



2019

Water Quality Report

INFORME DE CALIDAD DE AGUA

Photo credit: iStock.

Denver Water's Public Water System Identification: CO0116001





 Antero Reservoir is the highest reservoir in the South Platte River system and gathers water from the South Fork of the South Platte River, Salt Creek and other small tributaries. The reservoir is popular among anglers due to its shallow depth and warm water. Photo credit: Denver Water.

WHAT IS THIS REPORT?

The Environmental Protection Agency requires public water suppliers that serve the same people year-round (community water systems) to provide consumer confidence reports to their customers. These reports are also known as annual water quality reports. This report summarizes information regarding water sources used, any detected contaminants, compliance and educational information.

Where does your water come from?

Denver's drinking water comes from rivers, lakes, streams, reservoirs and springs fed by high-quality mountain snow runoff. Denver Water's supply is 100 percent surface water that originates in sources throughout 3,100 square miles of watersheds on both sides of the Continental Divide.

Mountain water sources

Denver Water's water sources are the South Platte River and its tributaries, the streams that feed Dillon Reservoir and the creeks and canals above the Fraser River. Denver Water stores its water in five mountain reservoirs: Antero, Eleven Mile Canyon, Cheesman, Dillon and Gross. From these reservoirs, the water is then sent to the metro area through a

complex system of streams, canals and pipes to be treated.

After treatment, drinking water is fed by both gravity and pumps to a system of underground, clean-water reservoirs before continuing to your home or business. More than 3,000 miles of pipe carry water to Denver Water customers.

Source water assessment

The Colorado Department of Public Health and Environment has completed a source water assessment of the potential for contaminants reaching any of Denver Water's three terminal reservoirs at Strontia Springs, Marston and Ralston, the last stop for the water before it is treated. The potential sources of contamination that may exist are: EPA areas of concern; permitted

wastewater discharge sites; above ground, underground and leaking storage tank sites; solid waste sites; existing or abandoned mine sites; other facilities; commercial, industrial and transportation activities; residential, urban recreational grasses; quarries, strip mines and gravel pits; agriculture; forests; septic systems; oil and gas wells and roads. For more information on the report, contact the Colorado Department of Public Health and Environment by calling 303-692-2000 or visit [Colorado.gov/cdphe/ccr](https://colorado.gov/cdphe/ccr). The report is located under "Guidance: Source Water Assessment Reports." Search the table using 116001 Denver Water Board. Or call Denver Water Customer Care at 303-893-2444.

Información importante acerca de la calidad del agua

Para recibir la versión en español del Informe de Calidad de Agua de 2019 de Denver Water, llame a Servicio al cliente al 303-893-2444 o visite denverwater.org/CalidadDeAgua.

DENVER WATER'S SYSTEM

Devoted to water quality

Denver Water proudly serves high-quality water to 1.4 million people in the city of Denver and many surrounding suburbs. Since 1918, we have expertly planned, developed and operated a complex system that provides clean, safe, great-tasting water. Denver Water is a public agency funded by water rates, new tap fees and the sale of hydropower, not taxes. We are Colorado's oldest and largest water utility — Denver Water has a total water service area of approximately 300 square miles.

Denver Water serves 25% of the state's population with less than 2% of all the water used in the state. The natural environment is our lifeline, and we help protect it by promoting wise water use.

We take our water quality very seriously. Last year we collected more than 35,000 samples and conducted more than 70,000 tests to ensure our water is as clean and safe as possible.

Denver Water vigilantly safeguards our mountain water supplies, and the water is carefully treated before it reaches your tap. This brochure provides data collected throughout 2018.



Denver Water's collection system covers about 4,000 square miles and extends into more than eight counties. Image credit: Denver Water.

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SOURCES OF DRINKING WATER

Sources of drinking water include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material. It can also pick up substances resulting from human activity and the presence of animals. Contaminants may include the following:

Microbial contaminants

- Viruses, bacteria and other microbes that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.

Inorganic contaminants

- Salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.

