DENVER WATER

Denver Water's 2001
Treated Water Quality Summary Report

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Introduction

Denver Water provides its customers with high quality drinking water. We want you to be aware of the components of that quality and to feel comfortable with and be knowledgeable of the water treatment process and the care and effort that go into providing the Denver Metropolitan Area with water that meets the most stringent standards.

We prepared the following report to provide you with important information about Denver Water's water quality. We want you to see why we are so proud of Denver's drinking water.

Explanation of Terms

To better understand this report, refer to the table below, it gives explanations of terms and measurement units that are used in the report:

Measurement Units Interpretation Table

Unit	*Full name*	Equivalent to:
	General terms	
SU	Standard units (a measurement of pH)	
µS	Micro Siemens (a measurement of specific conductance)	Micromhos
°C	Degrees Celsius (a measurement of temperature)	25 °C = approx. 77 °F (Fahrenheit)
	Chemical terms	
mg/L	Milligrams per liter	Parts per million (ppm)
µg/L	Micrograms per liter	Parts per billion (ppb)
NTU	Nephalometric turbidity units (a measurement of turbidity)	
pCi/L	PicoCuries per Liter (a measurement of radioactivity)	50 pCi/L = 4 mRem/yr.
mRem/yr.	Millirem per year (a measurement of radioactive dosage)	
AU	Absorbance units (a measurement of the absorbance at a specific wavelength)	
	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 the year from the raw water (plant influents) and the potable treated water leaving Denver Water's treatment plants (plant effluents). Results are expressed primarily as averages unless otherwise specified for parameters, such as temperature, that fluctuate seasonally. The data tables that begin on page 16 give the MCL, maximum contaminant level (the highest allowable level for a substance in drinking water), the range values from the lowest to the highest for the year, and the average (avg.) value, along with the number of samples tested (no.).

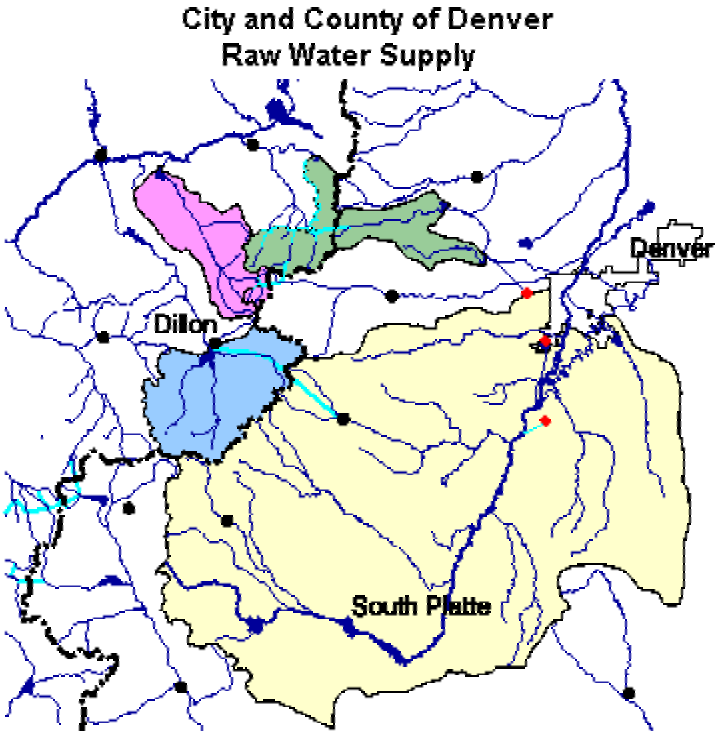
Parameters such as temperature, and turbidity, are measurements of physical characteristics and are expressed in units specific to their analyses. Chemical results are generally expressed in terms of concentration, weight or amount per unit volume, e.g. mg/L or µg/L. Microbiological results are generally expressed in terms of a count of organisms per volume of sample, e.g. CFU/100 ml. For total coliform, the percent of positive samples each month is calculated and reported. The EPA regulation states that no more than 5% of the samples may be positive per month.

Treatment Plant Effluent and Distribution System
Total Coliform Samples for 2001

Month	Number of Samples	Number of Positives	% Positive
January	519	0	0.00%
February	438	1	0.23%
March	546	0	0.00%
April	541	0	0.00%
May	581	1	0.17%
June	394	1	0.25%
July	410	1	0.24%
August	374	0	0.00%
September	358	1	0.28%
October	418	3	0.72%
November	322	0	0.00%
December	326	1	0.31%
	5,227	9	0.17%

Where Does Denver Get Its Water?

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 and the Dillon collection system on the west slope of the Continental Divide. The Moffat collection system spans both sides of the Continental Divide, with the majority of it being 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. Both sources provide high quality water, but their chemical 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 is moderately hard and the water in the Moffat system is soft.

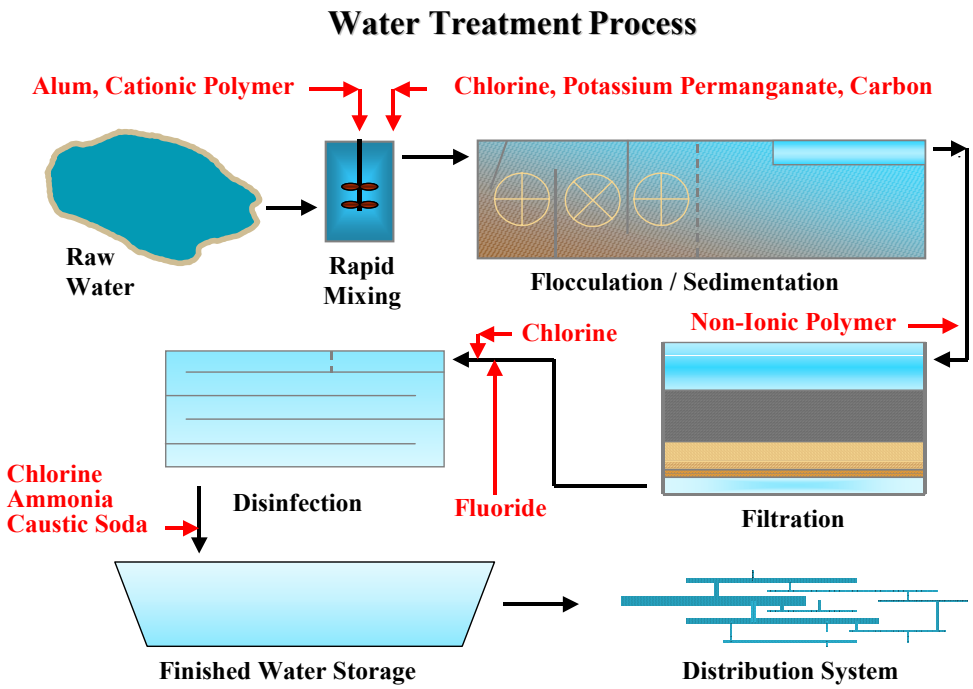


How Does Denver Make Drinking Water?

