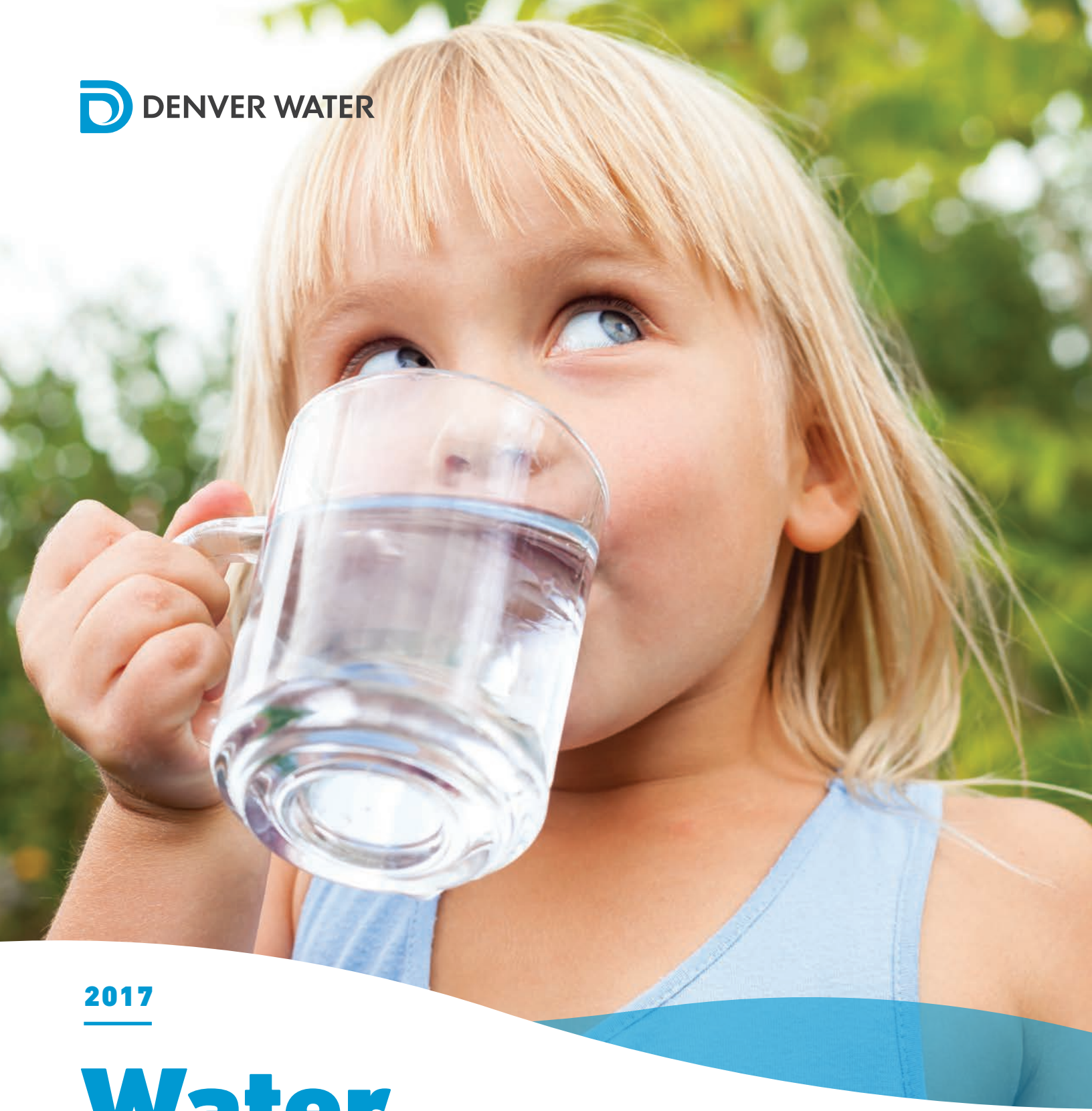
