city of Columbia
Water & Light

2022 Water Quality Report

Committed to quality

Access to safe, reliable water is our top priority.

City of Columbia Water & Light prides itself on maintaining a safe, reliable and efficient water system. Customers have benefitted from Columbia's clean, reliable drinking water for more than 100 years.

Water & Light monitors and evaluates the quality of the water multiple times a day throughout the treatment process. The Utility tests samples from more than 40 locations — including from the groundwater wells, during the treatment process and throughout the distribution system.

The Environmental Protection Agency (EPA) and the Missouri Department of Natural Resources (MDNR) require public water supply systems to report to customers on the quality of the water Water & Light provides.

The City is proud to report that the water we supply to our customers meets all water quality standards set by the EPA and MDNR.

On Feb. 17, 2023, the City received a Notice of Violation from the MDNR for failure to submit samples for routine lead and copper analysis for the 2022 calendar year. The Notice of Violation is for lead and copper testing that was to be conducted on water samples from customers' homes.

While this testing did not take place, that does not mean Columbia's water is below standards. There is no detectable lead in the water the City provides to its customers. Historically, Water & Light has not seen elevated amounts of lead and copper in testing results from customers' homes because Columbia's water is very stable.

However, Water & Light staff takes these violations seriously. Appropriate measures have been implemented to ensure that this does not happen again.

EPA sets legal limits on more than 90 contaminants in drinking water. The legal limit for a contaminant reflects the level that protects human health and that water systems can achieve using the best available technology.

This report lists only those substances found in measurable quantities in Columbia's drinking water. EPA rules also set water-testing schedules and methods that water systems must follow.

Columbia Water & Light reports any events that might compromise the water quality to the Missouri Department of Natural Resources.

A complete list of water quality testing results and reportable events with the water system is available at CoMo.gov.

Safe water supply is critical to protecting public health.

That is why City of Columbia Water & Light remains committed to supplying its citizens and customers with the highest quality water and service possible.

About Columbia's water

We rely on the City's water system to treat and transport water to 51,000 customers — a population of more than 126,000 people — residing and working in our more than 89 square mile service area.

The City is working to make improvements to the McBaine Water Treatment Plant. This project will restore the plant's capacity to treat 32 million gallons of water per day and include rehabilitation projects that will enhance the performance of this critical facility.

The source

Columbia's water is pumped from wells that tap a water-filled bed of sand and gravel in the McBaine Bottoms, just southwest of the City. Studies have indicated the aquifer can consistently yield up to 52 million gallons of water per day.

Columbia's 18 wells average 100 feet in depth, penetrating the aquifer to near its bottom. Collectively, the wells can pump about 31 million gallons per day to Columbia's McBaine Water Treatment Plant.

Treatment

Groundwater pumped from the wells is piped to the McBaine Water Treatment Plant. Water is treated using several processes, with each step providing additional quality improvements.

- **Aeration:** The water first flows through aerators. By adding air, dissolved gasses are removed and iron is oxidized. Oxidation of the water significantly reduces the levels of iron, carbon dioxide and hydrogen sulfide found naturally in the water.
- **Softening:** Water & Light adds lime, causing a chemical recaction between the lime and the calcium and magnesium that naturally occur in the well water. Heavy, insoluble particles of calcium and magnesium form and settle to the bottom of the softening basins, removing 50% of the hardness-causing minerals.
- **Primary disinfection:** The disinfection process starts with the first dosage of chlorine gas. Chlorine prevents bacterial growth and achieves compliance with the virus inactivation requirements of the Ground Water Rule.
- **Filtration:** Eight multimedia filters — comprised of anthracite, sand and garnet — remove any remaining suspended solids and turbidity from the settled water.
- **Secondary disinfection:** Liquid ammonium sulfate is added, which combines with chlorine to create chloramine. Chloramine has a longer lasting disinfectant residual and produces fewer disinfectant byproducts than free chlorine. Fluoride is also added at this step.

Distribution

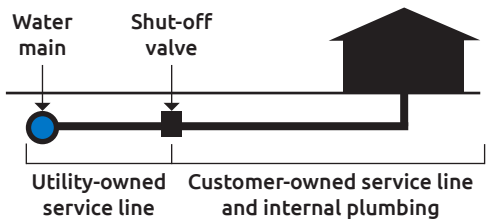
Finished water is transported from the Water Treatment Plant to reservoirs at the West Ash Pump Station and the South Pump Station. It is pumped from these locations to an additional reservoir, pump stations and three elevated storage facilities and directly to the distribution system to supply water to customers.

About lead

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 lines and home plumbing. Water & Light 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 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 (800.426.4791) or epa.gov/safewater/lead.

Utility-owned vs. customer-owned portion of the service line



CITY OF COLUMBIA UTILITIES

Public Water System ID Number: MO3010181

2022 Annual Water Quality Report

(Consumer Confidence Report)

This report is intended to provide you with important information about your drinking water and the efforts made to provide safe drinking water.