Denver Water has three treatment plants that process water collected from the areas shown above. Denver Water's three treatment plants have a combined maximum treatment capacity of 645 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 the 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 to make them larger. The larger particles are called "floc". Polymer strengthens the floc making it easy to filter in later processes. These now larger particles settle to the bottom of the sedimentation basin and the clarified water at the top of the basin is then sent to coal and silica sand dual media filters for filtration. Filtration further cleanses the water and removes microscopic debris. Each treatment plant aims for extreme clarity of the water, evidenced by low turbidities (a measure of clarity). Less than 0.10 turbidity units is a measure of clear, clean water. Potassium Permanganate or Carbon may also be added to control excess manganese or odors, respectively.

After filtration, the water is sometimes supplemented with a small amount of sodium silica fluoride to bring the total concentration of fluoride up to 0.90 mg/L. Caustic soda controls the pH, acidity/alkalinity of the water. It is added to adjust the pH of the water to between 7.5 S.U and 8.0 S.U. Finally, the water is thoroughly disinfected with a solution consisting of chlorine and a small amount of ammonia to form the final disinfectant called "chloramine."



Why Is The Water Treated This Way?

The treatment train outlined above is designed to remove dirt, particulate matter, naturally occurring organic matter (NOM), and microscopic organisms like bacteria that may be in the raw water. Effective filtration is crucial in the removal of microorganisms, including bacteria that are associated with solids such as dirt and debris. Disinfection kills potentially harmful microorganisms. Disinfection of drinking water has saved millions of lives over the century by preventing waterborne diseases such as typhoid and cholera.

Denver Water has used chlorine as a primary disinfectant since 1906. We use it early in the treatment process to allow sufficient contact time with the water for maximum disinfection. We have used chloramine since 1918. It is our secondary disinfectant. Chloramine is a very effective long lasting disinfectant that produces fewer disinfection by-products (DBPs), such as Trihalomethanes (THMs) and Haloacetic Acids (HAAs).

The Environmental Protection Agency (USEPA) establishes the regulations for all water utilities. In Colorado, the state health department (Colorado Department of Public Health and Environment) is the agency that oversees and enforces these regulations for water utilities. These regulations are very strict and require that drinking water is made safe for consumption over a person's lifetime. At present there are over 85 contaminants and groups of contaminants that are regulated in drinking water. Some of these contaminants are clearly a threat, like lead, while others are merely suspected of being health risks, but still considered serious enough to regulate. EPA 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 were regulated based on the possibility of their occurrence in water. Their regulatory limits or levels were determined based on the best available data from health studies. The majority of the EPA's drinking water regulations apply to treatment plant effluent water (the finished water after treatment). We're happy to report that Denver Water has never violated any regulations to date. The compounds and elements that were **not** detected in any of the three treatment plant effluents are listed immediately following the data tables on page 22.

How Well Is Denver Water Doing?

Denver Water has been very fortunate to have clean source water with which to start treatment. The table below illustrates the effectiveness of treatment for a few parameters of note.

As mentioned earlier turbidity is a measurement of the clarity of the water; thus a low turbidity indicates good water clarity. Most microorganisms including bacteria are attached to particulate matter, which 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 old standard was 0.50 turbidity units. New research indicates that the old turbidity standard was too high and a new regulation is now in effect. This regulation requires that turbidities in the treatment plant effluent waters be less than 0.30 turbidity units. For the last few years Denver Water has maintained plant effluent turbidities less than 0.20 turbidity units. Most of the time, we have less than 0.10 turbidity units!

Water hardness is relative, but in general, water with hardness above 12 grains per gallon is considered "hard" water. Hardness in water is an aesthetic quality and does not relate to the safety of the water. It relates to the mineral content of the water. When the mineral content of the water is higher, the water is harder. You may have noticed that in areas that have "hard" water, the ability to form soapsuds is lessened. Many customers inquire about the hardness of their water. The South Platte source has moderately hard water that varies seasonally from about 5 to 7 grains per gallon (gpg) of hardness. The Moffat source, on the other hand is very soft, with hardness in the range of about 2 to 4 gpg. Some customers normally served with water from the Moffat source, can detect the difference when they are served with water from the South Platte source.

The total coliform test is a measure of all types of coliform bacteria in the water. Coliform bacteria are found in the intestines of all mammals, including humans, as well as in soils and on plants. Coliform bacteria, which include *E. coli,* are tested to determine the safety of the water. We test for total coliform in our plant effluent waters as well as throughout our entire distribution system. On the rare occasion when a sample has tested positive for total coliform, we must then test for *E. coli,* as well as resample and re-test not only the original site, but also up and downstream of it. To date *E. coli* has not been detected in the treated water. If it was, public notification would be mandated, and we would isolate and correct the problem.

Values for 2001

Parameter	Treatment Plant	Raw Water Result	Finished Water Result
Turbidity	Marston	0.87	0.05
Turbidity	Foothills	2.45	0.04
Turbidity	Moffat	2.73	0.05
Total Coliform	Marston	179	None detected
Total Coliform	Foothills	268	None detected
Total Coliform	Moffat	81	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 ones as well. Contaminants that have been seen in news headlines include lead, arsenic, mercury, *Cryptosporidium, Giardia,* and *E. coli* (*Escherichia Coli*) among others. Denver Water has tested for these for over 13 years and has not detected them in the treated water. *Giardia* and *Cryptosporidium* have occasionally been detected in the raw water, but the effective treatment system in our plants, as outlined on page 5, removes or inactivates these microorganisms.