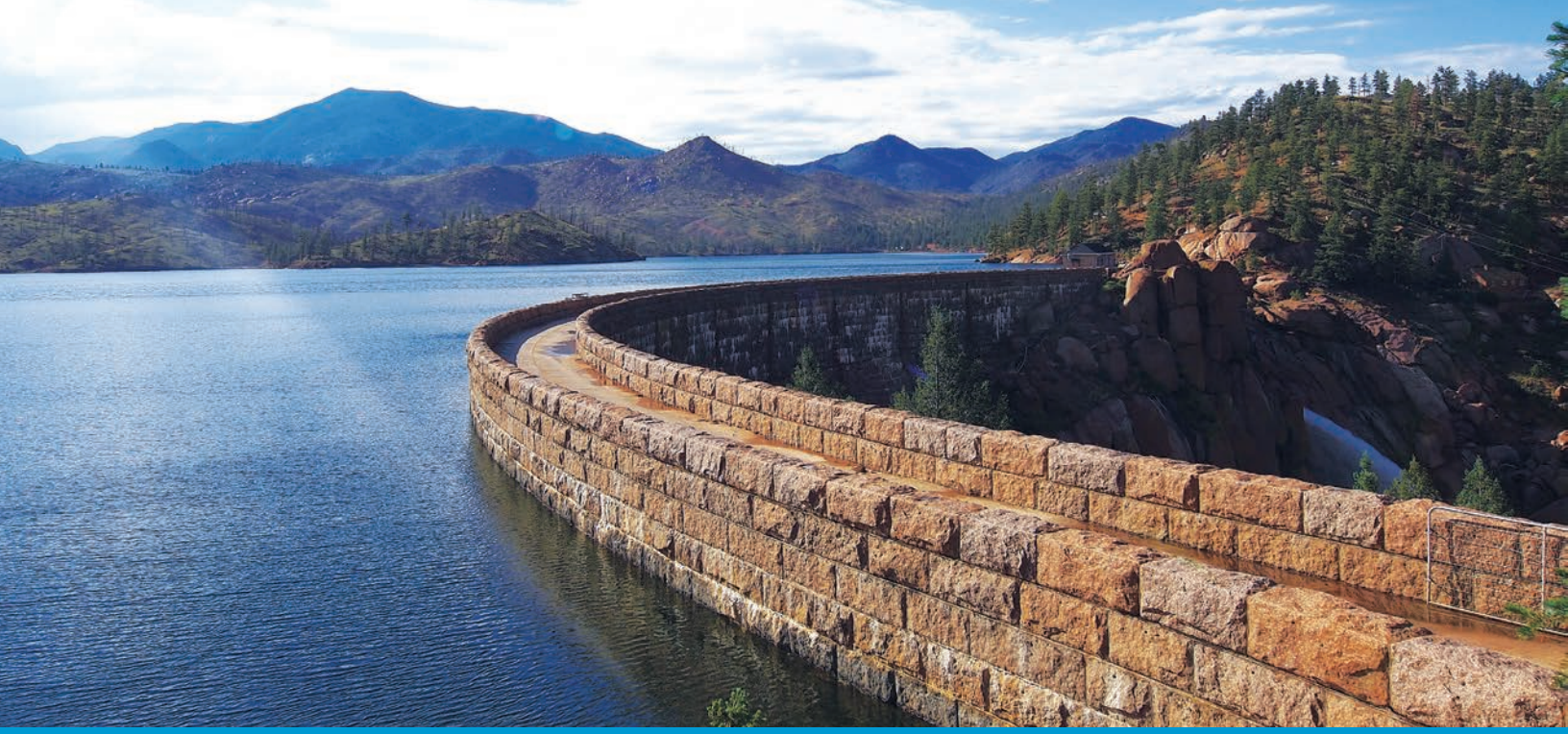
DENVER WATER



