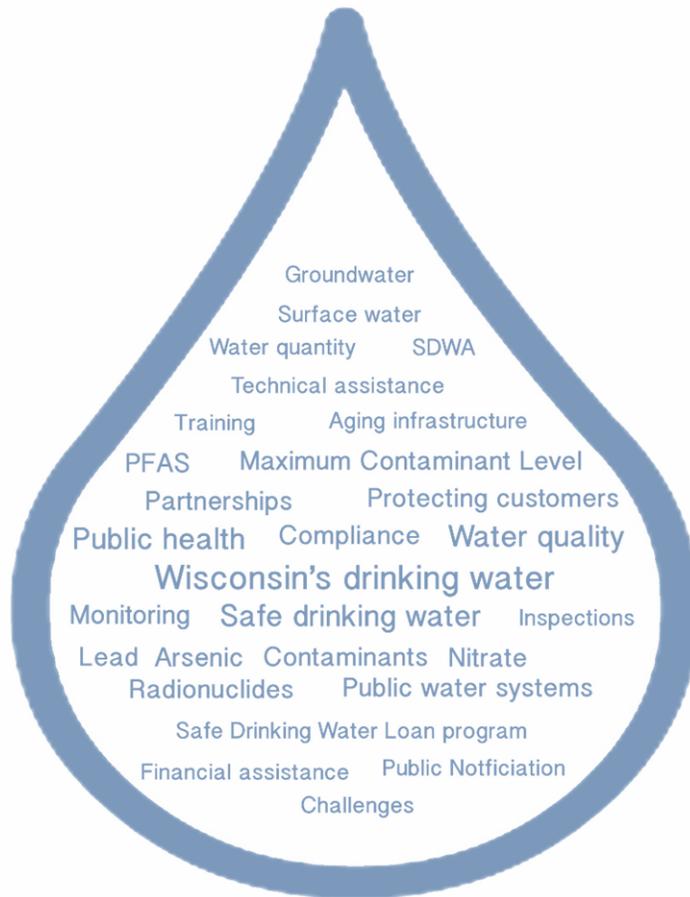
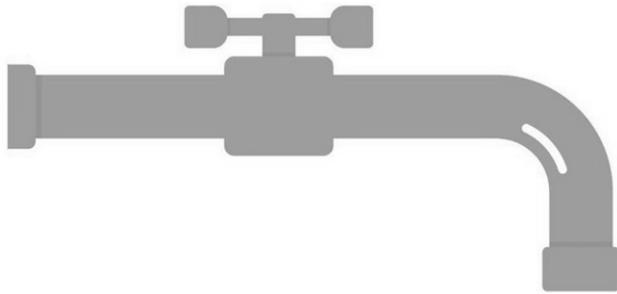


Wisconsin Public Water Systems 2020 Annual Drinking Water Report



Wisconsin Department of Natural Resources
Bureau of Drinking Water and Groundwater
dnr.wi.gov



Wisconsin Public Water Systems 2020 Annual Drinking Water Report

Obtaining copies of Wisconsin’s report

As required by the federal Safe Drinking Water Act, the *2020 Annual Drinking Water Report* is available to the public. To obtain copies, contact the Bureau of Drinking Water and Groundwater DG/5, Wisconsin Department of Natural Resources, PO Box 7921, Madison WI 53707, 608-266-1054. The report is also available on DNR’s web site, dnr.wi.gov, search “drinking water annual report.”

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EXECUTIVE SUMMARY

The Wisconsin Department of Natural Resources (DNR) is charged with protecting the quality and quantity of Wisconsin's water resources and is responsible for implementing and enforcing the Safe Drinking Water Act to safeguard Wisconsin's drinking water quality.

Strong state and federal regulations combined with the collaborative efforts and hard work of many people—including DNR, the US Environmental Protection Agency (EPA), individual owners and operators of public water systems, county health officials, professional associations, water quality organizations and water consumers—have allowed Wisconsin to manage its drinking water resources successfully.

Our *2020 Annual Drinking Water Report* summarizes compliance with the drinking water requirements during 2020 and highlights efforts that help public water systems provide a safe and adequate supply of drinking water in the state. Some of these include:

- During 2020, more than 98 percent of Wisconsin's public water systems provided water that met all of the health-based standards.
- The COVID-19 pandemic affected operations of public water systems statewide. DNR and water system personnel collaborated to find solutions to the new challenges.
- DNR and its partners performed more than 2,400 sanitary surveys, 6,300 annual site inspections and 300 on-site assessments during 2020. Inspections assess compliance with construction, operation and maintenance requirements, and assessments help to “find and fix” possible sources of microbial contamination.
- In partnership with DNR, county health departments provided monitoring and compliance assistance to small water systems in 54 counties around the state, while dealing with pandemic response at the same time.
- DNR's partners provided training and technical assistance to public water system owners and operators throughout the state during 2020. In response to the COVID pandemic, DNR and its partners created online alternatives to in-person training and ‘on-site virtual visits’ for providing technical assistance safely.
- DNR awarded more than \$93 million in financial assistance through the Safe Drinking Water Loan Program during 2020. The funding is helping 14 communities around Wisconsin make needed infrastructure improvements to their drinking water systems.

DNR is committed to protecting the state's drinking water to ensure that it is safe today and for the future.



INTRODUCTION

The Wisconsin Department of Natural Resources (DNR) works to protect the state's water resources and ensure the safety and availability of the state's drinking water supplies.

Wisconsin manages its drinking water resources by relying on effective state and federal regulations combined with strong collaborative partnerships between DNR, the US Environmental Protection Agency (EPA), public water systems, county health officials, professional associations, individual operators, other water quality organizations and water consumers.

The federal Safe Drinking Water Act (SDWA) requires states to publish an annual report showing violations of the drinking water standards. This *2020 Annual Drinking Water Report* summarizes how Wisconsin's public water supply systems complied with the drinking water requirements between January 1 and December 31, 2020. This report also highlights DNR's work and other initiatives that help to meet the goal of providing a safe and adequate supply of drinking water to the citizens and visitors of Wisconsin.

One issue dominated all our lives during 2020: the COVID-19 pandemic. Access to safe drinking water was critically important. People needed water for drinking but also for good hygiene. This report highlights many of DNR's efforts, along with those of water system owners and operators around the state, to respond to the pandemic and cope with those challenges.

WISCONSIN'S DRINKING WATER PROGRAM: THE BASICS

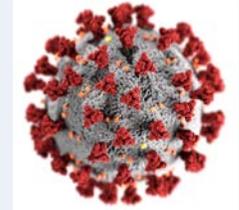
Requirements for public water systems come from the federal SDWA, first passed in 1972 and amended several times since then. The SDWA establishes national limits for contaminants in drinking water to protect public health. These limits, known as Maximum Contaminant Levels (MCLs), are health-based standards specific to each contaminant.

The SDWA also specifies how often public water systems must test their water for contaminants and report the results to the state, EPA and the public. Testing or "monitoring" requirements vary depending on a water system's size, the type of population served, and the vulnerability of the water source to contamination. In general, water systems serving residential consumers and larger populations have more stringent monitoring and reporting requirements.

Finally, the SDWA requires public water systems to notify their consumers when they have not met these requirements. Consumer notification must include a clear and understandable explanation of the violation that occurred, its potential adverse health effects, steps that the water system is taking to correct the problem and the availability of alternative water supplies during the violation.

Most states have obtained approval from EPA to administer their own public water supply programs. This primary enforcement authority means a state has adopted drinking water regulations that meet SDWA requirements and can enforce them. In Wisconsin, the DNR implements the state's drinking water program.

Drinking Water News on Tap **COVID-19 forces public water systems and DNR to overcome hurdles and work differently**



Life changed early in 2020, when the COVID-19 pandemic spread through our world. Water—safe drinking water—was essential, and not just for drinking. We also depended on water for hand washing and minimizing disease risk. The pandemic challenged public water systems everywhere: how to maintain operations, keep staff healthy and working, and keep providing water to consumers? It also challenged DNR: how to meet our responsibilities and devise ways to help the water systems meet theirs?

People at public water systems responded to the challenges with ingenuity and determination. Nothing was 'business as usual,' but water systems were expected to meet monitoring and water quality requirements, nonetheless. The water systems overcame numerous hurdles:

- How to keep treatment plants and the water infrastructure staffed and functioning? Some water systems divided their operators into shifts and worked alternating schedules. Some operators worked a week or two on duty—possibly staying at the facility the entire time—and then switched with another crew for some days off. Some operators were able to do much of their work remotely.
- How to monitor water quality when some contaminants are measured at taps in consumers' homes? People were understandably reluctant to bring outsiders into their homes, and operators had to restrict their own contacts to minimize disease risk. Water system operators worked with DNR staff to identify alternate sampling sites to continue monitoring water quality safely.
- Many systems had to suspend doing cross-connection inspections, so that inspectors could avoid entering homes and businesses. Catching up on those inspections could take a year or longer.
- Drinking water operators around the state did get sick with COVID-19. Some continued working through their illness—alone—if they were able. Some were hospitalized. Backup operators filled in, sometimes for weeks at a time, until their colleagues could return to work.

The pandemic demanded innovation from DNR also.

- How to communicate? Luckily, DNR's drinking water program had just equipped all field staff with cell phones when the pandemic started. And most staff already had laptop computers also.
- How to do 'virtual' inspections? Right away, DNR's engineers created methods for virtual sanitary survey inspections. The effort required lots of communication and coordination. Not all water systems had similar technology available, or people skilled at using it. Operators made the effort to provide pictures and electronic records, and DNR created methods for transmitting the information. It was an undertaking that required lots of patience but showed people's willingness to find solutions that worked.
- DNR held Zoom calls with water system operators around the state, to help people discuss questions and compare notes on strategies for maintaining operations during the emergency.
- Staff of DNR's drinking water program also volunteered with Wisconsin's Department of Health Services, helping to distribute personal protective equipment and vaccine around the state.

