2019 Drinking Water Quality Report

To Our Customers,

The global situation in recent months has emphasized the importance of public health and quality of life. At the Cambridge Water Department, our goal has always been to produce the highest quality water; our product can never be too safe and we go the extra mile to meet and exceed all standards. The Water Department provides continuous improvement to our source water, treatment, and distribution system based on science with a professional staff – because we want to provide nothing but the best for our customers.

This report provides information on your drinking water supplied by the Cambridge Water Department, how it is treated, the quality of the water you receive, and how Cambridge water meets and exceeds all state and federal drinking water standards. It also contains key information on how you can learn more about how the Water Department provides the best water – in person or remotely.

I encourage you to contact the Water Department with questions, comments, or suggestions about any aspect of the City of Cambridge's drinking water.

Sincerely,
Sam Corda, Managing Director
Cambridge Water Department | 617-349-4770

City of Cambridge Water Department

Distributed June 2020 | PWS ID # 3049000

24-Hour Emergency Customer Service:
617-349-4770

Where Does Your Water Come From?

Reservoirs

The Cambridge Water System extends across four towns and includes four bodies of water. The Hobbs Brook Upper Reservoir flows into the Hobbs Brook Lower Reservoir and connects with the Stony Brook Reservoir. The water then flows to Fresh Pond Reservoir through an underground aqueduct. The Stony Brook Reservoir watershed extends from Weston, north into the Town of Lincoln. The watershed for the Hobbs Brook Reservoirs includes areas of Waltham, Lexington, and Lincoln. The watershed for Fresh Pond Reservoir is completely within the City of Cambridge. The combined capacity of the Hobbs Brook and Stony Brook reservoir system is 3.1 billion gallons; an additional 1.3 billion gallons of water is stored in Fresh Pond Reservoir. Our water supply is backed up by interconnections to the Massachusetts Water Resources Authority (MWRA) system. For a more detailed map of our water sources and their protection areas please visit *cambridgema.gov/water*

Watershed Protection

As part of our ongoing commitment to protecting the water supply, we participated with the Massachusetts Department of Environmental Protection (MassDEP) in preparing a Source Water Assessment Program (SWAP) Report completed in 2003. The SWAP Report assesses the susceptibility of our public water supply and notes the key land use and protection issues, including: Zone A Land Uses, Residential Land Uses, Transportation Corridors, Hazardous Material Storage and Use, and Presence of Oil or Hazardous Materials Contamination Sites.

A copy of the Cambridge SWAP Report can be found on the MassDEP website at *mass.gov/eea/docs/dep/water/drinking/swap/nero/3049000.pdf* or at the Cambridge Water Department.

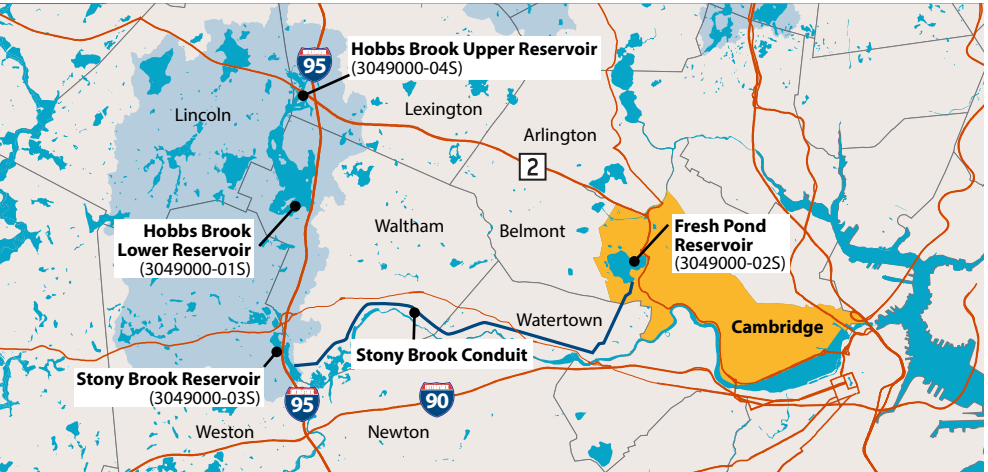
Because of the developed nature and types of land uses within the Cambridge watershed, our source waters are considered as having "high" susceptibility to contamination. Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge (watershed) area. If a source is susceptible to contamination, it does not necessarily mean the source has poor water quality. The Cambridge Water Department has taken the following actions to minimize contamination threats to our water supply:

- Work cooperatively with watershed towns on emergency response and stormwater management
- Placed spill kits at strategic points within the watershed
- Actively monitor source water quality throughout the watersheds, using the data to target source protection
- Work cooperatively with businesses in the watersheds to encourage source protection
- Adopted the Fresh Pond Master Plan, which includes long-term protection measures for Fresh Pond Reservation
- Implemented storm drainage modifications to divert street runoff away from Fresh Pond Reservoir
- Dedicated staff resources to inspections, public education, and coordination of source protection efforts

In 2011, the Watershed Division of the Cambridge Water Department updated its comprehensive Source Water Protection Program. The major components of the program to ensure a continuous supply of high quality water include:

1. **Extensive monitoring** – sampling and analysis of water chemistry and microbiology
2. **Hazardous materials emergency response planning** – to reduce the potential for contamination in the watershed
3. **Partnership development** – relationship-building with other parties in the watershed with common goals
4. **Proactive site review and monitoring** – to minimize potential impacts on the watershed from construction
5. **Stormwater management** – ensuring that Best Management Practices are implemented
6. **Community outreach** – public relations and education

For questions about our source water and our protection efforts, please contact Watershed Manager **David Kaplan** at *dkaplan@cambridgema.gov* or 617-349-4799.

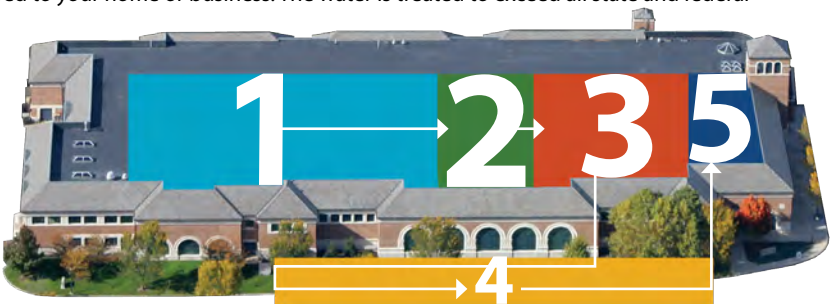


Check-Up on Our 124 Year-Old Lifelines

The treated water from the *Walter J. Sullivan Water Purification Facility (WPF)* is conveyed to the Payson Park Reservoir in Belmont, and then from the Reservoir to the City's customers in 40-inch diameter riveted steel pipes that were originally installed in 1896. The Water Department has reviewed the condition of these pipes many times over the years. The most recent evaluation was conducted in 2019 and utilized both "old fashioned" as well as "high tech" technologies to assess 12,000 feet of pipe between the Huron Avenue Gate House and the Payson Park Reservoir. Leak detection was performed using an acoustic listening device propelled internally through the live pipe main. The listening device also obtained closed circuit televsion (CCTV) images inside the main. Additionally, test pit excavations were made to expose the pipes for physical examination and to measure any pitting. The 124-year-old transmission mains were found to be in generally good condition, with no identified leakage and little to no reduction in pipe wall thickness. In 2020, we will be making some improvements to the cathodic protection system, and we will continue to perform preventive maintenance to prolong the life of these vital lifelines.

How Is Your Water Purified?

The source waters of the Cambridge reservoir system undergo extensive treatment at the *Walter J. Sullivan Water Purification Facility (WPF)* at Fresh Pond Reservation before drinking water is delivered to your home or business. The water is treated to exceed all state and federal drinking water standards.