Denver Water Values for 2001

Parameter	Treatment Plant	Raw Water Result	Finished Water Result
Lead	Marston	None detected	None detected
Lead	Foothills	None detected	None detected
Lead	Moffat	None detected	None detected
Arsenic	Marston	None detected	None detected
Arsenic	Foothills	None detected	None detected
Arsenic	Moffat	None detected	None detected
Mercury	Marston	None detected	None detected
Mercury	Foothills	None detected	None detected
Mercury	Moffat	None detected	None detected

Denver Water Values for 2001

Parameter	Treatment Plant	Raw Water Result	Finished Water Result
Giardia	Marston	2	None detected
Giardia	Foothills	3	None detected
Giardia	Moffat	None detected	None detected
Cryptosporidium	Marston	None detected	None detected
Cryptosporidium	Foothills	None detected	None detected
Cryptosporidium	Moffat	None detected	None detected
E. Coli	Marston	2	None detected
E. Coli	Foothills	6	None detected
E. Coli	Moffat	<1	None detected

What Can Be Found In Water In Nature?

All natural waters contain 'minerals' from the earth. Some minerals are beneficial, like calcium and some are detrimental, like lead. Generally, one can find a variety of naturally occurring minerals in all water, such as:

These mineral salts are the result of the natural erosion of soils and/or the decay of aquatic plants. 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. For example, mineral-rich water will often taste chalky or strong. Of the minerals shown above, and on the charts below, only barium and aluminum are regulated. Barium has a maximum contaminant level (MCL) and is a primary drinking water regulated mineral, while aluminum has a secondary maximum contaminant level (SMCL), which is a non-enforceable drinking water regulation*.

Average Values for 2001

Parameter	Treatment Plant	Raw Water Result	Finished Water Result	EPA Regulatory Limit
Aluminum*	Marston	0.18	0.08	0.05-0.2 ppm
Aluminum*	Foothills	0.08	0.04	0.05-0.2 ppm
Aluminum*	Moffat	0.06	None detected	0.05-0.2 ppm
Barium	Marston	0.05	0.04	2 ppm
Barium	Foothills	0.05	0.05	2 ppm
Barium	Moffat	0.02	0.02	2 ppm
Calcium	Marston	34.3	33.0	None
Calcium	Foothills	33.5	30.8	None
Calcium	Moffat	8.9	9.8	None

Average Values for 2001

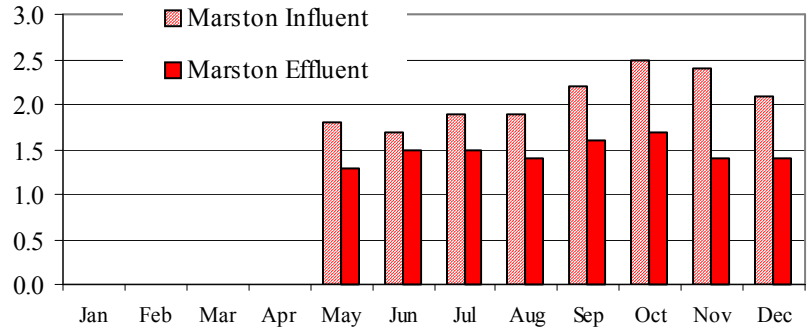
Parameter	Treatment Plant	Raw Water Result	Finished Water Result	EPA Regulatory Limit (MCL)
Magnesium	Marston	8.1	7.9	None
Magnesium	Foothills	6.4	7.3	None
Magnesium	Moffat	2.1	1.8	None
Potassium	Marston	2.1	2.1	None
Potassium	Foothills	2.3	2.0	None
Potassium	Moffat	0.7	0.7	None
Sodium	Marston	16.5	20.0	None
Sodium	Foothills	12.2	18.0	None
Sodium	Moffat	2.4	6.8	None

Most minerals are not removed by conventional treatment. Calcium, magnesium, iron and manganese amounts may be reduced by our treatment, but not completely removed. Please note that the comparisons above, though from the same treatment plants are not always from samples collected on the same dates for the raw and finished waters, and therefore, are general comparisons. Drinking water naturally contains several minerals that are in fact beneficial to humans and other mammals. The minerals in both of the tables above, in addition to iron and manganese, are beneficial at certain levels. However, at levels above the Regulatory Limits, where applicable, some of these minerals may cause detrimental effects over a long period of time. If there is no regulatory limit, or MCL listed, then the amount of the mineral that might cause a potential health concern is much higher than would ever be found in fresh water. Therefore, it would be a waste of time and resources to regulate that constituent. The compounds on the following pages list other substances that are commonly found at minute levels in drinking water and in most bottled waters. Please note that breaks or missing data in the graphs below represent the months when the treatment plant was not in service.

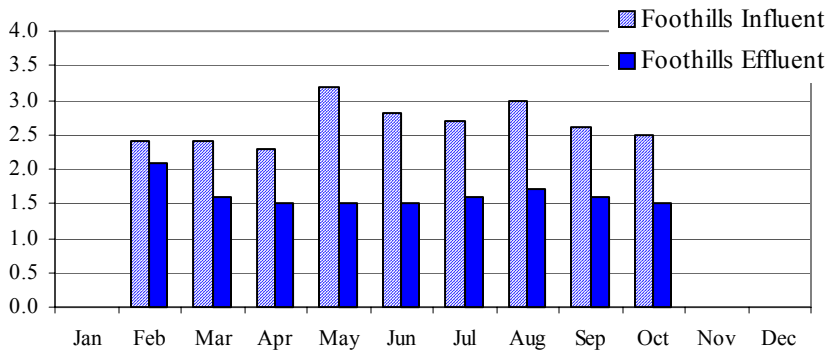
How Does The Treated Water Compare To The Raw Water?

SUVA stands for Specific Ultra Violet Absorbance. SUVA and DOC (Dissolved Organic Carbon) may be important in regards to the Disinfectants/Disinfection By-Product Rule because they are an indicator of naturally occurring organic matter. SUVA is calculated using the Absorbance of light in water at 254 nanometers and the DOC analysis result. The removal of SUVA and DOC in the treatment process is key to ensuring thorough disinfection. Therefore, the averages for the raw (influent) water are included with the treated (effluent) water.