Collaborating—creatively and with lots of communication—allowed Wisconsin's drinking water professionals to keep working to provide safe drinking water throughout the pandemic.

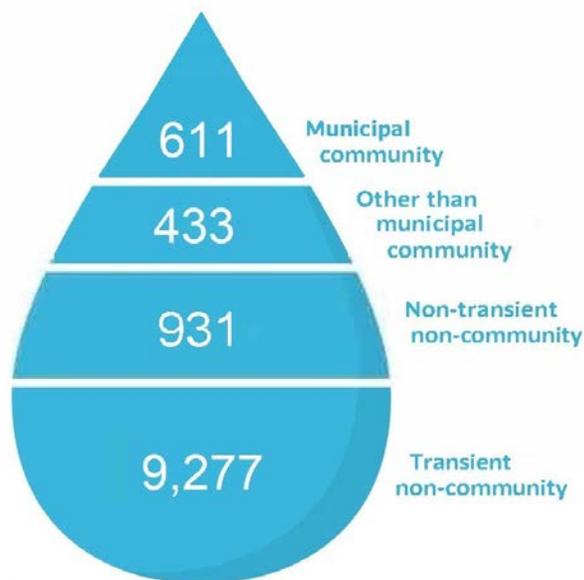
WISCONSIN’S PUBLIC WATER SYSTEMS

Wisconsin had 11,252 public water systems in 2020. While this is the largest number of any state, the number decreased—by several hundred—in Wisconsin. Many public water systems were closed during 2020 because of the COVID pandemic.

Public water systems are defined as those that provide water for human consumption to at least 15 service connections or regularly serve at least 25 people for 60 days or longer per year. Wisconsin has four types of public water systems:

- Community water systems serve water to people where they live. Wisconsin has 1,044 community water systems that serve 69 percent of the state’s population (Figure 1). The remainder of the state’s residents receive their water from private domestic wells.
 - **Municipal community (MC) water systems** are owned by cities, villages, towns or sanitary districts. This group also includes care and correctional facilities that are owned by counties or municipalities. Wisconsin has 611 municipal systems. Milwaukee Waterworks is the state’s largest, serving almost 600,000 people. Wisconsin’s smallest municipal water systems, by contrast, serve fewer than 50 people each.
 - **Other-than-municipal community (OC) water systems** serve residential consumers in areas supplied by privately-owned wells. The state’s OC water systems include mobile home parks, apartment buildings, condominium complexes and long-term care facilities.

Number of public water systems



Population served

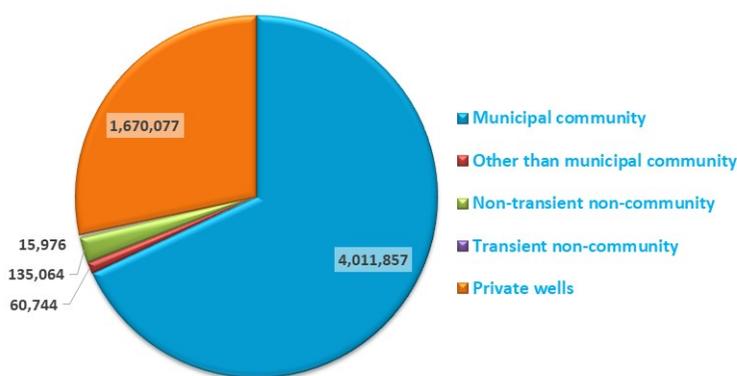


Figure 1. Wisconsin has more than 11,500 public water systems. The majority are very small transient non-community systems, but the state’s municipal water systems serve the largest share of the population.

- Non-community water systems serve water to people where they work, attend school or gather for food or entertainment. The wells supplying these systems are privately owned. Wisconsin has 10,208 non-community systems (see Figure 1).
 - **Non-transient non-community (NN) water systems** regularly serve at least 25 of the same people for six months or more per year. They include schools, day care centers, office buildings, industrial facilities, dairies and many other businesses.
 - **Transient non-community (TN) water systems** serve at least 25 people (though not necessarily the same people) for 60 days or longer per year. They include campgrounds, parks, motels, restaurants, taverns and churches. Wisconsin has more than 9,200 transient non-community water systems.

The vast majority of Wisconsin’s public water systems rely on groundwater pumped from wells. However, 56 systems use Wisconsin lakes to provide drinking water to their customers. These surface water systems serve some of the state’s largest communities, including Milwaukee and Green Bay. So, while more than 99 percent of the state’s public water systems use groundwater sources, surface water systems serve almost one-third of the state’s population (Figure 2).

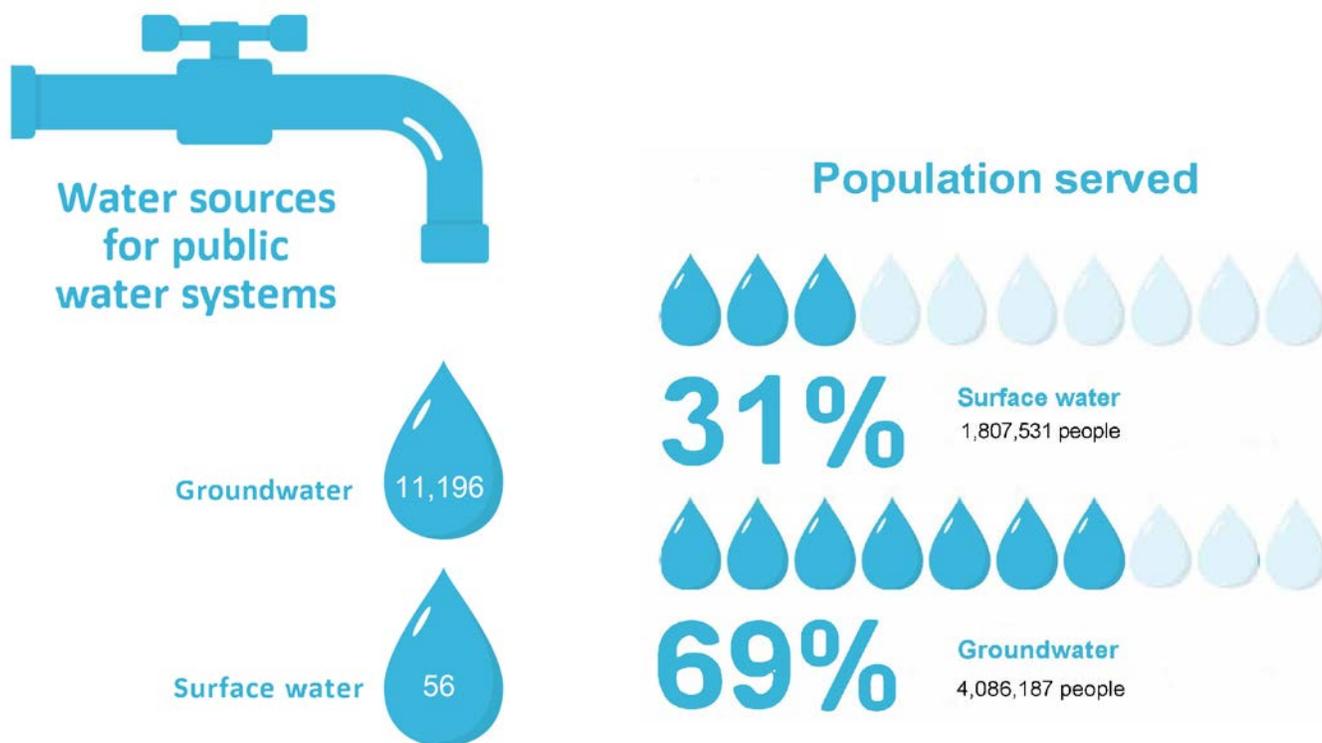


Figure 2. The majority of Wisconsin’s public water systems use groundwater pumped from wells. The 56 systems that use surface water from lakes include most of the state’s largest public water systems.

MONITORING AND TESTING FOR CONTAMINANTS IN DRINKING WATER

Monitoring is critically important for protecting our drinking water and identifying changes in water quality. All public water systems are required to monitor their water and test for contaminants. Monitoring involves collecting water samples, analyzing them for potential contaminants and reporting the results to DNR and consumers.



The frequency of monitoring and the number of contaminants measured depend on the type of water system and population served. The largest systems collect hundreds of water samples each month, while the smallest systems may collect only two samples per year.

Contaminants can have either acute or chronic health effects. Acute contaminants pose an immediate risk to human health—people can become ill within days or even hours of exposure. Maximum contaminant levels in drinking water are risk-based, set to prevent occurrences of acute or fatal illness. Chronic contaminants cause long-term health risks. Their maximum permissible levels are typically set so that only one in 1,000,000 people would face an increased risk of developing cancer by drinking two liters of water a day for 70 years.

All public water systems monitor for acute contaminants. The state's smallest systems, TNS, are not required to test for chronic contaminants.

Types of regulated contaminants

Regulated contaminants fall into several groups based on their microbial or chemical characteristics:

- Acute contaminants
 - *Escherichia coli* (or *E. coli*) bacteria
 - Nitrate and nitrite

- Chronic contaminants
 - Inorganic chemicals (IOCs)— arsenic, copper, lead, mercury and other chemicals
 - Synthetic organic chemicals (SOCs)— herbicides and pesticides
 - Volatile organic chemicals (VOCs)— benzene, toluene, xylene and other chemicals
 - Radionuclides—radioactive chemicals like radium and uranium
 - Disinfectants and disinfection byproducts—chlorine and byproducts like haloacetic acid and trihalomethanes

Most chemical groups contain multiple contaminants. For example, the synthetic organic contaminants comprise 30 regulated chemicals (although there are many more synthetic organic substances used in commerce). Municipal water systems, which have the most comprehensive monitoring requirements, test drinking water for more than 90 regulated contaminants to protect public health. Appendix A lists all the contaminants regulated under the SDWA and their health-based standards, or MCLs.



