



2014 Annual Drinking Water Report Wisconsin's Public Water Systems

**Bureau of Drinking Water and Groundwater
Wisconsin Department of Natural Resources**



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Executive Summary

Wisconsin's drinking water remained safe and affordable in 2014 due to strong efforts and partnerships among local water suppliers, the state, professional associations, consultants and others working on safe drinking water issues. On average, Wisconsin residents pay \$5.50 for 1,000 gallons of tap water—mere fractions of a penny per gallon according to the state Public Service Commission.

- Public water systems continued their strong performance with 95.5 percent, or 10,904 of 11,420 systems, meeting all health-based standards for regulated contaminants. This is the same proportion as Wisconsin achieved in 2013.
- Bacterial contamination again ranked as the most common health-based violation, followed by violations for nitrates and radioactivity. A violation of a health-based standard does not mean that people who drank the water experienced adverse health effects; it means users were exposed to what the U.S. Environmental Protection Agency (EPA) has determined to be an unreasonable risk of illness, or that the system failed to treat its water to the extent necessary.
- Monitoring and reporting (M/R) violations represent the area where public water system performance needs the most improvement, which is a continuing challenge. In 2014, Wisconsin Department of Natural Resources (DNR) staff worked to address 777 M/R violations, compared with 535 in 2013. Many of these violations (372) resulted from failure to notify customers of their lead and copper monitoring results. DNR continues working with public water systems through assistance from staff, contractors and county contacts to ensure that water samples are collected in the required time frames and public notices are issued correctly.
- Fewer formal enforcement actions were needed in 2014. This improvement is partly due to DNR's work in previous years establishing long-term agreements with several public water systems for correcting their violations.
- Thirty-one communities received more than \$52 million in assistance for drinking water system infrastructure improvements, of which \$46.2 million was low interest loans. These low interest loans can provide a cost savings of up to 30 percent to communities, enabling them to address challenges more quickly and economically.

Introduction

Wisconsin, like the United States in general, enjoys some of the cleanest drinking water in the world.

People can turn on the tap, fill a glass, and drink water without thinking twice, a testament to the state's glacial legacy of abundant fresh water, strong state and federal regulations, and the cooperative efforts of public water systems, trade associations, individual operators, county health officials, EPA, and DNR staff, among others.

Wisconsin and other states are required to report annually on how well public water systems—those which regularly serve at least 25 people 60 days of the year—meet federal standards for providing citizens with safe drinking water.

Wisconsin has 11,420 public water systems ranging from those serving small restaurants and gas stations up to the largest cities such as Madison and Milwaukee. The DNR Bureau of Drinking Water and Groundwater oversees them.

This report summarizes performance of the state's public water systems between January 1, 2014 and December 31, 2014. It documents that the vast majority of public water systems are providing safe drinking water to their customers. It highlights compliance with drinking water standards and state and local efforts to assure a safe, adequate supply of drinking water.

The report also details violations for systems that failed to collect and report the results of



required samples, sample results that exceeded safe drinking water standards, and public water systems that failed to use proper treatment techniques.

The report also details violations for public water systems that failed to notify their customers or produce and distribute an annual water quality report as required.

Safe Drinking Water Act

Under the Safe Drinking Water Act (SDWA), passed by Congress in 1972 and amended several times since, the EPA sets national limits for several groups of bacteriological and chemical contaminants in drinking water. These limits, health-based standards known as Maximum Contaminant Levels (MCLs), are specific for each contaminant.

Federal law details how frequently a public water system must test for contaminants and report results to the state or EPA. These testing or “monitoring” requirements vary according to system type, population served, vulnerability of the water source to contamination, and results of previous monitoring. To help the agency set new health-based standards, EPA also requires public water systems serving more than 10,000 people to monitor for additional unregulated contaminants of concern.

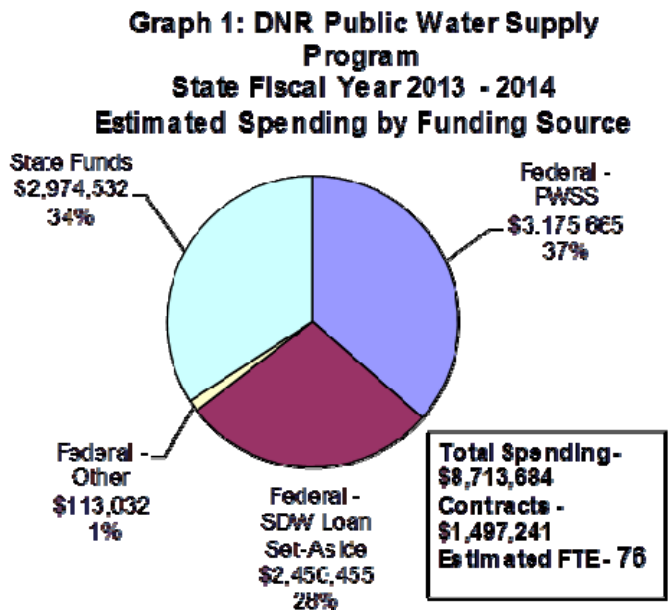
State primacy for the Safe Drinking Water Act

Under the SDWA, EPA may grant states authority to implement the program for their public water systems. Wisconsin has such authority or “primacy.” The DNR Drinking Water and Groundwater staff carry out the program. DNR staff maintain an inventory, review monitoring results, and conduct inspections to make sure public water systems meet of the SDWA. DNR staff also provide technical help to public water system owners and operators, review construction plans for public water systems, and coordinate formal enforcement to address significant violations when necessary. DNR also provides opportunities for communities to obtain low-interest loans

to help them improve or expand their public water systems.

Public Water Supply program funding

The public water supply program receives funding from several sources including federal and state governments (see Graph 1).



In 2014, DNR had the equivalent of 76 full-time staff working with the states 11,420 public water systems. Seventeen percent of the total budget went to contracts with organizations, colleges, county health departments and consultants for training and technical help.

