

Leavenworth Waterworks

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2023 WATER QUALITY REPORT

In 2022, Leavenworth Waterworks was 100% compliant with Federal Drinking Water Regulations.

Terms & Abbreviations Used in both tables

Action Level (AL): the concentration of a contaminant that, if exceeded, triggers treatment or other requirements.
Conductivity: the ability of water to conduct an electric current; expressed as micromhos per centimeter ($\mu\text{mhos/cm}$); indicates the degree of mineralization in water.
Langlier Index (LI): a measure of the corrosiveness of water.
Locational Running Annual Average (LRAA): average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters.
Maximum Contaminant Level (MCL): the "Maximum Allowed" MCL is 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.
Maximum Contaminant Level Goal (MCLG): the "Goal" is the level of a contaminant in drinking water below which there is no known or expected risk to human health. MCLGs allow for a margin of safety.
Maximum Residual Disinfectant Level (MRDL): 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.
Maximum Residual Disinfectant Level Goal (MRDLG): the level of a drinking water disinfectant below which there is no known or expected risk to human health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
Millirems per Year (mrem/yr): a measure of radiation absorbed by the body.
Million Fibers per Liter (MFL): a measure of the presence of asbestos fibers that are longer than 10 micrometers.
Monitoring Period Average (MPA): an average of sample results obtained during a defined time frame, common examples of monitoring periods are monthly, quarterly, and yearly.
Nephelometric Turbidity Unit (NTU): a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person. Turbidity is not regulated for groundwater systems.
Non-Detects (ND): lab analysis indicates that the contaminant is not present.
Parts per Billion (ppb): or micrograms per liter ($\mu\text{g/L}$).
Part per Million (ppm): or milligrams per liter (mg/L).
pH: the pH scale extends from 0, very acidic, to 14, very alkaline, with 7 being neutral.
Picocuries per Liter (pCi/L): a measure of the radioactivity in water.
Running Annual Average (RAA): an average of sample results obtained over the most current 12 months and used to determine compliance with MCLs.
Secondary Maximum Contaminant Level (SMCL): recommended level for a contaminant that is not regulated and has no MCL.
Treatment Technique (TT): a required process intended to reduce levels of a contaminant in drinking water.

=: equal to.
<: less than
≤: less than or equal to.

We Work Hard to Bring You Soft Water

The raw water we divert from the Missouri River and that we pump from the Missouri River alluvial aquifer is hard water prior to treatment. The hardness is caused by two common minerals: calcium and magnesium. These minerals occur naturally and mostly come from the limestone and dolomite formations that are prevalent in eastern Kansas. Even though hard water is generally safe to drink, it can have undesirable effects on cleaning and bathing. Soaps and detergents lather less in hard water and are less effective than in soft water. Hard water typically forms a residue (scum) when combined with detergents, which stay behind on dishes, laundry, sinks, showers, and bathtubs. Hard water also forms "scale" that clogs pipes and ruins water heaters. The scale also forms on indoor plumbing fixtures and appliances (like the inside of tea and coffee pots), and decreases the life of toilet flushing units. Similarly, insoluble salt residues that remain in hair after shampooing with hard water tend to leave hair rougher and harder to untangle. Many homeowners and businesses who have hard water use water softeners (ion-exchange devices), which are expensive to purchase, install, and operate. Fortunately, Leavenworth Waterworks employs lime softening at its two water treatment plants to remove most of the hardness caused by calcium and magnesium. Hardness at the North Treatment Plant is reduced from about 320 mg/L down to about 160 mg/L. Hardness at the South Treatment Plant is reduced from about 400 mg/L to about 120 mg/L. The result is great-tasting water without the expensive hassles of hard water.

Basic Information

This report is a summary of the quality of water provided to customers during 2022. It is a record reflecting the hard work and dedication of the five elected members of the Waterworks Board and the 35 Waterworks employees. All are committed to providing plentiful water that is safe to drink. The Waterworks Board meets at 5:00 PM on the second and fourth Mondays of each month at the Leavenworth Waterworks office, 601 Cherokee. The public is welcome to attend, because well-informed customers are our best allies in supporting improvements necessary to maintain high drinking water standards. The 2023 Waterworks Board members are Mr. Richard Gervasini (Chairman), Mrs. Christi Norris, Mr. Eric Peterson, Mr. Chad Lough, and Mr. Robert Walters.

This Water Quality Report is provided to all customers as required by the U.S. Congress in their 1996 amendment to the Safe Drinking Water Act. The details of the report are based on the Consumer Confidence Report regulations published by the U.S. Environmental Protection Agency (EPA) on August 19, 1998. The purpose of the annual report is to inform all customers about their drinking water, to increase awareness about the importance of source-water protection, and to involve customers more in decisions that may affect their health.

Free copies of this report are available at the Leavenworth Waterworks Office; 601 Cherokee and on our website at www.lvnwater.com. Copies will also be mailed to customers upon request. If you have any questions or want more information about this report, please contact Neil Seichepine, Water Treatment Manager at 913-727-1902.