Secondary standards

The SDWA sets aesthetic or “secondary” standards for additional contaminants. These substances may cause an unpleasant smell, taste, appearance, stain sinks or discolor clothes when they exceed certain levels. This group of chemicals includes iron, manganese and sulfate, among others. Public water systems may be required to take corrective actions if they exceed secondary standards for these contaminants. Table A-6 in Appendix A lists the secondary standards.

Action levels for certain contaminants

The SDWA establishes “action levels” rather than MCL standards for two contaminants: lead and copper. Exceeding an action level does not cause a violation, but it does require a water system to conduct additional monitoring and follow certain procedures to control levels of the contaminant in the drinking water supply. The action levels for lead and copper are listed in Table A-2 of Appendix A.



Treatment for contaminants

Public water systems may treat their water to meet regulatory MCL limits. Most treatments reduce or inactivate contaminants that may be present in the water. One common treatment is disinfection, which inactivates microbial contaminants so they cannot make us sick. Disinfection of drinking water has revolutionized our lives. Diseases that used to cause many deaths, like typhoid fever, have been almost eliminated thanks to disinfection. Other treatments—like filtration, oxidation and ion exchange—remove or reduce contaminants present in the water. Corrosion control treatment involves adding compounds to adjust the

chemistry of water and prevent certain contaminants from leaching (being dissolved or extracted) into the water, like lead from lead pipes.

Drinking Water News on Tap EPA revising regulations to reduce exposure to lead in drinking water

Late in December 2020, EPA released its proposed revisions to the Lead and Copper Rule. Then, early in 2021, EPA delayed the official publication to seek additional public input, especially from communities at highest risk of exposure to lead in drinking water. According to current estimates, rule revisions could take effect in late 2021.



Although this process could affect parts of the rule, we anticipate that its key goals will remain mostly unchanged. Specifically, EPA has indicated that its goals are to: protect children at schools and child-care facilities; get the lead out of our nation’s drinking water; and empower communities through information. Some highlights of how the rule revision addresses each of these goals are:



SCHOOLS & DAYCARE

Protect children at schools and child-care facilities

- Public water systems will be required to test for lead and copper at school and child-care facilities.
- Elementary schools and child cares will be tested on a five-year cycle (20 percent of facilities each year).
- Secondary schools can request testing at any time.



COMPLIANCE MONITORING

Get the lead out of our nation’s drinking water

- Water systems will be required to adjust sampling sites to better target locations with lead service lines.
- Systems will follow improved tap sampling procedures to collect water that has contact with the lead service line.
- Systems with higher levels will monitor more frequently.
- Systems will have to pay attention to individual locations with elevated levels of lead by identifying the cause and mitigating the problem (find-and-fix)
- For the first time, water systems will be required to develop a full lead service line inventory and create a plan for removing lead service lines.
- Importantly, the proposed revision prohibits “test-outs” to avoid replacing lead service lines. This practice is allowed under the current rule and has significantly slowed national progress in removing significant sources of lead from our homes.
- Systems must complete full lead service line replacement for it to “count” towards replacement requirements (i.e. private and public side both) because science has recently shown that partial lead service line replacement may increase short-term lead exposure.



MATERIALS INVENTORY



LSL REPLACEMENT

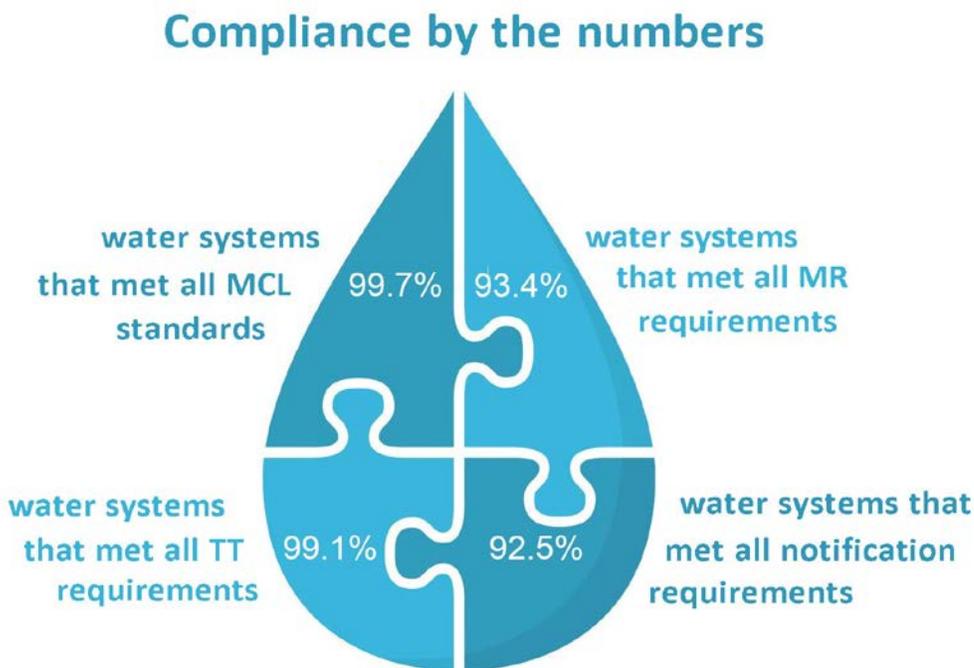
Empower communities through information

- Homeowners will learn about elevated levels of lead in their homes or water system sooner.
- People will understand where lead services lines are in their community and how to protect against exposure to lead in drinking water.
- Water systems will notify homeowners and building owners about opportunities to replace lead service lines, including financial assistance programs.

The deadline for water systems to comply with all new requirements will be three years after the rule revision takes effect.

COMPLIANCE WITH DRINKING WATER REQUIREMENTS

Compliance with drinking water requirements is measured in a variety of ways. DNR and EPA track whether water samples are collected in a timely manner and tested for the correct contaminants, and whether contaminant concentrations exceed permissible limits. They also track whether public water systems issue public notices or notifications in a timely manner, post or distribute notices as required, and whether systems correct deficiencies by appropriate deadlines. Violations can occur when deadlines are not met, water samples are not collected, or public notices are not issued. They also occur when sample results exceed permissible limits for contaminants. See Table 1 for a summary of the basic types of violations.



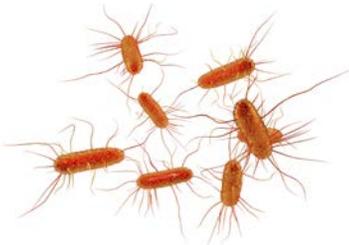
The majority of Wisconsin’s public water systems met all their regulatory requirements during 2020—86.9 percent of all systems. This section of the report summarizes compliance data for last year.

Table 1. What do the violations mean?	
Maximum contaminant level (MCL) violations	MCL violations occur when contaminants are detected at levels above what is permissible for protecting public health (i.e., the MCL standard).
Monitoring and reporting (MR) violations	MR violations occur when water samples are not collected on time or analyzed using approved methods, or when consumers are not notified of lead and copper results from samples collected in their homes.
Treatment technique (TT) violations	TT violations occur if water systems fail to employ the required processes or treatments to reduce exposure to contaminants. They include failure to correct “significant deficiencies” or “sanitary defects” and failure to follow approved start-up procedures for seasonal operation.
Notification violations	Notification violations occur when water systems fail to provide required public notices, fail to deliver Consumer Confidence Reports, or fail to notify DNR when significant deficiencies are corrected.

Maximum Contaminant Level violations

Some of the most serious violations at public water systems result from contaminants in the drinking water. Although a MCL violation does not necessarily mean that any consumers experienced adverse health effects from drinking the water, it requires a water system to notify consumers and take action to correct the problem.

During 2020, more than 99 percent of Wisconsin's public water systems provided water that met all the health-based MCL standards for regulated contaminants. Only 87 systems experienced MCL exceedances. The contaminants encountered most frequently were bacteria, nitrate, arsenic and radionuclides. Table B-1 in Appendix B summarizes the MCL violations during 2020.



- **Microbial contaminants**

Microbes, especially coliform bacteria, are common contaminants of drinking water supplies. Coliform bacteria occur widely in soil, plants and water; their presence in drinking water indicates a possible pathway for contamination. *Escherichia coli* (or *E. coli*) is a species of bacteria that indicates contamination from human or animal wastes when present in drinking water.

E. coli is an acute contaminant because people can become ill after a single exposure to the viruses that may be present when *E. coli* is detected. Exposure can cause short-term health effects like diarrhea, nausea, cramps and headaches but may have more serious effects on vulnerable populations, including infants, young children and people with immune system problems.

All public water systems in Wisconsin are required to monitor for the presence of coliform bacteria. When these bacteria are detected in a sample of drinking water (called a total coliform-positive result), additional actions are required to “find” sources of contamination and “fix” the issues allowing contaminants to enter the water system.

First, follow-up samples are collected to confirm the presence of coliform bacteria and specifically verify whether *E. coli* are detected. When bacterial contamination is confirmed, trained inspectors from DNR and counties throughout the state conduct on-site assessments. These inspections follow the “find and fix” approach to ensure that bacteria do not persist in the drinking water at these facilities. More than 300 assessments were completed during 2020. These free inspections provide a valuable service to public water system owners and consumers.