Four types of public water systems

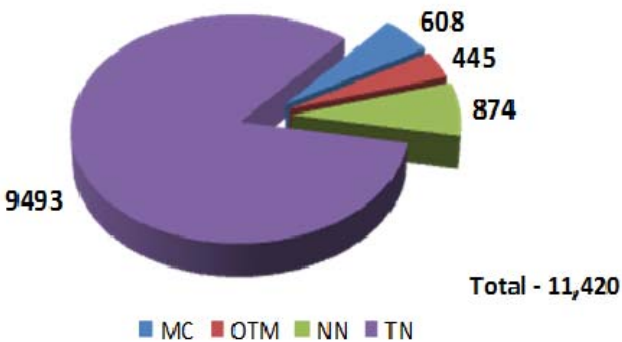
EPA and DNR define public water systems as those providing water for human consumption via piping to at least 15 service connections or regularly serving an average of at least 25 people a day for at least 60 days per year. There are four types of public water systems:

- **Municipal Community (MC) systems** are owned by cities, villages and sanitary districts and regularly serve at least 25 year-round residents.
- **Other Than Municipal Community (OTM) systems** are not publicly owned but regularly serve at least 25 year-round residents. These include mobile home parks, apartment buildings and condominiums.

- **Non-transient Non-community (NN) systems** regularly serve at least 25 of the same people six months of the year. They include schools, day care centers, and factories.
- **Transient Non-community (TN) systems** serve at least 25 people at least 60 days of the year. These include motels, restaurants, parks, taverns, churches, and campgrounds.

Graph 2 shows the breakdown of Wisconsin's 11,420 public water systems. By far, the state's 9,493 TN systems make up the largest category. However, the state's 608 municipal systems serve the most people, more than 60 percent of the population.

Graph 2: Number and Types of Public Water Systems in Wisconsin



Source and cost of water

The vast majority of Wisconsin's public water systems rely on groundwater as their water source. But the 58 systems that rely on lakes to provide their drinking water serve some of the state's biggest communities, including Milwaukee and Green Bay. Such "surface water" systems serve 1.9 million people, while groundwater systems serve about 3.1 million. The DNR tracks the amount of water pumped at Wisconsin's municipal water systems, which reached over 171 billion gallons in 2014 (Table 1).

Table 1: Water Use by Source		
Water pumped annually	Surface water	Groundwater
Gallons	74,021,965,543	97,330,710,811
Total	171,352,676,354	

Tap water for customers served by public water systems is a real bargain. On average, Wisconsin residents pay \$5.50 for 1,000 gallons of tap water—mere fractions of a penny per gallon.

Water Testing Differs by System

The SDWA mandates that public water systems collect water samples, test them, and report results to customers and the state. The specific contaminants monitored differ by water system type, population served, and whether the water source is a groundwater aquifer, lake or river.

How frequently water samples are collected and tested depends on the system type, the contaminants' characteristics and their risk to human health. For example, bacteria and nitrate pose a short-term risk to human health – people can become ill within hours or days of exposure. All public water systems must monitor for these acute contaminants. The largest public water systems collect hundreds of water samples every month while the smallest test once a year.

Contaminants that pose a long-term health risk are called chronic contaminants. Their maximum permissible levels in water are risk-based and are typically set so that 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. Chronic contaminants are monitored less frequently, and the smallest systems, the TNs do not test for chronic contaminants.

Regulated contaminants fall into several groups based on their characteristics. The categories of regulated contaminants are:

- Total coliform
- Nitrate
- Inorganic chemicals (IOCs);
- Volatile organic chemicals (VOCs);
- Synthetic organic chemicals (SOCs);
- Radionuclides
- Lead

Drinking Water News on Tap

Celebrating 40 Years of Safe Drinking Water

Every day millions of Wisconsinites experience something amazing -- and likely never think twice about it. They turn on their faucets, drink from a water fountain, bake bread or brew beer and, seemingly without effort, are provided with safe drinking water. 2014 marked the 40th anniversary of the Safe Drinking Water Act (SDWA), which assures that customers can draw water from any public water supply in the nation and know that it meets established drinking water standards. We enjoy the cleanest drinking water in the world. That's amazing in a world where 1 billion people still must walk on average 3.5 miles to get water—and can't be sure it's safe to drink.

Providing safe drinking water has been a collaborative effort between local operators, public utilities, county health officials, federal and state drinking and groundwater staff, association staff, testing laboratories and consultants, to name a few. Through these efforts safe drinking water is an amazing value - a mere fraction of the cost of bottled water.

Over the years, changes in the SDWA have facilitated a long-term approach for providing and protecting safe drinking water. EPA has provided over \$26 billion in state revolving loans to fund more than 10,000 projects since 1997. Wisconsin's community water systems and not-for-profit non-community water systems will need to invest an estimated \$6.2 billion before 2027 to continue providing safe and adequate supplies of drinking water.

In addition, the original Safe Drinking Water Act did not address source water protection, focusing only on the water that came out of customer's taps. But the 1996 Safe Drinking Water Act amendments made sure states assessed their drinking water sources and took steps to protect them from potential contaminant sources.

We have made great progress over the past 40 years, but many challenges remain. Looking toward the future, plans include integrating work across the Clean Water Act and the Safe Drinking Water Act. EPA is promoting integrated planning so cities can sequence wastewater and stormwater projects to get the biggest bang for their buck. Working together, the Safe Drinking Water Act will protect future generations for decades to come.

- Copper
- Disinfection by-products
- Groundwater Rule

Appendix A, page 15, contains a list of regulated contaminants and their health-based standards, or MCLs.

Each category may include multiple contaminants. For instance, “synthetic organic chemicals” include 30 different substances. Municipal systems, which test for the most contaminants, test for over 90 regulated contaminants to protect public health.

EPA also sets aesthetic or “secondary” standards for certain contaminants. These substances may cause an unpleasant smell, taste, appearance, or stain sinks or discolor clothes when they exceed certain levels. Public water systems may be required to take corrective actions if they exceed secondary standards for contaminants such as manganese, iron, copper and sulfate.

