



2019 City of Benicia Annual Water Quality Report

The City of Benicia (City) is proud to report that in 2019, your drinking water quality met or surpassed all federal and state drinking water health standards.

To ensure tap water is safe to drink, the United States Environmental Protection Agency (USEPA) and the State Water Resources Control Board (State Water Board) regulate the amount of certain contaminants in water provided by public water systems.

A primary purpose of this drinking water quality report is to provide our water customers detailed information regarding water sources and water quality provided to customers from January 1, 2019 through December 31, 2019.

This report and other information can be found on our website at www.ci.benicia.ca.us/publicworks

The City also encourages customers to participate in City Council meetings which take place every first and third Tuesday of the month at 7:00 p.m. in the Council Chambers located at 250 East L Street. Council Meetings provide an opportunity to participate in decisions that affect your drinking water.

Este informe contiene información es muy importante sobre su agua para beber. Favor de comunicarse City of Benicia 707-746-4394 para asistirlo en español.

If you have questions or comments regarding this report please contact Marc Bautista, Water Quality Supervisor, at 707-746-4295.

Should you have problems with your drinking water, please call the City's Water Treatment Plant at 707-746-4394.



WATER CONSERVATION

The City encourages its customers to use water wisely. Rebates are available for high efficiency washing machines, water-conserving products, and water efficient landscapes.

SOLANO COUNTY WATER AGENCY REBATES

- High-Efficiency Washing Machine \$100
- Turf Replacement up to \$2,000
- Smart Irrigation Controllers up to \$1,000
- Water Conserving Products up to \$50 each



For more information go to: www.scwa2.com/water-efficiency

JOIN THE BENICIA WATERSMART PROGRAM

The City of Benicia partnered with WaterSmart to offer customers FREE detailed information about your water use. It's part of our commitment to provide customers with the best tools to manage water use and your water bill.

If you haven't already signed up, get started today by logging on to the WaterSmart web portal at www.benicia.waterinsight.com. Questions can be emailed to winsight@ci.benicia.ca.us

SOURCES OF WATER AND CONTAMINANTS

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 include:

- Microbial contaminants, such as viruses and bacteria, that may come from wastewater treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and minerals, that 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, that 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, that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.
- Radioactive contaminants, that can be naturally occurring or be the result of oil and gas production, and mining activities.

Our water supply consist of three surface water sources: State Water Project water via the North Bay Aqueduct (NBA), Lake Berryessa transported through the Putah South Canal (PSC), and our local source, Lake Herman.

North Bay Aqueduct: The source water assessment of the NBA was completed in March 2003. NBA is considered most vulnerable to cattle and sheep grazing activities in the watershed associated with turbidity, total organic carbon, and coliform bacteria detected in the water supply. Approximately 85% of the watershed is grazing land or irrigated pastures.

Putah South Creek: The source water assessment of PSC was completed in May 2003. PSC is considered most vulnerable to the following activities: illegal activities/unauthorized dumping and herbicide application. PSC is also considered moderately vulnerable to the following activities: roads, storm drain discharges, and surface water recreation.

Lake Herman: The source water assessment of Lake Herman was completed in June 2002. Lake Herman is considered most vulnerable to the following activities: urban runoff, herbicides and pesticides used for outdoor irrigation, cattle grazing operations, and historic mining operations.

Even though the water sources are considered vulnerable to these activities all drinking water standards are met in the treated water delivered to customers.

SPECIAL INFORMATION

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.

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. USEPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and *Giardia* and other microbial contaminants are available online at www.cdc.gov/parasites/crypto/ and <https://www.cdc.gov/parasites/giardia/>

CRYPTOSPORIDIUM, GIARDIA, AND TURBIDITY EXPLAINED

Cryptosporidium and *Giardia* are naturally occurring microbial contaminants found in surface water throughout the world. The City's conventional water treatment plant provides a multi-barrier treatment process which includes filtration and disinfection with chlorine. Although filtration removes over 99.9% of these contaminants, even the most commonly used filtration methods cannot guarantee 100% removal. *Cryptosporidium* and *Giardia* must be ingested to cause disease, and may be spread through means other than drinking water. Ingestion of *Cryptosporidium* can cause Cryptosporidiosis and *Giardia* can cause Giardiasis; both are abdominal infections. Symptoms include nausea, diarrhea, and abdominal cramps.

Turbidity is a measure of the relative clarity of water. Turbidity is measured in NTUs or Nephelometric Turbidity Units. Turbidity is monitored as it is a good indicator of the effectiveness of our filtration systems. The regulatory limit for turbidity is less than 0.3 NTUs in 95% of the samples taken. The City's treated water turbidity was less than 0.1 NTUs for all of 2019. The filtered water is analyzed continuously and sampled by an operator at a minimum of every four hours throughout the day.

PRIMARY DRINKING WATER STANDARDS Table of Detected Contaminants for January 1, 2019 to December 31, 2019