Often, inspectors discover simple corrections that will eliminate pathways for contamination and help water systems get back on track. Problems like cracked electrical conduits at a wellhead or unnoticed cross connections to non-potable water sources often can be corrected quickly and inexpensively. Shock-chlorinating wells that have biofilms growing in them is another common corrective strategy.

The MCL for microbial contaminants is exceeded when the presence of *E. coli* is confirmed in a water supply (see Table A-1 in Appendix A for a description of the MCL). During 2020, there were 16 public water systems in Wisconsin (only 0.14 percent) with MCL violations for *E. coli*. Follow-up work at these systems has included identifying the sources of contamination, correcting defects and, in some cases, switching to a new water source.

- **Nitrate and nitrite**

Nitrate is the most widespread inorganic chemical that occurs as a contaminant of drinking water here in Wisconsin. Because it is water-soluble and leaches readily through soil, nitrate can move easily into the groundwater. Sources of nitrate and nitrite include agriculture and animal wastes, according to the Wisconsin Groundwater Coordinating Council.



Nitrate and nitrite are acute contaminants because they can cause serious illness in infants younger than six months old. The condition, called methemoglobinemia or “blue baby syndrome,” causes infants’ blood to be deprived of oxygen, and it can be fatal in extreme cases. Consuming water with high nitrate levels has also been linked to chronic diseases, and there is evidence of an association between exposure during early pregnancy and certain birth defects. In adults, the health concerns include increased cancer risk, because nitrate is converted within the human body to compounds that are known carcinogens.

All of Wisconsin’s 11,252 public water systems are required to monitor for nitrate and nitrite in drinking water. During 2020, violations for exceeding the nitrate MCL occurred at 33 public water systems (0.29 percent of all systems). These water systems are located throughout the state.

Federal and state regulations offer some flexibility for very small water systems that exceed the nitrate MCL. This provision allows transient non-community systems to continue operating with water that has nitrate above the MCL of 10 milligrams per liter (mg/L) but below 20 mg/L, providing certain conditions are met. Water systems must notify the public about the nitrate contamination, ensure that the water will not be consumed by infants or women of childbearing age, and provide an alternate water source.

Table 2. Summary of non-community water systems operating with nitrate levels exceeding the MCL during 2020	
water system status	number of systems
continuing operation started before 2020	236
continuing operation started during 2020	32
continuing operation ended during 2020	41
total number of systems on continuing operation	227

Wisconsin currently has almost 230 transient non-community water systems on “continuing operation” (Table 2). Some have remained in that status for more than 25 years. During 2020, another 32 TN systems exceeded the nitrate MCL and were allowed to use the continuing operation

option (similar to the previous year), and 41 systems went off continuing operation. Although the overall number of systems decreased slightly, it has remained above 200 for years. Nitrate contamination continues to be a significant challenge for water systems in Wisconsin.



- **Arsenic**

Arsenic is a naturally occurring element found in some rock formations in Wisconsin, which is why it is regularly detected as a contaminant of drinking water supplies here. Arsenic has no taste or odor, so the only way to detect it in drinking water is by testing. Health effects come from long-term exposure and include increased risk of skin cancer; there is some evidence of links to cancers of the lungs, bladder, liver, kidney and colon also. Exposure to arsenic can cause skin damage, circulatory system problems, and nervous system effects (like tremors). Arsenic exposure during pregnancy and early childhood may also affect learning, IQ scores and risk of certain cancers later in life.

Community and non-transient non-community water systems are required to monitor for the presence of arsenic (1,975 of Wisconsin’s water systems). During 2020, there were 14 systems with violations for exceeding the arsenic MCL (0.01 mg/L). These water systems are located in various areas, but most are in southern Wisconsin.

- **Radionuclides**

Radium and uranium are elements that occur naturally in rock formations in Wisconsin and are detected as contaminants of some drinking water supplies here. Health risks come from long-term exposure. For example, exposure over a lifetime could result in an elevated risk for cancer and kidney toxicity. All community water systems (serving residential consumers) are required to monitor for radionuclides. Of the 1,044 community water systems in Wisconsin, 15 (or 1.4 percent) had violations for exceeding the MCL standards for radium, uranium and/or alpha particle emitters during 2020. Most of these systems are located in the southern and northeastern parts of the state.

- **Lead and copper**

Lead and copper typically do not occur naturally in source water. Instead, through the process of corrosion, they can leach into the water as it flows through piping and fixtures containing these compounds. Water system dynamics such as water use, water temperature and physical and hydraulic disturbances can also contribute to lead and copper in drinking water. Lead pipe, brass, chrome plated brass, copper plumbing and lead-based solder are all potential sources. Lead can have serious health effects because it interferes with the red blood cells that carry oxygen in our bodies. It primarily affects brain development in infants and children but can have health effects for adults also. Copper is an essential nutrient, but long-term exposure to high levels can cause kidney and liver damage.

All community and non-transient non-community water systems are required to monitor for lead and copper. When an action level is exceeded, systems are required to conduct additional water sampling, to determine how overall water quality may be contributing to lead and copper levels. In addition, systems must provide special information to their consumers about health effects and the steps people can take to reduce

Table 2. Water systems with action level exceedances during 2020				
contaminant	number of water systems			
	MC	OC	NN	total
copper	5	4	14	23
lead	21	4	11	36

exposure. Finally, systems with action level exceedances also need to recommend and implement corrosion control to reduce concentrations of lead and copper in their drinking water.

During 2020, there were 36 public water systems that exceeded the lead action level and 23 that exceeded the action level for copper. Four water systems actually exceeded both action levels during the year. And, for about half of the municipal systems, 2020 was their first action level exceedance.

DNR works with public water systems that have violations for contaminant MCL exceedances to help them correct problems and return to compliance as soon as possible. Corrective actions can include steps like disinfection, reconstructing an existing well, drilling a new well to obtain an alternate water source or installing a treatment system. Microbial contaminants, nitrate, arsenic and radionuclides are all continuing priorities for DNR because of the common occurrence of these contaminants in Wisconsin.

Monitoring and reporting violations

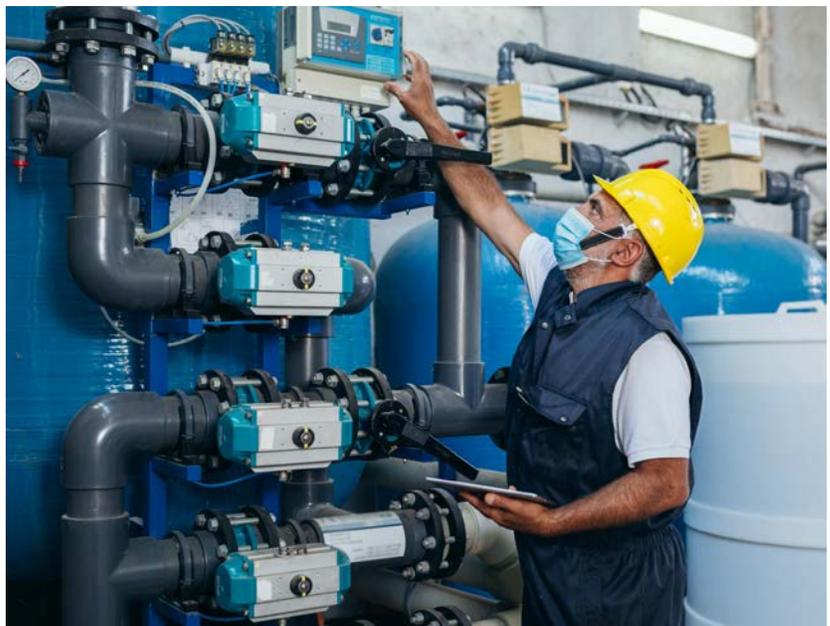
Public water systems are required to monitor to verify that contaminants in the water do not exceed the MCL thresholds. Monitoring and reporting violations occur much more frequently than MCL violations. During 2020, there were 1,147 MR violations at 743 of the state’s 11,525 public water systems (6.6 percent). Most often, these violations resulted from failure to collect required samples, samples collected late, and failure to notify consumers of lead and copper results. Table B-2 in Appendix B summarizes the MR violations that occurred during 2020.

MR violation numbers increased slightly in 2020. The COVID pandemic caused special challenges for public water systems, because some contaminants are monitored at the taps in consumers’ homes. For much of the year, access to these locations was affected by the pandemic. Residents were trying to restrict their contacts with other people, and water system operators were trying to minimize their disease risk too.

Treatment technique violations

Some parts of the SDWA establish “treatment technique” requirements instead of MCL standards for controlling levels of contaminants in water. Treatment techniques are procedures or actions that public water systems must follow to reduce levels of, or ensure control of, some contaminants. Treatment technique requirements have been established for controlling viruses, some bacteria, lead and copper.

Treatment technique (TT) violations occur when water systems fail to follow required procedures or complete required actions. TT violations signal the potential for health risks, since consumers cannot be certain whether their drinking water was adequately treated or protected to reduce exposure to contaminants.



Among Wisconsin’s 11,525 public water systems, 107 systems had treatment technique violations during 2020, so 99.1 percent of the state’s systems met these health-based requirements. Most of the treatment technique violations resulted from failing to meet deadlines for correcting defects or deficiencies identified during inspections or failing to follow approved seasonal start-up procedures. Table B-3 in Appendix B summarizes the treatment technique violations that occurred during 2020.

Notification and reporting violations

Informing consumers about their drinking water is an important aspect of water system operation. Water systems are required to notify consumers and DNR about multiple issues, including water quality, violations, operational problems and emergencies. Violations can occur if systems fail to provide public notification. Table B-4 in Appendix B summarizes all the notification violations that occurred during 2020.