Pesticides and herbicides

- Chemical substances resulting from a variety of sources, such as agricultural and urban stormwater runoff, and residential uses.

Organic chemical contaminants

- Substances including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and also may come from gas stations, urban stormwater runoff and septic systems.

Radioactive contaminants

- Substances that can be naturally occurring or be the result of oil and gas production, and mining activities.

WATER AT A GLANCE

All 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 the water poses a health risk. In order to ensure that tap water is safe to drink, the Colorado Department of Public Health and Environment's regulations set limits on the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration sets limits for contaminants in bottled water to provide the same protection for public health.

More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 800-426-4791 or by visiting epa.gov/drink/contaminants.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons 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 of infections. These people should seek advice about drinking water from their health care providers. Guidelines from the EPA and the Centers for Disease Control and Prevention on appropriate means to lessen the risk of infection by cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline, 800-426-4791.

Lead in drinking water

Since 1992, Denver Water has tested water inside homes within its distribution system considered at risk for lead and copper contamination, per EPA standards. Denver Water's source water — water leaving the treatment plants — and water in the distribution system have no detectable lead and trace levels of copper.

Lead can get into water through lead-containing household or building plumbing and faucets. Softened water is more aggressive toward household plumbing. Homes built before 1951 may have lead service lines, which are customer-owned pipes that connect the water main under the street to the

home. Homes built before 1987 may have lead solder in their plumbing — lead solder was banned from use on domestic plumbing in 1986. Homes that do not fall within these two categories are expected to be at lower risk for lead contamination in the water.

Lead exposure can cause serious health problems, especially for pregnant women and young children. The most common sources of lead in drinking water are materials and components for service lines and home plumbing.

Denver Water is responsible for providing high-quality drinking water, but cannot control the materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for at least a couple of minutes before using water

for drinking or cooking.

If you are concerned about lead, you can request to have your water tested. Information on lead in drinking water, testing and steps to minimize exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791, at epa.gov/safewater/lead and at denverwater.org/Lead.

Is there a presence of cryptosporidium and giardia?

Denver Water has tested for cryptosporidium (crypto) and giardia in both raw and treated water since the 1980s. Since that time, Denver Water has never detected a viable indication of either in the drinking water.

Crypto and giardia are microscopic organisms that, when ingested, can cause diarrhea, cramps, fever and other gastro-intestinal symptoms. Crypto and giardia are usually spread through means other than drinking water.

While most people readily recover from the symptoms, crypto and giardia can cause more serious illness in people with compromised immune systems. The organisms are in many of Colorado's rivers and streams and are a result of animal wastes in the watershed. At the treatment plants, Denver Water removes crypto and giardia through effective filtration, and giardia is also killed by disinfection.



If you are concerned about lead, Denver Water will test your water for free. Photo credit: Denver Water.

WATER QUALITY MONITORING VIOLATION

In 2018, our water system violated a drinking water monitoring requirement. Although this situation did not pose a safety risk and does not require you to take action, as our customers you have a right to know what happened and what we have done to correct this situation.



Denver Water conducts more than 70,000 tests annually to ensure safe drinking water. Photo credit: Denver Water.

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether our drinking water meets health standards. During the first three months of 2018, Denver Water made a scheduling error that resulted in a violation of Colorado’s drinking water regulations.

What happened?

Denver Water is required to inspect all drinking water storage tanks on a quarterly basis. During the first quarter of 2018 (January-March), one of our tanks was not inspected, resulting in a drinking water violation from the Colorado Department of Public Health and Environment. All tank inspections leading up to and following 2018’s first quarter demonstrated that the tank was sound and protective of public health. Second quarter testing showed we were in compliance with all drinking water regulations.

How did this impact water quality?

Denver Water monitors water quality throughout the Denver metro area 24/7/365, and our records show water quality was not compromised as a result of this missed tank inspection.

What is being done?

Your water is safe to drink, and water quality was never compromised because of this missed inspection. Denver Water has changed protocols and processes so that no future tank inspections will be missed.

