

ANNUAL WATER QUALITY REPORT

Reporting Year 2021



Presented By
**Town of Burlington, DPW
Water Department**

We're Continuing Our Hard Work

Once again, we are proud to present our annual water quality report covering the period between January 1 and December 31, 2021. Our staff continue to work hard every day, at all hours, to deliver the highest-quality drinking water without interruption. Although the challenges ahead are many, we feel that by 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.

For more information about this report, please call Russell Makiej, Water Treatment Manager, at (781) 270-1648 or email rmakiej@burlington.org.

Source Water Assessment

DEP has completed source water assessments for all drinking water sources across Massachusetts. The purpose of this Source Water Assessment Program (SWAP) was to determine the susceptibility of each drinking water source to potential contaminant sources. The relative susceptibility rating for all our wells was high. The susceptibility rating for the Shawsheen River was also rated as high, while the Mill Pond Reservoir was given a rating of moderate. It is important to understand that these susceptibility ratings do not imply poor water quality but rather the potential of the system to become contaminated within the assessment area.

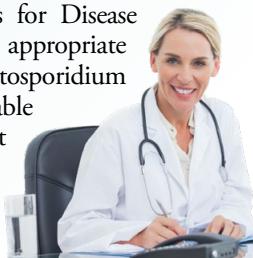
The complete SWAP report is available at the Burlington Department of Public Works and online at mass.gov/files/documents/2016/08/uc/3048000.pdf. For more information, call (781) 270-1648. The Town of Lexington's SWAP report can be found online at mass.gov/doc/northeast-region-source-water-assessment-protection-swap-program-reports/download.

The Benefits of Fluoridation

Fluoride is a naturally occurring element in many water supplies in trace amounts. In our system, the fluoride level is adjusted to an optimal level averaging 0.7 part per million (ppm) to improve oral health in children. At this level, it is safe, odorless, colorless, and tasteless. There are over 3.9 million people in 140 Massachusetts water systems and 184 million people in the U.S. who receive the health and economic benefits of fluoridation.

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 online at water.epa.gov/drink/hotline.



About Our Violation

In April 2021, we were required to begin sampling each of our treatment plant effluents for per- and polyfluoroalkyl substances (PFAS). We learned that both the Mill Pond and Vine Brook treatment plants exceeded the DEP MCL of 20 parts per trillion for PFAS6. We were issued a Notice of Noncompliance for this exceedance. We immediately opened our emergency connection to the MWRA through Lexington, significantly reduced the operations at the Vine Brook plant, and developed a plan to install filtration at the Mill Pond plant for PFAS6 removal. We also continue to work diligently on our next phase of constructing a water main connected to the MWRA, which will provide a volume of drinking water large enough for us to close the Vine Brook plant permanently. We expect both of these significant projects to be completed by the end of 2022. Water customers will continue to receive a quarterly Public Education/Public Notice until our drinking water contains no PFAS6 above the laboratory detection limit.

In April of 2021 we began sampling and analysis for PFAS compounds. Unfortunately, PFAS compounds were detected in the drinking water produced at both of our treatment plants. After our May 2021 analysis results were received and confirmed, we were issued a Notice of Non-compliance from MassDEP for exceeding the 20 part per trillion MCL for PFAS6 in drinking water.

In an effort to provide our residents with PFAS-free drinking water, in mid-May 2021, we began taking approximately 1 million gallons of water per day from our current connection to the MWRA through Lexington. We have begun construction of a new filter building to remove PFAS at our Mill Pond Plant. We have also begun construction of a larger water main to connect to the MWRA, which will provide us with a volume of drinking water large enough to enable us to permanently shut down the Vine Brook Groundwater Treatment Plant. Both of these important projects are projected to be completed by the end of 2022.

Some people who drink water containing these PFAS in excess of the MCL may experience certain adverse effects. These could include effects on the liver, blood, immune system, thyroid, and fetal development. These PFAS may also elevate the risk of certain cancers.

Substances That Could Be in Water

To ensure that tap water is safe to drink, the Massachusetts Department of Environmental Protection (DEP) and the U.S. Environmental Protection Agency (U.S. EPA) prescribe regulations limiting the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) and Massachusetts Department of Public Health (DPH) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily indicate that the water poses a health risk.

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. 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 which 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.

More information about contaminants and potential health effects can be obtained by calling the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Assessment Update

Coliforms are bacteria that are naturally present in the environment and 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. We found coliforms from samples collected during May 2021, indicating the need to look for potential problems in the water treatment process or distribution system. When this occurs, we are required to conduct an assessment to identify problems and correct any problems that were found during the assessment.

During 2021 we were required to conduct one Level 1 assessment, which was completed in June 2021. In addition, we were required to assess our sampling procedures and distribution system, and we completed all of these actions.

E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We found *E. coli* bacteria, 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 correct any problems that were found during these assessments.

We were required to complete a Level 2 assessment because our contracted laboratory found *E. coli* in samples collected in June 2021. A boil water order was issued by DEP, and we collected 37 repeat samples from our distribution system, storage tanks, and treatment plant effluents. These 37 samples were analyzed at an MWRA laboratory and found to be absent of any bacterial contamination. We hired an independent third-party consultant to complete our Level 2 assessment, and it was found that laboratory error was the reason for the false positive bacterial analyses found in the first round of samples. DEP lifted our boil water order upon learning of the repeat analysis results. To avoid this situation going forward, we have moved our coliform analysis to the MWRA lab permanently.



Where Does My Water Come From?

The sources for our treatment facilities are the Shawsheen River and the Vine Brook Aquifer. We produced about 773.931 million gallons of drinking water in 2021. The daily average was 2.871 million gallons, with the highest single-day usage just over 5 million gallons.

Groundwater Sources

We utilize four wells located in the Vine Brook Aquifer.