- **Public notice violations**

To protect public health, water systems are required to notify consumers whenever most violations occur or a situation poses risks to human health. Exceeding a contaminant MCL, failing to monitor drinking water supplies and failing to properly treat the water are all violations that require public notification.

Public notices must inform consumers about the nature of any violations, potential health effects, corrective actions that the water system is undertaking and any preventive measures that consumers should take. If a water system fails to notify consumers as required, public notice (PN) violations can occur.



Among all the violations summarized in this report, public notice violations were most numerous. These violations occurred at 850 of Wisconsin’s public water systems (7.6 percent of all systems) during 2020, similar to the previous year. Most public notice violations were related to monitoring for microbial contaminants and nitrate (missed or late samples).

- **Consumer Confidence Report violations**

All community water systems (those serving residential consumers) are required to prepare and deliver a water quality report each year. This is called the Consumer Confidence Report (or CCR) and it provides information about the source of a system’s water, levels of any contaminants detected in the water, and a summary of violations incurred by the water system during the previous year. CCR violations occur whenever water systems fail to distribute this annual report to their customers. Of Wisconsin’s 1,044 community water systems, only 33 (3.2 percent) got violations in 2020 for failing to distribute a CCR on time.

- **Notification violations**

Identifying significant deficiencies at public water systems is an important method for protecting public health. These are noted during inspections. Water systems are required to correct significant

deficiencies by specified deadlines and then notify DNR when the corrective actions have been completed. These requirements apply to all of Wisconsin’s public water systems, and failure to properly notify DNR can cause a violation. During 2020, only 14 water systems incurred violations for failing to provide these notifications.

Overall compliance with requirements

Even though the COVID pandemic presented challenges throughout last year, most of Wisconsin’s public water systems met all their regulatory requirements. During 2020, 86.9 percent of the state’s 11,252 water systems complied with all requirements. Compliance details for each type of public water system can be found in Appendix B, Table B-5.

DNR EFFORTS TO PROTECT WISCONSIN’S DRINKING WATER

To meet its responsibilities for implementing the SDWA, DNR works in multiple ways to help Wisconsin’s public water systems provide safe drinking water.

Program funding & staffing

Wisconsin’s public water supply program receives funding from several sources, including the federal and state governments (Figure 3). Of a total \$10.9 million in funding during 2020, the majority was used to pay for 88 full-time DNR staff along with contracts for help from outside organizations, county health departments and colleges. Despite having the largest number of public water systems nationwide, Wisconsin has fewer staff working to implement the SDWA than many other states do.

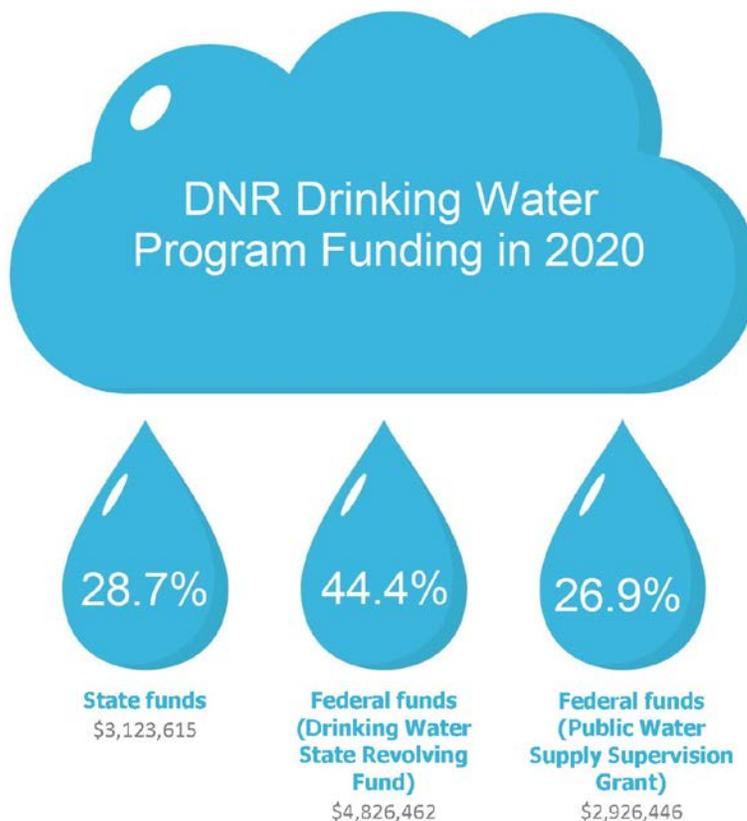


Figure 3. Funding for DNR’s public water supply program comes from both federal and state sources. During 2020, the program had 88 full-time staff.

Inspections & assessments

Inspecting public water systems is one of DNR’s fundamental responsibilities and a critically important tool. Inspections measure compliance with requirements and track changes over time. They also help to prevent future problems, because defects can be identified before health-based violations occur. Compliance inspections, called “sanitary surveys,” are comprehensive reviews of the water sources, pumps and piping, treatment facilities and operation and maintenance practices at public water systems.

Sanitary surveys are performed regularly, every three years at community water systems and every five years at non-community systems. Last year, the DNR and its contracted partners conducted 2,449 sanitary surveys throughout Wisconsin (Figure 4).

Sanitary surveys conducted during 2020

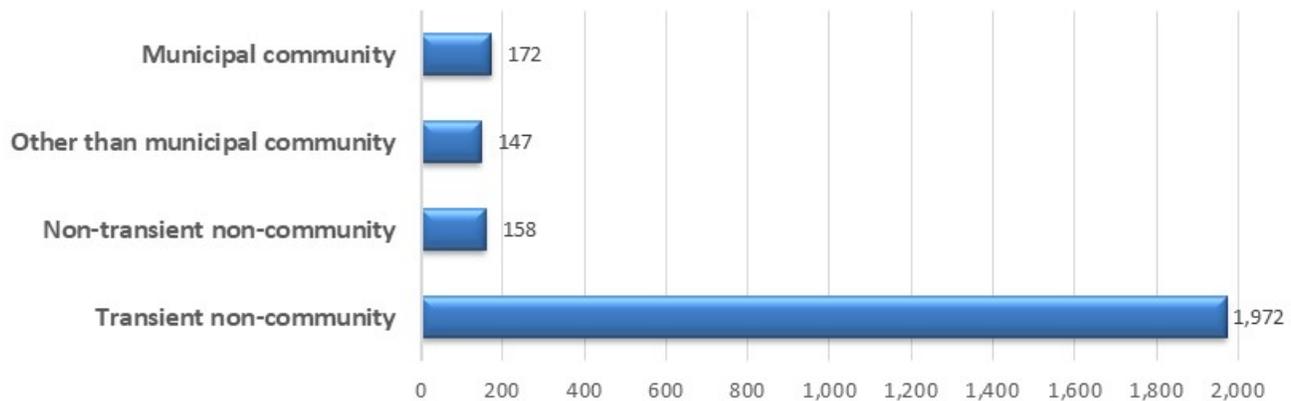


Figure 4. DNR and its partners completed 2,449 sanitary surveys in 2020.

In addition to regularly-scheduled sanitary surveys, DNR performs additional inspections called “assessments” at some water systems. When the presence of coliform bacteria is confirmed at a public water system, DNR responds by conducting an on-site assessment of the facility. The assessment aims to identify potential pathways for microbial contamination and the corrective actions needed to remedy any sanitary defects. During 2020, the DNR and its contracted partners performed 309 of these assessments. Fewer assessments were completed in 2020 because DNR and some of its contracted partners suspended field work during the early months of the COVID pandemic. County health department staff were also kept busy with emergency pandemic response.

In Wisconsin, some transient non-community systems can qualify for less frequent monitoring of microbial contaminants if they receive an annual site visit each year and correct all sanitary defects identified. During an annual site visit, the inspector checks the basic elements of the water system—for example, wells, pumps, water storage—and looks for any changes or problems. If any sanitary defects are identified, the system owner is notified about corrective actions needed. DNR and its contracted partners performed 6,362 annual site visits during 2020 to help water systems meet their requirements and qualify for reduced monitoring schedules.

Monitoring assistance

Compliance with monitoring requirements is essential to protecting drinking water quality for Wisconsin citizens and visitors. Water systems collect and analyze samples throughout the year to measure the quality of drinking water, and the DNR provides monitoring assistance to all operating systems in the state.

Monitoring assistance includes providing monitoring schedules and laboratory submission forms to water systems. DNR sends monitoring schedules twice yearly to community and non-transient non-community water systems to help ensure that sampling requirements are met. Preliminary schedules are sent four

months prior to the start of a compliance year (which is helpful for planning purposes), and final schedules are delivered at the start of each year.

Public water systems also receive all of their laboratory submission forms from the DNR. This ensures that they have the documentation necessary to complete their monitoring requirements. The forms contain information to notify laboratories about the contaminant(s) being monitored, the monitoring period, sample site location, sample instructions, sample collector and DNR representative.

