



MADISON WATER UTILITY Annual Water Quality Report

A SUMMARY OF WATER TESTING CONDUCTED IN 2018

PARA ESPAÑOL
HAGA CLIC AQUÍ

This annual report complies with federal and state drinking water regulations, which require us to provide water quality information to our customers each year. Unless otherwise noted, results are based on testing conducted in 2018. We are pleased to report that we continue to supply high quality water that meets or exceeds all federal and state standards for health and safety. Test results are summarized on page 3. Visit our website, madisonwater.org, to learn about water utility programs and projects.

Quality & Reliability since 1882

WHICH WELL SERVES MY ADDRESS?

The Madison water system consists of 23 wells and 900 miles of interconnected pipes. Most locations receive water from one to three wells. Our website has an application that can tell you which wells supply water to your home or business. There are links to detailed reports with the latest water quality test results. For more information, call the Water Utility or go to madisonwater.org/myWells.

WHAT KEEPS OUR WATER SAFE?

The high quality aquifer supplying our drinking water requires little treatment. Madison Water Utility disinfects the water with chlorine to reduce the risk of microbial contamination. A small amount of chlorine kills bacteria and viruses that can be present in groundwater. Chlorine also travels with the water and is ready to kill microbes that it might encounter in the system. Our goal is to maintain a chlorine residual above 0.1 milligrams per liter (mg/L) at all points in the distribution system. Typical concentrations range from 0.2 to 0.4 mg/L.

HOW ELSE IS THE WATER TREATED?

Fluoride is added to Madison drinking water to improve dental health and reduce tooth decay. The US Centers for Disease Control and Prevention (CDC) and Wisconsin Department of Health Services recommend maintaining an average fluoride level of 0.7 mg/L. Water from each well is tested daily to achieve this target. In 2018, the system-wide average of 6,466 tests was 0.71 mg/L.

Three wells have iron and manganese filters. A fourth is outfitted with a low-profile air stripper to remove volatile organic compounds (VOC) including PCE and TCE. After air stripping, an additive adjusts the pH to limit chemical scales that can clog water pipes.

Do Your Part To Protect Groundwater

- » Use no more than the recommended amount of road salt on sidewalks and driveways, wisaltwise.com
- » Properly dispose of household hazardous chemicals through Clean Sweep, danecountycleansweep.com
- » Promote healthy lawns and gardens without the use of harmful chemicals, clean-water.uwex.edu/pubs
- » Use non-toxic or biodegradable cleaning products

Your Water Source

Madison's drinking water comes from a deep sandstone aquifer that sits hundreds of feet below the city. The water originates as rain or snow that slowly soaks into the ground and is filtered through layers of soil and rock. This natural filtration process produces excellent water for us to enjoy.

PERFLUORINATED COMPOUNDS / PFAS

Madison monitors some substances in drinking water beyond state and federal requirements. In 2018, Madison Water Utility tested two wells for a class of chemicals known as "PFAS" (or per- and polyfluoroalkyl substances). Testing focused on Well 15 on Madison's east side and Well 16 on the west side, two wells where PFAS were previously detected. Madison Water Utility is testing all wells for PFAS in 2019. Find current and most up-to-date test results on our website, madisonwater.org/PFAS.

2018 testing detected low or trace levels of six different types of PFAS compounds at Well 15. One type was found at trace levels at Well 16.

2018 PFAS Testing (results in parts per trillion)	Well 15	Well 16
perfluorooctanoic acid (PFOA)	5.4	not detected
perfluorooctane sulfonic acid (PFOS)	5.1	not detected
perfluorobutane sulfonic acid (PFBS)	2.6	not detected
perfluoroheptanoic acid (PFHpA)	2.6	not detected
perfluorohexanoic acid (PFHxA)	5.3	not detected
perfluorohexane sulfonic acid (PFHxS)	21	2.4

PFAS are a widely-used class of chemicals found in non-stick cookware, water-resistant clothing, upholstery, carpeting, food packaging and firefighting foams. Thousands of types of PFAS compounds have been manufactured and many are still being used. PFAS are not regulated under the Safe Drinking Water Act, but the EPA has established a Lifetime Health Advisory Level for two types (PFOA and PFOS) of 70 parts per trillion.