Surface Water Source

The Mill Pond Plant source water is the Mill Pond Reservoir. Our reservoir holds 513 million gallons when full. Water is pumped from the Shawsheen River to fill the reservoir when river flow is sufficient for us to do so.

We also purchased 273.61 million gallons of water from the Massachusetts Water Resources Authority (MWRA) in 2021 through our connection with the Town of Lexington.

Test Results

Our water is monitored for many different kinds of substances on a very strict sampling schedule. The water we deliver must meet specific health standards. Here, we only show those substances that were detected in our water (a complete list of all our analytical results is available upon request). Remember that detecting a substance does not mean the water is unsafe to drink; 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									
				Town of Burlington, Department of Public Works		MWRA			
Substance (Unit of Measure)	Year Sampled	MCL [MRDL]	MCLG [MRDLG]	Amount Detected	Range Low-High	Amount Detected	Range Low-High	Violation	Typical Source
Barium (ppm)	2021	2	2	NA	NA	0.01	0.008–0.01	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chloramines (ppm)	2021	[4]	[4]	2.91	1.77–2.91	4	ND–4	No	Disinfectant used in drinking water treatment process
Chlorine (ppm)	2021	[4]	[4]	2.55	1.72–2.55	NA	NA	No	Disinfectant to control bacteriological growth
Fluoride (ppm)	2021	4	4	1.03	0.01–1.03	0.81	0.24–0.81	No	Water additive which promotes strong teeth; Naturally occurring
Haloacetic Acids [HAAs]–Stage 2 (ppb)	2021	60	NA	36	7.3–36	30.2	3.7–30.2	No	By-product of drinking water disinfection
Nitrate (ppm)	2021	10	10	0.82	0.13–0.82	0.83	0.05–0.83	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
PFAS6 (ppt)	2021	20	NA	53.8	32.1–53.8	NA	NA	Yes	Industrial and manufacturing sources associated with moisture- and oil-resistant coatings on fabrics and other materials; Firefighting foams
Total Organic Carbon (ppm)	2021	TT ¹	NA	2.5	2.1–2.5	NA	NA	No	Naturally present in the environment
TTHMs [total trihalomethanes]–Stage 2 (ppb)	2021	80	NA	78	19–78	34.8	6–34.8	No	By-product of drinking water disinfection
Turbidity ² (NTU)	2021	TT	NA	0.119	0.020–0.119	0.61	0.15–0.61	No	Soil runoff
Turbidity (lowest monthly percent of samples meeting limit)	2021	TT = 95% of samples meet the limit	NA	100	NA	NA	NA	No	Soil runoff

Tap water samples were collected for lead and copper analyses from sample sites throughout the community

Substance (Unit of Measure)	Year Sampled	AL	MCLG	Amount Detected (90th %ile)	Sites Above AL/Total Sites	Violation	Typical Source
Copper (ppm)	2021	1.3	1.3	0.025	0/34	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2021	15	0	ND	0/34	No	Corrosion of household plumbing systems; Erosion of natural deposits

Secondary Substances

				Town of Burlington, Department of Public Works		MWRA			
Substance (Unit of Measure)	Year Sampled	SMCL	MCLG	Amount Detected	Range Low-High	Amount Detected	Range Low-High	Violation	Typical Source
Chloride (ppm)	2021	250	NA	410	170–410	NA	NA	No	Runoff/leaching from natural deposits
Iron (ppb)	2021	300	NA	29	ND–30	NA	NA	No	Leaching from natural deposits; Industrial wastes
Manganese ³ (ppb)	2021	50	NA	120	ND–47,000	NA	NA	No	Leaching from natural deposits
Total Dissolved Solids [TDS] (ppm)	2021	500	NA	850	330–850	NA	NA	No	Runoff/leaching from natural deposits

UNREGULATED SUBSTANCES⁴

		Town of Burlington, Department of Public Works		MWRA		
Substance (Unit of Measure)	Year Sampled	Amount Detected	Range Low-High	Amount Detected	Range Low-High	Typical Source
1,4-Dioxane (ppb)	2021	0.19 ⁵	0.12–0.19 ⁵	NA	NA	Stabilizers, chlorinated solvents, and paint strippers

¹The value reported under Amount Detected for TOC is the lowest ratio between percentage of TOC actually removed and the percentage of TOC required to be removed. A value of greater than 1 indicates that the water system is in compliance with TOC removal requirements. A value of less than 1 indicates a violation of the TOC removal requirements.

²Turbidity is a measure of the cloudiness of the water. It is monitored because it is a good indicator of water quality and the effectiveness of disinfectants.

³Manganese is a naturally occurring mineral found in rocks, soil, groundwater, and surface water. Manganese is necessary for proper nutrition and part of a healthy diet, but it can have undesirable effects on certain sensitive populations at elevated concentrations. U.S. EPA and DEP have established public health advisory levels for manganese to protect against concerns of potential neurological effects.

⁴Unregulated contaminants are those for which the U.S. EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist U.S. EPA in determining their occurrence in drinking water and whether future regulation is warranted.

⁵This data comes from monthly analysis of the Vine Brook finished water. The DEP MCL is 0.3 ppb.

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 we 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 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 at (800) 426-4791 or online at epa.gov/safewater/lead.

Definitions

90th %ile: Out of every 10 homes sampled, 9 were at or below this level. This number is compared to the Action Level to determine lead and copper compliance.

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

Level 1 Assessment: A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.

Level 2 Assessment: A Level 2 assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an *E. coli* MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.

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 (Not detected): 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.

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).

ppt (parts per trillion): One part substance per trillion parts water (or nanograms per liter).

SMCL (Secondary Maximum Contaminant Level): These standards are developed to protect aesthetic qualities of drinking water and are not health based.

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