2018

Welcome to the City of El Dorado's 2017 Water Quality Report, our annual report card describing how your drinking water measures up against Environmental Protection Agency (EPA) and Kansas safety standards. El Dorado's water supply, treatment, and delivery professionals are committed to providing you with drinking water that is safe, pleasing, dependable and economical. We believe that informed customers are our best allies, and we are dedicated to giving you the information you need to make knowledgeable decisions about your drinking water. In addition to summarizing water quality data collected from January 1 to December 31, 2017, this brochure was developed to inform consumers about their drinking water source and quality; regulations that protect health; where customers can go for more information; programs that protect the high quality of our water supply sources; and treatment processes that assure our drinking water meets or surpasses all Federal and State standards.

Zebra Mussels

The Zebra Mussel is a small, bi-valve mollusk native to Eastern Europe and Western Asia. It was introduced accidentally to North America between 1985 and 1986 in the ballast water of commercial ships arriving from Europe. Biologists believe this highly invasive exotic species has spread from the Great Lakes into our major river systems primarily through inadvertent transport by commercial barge and recreational vessels.

In August 2003, Zebra Mussels were found in El Dorado Lake. There has been no change in water quality in the lake or treated drinking water as a result of Zebra Mussels. Because of their ability to filter large quantities of water, Zebra Mussels may eventually increase the clarity of the lake, but we do not anticipate any water quality problems.

The Zebra Mussel population continues to remain very low in El Dorado Lake. During the summer of 2007, a strange phenomenon occurred resulting in a huge die-off of Zebra Mussels. The die-off occurred in all age and size classes of Zebra Mussels, from the very small developing mussels to full-size adults. Water treatment personnel discovered significant drops in hardness and alkalinity had occurred in the spring and summer of 2007, due to heavy rains. Rainwater is naturally soft and at a lower pH, and with the lake already at record low levels after the winter of 2006, spring rains and summer flooding dramatically reduced hardness, something we later learned Zebra Mussels cannot tolerate. The Zebra Mussel population continues to remain very low, and therefore we have postponed the design of any improvements to deal with the problems they may create. We will continue to monitor Zebra Mussels very closely and proceed with alternative treatment techniques if necessary.

What's *Not* in El Dorado's water?

In addition to the contaminants reported in the table, El Dorado tested its drinking water for the substances listed below during 2017. No detectable levels of these substances were present.

Metals
Antimony
Beryllium
Cadmium
Chromium
Thallium
Silver

Pesticides & PCB's
Alachlor
Aldrin
Atrazine
Butachlor
Carbofuran (Furadan)
Chlordane
Dieldrin
Endrin
gamma-BHC (Lindane)
Heptachlor
Heptachlor Epoxide
Hexachlorobenzene
Hexachlorocyclopentadiene
Methoxychlor
Metolachlor (Dual)
Metribuzin (Sencor)
PCB-1016
PCB-1221
PCB-1232
PCB-1242
PCB-1248
PCB-1254
PCB-1260
Propachlor (Ramrod)
Simazine
Toxaphene

Microbial Contaminants
Coliform bacteria
E. Coli
Cryptosporidium
Giardia

Regulated Volatile Organic Compounds-VOCs
1,1-Dichloroethylene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
1,2-Dibromo-3-chloropropane
1,2-Dichlorobenzene
1,2-Dichlorethane
1,2-Dichloropropane
1,2,4-Trichlorobenzene
1,4-Dichlorobenzene
Benzene
Chlorobenzene
cis 1,2-Dichloroethylene
Ethylbenzene
Ethylene Dibromide (EDB)
Methyl tert-butyl ether
Styrene
Tetrachloroethylene (PCE)
Tetrachloromethane
Toluene
Trans 1,2-Dichloroethylene
Trichloroethylene (TCE)
Vinyl Chloride
Xylenes (Total)

Cryptosporidium and Giardia are protozoan parasites that occur in all natural waters such as lakes, rivers and streams. They originate from animal waste in the watershed. The City of El Dorado facilities provide multiple barriers for removal of Cryptosporidium and Giardia including clarification, disinfection, filtration and the management of filtration procedures to ensure the lowest turbidity possible. Ingesting Cryptosporidium oocysts can cause an illness called Cryptosporidiosis. Symptoms of this illness include diarrhea, abdominal cramps, nausea, vomiting, fever and headache. For individuals with healthy immune systems, the symptoms usually disappear within a few weeks. However, for those individuals with weakened immune systems, the illness can become serious and life threatening. Current regulations require a treatment technique for Giardia removal and inactivation under the Surface Water Treatment Rule (SWTR). The City of El Dorado Water Treatment Plant strictly follows these guidelines.