POTENTIAL CONTAMINANTS IN DRINKING WATER AND THEIR LIKELY SOURCES

Sources of drinking water, both tap water and bottled water, include rivers, lakes, springs, and wells. As water travels over the surface of the land and through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Types of potential contaminants and their likely sources include:

- **Microbial contaminants**, such as viruses and bacteria, may come from leaky sewer pipes, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants**, including metals, minerals, nutrients, and salts, can occur naturally or they may result from urban stormwater runoff, industrial wastewater discharges, mining, or farming activities.
- **Organic contaminants**, including synthetic and volatile organic compounds, are by-products of industrial processes that can come from chemical spills, gas stations, urban stormwater runoff, and septic systems.
- **Pesticides and herbicides** may come from a variety of sources such as agriculture, urban stormwater runoff, and residential use.
- **Radioactive substances** may occur naturally in rock formations and groundwater.

In order to ensure that tap water is safe, EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Routine monitoring helps to ensure that drinking water concentrations of any substance remain at safe levels.

THE EPA ON DRINKING WATER CONTAMINANTS

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's (EPA) Safe Drinking Water Hotline, 800-426-4791.

MICROBIOLOGICAL TESTING

Bacteria – To ensure drinking water safety, routine bacteriological tests are conducted. Over 200 distribution samples are collected each month from representative locations. Samples are tested for coliform bacteria, indicators of potential contamination. In 2018, the Water Utility collected 2,894 distribution samples with a single sample testing positive for coliform bacteria. The low number of coliform positive samples reflects good source water quality and adequate disinfection maintained in the distribution system.

Lead and Copper

The landmark Lead Service Replacement program helped our community remove or replace nearly 8,000 lead pipes between 1995 and 2011. Water quality tests conducted in 2017 (see table) show that lead and copper corrosion have been minimized. The next round of testing will take place in 2020.

	Ideal Goal (MCLG)	Action Level (AL)	90th Percentile	Range	Samples Above AL
Lead (ppb)	zero	15	3.2	0.2 - 26	1 of 54
Copper (ppb)	1300	1300	169	75 - 242	0 of 54

Elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water primarily comes from lead service pipes and household plumbing components. While Madison Water Utility has removed all known lead services, we cannot control the materials found in household plumbing components. Some faucets, fixtures, and pipes in your house could still contain lead. The longer water has been standing in the plumbing system, the more lead it may contain. You can minimize the potential for lead exposure by running water from a faucet for 2 to 3 minutes before using it for drinking or cooking. For more information on lead safety, go to www.epa.gov/safewater/lead.

Are you concerned about lead? Test your water. Contact a certified lab to get lead testing information: **Public Health Madison & Dane County**, 608-266-4821; **State Laboratory of Hygiene**, 608-224-6202.

How to Read the Water Quality Data Table

The EPA and Wisconsin Department of Natural Resources (WDNR) establish the safe drinking water regulations that limit the amount of contaminants allowed in drinking water. The table shows the concentrations of detected substances in comparison to the regulatory limits. Substances not detected are not included in the table.

Maximum Contaminant Level (MCL)

The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available technology.

Maximum Contaminant Level Goal (MCLG)

The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Action Level (AL)

The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a public water system shall follow.

Units in the Table

- One milligram per liter (mg/L) equals one part per million (ppm)
- One microgram per liter (µg/L) equals one part per billion (ppb)
- One milligram per liter equals 1,000 micrograms per liter
- One part per billion is equal to 1,000 parts per trillion
- One ppb is analogous to one second in 32 years
- Picocurie per liter (pCi/L) is a measure of radioactivity
- nd = non-detect

IMPORTANT NOTE ABOUT THE TABLE: The table reports the maximum and minimum concentrations for each substance found in at least one well. Several substances are found only in a few wells. Contaminant levels reported in the table may not be representative of the water quality at your home. Visit madisonwater.org or call 608-266-4654 to get more information about water quality for the well that serves your home or business.

