



We Are Columbia

# City of Columbia 2014 Water Quality Report

Public Water System 401001 ■ Columbia, SC ■ City of Columbia Water Works

A Publication of the City of Columbia's Department of Utilities and Engineering



Only Columbia Tap Water Delivers!

## Columbia Water: Quality on Tap Since 1835

The United States Environmental Protection Agency (EPA) and the South Carolina Department of Health and Environmental Control (DHEC) have established strict quality standards for drinking water. These standards are designed to protect consumers against disease-causing bacteria and other harmful substances. EPA requires public water systems to send their customers an annual report containing information about their drinking water quality and compliance with the standards. The City of Columbia hopes that this report will be both informative and helpful in making personal, health-based decisions regarding your drinking water consumption.

*We welcome your comments and questions. We may be reached during normal business hours by calling 803-545-3300. You are also welcome to attend regularly scheduled meetings of City Council that are generally held the first and third Tuesdays of each month at City Hall, 1737 Main Street at 6:00 p.m. Contact the Public Relations Department at 803-545-3020 for time and location or visit [www.columbiasc.net](http://www.columbiasc.net).*

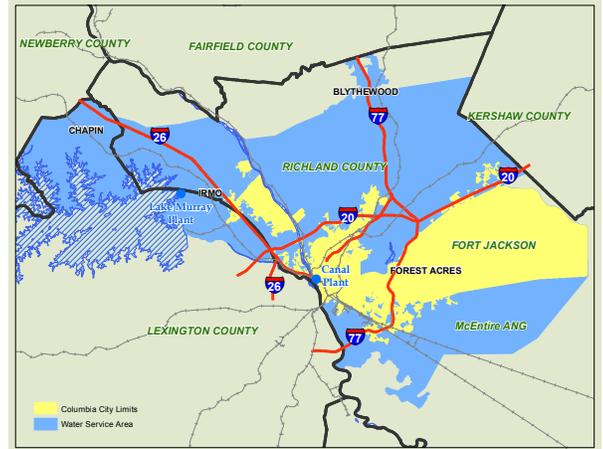
**FUN FACT DROPLET**

City of Columbia water customers pay **LESS THAN A PENNY PER GALLON** for water available 24/7 — on tap!



## Where Does Columbia's Water Come From?

The City of Columbia operates two drinking water treatment plants. One draws water from the Broad River Diversion Canal (Canal Plant) and the other draws from Lake Murray (Lake Plant). The two plants together produce an average of 60 million gallons of water per day. This water is furnished to approximately 375,000



people in Richland and Lexington counties through more than 2,400 miles of underground pipeline. The Lake Plant generally serves the area west of the Broad River and the area north of Interstate 20; the Canal Plant serves the remaining area.

The City of Columbia uses the following series of treatment techniques to produce its drinking water:

1. As water is pumped into the treatment plants, intake areas screen out floating debris such as plastic bottles, plants, and fish.
2. Aluminum sulfate (alum) and other treatment chemicals are rapidly mixed into the water to help particles in the water cling together or coagulate. This forms heavier particles, which are referred to as floc. The water mixture is then gently mixed so that coagulating particles continue to merge into larger floc particles.

3. These floc particles pass into a sedimentation basin where they settle to the bottom and are eventually removed.

4. The water then passes through filters that contain layers of sand and anthracite coal that remove any remaining particles. The small floc particles cling to filter material as water passes through.

5. After all particles have been removed, a small amount of chlorine is added to the water to keep bacteria from developing as it travels to your home or business. A small amount of fluoride is also added to the water to assist in preventing tooth decay.

*DHEC has completed a comprehensive water assessment report on the Broad River Diversion Canal (also referred to as the Columbia Canal) and Lake Murray. These Source Water Assessment reports are available and can be reviewed at 1136 Washington Street or by contacting 803-545-3300.*



## What is in Columbia's Drinking Water?

The City's drinking water met all state and federal requirements during 2014, and is considered safe to drink. The City's DHEC-certified laboratory performs more than 200,000 analyses each year to ensure that the water the City supplies to its customers meets all EPA and DHEC standards. Additional analyses are performed by DHEC, the state agency that regulates and oversees public water systems. Samples are tested at every stage of the treatment process

and at hundreds of points throughout more than 2,400 miles of pipeline that make up the City's distribution system. The City also conducts voluntary testing for microbial contaminants. Since 2004, the City has been participating in the Partnership for Safe Water. The Partnership's mission is to improve the quality of water delivered to customers by improving water system operations. The substances listed below were detected in the City's water supply during 2014.

