

Presented By
Hardin County
Water District No. 1



ANNUAL
WATER
QUALITY
REPORT

WATER TESTING PERFORMED IN 2016

We've Come a Long Way

Once again we are proud to present our annual water quality report covering the period between January 1 and December 31, 2016. In a matter of only a few decades, drinking water has become exponentially safer and more reliable than at any other point in human history. Our exceptional staff continues to work hard every day—at any hour—to deliver the highest quality drinking water without interruption. Although the challenges ahead are many, we feel that by relentlessly investing in customer outreach and education, new treatment technologies, system upgrades, and training, the payoff will be reliable, high-quality tap water delivered to you and your family.

Community Participation

You are invited to attend our regular Board of Commissioners meetings. They normally meet monthly on the third Tuesday of each month, 11:30 AM, at the District's Customer Service Center located at 1400 Rogersville Road, Radcliff, KY. For more information about the meetings, contact Ms. Andrea Palmer at (270) 351-3222. Minutes of past board meetings are available on our website at www.HCWD.com.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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 may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or <http://water.epa.gov/drink/hotline>.



Substances That Could Be in Water

To ensure that tap water is safe to drink, U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

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, in some cases, radioactive material; and substances resulting from the presence of animals or from human activity. Substances that may be present in source water include:

Microbial Contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, or wildlife;

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may 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 may also come from gas stations, urban stormwater runoff, and septic systems;

Radioactive Contaminants, which can be naturally occurring or may be the result of oil and gas production and mining activities.

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 may be obtained by calling the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

System Upgrade

Hardin County Water District No. 1 will be switching to chloramines disinfectant by the end of 2017 or early 2018. The primary reason for this change is related to a new connection with Louisville Water Company (LWC), which will provide the District with a reliable and abundant supplemental source in the near future. Water from LWC is disinfected with chloramines. To be able to mix LWC water with District water, the District will also be converting to the same disinfection method. In addition, several other benefits will be gained from the conversion, including a reduction in regulated disinfectant byproducts, a more persistent residual in the distribution system as compared with the District's current disinfectant chlorine, and an elimination of taste and odor issues that are common with chlorine. As the conversion approaches, the District will dispense more educational information to customers. If you have any questions, please contact Chris Gohman at (270) 862-4340 or cgohman@hcwd.com.

Where Does My Water Come From?

We own and operate both the Ft. Knox Water System (since 2012) as well as the original Hardin County Water District No. 1 system (1952). These systems include three water treatment plants (WTPs) and four separate water sources supplying these WTPs. The WTPs are the Pirtle Spring Water Treatment Plant (PWP), and two WTPs on Ft. Knox being Central (CWP) and Muldraugh (MWP). At certain times of the year, the Ft. Knox WTPs provide water to our County system customers. We provide the City of Vine Grove 100% of their supply and about 70% of Meade County Water District's supply. We can provide a backup supply to the City of Hardinsburg and Hardin County Water District No. 2.

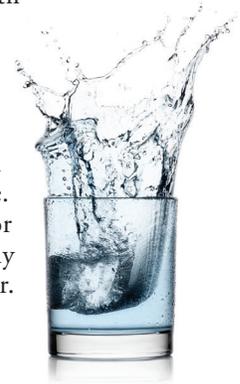
The source waters for the PWP are the Pirtle Spring, located at the plant site, and the Head of Rough Spring, located about 1.5 miles from the plant. The MWP is supplied by 15 deep underground water wells located on the West Point aquifer near the Ohio River. The CWP can be supplied by a surface water source near Otter Creek known as McCracken Spring, as well as the same well sources that supply the MWP.

During 2016 a total of 1,670 MG (million gallons) of potable water was treated at our WTPs and a total of 7.04 MG was purchased (0.4%) to supplement our production. The maximum demand day was 7.248 MG and occurred on December 28. The average daily water demand for the year was 4.562 MG. Wholesale customers purchased 341.5 MG for delivery to their customers, which was equivalent to 20% of total water sold.

How Is My Water Treated and Purified?

