

ANNUAL WATER QUALITY REPORT

WATER TESTING PERFORMED IN 2017

Presented By
CPWS

Columbia Power & Water Systems

PWS ID#: 0000128

CPWS: Protecting, Producing, Planning Ahead

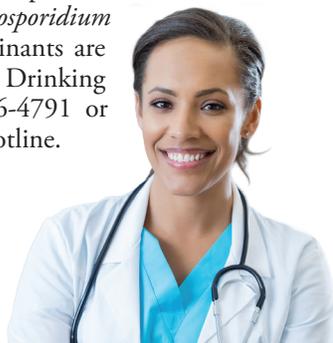
Once again, we are proud to present our annual drinking water report, covering all drinking water testing performed between January 1 and December 31, 2017. CPWS works around the clock to provide top-quality water to every tap. We ask that all of our customers help us protect our water sources, which are at the heart of our community and way of life.

Over the years, we have dedicated ourselves to producing drinking water that meets all state and federal standards. We continually strive to adopt new methods for delivering the best-quality drinking water to your homes and businesses. As new challenges to drinking water safety emerge, we remain vigilant in meeting the goals of source water protection, water conservation, and community education, while continuing to serve the needs of all our water users.

As part of CPWS' commitment to future generations, a multifaceted effort has been in place since 2015 to address the city's long-range water needs. In summary, over the next 20 years, CPWS would like to replace approximately 100 miles of its 535-mile water distribution system; update its current water treatment plant, while building a second plant to keep up with growth and provide treatment redundancy; and develop a second water intake on the Duck River to provide drought-resistant access to raw water. With the initial planning effort behind us, CPWS is well positioned to ensure future generations continue to have clean, plentiful water.

Do I Need to Take Precautions?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as those with cancer undergoing chemotherapy, those who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk for infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA and the Centers for Disease Control and Prevention guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available through the Safe Drinking Water Hotline at (800) 426-4791 or <http://water.epa.gov/drink/hotline>.



Why are Contaminants in My Water?

In order to ensure that tap water is safe to drink, the U.S. EPA and the Tennessee Department of Environment and Conservation prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily indicate that the water poses a health risk. 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, in some cases, radioactive material and substances resulting from the presence of animals or from human activity. Substances 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, or wildlife.

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may result from urban storm-water 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, urban storm-water runoff, and residential uses.

Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and may also come from gas stations, urban storm-water runoff, and septic systems.

Radioactive Contaminants, which can be naturally occurring or may be the result of oil and gas production and mining activities.

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Health Effects

The following health effects include contaminants listed in the Water Quality Data Tables:

Total Coliform—Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful bacteria may be present. If coliforms were found in more samples than allowed, this would be a warning of potential problems.

Turbidity—Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

Copper—Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal doctors.

Atrazine—Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular systems or have reproductive difficulties.

Barium—Some people who drink water containing barium in excess of the MCL over many years could experience an increase in blood pressure.

Fluoride—Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Children may get mottled teeth.

Lead—Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

Nitrate—Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you should ask advice from your health care provider. Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.

Sodium—Sodium levels in drinking water from most public water systems are unlikely to be a significant contributor to adverse health effects.

HAAs (Haloacetic Acids)—Some people who drink water containing HAAs in excess of the MCL over many years may have an increased risk of getting cancer.

TTHMs (Total Trihalomethanes)—Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.

Alpha Emitters—Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.

TOC (Total Organic Carbon)—TOC has no health effects; however, total organic carbon provides a medium for the formation of disinfection by-products. These by-products include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these by-products in excess of the MCLs may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.

Chlorine—Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and noses. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.

Chlorite—Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects.



Testing for Cryptosporidium

Cryptosporidium is a microbial parasite found in surface water throughout the U.S. Although filtration removes Cryptosporidium, the most commonly used filtration methods cannot guarantee 100% removal. Monitoring of source water and/or finished water indicates the presence of these organisms. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immunocompromised people are at greater risk of developing life-threatening illness. We encourage immunocompromised individuals to consult their doctor regarding appropriate precautions to avoid infection. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water.

Lead in Home Plumbing

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. Columbia Power & Water Systems 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 two 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, along with steps you can take to minimize exposure are available through the Safe Drinking Water Hotline at (800) 426-4791 or at www.epa.gov/lead.

