"ANNUAL DRINKING WATER QUALITY REPORT FOR 2020"

Annual Drinking Water Quality Report

Prepared by

Gloucester County Public Utilities

INTRODUCTION

This Annual Drinking Water Quality Report for calendar year 2020 is designed to inform you, the customer, about your drinking water quality. Our goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to protect your water supply. The quality of your drinking water must meet state and federal requirements administered by the Virginia Department of Health (VDH). Included in this report are details about where your water comes from, what it contains and how it compares to standards set by the EPA and VDH. The Gloucester County Department of Public Utilities is committed to providing you with information about your water supply, because customers who are well informed are our best allies in supporting improvements necessary to maintain the highest drinking water standards. If you have any questions about this report, or any aspect of your drinking water, or want to know how to participate in decisions that may affect the quality of your drinking water, please contact James C. Dawson, P.E., Director of Public Utilities, by telephone at (804) 693-4044 or by email at jdawson@gloucesterva.info.

GENERAL INFORMATION

Drinking water, including bottled drinking 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 can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, 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: (1) Microbial contaminants, such as viruses and bacteria, which may come from septic systems, agricultural livestock operations and wildlife. (2) Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from storm water runoff, domestic wastewater discharges, mining, or farming; (3) Pesticides and herbicides, which may come from a variety of sources such as agricultural, storm water runoff, and residential uses; (4) Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, storm-water runoff and septic systems; (5) Radioactive contaminants, which can be naturally occurring or be the results of mining activities. 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. 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/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Your drinking water comes from two sources. The first, surface water, comes from Beaverdam Reservoir. The water is treated at the County's Surface Water Treatment Plant (SWTP). Your Surface Water Treatment Plant employs conventional technology which includes chemical coagulation, sedimentation and filtration. Raw water pumped from the Beaverdam Reservoir is treated with potassium permanganate, to remove iron, organics and manganese, and powdered activated carbon to remove color organics, and to control taste/odor. This water is then pumped into a rapid mixing basin where alum and polymer are mixed into the water for coagulation. The mixed water is then drawn into vacuum chambers where it "pulsates" into our Superpulsator™ Clarifier units, which facilitates floc formation and settling to remove large particles. This process removes the large particles from the treatment process for disposal at the local landfill. Settled water from the Superpulsator™ Clarifier is next mixed with Sodium Hypochlorite (Chlorine) for further oxidation of organics and metals. The water is then filtered through dual media, sand and anthracite, high rate filters. The filtered water is treated inside the clearwell with chlorine for primary and secondary disinfection; Soda Ash for pH control; and corrosion inhibitor for corrosion control in the distribution system. The clearwell serves as temporary storage and location to blend treated surface water with the water produced by Reverse Osmosis (RO) as described below.

The second source of your drinking water is groundwater. The County's Reverse Osmosis (RO) plant, which treats water from two (2) deep (approximately 1,400 feet) wells, went into operation in April of 2003. Well #2 has been inactive since 2015 due to a less desirable water quality than Well #1. We look forward to replacing the well in the future. The groundwater is pumped to the RO plant where an antiscalant is added to prevent fouling of the membranes used in the process. Well water then passes through a series of 5-micron cartridge filters that removes suspended particles. Removing these particles prevents fouling of the membranes. After the cartridge filters, high-pressure pumps push the water through

the membranes used in the reverse osmosis process. The reverse osmosis process removes dissolved solids and pathogens from the groundwater. Finally, the water flows to the clearwell, located at the Surface Water Treatment Plant, where it is mixed and treated with the Surface Water Plant's water as described above.

Since June of 2014, the Department of Public Utilities has blended the product water from the Reverse Osmosis Plant and the Surface Water Treatment Plant at a ratio of 1:1 to ensure we will consistently produce water in accordance with Disinfection Byproduct and Lead and Copper Rules. Beginning in October of 2017, the department of Public Utilities began adding ammonia to the treated water to form chloramines. Chloramines provide longer-lasting disinfection as the water moves through pipes to consumers. Switching to chloramines has significantly reduced the potential of forming Trihalomethanes (Disinfection Byproducts) in our water system.

To protect our sources of drinking water, the Hampton Roads Planning District Commission (HRPDC) and Virginia Department of Health (VDH) evaluated the susceptibility of Gloucester's water supply to contamination. Contamination sources and pathways were reviewed using maps, known and observed activities, water quality data and information about the water source. Using criteria developed by the State in its EPA-approved Source Water Assessment Program, the following was determined:

	Source	***Susceptibility***
i.	Beaverdam Reservoir	High
ii.	R.O. Well #1	High

This does not mean that your drinking water is currently unsafe. Your current water quality is described in the rest of this report. A copy of the source water assessment report is available by contacting Mr. James C. Dawson, P.E., Director of Public Utilities, at (804) 693-4044.

DEFINITIONS

Contaminants in your drinking water are routinely monitored according to Federal and State regulations. The tables on the next few pages show the results of our monitoring for the 2017-2020 monitoring period. In the tables and elsewhere in this report you will find many terms and abbreviations that might be unfamiliar to you. The following definitions are provided to help you better understand these terms:

Non-detects (ND) - lab analysis indicates that the contaminant is not present.

Parts per million (ppm) or Milligrams per liter (mg/l) - one part per million corresponds to one minute in two years or a single penny in $10,000.

Parts per billion (ppb) Micrograms per liter - one part per billion corresponds to one minute in 2,000 years or a single penny in $10,000,000.

Parts per trillion (ppt) or Nanograms per liter (nanograms/l) - one part per trillion corresponds to one minute in 2,000,000 years or a single penny in $10,000,000,000.

Picocuries per liter (pCi/L) - picocuries per liter is a measure of the radioactivity in water.

