

City of Bern

- Water Quality Report (covers calendar year 2017)

This pamphlet lists water quality information for the City of Bern. It includes limited details on the source and quality parameters and how our water compares to Environmental Protection Agency (EPA) and state standards. It's important that customers be aware of the efforts that are made continually to improve their water system. To learn more, please attend any of the regularly scheduled meetings that are held on the second Tuesday of the month at 7 p.m. at City Hall. For more information, please contact Dallas Wood 785-294-1448.

The water source for Bern is from produced from the city's wells and some water is purchased from Nemaha RWD 1. A disinfectant is added to protect the water supply against microbial contaminants.

A message from EPA

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. The city treats water according to EPA's regulations. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

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

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 EPA's 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.

Contaminants that may be present in source water before treatment may include:

- **Microbial contaminants**, such as viruses and bacteria, which 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 and residential uses.

- **Radioactive contaminants**, which are naturally occurring.

- **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.

- **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. 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 thirty seconds to two 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>.

- **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. During 2017, the utility collected two samples per month and all were in compliance.

Water Quality Data

The table on the reverse side lists all the drinking water contaminants that we detected during the 2017 calendar year. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. Unless noted, the data presented in this table is from testing done January 1 - December 31, 2017. The state requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of the water quality, is more than one year old. The bottom line is that the water that is provided to you is safe.

Terms & Abbreviations

- **Maximum Contaminant Level Goal (MCLG)**: The "Goal" is 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 Contaminant Level (MCL)**: the "Maximum Allowed" MCL is the highest level of a contaminant allowed in drinking water. MCLs are set as close to the MCLGs as feasible using best available treatment technology.
- **Secondary Maximum Contaminant Level (SMCL)**: recommended level for a contaminant that is not regulated and has no MCL.
- **Action Level (AL)**: The concentration of a contaminant that, if exceeded, triggers treatment or other requirements.
- **Technique (TT)**: A required process intended to reduce levels of a contaminant in drinking water.
- **Maximum Residual Disinfectant Level (MRDL)**: 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.
- **Non-Detects (ND)**: Lab analysis indicates the contaminant not present.
- **Parts per Million (ppm) or milligrams per liter (mg/l)**
- **Parts per Billion (ppb) or micrograms per liter (µg/l)**
- **Picocuries per Liter (pCi/L)**: A measure of the radioactivity in water.
- **Millirems per Year (mrem/yr)**: Measure of radiation absorbed by the body.
- **Period Average (MPA)**: An average of sample results obtained during a defined time frame, common examples of monitoring periods are monthly, quarterly and yearly.
- **Nephelometric Turbidity Unit (NTU)**: A measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person. Turbidity is not regulated for ground water systems.
- **Running Annual Average (RAA)**: Average of sample results obtained over the most current 12 months and used to determine compliance with MCLs

Testing Results for the City of Bern

The City of Bern had no violations of drinking water regulations in 2017. Some of the test results shown below are more than one year old because of the monitoring schedule.

Regulated Contaminants	Collection Date	Highest Value	Range (low/high)	Unit	MCL	MCLG	Typical Source
ARSENIC	1/9/2017	5.5	4.9 - 5.5	ppb	10	0	Erosion of natural deposits
BARIUM	1/9/2017	0.14	0.085 - 0.14	ppm	2	2	Discharge from metal refineries
CHROMIUM	1/9/2017	6.8	6.1 - 6.8	ppb	100	100	Discharge from steel and pulp mills
FLUORIDE	1/9/2017	0.56	0.49 - 0.56	ppm	4	4	Natural deposits; Water additive which promotes strong teeth.
NITRATE	1/30/2017	6.1	3.6 - 6.1	ppm	10	10	Runoff from fertilizer use
SELENIUM	1/9/2017	2.1	1.6 - 2.1	ppb	50	50	Erosion of natural deposits

While the drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you should ask for advice from your health care provider.

Disinfection Byproducts	Monitoring Period	Highest RAA	Range (low/high)	Unit	MCL	MCLG	Typical Source
TTHM	2017 - 2019	4	3.7	ppb	80	0	By-product of drinking water chlorination

Lead and Copper	Monitoring Period	90 th Percentile	Range (low/high)	Unit	AL	Sites Over AL	Typical Source
COPPER, FREE	2015 - 2017	1.22	0.011 - 2.1	ppm	1.3	1	Corrosion of household plumbing
LEAD	2015 - 2017	1.9	1.1 - 2.7	ppb	15	0	Corrosion of household plumbing

Radiological Contaminants	Collection Date	Highest Value	Range (low/high)	Unit	MCL	MCLG	Typical Source
COMBINED RADIUM (-226 & -228)	1/9/2017	2.4	2.4	PCI/L	5	0	Erosion of natural deposits
COMBINED URANIUM	2/3/2015	19.4	19.4	µg/l	30	0	Erosion of natural deposits
GROSS ALPHA, EXCL. RADON & U	2/3/2015	6.3	6.3	pCi/l	15	0	Erosion of natural deposits.

