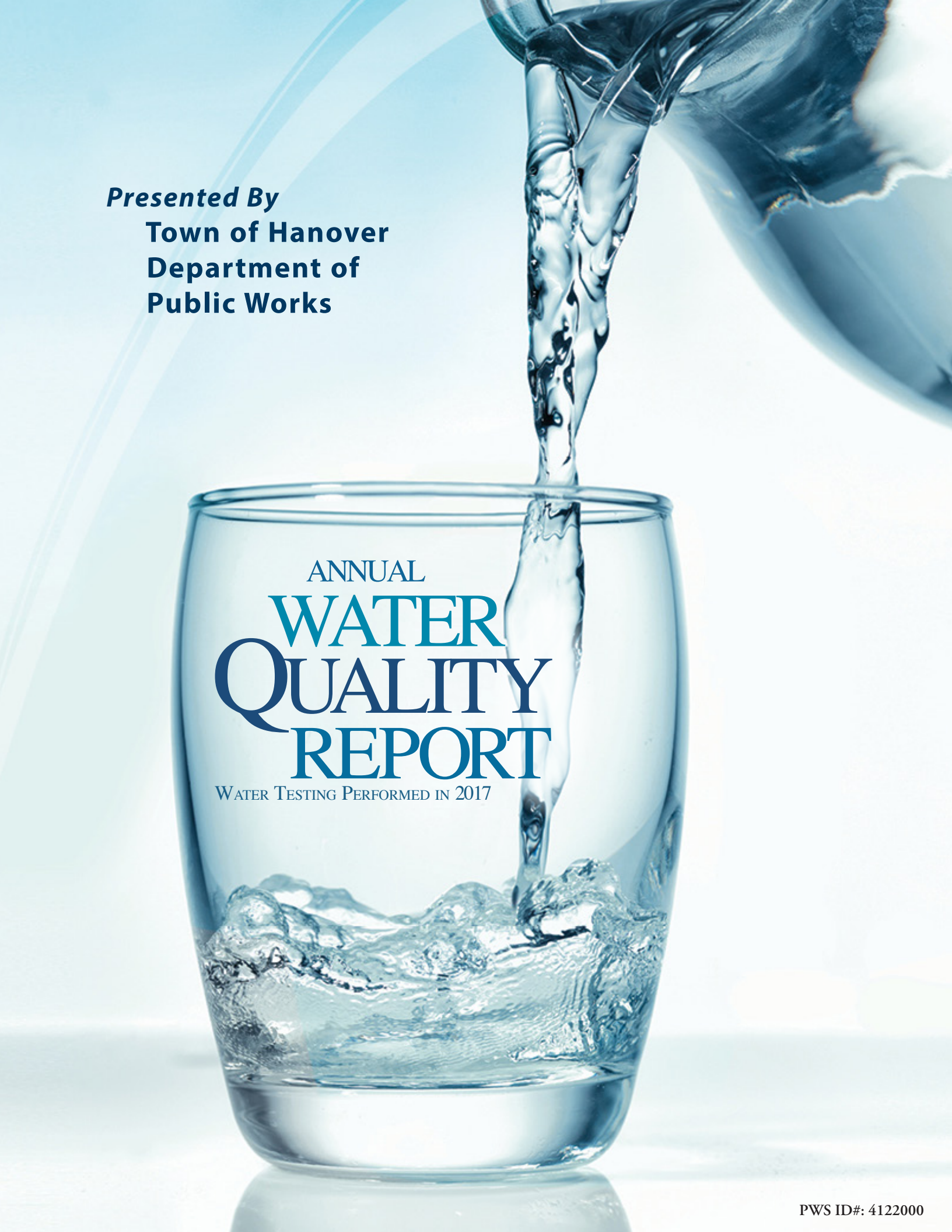


*Presented By*

**Town of Hanover**
**Department of**
**Public Works**

# ANNUAL WATER QUALITY REPORT

WATER TESTING PERFORMED IN 2017

PWS ID#: 4122000

## Quality First

Once again we are pleased to present our annual water quality report. 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 of our water users. Thank you for allowing us the opportunity to serve you and your family.