DNR Drinking Water Program DG3S P.O. Box 7921 Madison, WI 53707		Public Water Supply BACTERIOLOGICAL ANALYSIS (ENCLOSE FORM WHEN SENDING SAMPLE TO LAB)		Rev. 10/17
Section I: System Information (to be completed by Department of Natural Resources/SAMPLER)				
System Name: _____		System Type: MC ___ NN ___ OC ___ TN ___		Region: _____
System _____		(Check one)		Code: _____
Address: _____		City: _____		County: _____
PWS ID#: _____		DNR Contact: _____		
Sampler Phone/Name/Address (Notify DNR Contact of Corrections)		Sampler		
		If the laboratory has the ability to fax or e-mail results to you and you would like the lab to do that, please provide the appropriate information (leave blank if you prefer a paper copy): Fax number: _____ E-mail: _____		
Sample Source (location):		Sample Type (check one only -- see instructions on back):		
<input type="checkbox"/> D - Distribution System <input type="checkbox"/> W - Well/Source		<input type="checkbox"/> D - Routine Distribution <input type="checkbox"/> C* - Check: Same location as Positive "D" Sample <input type="checkbox"/> R* - Repeat: Within 5 connects of Positive "D" Sample <input type="checkbox"/> A - Additional Routine (month following positive "D")		
		<input type="checkbox"/> N - New Construction <input type="checkbox"/> I - Investigation <input type="checkbox"/> W - (Raw) Water WI Unique Well No: _____ Entry Point ID: _____		
		*IF THE SAMPLE TYPE IS "C" or "R": "D" or "A" Positive Sample Date: ___/___/___ "D" or "A" Positive Sample ID: _____		
Special Instructions: _____				
Collect sample between: ___/___/___ and ___/___/___ SAMPLES MUST BE ANALYZED WITHIN 30 HOURS OF COLLECTION. SEE SAMPLING INSTRUCTIONS ON BACK.				

DNR distributes updated monitoring site plans to all community and non-transient non-community systems annually. This helps to ensure that systems have current information about their approved monitoring site locations. Monitoring at approved locations is necessary for properly and consistently assessing drinking water quality.

DNR also distributes supplemental information annually to water systems that monitor for lead and copper. The information includes laboratory submission forms, instructions for sample collection, explanations of compliance determinations, forms for notifying consumers of sample results and certification forms for submitting information to DNR. This helps ensure that water systems collect lead and copper samples properly, understand compliance determinations and inform residents of analytical results when samples are collected from their homes.

Community and non-transient non-community water systems are eligible for monitoring waivers, or reduced monitoring frequencies, based on an assessment of potential contaminant sources and well vulnerability. During the vulnerability evaluation, DNR reviews previous water quality results, groundwater proximity to potential contaminant sources, local geology and well construction.

Assessments for monitoring waivers are conducted and reviewed on a three-year cycle, and each year the DNR distributes monitoring assessment information to the systems eligible for waivers. The evaluations are used for determining the proper monitoring frequency for all regulated contaminants. This monitoring assessment process enables systems to reduce monitoring costs by approximately \$3 million annually statewide.

Updated regulations

Chapter NR 812 of Wisconsin's Administrative Code establishes the standards for well construction and pump installation in this state. In 2020, Chapter NR 812 was revised to provide important protections for private drinking water wells and transient and non-transient public water supply wells. The revision's goals were to modernize and streamline the rules, to improve compliance and protection of drinking water. Some of the changes included:

- An updated definition of “schools” that matches the Safe Drinking Water Act and includes day care facilities. This will result in more stringent well construction requirements for wells serving vulnerable populations.
- Adding a definition for the ‘entry point’ and providing for an entry point sample tap in treatment approvals to allow for the proper monitoring of non-transient public water systems.
- Requiring additional well construction protections when wells are installed in areas of fractured limestone bedrock that are more susceptible to surface contamination.

Protection of water sources

Wellhead protection is a preventive program designed to protect public water supply sources and reduce infrastructure costs, treatment costs and public health risk. It represents a “first line of defense” approach to protecting our drinking water. Wellhead protection helps to prevent contaminants from entering public water supplies by managing the land use that contributes water to wells. Wisconsin’s wellhead protection program incorporates both regulatory and voluntary approaches, and DNR encourages the development and implementation of wellhead protection plans for all public water systems as a proactive step to protect wells from potential contamination. During 2020, 17 new wellhead protection plans were reviewed and approved by DNR.



Enforcement activity

Whenever water systems are not meeting the drinking water requirements, DNR works to resolve issues quickly to protect public health. The DNR follows a stepped enforcement process to help water systems return to compliance with regulatory requirements. “Stepped enforcement” includes a series of actions designed to resolve violations at the lowest level—of formality and severity—that is appropriate.

Most violations are resolved quickly and early in the process. Usually, the DNR sends a written Notice of Noncompliance (NON) to public water systems when problems are identified. Often, action is taken immediately to return to compliance.

When health-based violations occur—either because contaminants exceed the MCL standards or because deficiencies and defects are not corrected as required—the enforcement process is expedited to address problems. Water systems with MCL and TT violations receive Notices of Violation to begin the process of evaluating potential corrective actions and returning to compliance.

If health-based violations need to be resolved, or if a system does not take action after initially receiving a NON, the enforcement process proceeds through additional steps. These include a Notice of Violation and enforcement conference, which may be followed by written compliance agreements, consent orders, or penalty orders. The enforcement process emphasizes voluntary agreements about the corrective actions needed and the appropriate timeline for returning to compliance. If the DNR cannot resolve

violations by working with a water system, a case may be referred to the Wisconsin Department of Justice or EPA for further enforcement.

Table 4 summarizes DNR’s enforcement activity during 2020. Last year, DNR sent 1,629 Notice of Noncompliance letters but only 43 Notices of Violation, illustrating that most water systems resolved violations promptly after being notified of problems.

Table 4. Drinking water enforcement activity during 2020		
Enforcement action	purpose	number
Notice of Noncompliance (NON) sent	NON informs public water system owner about failure to collect samples, report results, or distribute required information or notices and actions needed for returning to compliance	1,629
Notice of Violation (NOV) sent	NOV notifies water system owner about a violation and schedules a meeting with DNR staff for more detailed discussion.	43
Enforcement conference held	Enforcement conferences are held to discuss the enforcement process, possible corrective actions and a timeline for returning to compliance.	18
Compliance agreement signed	Compliance agreement is a voluntary agreement describing corrective actions and the timeline for correcting violations. Agreements are typically used when return to compliance can be accomplished within a short time frame.	5
Consent order or administrative order signed	Consent (or administrative) order describes corrective actions and establishes a timeline and deadline for returning to compliance. Orders are usually used when returning to compliance will take longer than six months.	13
Referred to WI Department of Justice or US EPA	Referral occurs when further enforcement is needed.	2

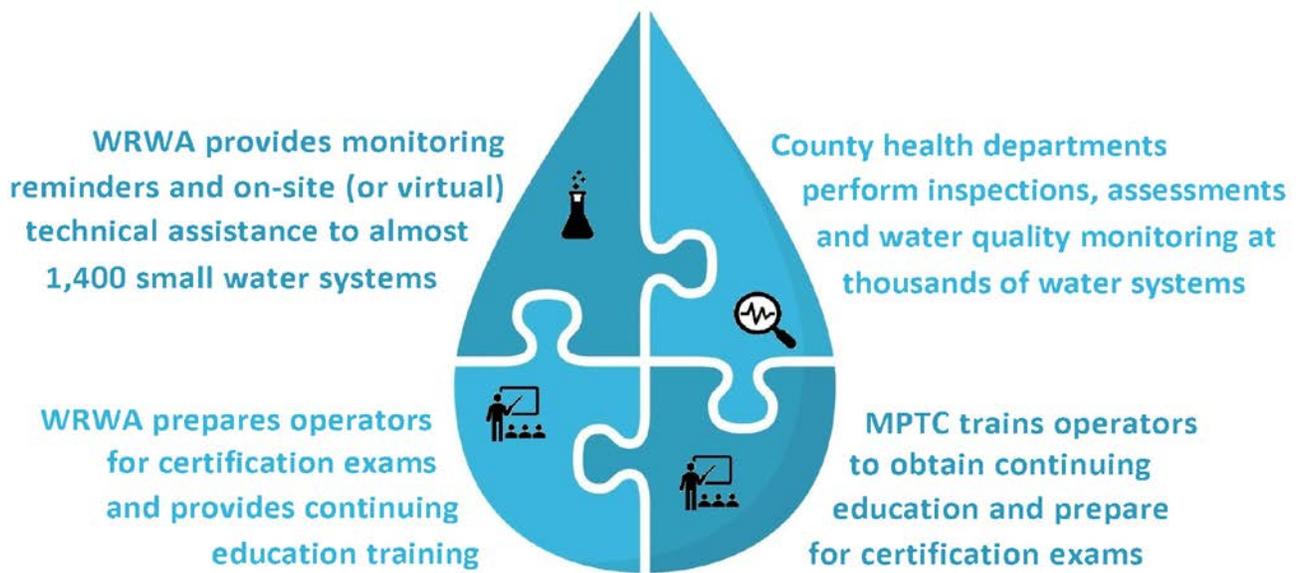
Partnerships

In Wisconsin, working toward the goal of safe drinking water is a cooperative effort between public water systems, professional associations, individual operators, DNR, local agencies, EPA, water consumers and many others. As part of this effort, the DNR contracts with numerous organizations to provide technical assistance, training and compliance support to the state’s water system owners and operators.

- **Compliance support**

DNR’s program to contract with county health departments is crucial to providing experienced inspections and monitoring of transient non-community water systems across the state. Wisconsin has 9,277 TN systems, many of which are small businesses, churches, restaurants, campgrounds and parks. County inspectors are responsible for assisting roughly 6,774 TN systems in 54 counties. County agents also conduct routine and all triggered monitoring for these systems.

During the COVID pandemic, local health departments had to respond rapidly to ever-changing public health emergency needs. During the early stages of the pandemic, health departments could not conduct field work or monitoring at public water systems. County staff resources were overtaxed due to extra demands related to pandemic response. Despite this, county sanitarians conducted 5,320 annual site inspections, 1,485 sanitary surveys and 165 Level 2 assessments in 2020. It was an incredibly challenging year for local health departments, who met the day-to-day challenges with resilience and dedication, reinforcing the value of this crucial partnership.



