

Leavenworth Waterworks

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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 (µmhos/cm); indicates the de-gree of mineralization in water.  
**Langlier Index (LI):** a measure of the corrosiveness of water.  
**Maximum Contaminant Level (MCL):** the "Maximum Allowed" MCL is the highest level of a contaminant that is allowed in drink-ing water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.  
**Maximum Contaminant Level Goal (MCLG):** the level of a contaminant in drinking water below which there is no known or or expected risk to human health. MCGLs allow for a margin of safety.  
**Maximum Residual Disinfectant Level (MRDL):** the highest level of a disinfectant allowed in drinking water. There is convincing evi-dence 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 ex-pected 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.  
**n/a:** not applicable  
**Nephelometric Turbidity Unit (NTU):** a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.  
**Non-Detects (ND):** laboratory analysis indicates that the constituent is not present.  
**Parts per Billion (ppb):** or micrograms per liter (µg/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.  
**Secondary Maxium Contaminant Level (SMCL):** recommended level for a contaminant that is not regulated and has no MCL.  
**Treatment Technique (TT):** a treatment technique is 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 Kan-sas. 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 hard-er 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.



In 2017, Leavenworth Waterworks was 100% compliant with Federal Drinking Water Regulations.

WATER QUALITY DATA — Table 1

Unregulated (Secondary) Contaminants (Units)	SMCL	Highest Detected Level	Range of Detected Level
Alkalinity, Total (MG/L)	300	110	50 - 110
Aluminum (MG/L)	0.05	0.058	0.058
Calcium (MG/L)	200	25	12 - 25
Carbon, Total Organic (TOC) (MG/L) <sup>1</sup>		1.52 & 2.86 actual removal ratio at plants	0.00 & 2.00 Lowest monthly removal ratio at plants
Chloride (MG/L)	250	22	17 - 22
Conductivity (µmhos/cm)	1500	550	450 - 550
Corrosivity (LI) <sup>2</sup>	0	0.42	-0.88 - 0.42
Hardness, Total (as CaCO <sub>3</sub> ) (MG/L)	400	140	120 - 140
Magnesium (MG/L)	150	28	11– 28
Metolachlor (ppb)		.38	.38
pH (pH)	8.5	8.9	7.6 - 8.9
Phosphorus (MG/L)	5	0.25	0.23 - 0.25
Potassium (MG/L)	100	5.8	5.7 - 5.8
Silica (MG/L)	50	18	9.2 - 18
Sodium (MG/L)	100	61	38 - 61
Solids, Total Dissolved (MG/L)	500	340	270 - 340
Sulfate (MG/L)	250	160	84 - 160

Terms & Abbreviations Can Be Found On Back Page

Water-Quality Data



The following water-quality tables list unregulated secondary and regulated primary drinking water contaminants that were detected during the 2017 cal-endar year. The presence of these contaminants in the water does not nec-essarily 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, 2017.

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

<sup>1</sup> 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.

<sup>2</sup> Langelier 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 2018 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.
- Water during the cool parts of the day, early morning or evening.



### 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, 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, 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 can also come from gas stations, urban storm water runoff and septic systems.

- Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and 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.

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.

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 2017, the Waterworks continued its program of replacing older, failing water mains. Three miles of pipeline were replaced. The program has begun to show results in the number of main breaks experienced. In 2012 the Waterworks repaired 133 leaks and breaks on the distribution system. In 2017, only 46 were experienced, a 289% reduction. This represents a significant reduction in time, money, and risk of exposure to contaminants. This program will continue for years to come. Please be patient with our contractors as they work to improve our system.

2017 also saw the completion of the installation of an emergency electrical generator at the South Plant. The plant and water supply will remain fully functional in the event of an extended power outage.

Work has also begun on the replacement of the water supply wells for the South Plant with a single horizontal collector well. The existing wellfield is ageing and losing capacity. We expect this project to be completed by mid—2020

Regulated (Primary)	MCL	MCLG	Highest Detected Level	Range	Met Standard	Source
Inorganic Contaminants						
Arsenic	10 ppb	0 ppb	1.7	1.7	✓	Erosion of natural deposits
Barium	2 ppm	2 ppm	0.038	0.014 - 0.038	✓	Discharge of drilling waters; Discharge from metal refineries; Erosion of natural deposits
Chloramines	MRDL= 4	MRDL= 4	2.51 <sup>1-2</sup>	2.1 - 3.1	✓	Water additive used to control microbes
Chromium	100 ppb	100 ppb	1.3	1.3	✓	Discharge from steel and pulp mills
Copper <sup>3</sup>	AL = 1.3 ppm	1.3 ppm	0.013	0.0013 - 0.016	✓	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Fluoride	4 ppm	4 ppm	0.71	0.2 - 0.71	✓	Erosion of natural deposits: Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Lead <sup>4</sup>	AL = 15 ppb	0	1	1.0 - 3.1	✓	Corrosion of household plumbing systems: Erosion of natural deposits
Nitrate	10 ppm	10 ppm	3.2	0.68 - 3.2	✓	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Selenium	50 ppb	50 ppb	3.7	3.7	✓	Erosion of natural deposits
Synthetic Organic Contaminants						
Atrazine	3 ppb	3 ppb	.37	.37	✓	Runoff from herbicide used on row crops
Volatile Organic Contaminants						
Haloacetic Acids (HAA5)	60 ppb	0	29 <sup>5</sup>	5 - 37	✓	By-product of drinking water disinfection
Total Trihalomethanes (THM's)	80 ppb	0	56 <sup>5</sup>	16 - 65	✓	By-product of drinking water chlorination
Microbiological Contaminants						
Total Coliforms	No more than 5% of monthly samples can be positive	0	0	0	✓	Naturally present in the environment
Turbidity						
Turbidity	TT = 1 max TT≤0.3 95% of the time or more	n/a	.275 <sup>6</sup>	.015 - .275	✓	Soil runoff

REMARKS

<sup>1-2</sup> 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.

<sup>3-4</sup> 31 sites were tested for copper & lead in July 2017. The 90th percentile level for copper was 0.013 ppm, and the 90th percentile level for lead was 1.

<sup>5</sup>This 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.

<sup>6</sup> 100 % of samples measured less than (≤) .3 NTU every month.

Turbidity 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.

Violations noted by KDHE Sanitary Survey

\*All treatment plant residuals from the North Plant go directly to the river.

\*\* Emergency plan is being reworked but has not been completed as of 8/23/2017.

Today, Leavenworth Waterworks provides filtered and softened water to about 50,000 people in the City of Leavenworth and surrounding communities through 180 miles of water transmission and distribution lines.