



# Drinking Water Quality

## Annual Report for the Year Ending 2020

### *Safe Water at Your Service*

We are pleased to report that your drinking water meets all State and Federal Requirements as administered by the Virginia Department of Health (VDH) Office of Water Programs. This report summarizes data collected and reported to VDH in 2020. Annual dissemination of this report is required under the federal Safe Drinking Water Act (SDWA). For additional information, you may call our Customer Service department at 540-868-1061, or visit Frederick Water's headquarters (315 Tasker Road, Stephens City VA). We also invite you to attend our monthly Board meetings, which are held on the third Tuesday of each month at the same location.

### *Frederick Water's Water Sources*

Frederick Water is primarily supplied by quarries in Stephens City and Clearbrook, with additional water supplied by groundwater wells. The water taken from these sources is treated at the James H. Diehl Water Filtration Plant and the James T. Anderson Water Filtration Plant. The filtration process consists of chemical addition, flocculation, sedimentation, filtration to remove turbidity, and chlorination to disinfect the water. Additional water is purchased from the City of Winchester. The City's water is drawn from the North Fork of the Shenandoah River. The waters from these three sources are blended in Frederick Water's system and distributed to our customers. Through source water assessments, VDH has determined that Frederick Water's water sources may be susceptible to contamination because they are surface water sources exposed to a wide array of contaminants at varying concentrations. Changing hydrologic, hydraulic and atmospheric conditions promote migration of contaminants from land use activities of concern within the assessment area.

### *Testing Your Water*

During 2020, Frederick Water's laboratories at the Diehl and Anderson Water Filtration Plants ran more than 50,000 process tests to ensure your drinking water meets the Virginia Department of Health and the United States Environmental Protection Agency (EPA) standards. For a behind-the-scenes look at the process of treating and testing your drinking water, visit <https://www.youtube.com/watch?v=2sNp6Iz6l9E>.

### *Water Quality*

Your water is routinely monitored according to Federal and State Regulations for a variety of components. Tables 1 through 4 summarize the results of our monitoring for the period between January 1 and December 31, 2020 unless otherwise noted. The summaries below include only contaminants that were detected at some level. Other components were analyzed but were not present or were below the detection limits of the lab equipment. The following definitions may be useful as you review the 2020 water quality information:

## Definitions

- Action Level (AL): The concentration of a contaminant, which, if exceeded, triggers a treatment or other requirement that a water system must follow.
- Maximum Contaminant Level (MCL): the highest level of 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 (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.
- 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 (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- mrem/year - Millirems per year. A measure of radiation absorbed by the body.
- N/A – Not Applicable.
- ND: Non-detect. Concentration levels so low they were not detectable.
- NTU: Nephelometric Turbidity Unit (a measure of the cloudiness of water).
- pCi/L - Picocuries per liter.
- ppb: Parts per billion - One part per billion corresponds to 1 drop in 15,750 gallons.
- ppm: Parts per million - One part per million corresponds to 1 drop in 16 gallons.
- TT -Treatment Technique - A required process intended to reduce the level of contaminant in drinking water.

## Results

Turbidity is a measurement of the cloudiness of water. It has no known health effects but can be used as an indicator of water quality and the effectiveness of our filtration. The turbidity level of filtered water must be less than or equal to 0.3 NTU in at least 95% of measurements taken each month, and no single measurement can exceed 1 NTU. Table 1 summarizes Frederick Water's 2020 turbidity results. Tables 2 and 3 provide additional information for components that require testing. Table 4 provides a summary of the most recent results for lead and copper (taken at Frederick Water customer taps).

Table 1: Turbidity

Turbidity	Highest Single Measurement (NTU)	Percent Less than 0.3 NTU	MCL	MCLG	Typical Source	Violation
Frederick Water – Anderson Plant	0.14	100	TT	N/A	Soil Runoff	No
Frederick Water – Diehl Plant	0.12	100	TT	N/A		No
City of Winchester – Miller Plant	0.19	100	TT	N/A		No

Table 2: Total Organic Carbon

Contaminant	MCLG	MCL	Removal Ratio			Exceedance	Date of Sample	Typical Source of Contamination
			Diehl	Anderson	Winchester City			
Total Organic Carbon	NA	TT*	1.0	1.0	1.8	No	Monthly 2020	Natural present in the environment

\*The required Treatment Technique for Total Organic Carbon is monitored by comparing actual percent removal to required percent removal. The required percent removal varies depending on several aspects of source water quality. Treatment is required to achieve a removal ratio of at least 1.0.

Table 3: Water Quality from Frederick Water and City of Winchester

Components	Amount Detected/Range			MCL	MCLG	Typical Source	Violation
	Water Source						
	Frederick Water Anderson Plant	Frederick Water Diehl Plant	City of Winchester Miller Plant				
Alpha Emitters <sup>1</sup> (pCi/L)	ND	0.9	ND	15	0	Decay of natural and man-made deposits	No
Beta/photon emitters <sup>2</sup> (pCi/L)	2.9	1.9	3.9	50	0	Decay of natural and man-made deposits	No
Combined Radium <sup>1</sup> (pCi/L)	0.6	0.9	ND	5	0	Erosion of natural deposits	No
Fluoride (ppm)	0.63	0.81	0.68	4	4	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories	No
Nitrate [as Nitrogen] (ppm)	2.6	2.36	1.46	10	10	Runoff from fertilizer use; leaching from septic tanks; erosion of natural deposits	No
Barium (ppm)	0.064	0.054	0.042	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	No

<sup>1</sup>Alpha emitters and combined radium were monitored in 2013 and 2020 for Frederick Water and 2018 for Winchester. <sup>2</sup>The MCL for Beta particles is 4 mrem/year. EPA considers 50 pCi/L to be the level of concern for Beta particles. Beta emitters were monitored in 2013 and 2020 for Frederick Water and 2018 for Winchester.

