

# ANNUAL WATER QUALITY REPORT

REPORTING YEAR 2020



*Presented By*  
**Haverhill Water Department**

## Quality First

Once again, we are pleased to present our annual water quality report covering all testing performed between January 1 and December 31, 2020. As in years past, we are committed to delivering the best-quality drinking water possible. To that end, we remain vigilant in meeting the challenges of new regulations, source water protection, water conservation, and community outreach and education while continuing to serve the needs of all our water users. Thank you for allowing us the opportunity to serve you and your family.

We encourage you to share your thoughts with us on the information contained in this report. After all, well-informed customers are our best allies.

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.

## Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as those with cancer undergoing chemotherapy, those 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>.

## 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 parts 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.



## Year in Review 2020

The Water Treatment Plant's upgrades and renovations were completed. Construction began in 2017, and all processes have been upgraded to assure the production of safe drinking water for today and for Haverhill's future needs.

Improvements were made in all chemical treatment areas, and four more filters were added. A second chlorine contact chamber was constructed, and the existing chamber was retrofitted with baffling, which almost doubled storage and disinfection contact time. New dissolved air flotation clarifiers were installed, replacing the old mechanical system.

The electrical service to the plant was completely upgraded and a new emergency generator was installed. New pumps and motors were installed on the raw water intake and finished water pump system to increase efficiency and output to meet the city's water needs. Lastly, the administration area and laboratory were also redesigned and updated.

In 2020, the city's water maintenance and distribution department, along with private contractors, added 3.5 miles of new water main. Some of that was new main that replaced old cast iron pipes. As these older mains were replaced, 38 lead service lines were removed and replaced with new water services.

The Water Department completed a system-wide leak detection survey in October of 2020. Only minor leaks were detected, and all have been repaired.

All three of Haverhill's finished water storage tanks were inspected and cleaned in 2020.

Haverhill contracted a new payment system, Invoice Cloud, in 2020 and began using their services in early 2021. Our customers now have more payment options and better access to Haverhill's billing system. Customers can pay their bills electronically, 24/7, at [www.cityofhaverhill.com](http://www.cityofhaverhill.com). There is no registration required for a one-time payment and you can also pay your bill by telephone at (844) 941-1605. You can find more information on billing at the Billing Office's Web page: [https://www.cityofhaverhill.com/departments/public\\_works\\_department/water\\_wastewater/billing\\_office/index.php](https://www.cityofhaverhill.com/departments/public_works_department/water_wastewater/billing_office/index.php)

In the latter part of 2020, we received some calls from residents saying there was a taste of chlorine in the water. Haverhill uses chlorine to disinfect the water in the water treatment plant before delivering water to our consumers. Chlorine is also used to disinfect new water mains and treatment plant equipment before putting them in service. Chlorine is added only in an amount necessary to ensure Haverhill's drinking water supply remains free from bacteria and meets all other disinfection regulations. It is a requirement that a chlorine residual must be detected throughout our water distribution system.

Recent improvements made at the water treatment plant and in the water distribution system have resulted in improved water quality, lower chlorine demand, and lower water age. The chlorine residuals now remain at more consistent levels in the system. The chlorination process is monitored continuously at the water treatment plant and tested in numerous sites throughout the city. The remaining level of chlorine present in the water is safe to drink and is well below the maximum residual disinfectant level.

## 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 that 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 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.

## 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 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 at (800) 426-4791 or at [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).

## Water Source

Our drinking water comes from combined water sources, all of which are surface water. Surface water means that all our water comes from above-ground 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 are also part of our drinking water system. These combined waters are then pumped from Kenoza Lake into the water treatment plant.



## Test Results

Our water is monitored for many different kinds of substances on a very strict sampling schedule. Also, the water we deliver must meet specific health standards. Here, we show only 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 often 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.

