

2017 Consumer Confidence Report for Broken Arrow, Verdigris WTP, OK1021508

Is my water safe?

We're very pleased to provide you our 2017 Annual Water Quality Report (Consumer Confidence Report) as required by the Safe Drinking Water Act (SDWA). This report covers all sampling and testing performed by the City of Broken Arrow and the other water provider between January 1 and December 31, 2017. This report also is designed to provide you details about where your water comes from, what it contains, and how it compares to standards set by regulatory agencies. The information presented is a snapshot of the water quality during the reporting period. We believe in providing you the information as an ongoing effort to educate consumers about the sources of water, quality, and delivery of your drinking water and to keep you informed of the needed improvements to the city's water distribution system infrastructure.

The City's top priority is to provide clean and good tasting water to its customers. Broken Arrow water is safe to drink and free of bacteria and harmful substances. Water treatment and distribution system operators continuously monitor the water throughout the treatment and distribution system. When the water leaves the treatment plant and flows towards Broken Arrow homes and businesses, it not only meets, but surpasses all federal and state requirements for purity. We collect and analyze thousands of samples each year to ensure the water supplied to homes and businesses is of the highest quality. This report is a summary of the test results from samples taken during 2017. The Environmental Protection Agency (EPA) limits how much of a harmful substance is in the public water supply after water treatment.

Our goal is to provide you a safe and dependable supply of drinking water that meets Federal and State requirements. Over the years, we have dedicated ourselves to distributing drinking water that meets all state and federal standards. As new challenges to drinking water emerge, we remain vigilant in meeting the goals of source water protection, water conservation and community education while continuing to serve the needs of all our water users. Please be assured that we are always available to assist you should you have any questions or concerns about your water.

How to Contact Us:

*For water quality, taste and concerns

-During business hours (Monday - Friday) 918-259-8373

-After business hours, weekends and holidays 918-259-8400

*For billing questions: Customer Service (Monday - Friday) 918-259-7000 ext. 8409

*This report can be found on the internet at www.brokenarrowok.gov/2017waterreport

Do I need to take special precautions?

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. EPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Water Drinking Hotline (800-426-4791).

Where does my water come from?

Our primary water supply is the City of Broken Arrow owned and operated Verdigris water treatment plant that came on line in April 2014. The \$62 million state of the art microfiltration plant is now the primary supplier of treated water. The water quality data for the Broken Arrow Verdigris plant is presented in Table I. Our secondary water source is the City of Tulsa. Water quality data for the City of Tulsa is presented in Table II. Water supplied by both sources are introduced into the same distribution system and mixed together.

Why are there contaminants in my drinking water?

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 effects can be obtained by calling the Environmental Protection Agency's (EPA) Safe Drinking Water Hotline (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:

microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural 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 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; and radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities. In order to ensure that tap water is safe to drink, EPA

prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

How can I get involved?

The Broken Arrow Municipal Authority (BAMA) is responsible for the operations of the City's water system. The Utilities Department is charged with the day to day operations of the water utility. If you want to learn more about the Authority and/or the water utility, you may attend any of the regularly scheduled meetings at City Hall (220 South 1st Street) on the first and third Tuesday of each month at 6:30 p.m. Additional information about the City Council and BAMA meetings can be found on the City web page at www.brokenarrowok.gov/.

Description of Water Treatment Process

Your water is treated in a "treatment train" (a series of processes applied in a sequence) that includes coagulation, flocculation, sedimentation, filtration, and disinfection. Coagulation removes dirt and other particles suspended in the source water by adding chemicals (coagulants) to form tiny sticky particles called "floc," which attract the dirt particles. Flocculation (the formation of larger flocs from smaller flocs) is achieved using gentle, constant mixing. The heavy particles settle naturally out of the water in a sedimentation basin. The clear water then moves to the filtration process where the water passes through membrane filters that remove even smaller particles. A small amount of chlorine or other disinfection method is used to kill bacteria and other microorganisms (viruses, cysts, etc.) that may be in the water before water is stored and distributed to homes and businesses in the community.

Water Conservation Tips

Did you know that the average U.S. household uses approximately 400 gallons of water per day or 100 gallons per person per day? Luckily, there are many low-cost and no-cost ways to conserve water. Small changes can make a big difference - try one today and soon it will become second nature.

- Take short showers - a 5 minute shower uses 4 to 5 gallons of water compared to up to 50 gallons for a bath.
- Shut off water while brushing your teeth, washing your hair and shaving and save up to 500 gallons a month.
- Use a water-efficient showerhead. They're inexpensive, easy to install, and can save you up to 750 gallons a month.

