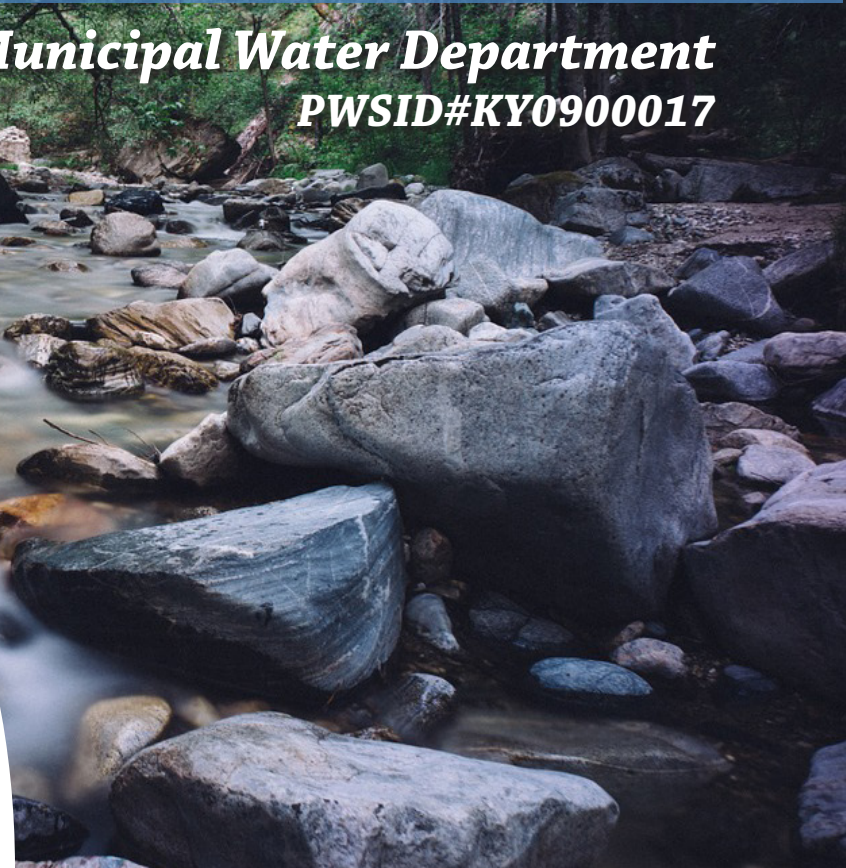


# 2016 Water Quality Report

*Bardstown Municipal Water Department*  
*PWSID#KY0900017*



Bardstown Municipal Water Department  
220 N 5th St  
Bardstown, KY 40004  
(502) 348-5947

## MEETING THE CHALLENGE

The Bardstown Municipal Water Department is pleased to present this annual water quality report. This report is designed to inform you about the quality of water and services we deliver to you every day. We strive to provide our customers with a safe and dependable supply of drinking water. We want you to be aware of the continual efforts made to improve our water system and to protect our water resources. Thank you for your support.

### SOME WAYS WE IMPROVED OUR SERVICES IN 2016:

- Doubled the number of sites to monitor for chlorine residual.
- Added four new automated flushing hydrants at critical locations.
- Increased manual flushing in rural areas where water usage is low.
- Optimized and reduced tank turnover.
- Participated in workshops with the Kentucky Division of Water, focusing on water age reduction and water quality improvement.
- Inspected and cleaned the water tanks in the Nelson County Industrial Park and Culvertown.
- Replaced aging water lines on Cathedral Manor, Norris Ct., Allison Ave., N. Fourth St. at Flaget, and a segment on E. Halstead.
- Decreased DBP by 30% from 2015 as a result of the work at the plant and in the distribution system.



## PROTECTING OUR WATER

We know that water is the most indispensable product in every home. We ask everyone to be conservative and help us protect our water source and water system. Please report any suspicious activity that you may see around water storage tanks, fire hydrants, pump stations, or Sympson Lake to law enforcement agencies or City Hall employees. Informed consumers are our best allies in maintaining safe drinking water. We encourage public interest and participation in our community's decisions affecting drinking water. Regular City Council meetings occur on the second and fourth Tuesdays, at the City Annex Building, 116 North Fifth Street at 7:00 P.M.