- **Technical assistance**

Wisconsin Rural Water Association (WRWA) helps small public water systems by giving them regular reminders about monitoring requirements and upcoming deadlines and providing specialized, on-site technical assistance. This assistance helps to train new operators and troubleshoot problems that occur. WRWA helps with a wide variety of topics, including new and seasonal water system start-up, water loss, reporting and completing compliance documents, monitoring site assessments, sampling and monitoring, contaminant tracing and investigation, and winter operations. During 2020, WRWA delivered more than 5,300 monitoring reminders and performed more than 600 on-site and ‘on-site virtual’ visits at other-than-municipal community and non-transient non-community water systems all around the state. DNR has a long-running partnership with WRWA, and both organizations regularly share feedback on how to improve their assistance to the state’s small water systems.

The COVID-19 pandemic presented many special challenges during 2020. Early in the pandemic, some water systems and businesses did not want to receive on-site technical assistance to avoid possible COVID transmission. The DNR and WRWA worked together to find alternatives and, in spring 2020, devised ‘on-site virtual visits.’ On-site virtual visits allowed WRWA to provide technical assistance via video-conferencing apps and extended phone calls. These alternative means offered a safe and effective way for WRWA to provide in-depth technical assistance to water systems that needed it. On-site virtual visits allowed WRWA to complete its technical assistance work for DNR and maintain a high level of service in a socially-distanced manner.

- **Training**

Moraine Park Technical College (MPTC) and Wisconsin Rural Water Association both provide training for water system operators to obtain certification and required continuing education. The DNR contracts with WRWA to provide hopeful operators with exam preparation training and help them pass the exam that is required to become certified by the state. Under a longstanding contract

with DNR, MPTC provides both continuing education and exam preparation for municipal waterworks operators. MPTC also provides continuing education training for small water system operators at the state's OTM and NN water systems. Both organizations are essential to helping build and develop a robust and knowledgeable drinking water workforce for our state.

When the pandemic struck in 2020, the DNR immediately began discussions with both WRWA and MPTC to find alternatives to in-person learning. All DNR-sponsored continuing education training and classes converted to a virtual format in the spring. Training was conducted via a variety of video-conferencing platforms, allowing instruction to proceed virtually throughout the year.

Financial assistance

Wisconsin receives federal funding to implement the SDWA, and the DNR uses most of that funding to provide low-interest loans and principal forgiveness awards for infrastructure improvements at eligible municipal water systems. Working together, DNR's community financial assistance program and public water program awarded almost \$94 million in funding from the Safe Drinking Water Loan Program during 2020.



The loan program funds projects that help Wisconsin communities meet the goal of providing safe drinking water for consumers at affordable prices. Since the Safe Drinking Water Loan Program began in 1998, 520 projects in Wisconsin have received more than \$835.1 million in loans and principal forgiveness.

Last year's funding was comprised of \$91.0 million in low interest loans and \$2.6 million in principal forgiveness. Depending on market interest rates, communities can save 20 to 30 percent from a lower interest rate loan compared with a market rate loan.

Wisconsin communities are using loan program funds for a variety of infrastructure improvements.

- The village of Crandon received \$459,789 to replace water mains.
- The village of Woodville received \$607,540 to construct a new well, wellhouse and connecting main that will replace an existing well with microbiological contamination.
- The city of Milwaukee received \$28,562,461 for rehabilitation of the east ground storage tank and Linndale north filtered water reservoir and water main replacements throughout the city.
- The city of Wausau received \$45,256,287 to construct a new water treatment plant, modifications to existing wells and new transmission mains that will meet current construction and design standards.

- The city of Eau Claire received \$11,174,785 to construct water treatment plant improvements and upgrades.
- The village of Mishicot received \$446,648 to replace water mains.

Appendix C lists all the communities that were awarded funding during 2020.

Drinking Water News on Tap

New funding effort aims to get the lead out

Federal legislation passed during 2020 allowed states to transfer funds into the Safe Drinking Water Loan Program specifically for addressing threats related to lead. Wisconsin has allocated at least \$63 million for this initiative.

This funding will build on Wisconsin’s innovative Private Lead Service Line Replacement Program. Awards are specifically aimed at funding lead service line (LSL) replacements in the privately-owned part of the service line. It is critically important to replace lead service lines in their entirety, but the private portion is not typically eligible for loan program funding.

The funding will be awarded as 100 percent principal forgiveness, enabling municipalities to replace private-side LSLs without incurring any debt.

These awards will mainly cover construction costs, though small communities can also get some assistance with engineering and administrative costs. Applications are being accepted through June 30, 2021, and the funding will be awarded during 2021.



CHALLENGES AHEAD

Wisconsin’s water supply infrastructure—like the rest of the nation’s—is aging. Citizens and communities face steep costs to maintain and upgrade the wells, pumps, pipes, and treatment facilities needed to bring drinking water to our homes and businesses every day.

EPA periodically conducts a Drinking Water Infrastructure Needs Survey and Assessment to quantify the nationwide need. The most recent information

comes from the 2015 survey. Nationally, an estimated \$472.6 billion are needed to meet the nation’s drinking water infrastructure needs between 2015 and 2034.



The price tag for Wisconsin was estimated to be over \$8.5 billion. Here's how that bill breaks down:

- \$5.3 billion—Distribution and transmission needs—includes replacing water mains, eliminating stagnant areas and dead end mains, installing and rehabilitating pumping stations to maintain adequate water pressure, installing and replacing water meters and installing backflow prevention to protect against contamination.
- \$1.6 billion—Treatment needs—constructing and rehabilitating treatment processes like disinfection, contaminant removal, filtration, and removal of objectionable secondary contaminants, along with the 'advanced' processes employed by systems using surface water sources.
- \$2.39 billion—Collective needs of Wisconsin's largest community water systems, serving populations greater than 100,000 (4 water systems statewide).
- \$3.9 billion—Needs of the state's community water systems serving 3,300 to 100,000 people (174 of Wisconsin's 1,055 community water systems serve populations in this range).
- \$1.7 billion—Needs of Wisconsin's smallest community water systems, serving fewer than 3,300 people (877, or 83 percent, of Wisconsin's community water systems serve small populations).
- \$612 million—Needs of the not-for-profit, non-community water systems in the state.

EPA is conducting the next Drinking Water Infrastructure Needs Survey and Assessment during 2021 and is expanding the survey to address several new issues that are very relevant for Wisconsin.

- EPA plans to assess the needs of two groups of small water systems: community water systems serving populations less than 3,300 people and non-profit non-community water systems. Most of Wisconsin's community water systems serve very small populations, and our state has the largest number of non-profit non-community water systems in the nation.
- Water systems will estimate the number of lead service lines (both publicly and privately owned) they have and the cost per LSL replacement. EPA will also gather data about water systems' policies regarding LSL replacement.
- For the first time, EPA will collect data about workforce issues. The operator workforce is aging, and information from the needs survey will address concerns about upcoming retirements and how to ensure an adequate workforce for the future.

Physical infrastructure is not the only need, though. Drinking water programs nationwide are struggling to do more with less. Funding levels for public water programs have remained flat for more than a decade. Over the same time, though, DNR and other state agencies have taken on more work to meet their responsibilities for implementing the SDWA and to address new issues like emerging contaminants. Nationally, there is a 40 percent gap between current funding and staffing levels and what states need to address all the challenges facing public water systems.

DNR is committed to protecting the state's drinking water and public health today and into the future. Although the future holds numerous challenges, many partners—including public water system owners and operators, water industry professionals, training and technical assistance providers and other agencies—are critically important in working toward this goal.

APPENDIX A. Maximum permissible levels of contaminants in drinking water

The tables in this appendix show the Maximum Contaminant Levels (MCLs) for the various groups of regulated drinking water contaminants.

Table A-1. MCLs for microbial contaminants	
contaminant	MCL
<i>Escherichia coli</i> bacteria	<p>MCL exceedance can occur in several ways:</p> <ul style="list-style-type: none"> • <i>E. coli</i>-positive repeat sample following a total coliform-positive routine sample. • Total coliform-positive repeat sample following an <i>E. coli</i>-positive routine sample. • Failure to collect all required repeat samples following an <i>E. coli</i>-positive routine sample. • Failure to test for <i>E. coli</i> after a total coliform-positive repeat sample.

Table A-2. MCLs for inorganic contaminants					
contaminant	MCL (mg/L)	contaminant	MCL (mg/L)	contaminant	MCL (mg/L)
Antimony	0.006	Chromium	0.1	Nickel	0.1
Arsenic	0.01	Copper	1.3 is Action Level*	Nitrate	10
Asbestos (fiber length >10 microns)	7 million fibers/L	Cyanide	0.2	Nitrite	1
Barium	2	Fluoride	4	Total Nitrate & Nitrite	10
Beryllium	0.004	Lead	0.015 is Action Level*	Selenium	0.05
Cadmium	0.005	Mercury	0.002	Thallium	0.002

* Exceeding an action level is not a violation; it requires water systems to take additional steps and employ techniques to control the corrosiveness of water.

