%
Nitrate/Nitrite	965	2	1462	99.8%	5,651	9	615	99.8%
Arsenic	965	6	711	99.4%	473	2	185	99.6%
Radionuclides	965	14	71,664	98.5%	N/A	N/A	N/A	N/A
Other Inorganic Chemicals	965	0	0	100.0%	473	0	0	100.0%
Disinfection byproducts <sup>3</sup>	731	2	3,738	99.7%	47	0	0	100.0%
Lead	965	10	369,996	99.0%	473	6	470	98.7%
Copper	965	28	80,957	97.1%	473	8	3,913	98.3%

### Pesticides and Industrial Contaminants

In 2023, MDH conducted 22,494 tests for pesticides and industrial contaminants at its 965 community water systems. No systems violated drinking water standards for these contaminants.

<sup>1</sup> Action Level Exceedance (ALE)

<sup>2</sup> Some contaminants are tested at all 5,651 noncommunity water systems; others are tested only at the 473 nontransient noncommunity water systems.

<sup>3</sup> Disinfection byproducts are monitored only at systems that disinfect their water or purchase disinfected water.

MDH conducted 9,717 tests for pesticides and industrial contaminants in the 473 nontransient noncommunity water systems in the state. No systems violated drinking water standards for these contaminants.

## Bacteriological Contamination

No community water system exceeded the standard for bacteriological contamination in 2023. All noncommunity water systems – transient and nontransient – are monitored for bacteriological contamination. There were 12 violations among the 5,651 noncommunity systems. All systems with violations worked with MDH staff to identify and make any corrections needed, disinfect their systems, and retest the water.

## Nitrate/Nitrite

Two community systems exceeded the standard for nitrate in 2023. Nine noncommunity systems (transient and nontransient) exceeded the standard for nitrate in 2023. These systems notified the people who used the water, offering bottled water to those with infants, while working with MDH staff to remedy the problems through steps such as installing treatment or using a new water source. No systems exceeded the standard for nitrite in 2023.

Seventy-two community systems participated in an ongoing nitrate source water monitoring program in 2023. Their source water is sampled prior to any treatment and before the water is distributed to customers. Of these 72 systems, eight had raw, untreated water above the standard for nitrate. The information collected in the program is used to help systems reduce nitrate levels in their source water.

## Arsenic

Six community water systems and two noncommunity water systems exceeded the standard for arsenic by the end of 2023.

Although residents were notified of the situation, no restrictions were placed on water consumption. Residents were told that this was not an emergency and were advised to consult with their doctors if they had any special concerns. Each of these systems has begun the process to meet the maximum contaminant level, including evaluating treatment options and finding other water sources. Examples of actions systems may take include researching, starting, or completing approved infrastructure or operational changes.



## Other Inorganic Chemicals

No community or noncommunity water systems exceeded the standard for other inorganic chemicals in 2023.

## Radioactive Elements

Radiation occurs naturally in the ground, and some radioactive elements may work their way into drinking water. Fourteen community water systems exceeded the standard for radium 226 & 228 and/or gross alpha emitters by the end of 2023.

Residents were notified of the situation. Some systems had restrictions placed on water consumption. Residents were told that this was not an emergency situation and were advised to consult with their doctors if they had any special concerns. These systems have either started or completed infrastructure changes or are studying alternatives to meet the maximum contaminant level. In a number of cases, previously installed treatment is now reaching the end of its useful life and must be replaced to maintain reduction of radioactive elements.

Noncommunity water systems are not regulated for radioactive elements.

## Disinfection By-products

Two community water system and no noncommunity water systems exceeded the standard for disinfection by-products in 2023. The affected systems are working to reduce the concentrations of disinfection by-products.

## Lead and Copper

As a result of the Lead and Copper Rule, implemented by the EPA in 1991, community water systems began sampling for lead and copper in 1992. Monitoring for lead and copper is done in individual homes and on a case-by-case basis. Samples are taken under worst-case conditions, including taking them after the water has been idle in the pipes, which could result in higher levels. If more than 10 percent of the homes sampled in a community are above the action level

(15 parts per billion for lead and 1,300 ppb for copper), the water system will be in exceedance and must take corrective actions and begin an ongoing public education program. The actions include corrosion control measures, such as adjusting water chemistry to make it less corrosive or less likely to absorb lead and/or copper from the plumbing. Replacement of lead service lines – which connect water mains to household plumbing – is another means of reducing levels.

