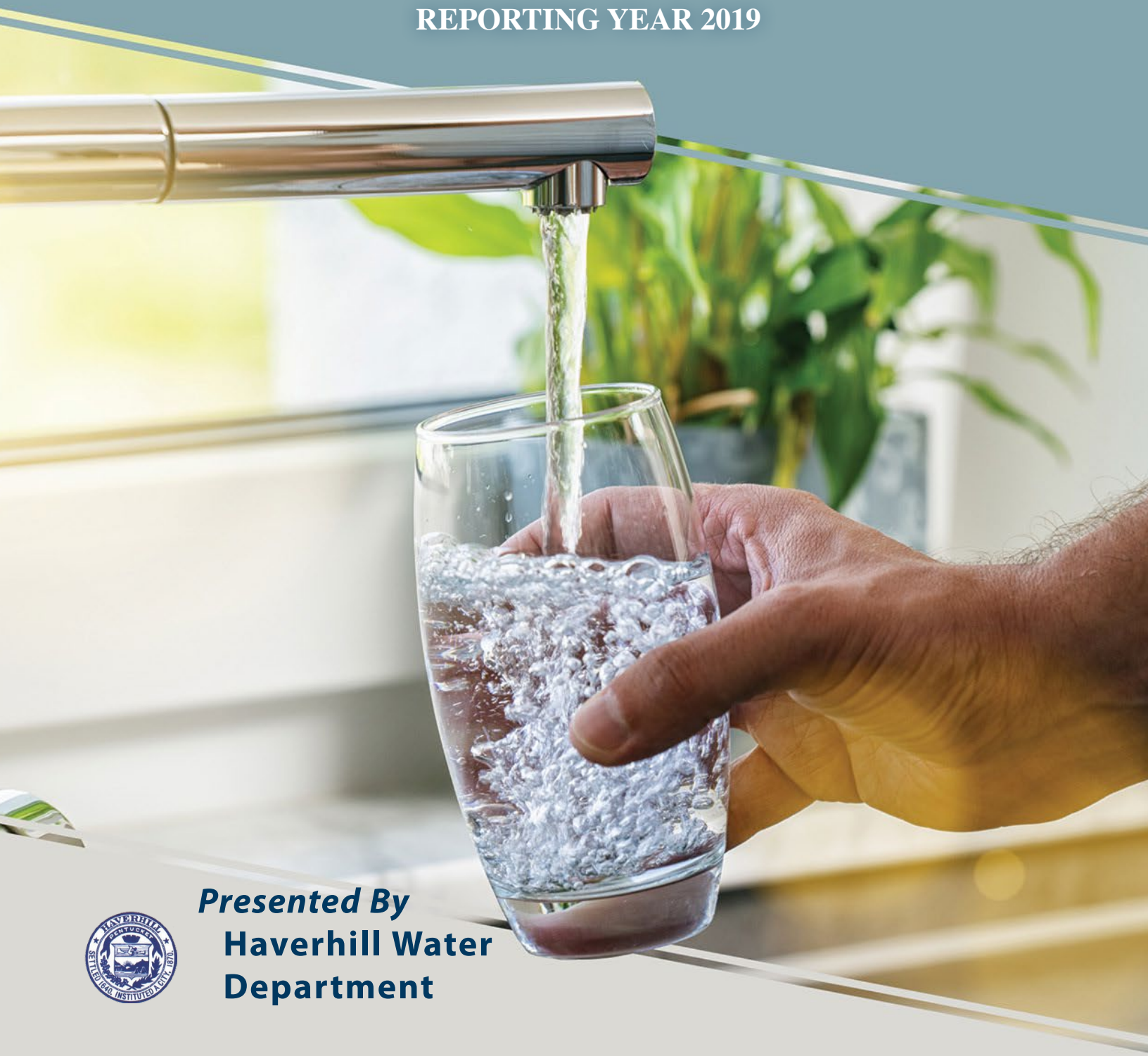
ANNUAL WATER QUALITY REPORT

REPORTING YEAR 2019



Presented By

Haverhill Water Department

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

PWS ID#: 3128000

Our Mission Continues

We are once again pleased to present our annual water quality report covering all testing performed between January 1 and December 31, 2019. Over the years, we have dedicated ourselves to producing drinking water that meets all state and federal standards. We continually strive to adopt new methods for delivering the best-quality drinking water to you. As new challenges to drinking water safety emerge, we remain vigilant in meeting the goals of source water protection, water conservation, and community education while continuing to serve the needs of all our water users.