EPA is responsible for establishing drinking water standards for new contaminants that may pose a health risk. To understand their prevalence nationally, EPA requires certain public water systems to test for molybdenum, norovirus, and oth-



*Leaking buried storage tanks are a major source of **volatile organic chemicals**; 59 different VOCs have been found in Wisconsin groundwater, which is the water source for most public water systems. Pesticides and nitrates are other top threats to ground-water quality.*

er compounds under the Unregulated Contaminant Monitoring Rule.

2014 Compliance Rates Strong

The vast majority of Wisconsin’s public water systems met all SDWA requirements: they collected water samples, tested them for the appropriate contaminants, reported the results, and did not exceed health-based standards. They also used appropriate treatment techniques and delivered Consumer Confidence Reports to their customers. Table 2 outlines how well public water systems complied with SDWA requirements in 2014, and Appendix B contains additional detail on violations that occurred during the year.

Table 2: Water systems’ compliance with SDWA Requirements--percent systems in compliance			
Water System Type	Type of Requirement		
	MCL (water samples met all health standards)	Monitoring/ Reporting	Treatment Technique
Municipal	92.8%	70.1%	99%
OTM (condos, mobile home parks, etc. with own water supply)	93.7%	70.1%	99%
Nontransient Non-community (schools, day care centers, etc. with own water supply)	93.6%	73.6%	99%
Transient Noncommunity (restaurants, taverns, churches, with own water supply)	95.9%	97.5%	100%

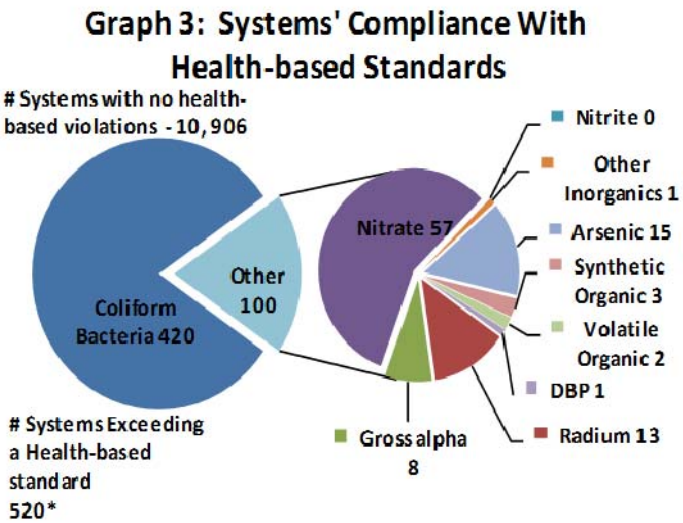
The performance of Wisconsin’s public water systems has been consistently strong since the 1980s. This achievement is especially important because SDWA requirements for most systems have increased, as EPA has implemented new regulations over the years. Meeting the monitoring and reporting requirements continues to be the area needing most improvement. Failing to test drinking water and report results is a

concern, because customers don't know if their drinking water meets the standards for quality.

Health-based violation summary

The most serious violations of the SDWA occur when contaminants are detected in water samples and exceed the MCL thresholds. A MCL violation does not mean that people who drank the water experienced adverse health effects. It means that the drinking water contained a contaminant at a higher concentration than what EPA has determined is allowable to protect human health.

During 2014, 95.5 percent of the state's public water systems—or 10,906 of 11,420—served water to their customers without exceeding any of the MCL standards for regulated contaminants (Graph 3).



*Several systems exceeded the MCL for both Radium and Gross Alpha, and are included in each category.

The remaining 4.5 percent, or 520 public water systems, collected water samples that exceeded the MCL for at least one contaminant. Of these, the state's smallest systems—TN systems—accounted for about 75 percent of the health-based violations. This group includes motels, restaurants, parks, taverns, churches, and campgrounds. Appendix C contains details of specific contaminants detected in water samples during 2014.

Bacterial violations top list again

In 2014, as in the past, the most MCL violations resulted because coliform bacteria were detected in drinking water. Public water systems collected a total of 78,546 samples for bacteriological analysis, and 3.7 percent, or 420 of the 11,420 public water systems reported results that exceeded the MCL. (Table 3), which is slightly more than the number in 2013. Those 420 systems serve an estimated 92,290 people.

Table 3: Systems Exceeding Bacteria Standards		
System Type	# Systems Exceeding the Bacteria Standard (MCL)	% Systems Exceeding the Bacteria Standard (MCL)
Municipally owned (Cities, villages, sanitary districts)	26	4.3%
Other-than-Municipal (mobile home parks, condo associations, etc. with own water supply)	11	2.5%
Non-transient non-community (schools, day cares, factories, etc. with own water supply)	32	3.7%
Transient non-community (Motels, taverns, restaurants, etc. with own water supply)	351	3.7%
TOTAL	420	3.7%

Coliform bacteria are microscopic organisms that can be found in human and animal waste, in soil, on plants, and in runoff. Coliform bacteria in water indicate that other bacteria, viruses and parasites that can cause illness may also be present. Such contaminants are a concern because people can become ill after just one exposure to water containing some kinds of microorganisms. Conversely, public water systems can usually address these problems quickly.

Most of the violations (351) occurred at the smallest public water systems, the TNS (motels, restaurants, parks, taverns, churches, and campgrounds). Bacterial MCL violations occurred at 3.7% of the transient non-community water systems.

- **Nitrate MCLs**

Public water systems reported 57 nitrate MCL violations in 2014, second only to bacteriological violations. This is a slight increase over the total reported in 2013. The contaminant poses an acute health risk to infants six months and younger and women who are or may become pregnant, and a longer term health threat to the general population.

- **Radioactivity MCLs**

In 2014, 15 community water systems served water that exceeded the combined radium standard and/or the gross alpha standard for at least part of the year, making this the third most prevalent MCL violation.

People exposed over their lifetime to drinking water with elevated radioactivity levels run a greater risk of developing bone cancer. Radium is a naturally occurring contaminant present in groundwater aquifers.

- **Contaminant trends over time**

Over the past seven years, 2.6-3.7% of Wisconsin's public water systems have incurred violations of the bacteria standards. This has consistently been the top health-related priority for DNR and public water systems, since bacteriological contamination represents an acute health risk. It will remain a top concern.