Water-Quality Data



The following water-quality tables list unregulated secondary and regulated primary drinking water contaminants that were detected during the 2022 calendar year. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in these tables are from water testing done from January 1 through December 31, 2022.

The State of Kansas requires Leavenworth Waterworks to monitor the water supply for certain contaminants less than once per year, because the concentrations of these contaminants are not expected to vary significantly from year to year. Therefore, some of the data, though representative of the water quality, may be more than one year old. The bottom line is that the water provided to you is safe to drink.

WATER QUALITY DATA — Table 1

Unregulated (Secondary) Contaminants (Units)	SMCL	Highest Detected Level	Range of Detected Level
Acetochlor ($\mu\text{g/L}$)		0.16	0 - 0.16
Alkalinity, Total (MG/L)	300	77	63 - 77
Aluminum (MG/L)	0.05	0.43	0 - 0.43
Calcium (MG/L)	200	29	12 - 29
Carbon, Total Organic (TOC) (MG/L) ¹		1.74 & 2.67 actual removal ratio at plants	1.08 & 1.87 Lowest monthly removal ratio at plants
Chloride (MG/L)	250	27	26 - 27
Conductivity ($\mu\text{mhos/cm}$)	1500	540	440 - 540
Corrosivity (LI) ²	0	0.77	0.30 - 0.77
Hardness, Total (as CaCO_3) (MG/L)	400	150	120 - 150
Magnesium (MG/L)	150	30	5 - 30
Nickel (MG/L)	0.1	0.0023	0 - 0.0023
pH (pH)	8.5	8.9	8.8 - 8.9
Phosphorus, Total (MG/L)	5	0.19	0.16 - 0.19
Potassium (MG/L)	100	6.1	6.0 - 6.1
Silica (MG/L)	50	13	11 - 13
Sodium (MG/L)	100	62	47 - 62
Solids, Total Dissolved (MG/L)	500	380	280 - 380
Sulfate (MG/L)	250	150	120 - 150
Zinc (MG/L)	5	0.014	0.0077 - 0.014

Terms & Abbreviations Can Be Found On Back Page

¹ Although Total Organic Carbon (TOC) is not a regulated contaminant, regulations require water systems to remove a percentage of TOC from the raw water. We are required to maintain a quarterly removal ratio greater than 1.0. Total organic carbon has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.

² Langlier Index (LI) is a measurement of the corrosiveness of water. KDHE considers water to be non-corrosive, which is desirable, if the LI is greater than 0.



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Waterworks Board News

We are pleased to share the 2023 Water Quality Report with you. This report is designed to inform you about the quality water and services we deliver to you every day. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and protect our water resources.

The Waterworks Board strives to ensure that all customers receive excellent service, the water system is operated well, water rates remain economical, and the drinking water is of high quality. The Waterworks Board believes softened water provides the best value to customers. Therefore, our drinking water not only complies with all EPA and KDHE regulations, it also is softened in the treatment process. Leavenworth Waterworks is the only supplier in Leavenworth County which provides softened water.

While taking good care of today's customer, the Waterworks Board must also plan for the future. Those involved in public works know that timely decisions and prudent improvements for the future are more difficult tasks than just taking care of today's business. Nevertheless, the Waterworks Board works hard to do what is best for both today and tomorrow.

Water Conservation Tips
Things you can do to save water:

- Fix leaking faucets, pipes, toilets, etc.
- Replace old fixtures; install water-saving shower heads or flow restrictors.
- Take shorter showers.
- Turn off the water after you wet your toothbrush.
- If you wash dishes by hand, don't leave the water running for rinsing.
- Water your lawn only when it needs it.



Drinking Water and Your Health

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 affect can be obtained by calling the EPA's Safe Drinking Water Hotline 1-800-426-4791.

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 the drinking water from their health care providers. Center for Disease Control and EPA guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline 1-800-426-4791.

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, in some cases, 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 before we treat it include:

- Inorganic contaminants, such as salts and metals, which can be naturally occurring, or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, storm water run-off, and residential uses.
- Organic contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff and septic systems.

- Radioactive contaminants, which can be naturally occurring or the result of mining activities.

To ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. We treat our water according to EPA's regulations. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protections for public health.

Our water system is required to test a minimum of 40 samples per month in accordance with the Revised Total Coliform Rule for microbiological contaminants. Total Coliform Rule (TCR) – Coliform bacteria are usually harmless, but their presence in water can be an indication of disease-causing bacteria. When coliform bacteria are found, special follow-up tests are done to determine if harmful bacteria are present in the water supply. If this limit is exceeded, the water supplier must notify the public by newspaper, television or radio. All water samples tested negative for coliform bacteria except the month of October of 2022 when 1 of 43 samples tested positive.

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.

Your water system 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.

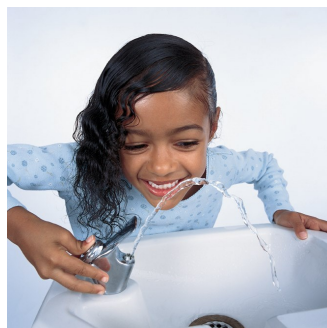
Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline 1-800-426-4791 or on-line at <http://epa.gov/safewater/lead>.

