2015 TREATED WATER QUALITY SUMMARY

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DENVER WATER

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2015 Treated Water Quality Report

DENVER WATER
2015 TREATED WATER SUMMARY

INTRODUCTION

Denver Water provides its customers with high-quality drinking water. We want you to be aware of how that quality is maintained and learn more about the water treatment process. We take great care providing the Denver-metro area with water that meets the most stringent standards. This report was prepared to provide you with important information about Denver's water quality.

Explanation of terms

To better understand this report, please refer to Table 1, which gives brief explanations of terms and measurement units that are used in the document. Parameters such as temperature and turbidity (which is a measure of the discoloration or particulates in the water that interferes with the clarity of the water) are measurements of physical characteristics and are expressed in units specific to their analyses. Chemical results are generally expressed in terms of concentration, weight or amount per unit volume, for example, mg/L or µg/L). Microbiological results are generally expressed in terms of a count of organisms per volume of sample for example, CFU/100 ml). See table below.

Table 1: Measurement Units Interpretation Table

Unit	Full Name	Equivalent to:
General Terms		
°C	Degrees Celsius (a measurement of temperature)	25°C ≈ (= approx.) 77°F (Fahrenheit)
µS	Micro Siemens (a measurement of Specific Conductance)	Micro mhos
NTU	Nephalometric Turbidity Units (a measurement of clarity, fine particulate matter)	
Chemical Terms		
mg/L	Milligrams per Liter	Parts per million (ppm)
µg/L	Micrograms per Liter	Parts per billion (ppb)
ng/L	Nanograms per Liter	Parts per trillion (ppt)
pCi/L	PicoCuries per Liter (a measurement of radioactivity)	
AU	Absorbance units (a measurement of the absorbance at a specific wavelength)	
gr/gal	Grains per gallon (a measure of water hardness, approximately = to 17.1 mg/L)	
Microbiological Terms		
CFU/100 ml	Colony forming units per 100 milliliters (a bacterial unit)	
Count/ml	Count of organisms per milliliter of sample (a bacterial unit)	

Report data

This report includes graphs and tables summarizing data for samples collected throughout 2015 from the drinking water leaving Denver Water's three potable treatment plants. This report also includes data from the source water to the treatment plants, and from the distributed water. The data in this report are directly related to drinking water compliance criteria. Denver Water uses these analyses to ensure the safety and aesthetic quality of the water.

Some of the data is presented in graphs to highlight changes over time in the parameters. Results are expressed primarily as averages unless otherwise specified. On page 13 of this report, treated water results are displayed in tables that include the regulatory limit for the analysis, where applicable. Water quality is monitored both at the treatment plants and at more than 130 locations in the distribution system for various parameters each week.

Report data, cont'd.

Data from total coliform bacteria testing are used as an indicator of water's safety. The percent of positive total coliform samples each month is calculated and reported to the Colorado Department of Public Health and Environment (state health department), the primacy agency that enforces the Environmental Protection Agency regulations in Colorado. No more than five percent of the samples may be positive per month for total coliform. As evident from Table 2 on page 4, Denver Water is well below the five percent level — out of thousands of samples, only one total coliform positive was detected in 2015, and it was negative for *E. coli.*

WHERE DOES DENVER GET ITS WATER?

Denver Water collects its water from two sources. The South Platte Collection System combines water from high mountain regions on the east slope of the Rocky Mountains, with water diverted from Summit County from Dillon Reservoir on the west slope of the Continental Divide. The Moffat Collection System spans both sides of the Continental Divide, with the majority of it located in Grand County on the West Slope. Raw water from the Moffat Collection System is sent through the Moffat Tunnel to facilities northwest of Denver for storage and treatment.

These sources provide high quality water, but their characteristics are quite different, and the source water mineral concentration varies seasonally with the amount of flow. In general, the water in the South Platte System has a higher mineral content than the water in the Moffat System.

Graphic 1: Denver Water's Watershed Collection System

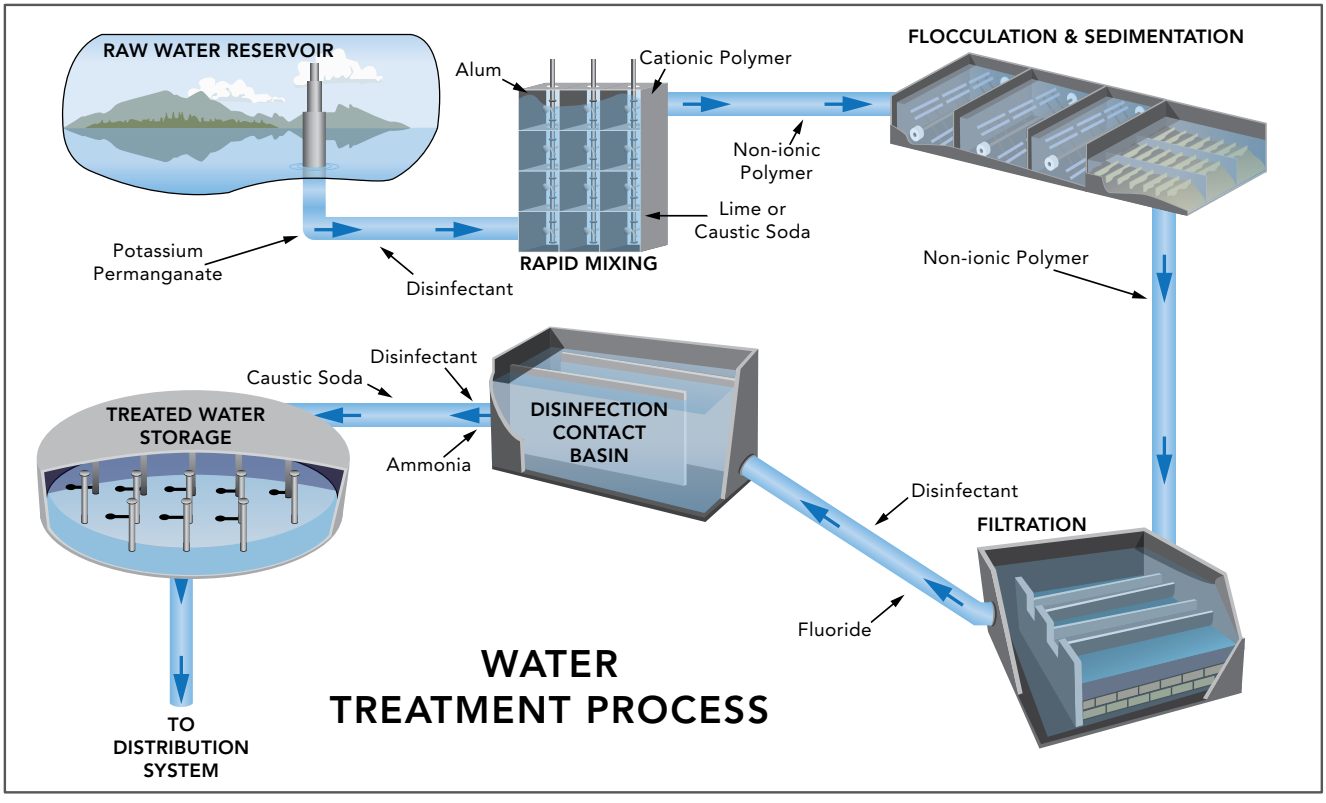
How is water treated to make it drinkable?

Denver Water has three treatment plants that process water for drinking, with a combined maximum treatment capacity of 715 million gallons per day. Two treatment plants, Foothills and Marston, process water from the South Platte Collection System. The third plant, Moffat, treats water from the Moffat Collection System. The treatment process begins with the addition of coagulants to raw water. These coagulants are commonly referred to as alum and polymer. Alum is aluminum sulfate, a chemical that attaches to dirt and other particles in the water. Through a process of slow mixing, the particles collide and stick together; as this process continues, the particles grow, becoming large enough to see. The larger particles are called floc. Polymer enhances the process, these now larger and heavier particles settle to the bottom of the sedimentation basin.