Substance	Highest Level Allowed (MCL)	Detected Level	Range of Detection	Goal (MCLG)	Violated	Year Sampled	Source of Contaminant
<b>INORGANIC COMPOUNDS</b>							
Lead	15 ppb (Action Level)	0.0 ppb (90th%) 0-7 ppb (range)	No sites exceeded the action level	0	None	2014	Corrosion of household plumbing systems & naturally occurring in the environment*
Copper	1.3 ppm (Action Level)	0.059 ppm (90th%) 0-0.089 ppb (range)	No sites exceeded the action level	0	None	2014	Corrosion of household plumbing systems & naturally occurring in the environment
Fluoride	4 ppm	0.54 ppm	0.52-0.56 ppm	4 ppm	None	2014	Naturally occurring in the environment by erosion of natural deposits and added at the treatment plants as an aid in preventing tooth decay
Nitrate/Nitrite (as Nitrogen)	10 ppm	0.23 ppm	0.1-0.36 ppm	10 ppm	None	2014	Runoff from fertilizer use, leaching from septic tanks, sewage, erosion of natural deposits
Chlorite (Lake Plant)	1 ppm	0.664 ppm	0.342-0.664 ppm	0.8 ppm	None	2014	By-product of drinking water chlorination
Chlorite (Canal Plant)	1 ppm	0.589 ppm	0.275-0.589 ppm	0.8 ppm	None	2014	By-product of drinking water chlorination
<b>ORGANIC COMPOUNDS</b>							
Total Trihalomethanes (THMs) (Chloroform, Bromodichloromethane, Dibromochloromethane, Bromoform)	80 ppb	33 ppb (LRAA - Locational Running Annual Average)	17-48 ppb	0	None	2014	By-product of drinking water chlorination formed when chlorine reacts with organic matter
Haloacetic Acids (HAAs) (Monochloroacetic Acid, Monobromoacetic Acid, Dichloroacetic Acid, Trichloroacetic Acid, Dibromoacetic Acid)	60 ppb	37 ppb (LRAA - Locational Running Annual Average)	22-47 ppb	0	None	2014	By-product of drinking water chlorination formed when chlorine reacts with organic matter
Total Organic Carbon (Lake Plant)	TT	45.26% removal (36.25% removal required)	36.30-58.10% removal	None	None	2014	Naturally occurring in the environment
Total Organic Carbon (Canal Plant)	TT	44.48% removal (35.42% removal required)	31.90-61.50%** **Ratio met through alternate criteria	None	None	2014	Naturally occurring in the environment
<b>MICROORGANISMS</b>							
Turbidity (Lake Plant)	<0.3 NTU TT	0.20 NTU-Highest single measurement 100%-Lowest monthly percentage meeting standard		N/A	None	2014	Naturally occurring in the environment
Turbidity (Canal Plant)	<0.3 NTU TT	0.23 NTU-Highest single measurement 100%-Lowest monthly percentage meeting standard		N/A	None	2014	Naturally occurring in the environment
Total Coliform Bacteria	Presence of coliform bacteria in <5% of monthly samples.	4.4% (Highest monthly percentage positive)	N/A	0	None	2014	Naturally occurring in the environment
<b>DISINFECTANTS</b>							
Chloramine	4 ppm	2.5 ppm (Highest quarterly average)	2.2-2.6 ppm	4 ppm	None	2014	Water additive to control microbial growth
Chlorine Dioxide (Lake Plant)	800 ppb	190 ppb	0-190 ppb	800 ppb	None	2014	Water additive to control microbial growth
Chlorine Dioxide (Canal Plant)	800 ppb	497 ppb	0-497 ppb	800 ppb	None	2014	Water additive to control microbial growth

\*If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service line and home plumbing. The City of Columbia is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. **When your water has been sitting in your pipes for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking.** If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at (800) 426-4791 or online at <http://www.epa.gov/safewater/lead>.