Water Quality Table

Substance Detected (units)	Ideal Goal (MCLG)	Highest Level Allowed (MCL)	Median Level Found	Range of Results	Violation (Yes/No)	Wells with Detections	Typical Source of Substance
Regulated Substances							
Antimony (ppb)	6	6	non-detect	nd - 1.1	NO	6, 13, 24	Discharge from petroleum refineries; fire retardants; electronics; ceramics
Atrazine (ppb) - 2017 data	3	3	non-detect	nd - 0.03	NO	Well 29	Runoff from herbicide used on row crops
Barium (ppb)	2000	2000	18	6.5 - 61	NO	All wells	Erosion of natural deposits; Discharge from metal refineries
Chromium, Total (ppb)	100	100	2.2	nd - 4.3	NO	All except Well 31	Erosion of natural deposits; Discharge from steel and pulp mills
1,2-Dichloroethane (ppb)	zero	5	non-detect	nd - 0.1	NO	Well 17	Discharge from industrial chemical factories
1,2-Dichloroethylene, cis (ppb)	70	70	non-detect	nd - 0.4	NO	8, 9, 11, 27	Discharge from industrial chemical factories; Biodegradation of PCE and TCE
Ethylbenzene (ppb)	700	700	non-detect	nd - 0.7	NO	Well 9	Discharge from petroleum refineries
Fluoride (ppm)	4	4	0.8	0.7 - 1.1	NO	All wells	Erosion of natural deposits; Added to promote strong teeth
Nickel (ppb)	n/a	100	1.6	nd - 2.7	NO	All except Well 31	Erosion of natural deposits; Electroplating, stainless steel and alloy products
Nitrate (ppm)	10	10	0.8	nd - 4.0	NO	Fourteen wells	Fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Selenium (ppb)	50	50	non-detect	nd - 2.0	NO	9,11,13,14,15,16,25,29	Erosion of natural deposits; Petroleum and metal refineries
Tetrachloroethylene [PCE] (ppb)	zero	5	non-detect	nd - 2.1	NO	6,9,11,14,18	Discharge from factories, dry cleaners, and auto shops
Thallium (ppb)	0.5	2	non-detect	nd - 0.3	NO	11,15,16,17,19,27,28	Ore processing sites; Electronics, glass, and drug factories
Toluene (ppb)	1000	1000	non-detect	nd - 0.2	NO	Well 9 & Well 31	Discharge from petroleum refineries
1,1,1-Trichloroethane (ppb)	200	200	non-detect	nd - 0.1	NO	Well 9 & Well 18	Discharge from metal degreasing sites, other factories
Trichloroethylene [TCE] (ppb)	zero	5	non-detect	nd - 0.3	NO	11, 14, 18	Discharge from metal degreasing sites, other factories
Xylene, Total (ppb)	10000	10000	non-detect	nd - 4.5	NO	Well 9 & Well 31	Discharge from petroleum and chemical factories
Radionuclides							
Gross Alpha (pCi/L)	zero	15	6.3	2.7 - 12	NO	Each well sampled: 7,8,19,24,27,28,30,31	Erosion of natural deposits
Radium, 226 + 228 (pCi/L)	zero	5	2.9	nd - 4.9	NO		Erosion of natural deposits
Gross Beta (pCi/L)	zero	50	5.7	nd - 13	NO		Decay of natural and man-made deposits
Uranium (ppb)	zero	30	0.3	0.3 - 0.4	NO	Only Well 31 sampled	Erosion of natural deposits
Disinfection By-Products (Distribution)							
Haloacetic Acids [HAA5] (ppb)	60	60	1.2	nd - 2.2	NO	n/a	By-product of drinking water chlorination
Haloacetic Acids [HAA9] (ppb)	n/a	n/a	2.8	2.4 - 3.2	NO	n/a	By-product of drinking water chlorination
Total Trihalomethanes [TTHM] (ppb)	zero	80	6.1	3.4 - 9.2	NO	n/a	By-product of drinking water chlorination
Unregulated Substances							
Chromium, Hexavalent (ppb)	n/a	n/a	0.5	nd - 2.0	NO	Thirteen wells	Erosion of natural deposits; Chrome plating, leather tanning, wood preservation
1,4-Dioxane (ppb)	n/a	n/a	0.1	nd - 0.3	NO	9,11,14,15,18	Discharge from chemical factories; Cosmetics and detergents
Metolachlor (ppb) - 2017 data	n/a	n/a	non-detect	nd - 0.01	NO	Well 14	Runoff from herbicide used on row crops
PFOA & PFOS (ppb)	n/a	n/a	non-detect	nd - 0.01	NO	Well 15	Firefighting foam; Landfills, food packaging, clothing, fabrics, upholstery
Strontium (ppb)	n/a	n/a	80	50 - 142	NO	All wells	Erosion of natural deposits
Trichlorofluoromethane (ppb)	n/a	n/a	non-detect	nd - 0.6	NO	Well 11	Discharge from industrial chemical factories; Degreaser, propellant, refrigerant
Other Substances							
Aesthetic Goal							
Chloride (ppm)	250	non-detect	nd - 140	NO	Ten wells	Erosion of natural deposits; Road salt application	
Iron (ppm)	0.3	0.02	nd - 0.54	NO	Seventeen wells	Erosion of natural deposits	
Manganese (ppb)	50	3.2	0.3 - 50	NO	All wells	Erosion of natural deposits	
Sodium (ppm)	n/a	8.5	2.3 - 51	NO	All wells	Erosion of natural deposits; Road salt application	
Sulfate (ppm)	250	22	7.4 - 114	NO	All wells	Erosion of natural deposits	