The clarified water at the top of the basin is then sent through silica sand filters at Moffat Treatment Plant and sand and anthracite coal dual media filters at Marston and Foothills treatment plants. Filtration removes virtually all of the particles carried over from the sedimentation process. Each treatment plant produces extremely clear water, evidenced by low turbidities (a measure of clarity). Less than 0.20 turbidity units represents clear, clean water. Potassium permanganate or powdered activated carbon may also be added to control excess manganese or odors, respectively. Most of Denver Water's supply has naturally occurring fluoride.

The Colorado Department of Public Health and Environment and the Centers for Disease Control and Prevention set the recommended level of fluoride. After filtration, the water may be supplemented to bring the total concentration of fluoride up to 0.70 mg/L. The health department and the Centers for Disease Control and Prevention have determined that 0.70 mg/L is the optimal level to prevent tooth decay. Caustic soda may be used to control the pH (acidity/alkalinity) of the water. It is added to adjust the pH of the water to greater than 7.5. Finally, the water is thoroughly disinfected to maintain its high quality as it travels to homes and businesses.

Graphic 2: Potable Water Treatment Process



Why is the water treated this way?

The treatment process is designed to remove dirt, particulate matter, naturally occurring organic matter, and microscopic organisms, such as bacteria, that are found in surface waters. Disinfection kills potentially harmful microorganisms. See Table 2. Disinfection of drinking water has saved millions of lives over the past century by preventing waterborne diseases such as typhoid and cholera. Denver Water uses a very effective long-lasting disinfectant, chloramine, that we make and have used since 1918. This produces lower concentrations of disinfection byproducts, such as Total Trihalomethanes and Haloacetic Acids, than would free chlorine. Disinfection byproducts above their regulatory limits are potentially harmful; therefore minimization of them is very important.

Table 2: Treatment Plant Treated Water and Distribution System Total Coliform Samples for 2015

Month	Number of Samples	Number of Positives	% Positive
January	408	0	0.00%
February	391	0	0.00%
March	397	0	0.00%
April	435	0	0.00%
May	429	0	0.00%
June	431	1	0.23%
July	425	0	0.00%
August	424	0	0.00%
September	442	0	0.00%
October	421	0	0.00%
November	371	0	0.00%
December	418	0	0.00%
Totals	**4,992**	**1**	**0.02%**

These regulations are very strict and require that drinking water is made safe for consumption over a person's lifetime. At present, there are more than 90 contaminants and groups of contaminants that are regulated in drinking water. Some of these contaminants, such as lead, have been shown to be a health risk, while others are merely suspected of being health risks but are still considered serious enough to regulate.

The Environmental Protection Agency has set regulatory limits for these compounds. Regulatory limits are levels of safety that must not be exceeded in order to maintain safe drinking water. Some contaminants are regulated based on the possibility of their occurrence in water. Regulatory limits or levels were determined based on the best available data from health effects studies. The majority of the EPA's drinking water regulations apply to the treated water entering the distribution system before it reaches the first customer. Denver Water is happy to report that we have never violated a regulatory limit for any contaminant to date.

How well is Denver Water doing?

Tables 3-5 illustrate the effectiveness of treatment for a few parameters of note. Turbidity is a measurement of the clarity of the water; thus, a low turbidity indicates very clear water. Most microorganisms, including bacteria, are attached to particulate matter (fine dirt and debris). Particulate matter accounts for much of the turbidity in water. Therefore, turbidity is an extremely important parameter and has been regulated by the EPA for many years. The turbidity regulation requires that turbidities in the treated water be less than or equal to 0.30 NTU (turbidity units) in 95 percent of the samples each month. In 2015, 100 percent of the samples were below 0.30 NTU. The water was clean and clear entering the distribution system (see graph on page 7).

The total coliform test is a measure of all types of coliform bacteria in the water. Coliform bacteria are ubiquitous. They are even found in soils and on plants. We test for coliform bacteria, which includes *E. coli (Escherichia coli)* (found in the intestines of all mammals, including humans) to determine the cleanliness of the water. We test for total coliform in our plants source and treated waters, as well as throughout our entire distribution system.

On the rare occasion when a sample has tested positive for total coliform, additional samples have to be taken at locations upstream and downstream of the original test site and again at the site itself. This re-sampling is mandated by the state health department to assure the safety of the water. Regardless, Denver Water's internal operating procedures would require this re-sampling. Samples are collected until results indicate the water is safe.

Table 3: Denver Water Average Values for 2015

CONTAMINANTS	TREATMENT PLANT	SOURCE WATER	TREATED WATER	EPA REGULATORY LIMIT
Lead (ppb)	Marston	None detected	None detected	15 ppb (action level)
	Foothills			
	Moffat			
Arsenic (ppb)	Marston			10 ppb
	Foothills			
	Moffat			
Mercury (ppb)	Marston			2 ppb
	Foothills			
	Moffat			
Giardia (Cysts/L)	Marston	1.5		Treatment Technique
	Foothills	Not tested		
	Moffat	0.66		
Cryptosporidium (Oocysts/L)	Marston	None detected		Treatment Technique
	Foothills	None tested		
	Moffat	None detected		
E. Coli (MPN/100 ml)	Marston	5		Ø
	Foothills	5		
	Moffat	None detected		

ARE THERE MORE SERIOUS CONTAMINANTS IN THE WATER?

Denver Water has tested for all of the EPA-regulated compounds for years, and in anticipation of upcoming regulations, has tested for newly identified contaminants as well. Contaminants that have been seen in news headlines include lead, arsenic, mercury, *Cryptosporidium, Giardia, and E. coli*, among others. Denver Water has tested for these for more than 20 years and has not detected them in the treated water. *Giardia, E. coli and Cryptosporidium* have occasionally been detected in the source water, but the effective treatment system in our treatment plants, as outlined on page 3, removes or inactivates these microorganisms.

Minerals in nature that are found in water

All natural waters contain minerals found in the earth's crust. These mineral salts result from the natural erosion of soils, rocks and/or the decay of plants and aquatic life. The amounts of these minerals in water also determine the characteristics of the water, such as its hardness. Minerals in water give water its flavor.

Mineral-rich water often tastes chalky. Of the minerals shown in Table 4 on page 6, only barium and aluminum are regulated in the treated water. Barium has a maximum contaminant level of 2,000 ppb, while aluminum has a secondary maximum contaminant level, which is a non-enforceable drinking water regulation (does not pose a health risk), of 50-200 ppb. Most minerals are not removed by conventional treatment. Calcium, magnesium, iron and manganese amounts may be reduced by water treatment, but not completely removed. Please note that these comparisons, though from the same treatment plants, are not always from samples collected on the same dates for the source and the treated waters, and therefore are general comparisons. Drinking water naturally contains several minerals that are beneficial to humans and mammals. The minerals (calcium, magnesium, potassium and sodium) in Table 4 are beneficial at prescribed levels. However, at levels above the regulatory limits (where applicable), some of these minerals may cause detrimental effects over a lifetime. If there is no regulatory limit, or maximum contaminant level, listed in the table, then the amount of the mineral that might cause a potential health concern is much higher than would ever be found in water.