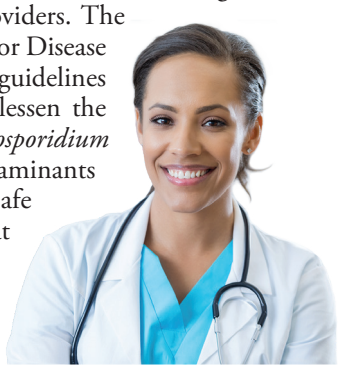
We encourage you to share your thoughts with us on the information contained in this report. After all, well-informed customers are our best allies.

## Where Does My Water Come From?

The Town of Hanover's water supply comes from nine groundwater sources. The Pond Street Water Treatment Plant draws water from three groundwater wells (Pond Street Well #1, Pond Street Well #2, and Pond Street Well #3); the Beal Water Treatment Plant draws water from two groundwater wells (Beal Well #1 and Beal Well #2), and the Broadway Water Treatment Plant draws water from four groundwater wells (Broadway Well #1, Broadway Well #2, Hanover Well #1, and Hanover Well #2). Combined, our treatment facilities provide roughly 500 million gallons of clean drinking water every year.

## 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.



## ACO Update

The Town of Hanover entered into an Administrative Consent Order (ACO) with DEP on July 2, 2015, due to our failure to meet the EPA standard of 80 parts per billion (ppb) for total trihalomethanes (TTHMs) in June and September of 2015. TTHMs are generally referred to as disinfection by-products. They result from the reaction of chlorine with organic matter present in the water being treated. Please note that, since September 2015, we have been in compliance with the TTHMs limit through the use of best management practices.

The ACO required that a permanent solution to this problem be in place within two (2) years of the effective date of the Consent Order. On October 29, 2015, our engineering firm, Weston & Sampson of Peabody, Massachusetts, submitted to DEP our Action Plan to address the elevated levels of TTHMs. This plan called for the conversion from chlorine to chloramines at all three treatment plants. Chloramines produce lower levels of TTHMs than chlorine and still provide the disinfectant properties of chlorine. They have been used by water utilities since the 1930s with more than one in five Americans drinking water treated with chloramines. For more information on the use of chloramines in drinking water, please visit the EPA Web site at: https://www.epa.gov/dwreginfo/chloramines-drinking-water.

There were delays in getting DEP approval of the original Action Plan. An updated Action Plan was submitted to DEP on July 16, 2017, and approved on March 20, 2018. As a result of these delays, we have requested an extension of the ACO deadline to December 31, 2019. We have yet to receive this extension but feel confident that it will be granted. Construction at the three treatment plants is expected to begin in the Fall of 2018.

## Radon

Radon is a radioactive gas that you cannot see, taste, or smell. It is found throughout the U.S. Radon can move up through the ground and into a home through cracks and holes in the foundation. Radon can build up to high levels in all types of homes. Radon can also get into indoor air when released from tap water used for showering, washing dishes, and other household activities. Compared to radon entering the home through soil, radon entering the home through tap water will in most cases be a small source of radon in indoor air. Radon is a known human carcinogen. Breathing air containing radon can lead to lung cancer. Drinking water containing radon may also cause increased risk of stomach cancer. If you are concerned about radon in your home, test the air in your home. Testing is inexpensive and easy. You should pursue radon removal for your home if the level of radon in your air is 4 pCi/L or higher. There are simple ways to fix a radon problem that are not too costly. For additional information, call your state radon program or call the U.S. EPA's Radon Hotline at (800) SOS-RADON.

## Source Water Assessment

A Source Water Assessment Plan (SWAP) is available at our office. 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.