In 2023, ten community systems exceeded the lead action level, and 28 community systems exceeded the copper action level; six noncommunity systems exceeded the lead action level, and eight noncommunity systems exceeded the copper action level. These systems are exploring options for getting back into compliance and conducting a public education program. The Minnesota Department of Health continues to work with these systems and has been doing its own education campaign since the early 1990s with information about lead and copper and simple precautions, such as flushing faucets when the water hasn't been used for several hours, people can follow to reduce their exposure. All community water systems also issue an annual water quality report (Consumer Confidence Report), which has the results of testing done in the previous calendar year.

## Strategic Initiatives

Even as MDH works to address current issues with the state's public water systems, it also has an eye on future challenges. Summarized here are some of the [strategic initiatives](https://www.health.state.mn.us/communities/environment/water/initiatives.html) (<https://www.health.state.mn.us/communities/environment/water/initiatives.html>) pursued in 2023, and that will continue in years to come, to best position Minnesota to continue to have a safe, abundant supply of drinking water

## Contaminants of Emerging Concern

One way MDH ensures the safety of drinking water is by addressing risks from contaminants of emerging concern (CECs). CECs are contaminants that have been newly discovered in the environment or are generating increased interest because of new scientific information about health or environmental effects. CECs can be naturally occurring or human made. MDH has many monitoring, policy, and communications projects to address CECs in drinking water. For a list of current projects, see the [CEC Project Inventory \(PDF\)](https://www.health.state.mn.us/communities/environment/water/docs/factsheet/cecprojects.pdf) (<https://www.health.state.mn.us/communities/environment/water/docs/factsheet/cecprojects.pdf>).

## Drinking Water Ambient Monitoring Program

The Drinking Water Ambient Monitoring Program (DWAMP) aims to establish ongoing, permanent monitoring capacity for CECs and other priority contaminants in drinking water sources across the state. The goals of this program are to address concerns about public health exposure to CECs and support data-driven water resource management decisions by characterizing water quality conditions in drinking water sources. The first round of annual sampling for DWAMP will begin in spring 2024.

The primary components of this program include proactive, investigative monitoring of systems for emerging contaminants, follow-up monitoring for systems with past low-level CEC detections, watershed-scale characterization to identify vulnerable aquifers, and seasonal surface water investigations.

The Drinking Water Ambient Monitoring Program is supported by the Minnesota Clean Water Fund, which was established by the 2008 Clean Water, Land and Legacy Amendment.

### Per- and polyfluoroalkyl substances (PFAS)

PFAS are a family of human-made chemicals that have been widely used for decades. They are extremely stable and do not break down in the environment. PFAS are a concern because exposure has been linked to harmful health effects in people over time, such as increased risk for immune suppression, liver dysfunction, lower birth weight, and certain types of cancer.

In 2023, MDH completed an initiative to sample all community water systems in Minnesota for PFAS through the [Statewide PFAS Monitoring Project](https://www.health.state.mn.us/communities/environment/water/pfas.html)

(<https://www.health.state.mn.us/communities/environment/water/pfas.html>). This project aimed to evaluate whether Minnesotans are exposed to PFAS at levels above health-based guidance values in drinking water. MDH has made sampling results publicly available on the [Interactive PFAS Dashboard for Drinking Water](https://www.health.state.mn.us/communities/environment/water/pfasmap.html) (<https://www.health.state.mn.us/communities/environment/water/pfasmap.html>), which was released in 2022. Funding for the Statewide PFAS Monitoring Project has come from EPA and the Minnesota Clean Water Fund.



On April 9, 2024 the Environmental Protection Agency released final primary drinking water regulations for PFAS, including an enforceable limit for PFOS, PFOA, PFHxS, GenX, and PFNA as well as a Hazard Index to evaluate mixtures of PFAS. The Minnesota Department of Health welcomes the EPA action and sees the establishment of maximum contaminant levels as an important step in protecting public health. By working on this issue for many years, Minnesota is in a better position than most states.

With the EPA announcement, MDH issued a joint statement with the Minnesota Pollution Control Agency that read, in part, “Because Minnesota has been a national leader in this work for years, we know that addressing PFAS in Minnesota’s drinking water will require significant additional resources and collaboration among multiple partners. We will continue to work with our federal delegation, EPA and parties responsible for PFAS pollution, to secure the resources that communities need in order to access clean drinking water.”