Table A-3. MCLs for radionuclides	
contaminant	MCL
Gross alpha particle activity	15 picocuries per liter
Radium-226 and Radium-228	5 picocuries per liter
Uranium	30 micrograms per liter

Table A-4. MCLs for disinfectants and disinfection byproducts			
DISINFECTION BYPRODUCTS		RESIDUAL DISINFECTANTS	
contaminant	MCL (mg/L)	disinfectant	MRDL * (mg/L)
Bromate	0.01	Chloramines (as Cl ₂)	4
Chlorite	1	Chlorine (as Cl ₂)	4
Haloacetic Acids	0.06	Chlorine dioxide (as ClO ₂)	0.8
Total Trihalomethanes	0.08	* MRDL = maximum residual disinfectant level	

Table A-5. MCLs for organic contaminants					
SYNTHETIC ORGANIC CONTAMINANTS (30 contaminants in group)					
contaminant	MCL (mg/L)	contaminant	MCL (mg/L)	contaminant	MCL (mg/L)
2,4-D	0.07	Dibromochloropropane	0.0002	Hexachlorobenzene	0.001
2,4,5-TP	0.05	Dinoseb	0.007	Hexachlorocyclopentadiene	0.05
Alachlor	0.002	Dioxin	3 x 10 ⁻⁸	Lindane	0.0002
Atrazine	0.003	Diquat	0.02	Methoxychlor	0.04
Benzo(a)pyrene	0.0002	Endothall	0.1	Oxamy	0.2
Carbofuran	0.04	Endrin	0.002	PCBs	0.0005
Chlordane	0.002	Ethylene Dibromide	0.00005	Pentachlorophenol	0.001
Dalapon	0.2	Glyphosate	0.7	Picloram	0.001
Di(2-ethylhexyl)adipate	0.4	Heptachlor	0.0004	Simazine	0.004
Di(2-ethylhexyl)phthalate	0.006	Heptachlor epoxide	0.0002	Toxaphene	0.003
VOLATILE ORGANIC CONTAMINANTS (21 contaminants in group)					
contaminant	MCL (mg/L)	contaminant	MCL (mg/L)	contaminant	MCL (mg/L)
Benzene	0.005	1,2-Dichloroethylene,trans	0.1	Toluene	1
Carbon Tetrachloride	0.005	Dichloromethane	0.005	1,2,4 Trichlorobenzene	0.07
o-Dichlorobenzene	0.6	1,2-Dichloropropane	0.005	1,1,1-Trichloroethane	0.2
p-Dichlorobenzene	0.075	Ethylbenzene	0.7	1,1,2 Trichloroethane	0.005
1,2-Dichloroethane	0.005	Chlorobenzene	0.1	Trichloroethylene	0.005
1,1-Dichloroethylene	0.007	Styrene	0.1	Vinyl Chloride	0.0002
1,2-Dichloroethylene,cis	0.07	Tetrachloroethylene	0.005	Xylenes (Total)	10

Table A-6. Secondary drinking water standards

Water containing inorganic chemicals in quantities above these limits is not hazardous to health but may be objectionable.

chemical	standard (mg/L)	chemical	standard (mg/L)
Aluminum	0.05 to 0.2	Iron	0.3
Chloride	250	Manganese	0.05
Color	15 units	Odor	3 (threshold number)
Copper	1	Silver	0.1
Corrosivity	Noncorrosive	Sulfate	250
Fluoride	2	Total Dissolved Solids (TDS)	500
Foaming agents	0.5	Zinc	5
Hydrogen Sulfide	Not detectable		

APPENDIX B. Summary of violations of drinking water requirements during 2020

The following tables summarize violations during 2020 at all of Wisconsin’s public water systems. The tables include violations of contaminant standards, monitoring and reporting requirements, treatment technique requirements, and notification requirements.

Table B-1. Maximum Contaminant Level violations during 2020						
contaminant	number of water systems with violations					number of violations
	total systems*	MC	OC	NN	TN	
MICROBIAL CONTAMINANTS	21	0	0	3	18	22
Total coliform bacteria					5	6
<i>E. coli</i> bacteria				3	13	16
INORGANIC CONTAMINANTS	48	4	6	19	19	109
antimony				1	n/a	7
arsenic		1	1	12	n/a	67
nitrate		3	5	6	19†	35
RADIONUCLIDES	15	13	2	n/a	n/a	297
combined radium 226+228		12	1			171
gross alpha particle activity		2				121
combined uranium			1			5
DISINFECTION BYPRODUCTS	2	2	0	0	n/a	3
total trihalomethanes		2				3
VOLATILE ORGANIC CONTAMINANTS	2	1	0	1	n/a	7
benzene		1				5
trichloroethylene				1		2
Overall totals	87	19	8	23	37	438
* Some water systems may have multiple violations within a contaminant group or violations in multiple categories.						
† An additional 227 TN systems were operating with nitrate levels above the MCL of 10 mg/L but below 20 mg/L.						

Table B-2. Monitoring and reporting violations during 2020						
contaminant	number of water systems with violations					number of violations
	total systems*	MC	OC	NN	TN	
MICROBIAL CONTAMINANTS	424	7	35	42	340	543
Ground Water Rule		1	7		40	51
Total Coliform Rule					5	5
Revised Total Coliform Rule monitoring		6	31	42	294	469
Revised Total Coliform Rule reporting					16	18
INORGANIC CONTAMINANTS	381	78	31	127	145	492
arsenic		9	1	5	n/a	21
lead and copper		61	21	110	n/a	261
nitrate and nitrite		17	11	21	145	214 (238 individual contaminants)
other inorganic contaminants (13 contaminants in group)		12	3	6	n/a	26 (342 individual contaminants)
RADIONUCLIDES	20	16	4	n/a	n/a	33 (114 individual contaminants)
DISINFECTANTS & DISINFECTION BYPRODUCTS	43	35	5	3	n/a	51
residual disinfectants		5	3	1		9
disinfection byproducts		30	2	2		42 (75 individual contaminants)
SYNTHETIC ORGANIC CONTAMINANTS (30 contaminants in group)	7	5	0	2	n/a	9 (115 individual contaminants)
VOLATILE ORGANIC CONTAMINANTS (21 contaminants in group)	15	9	0	6	n/a	19 (419 individual contaminants)
Overall totals	743	118	64	157	404	1,147
*Some water systems may have multiple violations within a contaminant group or violations in multiple contaminant groups.						

Table B-3. Treatment technique violations during 2020

contaminant	number of water systems with violations					number of violations
	total systems*	MC	OC	NN	TN	
MICROBIAL CONTAMINANTS	77	14	10	2	51	102
Ground Water Rule	28	12	8	1	7	38
Revised Total Coliform Rule	49	2	2	1	44	64
INORGANIC CONTAMINANTS	17	9	3	5	n/a	18
Lead and Copper Rule	17	9	3	5		
DISINFECTANTS & DISINFECTION BYPRODUCTS	15	11	1	3	n/a	15
Overall totals	107	33	13	10	51	135

*Some water systems may have violations in multiple categories.

Table B-4. Notification and other violations during 2020

requirement	number of water systems with violations					number of violations
	total systems*	MC	OC	NN	TN	
Consumer Confidence Report	33	16	17	n/a	n/a	34
Ground Water Rule	14	6			8	15
Public Notice	819	61	56	72	630	1,523
Overall totals	850	78	64	72	636	1,572

*Some water systems may have multiple violations within this group.

Table B-5. Public water system compliance with all requirements during 2020

water system type	total number of systems	number of systems complying with all requirements	percent of systems complying
MC	611	433	70.87%
OC	433	319	73.67%
NN	931	711	76.37%
TN	9,277	8,315	89.63%
Overall totals	11,252	9,778	86.90%

APPENDIX C. Communities receiving Safe Drinking Water Loan Program funding for drinking water projects during 2020

community	principal forgiveness funding	loan funding	total funding	project description
Arlington (village)	\$0	\$923,860	\$923,860	Water main replacement along Main St (STH 60)
Clintonville (city)	\$344,806	\$421,428	\$766,234	Water main replacements on Robert St and 12th St
Crandon (city)	\$206,906	\$252,883	\$459,789	Water main replacements on West Madison St, South Metonga Ave, North Boulevard Ave and West Jackson St
Eau Claire (city)	\$0	\$11,174,785	\$11,174,785	Water treatment plant improvements, including the addition of rapid mixing; four-stage flocculation and plate settlers; improvements to chemical pretreatment; construction of a shop area, electrical room and lime/polymer feed room; and valve and piping improvements to sludge pump building
Gresham (village)	\$362,307	\$241,538	\$603,845	Water main replacements on Schabow and Industrial streets
Milwaukee (city)	\$0	\$28,562,461	\$28,562,461	Rehabilitation of east ground steel storage tank at Lincoln Booster Station; rehabilitation of Linnwood north buried filtered water reservoir; and water main replacements at various locations
Mineral Point (city)	\$0	\$827,631	\$827,631	Replacement and upsizing of water mains on Iowa, Decatur and Pine streets
Mishicot (village)	\$0	\$446,648	\$446,648	Water main replacements on East Church St between STH 147 and CTH B
New Auburn (village)	\$181,617	\$423,773	\$605,390	Water main replacements on Main St, Columbia St and Dell St
Ridgeway (village)	\$266,938	\$622,856	\$875,071	Water main replacements on Farwell St, South Weaver St, North St, Level St and South St
Shelby Sanitary District #2	\$500,000	\$1,228,688	\$1,728,688	Construction of test well, final well, well house, hydropneumatic tank, chemical addition, connecting main, generator and discharge piping for well #2 in the Arbor Hills pressure zone
Stoddard (village)	\$0	\$837,054	\$837,054	Water main replacements on STH 35, Badger St, Division St, Broadway St, School St, STH 62, Cottage St and Proksch Coulee Rd

community	principal forgiveness funding	loan funding	total funding	project description
Wausau (city)	\$500,000	\$44,756,287	\$45,256,287	Construction of new water treatment plant (WTP) and work at wells 3, 6, 7, 9, 10 and 11 to accommodate new hydraulic conditions; necessary water main extensions to connect new WTP to the wells; and rehabilitation of portions of existing raw water main for use as finished water main
Woodville (village)	\$273,393	\$334,147	\$607,540	Construction of well #3, wellhouse, discharge piping and connecting water main, including test well, auxiliary power, SCADA, chemical equipment and abandonment of well #1
Total 2020 funding	\$2,635,967	\$91,054,039	\$93,675,283	