- Run your clothes washer and dishwasher only when they are full. You can save up to 1,000 gallons a month.
- Water plants only when necessary.
- Fix leaky toilets and faucets. Faucet washers are inexpensive and take only a few minutes to replace. To check your toilet for a leak, place a few drops of food coloring in the tank and wait. If it seeps into the toilet bowl without flushing, you have a leak. Fixing it or replacing it with a new, more efficient model can save up to 1,000 gallons a month.
- Adjust sprinklers so only your lawn is watered. Apply water only as fast as the soil can absorb it and during the cooler parts of the day to reduce evaporation.
- Teach your kids about water conservation to ensure a future generation that uses water wisely. Make it a family effort to reduce next month's water bill!
- Visit www.epa.gov/watersense for more information.

Source Water Protection Tips

Protection of drinking water is everyone's responsibility. You can help protect your community's drinking water source in several ways:

- Eliminate excess use of lawn and garden fertilizers and pesticides - they contain hazardous chemicals that can reach your drinking water source.
- Pick up after your pets.
- If you have your own septic system, properly maintain your system to reduce leaching to water sources or consider connecting to a public water system.
- Dispose of chemicals properly; take used motor oil to a recycling center.
- Volunteer in your community. Find a watershed or wellhead protection organization in your community and volunteer to help. If there are no active groups, consider starting one. Use EPA's Adopt Your Watershed to locate groups in your community, or visit the Watershed Information Network's How to Start a Watershed Team.
- Organize a storm drain stenciling project with your local government or water supplier. Stencil a message next to the street drain reminding people "Dump No Waste - Drains to River" or "Protect Your Water." Produce and distribute a flyer for households to remind residents that storm drains dump directly into your local water body.

Results of Cryptosporidium monitoring

Cryptosporidium is a microbial pathogen found in surface water throughout the U.S. Although filtration removes cryptosporidium, the most commonly-used filtration methods cannot guarantee 100 percent removal. Our monitoring indicates the presence of these organisms in our source water and/or finished water. Current test methods do not allow us to determine if the

organisms are dead or if they are capable of causing disease. Ingestion of cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immuno-compromised people are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water.

Additional Information for Lead

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. Verdigris River Water Treatment Plant 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 or at <http://www.epa.gov/safewater/lead>.

Water Quality Data Table I

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of contaminants in water provided by public water systems. The table below lists all of the drinking water contaminants that we detected during the calendar year of this report. Although many more contaminants were tested, only those substances listed below were found in your water. All sources of drinking water contain some naturally occurring contaminants. At low levels, these substances are generally not harmful in our drinking water. Removing all contaminants would be extremely expensive, and in most cases, would not provide increased protection of public health. A few naturally occurring minerals may actually improve the taste of drinking water and have nutritional value at low levels. Unless otherwise noted, the data presented in this table is from testing done in the calendar year of the report. The EPA or the State requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not vary significantly from year to year, or the system is not considered vulnerable to this type of contamination. As such, some of our data, though representative, may be more than one year old. In this table you will find terms and abbreviations that might not be familiar to you. To help you better understand these terms, we have provided the definitions below the table.

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Detect In Your Water	Range		Sample Date	Violation	Typical Source
				Low	High			
Disinfectants & Disinfection By-Products								
(There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants)								
Chlorine (as Cl ₂) (ppm)	4	4	3	0	3	2017	No	Water additive used to control microbes
Haloacetic Acids (HAA5) (ppb)	NA	60	25	17.33	35.4	2017	No	By-product of drinking water chlorination
TTHMs [Total Trihalomethanes] (ppb)	NA	80	43	30.97	50.95	2017	No	By-product of drinking water disinfection
Inorganic Contaminants								
Barium (ppm)	2	2	.041	NA	NA	2017	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Fluoride (ppm)	4	4	.4	.43	.43	2017	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Nitrate [measured as Nitrogen] (ppm)	10	10	1	NA	NA	2017	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Radioactive Contaminants								
Beta/photon emitters (mrem/yr)	0	4	2.11	NA	NA	2016	No	Decay of natural and man-made deposits.
Contaminants	MCLG	AL	Your Water	Sample Date	# Samples Exceeding AL	Exceeds AL	Typical Source	
Inorganic Contaminants								
Copper - action level at consumer taps (ppm)	1.3	1.3	.482	2016	0	No	Corrosion of household plumbing systems; Erosion of natural deposits	