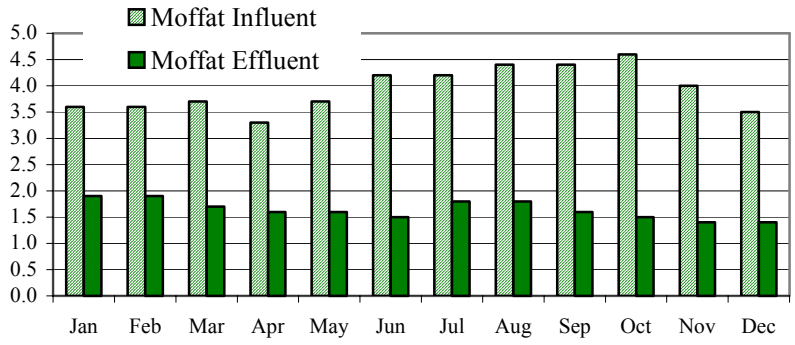
SUVA for Marston Influent and Effluent for 2001



SUVA for Foothills Influent and Effluent for 2001



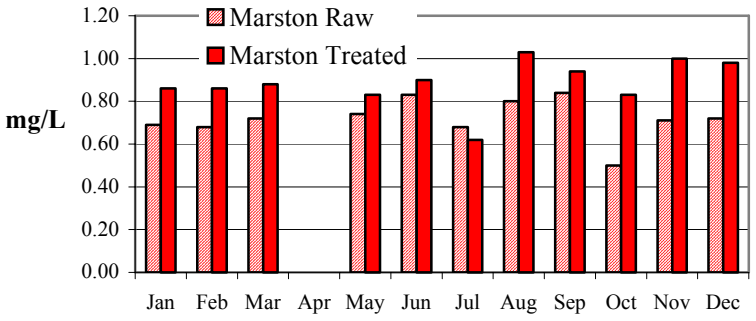
SUVA for Moffat Influent and Effluent for 2001



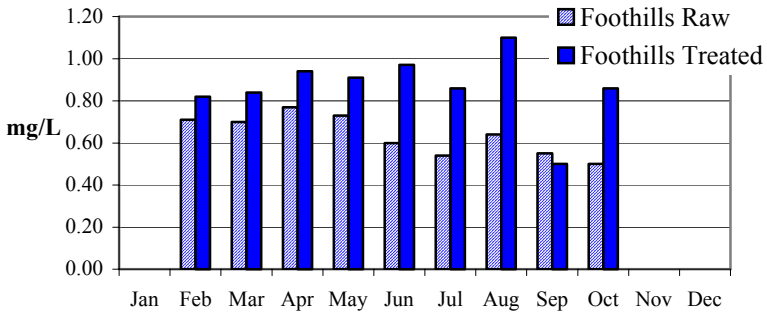
How Much Fluoride Is There In The Raw compared To The Treated Water?

Fluoride is a naturally occurring substance. The amount present in the South Platte source water is ideal for helping to prevent tooth decay as determined by the Colorado Department of Public Health and Environment. The Moffat source naturally has lower amounts of fluoride and therefore must be fortified at the treatment plant as directed by the state health department up to the recommended 0.90 mg/L. All of our treatment plants can supplement if needed.

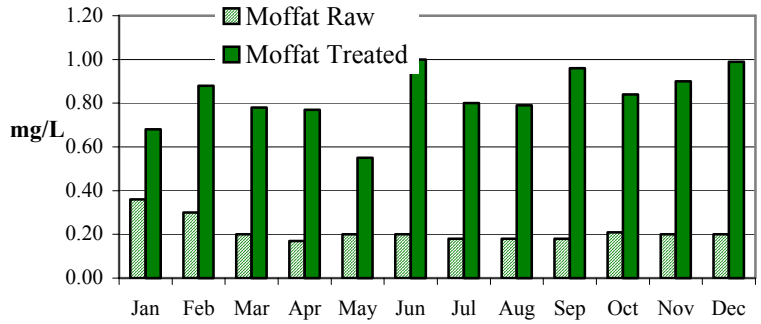
Comparison Between Marston's Raw and Treated Water Fluoride Levels



Comparison between Foothills' Raw and Treated Water Fluoride Levels



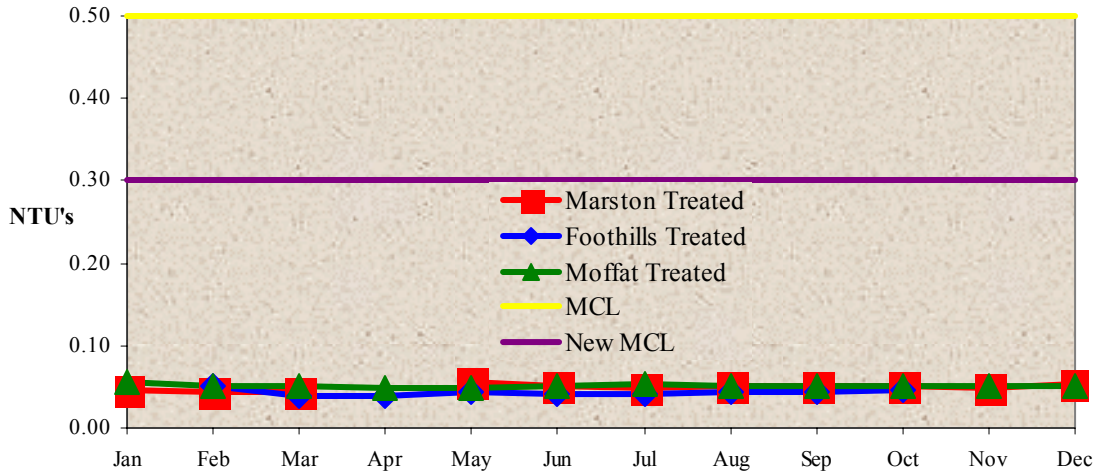
Comparison between Moffat's Raw and Treated Water Fluoride Levels