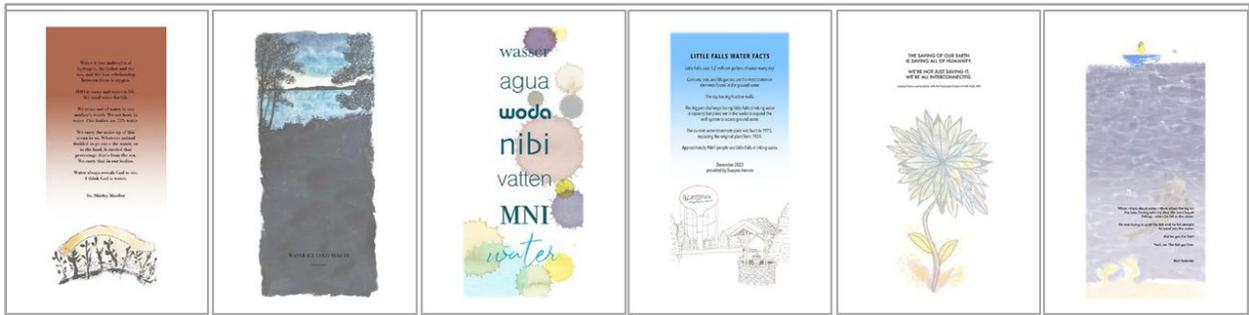
The majority of Minnesota community water systems have results below the MCLs. MDH staff are working with systems that have results reported above the MCLs on ways to reduce PFAS exposures through drinking water.

These resources may be found on the home page for the MDH [Drinking Water Protection Section](https://www.health.state.mn.us/communities/environment/water/dwp.html) (<https://www.health.state.mn.us/communities/environment/water/dwp.html>).

## SWP Collaborative Artist in Residence

The Source Water Protection Collaborative recently wrapped up the creative engagement pilot project, which commissioned artist Su Legatt to engage the residents of Little Falls on source water protection through artmaking and community events. Legatt is a Minnesota-based artist, educator, and community organizer. Through an artist-in-residence period from June to December 2023, Legatt held events and conversations with community leaders, educators, artists, and other residents to develop artwork that explored the community’s relationship to and understanding of its source water along with emphasizing how important groundwater is to the community at large. Little Falls residents engaged in paper-making activities and produced paintings and poetry that were combined to develop a series of broadsides that reflect community values, perspectives, and experiences around water. The final prints are at Great River Arts and on the [Su Legatt \(https://www.sulegatt.com/\)](https://www.sulegatt.com/) website, with proceeds going to [Friends of Crane Meadows \(Facebook\)](#) to expand their water protection efforts.

The [Source Water Protection Collaborative \(https://environmental-initiative.org/our-work/source-water-protection-collaborative/\)](https://environmental-initiative.org/our-work/source-water-protection-collaborative/) is Minnesota-based statewide partnership dedicated to promoting land use that safeguards drinking water sources, convened by Environmental Initiative, supported by Minnesota Department of Health, and made possible by Clean Water Fund. Below are samples of Su Legatt’s artwork:



## Lead and Copper

Since the publication of the EPA's Lead and Copper Rule Revisions in 2021, the Minnesota Department of Health has been preparing for the new rule requirements internally on a state implementation level as well as by working with systems to incorporate new practices that will align with the requirements of the revisions to meet implementation deadlines. In 2023, the EPA released the proposed Lead and Copper Rule Improvements to provide additional enhancements to the Lead and Copper Rule. The focus of the Lead and Copper Rule Improvements (LCRI) includes replacement of all lead service lines, faster response to action level exceedances, and more equitable protection of public health by prioritizing communities historically underserved communities.

The revisions require public water systems to identify and make public the locations of lead service lines by developing lead service line (LSL) inventories by October 16, 2024. The current LCR will be in effect until then. MDH has been working with the University of Minnesota on the [Minnesota Lead Inventory Tracking Tool \(https://maps.umn.edu/LSL/\)](https://maps.umn.edu/LSL/). The proposed rule will establish a lower action level of 10 parts per billion (ppb) instead of 15 ppb under the current rule. The rule requires systems to take steps to optimize their treatment and, for systems without corrosion control, to conduct a corrosion control study to identify the best treatment approach. MDH, which has seen few exceedances of the lead action level in recent years, has been reaching out to systems approaching 10 ppb to help prevent future exceedances. MDH will keep a close eye on the development and release of the LCRI and will work with Minnesota's water systems to help them meet requirements of the ever-changing regulatory landscape.