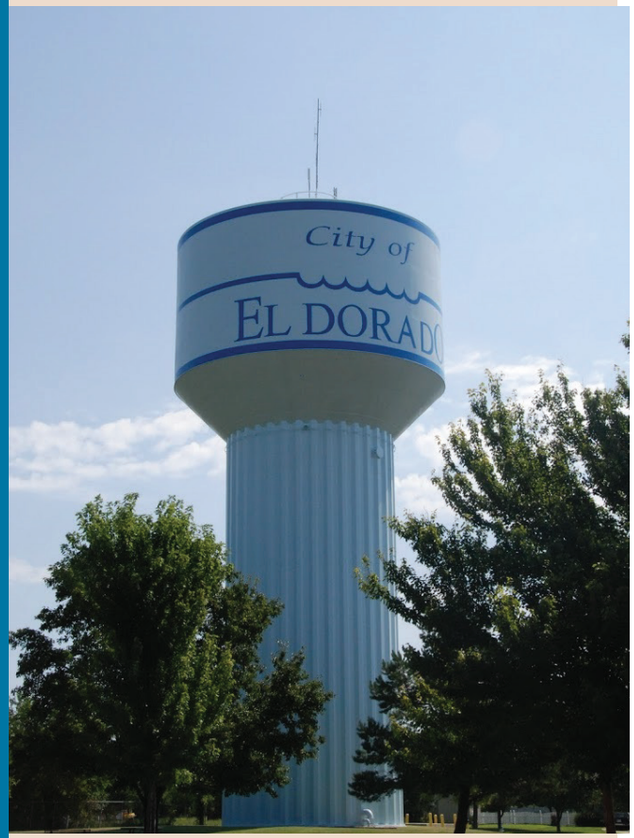
Fluoridation of Drinking Water On January 7, 2011 the US Enviromental Protection Agency (EPA) and the Health and Human Services Agency (HHS) recommended an adjustment in the recommended levels of fluoride in drinking water from previous optimum range of 0.7 mg/L to 1.2 mg/L to a set optimal level of 0.7 mg/L, KDHE recommends water systems fluoridate their water at the lower target level of 0.7 mg/L, as suggested by EPA and HHS.

The adjustment reflects new research that suggests children receive fluoride from many sources (toothpaste, processed foods, etc.), so less fluoride in the water is necessary to achieve the oral health benefits. These new recommendations reflect the fact that optimally fluoridated water continues to be a safe and cost-effective community strategy to reduce dental disease. Evidence has indicated that communities that fluoridate their water have been able to reduce tooth decay in their citizens by 20-40%. The KDHE continues to support community water fluoridation as a safe and effective public health measure to reduce dental disease among its citizens.

For more information about fluoride and its effect on oral health, please refer to www.cdc.gov/fluoridation.

EL DORADO

THE FINE ART OF LIVING WELL



2018 ANNUAL
DRINKING WATER QUALITY REPORT

See this report and other information about your water at:

ELDOKS.COM

Where does our water come from?
The City of El Dorado diverts water from El Dorado Reservoir. El Dorado Reservoir is an 8400-acre lake with a storage capacity of over 50 billion gallons. This amount of storage should allow the City to draw 22 million gallons per day in what is classified as a 50-year drought. Water from the lake is gravity fed through large mains to the water treatment plant.

Why does El Dorado have great tasting water?
To have great tasting water it certainly helps to have great source water. The drainage basin above El Dorado is mainly grasslands and rainwater runoff comprises most of the water entering the Lake. Because of these factors, the water is relatively soft (low mineral content) and the clarity is also very good. Annual turbidity averages fluctuate with rainfall, but usually are below 20 NTU's and sometimes as low as 2.5 NTU's. Some Kansas cities deal with turbidities in river water exceeding 1000 NTU's.

What causes taste and odor problems in Surface Water?
Geosmin, an earthy/musty tasting compound, is produced as a metabolic by-product of some forms of algae in the water. Algae grow faster in warmer weather and therefore, Geosmin can be produced in the early summer months until the Fall. The presence of Geosmin in drinking water does not represent a health problem, but is an aesthetic concern. Unusual wind conditions, warm temperatures and the lack of precipitation can cause algae blooms in the lake. We are able to prevent most taste and odor problems from reaching the customer by watching for these episodes and treating accordingly.