The staff at the Bardstown Water Treatment Plant work around the clock to provide top-quality water to every tap. If you want further information or want to discuss matters included in this report, please contact Jessica Filiatreau at (502) 348-5947 or Don Wilson at (502) 348-3064.

## PROTECTION OF DRINKING WATER IS EVERYONE'S RESPONSIBILITY

### You can help protect your water supply by:

- **Eliminating** excess use of lawn and garden fertilizers and pesticides
- **Picking up** after your pets
- **Disposing** of chemicals and used motor oil properly (AutoZone™ and Oil Express™ in Bardstown both accept small amounts of motor oil.)
- **Disposing** of used medicine properly
- **Volunteering** in watershed groups in our area
- **Remembering** that storm drains dump directly into local creeks and rivers
- **Keeping** livestock out of streams and creeks.

## Bardstown Municipal Water Plant Laboratory

### LEAD SAFETY

Good News: Lead levels in Bardstown's water system have been so consistently below action levels, that the DOW placed Bardstown on reduced monitoring. Recent testing shows this trend continuing.

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. Bardstown Municipal Water Dept. 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 exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking.

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 [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).



### Nitrate

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 advice from your health care provider.

### Barium

Some people who drink water containing barium in excess of the Maximum Contaminant Level (MCL) over many years could experience an increase in their blood pressure.

## ADDITIONAL HEALTH INFORMATION

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised people, such as people with cancer who are undergoing chemotherapy, people 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**.