For more information, contact Denver Water Customer Care at 303-893-2444. You can read more about our extensive treatment process at denverwaterTAP.org.

THE TREATMENT PROCESS

The treatment process consists of five steps:

1 COAGULATION/ FLOCCULATION: Raw water is drawn into mixing basins at our treatment plants where we add alum and polymer. This process causes small particles to stick to one another forming larger particles.

2 SEDIMENTATION: Over time, the now larger particles become heavy enough to settle to the bottom of a basin from which sediment is removed.

3 FILTRATION: The water is then filtered through layers of fine, granulated materials — either sand, or sand and coal, depending on the treatment plant. As smaller, suspended particles are removed, turbidity diminishes and clear water emerges.

4 DISINFECTION: As protection against any bacteria, viruses and other microbes that might remain, disinfectant is added before the water flows into underground reservoirs throughout the distribution system and into your home or business. Denver Water carefully monitors the amount of disinfectant added to maintain quality of the water at the farthest reaches of the system. Fluoride occurs naturally in our water but is also added to treated water, when needed, to achieve public health levels.

5 CORROSION CONTROL: PH is maintained by adding alkaline substances to reduce corrosion in the distribution system and the plumbing in your home or business.

WATER QUALITY DATA

Terms, abbreviations and symbols: Some of the terms, abbreviations and symbols contained in this report are unique to the water industry and might not be familiar to all customers. Terms used in the table are explained below.

Action level: Concentration of a contaminant that if exceeded triggers treatment or other requirements that a water system must follow.

Br: Short for below the reportable level for an analysis, meaning it's below the lowest reliable level that can be measured.

Contaminant: Potentially harmful physical, biological, chemical or radiological substance.

Maximum Contaminant Level (MCL): Highest level of a contaminant allowed in drinking water. MCLs are set as close to the Maximum Contaminant Level Goal as feasible using the best available treatment technology.

Maximum Contaminant Level Goal (MCLG): 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.

Maximum Residual Disinfectant Level (MRDL): Highest level of a disinfectant allowed in drinking water. There is convincing evidence that the addition of disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): Level of a drinking water disinfectant below which there is no known

or expected health risk. MRDLGs do not reflect the benefit of the use of disinfectants to control microbial contaminants.

Micrograms per liter (µg/L): Equivalent to parts per billion. One µg/L is comparable to one drop of water in 55,000 gallons.

Millirem (mrem): Unit of measure for radiation absorbed by the body. A chest x-ray typically involves 10 millirems.

Parts per billion (ppb): Equivalent to micrograms per liter. One ppb is comparable to one drop of water in 55,000 gallons.

Parts per million (ppm): Equivalent to milligrams per liter. One ppm is comparable to one drop of water in 55 gallons.

PicoCuries per liter (pCi/L): Measures radioactivity.

Running Annual Average (RAA): Average of the monitoring period average for a year.

Secondary Maximum Contaminant Level (SMCL): Nonenforceable, recommended limits for substances that affect the taste, odor, color or other aesthetic qualities of drinking water rather than pose a health risk.

Treatment Technique (TT): Required process intended to reduce the level of a contaminant in drinking water.

Turbidity: Measure of suspended material in water. In the water field, a turbidity measurement, expressed in **Nephelometric Turbidity Units (NTU)**, is used to indicate clarity of water.

REGULATED WATER CONTAMINANTS: WHAT IS IN THE WATER?