Turbidity And Hardness Graphs

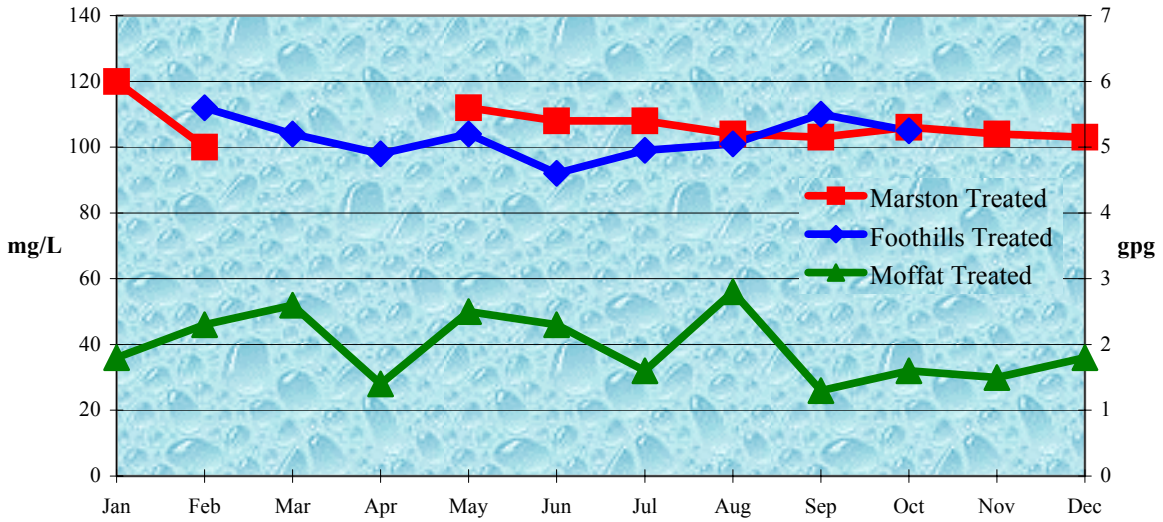
Turbidity refers to the clarity of the water. EPA has established a Maximum Contaminant Level (MCL) for turbidity where at least 95% of the samples must be less than or equal to 0.50 Nephalometric Turbidity Units (NTU) leaving the treatment plants. As of January 2002, 0.30 NTU's will be the new MCL.

Monthly Average Turbidity for Treatment Plant Effluents for 2001



Water hardness is a result of calcium and magnesium salts dissolved in water. High concentrations of these minerals make water 'hard'. There is no universal hardness scale for water. Generally, water with hardness as Calcium Carbonate of less than 12 grains per gallon is not considered hard. Therefore, the South Platte source is moderately hard water that varies seasonally from about 5 to 7 grains per gallon (gpg) of hardness and the Moffat source is soft, and varies seasonally from about 2 to 4 gpg. Most customers calling about hardness are inquiring for soap or detergent usage amounts, or adding tap water to their irons or humidifiers.

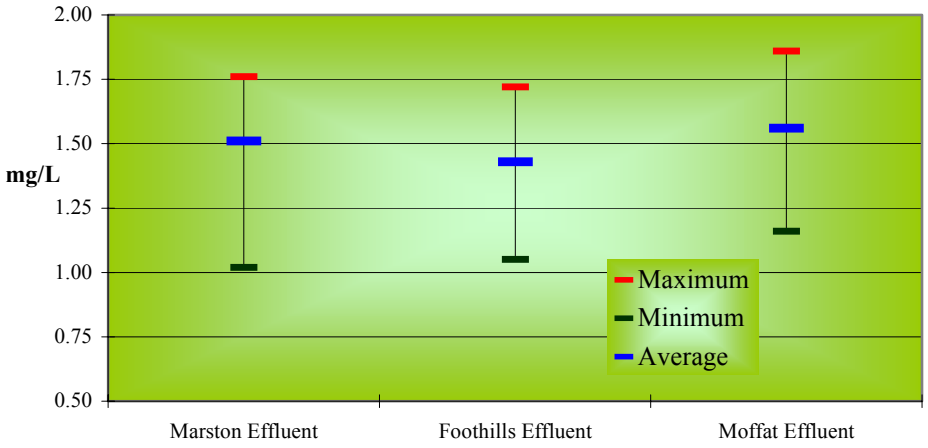
Monthly Average Hardness for Treatment Plant Effluents for 2001



How Much Chlorine Is In The Water?

Denver Water uses chloramine to disinfect the water. The EPA regulation for chloramine is 4 mg/L. During the late summer into the fall, the chloramine dosage was increased to minimize bacterial counts. The goal for chloramine dosage is 1.3 ± 0.2 mg/L.

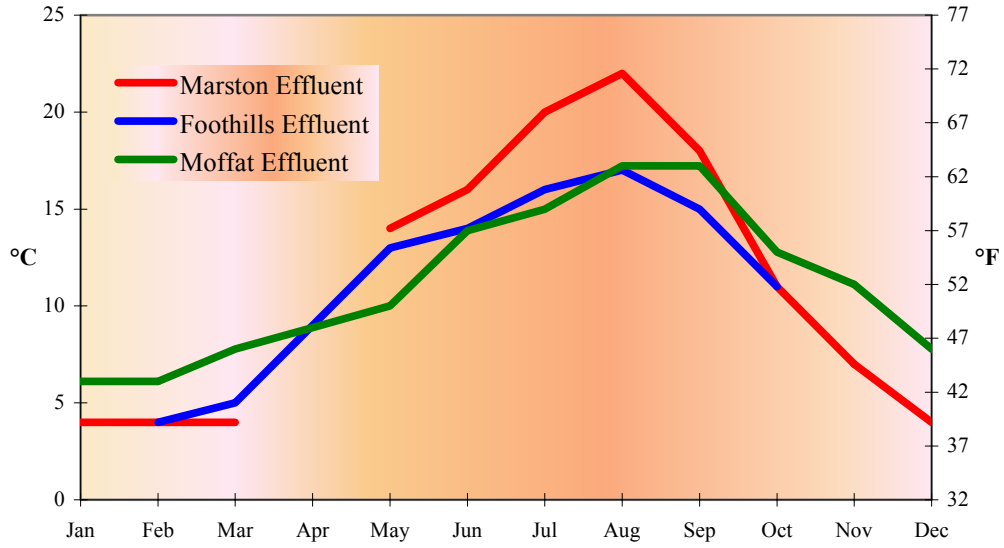
Chorine Ranges for the Treatment Plant Effluents for 2001



How Warm or Cold Can the Water Get?

The water temperatures leaving the treatment plants fluctuate seasonally. At higher temperatures, the disinfectant is more likely to dissipate. Chloramine residuals may be increased during the summer months to ensure thorough disinfection.

Average Monthly Temperatures for Treatment Plant Effluents for 2001



Is There A Complete List Of What Is In Denver's Water?