2017

Water Quality Report

REPORTE DE CALIDAD DE AGUA



Cheesman Reservoir, completed in 1905, was the first reservoir of Denver's mountain storage facilities.

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 the watershed that encompasses 4,000 square miles 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 one of three treatment plants in the city through a complex system of streams, canals and pipes.

After treatment, drinking water is fed by both gravity and pumps to a system of underground, clear-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 state health department 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 potential sources of contamination that may exist are: EPA Areas of Concern; Permitted Wastewater Discharge Sites; Aboveground, Underground and Leaking Storage Tank Sites; Solid Waste Sites; Existing/Abandoned Mine Sites; Other Facilities; Commercial/Industrial/Transportation; Residential, Urban Recreational Grasses; Quarries/Strip Mines/Gravel Pits; Agriculture; Forest; Septic Systems; Oil/Gas Wells and Road Miles. For more information on the report, contact the Colorado Department of Public Health and Environment by calling **303-692-2000**.

Información importante acerca de la calidad del agua

Para recibir la versión en español del Reporte de Calidad de Agua de 2017 de Denver Water, llame a Servicio al cliente al **303-893-2444** o visite **denverwater.org/Espanol**.

DENVER WATER'S SYSTEM

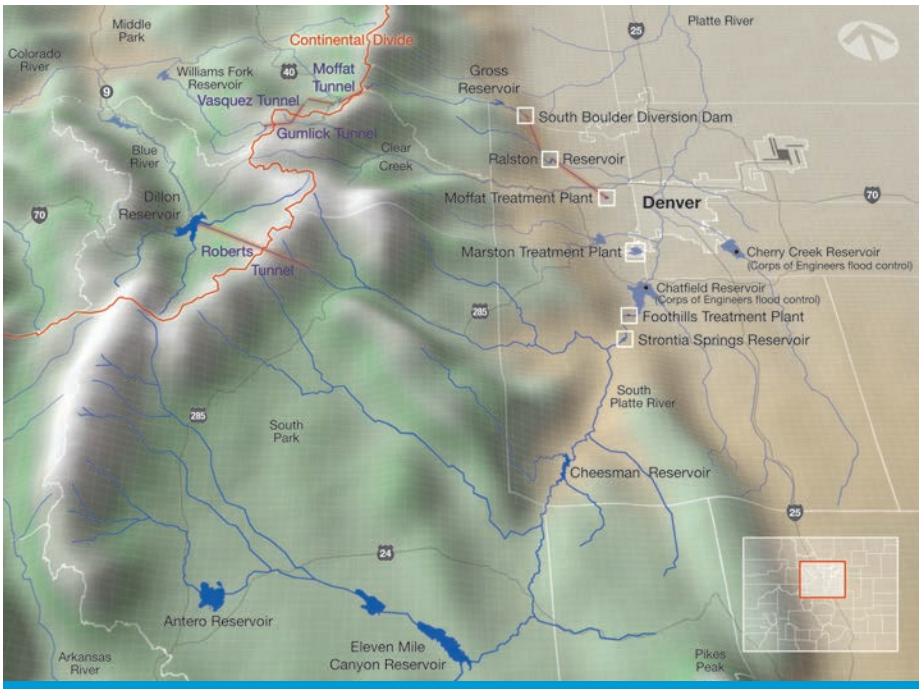
Devoted to water quality

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. The utility 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 percent of the state's population with less than 2 percent 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 68,000 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 2016.



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

Denver Water serves 25% of the state's population with less than 2% of all the water used in the state.

THE TREATMENT PROCESS

The treatment process consists of five steps:

1 COAGULATION/FLOCCULATION — Untreated water from terminal reservoirs (the final storage reservoir before water is transported by closed pipeline to the treatment plant) 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, cloudiness 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.

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 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. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791 or by visiting http://water.epa.gov/drink/contaminants.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as those with cancer undergoing chemotherapy, those 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. For more information about contaminants and potential health effects, or to receive a copy of the Environmental Protection Agency (EPA) and the U.S. Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and microbiological contaminants, call the EPA Safe Drinking Water Hotline at **1-800-426-4791**.

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. Softened water is more aggressive toward household plumbing. Homes and buildings built in 1951 or earlier may have lead service lines, which are the pipes that connect the water main under the street to the home. Homes built before 1988 may have lead solder in their plumbing — lead solder was banned from use on domestic plumbing in 1988. Homes that do not fall within these two categories are 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 cold water tap for up to a couple of minutes before using water for drinking or cooking. Always start with cold water, consuming hot water directly from the tap is not recommended as the environment within a hot water tank is considered corrosive.

Denver Water customers can request a free water quality test for lead for single-family and multi-unit residences, limit one per household. Information on lead in 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**, at **denverwater.org/Lead** or at **303-893-2444**.

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 treated 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, you may wish to have your water tested.

WATER QUALITY MONITORING VIOLATION

In 2016, our water system violated a drinking water monitoring requirement. Although this situation did not pose a safety risk and does not require that you take immediate action, as our customers, you have a right to know what happened, what you should do and what we have done to correct this situation.

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. From Jan. 1, 2013, to Dec. 31, 2016, we did not complete all monitoring for synthetic organic chemicals (SOCs) in accordance with compliance schedules.

What should I do?

There is nothing you need to do at this time.

What happened? What is being done?