DNR has been working with public water systems that exceed the MCLs for radium and arsenic for several years. Many public water systems have taken action to address these violations, including installing treatment systems, reconstructing wells, or finding alternative water sources that meet the SDWA standards for these contaminants. As a result of

these efforts, most public water systems are now in compliance with these standards, and DNR will be able to focus efforts on other areas of concern. DNR will continue to address new MCL arsenic and radioactivity violations as they are identified.

Research and monitoring results suggest that DNR will need to focus on nitrates and viruses as the next high priority contaminants of concern. The Wisconsin Department of Health Services has notified DNR that adverse health effects may result from long-term exposure (a year or more) to drinking water with nitrate levels exceeding the MCL. Working with public water systems to reduce nitrate levels below the MCL will continue to be a priority for DNR.

Monitoring and reporting violations

EPA specifies the water testing methods that public water systems must use and sets schedules for monitoring frequency and reporting results. A public water system that does not follow the schedule or use appropriate methods incurs a violation.

States must report M/R violations when samples are not taken or results are not reported during a compliance period. The Surface Water Treatment rule sets monitoring requirements for public water systems using lakes or rivers, or groundwater directly influenced by surface water as a source.



Monitoring public water systems for contaminants is the foundation for safe drinking water. States must report significant monitoring violations, which occur when no samples are taken, or results are not reported.

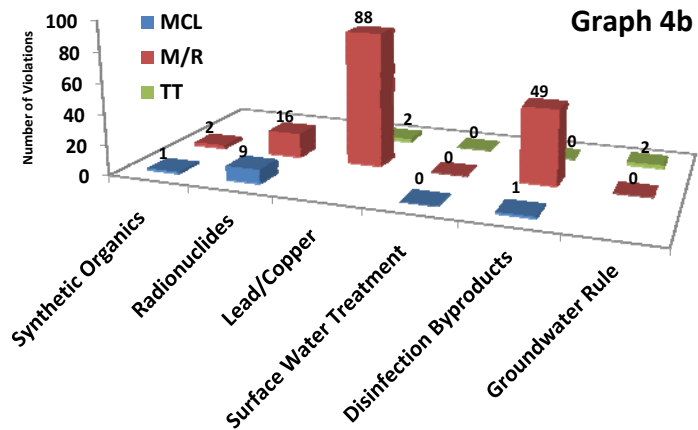
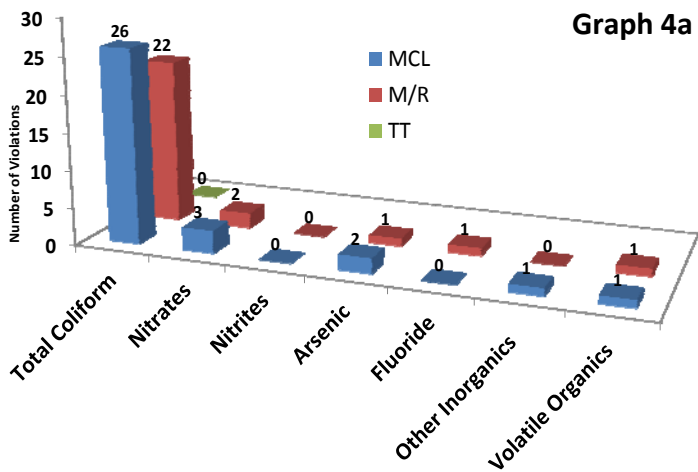
A major M/R violation of the Surface Water Treatment Rule occurs when a public water system fails to collect at least 90 percent of the required samples for turbidity and disinfectant residuals.

Failure of a system to notify customers of their lead and copper compliance monitoring results is also a M/R violation. In 2014, 372 public water systems incurred this violation.

During 2014, overall compliance for municipal water systems was very good, with about 96 percent complying with all monitoring requirements (Graph 4 a-b). Performance for these systems has historically been quite high.

Graph 4 a-b: Violations by Contaminant Group — Municipal Systems

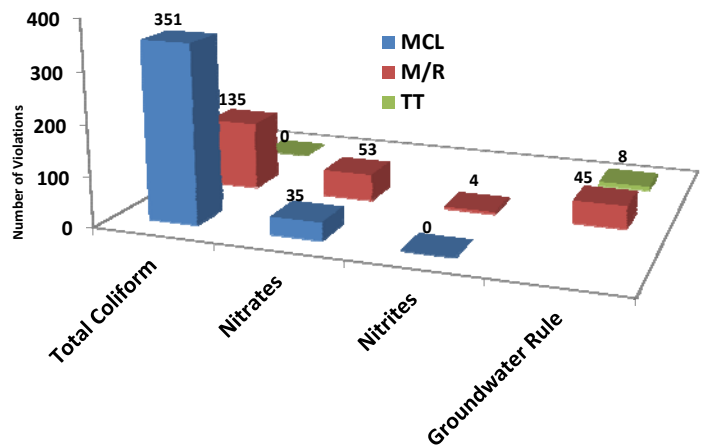
Total Number of MC Systems = 230



The compliance rate for transient non-community systems shows improvement over previous years. Only 1.4% of these systems incurred M/R violations for failing to monitor for bacteria, and fewer than 1% failed to collect nitrate samples, in 2014 (Graph 5). The DNR will continue to provide technical assistance to small public water system to improve their compliance with M/R requirements.

Graph 5: Violations by Contaminant Group — Transient Noncommunity Systems

Total Number of TN Systems = 631



Treatment technique violations

Treatment technique violations (TT) occur when a public water system fails to use a mandated process. TT violations represent an increased risk since customers can't be sure that their water was treated to adequately reduce exposure to a contaminant.

Wisconsin's public water systems reported 20 treatment technique violations in 2014.

Public notice violations

Public notification is required by federal and state regulations, and is key to informing and protecting the public. If a public water system exceeds a contaminant MCL, fails to properly treat its water, or does not monitor according to the prescribed schedule, it must notify its customers and correct the problem.