The tables on the next few pages show the results for the treatment plant effluent water. Either Denver Water's Water Quality Laboratory, or a contract laboratory did these analyses during 2001. The next six pages, pages 16 through 21, are tables of data for compounds detected in our three treatment plants effluent waters. The tables contain the name of the compound, the range of detection for the year, the average result, and the number of times for which it was tested. Most of the compounds detected are not regulated and do not pose a health or safety risk.

Compounds that were not detected in Denver's water are listed on page 22. 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 radon, are on this list. Some of the abbreviations next to the contaminant on page 22 are explained below.

AL – Action Levels are EPA enforceable triggers for compliance that force public notification and treatment optimization.

MCL – The U.S. Environmental Protection Agency's drinking water regulatory limits, Maximum Contaminant Levels. These are usually numeric values; sometimes they are designated as DS or TT (see below).

SMCL – The U.S. Environmental Protection Agency's Secondary Maximum Contaminant Level is usually non-enforceable, but is a recommendation or guideline except in the case of Fluoride where public notification is required if the SMCL is exceeded.

DS - The total coliform regulation is referred to as DS (Distribution System.) This means that the total coliform regulation (less than 5% positive samples/month) applies to the water in the city, not just the treatment plant effluents.

TT - The regulations for copper and lead are referred to as TT (Treatment Technique.) This means that the treatments used in the plants (corrosion control) are optimized to control the levels of these parameters.

Data Tables For Treatment Plant Effluents

Marston Treatment Plant Effluent

Analysis	MCL	Range	Avg.	No.
General (mg/L)				
Alkalinity, Total as $CaCO_3$		51 - 69	59	13
Chlorine, Total		1.02 –1.76	1.51	196
Hardness as $CaCO_3$		100 -120	106	13
Monochloramine as Cl_2		1.06 – 1.47	1.29	43
pH (SU)		7.5 –7.9	7.7	43
Specific Conductance (uS/cm)		240 - 370	319	194
Temperature (°C)		2 - 23	12	196
Total Dissolved Solids		189 - 210	196	9
Turbidity (NTU)	TT	<0.05 – 0.07	0.04	42
Metals (mg/L)				
Aluminum, Total		<0.09 – 0.12	0.08	9
Barium, Total	2	0.04 – 0.05	0.04	3
Calcium		29 - 36	33	10
Copper, Total	TT	<0.05 – 0.06	<0.05	3
Iron, Total		<0.01 – 0.01	<0.01	3
Magnesium		7.2 – 9.2	7.9	10
Manganese, Total		<0.005 – 0.013	0.008	3
Molybdenum, Total		0.020 – 0.037	0.030	3
Potassium		1.9 – 2.3	2.1	10
Sodium		18 - 23	20	10
Strontium		0.19 – 1.19	0.19	1
Ions (mg/L)				
Chloride		21.0 – 28.3	23.0	10
Fluoride	4.0	0.62 – 1.10	0.88	22
Nitrate-Nitrogen	10	<0.06 – 0.16	0.09	8
Silicon Dioxide		5.6 – 5.6	5.6	1
Sulfate		53.0 – 67.9	60.7	10

Marston Treatment Plant Effluent

Analysis	MCL	Range	Avg.	No.
Radiological				
Beta, Total (pCi/L)	50(4mRem/yr)	2 -4	3	2
Uranium, Available (mg/L)		0.0004 – 0.0014	0.0009	6
Microbiological				
m-Heterotrophic Plate Count (CFU/ml)		0.06 - 170	8.4	40
Disinfection By-Products (µg/L)				
1,1,1-Trichloropropanone		0.8 – 0.9	0.8	2
1,1-Dichloropropanone		0.6 – 0.6	0.6	2
Bromochloroacetic acid		1.0 – 2.2	1.7	5
Bromochloroacetonitrile		0.5 – 0.5	0.5	2
Bromodichloroacetic acid		1.9 – 3.0	2.3	3
Bromodichloromethane		3.2 – 6.3	4.7	7
Bromoform		<0.05 – 1.1	<0.05	7
Chloral hydrate		0.8 – 0.8	0.8	2
Chlorodibromoacetic acid		<2 - 2	<2	3
Chloroform		4.4 – 8.2	6.4	7
Cyanogen Chloride		1.7 – 1.7	1.7	1
Dibromochloromethane		1.0 – 2.6	2.0	7
Dichloroacetic acid		2.0 – 5.0	3.6	5
Dichloroacetonitrile		1.0 – 1.0	1.0	2
Haloacetic Acids (5)		6 - 13	8	5
Total Trihalomethanes	100	8 - 17	13	7
Trichloroacetic acid		3.0 – 6.9	4.1	5
Non-Specific Organic Compounds (mg/L)				
Total Organic Carbon		1.0 - 1.7	1.4	9
Total Organic Halogen		84 - 118	99	3
UV absorbance @ 254 nm (AU)		0.021 – 0.026	0.023	8

Foothills Treatment Plant Effluent

Analysis	MCL	Range	Avg.	No.
General (mg/L)				
Alkalinity, Total as $CaCO_3$		51 - 70	58	7
Chloramine, Total		1.05 - 1.72	1.43	175
Hardness as $CaCO_3$		92 - 112	103	12
Monochloramine as Cl_2		1.16 - 1.47	1.25	14
pH (SU)		7.6 - 7.9	7.8	14
Specific Conductance (uS/cm)		220 - 360	301	174
Temperature (°C)		4 - 20	12	175
Total Dissolved Solids		181 - 200	188	7
Turbidity (NTU)	TT	0.04 - 0.05	0.04	14
Metals (mg/L)				
Aluminum, Total		0.03 - 0.05	0.04	6
Barium, Total	2	0.04 - 0.05	0.05	4
Calcium		26 - 35.2	30.8	9
Copper, Total	TT	0.01 - 0.02	0.02	3
Iron, Total		<0.01 - 0.02	0.01	4
Magnesium, Total		5.9 - 8.9	7.3	9
Manganese, Total		<0.005 - 0.019	0.008	9
Molybdenum, Total		<0.005 - 0.055	0.028	9
Potassium		1.7 - 2.4	2.0	9
Sodium		14.4 - 24.0	18.0	9
Strontium		0.19 - 0.19	0.19	1
Ions (mg/L)				
Chloride		14.6 – 28.0	21.0	9
Fluoride	4.0	0.46 – 1.20	0.85	16
Nitrate-Nitrogen	10	<0.06 – 0.21	0.13	6
Silicon Dioxide		5.6 – 5.6	5.6	1
Sulfate		47.0 – 71.1	57.1	9