Table 4: Denver Water Average Values for 2015

PARAMETER	TREATMENT PLANT	SOURCE WATER	TREATED WATER	EPA REGULATORY LIMIT
Aluminum (ppb)	Marston	232	26	50 - 200 (SMCL)
	Foothills	265	40	50 - 200 (SMCL)
	Moffat	344	15	50 - 200 (SMCL)
Barium (ppb)	Marston	38	35.6	2,000 ppb
	Foothills	38	34.9	2,000 ppb
	Moffat	28	26	2,000 ppb
Calcium (ppm)	Marston	24.6	23.2	None
	Foothills	23.8	22.4	
	Moffat	11.3	14	
Magnesium (ppm)	Marston	7.6	6.9	
	Foothills	7.5	6.9	
	Moffat	3.5	3.1	
Potassium (ppm)	Marston	1.6	1.6	
	Foothills	1.7	1.5	
	Moffat	1.0	0.9	
Sodium (ppm)	Marston	14.7	16.7	
	Foothills	15.0	17.0	
	Moffat	4.5	10.2	

Table 5: Denver Water Average Values for 2015

PARAMETER	TREATMENT PLANT	SOURCE WATER	TREATED WATER	EPA REGULATORY LIMIT
Total Coliform Bacteria (MPN/100 ml)	Marston	223	None detected	No more than 5% positives/ month
	Foothills	312	None detected	
	Moffat	42	None detected	
Turbidity (NTU)	Marston	3.8	0.04	95% of samples less than 0.30 in any month
	Foothills	3.8	0.06	
	Moffat	5.3	0.05	

Comparison of fluoride between untreated and treated water

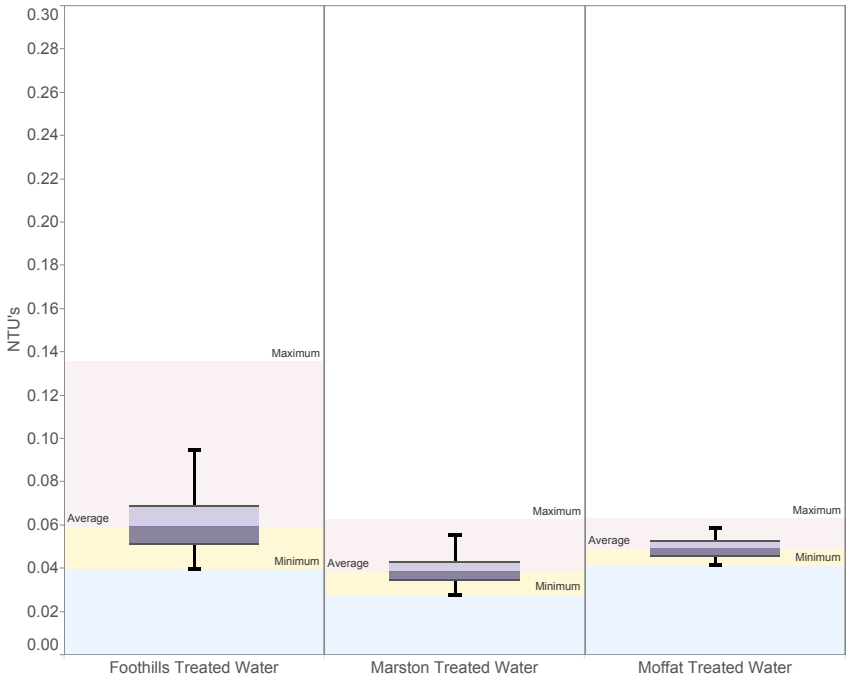
Denver Water's source water has natural fluoride. When needed, Denver Water supplements the water with fluoride to bring the total fluoride content up to 0.70 mg/L, to comply with the recommendation of the state health department and the Centers for Disease Control and Prevention (CDC) for the prevention of tooth decay. Water from the Moffat Collection System has lower amounts of natural fluoride and must be fortified to meet the recommended standard (Graph 2 on page 8)

Natural fluoride levels from the South Platte Collection System generally meet or exceed the recommended level in the source water, but both the Foothills and Marston treatment plants can supplement when needed (Graphs 3 and 4 on pages 8 and 9). Note: Fluoride is tested monthly for the source water and several times daily for treated water. Moffat Treatment Plant was out of service after September 2015, and Foothills Treatment Plant was out of service February and March of 2015. Marston Treatment Plant was out of service for brief periods during the winter months.

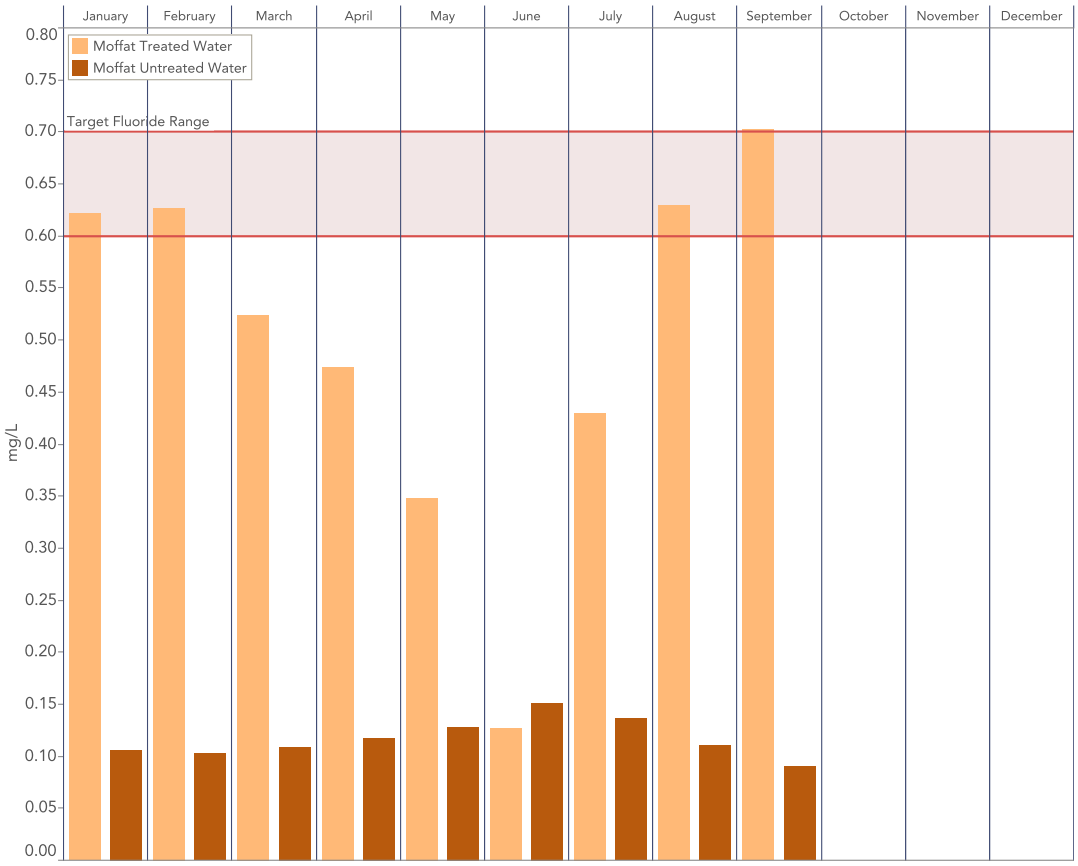
pH

We measure the pH range of water to prevent it from corroding residential and distribution system plumbing. The pH of water does not impact the safety of the water; it relates to the aggressiveness of it toward plumbing materials. Denver Water is required to maintain a pH greater than 7.5 to ensure that the water does not leach potentially harmful metals from plumbing, see Graph 5 on page 11.