Attencion!

Este informe contiene información muy importante. Tradúscalo o prequntele a alguien que lo entienda bien.
[Translated: This report contains very important information. Translate or ask someone who understands this very well.]

What is the source of my water?

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and groundwater wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Our water comes from the following source(s):

Source Name	Type
WELL # 15	GROUND WATER
WELL #1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, &18	GROUND WATER
ASH ST NEAR W ASHP PUMP STATION - ABANDON	GROUND WATER
CRUMP WELL	GROUND WATER
WELL # 8 FAIRVIEW CHURCH WELL	GROUND WATER
OLD WELL # 10 ROUTE TT KATY TRAIL WL	GROUND WATER
EL RAY HEIGHTS	GROUND WATER
BOONE CO # 1 BROWN SCHOOL RD - OTHER	GROUND WATER

Source Water Assessment

The Department of Natural Resources conducted a source water assessment to determine the susceptibility of our water source to potential contaminants. This process involved the establishment of source water area delineations for each well or surface water intake and then a contaminant inventory was performed within those delineated areas to assess potential threats to each source. Assessment maps and summary information sheets are available on the internet at https://drinkingwater.missouri.edu/. The Missouri Source Water Protection and Assessment maps and information sheets provide a foundation upon which a more comprehensive source water protection plan can be developed.

Why are there contaminants in my water?

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 the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

Contaminants that may be present in source water include:

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

B. 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.

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

D. Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

E. 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, the Department of Natural Resources prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Department of Health regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Is our water system meeting other rules that govern our operations?

The Missouri Department of Natural Resources regulates our water system and requires us to test our water on a regular basis to ensure its safety. Our system has been assigned the identification number MO3010181 for the purposes of tracking our test results. Last year, we tested for a variety of contaminants. The detectable results of these tests are on the following pages of this report. Any violations of state requirements or standards will be further explained later in this report.

How might I become actively involved?

If you would like to observe the decision-making process that affect drinking water quality or if you have any further questions about your drinking water report, please call us at **573-874-6242** to inquire about scheduled meetings or contact persons.

Do I need to take any special precautions?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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 and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Terms and Abbreviations

Population: 100733. This is the equivalent residential population served including non-bill paying customers.
90th percentile: For Lead and Copper testing. 10% of test results are above this level and 90% are below this level.
AL: Action Level, or the concentration of a contaminant which, when exceeded, triggers treatment or other requirements which a water system must follow.
HAA5: Haloacetic Acids (mono-, di- and tri-chloracetic acid, and mono- and di-bromoacetic acid) as a group.
LRAA: Locational Running Annual Average, or the locational average of sample analytical results for samples taken during the previous four calendar quarters.
MCLG: Maximum Contaminant Level Goal, or the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
MCL: Maximum Contaminant Level, or the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
n/a: not applicable.
nd: not detectable at testing limits.
NTU: Nephelometric Turbidity Unit, used to measure cloudiness in drinking water.
ppb: parts per billion or micrograms per liter.
ppm: parts per million or milligrams per liter.
RAA: Running Annual Average, or the average of sample analytical results for samples taken during the previous four calendar quarters.
Range of Results: Shows the lowest and highest levels found during a testing period, if only one sample was taken, then this number equals the Highest Test Result or Highest Value.
SMCL: Secondary Maximum Contaminant Level, or the secondary standards that are non-enforceable guidelines for contaminants and may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor or color) in drinking water. EPA recommends these standards but does not require water systems to comply
TT: Treatment Technique, or a required process intended to reduce the level of a contaminant in drinking water.
TTHM: Total Trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform) as a group.

March 13, 2023

CITY OF COLUMBIA UTILITIES

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Contaminants Report

CITY OF COLUMBIA UTILITIES will provide a printed hard copy of the CCR upon request. To request a copy of this report to be mailed, please call us at **573-874-6242**. The CCR can also be found on the internet at www.dnr.mo.gov/ccr/MO3010181.pdf.

The state has reduced monitoring requirements for certain contaminants to less often than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Records with a sample year more than one year old are still considered representative. No data older than 5 years need be included. If more than one sample is collected during the monitoring period, the Range of Sampled Results will show the lowest and highest tested results. The Highest Test Result, Highest LRAA, or Highest Value must be below the maximum contaminant level (MCL) or the contaminant has exceeded the level of health based standards and a violation is issued to the water system.