Please remember that we are always available should you ever have any questions or concerns about your water.

For more information about this report, or for any questions relating to your drinking water, please call Mary D'Aoust, Water Treatment Plant Chemist, at (978) 374-2385. This report can be viewed at https://www.cityofhaverhill.com/departments/public_works_department/water_wastewater/water/water_treatment_plant/index.php.

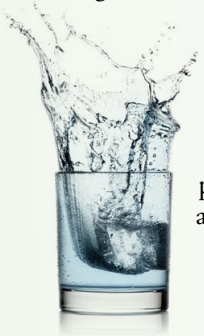
The Benefits of Fluoridation

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.

Source Water Assessment

A Source Water Assessment Plan (SWAP) is available at the water treatment plant. This plan is an assessment of the delineated area around our listed sources through which contaminants, if present, could migrate and reach our source water. It also includes an inventory of potential sources of contamination within the delineated area and a determination of the water supply's susceptibility to contamination by the identified potential sources.

This report assesses activities on our watershed and identifies potential pollution hazards. These potential hazards, if handled properly, would not pose a threat to our water supplies. These hazards fall in the following categories: fertilizer storage, livestock operations, manure storage/spreading, nurseries, pesticide storage/use, auto repair and body shops, bus and truck terminals, cemeteries, golf courses, junk/salvage yards, nursing homes, repair shops, sand and gravel mining/washing, fuel oil storage, lawn care/gardening, septic systems, aquatic wildlife, combined sewer overflows, composting facilities, fishing/boating, land application of sewage sludge, schools, colleges/universities, snow dump, stormwater drains/retention basins, and underground storage tanks. One or more of these hazards can be found on all of Haverhill's water sources. A water department employee checks these areas weekly to identify any violations.



If you would like to view this report, please contact the water treatment plant at (978) 374-2385.

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.

Water Sources

Our drinking water comes from combined water sources, all of which are surface water, or aboveground supplies. In Haverhill our sources are lakes, ponds, and a man-made reservoir. Water is pumped, as needed, from Millvale Reservoir and Crystal Lake into Kenoza Lake, where the Haverhill Water Treatment Plant is located. Water from Round Pond and Winnekenni Basin overflows into Kenoza Lake and is also part of our drinking water system. These combined waters are then pumped from Kenoza Lake into the water treatment plant.

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 at www.epa.gov/safewater/lead or contact the Haverhill Water Department at (978) 374-2368.

Substances That Could Be in Water

To ensure that tap water is safe to drink, the 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.

> We remain vigilant in delivering the best-quality drinking water

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.

Year in Review

In 2018 construction began on a new water pumping station on North Broadway at the Crystal Springs Golf Club. This pump station was completed and put online in December 2019.

In 2017 the Haverhill Water Department broke ground on a three-year construction project to update and renovate its water treatment plant. The updated processes will ensure that Haverhill's water quality will continue to meet and exceed Safe Drinking Water Act standards for generations to come.

In 2019 more new processes went online. First, two additional dissolved air flotation (DAF) clarifiers and sand filters are now in use. The plant now has four treatment trains that can be used to provide the highest quality for Haverhill's highest water demands. The DAF process has now completely replaced the older mechanical and gravity clarification process. Solids are removed from the treated water as they float up on air-saturated processed water, which is then collected and sent to the sewer system. DAFs are able to achieve this clarification in a much smaller footprint than the prior method, allowing room for the addition of more filters to the plant.

Second, a new contact chamber for disinfection is now online, along with completed updates to the old chamber. This will allow water to have longer contact time with the chlorine before it is sent out to the customer. That longer contact time means that chlorine doses can now be lower and still maintain maximum disinfection.

More updates to the city's water distribution system have been completed. The Haverhill Water System is one of the oldest in the Commonwealth, dating back to 1798. The city continues with its program to replace the aging water infrastructure with ongoing projects throughout the city to install new, larger water mains to replace old mains, some of them over 100 years old. Some of the pipes and valves being replaced in the current construction were installed in the early 1890s.