All three WTPs use a three-step treatment process. This includes clarification to remove larger particles in the raw water. The PWP and MWP also add powdered, activated carbon to absorb many other types of chemicals or contaminants. The water then passes through a multimedia filter system that uses four sizes of sand and gravel, plus a layer of anthracite coal. The filters are able to remove many other microscopic particles and contaminants. Finally, the treated water is kept in a holding tank where it is completely disinfected to meet all state and federal requirements. The finished water is then pumped through more than 400 miles of water mains until it reaches 13 storage tanks that can store up to 7 million gallons of treated water.

The PWP was completely rebuilt in 2009 and has won five industry awards since. Tours may be arranged for school and civic groups at any of our WTPs. Contact Mr. Gohman to arrange a tour.



QUESTIONS?

For more information about this report, or for any questions relating to your drinking water, please call Mr. Chris Gohman, Water Quality/Measurement Specialist, by phone at (270) 862-4340 or by fax at (270) 862-5740. He can also be contacted via e-mail at cgohman@hcwd.com.

Wellhead Protection Plan

Hardin County Water District No. 1 and Ft. Knox Water updated the Wellhead Protection Plans (WHPPs) in 2016. We held a county-wide public meeting that included representatives from all water-producing utilities in the county as well as personnel from KY Rural Water Association, KY Geological Survey, and Hardin County Planning and Zoning. This collaborative effort will serve to strengthen source water protection efforts. Earlier WHPP efforts included identifying the area basins that drain into our raw water sources, to identify possible types and sources of contamination, and then to develop programs or additional measures to better protect this source water from these contaminants. Pirtle Spring WTP found that its two separate sources do not share the same water. The Pirtle Spring, located at the plant site, collects water from a 27-square-mile area. The Head of Rough Spring, located about 1.5 miles from the water plant, receives water from a 17-square-mile area. Both of these watersheds are in largely agricultural areas and subject our treatment process to contaminants from agricultural runoff, including fertilizers, pesticides, and herbicides.

Fort Knox personnel conducted a comprehensive inventory of existing wells for the West Point well field and surrounding 5.5-square-mile protection area, which serves Muldraugh WTP, as well as the 19.4-square-mile recharge area for McCracken Springs, which serves Central WTP. These inventories identify and monitor potential sources of contamination to the water supply. One of the primary management strategies included in the Ft Knox WHPP is the use of control wells to protect the groundwater supply from chloride intrusion from nearby abandoned oil and gas wells.

A copy of these reports is available by contacting us during regular business hours.

Because of the karst aquifers through which both of our source waters traverse, our water is high in calcium, averaging about 80 ppm calcium and 200 ppm calcium hardness. The calcium that is provided in our drinking water is beneficial to our customers' health. Calcium is vital to several essential functions like blood clotting, muscle contraction (including the contraction of the heart), and bone/tooth formation. The Institute of Medicine recommends that each individual's recommended dietary allowance of calcium is 700-1300 mg/day depending on the age and the gender of the individual. By consuming the recommended 0.2 - 1.0 gallon(s) of water per individual per day, our customers can satisfy more than 20% of the recommended daily intake of calcium.



We do acknowledge that the hardness of our water does have its drawbacks. Water heaters, dishwashers, and humidifiers seem to be the most problematic as calcium precipitates out of water at higher temperatures, causing scale to build up on these heating elements and in these systems. A preventative maintenance program performed every 3-6 months for these household appliances can dramatically extend the life of these conveniences. Both Ft. Knox WTPs do, however, provide a softening process to lower the hardness of the finished water. This process lowers hardness by about 63%.

Lead in Home Plumbing

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. We are 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 www.epa.gov/lead.