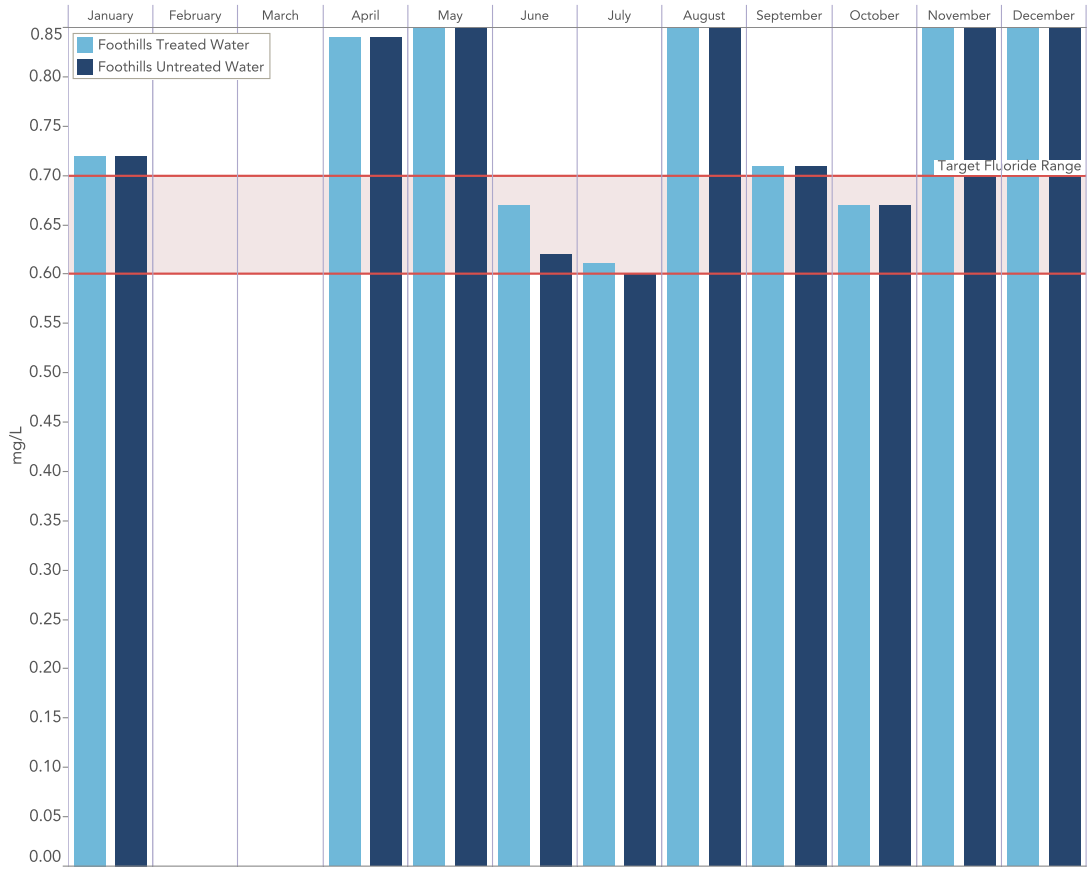
Graph 1: 2015 Treated Water Turbidity Ranges



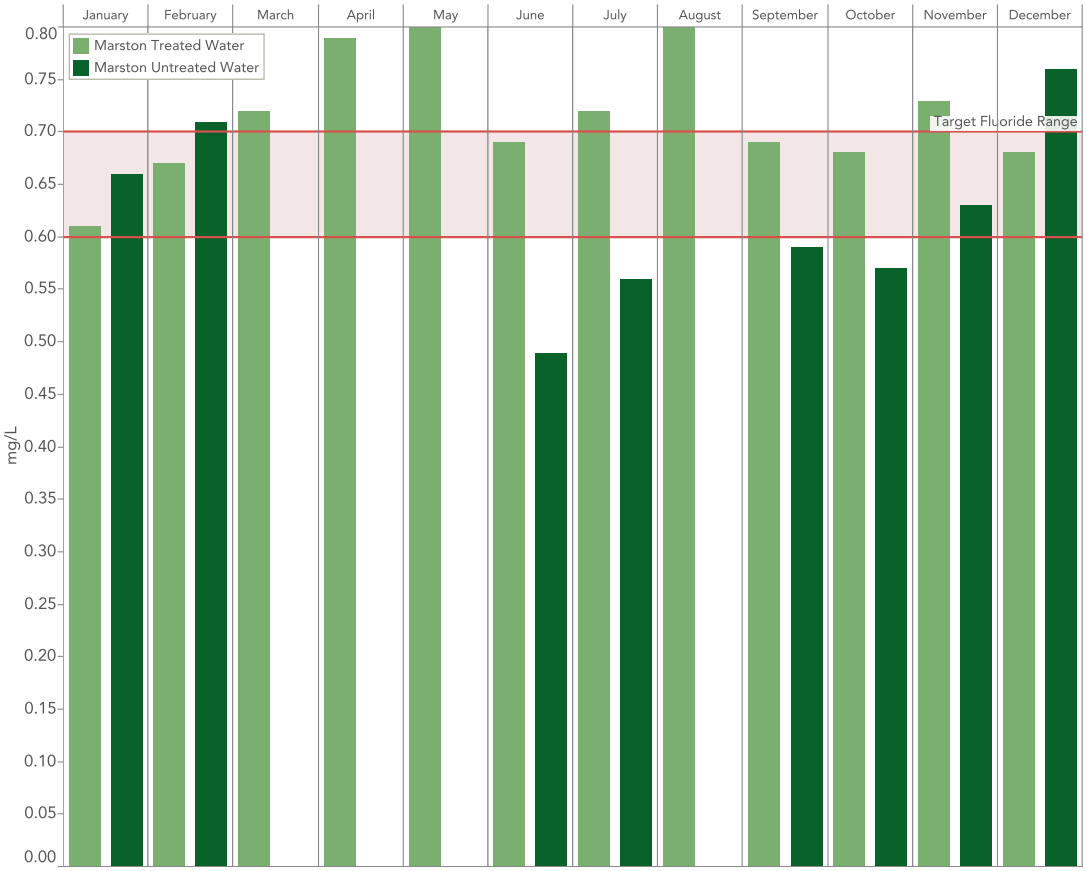
Graph 2: 2015 Fluoride Levels for Moffat Treatment Plant



Graph 3: 2015 Fluoride Levels for Foothills Treatment Plant



Graph 4: 2015 Fluoride Levels for Marston Treatment Plant



Water hardness

The hardness of water is a result of calcium and magnesium salts dissolved in water. Other minerals such as potassium and iron can contribute to water hardness. In Denver's water, the iron levels are non-detectable, but iron can come from old cast-iron water mains and the plumbing in buildings or homes. The units of measure for water hardness are in mg/L, but most customers' appliances state water hardness in grains per gallon, g/g. In the laboratory, we measure hardness in mg/L (ppm). Graph 6 on page 12, lists hardness in both mg/L and g/g. Denver's water sources are considered soft to moderately hard. The South Platte source water from Antero Reservoir to Strontia Springs Reservoir in Waterton Canyon is moderately hard and varies between 60 -120 mg/L or 3 – 7 g/g. The water that feeds Moffat Treatment Plant is all snowmelt around the Winter Park area and is considered soft water, and varies seasonally between 30 – 60 mg/L or 2 – 4 g/g. Most customers calling about water hardness are inquiring for detergent usage amounts for dishwashers and clothes washers or water amounts for their iron or other appliances. Our water tends to form a mineral scale on the inside of plumbing; this is purely aesthetic and does not impact the safety or health of the water. Many cities across the nation have much harder water than Denver's. Graph 6 on page 12, shows the seasonal fluctuations in hardness over the year.

WHICH TREATMENT PLANT SERVES MY AREA?

Denver Water's distribution system is completely integrated. This means that we can distribute water from any of our three potable treatment plants to anywhere in our system. Water is usually routed based on demand. Foothills Treatment Plant is our largest gravity fed potable water plant. It is often in service and serves much of the system. However, we can blend water from Foothills with Moffat or Marston or blend the water from any two potable treatment plants and send it anywhere in our system.

WHICH TREATMENT PLANT SERVES MY AREA? (cont'd.)

This complete redundancy is rather unique compared to other distribution systems in the United States. When wondering which treatment plant serves you, it is best to assume the water can come from any of the three treatment plants to your home or business at any given time.

LOOKING DOWN THE ROAD

Water quality is Denver Water's most important mission, and we make every effort to ensure our water is safe to drink.

Sometimes customers ask about hexavalent chromium in treated water. We test for it every year. Additionally, hexavalent chromium was one of the 30 contaminants we tested as part of the UCMR3 testing. Though we found it in extremely low amounts — ranging from not detected to 0.15 parts per billion — our goal is to eliminate it from drinking water. Scientists do not yet know what levels of hexavalent chromium may present a health concern, and studies are ongoing. We will continue to monitor and remain engaged in the EPA's effort to investigate it further.

Moffat Water Treatment Plant earns national award

As Colorado's oldest and largest water utility, Denver Water has a long history of supplying safe, reliable drinking water, summarized in the following Mission Statement: Denver Water will be a responsible steward of the resources, assets and natural environments entrusted to us in order to provide a high-quality water supply, a resilient and reliable system, and excellent customer service.

Denver Water has made a commitment to supply the highest quality of water the customers. Meeting this commitment is at the heart of everything Denver Water does.