Get Up to \$100 for Replacing Your Toilet

Take advantage of our Toilet Rebate Program

GET A \$100 BILL CREDIT for buying a new toilet!

There is still funding left for Madison Water Utility's 2019 Toilet Rebate Program. Replace your old toilet with a high-efficiency EPA WaterSense model & get a \$100 bill credit! Businesses, non-profits, single-family homes, condos & apartments are all eligible.

HOW TO SIGN UP

Visit madisonwater.org and click the "Sustainability" tab. You will need to fill out a Toilet Rebate Application and mail it in with the original purchase receipt. Buy a new, high-efficiency WaterSense toilet and start saving water and money today.

Unregulated Substances

Once every five years, US EPA prepares a list of unregulated contaminants for required testing by large utilities. In 2018, twenty-two Madison wells were tested for 17 of these chemicals. Results for manganese and the haloacetic acid group are reported in the Water Quality Table. Two other chemicals were found in one well—2-methoxyethanol (Well 26) and 1-butanol (Well 28). Later testing did not find either chemical at any well. Finally, bromide, a potential precursor to haloacetic acids, was found in five of seven wells tested. Levels ranged from 29–56 parts per billion. Madison continues to regularly test for other unregulated substances including 1,4-dioxane, hexavalent chromium, PFAS (see page one), and strontium. Results of these tests are included in the Water Quality Table.

Do I need to take special precautions?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as those with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Environmental Protection Agency's Safe Drinking Water Hotline at 800-426-4791.

Cryptosporidium and *Giardia*, two organisms commonly linked to water-borne illness, are found primarily in surface waters such as lakes and rivers. Because Madison's drinking water comes from a deep groundwater aquifer, these organisms do not pose a significant health risk in Madison tap water.

Information You Can Use

Madison Water Utility
119 E. Olin Avenue
Madison, WI 53713
608-266-4651

Water Utility General Manager: Tom Heikkinen
Water Utility Board President: Lauren Cnare

Water Quality Dept. or questions about this report . . . 608-266-4654

Certified Drinking Water Laboratories in Madison, WI:
Public Health Madison & Dane County 608-266-4821
Wisconsin State Laboratory of Hygiene. 608-224-6202

GET THE LATEST MADISON WATER NEWS ONLINE

- Visit our website: madisonwater.org
- Find us on Facebook: facebook.com/madisonwater
- Follow us on Twitter: twitter.com/MadWaterUtility and Instagram: instagram.com/madison_water
- Get updates on drinking water quality or water main flushing: sign-up at my.cityofmadison.com

LANGUAGE SERVICES

- Usted tiene derecho a recibir servicio gratuito de intérprete. Por favor llame al teléfono 608-266-4651 para mayor información.
- Koj muaj tvoj cai tau kev pab txhais lus pub dawb. Thov hu rau 608-266-4651.
- You have the right to free language services. Please call 608-266-4651 for more information.

GET INVOLVED

- Visit our **Project News** web page to learn about Madison Water Utility public works projects and provide input.
- Water Utility Board: Monthly meetings held at 119 E. Olin Avenue, starting at 4:30 p.m.

2019 dates:*

June 25	September 24
June 23	October 22
August 27	November 26

*Meeting dates are subject to change; check the calendar at madison.legistar.com/Calendar.aspx

On the web at MadisonWater.org

- » **Online Conservation Tool** – Track your weekly, daily, even hourly water use online.
- » **Toilet Rebate Program** – Find out how to get a \$100 bill credit for installing a water-efficient toilet!
- » **Inside MWU** – News about your water and the people who keep it flowing.