How is our water treated?
Although El Dorado's source water is of very high quality, extensive treatment is still needed to meet strict quality standards for drinking water. First, raw water is disinfected with chloramines to inactivate bacteria and viruses and to help prevent harmful organisms from growing in the distribution system. Chemicals are then added to remove particles, microorganisms and other contaminants. Another aide in achieving great tasting water is the addition of Sodium Permanganate ($NaMnO_4$). $NaMnO_4$ oxidizes many of the impurities associated with any surface water. After oxidizing these taste and odor compounds, the $NaMnO_4$ is removed in large settling basins and filter beds along with remaining particles, yielding clean, fresh water. Fluoride is added at a dosage of 0.50 ppm, to help prevent tooth decay. El Dorado Certified Water Treatment Operators monitor the treatment process continuously to ensure consistent quality and safety.

What is Atrazine? How does it get into water? How do you know if herbicides are a problem in our drinking water?
Atrazine is a widely used herbicide used to control weeds in the production of corn and sorghum. Atrazine and other herbicides are applied before and after planting, and are also used in urban areas to control weeds along railways. The maximum contaminant level (MCL) for Atrazine in drinking water is 3 Micrograms/Liter (ug/L). Samples collected over the last year were below detectable limits, which is 0.3 ug/L for Atrazine.

Drinking water contaminant sources and health information
Contaminants may be introduced into any drinking water before and after treatment, and may be natural or man-made.

Source Water. 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 land surface 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 untreated source water include:

• Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agriculture, livestock operations, and wildlife.

• Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

• Pesticides and herbicides, which may come from sources such as agriculture, urban stormwater runoff, and residential uses.

• Organic chemical contaminants, including synthetic and volatile organic chemicals are by-products of industrial processes, petroleum production, gas stations, urban stormwater runoff, and septic systems.

• Radioactive contaminants, which can be naturally-occurring or result from oil and gas production and mining activities.

In order to insure that the tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. These limits, called Maximum Contaminant Levels (MCLs), are set at very strict levels, as close as feasible to the level at which there are no known health risks for the general population. The Regulated Contaminants table in this report compares the highest contaminant levels detected in El Dorado's water with the MCLs.

Special Health Concerns
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 drinking water from their health care providers. For information about contaminants and potential health effects, or to receive a copy of the U.S. Environmental Protection Agency (EPA) and the U.S. Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium, Giardia, and microbiological contaminants, call the EPA Safe Drinking Water Hotline at 1-800-426-4791.

Source Water Protection — El Dorado Lake Ecosystem Restoration Project The City of El Dorado, Corps of Engineers, Kansas Department of Wildlife, Parks, and Tourism, Kansas Water Office and the Butler County Conservation District have joined forces to put together a plan to protect and extend the life of El Dorado Lake. The useful life span of a lake is largely dependent upon the rate in which it fills with sediment. Sediment basically comes from two sources. Rainfall runoff carries soil particles from cropland, rangeland and from the banks of creeks, into the lake where it settles on the bottom. The other source is from wave action caused by strong Kansas winds. Waves pound the shorelines, causing the banks to erode and slough off into the lake. Best Management Practices (BMP's) can be implemented on farms and ranches at little or no cost to the landowner. BMP's are any practices that increase the water quality of runoff into the tributaries of El Dorado Lake, such as terracing, grass buffer strips, fencing cattle out of timber, providing alternative water sources such as windmills, etc. BMP's are a benefit to the landowner, because it allows them to retain valuable soil on their operation.

Help Keep Our Streams Clean
The City of El Dorado is concerned about water quality in Kansas streams and encourages everyone to do their part to reduce the amount of pollution entering stormwater drains. Remember, anything you dump on your driveway, curb or street, drains directly into the Walnut River.

WATER QUALITY DATA

During 2017, El Dorado's Water Treatment staff and Kansas Department of Health and Environment Laboratory performed more than 30,000 tests for about 85 different contaminants. The table below lists all of the drinking water contaminants tested for during the 2017 calendar year.

What does this table mean?

Last year, as in years past, your tap water met or surpassed all EPA and Kansas health standards for drinking water.