Safe, Reliable Water Sources

Your drinking water comes from two sources. The surface water which is treated at the North Water Plant, located in northeast Leavenworth, is drawn directly from the river by pumps located on the west bank of the Missouri River. The groundwater which is treated at the South Water Plant, located a half a mile southeast of Leavenworth, comes from nine wells situated approximately 300 feet from the river. The wells draw water from an aquifer fed by the Missouri River.

State-certified operators at each treatment plant work 24 hours per day, 7 days per week to make the water safe for drinking and pleasantly soft for every household and commercial use. The water is subjected to rigorous treatment to remove sediment, harmful bacteria, and undesirable minerals and contaminants. To prevent disease, operators disinfect the water with chlorine and ammonia.

Your water is safe to drink.



The U.S. Congress, EPA, and Kansas Department of Health and Environment (KDHE) develop and enforce drinking water regulations to protect public health. Our drinking water consistently meets or exceeds these rigorous standards. Last year, KDHE completed more than 900 tests for over 100 contaminants to assure quality control of our water. This was in addition to the numerous hourly and daily checks and tests performed by our plant operators at each of the two Leavenworth Waterworks treatment plants. Frequent sampling of the treated water is also done at numerous customer locations throughout the city water-service.

Construction Projects

In 2022, construction activities were limited. Inflation as well as supply-chain issues continue to affect the delivery of projects to improve reliability of the system and the safety of the water provided. A water main replacement project for Cherokee Street between 12th and 20th Streets was contracted for in May 2022. However, delivery time for materials exceeded the calendar. The project will be completed in 2023.

The proposed water storage tank project, designed in 2021, has also been delayed. We have yet to receive an easement for the proposed construction site from the US Department of Justice.

Regulated (Primary)	MCL	MCLG	Highest Detected Level	Range	Met Standard	Source
Inorganic Contaminants						
Arsenic	10 ppb	0 ppb	1.0	0 - 1.0	✓	Erosion of natural deposits
Atrazine ¹	3 ppb	3 ppb	0.81	0 - 0.81	✓	Runoff from herbicide used on row crops
Barium	2 ppm	2 ppm	0.013	0.0095 - 0.013	✓	Discharge from metal refineries
Chloramines	MRDL= 4	MRDL= 4	3.00 ²⁻³	1.50 - 3.40	✓	Water additive used to control microbes
Chromium	100 ppb	100 ppb	3.0	2.2 - 3.0	✓	Discharge from steel and pulp mills
Copper ⁴	AL = 1.3 ppm	Sites Over AL: 0	90th Percentile 0.0092 ppm	0.000 - 0.015	✓	Corrosion of household plumbing systems.
Fluoride	4 ppm	4 ppm	0.70	0.00 - 0.70	✓	Natural deposits; Water additive which promotes strong teeth
Lead ⁵	AL = 15 ppb	Sites Over AL: 0	90th Percentile 1.0 ppb	0 - 1.3	✓	Corrosion of household plumbing systems
Nitrate	10 ppm	10 ppm	1.5	0 - 1.5	✓	Runoff from fertilizer use
Nitrate-Nitrite	10 ppm	10 ppm	0.99	0.99	✓	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Nitrite	1 ppm	1 ppm	0.14	0.14	✓	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Selenium	50 ppb	50 ppb	3.4	1.5 - 3.4	✓	Erosion of natural deposits
Volatile Organic Contaminants						
Total Haloacetic Acids (HAA5)	60 ppb	0 ppb	15 ⁶	7.3 - 26	✓	By-product of drinking water disinfection
Total Trihalomethanes (THM's)	80 ppb	0 ppb	41 ⁶	16 - 76	✓	By-product of drinking water chlorination
Microbiological Contaminants						
Total Coliforms	No more than 5% of monthly samples can be positive	N/A	0 ⁷	0	✓	Naturally present in the environment
Turbidity						
Turbidity ⁸	TT = 1 max TT ≤ 0.3 95% of the time or more	N/A	0.339	0.023 - 0.339	✓	Soil runoff

REMARKS

¹Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.
²⁻³ We are required to maintain a minimum residual of 1.0 ppm throughout our distribution system as a measure of protection against microbiological contamination. This compliance figure is based on the rolling annual averages of continuous MRDL measurements collected throughout the year.
⁴⁻⁵ 30 sites were tested for copper & lead in July 2020. The 90th percentile level for copper was 0.0092 ppm, and the 90th percentile level for lead was 1.0 ppb.
⁶This compliance figure is based on a "running annual average" of results from samples collected 4 times per year. The "running annual average" is the average of the results for the most recent four quarters.
⁷100% of samples tested negative every month except the month of October 2022 when 1 of 43 samples tested positive.
⁸Turbidity is a measurement of the cloudiness of water. We monitor it per KDHE and EPA regulations because it is a good indicator of the effectiveness of our filtration systems at the treatment plants. Appreciable turbidity inhibits chlorine disinfection and may indicate that disease-causing organisms are present in the water supply.