**Haverhill received a Notice of Noncompliance (NON) from the Massachusetts Department of Environmental Protection (MassDEP) regarding the lead and copper sampling plan monitoring for 2020. During the summer, the Haverhill Water Department completed a round of Lead and Copper Monitoring. As part of this monitoring, water systems are required to submit a sampling plan before the samples are taken. This plan must include the 30 customer addresses where the homeowners have agreed to participate and also include alternative sites. Haverhill did not have the plan approved before sampling began. We erroneously believed that the 2017 plan could be used and amended if alternative sites were needed. All sample sites used met regulation requirements and were eventually approved. Samples were taken and analyzed, and the results are included in this report. For the next monitoring period in 2023, a complete sample plan will be approved before sampling begins.**

We participated in the 4th stage of the U.S. EPA's Unregulated Contaminant Monitoring Rule (UCMR4) program by performing additional tests on our drinking water. UCMR4 sampling benefits the environment and public health by providing the EPA with data on the occurrence of contaminants suspected to be in drinking water, in order to determine if the EPA needs to introduce new regulatory standards to improve drinking water quality. Unregulated contaminant monitoring data are available to the public, so please feel free to contact us if you are interested in obtaining that information. If you would like more information on the U.S. EPA's Unregulated Contaminant Monitoring Rule, please call the Safe Drinking Water Hotline at (800) 426-4791.

REGULATED SUBSTANCES							
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Barium (ppm)	2020	2	2	0.008	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chlorine (ppm)	2020	[4]	[4]	1.27	0.44–1.95	No	Water additive used to control microbes
Fluoride (ppm)	2020	4	4	0.67	0.04–1.18	No	Water additive that promotes strong teeth
Haloacetic Acids [HAAs] (ppb)	2020	60	NA	18.5	3.9–24	No	By-product of drinking water disinfection
TTHMs [Total Trihalomethanes] (ppb)	2020	80	NA	51.6	10–64	No	By-product of drinking water disinfection
Total Organic Carbon <sup>1</sup> (ppm)	2020	TT	NA	1.46	0.4–2.1	No	Naturally present in the environment
Turbidity <sup>2</sup> (NTU)	2020	TT	NA	0.25	0.04–0.25	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2020	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)	2020	1.3	1.3	0.051	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2020	15	0	2.0	0/30	No	Lead services 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)	2020	50	NA	14	NA	No	Leaching from natural deposits
pH (Units)	2020	6.5–8.5	NA	6.9	6.9–8.13	No	Naturally occurring
Total Dissolved Solids [TDS] (ppm)	2020	500	NA	136	NA	No	Runoff/leaching from natural deposits
Zinc (ppm)	2020	5	NA	0.657	NA	No	Runoff/leaching from natural deposits; Industrial wastes

## UNREGULATED CONTAMINANT MONITORING RULE - PART 4 (UCMR4)<sup>3</sup>

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Bromide (ppb)	2020	33.25	25–51	Naturally occurring
HAA6Br (ppb)	2020	7.59	2.40–10.13	By-product of drinking water disinfection
HAA9 (ppb)	2020	20.23	3.99–32.02	By-product of drinking water disinfection
Manganese (ppb)	2020	9.9	8.0–12.0	Naturally occurring
Total Organic Carbon [TOC] (ppm)	2020	3.93	3.4–4.2	Naturally occurring

## UNREGULATED AND OTHER SUBSTANCES<sup>3</sup>

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Alkalinity (ppm)	2020	26	NA	Naturally occurring
Chlorate (ppb)	2020	140.7	98–190	By-product of drinking water disinfection
Sulfate (ppm)	2020	22	NA	Runoff/leaching from natural deposits; Industrial waste

<sup>1</sup>The value reported under Amount Detected for TOC is the lowest ratio between the percentage of TOC actually removed to 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.

<sup>2</sup>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.

<sup>3</sup>Unregulated contaminants are those for which the U.S. EPA has not established drinking water standards. The purpose of monitoring unregulated contaminants is to assist the EPA in determining their occurrence in drinking water and whether future regulation is warranted.

## 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 that, if exceeded, triggers treatment or other requirements that 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.

## Treatment Train Description

The Haverhill Water Treatment Plant is a conventional filtration plant, which includes coagulation, flocculation, and clarification. The clarified, treated water then goes through a two-stage (sand and then granular activated carbon) filtration process. After filtration, it is fluoridated, and 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.

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

In 2020, construction was completed on the water treatment plant. New processes went online which are described in our Year in Review article.

## 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, school, colleges/universities, snow dump, stormwater drains/retention basins, and underground storage tanks. One or all 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.

## 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 (backpressure). 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 (backsiphonage).

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.