ANNUAL WATER QUALITY REPORT

WATER TESTING PERFORMED IN 2018

Presented By
Chelmsford Water District

PWS ID#: 3056000

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, 2018. Over the years, we have dedicated ourselves to producing drinking water that meets or exceeds 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 any questions relating to your drinking water, please contact Todd Melanson at (978) 256-2381 or visit our website at www.chelmsfordwater.com.

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.

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.

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.

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.

Where Does My Water Come From?

Chelmsford Water District customers are fortunate because we enjoy an abundant water supply from 20 sources. The Chelmsford Water District draws water from the Merrimack and Concord River basins. Our reservoirs hold one of the state's largest capacities: 15.3 million gallons of water. Combined, our facilities provide roughly 1 billion gallons of clean drinking water each year. The Riverneck Road Treatment Plant was placed in service at the end of 2004 and has the capability of treating up to 3 million gallons of water per day. The Crooked Spring Treatment Plant was placed in service in the spring of 2007 and has the capability of treating up to 4 million gallons a day. The Smith Street Treatment Plant was refurbished and put back into service in the fall of 2012. To learn more about our watershed, visit www.epa.gov/surf.

Groundwater Sampling Update

On March 7, May 2, August 7, November 6, and December 5, we were informed that at least one of our routine bacteria samples from our untreated source water samples that were collected on March 6, May 1, August 6, November 5, and December 4 was positive for fecal contamination (E. coli). With the knowledge that the district's untreated source water is vulnerable to this type of contamination, and because of the enacting of the Ground Water Rule (GWR), the Chelmsford Water District has ensured that its treated water is and will remain safe through disinfection practices by being 4-log certified by state agencies as of February 24, 2010. The district maintains this certification on a day-to-day basis and reports this status to the state monthly. Because the district is in compliance with the GWR with respect to this certification, no other steps are required. The reporting of these positive results is for informational purposes only and is a regulatory requirement. At no time was the public's health at risk.

Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

Table Talk

Get the most out of the Testing Results data table with this simple suggestion. In less than a minute, you will know all there is to know about your water:

> For each substance listed, compare the value in the Amount Detected column against the value in the MCL (or AL, SMCL) column. If the Amount Detected value is smaller, your water meets the health and safety standards set for the substance.

Other Table Information Worth Noting

Verify that there were no violations of the state and/or federal standards in the Violation column. If there was a violation, you will see a detailed description of the event in this report.

If there is an ND or a less-than symbol (<), that means that the substance was not detected (i.e., below the detectable limits of the testing equipment).

The Range column displays the lowest and highest sample readings. If there is an NA showing, that means only a single sample was taken to test for the substance (assuming there is a reported value in the Amount Detected column).

If there is sufficient evidence to indicate from where the substance originates, it will be listed under Typical Source.

Level 1/2 Assessment Update

Coliforms are bacteria that are naturally present in the environment and are 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, 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 to correct any problems that were found during these assessments.

During the past year, we were required to conduct one Level 1 assessment, which was completed. In addition, we were required to take two corrective actions, and we completed those both of those actions.

How Is My Water Treated and Purified?

The Crooked Spring Treatment Plant went online in spring 2007. Nine of the district's wells are processed through this plant, including the four gravel-packed wells from the wellfield at Meadowbrook #3 pumping station that went online in November 2007. The raw water goes through an aeration tower to remove any potential volatile organic compounds, then through a greensand filtration system to remove high levels of iron and manganese before it enters the distribution system. This plant recycles the backwash discharged water to a lagoon, where it reenters the ground and becomes part of the aquifer.

Raw water is drawn from the other nine wells in the eastern area of the district and sent through the greensand filtration system at the Riverneck Road Treatment Plant to remove elevated levels of iron and manganese. The prefiltration process also incorporates an aeration tower to remove any potential volatile organic compounds from the raw water. The backwash water generated from the treatment process is stored in an on-site 100,000-gallon underground storage facility. The facility has the capability to pump all the backwash water to the nearby public sewer or recycle the water to the treatment plant.

The Smith Street Treatment Plant and wells, after being unused since 1999, were reopened in fall 2012 with DEP approval. The district refurbished the wells and retrofitted the treatment system. Raw water entering the Smith Street Treatment Plant is serviced by an aeration and membrane filtration system to remove iron and manganese. This plant and its wells allow for system relief during times of withdrawal stress and emergency backup for both the Crooked Spring and Riverneck Road Treatment Plants.

All of Chelmsford Water District's water is processed through state-of-the-art treatment, including disinfection and pH control. Faced with deteriorating water quality and increasing peak demands for water during daytime hours, the Board of Water Commissioners has made and kept the commitment to our customers to provide treatment for all the district's wells.

Source Water Assessment

The Source Water Assessment and Protection (SWAP) program assesses the susceptibility of public water supplies to potential contamination due to land uses and activity within the recharge areas. Established under the federal Safe Drinking Water Act, the program requires every state to inventory land uses within the recharge areas of all public water supply sources to assess the susceptibility of drinking water sources to contamination from these land uses and publicize the results to provide support for improved protection.

