

## Leavenworth Water Department



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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 ( $\mu\text{mhos/cm}$ ); 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 ( $\text{mg/L}$ ).  
**pH:** the pH scale extends from 0, very acidic, to 14, very alkaline, with 7 being neutral; also negative log of hydrogen ion concentration.  
**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.  
**≤:** 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 the 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, the Leavenworth Water Department 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.

# 2011 Water Quality Report

## Leavenworth Water Department

In 2010, the Leavenworth Water Department had no violations of Drinking Water Regulations.

### Water-Quality Data

The following water-quality tables list unregulated secondary and regulated primary drinking water contaminants that were detected during the 2010 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, 2010.

The State of Kansas requires the Leavenworth Water Department 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
Alkalinity, Total (ppm)	300	106	25 - 106
Aluminum (ppb)	500	450	<10 - 450
Calcium (ppm)	200	31	7.9 - 31
Carbon, Total Organic (TOC) (ppm) <sup>1</sup>	100	3.5	1.2 - 3.5
Chloride (ppm)	250	32	19 - 32
Conductivity (UMHOS/CM)	1500	610	300 - 610
Corrosivity (LI) <sup>2</sup>	0	0.45	-0.43 - 0.45
Hardness, Total (AS CAC03) (ppm)	400	170	63 - 170
Magnesium (ppm)	150	25	3.1 - 25
Metolachlor (ppb)	N/A	0.90	<.25 - .90
Nickel (ppb)	100	0.0014	0 - 0.0014
pH (pH)	8.5	8.6	8.5 - 8.6
Phosphorus (ppb)	5000	200	140 - 200
Potassium (ppm)	100	5.9	5.9
Silica (ppm)	50	18	8.6 - 18
Sodium (ppm)	100	55	33 - 55
Solids, Total Dissolved (ppm)	500	330	162 - 330
Sulfate (ppm)	250	160	53 - 160
Zinc	5	0.005	0 - 0.005

#### REMARKS

<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 monthly removal ratio greater than 1.0. TOC has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes and haloacetic acids. 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.



The Water Department 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](http://www.lvnwater.com) for details.

## Basic Information

This report is a summary of the quality of water provided to customers during 2010. It is a record reflecting the hard work and dedication of the five elected member of the Waterworks Board and the 34 Water Department 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 Water Department 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 Mrs. Joanne Runyon (Chair), Mr. Michael Bogner, Dr. Paul Kittle, Mr. Howard C. Kirk III, and Mr. Thomas Koch.

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.

A copy of the report is being mailed to each Water Department customer. Free copies of the report are available at the Water Department and on our website at [www.lvnwater.com](http://www.lvnwater.com).

If you have any questions or want more information about this report, please contact John Kaufman or Sue Barnes at the Water Department, 913-682-1513.



### 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 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 byproducts 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 in 2010.

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 for the Safe Drinking Water Hotline 1-800-426-4791 or on-line at <http://epa.gov/safewater/lead>.

## Sources of Water

Your drinking water comes from two sources — surface water and ground water. Surface water is diverted directly from the Missouri River and treated at the North Water Plant. Treatment includes filtering, lime softening, fluoridation, and disinfection.

Ground water is pumped from nine shallow wells constructed in the Missouri River alluvial aquifer southeast of Leavenworth. This water is treated at the South Water Plant. Treatment includes filtering, lime softening, fluoridation, and disinfection.

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 Water Department treatment plants. Frequent sampling of the treated water is also done at numerous customer locations throughout the city water-service area.

New radio-read meters improve accuracy and reduce costs.



### New Water Mains to Replace Old Pipe

In 2011, the Water Department will replace about 4,000 feet of old and deteriorated cast iron water mains in the City of Leavenworth. New fire hydrants and isolation valves will also be installed. Over the next three years, about 3.4 miles of deteriorated water mains will be replaced as part of the Water Department's infrastructure replacement program.



Old cast iron water mains on Delaware from 13th to 16th, on Klemp from Kansas to Quincy, and on 16th from Santa Fe to Thornton will be replaced with new fusible and durable high-density polyethylene (HDPE) pipe beginning in May 2011. The new HDPE pipe will be installed by horizontal directional drilling, which minimizes trenching and surface disturbance.



