

Leavenworth Waterworks

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Source Water Assessment Report

An assessment of our source water was completed. For results of the assessment please contact us or view on-line at www.kdheks.gov/nps/swap/SWreports.html

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 300 mg/L down to about 130 mg/L. Hardness at the South Treatment Plant is reduced from about 400 mg/L to about 70 mg/L. The result is great-tasting water without the expensive hassles of hard water.

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.
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 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.
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 ($\mu\text{g/L}$).
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.
Secondary Maximum 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.

2016 Water Quality Report

Leavenworth Waterworks

In 2015, 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
Acetochlor (ppb)		0.25	<0.10 - 0.25
Alkalinity, Total (ppm)	300	66	57 - 66
Aluminum (ppb)	0.05	0.15	0.013 - 0.15
Calcium (ppm)	200	30	23 - 30
Carbon, Total Organic (TOC) (ppm) ¹		3.08	1.14 - 3.08
Chloride (ppm)	250	25	20 - 25
Conductivity ($\mu\text{mhos/cm}$)	1500	650	490 - 650
Corrosivity (LI) ²	0	1.1	0.32 - 1.1
Hardness, Total (as CaCO_3) (ppm)	400	160	120 - 160
Magnesium (ppm)	150	24	12 - 24
Metolachlor (ppb)		0.75	<0.25 - .75
Nickle (ppm)	10	1.1	<1.0 - 1.1
pH (pH)	8.5	9.4	8.8 - 9.4
Phosphorus (ppb)	5000	0.2	0.18 - 0.2
Potassium (ppm)	100	6.3	6.2 - 6.3
Silica (ppm)	50	11	8.7 - 11
Sodium (ppm)	100	72	50 - 72
Solids, Total Dissolved (ppm)	500	400	310 - 400
Sulfate (ppm)	250	200	160 - 200
Zinc (ppm)	5	0.0054	<0.0050 - 0.0054

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 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.

Basic Information

This report is a summary of the quality of water provided to customers during 2015. It is a record reflecting the hard work and dedication of the five elected members of the Waterworks Board and the 34 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 current Waterworks Board members are Mr. Dick Gervasini, (Chairman), Mr. Greg Kaaz, Ms. Teresa Wood, Ms. Christi Norris and Mr. Davis Moulden.

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 Jeff Arnold, 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 2015 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, 2015.

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.



Leavenworth Waterworks accepts payments using VISA, MasterCard, and Discover credit and debit cards, electronic checks, and by automatic withdrawal from your checking account. Call 913-682-1513 or visit our web site at www.lvnwater.com for details.

Waterworks Board News

We are pleased to share the 2016 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.

Construction Projects

In order to improve the reliability of our distribution system, the Leavenworth Waterworks Board has undertaken a program of water main replacements. Approximately three (3) miles of mains are scheduled this year for upgrade. The majority of the mains to be replaced are small diameter, cast iron pipe installed fifty (50) to seventy five (75) years ago that are now at the end of their service life.

The majority of the work will be contracted to independent construction firms. Please be patient with their work. Short service interruptions will be necessary to transfer service connections to the new mains.



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. 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 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 stormwater 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 stormwater 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 stormwater 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 except the month of February 2015 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 area.

Several times in the past few months the question has been asked—could we have a problem with lead in our water like Flint Michigan? The short answer is—highly unlikely. Flint Michigan made a number of poor decisions including switching to a corrosive water source and failed to add an anticorrosion agent to its treatment process causing lead to leach into the water.

Since 1948 Leavenworth Waterworks has employed a treatment process known as lime softening. For this process to work, the pH of water must be raised to a very high level. After softening, the water is adjusted to a slightly positive value. Water with a positive pH is noncorrosive to metal piping. Leaving the water pH slightly positive also causes a film of minerals to build up on all metal piping and fittings, protecting the water further. The process is continuously monitored by our staff for quality control.



Regulated (Primary)	MCL	MCGL	Highest Detected Level	Range	Met Standard	Source
Inorganic Contaminants						
Arsenic	10 ppb	0	1.1	<1.0 - 1.1	✓	Erosion of natural deposits
Barium	2 ppm	2 ppm	0.052	0.011 - 0.052	✓	Discharge of drilling waters; Discharge from metal refineries; Erosion of natural deposits
Chloramines	MRDL= 4	MRDL= 4	2.60 ¹⁻²	1.8 - 3.3	✓	Water additive used to control microbes
Copper ³	AL = 1.3 ppm	1.3 ppm	0.011	0.0012 - 0.021	✓	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Fluoride	4 ppm	4 ppm	0.8	0.27 - 0.8	✓	Erosion of natural deposits: Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Lead ⁴	AL = 15 ppb	0	1	<1.0 - 1	✓	Corrosion of household plumbing systems: Erosion of natural deposits
Nitrate	10 ppm	10 ppm	1.6	0.62 - 1.6	✓	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Selenium	50 ppb	50 ppb	2.8	<1.0 - 2.8	✓	Erosion of natural deposits
Synthetic Organic Contaminants						
Atrazine	3 ppb	3 ppb	1.2	<0.30 - 1.2	✓	Runoff from herbicide used on row crops
Volatile Organic Contaminants						
Haloacetic Acids (HAA)	60 ppb	n/a	20 ⁵	7.7 - 32	✓	By-product of drinking water disinfection
Total Trihalomethanes (THM's)	80 ppb	n/a	41 ⁵	11 - 79	✓	By-product of drinking water chlorination
Microbiological Contaminants						
Total Coliforms	No more than 5% of monthly samples can be positive	0	0 ⁶	0	✓	Naturally present in the environment
Turbidity						
Turbidity	TT = 1 max TT≤0.3 95% of the time or more	n/a	0.17 ⁷	0.01 - .17	✓	Soil runoff

REMARKS

¹⁻² 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.
³⁻⁴ 31 sites were tested for copper & lead in July 2014. The 90th percentile level for copper was 0.013 ppm, and the 90th percentile level for lead was 1.1. Since we have never exceeded the Action Level (AL) we are not required to test for lead or copper again until July 2017.
⁵ 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.
⁶ 100% of samples tested negative every month except the month of February 2015 when 1 of 43 samples tested positive.
⁷ 100 % 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.