Terms, Abbreviations, and Symbols Used in This Report:

Some of the terms, abbreviations and symbols contained in this report are unique to the water industry and may not be familiar to all consumers. Terms used in the table are explained below:

ppm – parts per million, or milligrams per liter (mg/L)

ppb – parts per billion, or micrograms per liter (ug/L)

picoCuries per liter (pCi/L) – a picoCurie is a measure of radioactivity in water and equals one trillionth of a Curie.

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

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

Maximum Contaminant Level Goal – The "Goal" (MCLG) is 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.

Maximum Contaminant Level (MCL) – The 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.

Secondary Maximum Contaminant Level (SMCL) – SMCLs are non-enforceable, recommended limits for substances that affect the taste, odor, color, or other aesthetic qualities of drinking water, rather than posing a health risk.

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 health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

NTU/Turbidity – Turbidity is a measure of the cloudiness of the water, which is caused by particles of matter. Organic and inorganic matter, silt, algae or other tiny organisms can contribute to the level of turbidity. Turbidity is measured with an instrument called a turbidimeter, which shines a beam of light through water, measuring the amount of light that is scattered by suspended material. It is measured in "Nephelometric Turbidity Units," or NTUs. Although turbidity has no health effects, it is regulated because it serves as an indicator of treatment plant performance.

90th Percentile – In a ranking of the 10 samples with the highest level of contaminant, the ninth highest sample is the value that represents the 90th percentile.

Waiver – State permission not to test for a specific contaminant.

RAA – Running Annual Average

2017 Secondary Constituents

Most of the questions we receive from our customers deal with characteristics or substances that are not regulated in drinking water. These properties affect the way we use water, or the way it looks, tastes, or smells. "Secondary" constituents include non-toxic metals and salts and properties that may impact the treatment and distribution system, or affect public acceptance of drinking water. There are no MCLs for these materials; instead, the EPA has established "Secondary Maximum Contaminant Levels" (SMCLs), which are non-enforceable recommended limits based on qualities such as taste, odor, and appearance. Some secondary substances, such as hardness and calcium, affect how much soap we need to use, or contribute to the formation of scale in plumbing or films on surfaces.

Constituent	Units	Recommended Limit (SMCL)	Range in Distribution System
Secondary Constituents		**SMCL**	**(Min.-Max.)**
pH	Std. Units	8.5	7.6-8.5
Sodium	ppm	100	7-12
Aluminum	ppm	.05	.056-.090
Sulfate	ppm	250	4-12
Total Phosphorus (P)	ppm	5	<.045-.15
Silica	ppm	50	1.2-8.1
Zinc	ppm	5	.005-.025
Chloride	ppm	250	7.5-12
Total Dissolved Solids	ppm	500	120-160
Alkalinity (Total)	ppm	300	90-140
Hardness, Total (as CaCO3)	ppm	<50 = soft, >150 = hard	90-130
	grains per gallon	<3 = soft, >8.8 = hard	7.6 - 5.3
Calcium	ppm	200	25-41
Magnesium	ppm	150	4.0-7.0
Potassium	ppm	100	2.0-4.0
Specific Conductivity	umhos/cm	1500	210-310
Iron	ppm	.3	<.010
Manganese	ppm	.05	<.001
Nickel	ppm	.1	<.001

Backflow Prevention Program

In accordance with State regulations, the Public Utilities Department has implemented a Cross-Connection Backflow Prevention Program to help keep your water safe. This program requires backflow prevention assemblies on any connection to City water where there is a potential for contamination, including but not limited to irrigation systems, fire sprinklers, soft drink machines or boilers. You can help protect our water by making sure your outside faucets are protected with an atmospheric vacuum breaker. In most homes built after 1990, the outside faucets have built-in atmospheric vacuum breakers. But for those without, we have a limited supply of atmospheric vacuum breakers available free of charge at the Water Treatment Plant. Please contact us for more information at 322-4443.

Lead & Copper

The interaction of treated water with water mains and household plumbing may contribute other substances, such as lead and copper, to consumers' tap water. In 2015, El Dorado completed extensive lead & copper sampling in our distribution system (at customer taps), and all results were well below MCL's (see table for results).

More About Lead

Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible the lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. Always use cold water to prepare food or beverages; hot water can pick up lead or other metals from your plumbing or hot water tank. Flushing the tap briefly is also a good way to eliminate lead. In all cases, our drinking water tests have shown that flushing the tap for 30 seconds reduces any lead that may be present far below any level of concern. Additional information is available from the EPA Safe Drinking Water Hotline at 1-800-426-4791.

Need More Information?