Data collected throughout 2018

Regulated leaving the treatment plant (entry point to the distribution system)	Units of measurement	MCLG	Highest levels allowed (MCL)	Average level detected (range of all results)	Violation	Sampling frequency	Sources of contaminant
Aluminum	ppb	N/A	50-200 (SMCL)	30 (11-84)	No	Monthly	Erosion of natural deposits; water treatment chemical.
Antimony	ppb	6	6	0.02 (0-0.09)	No	Monthly	Discharge from petroleum refineries; runoff from fire retardants, ceramics, electronics, solder.
Arsenic	ppb	0	10	0 (br)	No	Monthly	Erosion of natural deposits; runoff from orchards, runoff from glass and electronics, solder.
Barium	ppm	2	2000	31 (16-43)	No	Monthly	Erosion of natural deposits; discharge of drilling wastes.
Beryllium	ppb	4	4	0.0 (br)	No	Monthly	Discharge from metal refineries, coal-burning factories, electrical, aerospace and defense industries.
Cadmium	ppb	5	5	0.01 (0-0.1)	No	Monthly	Corrosion of galvanized pipes; erosion of natural deposits, discharge from metal refineries; runoff from waste batteries and paints.
Chromium	ppb	100	100	0.2 (br-1.1)	No	Monthly	Discharge from steel and pulp mills; erosion of natural deposits.
Copper	ppm	1.3	1000 (SMCL)	0.4 (br-2.5)	No	Monthly	Erosion of natural deposits.
Mercury	ppb	2	2	0 (br-0.07)	No	Monthly	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands.
Selenium	ppb	50	50	0.2 (br-3.4)	No	Monthly	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines.
Thallium	ppb	2	2	0 (br)	No	Monthly	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands.
Uranium	ppb	zero	30	0.3 (br-1)	No	Monthly	Erosion of natural deposits; mine drainage.
Cyanide, Total	ppb	200	200 (Regulated as Free CN)	0 (br)	No	>Annually	Discharge from steel/metal factories; discharge from plastic and fertilizer factories.
Gross Alpha	pCi/L	0	15	0 (br)	No	Annually	Erosion of natural deposits; mine drainage.
Beta Emitters	mrem/year	4	4 (or 50 pCi/L)	0 (br)	No	Annually	Erosion of natural deposits; mine drainage.
Fluoride*	ppm	4.0	4.0 (2.0 is SMCL)	0.6 (0-0.8)	No	Monthly	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories.
Nitrate as N	ppm	10	10	0 (0-0.1)	No	Monthly	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
Nitrite as N	ppm	1	1	0 (br)	No	Monthly	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
2,4-D**	ppb	70	70	0 (br-0) Foothills	No	Special Frequency	Runoff from herbicide used on row crops.
Turbidity	NTU	N/A	TT ≤0.30 NTU in 95% of samples/month	Highest turbidity level for 2018: 0.19 Mar Percentage of Samples <0.3 NTU: 100%	No	> Daily	Soil runoff.
Total Organic Carbon		N/A	TT	Compliance description: Denver Water uses enhanced treatment to remove the required amount of natural organic material and/or demonstrates compliance with alternative criteria.	No	Twice per month	Natural organic matter that is present in the environment.

Notes: * If fluoride's secondary maximum contaminant level is 2 milligrams per liter or higher, the public must be notified. **One entry point sample resulted in 0.1 ppb of 2,4-D. Although the MCL/MCLG is 70 ppb, Denver Water tested for this compound on a quarterly basis in 2018.

Regulated in the distribution system	Units of measurement	MCLG	MCL	Violation	Sampling frequency	Sources of contaminant
Total Trihalomethanes (TTHM)	ppb	N/A	80	Highest locational RAA: 23.9 (10.8-28.5)	Monthly	Byproduct of drinking water disinfection.
Haloacetic Acids (HAA ₅)	ppb	N/A	60	Highest locational RAA: 14.5 (7-20)	Monthly	Byproduct of drinking water disinfection.
Total Coliform	Absent or Present	zero	No more than 5% positive per month	Highest monthly percentage: 0.8% in August 2018 of present T. coli. Number of positives out of number of samples for the year: 3 out of 4,528 samples or 0.07%	Daily	Naturally present in the environment.
Disinfectant as Total Cl ₂	ppm		TT, (4 mg/L is MRDL)	0 out of 4,567 samples; had no samples below 0.02 ppm in 2018	Daily	Drinking water disinfectant used to control microbes.