Secondary Contaminants-	Collection Date	Highest Value	Range (low/high)	Unit	SMCL
ALKALINITY, TOTAL	1/9/2017	350	290 - 350	MG/L	300
CALCIUM	1/9/2017	92	72 - 92	MG/L	200
CHLORIDE	1/9/2017	22	18 - 22	MG/L	250
CONDUCTIVITY @ 25 C UMHOS/CM	1/9/2017	860	670 - 860	UMHO/CM	1500
CORROSIVITY	1/9/2017	0.65	0.38 - 0.65	LANG	0
GROSS URANIUM BY ACTIVITY	2/3/2015	13.8	13.8	PCI/L	
HARDNESS, TOTAL (AS CaCO3)	1/9/2017	370	290 - 370	MG/L	400
IRON	1/9/2017	0.64	0.6 - 0.64	MG/L	0.3
MAGNESIUM	1/9/2017	33	26 - 33	MG/L	150
MANGANESE	1/9/2017	0.35	0.15 - 0.35	MG/L	0.05
NICKEL	1/9/2017	0.0025	0.0025	MG/L	0.1
PH	1/9/2017	7.7	7.7	PH	8.5
PHOSPHORUS, TOTAL	1/9/2017	3.3	0.94 - 3.3	MG/L	5
POTASSIUM	1/9/2017	2.1	1.7 - 2.1	MG/L	100
SILICA	1/9/2017	29	28 - 29	MG/L	50
SODIUM	1/9/2017	54	35 - 54	MG/L	100
SULFATE	1/9/2017	83	38 - 83	MG/L	250
TDS	1/9/2017	400	400	MG/L	500
ZINC	1/9/2017	0.0053	0.0053	MG/L	5

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The City purchases water from Rural Water District No. 1, Nemaha County. That system's testing results are shown below. The district had no violations of drinking water regulations in 2017.

Regulated Contaminants	Collection Date	Water System	Highest Value	Range (low/high)	Unit	MCL	MCLG	Typical Source
ARSENIC	1/9/2017	NEMAHA CO RWD 1	3	1.7 - 3	ppb	10	0	Erosion of natural deposits
BARIUM	1/9/2017	NEMAHA CO RWD 1	0.058	0.047 - 0.058	ppm	2	2	Discharge from metal refineries
CHROMIUM	1/9/2017	NEMAHA CO RWD 1	6.7	5.3 - 6.7	ppb	100	100	Discharge from steel and pulp mills
FLUORIDE	1/9/2017	NEMAHA CO RWD 1	0.28	0.27 - 0.28	ppm	4	4	Natural deposits; Water additive which promotes strong teeth.
NITRATE	1/30/2017	NEMAHA CO RWD 1	6.3	1.5 - 6.3	ppm	10	10	Runoff from fertilizer use
SELENIUM	1/9/2017	NEMAHA CO RWD 1	9.8	3.4 - 9.8	ppb	50	50	Erosion of natural deposits

Secondary Contaminants	Collection Date	Water System	Highest Value	Range (low/high)	Unit	SMCL
ALKALINITY, TOTAL	1/9/2017	NEMAHA CO RWD 1	300	280 - 300	MG/L	300
CALCIUM	1/9/2017	NEMAHA CO RWD 1	190	170 - 190	MG/L	200
CHLORIDE	1/9/2017	NEMAHA CO RWD 1	32	9.3 - 32	MG/L	250
CONDUCTIVITY @ 25 C UMHOS/CM	1/9/2017	NEMAHA CO RWD 1	1300	1200 - 1300	UMHO/CM	1500
CORROSIVITY	1/9/2017	NEMAHA CO RWD 1	0.91	0.74 - 0.91	LANG	0
HARDNESS, TOTAL (AS CaCO3)	1/9/2017	NEMAHA CO RWD 1	680	640 - 680	MG/L	400
IRON	1/9/2017	NEMAHA CO RWD 1	0.047	0.012 - 0.047	MG/L	0.3
MAGNESIUM	1/9/2017	NEMAHA CO RWD 1	52	43 - 52	MG/L	150
MANGANESE	1/9/2017	NEMAHA CO RWD 1	0.0066	0.0029 - 0.0066	MG/L	0.05
NICKEL	1/9/2017	NEMAHA CO RWD 1	0.0013	0.0013	MG/L	0.1
PH	1/9/2017	NEMAHA CO RWD 1	7.8	7.6 - 7.8	PH	8.5
PHOSPHORUS, TOTAL	1/9/2017	NEMAHA CO RWD 1	0.031	0.031	MG/L	5
POTASSIUM	1/9/2017	NEMAHA CO RWD 1	2.2	1.7 - 2.2	MG/L	100
SILICA	1/9/2017	NEMAHA CO RWD 1	21	18 - 21	MG/L	50
SODIUM	1/9/2017	NEMAHA CO RWD 1	36	28 - 36	MG/L	100
SULFATE	1/9/2017	NEMAHA CO RWD 1	380	340 - 380	MG/L	250
TDS	1/9/2017	NEMAHA CO RWD 1	890	820 - 890	MG/L	500
ZINC	1/9/2017	NEMAHA CO RWD 1	0.014	0.0076 - 0.014	MG/L	5