Public water system operators must inform their customers of the nature of the violation, corrective actions that are being taken, potential health effects, and any preventative measures consumers should take, including using bottled water or boiling their water. Public notices can be done using radio or television, e-mail, newspapers, door-to-door notification, or inserts in water bills. Public water systems that exceed a bacteriological MCL must notify the public within 24 hours.

In 2014, 3,097 public water systems had violations of the public notice requirements. Most of the violations involved the failure to monitor for chronic chemicals, the lowest risk level of the three tiers of violations.

Consumer confidence report violations

All community water systems are required to provide customers with a Consumer Confidence Report (CCR) by July 1 of each year. The report outlines results of all water quality monitoring and any violations of SDWA requirements during the previous calendar year. In 2014, the vast majority of Wisconsin's community water systems met this reporting requirement: 1,009 of 1,053 systems, or about 96 percent, submitted CCRs on time.

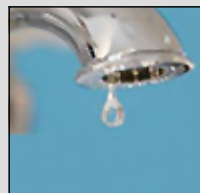
Enforcement actions in 2014

When problems occur, DNR staff try to resolve them as quickly and informally as possible to protect public health. Most problems are resolved when DNR staff send a public water system written notification of a violation. Table 4 shows a history of violation actions over the past 5 years.

Table 4: Violation Actions			
Year	Total Violations	Informal Actions	Formal Actions
2010	1,268	2,985	91
2011	1,118	2,437	163
2012	940	2,171	74
2013	1,262	2,469	47
2014	1,325	2,690	21

What's in My Water?

Every year Wisconsin's community water systems (those that serve residents) must provide each customer with a Consumer Confidence Report.



This report details contaminants detected in the water, health effects, and treatment methods. If you didn't receive a report, contact your water system or generate your own:

<http://dnr.wi.gov/topic/DrinkingWater/CCR.html> or search "CCR" on the DNR web page

In 2014, there were 777 monitoring and reporting violations, compared to 535 in 2013. This includes 372 M/R violations for failure to notify customers of their lead and copper monitoring results. DNR will continue to work with public water systems through contractors and county agencies to reduce the number of M/R violations. DNR developed long-term agreements for correcting MCL violations at several public water systems in 2013. Since these agreements were in place, no further enforcement actions were necessary in 2014.

DNR follows a stepped enforcement process designed to resolve violations as soon as possible.

- **Informal actions 2014**

DNR issued 2,690 Notices of Non-compliance, which informed public water systems about failure to report sample results or other information required by the SDWA, or that test results exceeded a drinking water standard.

DNR sent 125 Notice of Violation letters, requiring public water system owners to meet with DNR drinking water and enforcement staff to discuss corrective actions and a timetable for returning the system to compliance.

DNR held 75 enforcement conferences to develop written documents that establish actions and timelines necessary for public water systems to return to compliance.

- **Formal actions 2014**

DNR developed 21 formal written documents that established actions and time lines necessary for a public water system to return to compliance. Here is the breakdown of those numbers:

- ⇒ 19 Administrative Penalty Orders outline requirements for returning to compliance and assess forfeitures.
- ⇒ 2 cases referred to Department of Justice for further enforcement. DNR follows a stepped enforcement process designed to resolve violations as soon as possible.

DNR Helps Provide Safe Water

DNR is committed to supporting public water systems in providing safe drinking water. A variety of activities help public water systems meet requirements of the SDWA.

Technical assistance — The DNR works with contractors who provide technical help over the telephone, via e-mail and in person. NN and OTM systems receive quarterly calls reminding samplers about SDWA monitoring requirements that must be completed. When water quality problems occur, contractors also visit the site to help the operator investigate the problem and resolve it. Last year, contractors made 450 site visits to provide technical assistance to the states NN and OTM public water systems.

On-site help — In 2014, drinking water staff conducted 2,990 in-depth inspections of the water source, facilities, equipment, operation and maintenance at public water systems. Inspections are important prevention tools; they can help identify problems before a health-based violation occurs.

Vulnerability assessments — Every three years, drinking water staff evaluate well construction and potential contamination sources at the three largest categories of public water systems, those serving the same people most

often. DNR may reduce monitoring frequency when an assessment shows the public water system meets particular criteria. These reductions must be re-evaluated every three years. They significantly reduce monitoring costs, saving Wisconsin public water systems more than \$3 million per year.

Annual monitoring schedules — To promote timely monitoring and reporting, DNR sends annual monitoring letters and schedules to public water system operators detailing all sampling that must be completed for the year.

Protecting drinking water sources — Wellhead protection plans for municipal water systems have a goal of preventing groundwater pollution by minimizing potential sources of contamination near public water supplies. By the end of 2014, 391 municipal systems in Wisconsin had developed wellhead protection plans.

Financial assistance — The Safe Drinking Water Loan Program (SDWLP) makes funds available for infrastructure improvements in communities served by municipal water systems. During 2014, DNR's community financial assistance and drinking water staff awarded more than \$52 million to systems to help provide safe water to consumers at affordable prices. The financial assistance consisted of more than \$46.2 million in low interest loans and \$6.1 million in principal forgiveness (grants). Depending on interest rates, communities can save 20-30% with a low interest loan, compared to a market rate loan. Appendix D contains a list of all the communities receiving assistance.

Since the SDWLP began in 1998, 258 projects in Wisconsin have received more than \$522 million in loan and principal forgiveness funding. Some examples of how communities used funds to provide safe drinking water in 2014 include:

- The Village of Lena received \$3,285,288 to construct treatment at wells #1 and #2, install chemical feed equipment and make SCADA upgrades to remove radium.

- The City of Bayfield received \$661,884 to replace undersized water mains and services.
- The City of Milwaukee received \$8,548,447 for installation of new emergency backup power, chemical feed and ancillary operations at the Linnwood Treatment Plant.
- The Village of Spencer received \$1,093,568 for construction of a new well and transmission main to address bacterial contamination.
- The City of Prairie du Chien received \$503,175 to replace water mains, services and hydrants on Washington and Crawford Streets.

» Find a full listing in Appendix D on page 21



Drillers work to install a new well. The Safe Drinking Water Loan Program (SDWLP) makes funds available for infrastructure improvements in communities served by municipal water systems.