Water Quality Data Table II

City of Tulsa 2017 Water Quality Data

Regulated Contaminants	Level Found	Minimum	Maximum	Maximum Contaminant Level (MCL*)	MCLG*	Violation	Likely Source of Contaminants
Turbidity Level found			0.21	TT*=less than 0.3 NTU 95 percent of the time	N/A	No	Soil runoff
Lowest monthly % meeting regs	100.0%						
Barium	0.043	0.032	0.053	2 parts per million	2	No	Naturally present in the environment, drilling waste, metal refineries
Total Chlorine	2.4	1.5	3.0	MRDL*=4.0 parts per million annual avg.	4	No	Water additive to control microbes
Chlorite	0.15	0.00	0.29	1 part per million	0.8	No	By-product of drinking water disinfection
Total Chromium***	0.14	0	0.28	100 parts per billion	100	No	Discharge from steel and pulp mills; erosion of natural deposits
Copper**	0.28 parts per million (ppm) at the 90th percentile; 0 sites above AL*			AL* = 1.3 ppm at 90th percentile	1.3	No	Corrosion of household plumbing systems, erosion of natural deposits, leaching from wood preservatives
Fluoride	0.68	0.00	0.85	4 parts per million	4	No	Erosion of natural deposits, water additive which promotes strong teeth, discharge from fertilizer and aluminum factories
Lead**	2.28 parts per billion (ppb) at the 90th percentile; 0 sites above AL*			AL* = 15 ppb at 90th percentile	0	No	Corrosion of household plumbing systems, erosion of natural deposits
Nitrate/Nitrite	0.12	0	0.27	Nitrate = 10 parts per million Nitrite = 1 part per million	10; 1	No	Naturally occurring, fertilizers, sewage treatment plants, erosion of natural deposits, leaching from septic tanks
Total Organic Carbon	1.9	0.9	2.8	Results are parts per million. MCL is TT*=percent removal	N/A	No	Naturally found in the environment
Haloacetic Acids	24	6	32	60 parts per billion LRAA*. Level found is highest LRAA; Minimum and Maximum are from individual readings	N/A	No	By-product of drinking water disinfection
Total Trihalomethanes	36	19	58	80 parts per billion LRAA*. Level found is highest LRAA; Minimum and Maximum are from individual readings	N/A	No	By-product of drinking water disinfection
Secondary Contaminants	Average	Minimum	Maximum	Recommended Level (Non-Health Based Standards)	Likely Source of Contaminants		
pH	N/A	7.5	8.6	Aesthetic level 6.5-8.5 s.u.*	Measure of acidity. Naturally present, adjusted in drinking water treatment		
Chloride	12	11	13	Aesthetic level 250 parts per million	Naturally present, brine from oilfield operations		
Sulfate	12	4.2	33	Aesthetic level 250 parts per million	Naturally present in the environment		
Other Required Monitoring	Average	Minimum	Maximum	Recommended Level	Likely Source of Contaminants		
Sodium	9	5.7	11	Results are parts per million. Standard has not been established.	Naturally occurring, urban stormwater runoff or discharge from sewage treatment plants		
Cryptosporidium	Second round of monitoring (over 48 month duration) was completed in 2017. At the time of this report, official reporting calculations have not been finalized by the Oklahoma Department of Environmental Quality. Detections were found in source water only and were not detected at levels of concern; Cryptosporidium is a microbial pathogen found in surface water throughout the U.S. Although filtration removes cryptosporidium, the most commonly-used filtration methods cannot guarantee 100 percent removal. Our monitoring indicates the presence of these organisms in our source water. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Ingestion of cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immuno-compromised people are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water.						

Unit Descriptions	
Term	Definition
ppm	ppm: parts per million, or milligrams per liter (mg/L)

Unit Descriptions	
ppb	ppb: parts per billion, or micrograms per liter ($\mu\text{g/L}$)
mrem/yr	mrem/yr: millirems per year (a measure of radiation absorbed by the body)
NA	NA: not applicable
ND	ND: Not detected
NR	NR: Monitoring not required, but recommended.

Important Drinking Water Definitions	
Term	Definition
MCLG	MCLG: Maximum Contaminant Level Goal: 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.
MCL	MCL: Maximum Contaminant Level: 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.
TT	TT: Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.
AL	AL: Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
Variances and Exemptions	Variances and Exemptions: State or EPA permission not to meet an MCL or a treatment technique under certain conditions.
MRDLG	MRDLG: Maximum residual disinfection level goal. 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.
MRDL	MRDL: Maximum residual disinfectant level. 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.
MNR	MNR: Monitored Not Regulated
MPL	MPL: State Assigned Maximum Permissible Level

For more information please contact:

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