Denver Water has adopted water quality and treatment performance goals higher than the existing regulations, including the goal of achieving the American Water Works Association's (AWWA's) Partnership for Safe Water Phase IV status at all three of Denver Water's potable drinking. By adopting this goal, Denver Water has made a commitment and recognizes the value of the Partnership for safe water optimization goals and the public health benefits and acceptance of pursuing a goal "beyond the regulations."

Congratulations are in order to everyone at Denver Water's Moffat Treatment Plant for earning the AWWA's Partnership for Safe Water Director's Award. The Moffat team completed a Phase III Self Assessment, which involved openly examining the plant itself and all of its operations and administrative processes. The team compiled its findings and submitted its report to an industry group for review and feedback.

Photo:
Front row left to right: *Andrea Song, assistant water treatment plant supervisor; Michelle Miller, water treatment technician; Penfield Tate, Denver Water Board president.*

Back row left to right: *John Hitchcock, water treatment lead technician; Zeke Campbell, water quality/treatment system manager; Thomas Gougeon, Denver Water Board vice president; Greg Austin, Denver Water Board vice president; Whitney Rux, process control specialist; and Zack Alabbasi, Moffat Water Treatment Plant supervisor.*

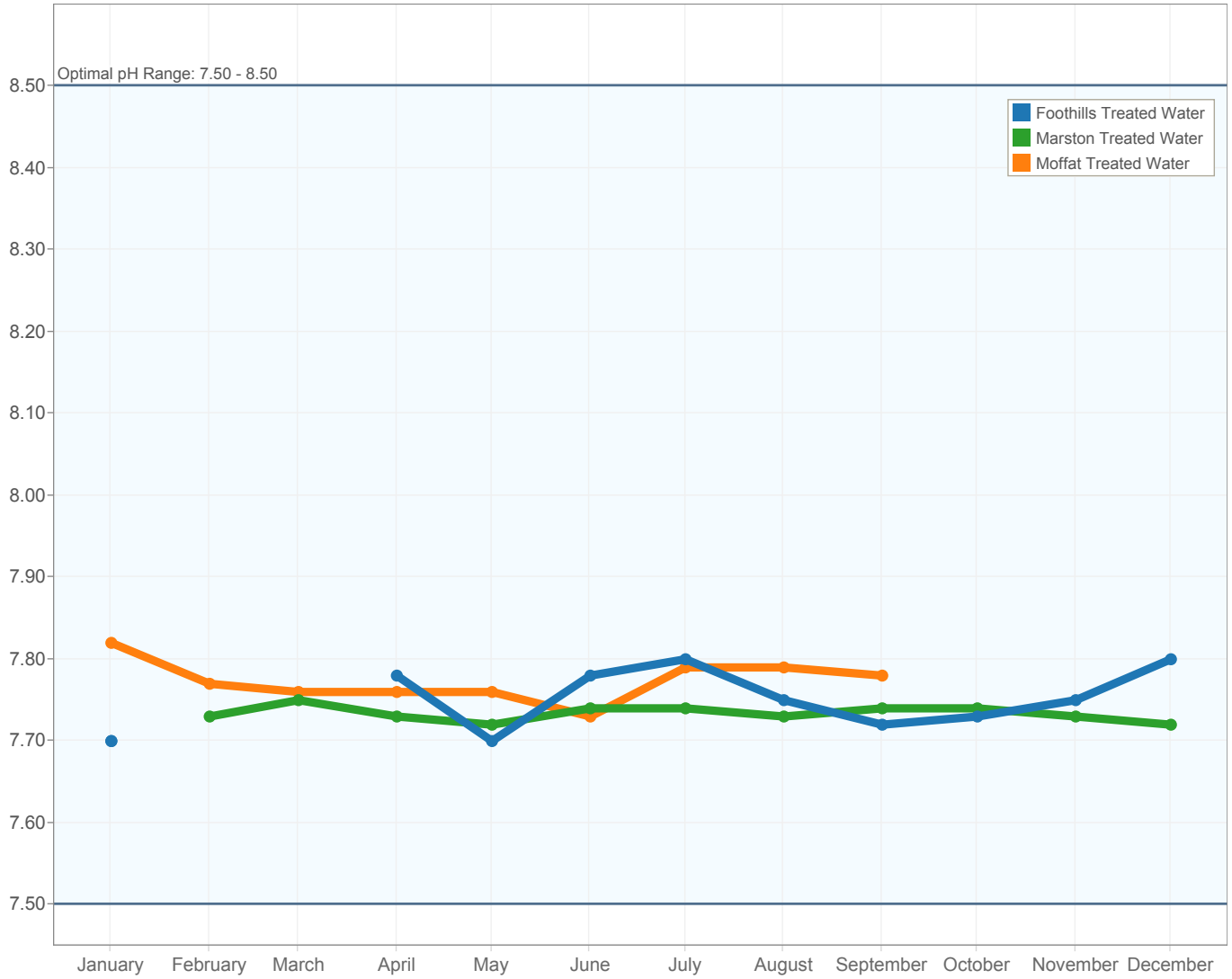
Moffat Water Treatment Plant (cont'd.)

The goal is to push water utilities to reach the highest level of performance so they can deliver the highest quality of water and service to their customers.

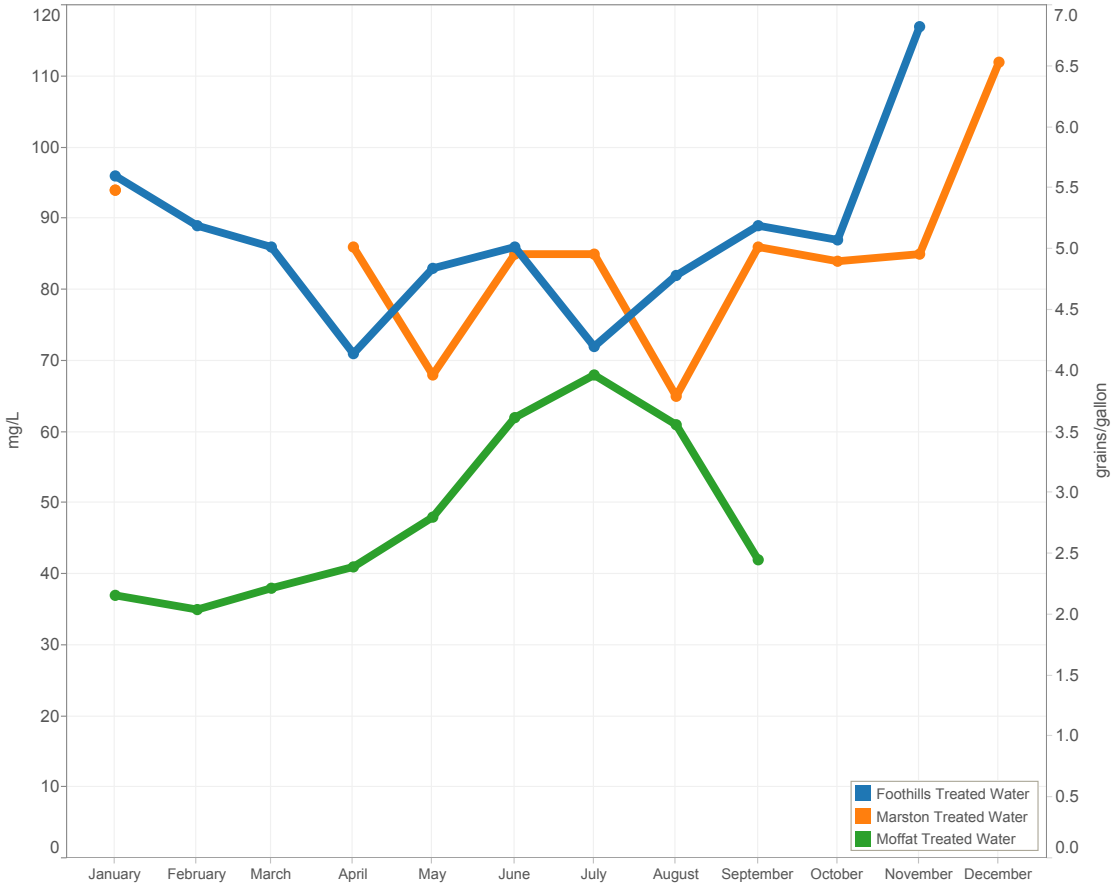
"When you receive an award like this, it's a symbol of the team effort of everyone not only at Moffat, but across all of Denver Water," said Zack Alabbasi, Moffat Treatment Plant supervisor. "Denver Water's goal is to continually strive to improve and maintain our water quality and treatment, so being recognized as one of the highest performing water utilities in the country affirms our commitment," said Andrea Song, Moffat Water Treatment Plant assistant supervisor. The team will be recognized at the AWWA's annual conference in Chicago, this June.