Partnering for safe drinking water

Safe drinking water results from a cooperative effort between public water systems, federal, state, and local agencies, trade associations, individual operators and DNR staff, among others.

In 2014, \$1.497 million, or 17 percent of the program's total \$8.7 million budget, went to contracts with trade associations, county health officials and consultants to help provide educational training and technical assistance to water system owners and operators.

These contract programs paid for:

- County health officials to collect the water samples required of churches, restaurants and parks, and other Transient Non-community Systems.
- Wisconsin Rural Water Association to help small public water systems by providing one-on-one technical assistance, training programs, and continuing education for certified operators.
- Helping Moraine Park Technical College to provide a Water Quality Technology degree program that offers training for new operators and continuing education opportunities for certified operators around the state.

Challenges for the future

Wisconsin's water supply infrastructure, like the nation's, is aging. Citizens and communities face a big bill to upgrade the pipes, pumps, and treatment systems necessary to bring safe water to our homes every day.

In 2011, EPA conducted the most recent Drinking Water Infrastructure Needs Survey and Assessment. Nationally, an estimated \$384 billion is needed to meet infrastructure needs between 2011 and 2031. EPA estimated the price tag for Wisconsin to be over \$7.1 billion. Here's how that bill breaks down:

- Over 60% of Wisconsin's needs (\$4.4 billion) are for distribution and transmission infrastructure.
- Our 20-year treatment needs will cost \$1.4 billion.
- The estimate for Wisconsin's largest community water system—those serving populations over 100,000 people—is more than \$1.7 billion in needs.
- Needs in community water systems that serve populations of 3,300-100,000 are estimated to be almost \$3.4 billion.
- The state's smallest community water systems—that serve populations below 3,300—are estimated at \$1.5 billion.
- The estimate to meet the needs of the state's not-for-profit non-community water systems is about \$550 million.

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Appendix A

Maximum Permissible Contaminant Levels for Drinking Water

MCL = Maximum Contaminant Level Violation - Contaminant level exceeds the maximum concentrations allowed in drinking water.

MRDL = Maximum Residual Disinfectant Level.

INORGANIC CONTAMINANTS	MCL (milligrams per liter or mg/L)	VOLATILE ORGANIC CONTAMINANTS	MCL (mg/L)	SYNTHETIC ORGANIC CONTAMINANTS	MCL (mg/L)
Antimony	0.006	Benzene	0.005	2,4-D	0.07
Arsenic	0.010	Carbon Tetrachloride	0.005	2,4,5-TP	0.05
Asbestos (fiber length >10 microns)	7 million fibers per liter	o-Dichlorobenzene	0.6	Alachlor	0.002
Barium	2	p-Dichlorobenzene	0.075	Atrazine	0.003
Beryllium	0.004	1,2-Dichloroethane	0.005	Benzo(a)pyrene	0.0002
Cadmium	0.005	1,1-Dichloroethylene	0.007	Carbofuran	0.04
Chromium	0.1	1,2-Dichloroethylene,cis	0.07	Chlordane	0.002
Cyanide	0.2	1,2-Dichloroethylene,trans	0.1	Dalapon	0.2
Fluoride	4.0	Dichloromethane	0.005	Di(2-ethylhexyl)adipate	0.4
Mercury	0.002	1,2-Dichloropropane	0.005	Di(2-ethylhexyl)phthallate	0.006
Nickel	0.1	Ethylbenzene	0.7	Dibromochloropropane	0.0002
Nitrate	10	Chlorobenzene	0.1	Dinoseb	0.007
Nitrite	1	Styrene	0.1	Dioxin	3x1 ⁻⁸
Total Nitrate & Nitrite	10	Tetrachloroethylene	0.005	Diquat	0.02
Selenium	0.05	Toluene	1	Endothall	0.1
Thallium	0.002	1,2,4 Trichlorobenzene	0.07	Endrin	0.002
		1,1,1-Trichloroethane	0.2	Ethylene Dibromide	0.00005
Lead & Copper	Action Level	1,1,2 Trichloroethane	0.005	Glyphosate	0.7
Lead	0.015	Trichloroethylene	0.005	Heptachlor	0.0004
Copper	1.3	Vinyl Chloride	0.0002	Heptachlor epoxide	0.0002
		Xylenes (Total)	10	Hexachlorobenzene	0.001
Radionuclides	MCL Picocuries per liter (pCi/L)			Hexachlorocyclopentadiene	0.05
Gross Alpha	15			Lindane	0.0002
Radium 226+228 (combined radium)	5	Disinfection Byproducts		Methoxychlor	0.04
Uranium	30 micrograms/l (ug/l)	Total Trihalomethanes	0.080	Oxamy	0.2
		Haloacetic Acids	0.060	PCBs	0.0005
		Bromate	0.010	Pentachlorophenol	0.001
		Chlorite	1.0	Picloram	0.001
				Simazine	0.004
				Toxaphene	0.003
		Residual Disinfectants	MRDL (mg/L)		
		Chlorine	4.0 as Cl ₂		
		Chloramines	4.0 as Cl ₂		
		Chlorine dioxide	0.8 (as ClO ₂)		

Appendix B

Number of Systems in Violation by System Type

Reporting period Jan. 1, 2014 to Dec. 31, 2014

MCL = Maximum Contaminant Level violation—contaminant level exceeds the maximum concentration allowed in drinking water.

M/R = Monitoring and Reporting violations—system fails to collect water samples and/or fails to report results.

TT = Treatment Technique violation—system fails to take measures to ensure control of a contaminant when there is no reliable method to measure a contaminant at particularly low concentrations.