## WATER QUALITY DATA — Table 2

Regulated (Primary) Contaminants (Units)	MCL	MCLG	Highest Detected Level	Range of Detected Level	Typical Sources of Contaminant
<b>Inorganic Contaminants</b>					
Barium (ppm)	2	2	0.08	0.027 - 0.08	discharge of drilling wastes and metal refineries; erosion of natural deposits
Chloramines (ppm)	MRDL=4	MRDLG= 4	2.98 <sup>1</sup>	2.63 - 3.06 <sup>2</sup>	disinfectant, water additive used to control microbes
Copper (ppm) <sup>3</sup>	AL = 1.3	1.3	0.13	.0023 - 0.13	corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Fluoride (ppm)	4	4	1.0	0.45 - 1.0	erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer & aluminum factories
Lead (ppb) <sup>4</sup>	AL = 15	0	21	0 - 21	corrosion of household plumbing systems; erosion of natural deposits
Selenium (ppb)	50	50	3.8	<1.0 - 3.8	erosion of natural deposits
Nitrate	10	10	2.6	0.23 - 2.6	runoff from fertilizer use, leaching from septic tanks, sewage, erosion of natural deposits
<b>Radionuclides-Remark<sup>5</sup></b>					
Gross Alpha, (pCi/l)	15	0	<3	<3	erosion of natural deposits
Radium, Combined 226 (pCi/l)	5	0	<1.0	<1.0	erosion of natural deposits
Radium - 228 (pCi/l)	5	0	<1.0	<1.0	erosion of natural deposits
Uranium Mass (ug/L)	30	0	<1.0	<1.0	erosion of natural deposits
<b>Synthetic Organic Contaminants Including Pesticides and Herbicides</b>					
Arsenic (ppb)	10	0	1.3	<1.0 - 1.3	erosion of natural deposits
Atrazine (ppb)	3	3	3.3	<0.30 - 3.3	runoff from herbicides used on row crops. Some 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.
<b>Volatile Organic Contaminates</b>					
Total Haloacetic Acids (ppb)	60	n/a	25.8 <sup>6</sup>	7.4 - 53 <sup>6</sup>	byproduct of drinking water disinfection. Some people who drink water containing haloacetic acids in excess of MCL over many years may have an increased risk of getting cancer.
Total Trihalomethanes (ppb)	80	n/a	39.77 <sup>6</sup>	14 - 79 <sup>6</sup>	byproduct of drinking water disinfection. 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 systems, and may have an increased risk of getting cancer.
<b>Microbiological Contaminants</b>					
Total Coliform Bacteria (% of monthly samples)	No more than 5% of monthly samples can be positive	0	0 <sup>7</sup>	0	naturally present in the environment
<b>Turbidity</b>					
Turbidity (NTU)	TT= 1 max TT≤0.3 95% of the time or more	n/a	0.084 <sup>8</sup>	0.02 - 0.084	soil runoff

<sup>1</sup> This compliance value is based on the highest "running annual average" of continuous MRDL measurements collected throughout the year. The "running annual average" is the average of the quarterly averages for the most recent four quarters.

<sup>2</sup> These compliance figures are the lowest and highest monthly MRDL averages.

<sup>3</sup> 30 Sites were tested for copper in July 2008. The 90th percentile level was 0.034 ppm. Since we have never exceeded the Action Level (AL) of 1.3 ppm, we are not required to test again until July 2011.

<sup>4</sup> 30 sites were tested for lead in July 2008. One sample detected a concentration of 21 ppb. The sample site was retested and found to be below the MCL. No lead was detected at the 90th percentile level. Since the Action Level (AL) of 15 was not exceeded, the Water Department is not required to test for lead again until July 2011.

<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> These figures are the lowest and highest results for individual samples during 2010

<sup>7</sup> 100% of samples tested negative every month.

<sup>8</sup> 100% of samples measured less than (≤) 0.3 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.

Today, the Leavenworth Water Department 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.