The table below lists the contaminant we did not properly test for:

Contaminant	SOCs*
Required Sampling Frequency	Triennially
Number of Samples Taken	1 set (requirement was 2)
When Samples Should Have Been Taken	January 2013 to December 2016
When Samples Will Be Taken	2nd Quarter 2017 and 3rd Quarter 2017

The Colorado Department of Public Health and Environment required that Denver Water monitor water from its treatment plants for SOCs in the 2013 to 2016 timeframe. The regulation requires us to collect two sample sets, each in different quarters during one of the three years. Denver Water is required to monitor 31 SOC compounds triennially. With the exception of two compounds (diquat and endothall), the remaining SOC compounds were monitored per the required schedule. Because the correct sampling frequency was not followed for diquat and endothall, this caused Denver Water to have an SOC monitoring violation per the Colorado Primary Drinking Water Regulations.

Denver Water has had an active monitoring program for more than 10 years and we have not detected SOCs in our system in past compliance cycles.

For more information, you can contact Customer Care at 303-893-2444 or 1600 West 12th Avenue, Denver, CO, 80204.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand.

*SOCs: Endrin, BHC-Gamma, Methoxychlor, Toxaphene, Dalapon, Diquat, Endothall, Di(2-Ethylehexyl) Adipate, Oxamyl, Simazine, Di(2-Ethylhexyl) Phthalate, Picloram, Dinoseb, Hexachlorocyclopentadiene, Carbofuran, Atrazine, Lasso, Heptachlor, Heptachlor Epoxide, 2,4-D, 2,4,5-TP, Hexachlorobenzene, Benzo(A)Pyrene, Pentachlorophenol, Total Polychlorinated Biphenyls (PCB), 1,2-Dibromo-3-Chloropropane, Ethylene Dibromide, Chlordane, Aldicarb, Aldicarb sulfoxide, Aldicarb sulfone

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 storm water 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 storm water 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 storm water 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 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.

Contaminant: a 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): 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: Concentration of a contaminant, that if exceeded, triggers treatment or other requirements that a water system must follow.

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

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

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

Turbidity: A measure of suspended material in water. In the water field, a turbidity measurement (expressed in Nephalometric Turbidity Units) is used to indicate clarity of water.

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 posing a health risk.

Maximum Residual Disinfectant Level (MRDL): Highest level of a disinfectant allowed in drinking water. There is convincing evidence 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 benefit of the use of disinfectants to control microbial contaminants.

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

REGULATED WATER CONTAMINANTS: WHAT IS IN THE WATER?

DATA COLLECTED THROUGHOUT 2016

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)	35 (13 - 123)	No	Monthly	Erosion of natural deposits, water treatment chemical
Antimony	ppb	6	6	0.05 (br[1] - 0.08)	No	Monthly	Discharge from petroleum refineries, fire retardants, ceramics, electronics, solder
Arsenic	ppb	0	10	0.5 (br - 0.5)	No	Monthly	Erosion of natural deposits, runoff from orchards, runoff from glass and electronics, solder
Barium	ppm	2	2	0.03 (0.02 - 0.04)	No	Monthly	Erosion of natural deposits, discharge of drilling wastes
Chromium	ppb	100	100	0.6 (br - 1)	No	Monthly	Discharge from steel and pulp mills, erosion of natural deposits
Copper	ppm	N/A	1.0 (SMCL)	0.003 (br - 0.02)	No	Monthly	Erosion of natural deposits
Iron	ppm	N/A	0.3 (SMCL)	0.02 (br - 0.14)	No	Monthly	
Manganese	ppb	N/A	50 (SMCL)	7 (br - 28)	No	Monthly	
Selenium	ppb	50	50	0.5 (br - 0.6)	No		
Zinc	ppm	N/A	5 (SMCL)	0.002 (br - 0.005)	No	Monthly	
Uranium	ppb	zero	30	0.5 (br - 1.4)	No	Monthly	Erosion of natural deposits, mine drainage
Gross Alpha	pCi/L		15	br (br - 1)	No	Annually	Erosion of natural deposits, mine drainage
Chloride	ppm	N/A	250 (SMCL)	19 (4 - 35)	No	Monthly	
Fluoride	ppm	4.0	4.0 (2.0 is SMCL)[2]	0.7 (0.2 - 1.1)	No	Monthly	Erosion of natural deposits, water additive that promotes strong teeth, discharge from fertilizer and aluminum factories
Nitrate as N	ppm	10	10	0.1 (br - 0.2)	No	Monthly	Runoff from fertilizer use, leaching from septic tanks/sewage, erosion of natural deposits
Sodium	ppm	N/A	N/A	14.8 (7.5 - 20)	No	Annually	Naturally present in the environment
Sulfate	ppm	N/A	250 (SMCL)	40 (16 - 67)	No	Monthly	Naturally present in the environment
Turbidity[3]	NTU	N/A	TT ≤0.30 NTU in 95% of samples/month	Highest Turbidity Level for 2016: 0.18 **Percentage of Samples <0.3 NTU: 100%**	No	12 times daily/ plant	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	Weekly	Natural organic matter that is present in the environment