	Municipal			Other-than-municipal			Non-transient Non-community			Transient Non-community			Totals
	MCL	M/R	TT	MCL	M/R	TT	MCL	M/R	TT	MCL	M/R	TT	
Total Coliform	26	22	0	11	15	0	32	31	0	351	135	0	623
Nitrates	3	2		8	2		11	3		35	53		117
Nitrites	0	0		0	0		0	0		0	4		4
Arsenic	2	1		3	0		10	0					16
Fluoride	0	1		0	0		0	0					1
Other Inorganics	1	0		0	0		0	1					2
Volatile Organics	1	1		0	0		1	2					5
Synthetic Organics	1	2		0	0		2	0					5
Radionuclides	9	16		6	0								31
Lead/Copper		88	2		115	1		186	13				405
Surface Water Treatment	0	0	0	0	0	0							0
Disinfection By-products	1	49	0	0	1	0	0	1	0				52
Groundwater Rule		0	2		0	2		7	0		45	8	64
Totals	44	182	4	28	133	3	56	231	13	386	237	8	1325

Appendix C

Drinking Water Violations by Contaminant Group

Reporting period Jan. 1, 2014 to Dec. 31, 2014

VOLATILE ORGANIC CONTAMINANTS	MCL (mg/L)	Max. Contaminant Level (MCL)		Treatment Technique		Monitoring/Reporting (M/R)	
		# Violations	Systems In Violation	# Violations	Systems In Violation	# Violations	Systems In Violation
Benzene	0.005	1	1	0	0	3	3
Carbon Tetrachloride	0.005	0	0	0	0	3	3
o-Dichlorobenzene	0.6	0	0	0	0	3	3
p-Dichlorobenzene	0.075	0	0	0	0	3	3
1,2-Dichloroethane	0.005	0	0	0	0	3	3
1,1-Dichloroethylene	0.007	0	0	0	0	3	3
1,2-Dichloroethylene,cis	0.07	0	0	0	0	3	3
1,2-Dichloroethylene,trans	0.1	0	0	0	0	3	3
Dichloromethane	0.005	1	1	0	0	3	3
1,2-Dichloropropane	0.005	0	0	0	0	3	3
Ethylbenzene	0.7	0	0	0	0	3	3
Chlorobenzene	0.1	0	0	0	0	3	3
Styrene	0.1	0	0	0	0	3	3
Tetrachloroethylene	0.005	0	0	0	0	3	3
Toluene	1	0	0	0	0	3	3
1,2,4 Trichlorobenzene	0.07	0	0	0	0	3	3
1,1,1-Trichloroethane	0.2	0	0	0	0	3	3
1,1,2 Trichloroethane	0.005	0	0	0	0	3	3
Trichloroethylene	0.005	0	0	0	0	3	3
Vinyl Chloride	0.0002	0	0	0	0	3	3
Xylenes (Total)	10	0	0	0	0	3	3
Disinfection By products (DBP)	80	0	0	0	0	3	3
TOTALS		2	2	0	0*	66	3*

* The same water systems each had at least 1 violation for each contaminant within the VOC category. When calculating the total number of systems in violation, systems with violations of multiple contaminants in the same group are only counted once.

Appendix C (continued)

Drinking Water Violations by Contaminant Group

Reporting period Jan. 1, 2014 to Dec. 31, 2014

SYNTHETIC ORGANIC CONTAMINANTS	MCL (mg/L)	Max. Contaminant Level (MCL)		Treatment Technique		Monitoring/Reporting (M/R)	
		# Violations	Systems In Violation	# Violations	Systems In Violation	#Violations	Systems In Violation
1,2 Dibromo-3-Chloropropane (DBPC)	0.0002	0	0	0	0	2	2
2,3,7,8-TCDD (Dioxin)	3x10 ⁻⁸	0	0	0	0	2	2
2,4-D	0.07	0	0	0	0	2	2
2,4,5-TP	0.05	0	0	0	0	2	2
Alachlor	0.002	0	0	0	0	2	2
Atrazine	0.003	0	0	0	0	2	2
Benzo(a)pyrene	0.0002	0	0	0	0	2	2
Carbofuran	0.04	0	0	0	0	2	2
Chlordane	0.002	0	0	0	0	2	2
Dalapon	0.2	0	0	0	0	2	2
Di(2-ethylhexyl)adipate	0.4	0	0	0	0	2	2
Di(2-ethylhexyl)phthallate	0.006	2	2	0	0	2	2
Dinoseb	0.007	0	0	0	0	2	2
Diquat	0.02	0	0	0	0	2	2
Endothall	0.1	0	0	0	0	2	2
Endrin	0.002	0	0	0	0	2	2
Ethylene Dibromide	0.00005	1	1	0	0	2	2
Glyphosate	0.7	0	0	0	0	2	2
Heptachlor	0.0004	0	0	0	0	2	2
Heptachlor epoxide	0.0002	0	0	0	0	2	2
Hexachlorobenzene	0.001	0	0	0	0	2	2
Hexachlorocyclopenta-	0.05	0	0	0	0	2	2
Lindane	0.0002	0	0	0	0	2	2
Methoxychlor	0.04	0	0	0	0	2	2
Oxamyl	0.2	0	0	0	0	2	2
PCBs	0.0005	0	0	0	0	2	2
Pentachlorophenol	0.001	0	0	0	0	2	2
Picloram	0.001	0	0	0	0	2	2
Simazine	0.004	0	0	0	0	2	2
Toxaphene	0.003	0	0	0	0	2	2
TOTALS		3	3	0	0*	60	*2

*The same systems had violations of all the contaminants within the “Synthetic Organic Chemicals” category with the exception of two chemicals. When calculating the total number of systems in violation, systems are only counted once for violations of multiple contaminants within the same contaminant group.