## DISINFECTION BY-PRODUCTS

JESSICA FILITREAU, CITY CIVIL ENGINEER

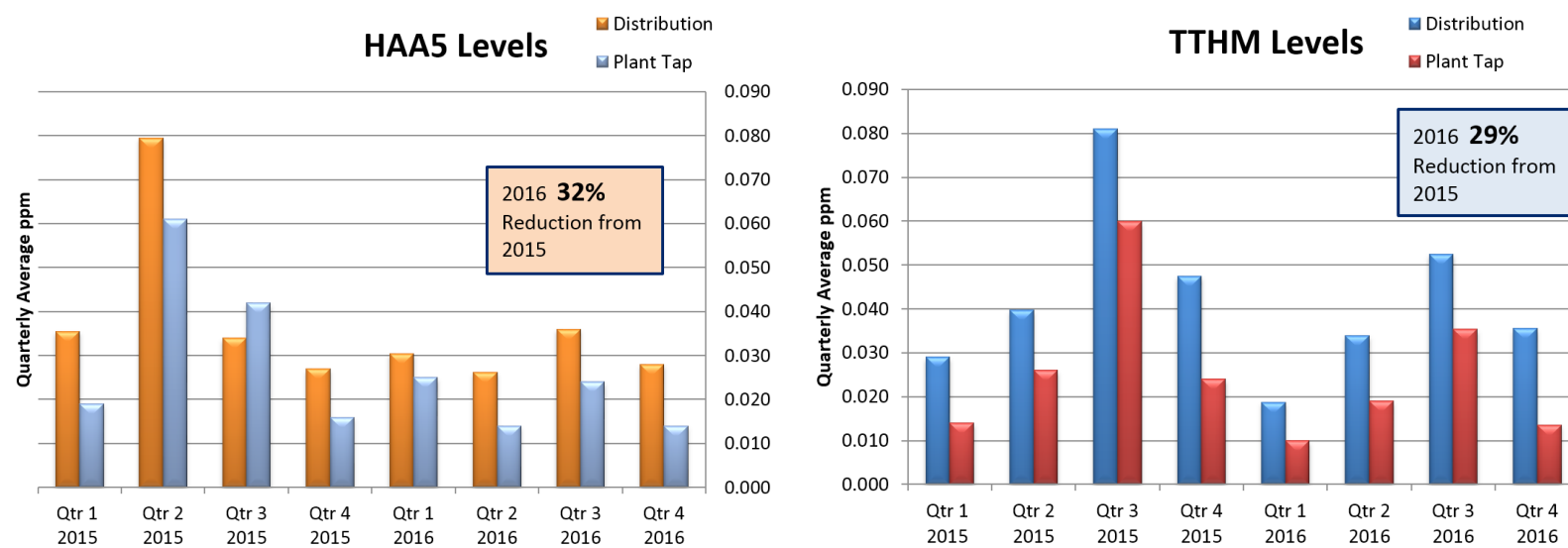


Jessica Filitreau  
City Civil Engineer

“Disinfection in public water systems is critical for maintaining safe drinking water. The Division of Water Stage 2 Disinfection By-products (DBPs) compliance regulation monitors Total Haloacetic Acids (HAA5s) and Total Trihalomethanes (TTHMs) at designated locations in the water distribution system. These TTHMs and HAA5s are by-products of the chlorine disinfection process. The regulatory annual quarterly average for HAA5 is 0.06 ppm (parts per million) and 0.08 ppm for TTHMs. We have remained in compliance with the regulation but want to further improve water quality for our Bardstown water customers and our wholesale water districts’ customers.

In May 2015, we saw a sudden increase in DBP formation at the treatment plant. We immediately responded by conducting a thorough evaluation of the process controls at the plant. We found that the issue was with the exterior filter units, so we immediately put a plan of action in place. In July 2015, the chlorination point of the treatment process was temporarily moved to the top of the filters. A comprehensive filter evaluation study determined that the filters did not have enough backwash flow to achieve the cleaning desired. In the fall of 2015, we hired GRW Engineers to design the backwash improvement and a permanent top-of-filter chlorination system. The project was bid this January, and TSI Construction Inc. will begin work in Spring, 2017.

During this design phase, we continued to look for immediate ways to improve. The two filters were acid-cleaned at the start of August, just prior to 3rd Quarter sampling, and the other two filters were cleaned after sampling. We also looked for technology that would improve water quality to meet the increasingly strict State EPA guidelines. With the help of S4 Water Sales & Services, LLC, we received permission from the KY Division of Water to implement GAC (Granular Activated Carbon) as the primary media in one of the four filter units as a trial study. The goal is to further reduce total organic carbon content in water before post chlorination, thus reducing disinfection by-products (DBPs). The GAC media was installed in July of 2016 and HAA5 numbers were reduced to half the regulated value at the water treatment plant during the 3rd-quarter sampling. We turned to John and Tom O’Conner with H20 Engineering to determine if converting our post disinfection to chloramine would help us meet our long-term goals. We found that chloramine is the most economical and effective option while allowing Bardstown to be compatible with regional producers. In the fall of 2016, we hired Kenvirons, Inc. to design these plant improvements. This should provide a more stable disinfectant at the farthest reaches of the water system and those of our wholesale customers.”



## WHAT'S WRONG WITH ALGAE?

Please help us reduce algae growth in our water supply by not sweeping your grass clippings into the street.



Algae naturally occurs in lakes and ponds.

Excess nutrients can cause high levels of algae growth.

Excessive algae growth can block out sunlight and deplete the oxygen level in the water.

Excessive algae growth can kill fish.

Algae growth can cause unpleasant taste and odor in your drinking water.

Algae growth can result in increased costs to water treatment.

Over the last five years, the City of Bardstown Water Department has spent over \$91,000 on algaecide alone to treat Sympton Lake.

## WHAT CAN I DO?

When mowing your yard, make sure you don't blow grass clippings into the street. Make the first few passes with the lawnmower blowing the grass clippings into your lawn. If there are grass clippings on the street or sidewalk, use a broom or leaf blower to blow them back into the lawn. You should mow your lawn when the grass is dry, to avoid clumping. Mow every five to seven days in the spring. During the summer, it may be enough to mow every two weeks.

When you leave grass clippings in your yard, you're adding free fertilizer to your lawn. Grass clippings are about 90 percent water, so they decompose very quickly, adding their nutrients to the soil, and leaving you with a fuller, greener lawn. In addition, leaving your grass clippings on the lawn can save you money by lowering your fertilizer needs, while simultaneously reducing water pollution. Excess fertilizer may harm your lawn or pollute surface water by traveling through the stormwater system and into the nearest lake or stream. You should apply only the amount of fertilizer your lawn needs. A soil test will tell you how much, if any, fertilizer you should be adding to your lawn by indicating the amount of phosphorus in your soil. Soil test kits cost \$5 and are available by calling your Nelson County Extension Office at (502) 348-9204.