Foothills Treatment Plant Effluent

Analysis	MCL	Range	Avg.	No.
Radiological				
Beta, Total (pCi/L)	50(4mRem/yr)	<2 - 4	2	2
Uranium, Available (mg/L)		<0.0001 - 0.0012	0.0008	7
Microbiological				
m-Heterotrophic Plate Count (CFU/ml)		<0.01 - 0.90	0.11	36
Disinfection By-Products (µg/L)				
1,1,1-Trichloropropanone		0.9 - 2.1	1.3	4
1,1-Dichloropropanone		0.4 - 0.8	0.6	4
Bromochloroacetic acid		<0.5 - 2.9	1.7	6
Bromochloroacetonitrile		0.3 - 0.6	0.4	4
Bromodichloroacetic acid		<1 - 4	2	4
Bromodichloromethane		5.0 - 9.3	7.4	11
Bromoform		<0.5 - 1.1	<0.5	11
Chloral hydrate		1.1 - 3.3	1.8	4
Chlorodibromoacetic acid		<2 - 2	<2	4
Chloroform		8.2 - 31.8	17.7	11
Cyanogen Chloride		4.7 - 4.7	4.7	1
Dibromochloromethane		0.7 - 2.3	1.5	11
Dichloroacetic acid		4.4 - 15.0	8.0	6
Dichloroacetonitrile		1.0 - 2.2	1.5	4
Haloacetic Acids (5)		11 - 35	19	6
Total Trihalomethanes	100	15 - 41	27	11
Trichloroacetic acid		5.4 - 20.3	10.4	6
Non-Specific Organic Compounds (mg/L)				
Total Organic Carbon		1.5 - 2.9	1.9	4
Total Organic Halogen		83 - 212	140	5
UV absorbance @ 254 nm (AU)		0.024 - 0.024	0.024	1

Moffat Treatment Plant Effluent

Analysis	MCL	Range	Avg.	No.
General (mg/L)				
Alkalinity, Total as $CaCO_3$		19 - 26	22	14
Chloramine, Total		1.16 - 1.86	1.56	249
Hardness as $CaCO_3$		22 - 48	33	16
Monochloramine as Cl_2		1.21 - 1.72	1.48	47
pH (SU)		7.5 - 8.3	7.8	46
Specific Conductance (uS/cm)		60 - 140	96	246
Temperature (°C)		4 - 20	11	249
Total Dissolved Solids		59 - 84	57	10
Turbidity (NTU)	TT	0.04 - 0.07	0.05	47
Metals (mg/L)				
Aluminum, Total		<0.02 - 0.04	<0.09	12
Barium, Total	2	0.02 - 0.03	0.02	12
Calcium		8.4 - 12.3	9.8	12
Copper, Total	TT	<0.005 - <0.01	<0.005	12
Iron, Total		<0.01 - 0.03	<0.07	12
Magnesium, Total		1.2 - 2.5	1.8	12
Manganese, Total		<0.005 - 0.006	<0.005	12
Molybdenum, Total		<0.005 - <0.005	<0.005	12
Potassium		<0.8 - 0.7	0.7	12
Sodium		5.4 - 8.6	6.8	12
Strontium		0.036 - 0.036	0.036	1
Ions (mg/L)				
Chloride		2.2 - 4.8	3.2	12
Fluoride	4.0	0.22 - 1.10	0.80	25
Nitrate-Nitrogen	10	<0.06 - 0.09	0.05	9
Silicon Dioxide		6.5 - 6.5	6.5	2
Sulfate		14.0 - 24.3	18.0	12

Moffat Treatment Plant Effluent

Analysis	MCL	Range	Avg.	No.
Radiological				
Beta, Total (pCi/L)	50(4mRem/yr)	<2 - 3	2	3
Uranium, Available (mg/L)		<0.0001 - 0.0016	0.0008	8
Microbiological				
m-Heterotrophic Plate Count (CFU/ml)		0.07 - 9	0.89	50
Disinfection By-Products (µg/L)				
1,1,1-Trichloropropanone		0.8 - 1.0	0.9	5
1,1-Dichloropropanone		0.3 - 0.5	0.4	5
Bromochloroacetic acid		<0.5 - 1.2	<0.5	7
Bromochloroacetonitrile		<0.2 - <0.2	<0.2	5
Bromodichloroacetic acid		<1 - 3	<1	5
Bromodichloromethane		0.9 - 2.5	1.6	13
Bromoform		<0.5 - 1.3	<0.5	13
Chloral hydrate		0.4 - 1.2	0.8	5
Chlorodibromoacetic acid		<2 - <2	<2	5
Chloroform		7.1 - 15.0	11.2	13
Cyanogen Chloride		3.3 - 3.3	3.3	1
Dibromochloromethane		<0.2 - 1.3	<0.5	13
Dichloroacetic acid		3.5 - 10.0	5.6	7
Dichloroacetonitrile		0.6 - 1.2	0.9	5
Haloacetic Acids (5)		7 - 18	12	7
Total Trihalomethanes	100	8 - 17	13	13
Trichloroacetic acid		3.0 - 8.1	6.1	7
Non-Specific Organic Compounds (mg/L)				
Total Organic Carbon		1.2 - 1.2	1.2	1
Total Organic Halogen		60 - 120	88	5
UV absorbance @ 254 nm (AU)		-	-	0

What Is Not Found In Denver's Drinking Water?

Denver's water was analyzed for the following parameters. Either they were not detected or the average result was less than the detection limit. The MCL is listed after the analysis in parentheses if applicable. The unit of measure is also listed if different than that listed for the subsection. These potential contaminants are on EPA's nation-wide list of regulatory concerns.