Table 4: Water Quality in the Distribution System

Component	Highest Monthly % of Positive Samples		MCL (Max Allowed)	MCLG (Goal)	Typical Source	Violation
	Frederick Water	Winchester				
Total Coliform Bacteria	ND	ND	TT	N/A	Naturally present in the environment	No
Chemical Component	Highest Quarterly System Running Annual Average		MRDL (Max allowed, Compliance Based on System Running Annual Average)	MRDLG (Goal)	Typical Source	Violation
Chlorine (ppm)	Average: 1.9 Range: 1.0- 2.7	Average: 1.57 Range: 0.3-3.1	4	4	Water Additive used to control microbes	No
Disinfection Byproducts	Highest Quarterly Locational Running Annual Average		MCL (Locational Running Annual Average)	MCLG (Goal)	Typical Source	Violation
Total Trihalomethanes (ppb)	Average: 24.5 Range: 15-42	Average: 56 <sup>1</sup> Range: 26-95	80	N/A	Byproduct of drinking water disinfection	No
Haloacetic Acids (ppb)	Average: 18.9 Range: 9-28	Average: 42 <sup>1</sup> Range: 26-55	60	N/A	Byproduct of drinking water disinfection	No

<sup>1</sup>Data Collected in 2019

Table 5: Water Quality at the Tap

Metal Components	90th Percentile Level	Action Level (AL)	MCLG	Number of Sites Above AL	Typical Source	Violation
Copper (ppm)	0.05	1.3	1.3	0	Corrosion of household plumbing; erosion of natural deposits	No
Lead (ppb)	ND	15	0	0	Corrosion of household plumbing; erosion of natural deposits	No

## *Lead and Copper*

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. Frederick Water is responsible for providing high quality drinking water but cannot control the variety of materials used in private 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 EPA at <https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water> or by calling the Safe Drinking Water Hotline at 800-426-4791.

## *Water Hardness*

The average hardness of our water is 303 ppm or 17.7 grains (1 grain = 17.1 ppm) and may cause calcium buildup and/or glassware spotting. Please be assured that there are no known harmful health effects associated with high hardness. Water hardness is not regulated by the Virginia Department of Health (VDH). It may also be helpful to note that hard water is the opposite of corrosive water (such as the water in Flint, Michigan).

## *Cryptosporidium*

Cryptosporidium is a microbial pathogen found in surface waters throughout the United States. Ingestion of Cryptosporidium may cause cryptosporidiosis, an abdominal infection characterized by nausea, diarrhea, and abdominal cramps. Cryptosporidium may be spread through means other than drinking water. Most healthy individuals can overcome the disease within a few weeks; however immuno-compromised people are at risk of developing a potentially life-threatening illness. Frederick Water was required by the U.S. Environmental Protection Agency (EPA) to sample and test the source water at each of its water treatment plants for Cryptosporidium as part of the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). This sampling and testing was performed once monthly from April 2016 through March 2018. The City of Winchester likewise conducted testing from October 2016 through September 2018. Results of monitoring during this time period have shown no presence of Cryptosporidium in any of the source waters. EPA/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).

## *Sodium*

Sodium was detected at an average concentration of 10.8 mg/l. There is no MCL for sodium. We are providing this information for consumers who wish to know the level of sodium in our water. For individuals on a very low sodium diet (500 mg/day), EPA recommends that drinking water sodium not exceed 20 mg/l. To avoid adverse effects on taste, the EPA recommends that sodium concentrations in drinking water not exceed 30-60 mg/l, a threshold for taste-sensitive segments of the population.

## ***Source Water Protection and Water Conservation***

Protection of sources which supply public drinking water is of vital importance to the residents serviced by Frederick Water. The water supply represents a valuable resource and investment which, if it were to become polluted, could negatively impact public health and would be expensive to restore or replace. Frederick Water has adopted a Source Water Protection Plan to keep source waters clean and healthy. Read the plan on our website: <https://www.frederickwater.com/source-water-protection-plan>.

Frederick Water endorses wise water use, especially during the hottest periods of the summer when demands are the greatest. When necessary, voluntary conservation measures will be implemented, and in the event of a water emergency, Frederick Water will impose mandatory water restrictions as outlined in Frederick Water's Water Conservation policy. For more information, tips, and tools for water conservation, visit our website: <https://www.frederickwater.com/m/main-menu/1124>.

## ***Special Information for Vulnerable Populations***

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 persons and infants can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers. The Environmental Protection Agency and the Centers for Disease Control guidelines on appropriate means to lessen the risk of infections by Cryptosporidium and other microbiological contaminants are available from the EPA's Safe Drinking Water Information website at <https://www.epa.gov/ground-water-and-drinking-water/safe-drinking-water-information> or the Centers for Disease Control at 800-CDC-INFO.

## ***Stay in Touch:***

Frederick Water would be happy to collaborate with local schools, community members or other organizations. Our staff is willing to provide tours of our facilities, and to share our knowledge of water treatment and conservation.

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