CONTAMINANT	Untreated Source Waters				Treated Water				CONTAMINANT SOURCE			
	North Bay Aqueduct		Lake Berryessa		Lake Herman		Benicia's Treated Water			Maximum Contaminant Levels (MCL, MRDL or AL)	State or federal goal (PHG, MCLG, or MRDLG)	
	Range	Average	Range	Average	Range	Average	Range	Average				
Aluminum (ppm)	0.2 - 0.7	0.5		0.22		0.13		ND	1	0.6	Erosion of natural deposit; water treatment residue	
Arsenic (ppb)	2.7 - 3.8	3.3		3.2		7.9		ND	10	0.004	Erosion of natural deposit; orchard runoff	
Fluoride (ppm)	0 - 0.2	0.08		ND		0.27	0.1 - 1	0.8	2	1	Erosion; water treatment additive	
Total Chromium (ppb)	0 - 15	3.8		ND		ND		ND	50	100	Erosion, discharge from steel or pulp mills, chrome plating	
Hexavalent Chromium (ppb)		ND		ND		ND		ND	No MCL		Erosion of natural deposits, industrial discharges	
Cadmium (ppb)	0 - 2.3	0.6		ND		ND		ND	5	0.04	Erosion of natural deposits, industrial discharges	
Barium (ppm)	0 - 0.08	0.04		ND		ND		ND	1	2	Erosion of natural deposits, industrial discharges	
Lead (ppb)	5 - 23	28		ND		ND		ND	15	0.2	Corrosion, erosion, industrial discharges	
Coliform Bacteria	Present in Source Water							ND	5% Positive	0		Naturally present in the environment
Chlorination Byproducts									RAA			
Total Trihalomethane (ppb)		ND		NA		NA	38 - 73	59	80	NA	By-product of drinking water chlorination	
Total Haloacetic Acids (ppb)		NA		NA		NA	9.9 - 19	16	60	NA	By-product of drinking water chlorination	

SECONDARY CONSUMER ACCEPTANCE STANDARDS

CONTAMINANT	Range	Average	Range	Average	Range	Average	Range	Average	Notification Level	CONTAMINANT SOURCE
Aluminum (ppb)	220 - 650	480		220		130		ND	200	Erosion of natural deposits; water treatment residue
Color (units)	84 - 369	203		40		25		ND	15	Naturally occurring organic materials
Iron (ppb)	494 - 1,740	985		370		220		ND	300	Erosion; industrial waste
Manganese (ppb)	34 - 102	59		ND		22		ND	50	Leaching from natural deposits
Threshold Odor (units)	3 - 4	4		ND		1		1	3	Naturally occurring organic materials
Turbidity (NTU)	5 - 29	15		12		15	0.01 - 0.3	0.03	TT	Soil runoff
Total Dissolved Solids (ppm)	150 - 331	209		200		350	106 - 840	237	1,000	Runoff/leaching from natural deposits
Conductivity (µS/cm)	229 - 533	349		340		580	168 - 1,424	400	1,600	Substances that form ions in water
Chloride (ppm)	15 - 55	30		5.9		34		8.8	500	Runoff/leaching of natural deposits
Sulfate (ppm)	15 - 54	30		21		48		28	500	Runoff of natural deposits; industrial waste

ADDITIONAL CONSTITUENTS ANALYZED

CONTAMINANT	Range	Average	Range	Average	Range	Average	Range	Average	Notification Level
Boron (ppb)	140 - 230	165		NA		NA		NA	1,000
Vanadium (ppb)	4 - 6	5		NA		NA		NA	50
Calcium (mg/l)	13 - 27	19		18		36		11	
Free Chlorine Residual (ppm)		NA		NA		NA			4.0
Total Hardness (ppm)	85 - 137	107		164		190	59 - 198	112	
Magnesium (ppm)	10 - 26	16		29		24		7.5	
Potassium (ppm)	2 - 3	2.2		1.4		NA		NA	
Sodium (ppm)	18 - 61	33		10		54		27	
Alkalinity (ppm)	84 - 120	101		150		200	69 - 180	110	



Lead and Copper

In September 2018, the City tested 45 customers' homes for lead and copper. The City must test for lead and copper every three years. The next lead and copper test is scheduled for September 2021. The EPA's Action Levels (ALs) for lead are 15 ppb and 1,300 ppb for copper. Results from the 2018 monitoring are below.

Contaminant	Action Level	PHG	Benicia's Water 90th Percentile Value	Number of Sites Above the AL	Contaminant Source
Lead (ppb)	15	2	1.6	0	Corrosion of household plumbing systems
Copper (ppb)	1,300	300	81	0	

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 material and components associated with water distribution service lines and home plumbing. The City proactively adjusts the pH of the water to form a calcium carbonate protective liner between the pipe material and the water supply to prevent lead and copper from leaching into the drinking water supply.

As of January 1, 2016, all brass plumbing fixtures must be lead-free. The City replaced all lead service lines; the remaining potential sources of lead are from older brass fixtures or solder joints in private structures. According to the USEPA, homes build before 1986 are more likely to have lead pipes or fixtures and solder that contain lead. However, due to the City's effective corrosion control program, very little lead is leached from these two plumbing materials. If a customer believes it is at risk of lead exposure from drinking water, we encourage you to have your water tested by a certified laboratory.

Key Terms

AL	Regulatory action level. The concentration which, if exceeded, triggers treatment or other requirements that the water system must follow.	MRDLG	Maximum Residual Disinfectant Level Goal. The level of drinking water 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.
MCL	Maximum Contaminant Level. The highest level of a contaminant that is allowed in drinking water. Set by USEPA as close to the MCLGs as economically and technologically feasible.	NA	Not Applicable or not available
MCLG	Maximum Contaminant Level Goal. The level of a contaminant in drinking water below which there is no known or expected risk to health. Set by USEPA.	ND	Not Detected
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.	PDWS	Primary Drinking Water Standard. MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, water treatment requirements.
		PHG	Public health goal. The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California EPA.
		RAA	Running Annual Average

Units

ppb	Parts per billion or micrograms per liter (µg/L)
ppm	Parts per million or milligrams per liter (mg/L)
TON	Threshold Odor Number, a measure of odor in water
NTU	Nephelometric Turbidity Units, a measure of the relative clarity of water.
µS/cm	microsiemens per centimeter, a measure of electrical conductance