Hanover's wells are located in aquifers with high vulnerability to contamination due to the absence of hydrogeologic barriers (e.g., clay) that can prevent contaminant migration. As a result, Hanover's sources are considered highly susceptible to contamination from a variety of sources such as petroleum products, industrial solvents, fertilizers, and microbial contaminants. Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area and does not imply poor water quality.

In November of 2015, gasoline constituents were detected in the soil and groundwater at 831 Washington Street. The site is currently used as an automobile repair facility. However, it was at one time used as a gasoline filling station, and it is likely that this contamination is due to the former on-site gasoline tanks and a dispenser, which were removed from the property in 1985. This contamination is located approximately 1,500 feet south-southeast of Hanover Pond Street Well #1. We are pleased to report that the firm in charge of the clean-up (Irwin Engineers of Natick, Massachusetts) has concluded that the down gradient extent toward the supply wells appears to be limited to the site and does not extend north of Rawson Road. In addition, we routinely monitor our finished water for volatile organic compounds, and we have not detected any gasoline constituents in the Pond Street finished water. If you wish to review the site files at DEP, you can do so online by visiting the Web site https://eeaonline.eea.state.ma.us/portal#!/search/wastesite. Search for Tracking Number (RTN) 4-25884. Please contact this office if you have additional questions.

> "Water treatment is a complex, time-consuming process."

### What Residents Can Do to Protect Your Drinking Water Supplies

- Never dispose of household hazardous waste into your septic system.
- Participate in household hazardous waste collection days for used oil, antifreeze, paints, and other chemicals.
- Apply pesticides and fertilizers minimally and properly. More information on environmentally sound lawn care is available at http://www.mass.gov/eea/agencies/massdep/water/watersheds/lawns-and-landscapes-in-your-watershed.html.

## 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, call the Safe Drinking Water Hotline at (800) 426-4791.

## QUESTIONS?

For more information about this report, or for any questions relating to your drinking water, please call Neal Merritt, Deputy Superintendent of Public Works (Water Operations), at (781) 826-3189.

## 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 or at www.epa.gov/lead.

## 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.

## Test Results

The water quality information presented in the following tables is from the most recent round of testing done in accordance with the very strict sampling schedule. Most of the data presented is from testing done between January 1 and December 31, 2017. We monitor for some substances less often than once a year because their concentrations are not expected to vary significantly from year to year. As a result, some of our data, though representative, is more than a year old. For each of those substances, the date of the most recent sample is shown in the table.

We participated in the 3rd stage of the U.S. EPA's Unregulated Contaminant Monitoring Rule (UCMR3) program by performing additional tests on our drinking water. UCMR3 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. Contact us for more information on this program.

### REGULATED SUBSTANCES

| SUBSTANCE (UNIT OF MEASURE) | YEAR SAMPLED | MCL [MRDL] | MCLG [MRDLG] | AMOUNT DETECTED | RANGE LOW-HIGH | VIOLATION | TYPICAL SOURCE |
|---|---|---|---|---|---|---|---|
| **Alpha Emitters** (pCi/L) | 2012 | 15 | 0 | 2.21 | 0.923–2.21 | No | Erosion of natural deposits |
| **Chlorine** (ppm) | 2017 | [4] | [4] | 0.19 | 0.01–0.95 | No | Water additive used to control microbes |
| **Combined Radium** (pCi/L) | 2015 | 5 | 0 | 1.90 | NA | No | Erosion of natural deposits |
| **Haloacetic Acids [HAAs]** (ppb) | 2017 | 60 | NA | 11 | ND–19 | No | By-product of drinking water disinfection |
| **Nitrate** (ppm) | 2017 | 10 | 10 | 1.13 | 0.49–1.13 | No | Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits |
| **Perchlorate** (ppb) | 2017 | 2 | NA | 0.21 | 0.15–0.21 | No | Inorganic chemicals used as oxidizers in solid propellants for rockets, missiles, fireworks, and explosives |
| **TTHMs [Total Trihalomethanes]** (ppb) | 2017 | 80 | NA | 76 | 6–95 | No | By-product of drinking water disinfection |