Regulated Contaminants

Regulated Contaminants	Collection Date	Highest Test Result	Range of Sampled Result(s) (low – high)	Unit	MCL	MCLG	Typical Source
BARIUM	1/13/2021	0.168	0.168	ppm	2	2	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
FLUORIDE	1/13/2021	0.54	0.54	ppm	4	4	Natural deposits; Water additive which promotes strong teeth
NITRATE-NITRITE	1/10/2022	0.018	0.018	ppm	10	10	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits

Disinfection Byproducts	Sample Point	Monitoring Period	Highest LRAA	Range of Sampled Result(s) (low – high)	Unit	MCL	MCLG	Typical Source
(HAA5)	DBPDUAL-01	2022	12	7.21 - 12.1	ppb	60	0	Byproduct of drinking water disinfection
(HAA5)	DBPDUAL-02	2022	11	6.64 - 11.1	ppb	60	0	Byproduct of drinking water disinfection
(HAA5)	DBPDUAL-03	2022	11	9.73 - 11.2	ppb	60	0	Byproduct of drinking water disinfection
(HAA5)	DBPDUAL-04	2022	10	9.86 - 10.6	ppb	60	0	Byproduct of drinking water disinfection
(HAA5)	DBPDUAL-05	2022	10	7.13 - 10.1	ppb	60	0	Byproduct of drinking water disinfection
(HAA5)	DBPDUAL-06	2022	11	8.39 - 12.4	ppb	60	0	Byproduct of drinking water disinfection
TTHM	DBPDUAL-01	2022	34	29.2 - 34.4	ppb	80	0	Byproduct of drinking water disinfection
TTHM	DBPDUAL-02	2022	34	28.6 - 38.3	ppb	80	0	Byproduct of drinking water disinfection
TTHM	DBPDUAL-03	2022	34	27.9 - 34.7	ppb	80	0	Byproduct of drinking water disinfection
TTHM	DBPDUAL-04	2022	33	28.7 - 33.9	ppb	80	0	Byproduct of drinking water disinfection
TTHM	DBPDUAL-05	2022	33	26.1 - 34	ppb	80	0	Byproduct of drinking water disinfection
TTHM	DBPDUAL-06	2022	32	28.3 - 33.9	ppb	80	0	Byproduct of drinking water disinfection

Lead and Copper	Date	90th Percentile: 90% of your water utility levels were less than	Range of Sampled Results (low – high)	Unit	AL	Sites Over AL	Typical Source
COPPER	2017 - 2019	0.0582	0.00499 - 0.156	ppm	1.3	0	Corrosion of household plumbing systems
LEAD	2017 - 2019	3.06	0 - 5.34	ppb	15	0	Corrosion of household plumbing systems

Violations and Health Effects Information

During the 2022 calendar year, we had the below noted violation(s) of drinking water regulations.

Compliance Period	Analyte	Type
7/1/2022	LEAD & COPPER RULE	FOLLOW-UP OR ROUTINE TAP M/R (LCR)

Special Lead and Copper Notice:

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 lines and home plumbing. CITY OF COLUMBIA UTILITIES 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 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 (800-426-4791) or at http://water.epa.gov/drink/info/lead/index.cfm.

All contaminant sample results from past and present compliance monitoring are available online at the Missouri DNR Drinking Water Watch website at www.dnr.mo.gov/DWW/. To see the Lead and Copper results, enter your water system's name in the box titled Water System Name, then select Find Water Systems at the bottom of the page. On the next screen, click on the Water System Number. At the top of the next page, under the Help column, click on Other Chemical Results by Analyte. Scroll down to Lead and click the blue Analyte Code (1030). A Sample Collection Date range may need to be entered. The Lead and Copper locations will be displayed under the heading Sample Comments. Scroll to find your location and click on the Sample No. for results. If you assisted the water system in taking a Lead and Copper sample but cannot find your location on the list, please contact CITY OF COLUMBIA UTILITIES for your results.

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Optional Monitoring (not required by EPA)

Optional Contaminants

Monitoring is not required for optional contaminants.

Secondary Contaminants	Collection Date	Your Water System Highest Sampled Result	Range of Sampled Result(s) (low - high)	Unit	SMCL
ALKALINITY, CACO3 STABILITY	1/13/2021	153	153	MG/L	
BROMIDE	1/8/2020	0.0688	0.0688	MG/L	0.05
CALCIUM	1/13/2021	49.8	49.8	MG/L	
CHLORIDE	1/13/2021	36.6	36.6	MG/L	250
HARDNESS, CARBONATE	1/13/2021	210	210	MG/L	
IRON	1/13/2021	0.136	0.136	MG/L	0.3
MAGNESIUM	1/13/2021	20.9	20.9	MG/L	
MANGANESE	1/13/2021	0.00755	0.00755	MG/L	0.05
NICKEL	1/13/2021	0.00154	0.00154	MG/L	0.1
PH	1/13/2021	8.16	8.16	PH	8.5
POTASSIUM	1/13/2021	4.87	4.87	MG/L	
SODIUM	1/13/2021	41.6	41.6	MG/L	
SULFATE	1/13/2021	91.4	91.4	MG/L	250
TDS	1/13/2021	351	351	MG/L	500
ZINC	1/13/2021	0.005	0.005	MG/L	5

Secondary standards are non-enforceable guidelines for contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor or color) in drinking water. EPA recommends these standards but does not require water systems to comply.