We have an obligation to make sure the water is safe for all — we drink the water, too. Though we have caretakers who live at and monitor our mountain reservoirs, customers help too — an effort we sincerely appreciate. If you have any concerns, questions or comments regarding water quality, call Denver Water at 303-893-2444.

Graph 5: 2015 pH Results for Treated Water



Graph 6: 2015 Hardness Results for Treated Water



REGULATORY TERMINOLOGY

Pages 12 through 15 are tables of data for compounds found in the treated water. The tables contain the name of the compound, the maximum contaminant level (see below) where applicable, the average result, the range of detections for the year, and the number of times for which it was tested in 2015. Most of the compounds found are not regulated and do not pose a health or safety risk. Regulatory abbreviations are explained below.

AL: Action levels are enforceable triggers for compliance that force public notification and treatment optimization.

MCL: Maximum contaminant level, which are the Environmental Protection Agency's drinking water regulatory limits. Based on health and toxicology studies, results at or below these levels in drinking water are considered safe. These are usually numeric values; sometimes they are designated as DS or TT. (see below)

SMCL: Secondary maximum contaminant level, the Environmental Protection Agency's nonenforceable, but recommended guideline level of a contaminant or compound. When the fluoride secondary maximum contaminant level exceeds 2 mg/L, we must notify the public.

DS: Distribution system is how the total coliform regulation is decreed. This means that the total coliform regulation (less than 5 percent total coliform positive samples per month) applies to the water in the distribution system (service area) not just the treatment plant effluents.

TT: Treatment Technique refers to the water treatment process used in the plants, which must be optimized to control the levels of contaminants, such as the corrosion control process (maintaining a pH greater than 7.5 and alkalinity greater then 15) used to control lead and copper. To date, we have not detected lead in the raw, treated or distribution system water, and only small amounts of copper (less than a tenth of the regulatory limit 1.3 mg/L) have been found.

Compounds that were below reporting levels in Denver's water are listed on pages 16-18. We test for all of these compounds and contaminants at least annually. Contaminants that have been in the news recently, such as arsenic, lead, and TCE are on the notfound list.

Data Tables For Treated Water

Marston Treated Water

Analysis	MCL	Average	Range	No.
General (mg/L)				
Total Alkalinity as $CaCO_3$	>15	64	52 - 73	11
Total Chlorine		1.74	1.58 - 1.98	4,050
Hardness as $CaCO_3$		84	71 - 96	10
pH (SU)	>7.5 daily average	7.74	7.6 - 8.09	4,049
Specific Conductance (µS)		300	229 - 386	48
Temperature (°C)		11	5 - 18	49
Total Dissolved Solids		175	151 - 209	11
Turbidity (NTU)	Treatment Technique	0.04	0.02 - 0.08	4,049
Metals (µg/L)				
Aluminum		26	20 - 39	11
Barium	2,000	35	33.7 - 37.3	11
Boron		13.8	11.5 - 19.3	11
Calcium (mg/L)		23.2	19.1 - 29.9	11
Copper	AL	5.4	2.9 - 8.8	11
Magnesium (mg/L)		6.9	5.6 - 8.5	11
Manganese		3.9	0.9 - 12.7	11
Molybdenum		3.5	0.9 - 12.7	11
Potassium (mg/L)		1.6	1.4 - 2.0	11
Sodium (mg/L)		16.7	n/a	1
Strontium (mg/L)		0.16	n/a	1
Analysis	**MCL**	**Average**	**Range**	**No.**
Ions (mg/L)				
Ammonia as N		0.092	0.047 - 0.176	43
Chloride		26.0	20.0 - 29.5	11
Fluoride	4.0	0.72	0.47 - 1.04	873
Nitrate as N	10	0.12	0.08 - 0.22	11
Silicon		3.7	3.0 - 4.5	11
Sulfate		48.7	35.7 - 66.6	11
Radiological (pCi/				
Uranium (µg/L)	30	0.3	0.2 - 0.5	11
Disinfection By Products (µg/L)				
Bromochloroacetic acid		3.3	2.7 - 4.0	5
Bromodichloromethane		6.2	4.0 - 8.3	16
Chloroform		14.7	4.8 - 33.8	16
Dibromochloromethane		1.4	0.6 - 2.8	16
Dichloroacetic acid		10.7	5.8 - 16.6	11
Haloacetic Acids (5)	$60^{(DS)}$	19	10 - 32	11
Monobromoacetic acid		1.2	<1.0 - 5.9	11
Total Trihalomethanes	$80^{(DS)}$	22	10 - 42	16
Trichloroacetic acid		7.2	4.1 - 11.2	11
Non Specific Organics				
Total Organic Carbon (mg/L)		2.4	1.5 - 3.8	51

Data Table For Treated Water

Foothills Treated Water

Analysis	MCL	Average	Range	No.
General (mg/L)				
Total Alkalinity as $CaCO_3$	>15	62	52 - 74	10
Total Chlorine		1.75	1.45 - 2.15	3,674
Hardness as $CaCO_3$		82	65 - 94	9
pH (SU)	>7.5 daily average	7.81	7.55 - 8.04	1,837
Specific Conductance (µS)		291	230-370	44
Temperature (°C)		13	6 - 21	45
Total Dissolved Solids		173	147 - 201	10
Turbidity (NTU)	Treatment Technique	0.06	0.04 - 0.29	3,643
Metals (µg/L)				
Aluminum		40	24 - 58	10
Barium	2,000	34.9	31.5 - 37.3	10
Boron		13.5	11.0 - 16.1	10
Calcium (mg/L)		22.4	17.7 - 27.4	10
Copper	AL	4.9	1.5 - 9.6	10
Magnesium (mg/L)		6.9	5.1 - 9.0	10
Manganese		13	3.2 - 14.2	10
Molybdenum		3.6	1.4 - 11.2	10
Potassium (mg/L)		1.5	1.3 - 1.7	10
Sodium (mg/L)		17	n/a	1
Strontium (mg/L)		0.16	n/a	1
Zinc		2.2	<1.0 - 4.0	10
Ions (mg/L)				
Ammonia as N		0.076	0.037 - 0.159	43
Chloride		25.6	20.1 - 32.8	11
Fluoride	4.0	0.77	0.42 - 1.02	614
Nitrate + Nitrate as N	10	0.11	<0.04 - 0.18	10
Silicon		3.8	3.1 - 4.5	10
Sulfate		47	33 - 66	10
Radiological (pCI/L)				
Uranium (µg/L)	30	0.4	<0.1 - 1.0	10
Disinfection By Products (µg/L)				
Bromochloroacetic acid		2.5	1.9 - 2.9	4
Bromodichloromethane		5.8	3.5 - 8.0	12
Chloroform		16.1	5.8 - 41.0	12
Dibromochloromethane		1.1	0.6 - 2.0	12
Dichloroacetic acid		11.8	7.8 - 17.4	10
Haloacetic Acids (5)	$60^{(DS)}$	21	13 - 32	10
Monobromoacetic acid		1.6	<1.0 - 6.5	10
Total Trihalomethanes	$80^{(DS)}$	23	10 - 50	12
Trichloroacetic acid		8.1	4.4 -12.8	10
Non Specific Organics				
Total Organic Carbon (mg/L)		2.5	1.7 - 3.8	45