Why Do We Flush Water Mains?

Distribution mains (pipes) convey water to homes, businesses, and hydrants in your neighborhood. The water entering distribution mains is of very high quality; however, water quality can deteriorate in areas of the distribution mains over time. Water main flushing is the process of cleaning the interior of water distribution mains by sending a rapid flow of water through the mains.

Flushing maintains water quality in several ways. For example, removing sediments such as iron and manganese. Although iron and manganese do not pose health concerns, they can affect the taste, clarity, and color of the water. Additionally, sediments can shield microorganisms from the disinfecting power of chlorine, contributing to the growth of microorganisms within distribution mains. Flushing helps remove stale water and ensures the presence of fresh water with sufficient dissolved oxygen, disinfectant levels, and an acceptable taste and smell.

During flushing operations in your neighborhood, some short-term deterioration of water quality, though uncommon, is possible. You should avoid tap water for household uses at that time. If you do use the tap, allow your cold water to run for a few minutes at full velocity before use, and avoid using hot water to prevent sediment accumulation in your hot water tank.

Please contact CPWS if you have any questions or if you would like more information on our water main flushing schedule.

What's a Cross-Connection?

Cross-connections that contaminate drinking water distribution lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment (boilers), systems containing chemicals (air conditioning systems, fire sprinkler systems, irrigation systems), or water sources of questionable quality. Cross-connection contamination can occur when the pressure in the equipment or system is greater than the pressure inside the drinking water line (back-pressure). Contamination can also occur when the pressure in the drinking water line drops due to fairly routine occurrences (main breaks, heavy water demand), causing contaminants to be sucked out from the equipment and into the drinking water line (back-siphonage).

Outside water taps and garden hoses tend to be the most common sources of cross-connection contamination at home. The garden hose creates a hazard when submerged in a swimming pool or when attached to a chemical sprayer for weed killing. Garden hoses that are left lying on the ground may be contaminated by fertilizers, cesspools, or garden chemicals. Improperly installed valves in your toilet could also be a source of cross-connection contamination.

Community water supplies are continuously jeopardized by cross-connections unless appropriate valves, known as backflow prevention devices, are installed and maintained. We have surveyed industrial, commercial, and institutional facilities in the service area to make sure that potential cross-connections are identified and eliminated or protected by a backflow preventer. We also inspect and test backflow preventers to make sure they provide maximum protection. For more information on backflow prevention, contact the Safe Drinking Water Hotline at (800) 426-4791.



What is the Source of My Water?

Your water comes from a surface water source called the Duck River. Our goal is to protect our water from contaminants, and we work with the State of Tennessee to determine the vulnerability of our water source to potential contamination.



The Tennessee Department of Environment and Conservation has prepared a Source Water Assessment Program (SWAP) Report for the water sources serving this water system. The SWAP Report assesses the susceptibility of public water supplies to potential contamination. Water sources

have been rated as reasonably susceptible (high), moderately susceptible (moderate), or slightly susceptible (low) based on geological factors and human activities in the vicinity of the water source. The Columbia Water System's water source rated as slightly susceptible to potential contamination.

Columbia Power & Water Systems submitted a Source Water and Wellhead Protection Plan (SWPP) in December 2015, which was approved by TDEC in January 2016. The plan included a listing of potential discharge within the "critical zone" that encompasses an area beginning 0.5 miles downstream of the intake and extending 5.0 miles upstream of the intake—based on a 1,000-foot corridor parallel to the designated stream banks. The list also included facilities in the "protection zone" that extend 15.0 miles upstream of the intake.

For an explanation of Tennessee's Source Water Assessment Program, a copy of the source water protection plan, the source water summaries, susceptibility scorings, and TDEC's overall report to the EPA, please visit www.tn.gov/environment, or call (888) 891-TDEC or CPWS at (931) 388-4833 to obtain copies of specific assessments.

How Can I Get Involved?

Columbia Power & Water Systems operates under the Board of Public Utilities of the City of Columbia, Tennessee. Formal board meetings are typically held on the third or fourth Wednesday of each month, beginning at 3:30 p.m. in the CPWS board room at 201 Pickens Lane. CPWS encourages community participation in those meetings. For more information, please visit www.cpws.com or call (931) 388-4833.