**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%TILE) | SITES ABOVE AL/TOTAL SITES | VIOLATION | TYPICAL SOURCE |
|---|---|---|---|---|---|---|---|
| **Copper** (ppm) | 2017 | 1.3 | 1.3 | 0.51 | 0/32 | No | Corrosion of household plumbing systems; Erosion of natural deposits |
| **Lead** (ppb) | 2017 | 15 | 0 | 6 | 0/32 | No | Corrosion of household plumbing systems; Erosion of natural deposits |

## Definitions

**90th Percentile:** 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.

**LRAA (Locational Running Annual Average):** The average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters. Amount Detected values for TTHMs and HAAs are reported as the highest LRAAs.

**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.

*continued...*

## SECONDARY SUBSTANCES

| SUBSTANCE (UNIT OF MEASURE) | YEAR SAMPLED | SMCL | MCLG | AMOUNT DETECTED | RANGE LOW-HIGH | VIOLATION | TYPICAL SOURCE |
|---|---|---|---|---|---|---|---|
| **Aluminum** (ppb) | 2017 | 200 | NA | 70 | 10–70 | No | Erosion of natural deposits; Residual from some surface water treatment processes |
| **Chloride** (ppm) | 2017 | 250 | NA | 134 | 104–134 | No | Runoff/leaching from natural deposits |
| **Color** (Units) | 2017 | 15 | NA | 10 | 5–10 | No | Naturally occurring organic materials |
| **Copper** (ppm) | 2017 | 1.0 | NA | 0.23 | 0.23–0.23 | No | Corrosion of household plumbing systems; Erosion of natural deposits |
| **Iron** (ppb) | 2017 | 300 | NA | 130 | 20–130 | No | Leaching from natural deposits; Industrial wastes |
| **Manganese** (ppb) | 2017 | 50 | NA | 50 | 19–50 | No | Leaching from natural deposits |
| **Odor** (TON) | 2017 | 3 | NA | 5 | 2–5 | No | Naturally occurring organic materials |
| **pH** (Units) | 2017 | 6.5–8.5 | NA | 7.9 | 7.5–7.9 | No | Naturally occurring |
| **Sulfate** (ppm) | 2017 | 250 | NA | 119 | 25.9–119 | No | Runoff/leaching from natural deposits; Industrial wastes |
| **Total Dissolved Solids [TDS]** (ppm) | 2017 | 500 | NA | 540 | 290–540 | No | Runoff/leaching from natural deposits |
| **Zinc** (ppm) | 2017 | 5 | NA | 0.011 | 0.007–0.011 | No | Runoff/leaching from natural deposits; Industrial wastes |

## UNREGULATED SUBSTANCES [1]

| SUBSTANCE (UNIT OF MEASURE) | YEAR SAMPLED | AMOUNT DETECTED | RANGE LOW-HIGH | TYPICAL SOURCE |
|---|---|---|---|---|
| **Bromodichloromethane** (ppb) | 2017 | 34.3 | 0.7–34.3 | By-product of drinking water chorination |
| **Bromoform** (ppb) | 2017 | 11.5 | 1.0–11.5 | By-product of drinking water chlorination |
| **Chloroform** (ppb) | 2017 | 39.8 | 0.5–39.8 | By-product of drinking water chlorination |
| **Dibromochloromethane** (ppb) | 2017 | 34.9 | 2.1–34.9 | By-product of drinking water chlorination |
| **Sodium** [2] (ppm) | 2016 | 51.0 | 51.0–51.0 | Discharge from the use and improper storage of sodium-containing de-icing compounds |

[1] 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.

[2] The Massachusetts Department of Environmental Protection maintains a guideline level of 20 ppm for sodium.

## Definitions

**pCi/L (picocuries per liter):** A measure of radioactivity.

**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):** SMCLs are established to regulate the aesthetics of drinking water like appearance, taste and odor.

**TON (Threshold Odor Number):** A measure of odor in water.