Data Table For Treated Water

Moffat Treated Water

Analysis	MCL	Average	Range	No.
General (mg/L)				
Total Alkalinity as $CaCO_3$	>15	34	28 - 47	9
Total Chlorine		1.79	1.49 - 2.0	2,621
Hardness as $CaCO_3$		48	35 - 68	9
pH (SU)	>7.5 daily average	7.8	7.2 - 8.3	1,317
Specific Conductance (µS)		143	110 - 240	39
Temperature (°C)		11	5 - 19	39
Total Dissolved Solids		100	76 - 134	9
Turbidity (NTU)	Treatment Technique	0.06	0.04 - 0.08	2,621
Metals (µg/L)				
Aluminum		15	10 - 21	9
Barium	2,000	26	20.1 - 34.0	9
Boron		8.2	5.1 - 11.6	9
Calcium (mg/L)		14	10.2 - 20.0	9
Copper (mg/L)	AL	4.2	1.4 - 9.7	9
Magnesium (mg/L)		3.1	2.4 - 4.3	9
Manganese		<0.5	<0.5 - 0.9	9
Molybdenum		1.5	1.2 - 1.9	9
Nickel		0.3	<0.1 - 0.6	9
Potassium (mg/L)		0.9	0.7 - 1.2	9
Sodium (mg/L)		10.2	n/a	1
Strontium (mg/L)		0.09	n/a	1
Ions (mg/L)				
Ammonia as N		0.076	0.031 - 0.14	42
Chloride		10.1	5.2 - 17.5	9
Fluoride	4.0	0.5	0.5 - 1.06	1,308
Nitrate-Nitrogen	10	0.10	0.05 - 0.18	9
Silicon		3.3	2.5 - 4.3	9
Sulfate		32	20 - 49	9
Radiological (pCi/L)				
Uranium (µg/L)	30	0.3	<0.1 - 0.6	9
Disinfection By Products (µg/L)				
Bromochloroacetic acid		1.1	<1.0 - 1.9	6
Bromodichloromethane		3	1.4 - 5.2	13
Chloroform		9.5	5.5 - 15.7	13
Dibromochloromethane		0.4	<0.5 - 0.9	13
Dichloroacetic acid		8.3	5.2 - 13.7	10
Haloacetic Acids (5)	60(DS)	15	9 - 25	10
Monobromoacetic acid		<1.0	<1.0 - 3.7	10
Total Trihalomethanes	80(DS)	13	7 - 20	13
Trichloroacetic acid		5.8	4.2 - 7.5	10
Non Specific Organics				
Total Organic Carbon (mg/L)		1.8	1.1 - 3.2	40

Contaminants not found in Denver's drinking water

The following analyses were performed, and each of these constituents was either below the reporting limit or the average result was less than the reporting limit. VOCs are volatile organic chemicals (easily airborne), and SOCs are synthetic organic chemicals, (typically man made). The maximum contaminant level (MCL) is listed after the contaminant in parentheses, if regulated in drinking water. The unit of measure is also listed if different than that listed for the subsection.

General Parameters	Plankton	Benzo(g,h,i)perylene	Epichlorohydrin
Chlorine, Free	Cylindrospermopsin (Algal Toxin)	Benzo(k)fluoranthene	Ethyl acrylate
Asbestos (7 MFL)	Microcystin-LA (Algal Toxin)	Chloroprene	Ethyl methacrylate
Metals - plumbing, mining, natural errosion (µg/L)	Microcystin -LF (Algal Toxin)	Chloropropylate	Galaxolide
	Microcystin-LR (Algal Toxin)	Chrysene	Isobutylparaben
Antimony (6)	Microcystin-LY (Algal Toxin)	Cyclohexanone	Isopropyl ether
Arsenic (10)	Microcystin-RR (Algal Toxin)	Dibenzo(a,h)anthracene	Methyl paraben
Beryllium (4)	Microcystin-YR (Algal Toxin)	Diethanolmine (DEA)	Methacrylonitrile
Cadmium (5)	Nodularin (Algal Toxin)	Ethyl acrylate	Polychlorinated Biphenyls (PCB)
Chromium (100)	Total Coliform (DS)	Ethyl tert-butyl ether	PCB 1016 Aroclor
Cobalt	**Disinfection By-Products - reaction between the disinfectant and natural organic matter (µg/L)**	Fluoranthene	PCB 1221 Aroclor
Iron		Fluorene	PCB 1232 Aroclor
Lead (TT1)		Hexachlorobenzene	PCB 1242 Aroclor
Lithium	Bromoform	Hexachlorocyclopentadiene	PCB 1248 Aroclor
Mercury (2)	Carbon Tetrachloride	Indeno(1,2,3-cd)pyrene	PCB 1254 Aroclor
Selenium (50)	Chlorate	Isophorone	PCB 1260 Aroclor
Silver	Chloroacetonitrile	Methacrylonitrile	Perfluoro octanesulfonic acid (PFOS)
Thallium (2)	Monochloroacetic Acid	Methyl acrylate	Perfluoro-1-butanesulfonic acid (PFBS)
Titanium	N-nitrosodiethylamine (Nitrosamine)	Methylmethacrylate	Perfluoro-1-hexanesulfonic acid (PFHxS)
Vanadium	N-nitrosodimethylamine (NDMA)	Naphthalene	Perfluoroheptanoic acid (PFHpA)
Ions - from farming, and industry, (mg/L, µg/L)	N-nitrosodi-n-butylamine	n-Butyl Acrylate	Perfluoro-nonanoic acid (PFNA)
	N-nitrosodi-n-propylamine	N-nirtosopyrollidine	Perfluorooctanoic acid (PFOA)
Bromide	N-nitrosomethylethylamine	Nitrobenzene	Phenol
Carbon disulfide	N-nitrososdiphenylamine	Nonylphenol isomer mix	Pyrene
Cyanide, Total	Tribromoacetic Acid	Pyrene	Tetrabromobisphenol A
Hydroxide	**Synthetic Organic Compounds (SOC) - from Feedstock/ combustion by-products, Flame retardants (µg/L)**	TCPP	Toxaphene
Nitrite-Nitrogen (1)		TDCPP	**Pesticides µg/L**
Ortho Phosphorus, Dissolved		Trichloronate	1,2-Dibromo-3-chloropropane (0.2)
Perchlorate	2-Chlorobiphenyl	**SOC - Plastizers, Surfactants, Personal Care Products µg/L, ng/L**	2,4,5-T
Radiological errosion of natural deposits/mining (pCi/L)	2-Chlorophenol		2,4,5-Trichlorobiphenyl
	2-Nitrophenol	1,2,4,5-Tetrachlorobenzene	2,4,6-Trichlorophenol
Alpha	2,4-Dichlorophenol	1,1,2-Trichloro-1,2,2-trifluoroethane	2,4-D (70)
Beta	2,4-Dimethylphenol	2,4,5-Trichlorobiphenyl	2,4-DB
Cesium-134,137	2,4-Dinitrophenol	4-Chloro-3-methylphenol	3-Hydroxycarbofuran
Iodine-129, 131	2,4-Dinitrotoluene	Benzyl chloride	4,4'-DDD
Radium 226/228 (5)	2,6-Dinitrotoluene	Bis(2-ethylhexyl)adipate	4,4'-DDE
Strontium-90	3,5-Dichlorobenzoic acid	Bis(2-ethylhexyl)phthalate	4,4'-DDT
Thorium-227,234	4-tert-Octylphenol	Bisphenol A	alpha-BHC
Thallium=208	4-Nitrophenol	Butyl benzyl phthalate	alpha-Chlordane
Uranium-235	4,6-Dinitro-2-methylphenol	Butylparaben	Acifluourfen
Zinc-65	Acenaphthene	Chloroprene	Alachlor (2)
Microbiological - animal and human activity, Algal toxins	Acenaphthylene	Desethylatrazine	Aldicarb
	Acetochlor	Desisopropylatrazine	Aldicarb sulfone
Cryptosporidium (oocysts/L)	Ametryn	Diethyl phthalate	Aldicarb sulfoxide
E. coli (count/100 ml)	Anthracene	Dimetyl phthalate	Aldrin
Giardia (TT1) *(cysts/L)*	Benzo(a)anthracene	Di-n-butyl phthalate	Atraton
Legionella (TT1)	Benzo(a)pyrene (0.2)	Di-n-octyl phthalate	Atrazine (3)