### Funding of Lead Service Line Replacement

MDH estimates that there are more than 100,000 lead service lines in the state. Typically, a city owns the portion of pipe that extends from the water main to the edge of private property. Traditionally, the property owner is responsible for the costs of the service line from that point into the home.

The federal Infrastructure Investment & Jobs Act (IIJA), also referred to as the Bipartisan Infrastructure Law, provides five years of infrastructure funding. This funding is delivered through Minnesota's Drinking Water Revolving Fund (DWRP), which is jointly administered by MDH and the Public Facilities Authority.

The IIJA provides federal dollars for lead service line replacement in Minnesota. To receive funding for lead service line replacements, water systems must apply to the DWRP. During the 2023 legislative session, the state provided an additional \$240 million to assist with the replacement of lead service lines. With the addition of state funds, replacement of the portion of the service line owned by the property owner is funded by a 100 percent grant to the water system. The portion of the service line owned by the water system is eligible for a combination of a grant and zero-percent loan, which would be paid off by state funds before the first loan payment is due.

More information about lead service lines and replacement is on-line:

[Lead Service Line Replacement Program Facts](https://www.health.state.mn.us/communities/environment/water/lslrprogram.html)

(<https://www.health.state.mn.us/communities/environment/water/lslrprogram.html>)

### Lead Testing in School and Child Care Settings

In 2017, state legislation was passed to require school districts and charter schools to test for lead in drinking water. MDH and the Minnesota Department of Education created a model plan that schools can use for testing for lead in their buildings. Additionally, MDH has a testing program for lead in drinking water to provide free sample kits and laboratory analysis to eligible schools and child-care providers. MDH provides education, outreach, and technical assistance to these facilities. Contractor services are available as an option to help schools and child cares with sample collection.

The 2023 legislative session resulted in updates to the lead in drinking water statute, including:

- Adding child-care centers to the requirement for testing for lead in drinking water;
- Setting a trigger level of 5 parts per billion for remediation;
- Creating a new process for facilities to report their lead in drinking water results to MDH on an annual basis;
- Posting results online for the public to access; and
- Creating a remediation grant for schools and child cares.

MDH is currently working with Minnesota’s schools and child cares, in collaboration with the Minnesota Department of Education and Minnesota Department of Human Services, to help ensure these requirements are met.

### Addressing Infrastructure Needs

Through the IJJA, the DWRF will receive supplemental program funding. There will be dedicated funding sources for inventory and replacement of lead service lines as well as management of emerging contaminants.

The chart below represents the associated funding amounts for the first of five years of funding.



## Climate Resiliency

Climate change is resulting in warmer temperatures and changing precipitation. This is causing changes in air quality, weather patterns, water quality and quantity, and ecosystems, which, in turn, are leading to more air pollution, extreme heat, floods, drought, and ecosystem threats. Heavy precipitation and flooding events can cause damage to infrastructure and increase the risk of drinking water contamination. Drought can also stress the water supply. These weather events create new problems and worsen existing ones for public water systems. Climate resiliency means being able to anticipate, prepare for, and respond to issues related to climate change.

MDH has a climate workgroup to advance climate resiliency for Minnesota's drinking water. The group has completed an analysis of public wells within a floodplain to identify public water systems at high risk during flooding events. The group continues to provide technical assistance for public water systems on extreme weather events and drinking water impacts. Staff from MDH's Drinking Water Protection (DWP) Section have partnered with the Minnesota Rural Water Association (MRWA), EPA, and others on training opportunities and continue to pursue opportunities to address the needs of public water systems and resource partners in making drinking water resilient to climate impacts.

Along with other state and local partners, MDH will help implement the state [Climate Action Framework \(https://climate.state.mn.us/minnesotas-climate-action-framework\)](https://climate.state.mn.us/minnesotas-climate-action-framework) to ensure the health, well-being, and resiliency of communities in the face of climate change.

MDH has a webpage about climate change and its impacts on water at [Water Changes \(https://www.health.state.mn.us/communities/environment/climate/water.html\)](https://www.health.state.mn.us/communities/environment/climate/water.html).

## Health Equity

Access to clean, affordable water is a human right. It is also a social determinant of health that, when unrealized, compounds environmental and economic disadvantages to weaken immunity and exacerbate health conditions. MDH, through its DWP Section, works to promote safe and sufficient drinking water distribution for everyone everywhere in Minnesota. DWP's strategic visioning approach to health equity focuses on funding, water infrastructure, and promising practices.