What Is My System's Ranking?

A susceptibility ranking of high was assigned to this system using the information collected during the assessment by the Massachusetts Department of Environmental Protection (DEP). It is important to understand that this susceptibility rating does not imply poor water quality, only the system's potential to become contaminated within the assessment area.

Where Can I See the SWAP Report?

The complete SWAP report is available at the Chelmsford Water District, the Chelmsford Board of Health, and online at https://www.mass.gov/files/documents/2019/02/22/swap-nero-with-inst.pdf. For more information, call the environmental compliance manager, Todd Melanson, at (978) 256-2931.

Community Participation

You are invited to participate in our public forum and voice your concerns about your drinking water. We meet the second Wednesday of each month at 1 p.m. at the Chelmsford Water District office, 20 Watershed Lane, Chelmsford, Massachusetts. Please check our website for monthly agenda.

Protecting Your Water

Bacteria are a natural and important part of our world. There are around 40 trillion bacteria living in each of us; without them, we would not be able to live healthy lives. Coliform bacteria are common in the environment and are generally not harmful themselves. The presence of this bacterial form in drinking water is a concern, however, because it indicates that the water may be contaminated with other organisms that can cause disease.

In 2016 the U.S. EPA passed a new regulation called the Revised Total Coliform Rule, which requires additional steps that water systems must take in order to ensure the integrity of the drinking water distribution system by monitoring for the presence of bacteria like total coliform and *E. coli*. The rule requires more stringent standards than the previous regulation, and it requires water systems that may be vulnerable to contamination to have procedures in place that will minimize the incidence of contamination. Water systems that exceed a specified frequency of total coliform occurrences are required to conduct an assessment of their system and correct any problems quickly. The U.S. EPA anticipates greater public health protection under the new regulation due to its more preventive approach to identifying and fixing problems that may affect public health.

Though we have been fortunate to have the highest-quality drinking water, our goal is to eliminate all potential pathways of contamination into our distribution system, and this new rule helps us to accomplish that goal.

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.

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. The information in the data tables shows only those substances that were detected between January 1 and December 31, 2018. Remember that detecting a substance does not necessarily 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.

We participated in the fourth 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 U.S. EPA with data on the occurrence of contaminants suspected to be in drinking water, in order to determine if U.S. 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 Contaminants 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
Arsenic (ppb)	2018	10	0	1	ND–1	No	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Barium (ppm)	2018	2	2	0.046	0.027–0.046	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Haloacetic Acids [HAA] (ppb)	2018	60	NA	29.5	0–22.7	No	By-product of drinking water disinfection
Hexachlorocyclopentadiene (ppb)	2016	50	50	0.29	ND–0.29	No	Discharge from chemical factories
Nitrate (ppm)	2018	10	10	0.87	0.14–0.87	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes] (ppb)	2018	80	NA	80	27.8–71.4	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 %ILE)	SITES ABOVE AL/ TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2018	1.3	1.3	0.150	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2018	15	0	8	2/30	No	Corrosion of household plumbing systems; Erosion of natural deposits

SECONDARY SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Chloride (ppm)	2018	250	NA	244	95.8–244	No	Runoff/leaching from natural deposits
Iron (ppb)	2018	300	NA	0.014	ND–0.014	No	Leaching from natural deposits; Industrial wastes
Manganese[1] (ppb)	2018	50	NA	162	6–162	No	Leaching from natural deposits

UNREGULATED SUBSTANCES [2]

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Bromodichloromethane (ppb)	2018	11.4	3.2–11.4	Chlorination by-product
Bromoform (ppb)	2018	0.8	ND–0.8	Chlorination by-product
Chloroform (ppb)	2018	24.0	2.1–24.0	Chlorination by-product
Dibromomethane (ppb)	2018	5.1	2.5–5.1	Chlorination by-product
Nickel (ppb)	2018	8	ND–8	Naturally occurring element
Sodium (ppm)	2018	96.3	49.6–96.3	Naturally occurring

UNREGULATED CONTAMINANT MONITORING RULE - PART 4 (UCMR4) [2]

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Bromide (ppb)	2018	101	51.2–101	By-product of drinking water disinfection
Bromochloroacetic Acid (ppb)	2018	3.8	ND–3.8	By-product of drinking water disinfection
Bromodichloroacetic Acid (ppb)	2018	2.6	ND–2.6	By-product of drinking water disinfection
Chlorodibromoacetic Acid (ppb)	2018	0.99	ND–0.99	By-product of drinking water disinfection
Dibromoacetic Acid (ppb)	2018	0.58	ND–0.58	By-product of drinking water disinfection
Dichloroacetic Acid (ppb)	2018	25.2	0.56–25.2	By-product of drinking water disinfection
Manganese[1] (ppb)	2018	584	4–584	Leaching from natural deposits
Total Organic Carbon [TOC] (ppm)	2018	9.75	1.71–9.75	Naturally occurring
Trichloroacetic Acid (ppb)	2018	22.5	0.53–22.5	By-product of drinking water disinfection

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

[2] 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.

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.

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.

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.