Test Results

Our water is monitored for many different kinds of substances on a very strict sampling schedule, and 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

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Barium (ppm)	2019	2	2	0.005	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chlorine (ppm)	2019	[4]	[4]	1.69	0.54–2.10	No	Water additive used to control microbes
Fluoride (ppm)	2019	4	4	0.85	0.02–1.10	No	Water additive that promotes strong teeth
Haloacetic Acids [HAAs] (ppb)	2019	60	NA	23.3	8.5–32	No	By-product of drinking water disinfection
Nitrate (ppm)	2019	10	10	0.069	NA	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Perchlorate (ppb)	2019	2	NA	0.08	NA	No	Inorganic chemicals used as oxidizers in solid propellants for rockets, missiles, fireworks, and explosives
Total Organic Carbon [TOC] (ppm)	2019	TT[1]	NA	2.0	1.6–2.4	No	Naturally present in the environment
TTHMs [Total Trihalomethanes] (ppb)	2019	80	NA	60.4	33–73	No	By-product of drinking water disinfection
Turbidity[2] (NTU)	2019	TT	NA	0.32	0.03–0.32	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2019	TT = 95% of samples meet the limit	NA	100	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)	2017	1.3	1.3	0.07	0/32	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2017	15	0	3.0	1/32	No	Lead service lines; Corrosion of household plumbing systems, including fittings and fixtures; Erosion of natural deposits

SECONDARY SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Manganese (ppb)	2019	50	NA	10	NA	No	Leaching from natural deposits
pH (Units)	2019	6.5–8.5	NA	7.4	7.37–8.13	No	Naturally occurring
Total Dissolved Solids [TDS] (ppm)	2019	500	NA	216	NA	No	Runoff/leaching from natural deposits
Zinc (ppm)	2019	5	NA	0.674	NA	No	Runoff/leaching from natural deposits; Industrial wastes

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.

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

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).

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.

UNREGULATED AND OTHER SUBSTANCES [3]				
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Alkalinity (ppm)	2019	48	NA	Naturally occurring
Chlorate (ppb)	2019	160	45–220	By-product of drinking water disinfection
Sulfate (ppm)	2019	20	NA	Runoff/leaching from natural deposits, Industrial waste

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

[2] 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.

[3] Unregulated 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.

Water Treatment Process

The water treatment plant is a conventional filtration plant, which includes coagulation, flocculation, and clarification. The treated water then goes through a two-stage (sand, then granular activated carbon) filtration process. After filtration it is fluoridated, then disinfected with sodium hypochlorite before it is pumped into the distribution system. Last year, the water treatment plant processed 1.9 billion gallons of water. In 2019 new processes went online, which are described in our Year in Review section.

The distribution system is made up of three storage tanks with a capacity of 17 million gallons, twelve pumping stations, and approximately 300 miles of water main.

What's a Cross-Connection?

Cross-connections that contaminate drinking water distribution lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment (boilers), systems containing chemicals (air-conditioning systems, fire sprinkler systems, irrigation systems), or water sources of questionable quality. Cross-connection contamination can occur when the pressure in the equipment or system is greater than the pressure inside the drinking water line (back pressure). Contamination can also occur when the pressure in the drinking water line drops due to fairly routine occurrences (main breaks, heavy water demand), causing contaminants to be sucked out from the equipment and into the drinking water line (back siphonage).

Outside water taps and garden hoses tend to be the most common sources of cross-connection contamination at home. The garden hose creates a hazard when submerged in a swimming pool or when attached to a chemical sprayer for weed killing. Garden hoses that are left lying on the ground may be contaminated by fertilizers, cesspools, or garden chemicals. Improperly installed valves in your toilet could also be a source of cross-connection contamination.

Community water supplies are continuously jeopardized by cross-connections unless appropriate valves, known as backflow prevention devices, are installed and maintained. We have surveyed industrial, commercial, and institutional facilities in the service area to make sure that potential cross-connections are identified and eliminated or protected by a backflow preventer. We also inspect and test backflow preventers to make sure that they provide maximum protection.

For more information on backflow prevention, contact the Safe Drinking Water Hotline at (800) 426-4791 or contact the Haverhill Water Department at (978) 374-2375.

Contact Telephone Numbers

Backflow/Cross-Connections	(978) 374-2375
Water Billing	(978) 374-2370
Water Maintenance	(978) 374-2368
Water Meters	(978) 373-8487
Water Treatment	(978) 374-2385

Additional Monitoring

Due to an elevated level found during the Unregulated Contaminant Monitoring Rule 3 (UCMR3) sampling period, the Haverhill Water Department decided to continue testing for chlorate monthly. Chlorate is a contaminant associated with the product Haverhill uses to disinfect the treated water. The product, sodium hypochlorite, breaks down over time due to light and heat and produces chlorate. Haverhill has taken steps to reduce chlorate formation in its sodium hypochlorite storage area. The chlorate results for 2019 are included in this report.