## DEFINITIONS AND ABBREVIATIONS

### Maximum Contaminant Level Goal (MCLG)

The level of a contaminant in the 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 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 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 or (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.

### N/A

Not applicable

### Action Level (AL)

The concentration of a contaminant, which, if exceeded, triggers the treatment or other requirements, which a water system must follow.

### Treatment Technique (TT)

A required process intended to reduce the level of a contaminant in drinking water.

### Nephelometric Turbidity Units (NTU)

A measure of the cloudiness of water. Low turbidity is an indicator of the effectiveness of the filtration process.

### BDL

Below detection level

### ppm

Parts per million, or milligrams per liter (mg/l)

### ppb

Parts per billion, or micrograms per liter (ug/l)

### pCi/L

Picocuries per liter (a measure of radioactivity)

### µg/L

Micrograms per liter

## THE WATER QUALITY DATA TABLE

### The Bardstown Municipal Water Department

routinely monitors for constituents in your drinking water according to federal and state laws. The table on the facing page shows the results of our required monitoring for the period of January 1st to December 31st, 2016. It is important to remember that the presence of these constituents does not necessarily pose a health risk.

**Every regulated contaminant** that we detected in the water, even in the minutest traces, is listed here. The table contains the name of each substance, the highest level allowed by regulation (MCL), the ideal goals for public health, the amount detected, the usual sources of such contamination, and footnotes explaining our findings.

This table is part of the completed Source Water Assessment Plan (SWAP) which is available for inspection at the Lincoln Trail Area Development District, 613 College St. Rd., Elizabethtown, KY 40601, or by telephone at (270) 769-2393.

## PUBLIC NOTICE

**Bardstown Municipal Water Dept. received a Notice of Violation** numbered 2016-9950643 for failure to submit LT2 Source Water Monitoring form on or before the July 1, 2016 deadline. Though this was not an emergency, we wish to inform our customers of what happened and what was done to correct the situation.

**Bardstown Water staff** and our environmental laboratory were confused about the July 1, 2016 submission deadline for LT2 Source Water Monitoring form. It was submitted on a later date to the KY Division of Water's Department of Environmental Protection.

**We started monitoring/sampling** Cryptosporidium, E. Coli and Turbidity testing on April 2016 till March 2018 in accordance with 401 KAR 8:150 LONG TERM 2 ENHANCED SURFACE WATER TREATMENT (LT2ESWTR) Rule.

## WATER QUALITY DATA 2016

	Allowable Levels	Highest Single Measurement	Lowest Monthly %	Compliance Achieved	Likely Source
Turbidity (NTU) TT	No more than 1 NTU Less than 0.3 NTU in 95% of monthly	0.29	100	Yes	Soil runoff