Action Level (AL) - the concentration of a contaminant which, if exceeded, triggers 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.

Maximum Contaminant Level, or 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 Contaminant Level Goal, or MCLG - 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.

Secondary Maximum Contaminant Level, or SMCL - recommended levels for contaminants that affect water's taste, color, odor or appearance.

NTU (Nephelometric Turbidity Unit)- the amount of turbidity in a water sample as measured by the amount of light scattered by turbidity of the sample.

Maximum Residual Disinfectant Level (MRDL) - the level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an acceptable possibility of adverse health effects.

Maximum Residual Disinfectant Level Goal (MRDLG) - the level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur.

Level 1 Assessment - An evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment.

WATER QUALITY RESULTS

I. Contaminants Regulated at the Treatment Plant

Contaminant	*Ideal Goals EPA's MCLG*	*Highest Allowable Level EPA's MCL*	*Level Detected*	*Typical Source of Contaminant*
Gross Beta*[a]	0	50 pCi/L	0.8 pCi/L	Decay of man-made products and natural deposits
Combined Radium[a]	0	5pCi/L	0.7 pCi/L	Erosion of natural deposits
Barium	2 ppm	2 ppm	0.11 ppm	Erosion of natural deposits

Metal sampling was collected on October 5, 2020.
*The MCL for beta particles is 4 mrem/year. EPA considers 50 pCi/L to be the level of concern for beta particles. [a]Sample collected on April 12, 2017 (Radiological sampling is required every six years. The next collection is due in 2023)
+ Nitrate/Nitrite-Nitrogen samples were collected April 7, 2020. There were no detections for combined nitrate/nitrite.

Contaminant	*Ideal Goals EPA's MCLG*	*Highest Allowable Level EPA's MCL*	*Highest Detected*	*Lowest Monthly Percentage of Samples Meeting the Turbidity Limit*	*Typical Source of Contaminant*
Turbidity	NA	100% Below 0.3 NTU	0.128 NTU	100%	Soil runoff
Date	-	-	08-29-20		

Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of filtration system.

Contaminant	*MCLG*	*Required Removal Ratio*	*Removal Ratio*		*Typical Source of Contaminant*
			Lowest Running Annual Average	*Monthly Range*	
Total Organic Carbon*	TT	1.0	1.12	0.93-1.40 mg/l	Naturally present in the environment

*Total organic carbon results are given as removal ratios. Lowest Running Annual Average equal to or greater than one meets water quality standards.

II. Other Contaminants Regulated in the Distribution System

Contaminant	*MCLG*	*Highest Allowable MCL*	*Amount Detected*		*Typical Source of Contamination*
			Highest Locational Running Annual Average	*Quarterly Range*	
Trihalomethanes (THM)	N/A	80 ppb	39 ppb	28-41 ppb	By-product of drinking water disinfection
Haloacedic Acids (HAA)	N/A	60 ppb	18 ppb	10-25 ppb	By-product of drinking water disinfection

III. Contaminants Regulated at the Customer's Tap

Contaminant	*Ideal Goals EPA's MCLG*	*Highest Allowable Level EPA's MCL (Action Level)*	*90th Percentile*	*No. of Sites Exceeding A.L.*	*Typical Source of Contamination*
Lead	0 ppb	15 ppb	2 ppb	1	Corrosion of household plumbing systems; erosion of natural deposits
Copper	1.3 ppm	1.3 ppm	0.12 ppm	0	Corrosion of household plumbing systems; erosion of natural deposits

The County collected 66 lead and copper samples from residences in 2018. Lead and copper tests are collected by the homeowner and tested by an independent laboratory. The most recent lead and copper sampling process in April, resulted in the 90 percentiles of residences containing less than 15 ppb of lead concentrations in drinking water.

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. Gloucester County Public Utilities 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 15 to 30 seconds or until it becomes cold or reaches a steady temperature 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. Infants and children who drink water containing lead more than the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

V. Disinfectants

Disinfectant	*Units of Measurement*	*MRDLG*	*MRDL*	*Level Detected (Highest*	*Violation (Y/N)*	*Range of Detection at Sampling Points*	*Typical Source*

				(Highest Annual Quarterly Average)			
Chlorine	ppm	4	4	3.21 mg/L	N	0.1 – 4.3 mg/L	Water additive used to control microbes

Presence of coliforms

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. In September 2020 we found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessments to identify problems and to correct any problems that are found. We conducted the assessment and found no potential problems or corrective actions were needed.

We constantly monitor for various contaminants in the water supply to meet all regulatory requirements. The table lists only those contaminants that had some level of detection. Many other contaminants have been analyzed but were not present or were below the detection limits of the lab equipment. The water quality results in the preceding tables are from testing done in 2020, unless otherwise noted. The state allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently.

MCLs are set at very stringent levels by the U.S. Environmental Protection Agency. In developing the standards, EPA assumes that the average adult drinks 2 liters of water each day throughout a 70-year life span. EPA generally sets MCLs at levels that will result in no adverse health effects for some contaminants or a one-in-ten-thousand to one-in-a-million chance of having the described health effect for other contaminants.

VIOLATION INFORMATION

Gloucester Public Utilities had no violations during 2020. The Department constructed a capital project designed to improve the levels of TTHM in drinking water. That was completed in late 2017 (mentioned under the "general information" section)

ADDITIONAL HEALTH INFORMATION

Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community because of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline (800-426-4791).

The average sodium concentration in the sample collected from October 5, 2020 was 128 mg/l. This concentration exceeds the recommended maximum contaminant level of 20 mg/l for persons on a "strict" sodium diet.

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A copy of this report is also available by visiting the Gloucester County website at www.gloucesterva.info and accessing the Public Utilities Department home page.