## What Has Columbia Been Up to Over the Past Year?

The City of Columbia Water Works constantly evaluates the health of its water treatment and distribution systems. This year the City completed a \$2.7 million dollar project called the “Chapin Booster Pump Station”. This drinking water pump station off of Broad River Road provides an additional source of water to the entire town of Chapin. This pump station supplies up to three million gallons of drinking water per day, and is designed so that it can fill a planned 750,000 gallon water storage tank in the Town of Chapin. This project will help ensure reliable service to the town for many years into the future.

*Above, right: The Chapin booster pump station.  
Right: A look inside the new booster pump station.*



## What Do These Terms and Symbols Mean?

**Action Level** — A limit, that is not a MCL, that applies to contaminants such as lead and copper that enter the water after treatment. Action levels may trigger special monitoring, public education or treatment techniques.

**Detected Level** — The concentration of a substance detected in a water sample. The detected levels specified in the table to the left are the highest levels detected if multiple samples were collected, except for Total Organic Carbon (TOC) or unless specified otherwise. For TOC, the specified removal rate is the rate required by DHEC based on data reported by the City.

**HRL (Health Reference Level)** — An EPA-defined benchmark for evaluating contaminant occurrence based on health effects information.

**LRAA (Locational Running Annual Average)** — An average at each sample point for four quarters in the calendar year.

**MCL (Maximum Contaminant Level)** — EPA’s regulation limit for the highest allowable amount of a substance in drinking water.

**MCLG (Maximum Contaminant Level Goal)** — The EPA’s target level for a contaminant below which there are no known or suspected health effects. The MCLG is not necessarily a level achievable with currently available treatment techniques.

**N/A (Not Applicable)** — Does not apply.

**NTU (Nephelometric Turbidity Unit)** — Units of measure to indicate water clarity.

**ppb (parts per billion)** — One part in a billion parts (equivalent to one penny in \$10,000,000).

**ppm (parts per million)** — One part in a million parts (equivalent to one penny in \$10,000).

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

**90th% (90th Percentile)** — The Action Level for lead and copper for a water system that serves more than 100,000 people.

< Less than.

> Greater than.

**EPA requires that all annual water quality reports contain the following:**

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

The sources of drinking water (both tap water and bottled 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 radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

\*Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

\*Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

\*Pesticides and herbicides, which may come from a variety of sources such as agriculture, stormwater runoff, and residential uses.

\*Organic chemical contaminants, including synthetic and volatile organics, which are by-products of industrial processes and petroleum production and can also come from gas stations, urban stormwater runoff, and septic systems.

\*Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Federal Drug Administration regu-

lations establish limits for contaminants in bottled water, which must provide the same protection for public health.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants, can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium are available from the Safe Drinking Water Hotline (800-426-4791). Testing since 1994 has revealed no signs of Cryptosporidium in Columbia’s treated water.

**FUN  
FACT  
DROPLET**

Approximately  
**2,400 MILES OF PIPE**  
carry water through  
the Midlands. That’s  
enough to drive to  
Los Angeles, CA!

## 2014 UCMR 3 Unregulated Contaminants

Unregulated contaminants are those substances that do not have a drinking water standard set by EPA. Every five years, EPA is required by the Safe Drinking Water Act to identify a list of potential contaminants, make a rule for water systems to test for them, and then make a decision whether regulation is necessary. As part of the Unregulated Contaminant Monitoring Rule 3 (UCMR 3), DHEC recently tested Columbia's treated and distribu-

tion system water for 30 unregulated contaminants. Twenty-three of the contaminants under review were not detected, but seven were detected. Those contaminants that were detected are included in this report. **If you have any questions about these results or are interested in the full list of contaminants that were monitored, please contact Jonathan Sherer at (803)255-8160.**