Contaminants not found in Denver's drinking water

Pesticides µg/L (cont.)	Dioxathion	Metazachlor	Siduron, Total
Azinphos-ethyl	Dioxin	Methiocarb	Silvex (50)
Azoxystrobin	Diphenamid	Methomyl	Simazine (4)
Baygon	Disulfoton	Methoxychlor	Simetryn
Bendiocarb	Disulfoton sulfone	Methyl paraoxon	Stirofos
Benfluralin	Disulfoton sulfoxide	Methyl parathion	Sulfotep
Bensulide	Diuron	Metolachlor	Tebuthiuron
Bentazon	Dursban	Metribuzin	Terbacil
ß-BHC (beta-BHC)	Endosulfan sulfate	Metsulfuron-methyl	Terbufos
Bolstar	Endosulfan –A	Mevinphos	Terbutryn
Bromacil	Endosulfan –B	MGK 264 isomer a	Thidiazuron
Butachlor	Endrin (2)	MGK 264 isomer b	Thiobencarb
Butylate	Endrin Aldehyde	MGK 326	Thionazin
Carbaryl	EPN	Mirex	trans-Nonachlor
Carbofuran	EPTC	Molinate	Triademefon
Carbophenothion	Esfenvalerate	Monocrotophos	Triadimenol
Carboxin	Ethalfluralin	Monuron	Tribufos
Chlordane	Ethion	Naled	Trichloronate
Chlorfenvinphos	Ethofumesate	Napropamide	Tricyclazole
Chloridazon	Ethoprop	Neburon	Trifluralin
Chlorneb	Ethylene dibromide	N-nitrosomorpholine	Vernolate
Chlorobenzilate	Etridiazole	N-nitrosopiperidine	Vinclozolin
Chlorothalonil	Famphur	Norflurazon	Z-Phosphamidon
chlorpyrifos methyl	Fenamiphos	Oryzalin	**Volatile Organic Compounds (VOC) - from solvents, feedstock/ fuels, Flame retardants (µg/L, ng/L)**
cis-Nonachlor	Fenarimol	Oxadiazon	
cis-Permethrin	Fenitrothion	Oxamyl (200)	
Clomazone	Fenoxaprop-ethyl	Oxychlordane	1,1,1,2-Tetrachloroethane
Clopyralid	Fensulfothion	Oxyfluorfen	1,1,1-Trichloroethane (200)
Coumaphos	Fenthion	Paclobutrazol	1,1,2,2-Tetrachloroethane
Crotoxyphos	Fenuron	Parathion	1,1,2-Trichloroethane (5)
Cyanazine	Fipronil	Pebulate	1,1-Dichloroethane
Dacthal	Fluazifop-butyl	Pendimethalin	1,1-Dichloroethene (7)
Dalapon (200)	Fluchloralin	Pentachlorophenol (1)	1,1-Dichloropropene
DCPA acid metabolites	Fluometuron	Pentachloronitrobenzene	1,2,3-Trichlorobenzene
Demeton O	Fluridone	Permathrin Isomers	1,2,3-Trichloropropane
Demeton S	Fonofos	Permathrin, cis & trans	1,2,3-Trimethylbenzene
Desethylatrazine	gamma-Chlordane	Phorate	1,2,4-Trichlorobenzene (70)
Desisopropylatrazine (DIA)	Halofenozide	Phosmet	1,2,4-Trimethylbenzene
delta- BHC	Halosulfuron methyl	Picloram	1,2-Dichloropropane (5)
Diazinon	Heptachlor (0.4)	Profluralin	1,3,5-Trimethylbenzene
Dicamba	Heptachlor Epoxide (0.2)	Prometon	1,3-Dichloropropane
Dichlobenil	Hexachlorobenzene	Prometryn	1,3-Dichloropropene
Dichlofenthion	Hexazinone	Pronamide	1,4-Dioxane
Dichloran	Imidacloprid	Propachlor	1-Chlorobutane
Dichloprop	Isophorone	Propanil	2,2-Dichloropropane
Dichlorvos	Kepone	Propargite	2-Hexanone
Dicrotophos	Leptophos	Propazine	2-Nitropropane
Dieldrin	Lindane	Propiconazole isomer a	4-Methyl-2-Pentanone (MIBK)
Diflubenzuron	Linuron	Propiconazole isomer b	Acrylonitrile
Dimethoate	Malathion	Propoxur	Allyl chloride
Dinoseb	Metalaxyl	Prothiofos	Anilazine

Contaminants not found in Denver's drinking water

Volatile Organic Compounds (VOC) - from solvents, feedstock/ fuels, Flame retardants (µg/L, ng/L) (cont.)	Trichloroethylene (5) (TCE)	Oleandomycin
	Trichlorofluoromethane	Oxytetracycline
	Vinyl acetate	Paraxanthine
Anthracene	Vinyl Chloride (2)	Penicillin G
Benzene (5)	Xylenes (10000)	Penicillin V
Bromobenzene	**Pharmaceuticals/Hormones (µg/L, ng/L)**	Phenanthrene
Bromoethane		Prednisone
Bromomethane	17 alpha-Estradiol	Primidone
Carbon disulfide	17 alpha-Ethynyl estradiol	Progesterone
Chlorobenzene (100)	17-beta-Estradiol	Roxithromycin
Chlorodifluoromethane (CFC 22)	Acetaminophen (Tylenol)	Salicylic acid
Chloroethane	Antipyrine	Salinomycin
Chloromethane	Atenolol	Simvastatin
cis-1,2-Dichloroethene (70)	Azithromycin	Sulfachloropyridazine
cis-1,3-Dichloropropene	Bacitracin	Sulfadiazine
Dibromomethane	Bezafibrate	Sulfadimethoxine
Dichlorodifluoromethane (CFC-12)	Caffeine	Sulfamerazine
Dichloromethane (5)	Carbadox	Sulfamethazine
Diisopropyl ether	Carbamazepine	Sulfamethizole
Epichlorohydrin	Carboxin	Sulfamethoxazole
Ether	Chloramphenicol	Sulfasalazine
Ethyl Benzene (700)	Chlorotetracycline	Sulfathiazole
Ethyl tert-butyl ether	Ciprofloxacin	trans-Testosterone
Hexachloroethane	Clofibric acid	Tetracycline
Hexachlorobutadiene	cis-Testosterone	Theobromine
Isopropylbenzene (Cumene)	Cotinine	Theophylline
m-Dichlorobenzene	Dexamethasone	Thiabendazole
Methyl iodide	Diazepam (Valium)	trans-Testosterone
Methyl tert-butyl ether (MTBE)	Diclofenac	Triclocarban
n-Butylbenzene	Diethylstilbestrol (DES)	Triclosan
n-Propylbenzene	Dilantin	Trimethoprim
o-Chlorotoluene	Diltiazem	Tylosin
o-Dichlorobenzene (600)	Doxycycline	Virginiamycin M1
p-Chlorotoluene	Enrofloxacin	
p-Dichlorobenzene (78.5)	Erythromycin	
Pentachlorobenzene	Estradiol	
Pentachloroethane	Estriol	
p-Isopropyltoluene (Cymene)	Estrone	
Propionitrile	Fluoxetine (Prozac)	
sec-Butylbenzene	Gemfibrozil	
Styrene (100)	Ibuprofen	
tert-Amyl Methyl ether (TAME)	Iopromide	
tert-Butyl alcohol	Lasalocid	
tert-Butylbenzene	Levothyroxine (Synthroid)	
Tetrachloroethene (5)	Lincomycin	
Tetrahydrofuran	Meprobamate	
Toluene (1000)	Monensin	
trans-1,2-Dichloroethene (100)	Naproxen (Aleve)	
trans-1,3-Dichloropropene	Narasin	
trans-1,4-Dichloro-2-butene	Norfloxacin	

DENVER WATER

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WATER QUALITY LAB • 6100 WEST QUINCY AVENUE • DENVER, COLORADO 80235
Phone: 303-628-5996 • Fax 303-795-2495