### Regulated Contaminant Test Results

Contaminant [code] (units)	MCL	MCLG	Level Found	Range of Detection	Date of Sample	Compliance Achieved Yes/No	Likely Source of Contamination
<b>Radioactive Contaminants</b>							
<sup>a</sup> Alpha emitters [4000] (pCi/L)	15	0	0.02	0.02 to 0.02	2/14/10	Yes	Erosion of natural deposits
<sup>a</sup> Uranium (µg/L)	30	0	0.09	0.09 to 0.09	2/14/10	Yes	Erosion of natural deposits
<sup>a</sup> Beta/photon emitter (pCi/L)	50	0	4	4	4 to 4	2/14/10	Yes
<b>Inorganic Contaminants</b>							
Barium [1010] ppm	2	2	0.02	0.020 to 0.020	3/16/16	Yes	Drilling wastes; metal refineries; erosion of natural deposits
<sup>b</sup> Copper [1022] (ppm) (# Sites exceeded the AL)	AL=1.3	1.3	0.15 (90th percentile)	0 - 0.073 0 sites exceed AL	7/22/14	Yes	Corrosion of household plumbing systems, erosion of natural deposits; leaching from wood preservatives
Fluoride [1025] (ppm)	4	4	0.7	0.7 to 0.7	3/16/16	Yes	Water additive which promotes strong teeth
<sup>b</sup> Lead [1030] (ppb) (# sites exceeded the AL)	AL= 15	0	4 (90th percentile)	0 - 10 0 sites exceed AL	7/22/14	Yes	Corrosion of household plumbing systems, erosion of natural deposits
Nitrate [1040] (ppm)	10	10	1.5	1.50-1.50	3/16/16	Yes	Runoff from fertilizer use; leaching from septic tanks, sewage, erosion of natural deposits.
<b>Disinfectants/Disinfection Byproducts and Precursors</b>							
Total Organic Carbon (ppm) (measured as ppm, but reported as a ratio)	TT*	N/A	2.31 (lowest average)	1.91 to 4.06 (monthly ratios)	Jan-Dec 2016	Yes	Naturally present in the environment
* Monthly ratio is the % TOC removal achieved to % TOC removal required. Annual average of the monthly ratio must be 1.00 or greater for compliance							
Chlorine (ppm)	MRDL 4	MRDLG 4	0.95 (highest average)	0.22 to 2.15	Jan. 1 <sup>st</sup> -Dec. 31 <sup>st</sup> 2016	Yes	Water additive used to control microbes.
Haloacetic acids or HAA (ppb) Stage2	60	N/A	44 (highest individual LRAA)	14 to 49	1 <sup>st</sup> - 4 <sup>th</sup> QTR 2016	Yes	By-product of drinking water chlorination
TTHM Stage 2 [total trihalomethanes] Stage2 (ppb)	80	N/A	55 (highest individual LRAA)	10 to 57	1 <sup>st</sup> - 4 <sup>th</sup> QTR 2016	Yes	By-product of drinking water chlorination

<sup>a</sup> **Radioactive Contaminants** - The data presented in this report are from the most recent testing done in accordance with the administrative regulations in 401 KAR Chapter 8:550 Section 1. Our next Radionuclide compliance monitoring will be collected during the 2019 calendar year.

<sup>b</sup> **Lead and Copper** - Bardstown Municipal Water Department qualifies for reduced monitoring at a frequency of once every three years. We did not exceed the action levels for Lead and Copper during the compliance year 2014-2016. Our next sampling will be taken in the warm weather months of June, July, August or September of 2017.

The data presented in this report is from the most recent testing done in accordance with administrative regulations in 401 KAR Chapter 8. As authorized and approved by EPA, the State has reduced monitoring requirements for certain contaminants to less often than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data in this table, though representative, may be more than one year old. Unless otherwise noted, the report level is the highest level detected.

## WHERE DOES MY WATER COME FROM?

**Our water comes entirely** from surface water sources – Sympson Lake and the Beech Fork River. An 8.8-square-mile area of the Buffalo Creek watershed feeds Sympson Lake. The Beech Fork River Pumping Station is fed by a 669-square-mile area extending upstream from Bardstown, toward Chaplin, Springfield and Lebanon. 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 and through the ground, it dissolves naturally-occurring minerals, and can pick up substances resulting from the presence of animals or from human activity.

**The Bardstown Municipal** Water Department withdraws just under four million gallons per day of raw water from Sympson Lake. Areas of high concern at the intake consist of row crops, bridges and culverts, and urban and recreational grasses. These high areas of concern do not represent a danger to the environment. It is the potential for chemical spills, leaks, or hazardous material accidentally spilling into the water source that gives these sites the susceptibility ranking of *high*. However, when all aspects of the source assessment are analyzed, the overall ranking for Bardstown's water source is *moderate*.

For approximately half the year, water is withdrawn from the Beechfork River and pumped into Sympson Lake as a supplemental supply.

Excessive algae is the number one issue with our source water that causes nuisance taste and odor issues. Left uncontrolled, it can kill fish by blocking out sunlight and deplete oxygen levels.



Sympson Lake  
Bardstown KY

## A MESSAGE FROM THE E.P.A

**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 Safe Drinking Water Hotline: (800) 426-4791.

### ***Contaminants that may be present in our source water include:***

- 1.** Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- 2.** Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- 3.** Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- 4.** 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.
- 5.** 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, the U.S. EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water that provide the same protection for public health.*