Water quality and safety are increasingly complex and the information in this brief summary may not answer all of your questions. For more information about this report or other water quality issues or concerns, please call Kurt Bookout at (316) 322-4980 or Brett Perry at 322-4441.

En Español

Este informe contiene informacion muy importante sobre su agua beber. Traduzcalo o hable con alguien que lo entienda bien.

Free Copies of This Report

Extra copies can be picked up at City Hall.

REGULATED CONTAMINANTS REPORT: WHAT'S IN EL DORADO'S WATER?

Contaminant	CCR Units	EPA Goal (MCLG)	Highest Level Allowed (MCL)	Level Detected for Compliance	MCL Violation	Sample Date/ Frequency	Likely Source of Substances
Regulated leaving the Treatment Facility							
Turbidity	NTU Turbidity of Water	N/A	TT=95% of monthly samples must be less than 0.5 NTU	0.15 100% of samples were in compliance. Range .029-.075	NO	Every 4 hours Continuous	Soil run-off, sediments and other particles present in untreated surface water.
Barium	ppm	2	2	0.076	NO	YEARLY	Erosion of natural deposits. Discharge of drilling wastes.
Fluoride	ppm	4	4	.41	NO	QUARTERLY	Water additive to promote strong teeth; erosion of natural deposits.
Arsenic	ppb	N/A	10	1.2	NO	YEARLY	Erosion of natural deposits; run off from orchards.
Mercury (Inorganic)	ppb	2	2	<0.5	NO	YEARLY	Geological and manufacturing of paint, paper, & fungicides.
Selenium	ppb	50	50	<1.0	NO	YEARLY	Discharge from petroleum or metal refineries; erosion of natural deposits.
Nitrate, as Nitrogen	ppm	10	10	.40	NO	YEARLY	Runoff from fertilizer use; leaching from septic tanks; sewage; erosion of natural deposits.
Benzene	ppb	0	5	<0.5	NO	Study every 3 years 2017	Discharge from factories; leaching from gas storage tanks and landfills.
Chromium	ppb	100	100	<1.1	NO	YEARLY	Discharge from steel and pulp mills.
Ethylbenzene	ppb	700	700	<0.5	NO	Study every 3 years 2017	Discharge from petroleum refineries.
Styrene	ppb	100	100	<0.5	NO	Study every 3 years 2017	Discharge from rubber and plastic factories; leaching from landfills.
Gross-Alpha emitters	pCi/L	0	15	<3.0	NO	Study every 3 years 2017	Erosion of natural deposits.
Combined Radium 226 & 228	pCi/L	0	5	0.9	NO	Study every 3 years 2017	Decay of natural and man-made deposits.
Xylenes	ppb	10	10	<1.0	NO	Study every 3 years 2017	Discharge from petroleum factories, discharge from chemical factories.
Toluene	ppb	1	1	<0.5	NO	Study every 3 years 2017	Discharge from petroleum factories.
Regulated in the Distribution System[1]							
Total Trihalomethanes (TTHM's)	ppb	0	80	17.80	NO	Quarterly/RAA	By product of Chlorine disinfection of drinking water.
Haloacetic Acids (HAA5's)	ppb	0	60	19.38	NO	Quarterly/RAA	
TOC (Total Organic Carbon)	ppm	N/A	TT Removal Ratio >1*	1.00	NO	RAA 2017	Naturally present in the environment.
Total Chlorine (chloramine)	ppm	4.0 [MRDLG]	4.0 [MRDL]	3.148	NO	15 per month	Drinking water disinfectant.
Regulated at the Consumer's Tap[2]							
Data from 2015 Lead and Copper Study Next study scheduled for summer 2018			Action Level (AL)	90th percentile value	MCL Violation?	Sample Date/ Frequency	Likely Source of Substances.
Lead	ppb	0	AL=15	2.6	NO	Aug - Sept. 2015	Corrosion of household plumbing.
Copper	ppm	0	AL=1.3	0.250	NO	Study every 3 years	

*(Footnote) TOC compliance is achieved by using alternative compliance criteria #3, which allows El Dorado to record a value of 1.0. Compliance criteria #3 is running annual average THM's & HAA5's below 40 ppb & 30 ppb respectively.

1. TTHM's, HAA5's and TOC's are regulated as a running annual average, by quarter, not a single value.
2. The Action Levels for Lead and Copper are set at the 90th percentile of all samples collected; 90% of the samples must be below the Action Level.