1 Pretreatment: The first steps in the treatment process combine preoxidation with ozone, coagulation, and dissolved air flotation (DAF) to remove manganese, natural color, sediment and particles, algae, protozoa, viruses, and bacteria.

2 Ozone: Fine bubbles of ozone are dissolved into the water to kill bacteria, viruses, and protozoa.

3 Filtration: The water passes through granular activated carbon (GAC) to remove organic compounds. Filtration also acts as a "polishing step" to remove additional particles, color, and protozoa.

4 Disinfection: Chlorine is used to provide the second step of disinfection for redundancy in the overall process, and monochloramine is added to maintain a disinfectant residual throughout the distribution system.

5 Post Treatment: The pH of the water is adjusted for corrosion control and fluoride is added for dental health.

To ensure the highest quality water, the Cambridge Water Department's state-certified laboratory continuously monitors the effectiveness of the treatment process and makes adjustments to the treatment.

Want to Learn More? *Check out our website to "visit" our beautiful treatment facility. The Water Department looks forward to resuming tours in the future! cambridgema.gov/water*

Viruses and Our Multi-Barrier Approach to Treatment

The purification of Cambridge drinking water involves a multi-barrier approach. Recognizing each individual treatment step may not completely remove or prevent all contamination, we combine several steps so that they work together to provide the greatest protection of public health. The best barrier to viruses is disinfection, and we use two powerful disinfectants – ozone and chlorine – to provide that one-two punch, while the monochloramine residual in the finished water carries the protection into the distribution system.

Water Quality Spotlight: PFAS

Per- and polyfluoroalkyl substances (PFAS) are a large group of man-made organic chemicals that include PFOA, PFOS, and GenX. PFAS have been manufactured and used in a variety of industries around the globe, including in the United States since the 1940s. PFAS are found in firefighting foams, but also found in a wide range of consumer products that people use daily such as cookware, pizza boxes, and stain repellents. There is research that shows exposure to PFAS can lead to adverse health outcomes in humans. While consumer products and food are the largest source of exposure to these chemicals for most people, drinking water can be an additional source of exposure in communities where these chemicals have contaminated water supplies. Such contamination is typically localized and associated with a specific facility; for example, an airfield where PFAS were used for firefighting or a facility where these chemicals were produced or used.

The Cambridge Water Department has been proactively monitoring our source and treated water for PFAS. As of the third round of PFAS testing in March 2020, the quarterly average is 17.1 parts per trillion (ppt). This level is below the current Environmental Protection Agency (EPA) Health Advisory of 70 ppt, the MassDEP Guideline Level of 20 ppt, and the recently proposed MassDEP standard of 20 ppt. Given the emerging concerns about PFAS, the City of Cambridge has adopted a thorough communication approach to inform the public about the status of their drinking water. For more information about our efforts to proactively ensure the safety of our water supply, please see our website at: *cambridgema.gov/Water/wateroperationsdivision/waterchemistryinformation/pfasinformation*

Small Flow – Big Impact

A common recommendation to save water is turning off the bathroom faucet while brushing your teeth (up to 3,000 gallons per year!), but did you know you can also reduce use while the water is running? Replacing faucets and aerators with ones that have earned the EPA WaterSense label can save up to 700 gallons per year. As a bonus, there is less demand on your water heater too! And no need to call the plumber – water savings can be achieved as simply as twisting on an inexpensive WaterSense aerator.

look for WaterSense Meets EPA Criteria

- To learn more about EPA WaterSense faucets and faucet accessories, visit: *epa.gov/watersense/bathroom-faucets*
- For more water conservation information visit: *cambridgema.gov/Water/administration/waterconservation*

Important Information from EPA & MassDEP about Sources of Drinking Water and Drinking Water Contaminants

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.

Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife
- Inorganic contaminants, such as salts and metals, can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, and farming
- Pesticides and herbicides may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses
- Organic chemical contaminants include synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems
- Radioactive contaminants can be naturally occurring or be the result of oil and gas production, and mining activities

In order to ensure that tap water is safe to drink, MassDEP and EPA prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. FDA and the Massachusetts Department of Public Health 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 contamination. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline: 800-426-4791.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised 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 can be particularly at risk from infections. These people should seek advice from their health care providers. EPA/Centers for Disease Control and Prevention (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline: 800-426-4791.

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. The Cambridge Water Department is responsible for providing high quality drinking water, but 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 for free. 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 *epa.gov/safewater/lead*. Home Lead Testing Kits are available at 250 Fresh Pond Parkway for Cambridge residents.

Protect Your Drinking Water at Home!

A "cross connection" is a connection between a drinking water pipe and a polluted source. The pollution can come from your own home. For instance, you're going to spray fertilizer on your lawn. You hook up your hose to the sprayer that contains the fertilizer. If the water pressure drops (say, because of fire hydrant use in the City) when the hose is connected to the fertilizer, the fertilizer may be sucked back into the drinking water pipes through the hose. Over half of cross-connection incidents involve unprotected garden hoses.

Here are some simple steps that you can take to prevent cross-connection hazards:

- Never submerge a hose in soapy water buckets, pet watering containers, pools, tubs, sinks, drains, or chemicals
- Buy appliances and equipment that come with a built-in backflow preventer
- Install a hose bibb vacuum breaker on every threaded water fixture. This inexpensive device is available at most hardware stores and home-improvement centers, and the installation is as easy as attaching a garden hose to a spigot

For additional information on cross connections and on the status of Cambridge's cross connection program, please contact by phone, email or website:

John Blouin | Cambridge Water Department
Cross Connection Supervisor | 617-349-4025
jblouin@cambridgema.gov
cambridgema.gov/Water/administration/crossconnectioncontrol

	Compound	Units	Highest Level Found	Range of Detections (low-high)	Highest Level Allowed (MCL or MRDL)	Ideal Goal (MCLG or MRDLG)	Violation	How it gets in the water
Regulated Compounds	**Barium**	ppm	0.049	0.049	2	2	NO	Erosion of natural deposits
	Chlorine (as monochloramine)	ppm	2.39[1]	0.89 - 3.26[2]	4	4	NO	Water disinfectant
	Copper[3] [4]	ppb	26	1 - 92 (no homes exceeded the AL)	AL = 1,300	0	NO	Corrosion of household plumbing systems
	Fluoride	ppm	0.83	0.54 - 0.83	4	4	NO	Added to water to promote strong teeth
	Gross Alpha[5]	pCi/L	1.18	no range, 1 sample required	15	0	NO	Erosion of natural deposits
	Lead[3] [4]	ppb	7	ND - 122 (2 homes exceeded the AL)	AL = 15	0	NO	Corrosion of household plumbing systems
	Nitrate as Nitrogen	ppm	0.70	0.24 - 0.70	10	10	NO	Naturally present in the environment
	Nitrite as Nitrogen	ppm	0.195	ND - 0.195	1	1	NO	Runoff from fertilizer use
	Radium[5] (226 & 228 combined)	pCi/L	0.29	no range, 1 sample required	5	0	NO	Erosion of natural deposits
	Total Haloacetic Acids	ppb	26.4[1]	5.5 - 76.4[2]	60[7]	0	NO	Byproduct of water disinfection
	Total Trihalomethanes[6]	ppb	13.8[1]	6.8 - 23.0[2]	80[7]	0	NO	Byproduct of water disinfection
	Turbidity[8]	NTU	0.183	0.040 - 0.183	TT = 0.3 NTU	N/A	NO	Suspended matter from soil runoff
Secondary Compounds	**Aluminum**	ppb	27	27	200	-	NO	Erosion of natural mineral deposits
	Chloride	ppm	196	196	250	-	NO	Erosion of natural mineral deposits
	Manganese	ppb	7.1	4.0 - 12.6	50	-	NO	Naturally occurring minerals
	Sodium	ppm	118	118	20[9]	-	NO	Road salt
	Sulfate	ppm	34.3	34.3	250	-	NO	Erosion of natural mineral deposits
	Total Dissolved Solids	ppm	416	416	500	-	NO	Naturally occurring minerals