## Funding

The diversity in our state is expanding, and understanding Minnesota's history and demographic landscape is crucial to advancing equitable access to drinking water, especially for vulnerable communities. DWP has developed funding processes that help direct resources to communities with the greatest need. As a result, a number of small water systems serving low median household income populations that struggle with water quality violations are receiving funding to improve their drinking water.

## Source Water Protection Grants

One of the ways MDH provides support and assistance to small systems is through source water protection grants. These grants are awarded for activities that help protect and secure their

drinking water supply. While the grant awards are modest, they can make a significant difference for systems.

For example, the city of Pennock has a small public water system that supports fewer than 500 people and uses two municipal wells to supply drinking water to its customers. Locating and sealing wells were identified as priorities in Pennock's wellhead protection plan, the plan to protect the drinking water source.

Pennock, MDH, and MRWA staff dealt with a former municipal well located near City Hall, one that could be a risk for contaminants to directly enter the groundwater aquifer, creating a risk to the city's drinking water supply. The city used a Source Water Protection Implementation Grant to investigate the well site and followed up with the necessary well sealing preparation work. To finish the project, the city applied for both Implementation and Competitive grants, which ultimately led to the successful completion in April 2023. Without the opportunity provided by the Source Water Protection grants and collaborative work with MDH and MRWA, the city would likely not have been able to gather the support or resources necessary to eliminate the risk of contamination to its drinking water source.



Of the 139 Source Water Protection grant awards in 2023, 116 recipients received a health equity point in the application. St. Louis, Morrison, Stearns, and Crow Wing Counties had the highest number of grant awards with the health equity point.

### **Drinking Water Revolving Fund**

DWP also targets assistance to disadvantaged public water systems through the Drinking Water Revolving Fund (DWRF). DWP provides funding consisting of a combination of principal-forgiveness grants and below-market-rate loans to communities that otherwise lacked the resources to complete a needed project.

One of the success stories is the funding coordination for infrastructure improvements needed in the city of Danube to address ongoing violations for radium 226/228. Danube, with a population of 493, was one of the highest-ranked projects on the state's DWRF Project Priority

List (PPL), meeting the grant criteria of being underserved and small or disadvantaged. The city median household income (MHI) met Minnesota's affordability threshold for disadvantaged communities. The affordability criteria use the drinking water system's annual expenses and compares that total to the city's current MHI of \$53,906. The water system is considered disadvantaged if the yearly expenses exceed 1.2% of the MHI. By being on the DWRP PPL, the city was able to access funds from different funding programs for the \$4.4 million well and treatment plant project. The overall funding package consists of funding from an EPA Small, Underserved, Disadvantaged Community grant; a Community Development block grant from the Minnesota Department of Employment and Economic Development; a Water Infrastructure Fund (WIF) grant from the Minnesota Public Facilities Authority; and a combined U. S. Department of Agriculture Rural Development loan and grant.