QUESTIONS?

For more information about this report, or for questions related to your drinking water, please call Jonathan Hardin, Director of Water Operations, at (931) 375-7646.

Think Before You Flush!

Flushing unused or expired medications can be harmful to your drinking water. Properly disposing of unused or expired pharmaceuticals helps protect you and the environment. Keep medications out of Tennessee's waterways by disposing at one of TDEC's permanent drop-off bins, through local community "take back" events, or contact your local pharmacy or health department. Visit www.tn.gov/environment for more information.



By the Numbers



Sampling Results

During the past year, we have taken hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. While we conducted tests for more than 84 contaminants, only 16 were detected—all at safe levels. The tables that follow mainly show only those contaminants that were detected in the water. The State of Tennessee requires us to monitor for certain substances less often than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

Most of the information presented in the following table is from testing done between January and December of 2017.

REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Alpha Emitters (pCi/L)	2012	15	0	5.5	NA	No	Erosion of natural deposits
Atrazine (ppb)	2017	3	3	<0.0001	NA	No	Runoff from herbicide used on row crops
Barium (ppm)	2017	2	2	0.0216	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chlorine (ppm)	2017	4	4	2.69 Average	1.44–3.80	No	Water additive used to control microbes
Chlorite (ppm)	2017	1	0.8	0.363 Average	0.036–0.536	No	By-product of drinking water disinfection
Fluoride (ppm)	2017	4	4	<0.100 Average	<0.1	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Haloacetic Acids [HAA] ¹ (ppb)	2017	60	NA	50 (highest LRAA at Site # 1)	1–60	No	By-product of drinking water disinfection
Nitrate [as Nitrogen] (ppm)	2017	10	10	0.496	NA	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Selenium (ppb)	2017	50	50	1.80	NA	No	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines
Sodium (ppm)	2017	NA	NA	17.0	NA	No	Erosion of natural deposits; Used in water treatment
TTHMs [Total Trihalomethanes] ² (ppb)	2017	80	NA	70 (highest LRAA at Site # 1)	1–80	No	By-product of drinking water chlorination
Total Coliform Bacteria	NA	Presence of coliform bacteria in 5% of monthly samples	0	0	NA	No	Naturally present in the environment
Total Organic Carbon [TOC] ³ (ppm)	2017	TT	TT	57.5% Average Removal	25% Highest Removal Required	No	Naturally present in the environment
Turbidity (NTU)	2017	TT	NA	0.087	0.040–0.730	No	Soil runoff
Turbidity ⁴ (lowest monthly percent of samples meeting limit)	2017	TT = 99% of samples meet the limit	NA	99% of samples met limit	NA	No	Soil runoff

Tap water samples were collected for lead and copper analyses from sample sites throughout the community⁵

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH%TILE)	SITES ABOVE AL/TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2016	1.3	1.3	0.106	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Lead (ppb)	2016	15	0	2.02	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits

(sampling data continued on next page)

UNREGULATED SUBSTANCES ⁶

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Bromodichloromethane (ppm)	2017	0.00185	NA	By-product of drinking water chlorination
Chloroform (ppm)	2017	0.00494	NA	By-product of drinking water chlorination

¹ Some people who drink water containing HAAs in excess of the MCL over many years may have an increased risk of getting cancer.

² Some people who drink water containing TTHMs in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.

³ Met the treatment technique for Total Organic Carbon in 2017.

⁴ Met the treatment technique for Turbidity with 99% of monthly samples below the Turbidity limit of 0.3 NTU.

⁵ Zero out of 30 sites sampled exceeded the copper or lead action levels.

⁶ Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted. For additional information, call the Safe Drinking Water Hotline at 1-800-426-4791.

Definitions

AL (Action Level): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

MCL (Maximum Contaminant Level): 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.

MCLG (Maximum Contaminant Level Goal): 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.

MRDL (Maximum Residual Disinfectant Level): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG (Maximum Residual Disinfectant Level Goal): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

NA: Not applicable.

NTU (Nephelometric Turbidity Units): Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

pCi/L (picocuries per liter): A measure of radioactivity.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

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