General
Chlorine, Free
Metals (mg/L)
Antimony, Total (0.006)
Arsenic, Total (0.05)
Beryllium, Total (0.004)
Cadmium, Total (0.005)
Chromium, Total (0.1)
Lead, Total (TT^1)
Mercury, Total (0.002)
Selenium, Total (0.05)
Silver, Total
Thallium, Total (0.002)
Zinc
Ions (mg/L)
Ammonia-Nitrogen
Bromide
Nitrite-Nitrogen (1)
Ortho Phosphorus, Dissolved
Radiological (pCi/L)
Alpha, Total (15)
Plutonium 239 + 240
Radium-226, 228
Radon
Strontium 89 + 90
Microbiological
Cryptosporidium
Giardia (TT^1)
Plankton
Total Coliform (DS)
Volatile Organic Compounds (µg/L)
1,1,1,2-Tetrachloroethane
1,1,1-Trichloroethane (200)
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane (5)
1,1-Dichloroethane
1,1-Dichloroethene (7)
1,1-Dichloropropene
1,2,3-Trichlorobenzene
1,2,3-Trichloropropane
1,2,3-Trimethylbenzene
1,2,4-Trichlorobenzene (70)
1,2,4-Trimethylbenzene
1,2-Dichloroethane (5)
1,2-Dichloropropane (5)
1,2-Dichloropropene
1,3-Dichloropropene
1,3,5-Trimethylbenzene
1,3-Dichloropropane
1-Chlorobutane
2,2-Dichloropropane
2-Butanone
2-Hexanone
2-Nitropropane
4-Methyl-2-Pentanone
Acetone
Acrylonitrile
Allyl chloride
Benzene (5)
Bromobenzene
Bromochloromethane
Bromomethane
Carbon disulfide
Chloroacetonitrile
Chlorobenzene (100)
Chloroethane
Chloromethane
cis-1,2-Dichloroethene (70)
cis-1,3-Dichloropropene
Dibromomethane
Dichlorodifluoromethane
Dichloromethane (5)
Diethyl ether
Ethyl Benzene (700)
Ethyl methacrylate
Hexachlorobutadiene
Hexachloroethane
Iodomethane
Isopropyl Benzene
m-Dichlorobenzene
Methacrylonitrile
Methyl tert-butylether
Methylacrylate
Methylmethacrylate
Naphthalene
n-Butyl Benzene
Nitrobenzene
n-Propyl Benzene
o-Chlorotoluene
o-Dichlorobenzene (600)
p-Chlorotoluene
p-Dichlorobenzene (78.5)
Pentachloroethane
p-Isopropyl Toluene
Propionitrile
sec-Butyl Benzene
Styrene (100)
tert-Butyl Benzene
Tetrachloroethene (5)
Tetrahydrofuran
Toluene (1000)
trans-1,2-Dichloroethene (100)
trans-1,3-Dichloropropene
trans-1,4-Dichloro-2-butene
Trichloroethylene (5)
Trichlorofluoromethane
Vinyl acetate
Vinyl Chloride (2)
Xylenes (10000)
Disinfection By-Products (µg/L)
Carbon tetrachloride (5)
Chloropicrin
Dibromoacetic acid
Dibromoacetonitrile
Monobromoacetic Acid
Monochloroacetic Acid
Trichloroacetonitrile
Pesticides (µg/L)
1,2-Dibromo-3-chloropropane (0.2)
2,4,5-T
2,4-D (70)
2,4-DB
3,5-Dichlorobenzoic acid
3-Hydroxycarbofuran
4,4'-DDD
4,4'-DDE
4,4'-DDT
4-Nitrophenol
α-BHC
Acetochlor
Acifluourfen
Alachlor (2)
Aldicarb
Aldicarb sulfone
Aldicarb sulfoxide
Aldrin
Ametryn
Atraton
Atrazine (3)
β-BHC
Bentazon
Bromacil
Butachlor
Butylate
Carbaryl
Carbofuran (40)
Chloramben
Chlordane (2)
Chlorneb
Chlorobenzilate
Chlorothalonil
Chlorpropham
cis-Permethrin
Cyanazine
Cycloate
Dacthal
Dalapon (200)
δ-BHC
Dicamba
Dichlorprop
Dichlorvos
Dieldrin
Dinoseb (7)
Diphenamid
Diquat (100)
Dursban
Endosulfan sulfate
Endosulfan-A
Endosulfan-B
Endothall (100)
Endrin (2)
Endrin Aldehyde
EPTC
Ethoprop
Ethylene dibromide (0.05)
Etridiazole
Fenarimol
Fluridone
Glyphosate (700)
Heptachlor (0.4)
Heptachlor Epoxide (0.2)
Hexachlorocyclopentadiene (50)
Hexazinone
Lindane (0.2)
Malathion
Methiocarb
Methomyl
Methoxychlor (40)
Methyl paraoxon
Metolachlor
Metribuzin
Mevinphos
MGK-264
Mirex
Molinate
Napropamide
Oxamyl (200)
Paraquat
Pebulate
Picloram (500)
Prometon
Prometryn
Pronamide
Propachlor
Propazine
Propoxur
Silvex (50)
Simazine (4)
Simetryn
Stirofos
Tebuthiuron
Terbacil
Terbutryn
Toxaphene (3)
trans-Permethrin
Triademefon
Tricyclazole
Trifluralin
Vernolate
Synthetic Organic Compounds (µg/L)
1,2,4,5-Tetrachlorobenzene
2,2,4,4-Tetrachlorobiphenyl
2,3-Dichlorobiphenyl
2,4-Dinitrotoluene
2,4,5-Trichlorobiphenyl
2-Chlorobiphenyl
Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene (0.2)
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Bis(2-ethylhexyl)adipate (400)
Bis(2-ethylhexyl)phthalate
Butyl benzyl phthalate
Chrysene
Dibenzo(a,h)anthracene
Diethyl phthalate
Dimethyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Fluoranthene
Fluorene
Hexachlorobenzene (1)
Indeno(1,2,3-cd)pyrene
Isophorone
Pentachlorobenzene
Pentachlorophenol (1)
Phenanthrene
Polychlorinated Biphenyls (0.5)
Pyrene

Looking Down The Road

What does the future hold in terms of water treatment and drinking water? Many drinking water utilities around the country are exploring new treatments and techniques to optimize treatment for new regulations and greater protection from contaminants in the future. Denver Water is expanding and updating its treatment plants to accomplish this task.

Many new challenges await us in the drinking water industry. We are our own customers; therefore, we have a stake in making sure that the water is safe for all of us. We are also environmental scientists and we care about the preservation of our watershed and the natural beauty that surrounds it. Though we have caretakers who live near our mountain reservoirs and monitor them, customers help with this effort and we appreciate it. We are committed to meeting your water needs by continuing to provide high quality drinking water and excellent service. If you have a water quality concern or just have questions, or comments regarding water quality, give us a call at 303-893-2444.

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