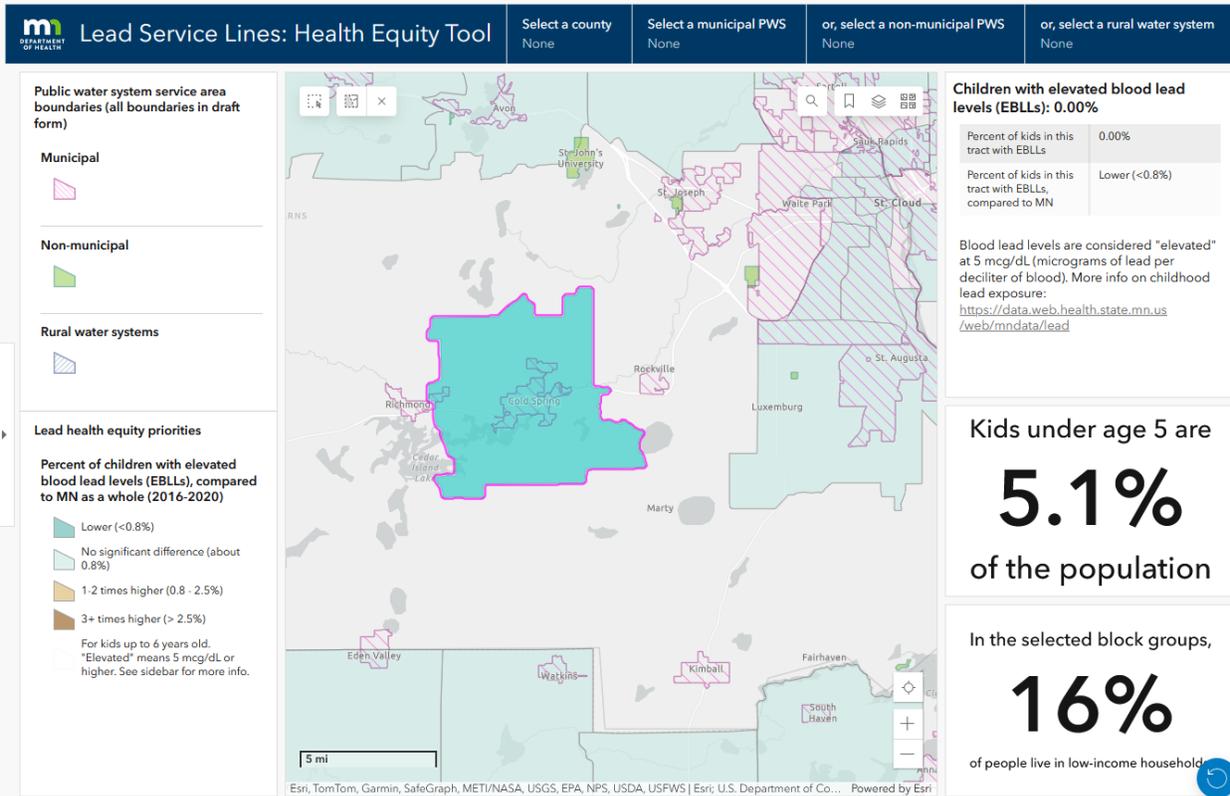
### **The DWP Health Equity Workgroup**

Created in September 2022 to explore pathways to a more equitable water future, the DWP Health Equity Workgroup advances health equity by identifying challenges and barriers within the drinking water sector and by working toward sustainable solutions. The workgroup is engaged in implementing a range of activities, including a Lead Service Line Replacement Planning tool, a GIS application with public system service area boundaries (described below), staff education, and enhanced community engagement.

### **GIS Applications**

The workgroup has developed a web-based GIS tool to help DWP visualize PWS service area boundaries and socioeconomic areas of concern. This tool allows users to understand spatial patterns and relationships, helping MDH to identify areas of need within the state.

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*Example visual from draft GIS application for health equity analysis*

MDH continues to help communities with the greatest need access funds by improving technical assistance, increasing the amount of fully subsidized service, and prioritizing projects in high-poverty and historically underinvested communities. Advancing water equity is not a one-year project but a generational commitment that will require sustained leadership and partnership with all communities.

## For More Information

**Detailed Violation Report Available:** This annual report provides an overview of monitoring results and health-related water quality violations in Minnesota in 2023.

In addition, a report listing all violations of the Safe Drinking Water Act in Minnesota for calendar year 2023 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](mailto:health.drinkingwater@state.mn.us).

The detailed report includes information about violations of National Primary Drinking Water Regulations including the following:

Maximum contaminant level (MCL) violations

Maximum residual disinfectant level (MRDL) violations

Treatment technique requirement (TT) violations

Significant monitoring and reporting requirements (M/R) violations

Significant monitoring requirement (M) violations

Significant reporting requirement (R) violations

Variances and exemption violations

Recordkeeping violations

Significant public notification requirement violations

Significant consumer confidence report (CCR) notification requirement violations

**Consumer Confidence Reports:** Individual community water systems produce an annual report (called a Consumer Confidence Report) listing contaminants that were detected, even in trace amounts, during the previous calendar year. The reports are available from the individual water systems or on-line: [Consumer Confidence Reports](https://www.health.state.mn.us/communities/environment/water/com/ccr.html) (<https://www.health.state.mn.us/communities/environment/water/com/ccr.html>).

## 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  
 Minnesota Board of Water and Soil Resources  
 Minnesota Pollution Control Agency  
 Minnesota Department of Natural Resources  
 Minnesota Department of Agriculture  
 Metropolitan Council  
 Environmental Quality Board  
 Minnesota Clean Water Council  
 Public Facilities Authority  
 U. S. and Minnesota Geological Survey  
 Minnesota Ground Water Association  
 Minnesota Water Well Association  
 Minnesota Clean Water Land and Legacy Amendment  
 Suburban Utility Superintendents Association  
 Water Resource Programs at St. Cloud Technical and Community College, the  
 University of Minnesota, and St. Paul College  
 Association of State Drinking Water Administrators  
 U. S. Environmental Protection Agency  
 . . . and many more!

**Safe Drinking Water Is Everyone’s Job**