UCMR 3 (Entry Point to the Distribution System)[4] (2013)	Units of Measurement	MCLG	MCL	Average Level Detected (Range of All Results)	Violation?	Sampling Frequency	Sources of Contaminant
Chromium, Total	ppb	100	100	<0.2 (<0.2 - 0.37)	No	Quarterly	Erosion of natural deposits, discharge of drilling wastes
Chlorodifluoromethane	ppb	N/A	N/A	<0.080 (<0.080 - 0.097)	No	Quarterly	Refrigerant, discharge from wastewater
Hexavalent Chromium (Dissolved)	ppb	N/A	N/A	0.06 (<0.03 - 0.25)	No	Quarterly	Byproduct of disinfection reaction of Total Chromium
Molybdenum	ppb	N/A	N/A	6.8 (<1 - 15)	No	Quarterly	Erosion of natural deposits, discharge of drilling wastes
Strontium	ppb	N/A	N/A	159 (44-240)	No	Quarterly	Erosion of natural deposits
Vanadium	ppb	N/A	N/A	0.3 (<0.2 - 0.66)	No	Quarterly	Erosion of natural deposits

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[5] : 27 (14 - 42)	No	Monthly	Byproduct of drinking water disinfection
Haloacetic Acids (HAA_5)	ppb	N/A	60	Highest locational RAA: 17 (6 - 28)	No	Monthly	Byproduct of drinking water disinfection
Total Coliform	Absent or Present	zero	No more than 5% positive per month	Highest monthly percentage: 0.24% in June 2016 **Number of postives out of number of samples for the year:** 1 out of 4,832 samples or 0.02%	No	Daily	Naturally present in the environment
Disinfectant as Total Cl_2	ppm		TT	Lowest monthly percentage of samples meeting TT requirement of a detectable (greater than or equal to 0.2 ppm) residual: 99.75% in November 2016 For any two consecutive months, at least 95% of samples (per month) must have a detectable disinfectant level. Four out of 4,906 samples had a non-detectable residual in 2016.	No	Daily	Drinking water disinfectant used to control microbes

Regulated at the Customer's Tap[6]	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	0.26	0 out of 167 homes	No	April - June	Corrosion of household plumbing
Lead	ppb	0.0	15	10	7 out of 167 homes	No	April - June	Corrosion of household plumbing
Copper	ppm	1.3	1.3	0.24	0 out of 356 homes	No	July - November	Corrosion of household plumbing
Lead	ppb	0.0	15	10	13 out of 356 homes	No	July - November	Corrosion of household plumbing

Raw Source Water	Positives	Sample Size
Cryptosporidium[7]	4	38

Footnotes and Definitions:

1. br means below the reportable level for an analysis; the reportable level is the lowest reliable level that can be measured.
2. The Fluoride SMCL of 2 mg/L triggers notifying the public of the exceedance.
3. Turbidity has no known health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth.
4. The 1996 Amendments to the Safe Drinking Water Act require that once every five years EPA issue a new list of no more than 30 unregulated contaminants to be monitored by public water systems. UCMR 3 (the Third Unregulated Contaminant Monitoring Rule) provides EPA and other interested parties with scientifically valid data on the occurrence of contaminants in drinking water. The data in this table is from the Assessment Monitoring (List 1 Contaminants), more data is available on the EPA website under UCMR3 https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#3. EPA can use this information to develop regulatory decisions. These analyses were done in 2013.
5. RAA: Running Annual Average.
6. The last compliance sampling for lead and copper was in fall 2016. The next will be in spring 2017. The results in the table are from spring and fall 2016.
7. Cryptosporidium is a microbial pathogen found in surface water throughout the United States. Although filtration and conventional water treatment removes Cryptosporidium, the most commonly-used filtration methods cannot guarantee 100 percent removal. Our raw water monitoring indicates the presence of these organisms in our source water. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Ingestion of Cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immuno-compromised people, infants and small children, and the elderly are at greater risk of developing lifethreatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water. Cryptosporidium has never been detected in Denver Water's finished drinking water.

DenverWater.org
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303-893-2444