Test Results

Our water is monitored for many different kinds of contaminants on a very strict sampling schedule. The information below represents only those substances that were detected; our goal is to keep all detects below their respective maximum allowed levels. The State recommends monitoring for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

REGULATED SUBSTANCES

				Hardin County Water District No. 1		Fort Knox Water Plant			
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Atrazine (ppb)	2016	3	3	4 ¹	ND-4	NA	NA	No	Runoff from herbicide used on row crops
Barium (ppm)	2016	2	2	0.028	NA	NA	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chlorine (ppm)	2016	[4]	[4]	1.36	0.40-2.20	1.50	0.64-2.18	No	Water additive used to control microbes
Combined Radium (pCi/L)	2014	5	0	1.3	NA	NA	NA	No	Erosion of natural deposits
Fluoride (ppm)	2016	4	4	0.3	NA	0.6	0.5-0.7	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Haloacetic Acids [HAA] (ppb)	2016	60	NA	22.3	3-34	6.15	2-11.7	No	By-product of drinking water disinfection
Nitrate (ppm)	2016	10	10	1.0	NA	0.4	ND-0.7	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes] (ppb)	2016	80	NA	28.3	12-32	35.3	10.9-62.3	No	By-product of drinking water disinfection
Total Coliform Bacteria [before April 2016] ² (# positive samples)	2016	1 positive monthly sample	0	1	NA	0	NA	No	Naturally present in the environment
Total Organic Carbon ³ (ppm)	2016	TT	NA	1.3	0.7-3.4	0.61	0.5-1.5	No	Naturally present in the environment
Turbidity ⁴ (NTU)	2016	TT	NA	0.630	0.020-0.630	0.137	0.033-0.137	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2016	TT = 95% of samples meet the limit	NA	99.46	NA	100	NA	No	Soil runoff

Tap water samples were collected for lead and copper analyses from sample sites throughout the community from Hardin County Water District No.1

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH%TILE)	SITES ABOVE AL/ TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2016	1.3	1.3	0.239	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2016	15	0	3	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits

LONG TERM 2 ENHANCED SURFACE WATER TREATMENT RULE (RAW WATER TEST RESULTS)

				Hardin County Water District No. 1		Fort Knox Water Plant			
SUBSTANCE	YEAR SAMPLED	AMOUNT DETECTED		AMOUNT DETECTED		TYPICAL SOURCE			
<i>Cryptosporidium/giardia</i>	2016	ND		ND		Naturally occurring			

¹ Hardin County Water District No. 1 had a detect of Atrazine on 5/03/16 with a 4 ppb. We re-sampled on 5/16/16 and had a result of 0.8 ppb. With the average of the two samples we were below the MCL, but these detects triggered quarterly monitoring. We sampled again on 8/30/16 and 10/5/16, with both samples resulting in <0.2 ppb. Atrazine is a herbicide and can get into our spring in a heavy rain event. We increased powdered activated carbon treatment in our process during heavy rain events to help minimize organics, such as Atrazine.

² The District generally collects 32 samples per month for the county utility and Louisville Water generally collects 25 samples per month for the Ft. Knox utility. In February 2016, the District had one positive total coliform/negative *E. coli* sample. If a system collecting fewer than 40 samples per month has two or more positive samples in one month, the system has an MCL violation.

³ The monthly ratio is the percent of total organic carbon (TOC) removal achieved compared to the percent of TOC removal required. The annual average of monthly ratios must be 1.0 or greater for compliance. Hardin County Water District No. 1 and Ft. Knox Water achieved this criteria in 100% of the monthly samples.

⁴ Turbidity is a measure of the cloudiness of the water. It is monitored because it is a good indicator of the effectiveness of the filtration system. Turbidity cannot exceed 1 NTU and must be <0.3 NTUs in greater than 95% of monthly samples.

Definitions

AL (Action Level): The concentration of a contaminant, which if exceeded, triggers treatment or other requirements which a water system shall follow.

LRAA (Locational Running Annual Average): The average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters. Amount Detected values for TTHMs and HAAs are reported as LRAAs.

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.

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.

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.

MRDLG (Maximum Residual Disinfectant 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.

NA: Not applicable

ND: Indicates that the substance was not found by laboratory analysis.

NTU (Nephelometric Turbidity Units): Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

pCi/L (picocuries per liter): A measure of radioactivity.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

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