Substance	Location	Units	Health Reference Level	Average*	Range	Sources and Notes
Chromium-6	Canal Plant	ppb	0.1 ppb (California)	0.104	0.098-0.11	Naturally-occurring element
	Lake Murray Plant			0.075	0.097-0.053	
	Distribution System 1			0.105	0.1-0.11	
	Distribution System 2			0.083	0.069-0.097	
1,4 Dioxane	Canal Plant	ppb	0.35 to 35 ppb (EPA) 0.8 ppb (California)	0.265	0.25-0.28	Cyclic aliphatic ether; used as a solvent or solvent stabilizer in manufacturing and processing of paper, cotton, textile products, automotive coolant, cosmetics, and shampoos
	Lake Murray Plant			0.036	0-0.072	
	Distribution System 1			0	0	
	Distribution System 2			0	0	
Total Chromium	Canal Plant	ppb	100 ppb	0.15	0-0.3	See Chromium-6 for use or source information; though the amount measured when analyzing for "total chromium" is the sum of chromium in all of its valence states, the MCL for EPA's current total chromium regulation was determined based upon the health effects of chromium-6
	Lake Murray Plant			0.15	0-0.3	
	Distribution System 1			0.13	0-0.26	
	Distribution System 2			0.115	0-0.23	
Molybdenum	Canal Plant	ppb	40 ppb	2.55	2.5-2.6	Naturally-occurring element
	Lake Murray Plant			0	0	
	Distribution System 1			2.65	2.5-2.8	
	Distribution System 2			0	0	
Strontium	Canal Plant	ppb	4,000 ppb	47.5	42-53	Naturally-occurring element
	Lake Murray Plant			55.5	52-59	
	Distribution System 1			50.5	49-52	
	Distribution System 2			53	50-56	
Vanadium	Canal Plant	ppb	21 ppb	1.15	1.1-1.2	Naturally-occurring elemental metal
	Lake Murray Plant			0.865	0.8-0.93	
	Distribution System 1			1.15	1.1-1.2	
	Distribution System 2			0.82	0.76-0.88	
Chlorate	Canal Plant	ppb	210 ppb (EPA) 700 ppb (California)	305	280-330	Disinfection byproduct. Although the results found are higher than the Health Reference Level, regulatory limits are potentially in the range of 500 - 700 ppb. The City of Columbia would not have exceeded the probable regulatory limits for this chemical.
	Lake Murray Plant			190	170-210	
	Distribution System 1			315	290-340	
	Distribution System 2			220	210-230	

\*From two sampling events in 2014. Additional monitoring scheduled for 2015.

## Finished Water Secondary Standards

Some attributes of water, which are listed in the table below, affect the taste, odor, and hardness of our drinking water. Because these attributes of water do not impact a person's health, EPA has established secondary standards that are non-enforceable, recommended guidelines. The City meets these guidelines in addition to the regulations set forth by EPA.

For commercial customers with boilers or chillers, breweries, and other customers who need additional information, please contact **Jonathan Sherer, Water Works Specialist, at (803) 255-8160 or jdsheer@columbiasc.net.**

Parameter	Units	MCL	Range	Average	Possible Sources
Chloride	ppm	250	7-12	10	Soil runoff
Color	Color units*	15	0	0	Naturally-occurring
Iron	ppm	0.3	0.010-0.182	0.032	Soil runoff, pipe material
Manganese	ppm	0.05	0.005-0.011	0.006	Soil runoff
pH	s.u.**	6.5-8.5	7.4-8.4	8	Controlled at treatment plant
Sulfate	ppm	250	10-18	15	Drinking water additive
Total Dissolved Solids	ppm	500	16-164	55	Soil runoff
Conductivity	µmho/cm	No standard	110-141	123	Naturally-occurring
Alkalinity	ppm	No standard	23-28	25	Drinking water additive

\* A standard scale that was developed for measuring color intensity in water samples.

\*\* Standard unit (s.u.); pH is measured on a logarithmic scale, ranging from 0 to 14 s.u., with 7 s.u. being neutral pH.

### For additional information:

City of Columbia Water Quality  
Complaints/Billing/Customer Care Center  
**803-545-3300**

S.C. Department of Health and  
Environmental Control/Bureau of Water  
**803-898-4300**

EPA Drinking Water Hotline  
**800-426-4791**

National Lead Information Clearinghouse  
**800-424-LEAD**

Consumer Product Safety Commission  
**800-638-2772**

Please visit us at:  
[columbiasc.net/  
drinkingwater](http://columbiasc.net/drinkingwater)

*Esté informe contiene información muy importante sobre el agua que usted toma. Tradúscalo o hable con un amigo quien lo entienda bien.*

**FUN  
FACT  
DROPLET**

On average,  
Americans use about  
**100 GALLONS**  
of water  
per person  
each day.