Appendix C (continued)

Drinking Water Violations by Contaminant Group

Reporting period Jan. 1, 2014 to Dec. 31, 2014

INORGANIC CONTAMINANTS	MCL (mg/L)	MCLs		Treatment Technique		Monitoring/Reporting	
		Violations	Systems in Violation	Violations	Systems in Violation	Violations	Systems In Violation
Antimony	0.006	0	0	0	0	4	4
Arsenic	0.05	15	15	0	0	5	5
Asbestos (fiber length > 10 microns)	7 million. fibers per liter	0	0	0	0	4	4
Barium	2	0	0	0	0	4	4
Beryllium	0.004	0	0	0	0	4	4
Cadmium	0.005	0	0	0	0	4	4
Chromium	0.1	0	0	0	0	4	4
Cyanide	0.2	0	0	0	0	4	4
Fluoride	4	0	0	0	0	5	5
Mercury	0.002	0	0	0	0	4	4
Nickel	0.1	1	1	0	0	4	4
Nitrate	10	56	56	0	0	114	108
Nitrite	1	0	0	0	0	12	15
Selenium	0.05	0	0	0	0	4	4
Sodium		0	0	0	0	4	4
Thallium	0.002	0	0	0	0	4	4
SECONDARY CONTAMINANTS	Standard (mg/l)					Significant Monitoring/Reporting	
(Not health-related standards)						Violations	Systems In Violation
Alkalinity	**					5	5
Aluminum	0.05 to 0.2					5	5
Chloride	**					5	5
Hardness	**					5	5
Iron	0.3					5	5
Manganese	0.05					5	5
Magnesium	**					5	5
pH	**					5	5
Total Dissolved Solids	500					5	5
Silver	0.1					5	5
Zinc	5					5	5
TOTALS		72	72	0	0	239	*133

*To calculate the total number of systems in violation, systems are only counted once for violations of multiple contaminants within the same contaminant group.

** There are no drinking water standards for these compounds, but results are used together to determine corrosivity and other water quality characteristics.

Appendix C (continued)

Drinking Water Violations by Contaminant Group Reporting period Jan. 1, 2014 to Dec. 31, 2014

Contaminant Group	MCL (mg/L) Or Action Level	Maximum Contaminant Levels (MCLs)		Treatment Technique		Monitoring/Reporting (M/R)	
		# Violations	Systems in Violation	# Violations	Systems In Violation	# Violations	Systems In Violation
Lead	0.015	N/A	N/A	18	16	11	11
Copper	1.3	N/A	N/A	18	16	11	11
Water Quality Parameters						6	6
Lead Customer Notice						372	372
TOTALS				18	16	389	389*
Radionuclides	Picocuries per liter			0	0		
Gross Alpha	15	98	8	0	0	26	16
Radium 226+228 (combined radium)	5	106	13	0	0	30	16
Combined Uranium	30 mg/l	0	0	0	0	2	2
TOTALS		204	19*	0	0	58	16*
Total Coliform Rule Totals	No Detect	387	420	0	0	215	203

*To calculate the total number of systems in violation, systems are only counted once for violations of multiple contaminants within the same contaminant group.

Appendix D

Communities Receiving Low-Interest-Loans for Drinking Water Projects

Municipality	County	Loan Amount	Project Description
New Holstein, City of	Calumet	\$716,604	Replace mains, lead services, hydrants and valves
New Auburn, Village of	Chippewa	\$373,625	Construct Well # 2, wellhouse and connecting main
Spencer, Village of	Marathon	\$1,093,568	Construct new well and transmission main
Readstown, Village of	Vernon	\$15,257	Replace undersized water mains with 6 inch mains
Kendall, Village of	Monroe	\$535,989	Replace undersized main, lead services and construct a looping main and an additional river crossing
Oak Creek, City of	Milwaukee	\$5,471,070	Water main replacements in Rowan estates, Howell estates and Cedar Hills
Greendale, Village of	Milwaukee	\$711,888	Improve SCADA & Flow Control, Renovate Booster & Ground Storage
Fountain City, City of	Buffalo	\$634,236	Replace main supply line from Reservoir & Well #1, install impervious roof on Reservoir and rehabilitate Well #1
Cameron, Village of	Barron	\$1,522,192	Construct taller storage tank to eliminate low pressure areas
Friesland, Village of	Columbia	\$262,002	Replace water main on East Winnebago
Lake Delton, Village of	Sauk	\$4,541,467	Construct elevated tank, connecting main, SCADA modifications, looping main and pressure reduction station
Shell Lake, City of	Washburn	\$751,921	Replace water mains on 1 st , 2 nd , 5 th & 8 th Streets
Hancock, Village of	Waushara	\$834,481	Construct Well #2, wellhouse, connecting main, treatment and telemetry
Prairie du Chien, City of	Crawford	\$503,175	Replace mains, services and hydrants on Washington and Crawford Streets
Dallas, Village of	Barron	\$852,046	Replace 3 inch water mains with 6 inch on Dallas Street
Bayfield, City of	Bayfield	\$661,884	Replace 2,000 feet of undersized water mains and services

Appendix D (continued)

Communities Receiving Low-Interest-Loans for Drinking Water Projects

Municipality	County	Loan Amount	Project Description
Turtle Lake, Village of	Barron	\$1,319,682	Construct Well #4 with treatment to reduce arsenic
South Wayne, Village of	La Fayette	\$272,597	Replace undersized main with 8 inch mains on Grove thru McKnight Streets
Two Rivers, City of	Manitowoc	\$435,826	Replace water mains and lead services, loop School Street
Avoca, Village of	Iowa	\$233,637	Install new 8 inch water mains on Third, Fourth and Fifth Streets
Mount Hope, Village of	Grant	\$297,002	Replace undersized main with 8 inch mains on CTH JJ
Central Brown County Water Authority	Brown	\$12,958,106	Construct new storage, pumping station and modify controls
Grantsburg, Village of	St Croix	\$875,953	Replace undersized main on Broadway and North Oak Streets
Oconto Falls, City of	Oconto	\$1,298,899	Replace undersized main and install hydrants, construct a loop along STH 22
Lena, Village of	Oconto	\$3,285,288	Construct radium removal at Well #1 & #2, chemical feed and SCADA
Milwaukee, City of	Milwaukee	\$8,548,447	Emergency backup power, chemical feed and ancillary operation at Linnwood Plant
Two Rivers, City of	Manitowoc	\$327,867	Directional bored 16 inch East Twin River crossing
Black River Falls, City of	Jackson	\$982,692	Replace old reservoir with new water tower
Elroy, City of	Juneau	\$629,308	Replace undersized main, construct a looping main on CTH O and an additional river crossing
Cassville, Village of	Grant	\$410,102	Replace undersized main in Mulberry Drive area
Rhineland, City of	Oneida	\$918,688	Construct Well #8, wellhouse and connecting main
	Total	\$52,275,499	