Regulated at the customer's tap	Units of measurement	MCLG	Action level at the 90th percentile	90th percentile value	No. of samples exceeding action level	Violation	Sampling dates	Sources of contaminant
Copper	ppm	1.3	1.3	0.27	0 (559)	No	January-June	Corrosion of household plumbing.
Lead	ppb	0.0	15	11	19 (559)	No	January-June	Corrosion of household plumbing.
Copper	ppm	1.3	1.3	0.21	0 (602)	No	July-December	Corrosion of household plumbing.
Lead	ppb	0.0	15	11	35 (602)	No	July-December	Corrosion of household plumbing.

Secondary contaminant (Regulation 11 requirement)	MCLG	Highest levels allowed (MCL)	Average level detected (range of all results)	Violation	Sampling frequency	Sources of contaminant
Sodium	N/A	N/A	13.1 (6.7-16.5)	No	Annual	Naturally occurring.

TESTING FOR UNREGULATED CONTAMINANTS

Since 1996, the Environmental Protection Agency, through its Unregulated Contaminant Monitoring Rule, every five years requires water utilities across the country to test for a list of substances that are suspected of being in drinking water but are not currently regulated under the Safe Drinking Water Act. Utilities report their test results to the EPA, which uses the information to learn more about the presence of these substances and decide whether they should be regulated in the future to protect public health.

Denver Water’s 2018 test results were reported to the EPA as required. Below are the substances that were detected during Denver Water’s tests and the levels at which they were found.

The American Water Works Association has more information about the rule and the process on its website: drinktap.org/Water-Info/Whats-in-My-Water/Unregulated-Contaminant-Monitoring-Rule-UCMR. Information about the rule also can be found on the EPA’s website at epa.gov/dwucmr/learn-about-unregulated-contaminant-monitoring-rule or you can contact the Safe Drinking Water Hotline at 800-426-4791 or water.epa.gov/drink/contact.cfm.

Unregulated contaminants in the distribution system	Year	Sample site(s)	Average	Range	Units of measure
Germanium	2018	Treatment plant effluents	0	br	µg/L
Manganese	2018	Treatment plant effluents	11.3	1.07-23.3	µg/L
α-hexachlorocyclohexane	2018	Treatment plant effluents	0	br	µg/L
chlorpyrifos	2018	Treatment plant effluents	0	br	µg/L
dimenthipin	2018	Treatment plant effluents	0	br	µg/L
ethoprop	2018	Treatment plant effluents	0	br	µg/L
oxyfluorfen	2018	Treatment plant effluents	0	br	µg/L
profenofos	2018	Treatment plant effluents	0	br	µg/L
tebuconazole	2018	Treatment plant effluents	0	br	µg/L
total permethrin (cis- & trans-)	2018	Treatment plant effluents	0	br	µg/L
tribufos	2018	Treatment plant effluents	0	br	µg/L
butylated hydroxyanisole	2018	Treatment plant effluents	0	br	µg/L
o-toluidine	2018	Treatment plant effluents	0	br	µg/L
quinoline	2018	Treatment plant effluents	0	br	µg/L
1-butanol	2018	Treatment plant effluents	0	br	µg/L
2-methoxyethanol	2018	Treatment plant effluents	0	br	µg/L
2-propen-1-ol	2018	Treatment plant effluents	0	br	µg/L
Bromochloroacetic acid (BCAA)	2018	Distribution system	2.0	1.4-3.0	µg/L
Bromodichloroacetic acid (BDCAA)	2018	Distribution system	1.4	1.1-2.0	µg/L
Chlorodibromoacetic acid (CDBAA)	2018	Distribution system	0.4	0.3-0.4	µg/L
Tribromoacetic acid (TBAA)	2018	Distribution system	0	br	µg/L
Total Organic Carbon (TOC)	2018	Treatment plant influents (raw water)	2.7	2.3-3.4	mg/L
Bromide	2018	Treatment plant influents (raw water)	0	br	mg/L



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For more information on water quality, including opportunities
for public participation, visit denverwater.org.