Unregulated Compounds[10]	Units	Average Detected	Range of Detections (low-high)	Date Collected	Possible Sources
Bromochloroacetic Acid (BCAA)	ppb	2.25	2.16 - 2.31	Various	Byproduct of water disinfection
Bromodichloroacetic Acid (BDCAA)	ppb	0.57	0.54 - 0.59	Various	Byproduct of water disinfection
Chlorodibromoacetic Acid (CDBAA)	ppb	0.59	0.37 - 0.74	Various	Byproduct of water disinfection
Perfluorooctanesulfonic acid (PFOS)[11]	ppt	18.4	15.5 - 20.1	Various	Man-made chemicals. Used as surfactants to make products stain or water resistant, in fire-fighting foam, for industrial purposes, and as a pesticide. Used in fluoropolymers (such as Teflon), cosmetics, greases and lubricants, paints, adhesives, and photographic films. PFOS U.S. manufacturing phased out in 2002; PFOS may be still generated incidentally or in imported products.
Perfluorooctanoic acid (PFOA)[11]					
Perfluorohexanesulfonic acid (PFHxS)[11]					
Perfluoroheptanoic acid (PFHpA)[11]					
Perfluorohexanesulfonic acid (PFHxA)	ppt	4.3	4.1 - 4.4	Various	
Perfluorobutanesulfonic acid (PFBS)	ppt	2.6	2.3 - 2.9	Various	

Notes

1: Highest level detected is based on average of four quarterly samples.
2: Highest value in range is based on individual samples, rather than averages.
3: The Action Level (AL) and the highest level found are based on the 90th percentile of the samples.
4: Most recent lead and copper results were obtained in 2017.
5: Most recent gross alpha and radium results were obtained in 2014.
6: No other volatile organic compounds (VOCs) were detected other than trihalomethanes.
7: Highest level allowed (MCL) for this substance is based on the average of four quarterly samples.
8: Treatment Technique (TT): Turbidity is a measure of treatment performance and is regulated as a treatment technique. 100% of samples met the TT requirement.
9: An 8 ounce glass of Cambridge water contains approximately 28 milligrams of sodium, well within the FDA's "very low sodium" category.
10: As required by US EPA, our water system has sampled for a series of unregulated contaminants. Unregulated contaminants are those that don't yet have a drinking water standard set by EPA. The purpose of monitoring for these contaminants is to help EPA decide whether the contaminants should have a public health protection standard. While this water quality report is for 2019, we are required to provide the notice of results of the unregulated contaminants within 12 months and therefore are providing all results received to date including from 2020.
11: MassDEP's Office of Research and Standards has set an ORSG of 20 ppt for PFOS, PFOA, PFNA, PFHxS, PFHpA, and PFDA individually or as a group.

Terms & Abbreviations

AL: Action Level – The concentration of a contaminant that, 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.

N/A: Not Available – An ideal goal has not been established by EPA or MassDEP for this compound.

ND: Not Detected

NTU: Nephelometric Turbidity Unit – A measure of the turbidity (or clarity) of water. We monitor it because it is a good indicator of the effectiveness of our filtration system.

pci/L: Picocuries per liter – A measure of radiation.

ppb: Parts per Billion or micrograms per liter – (µg/L)

ppm: Parts per Million or milligrams per liter – (mg/L)

ppt: Parts per Trillion or nanograms per liter – (ng/L)

TT: Treatment Technique – A required process intended to reduce the level of a contaminant in drinking water. Turbidity is a measure of treatment performance and is regulated as a treatment technique. 95% of our turbidity readings each month must be below 0.3 NTU.

90th Percentile– Nine out of every 10 homes were at or below this level.

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Follow us on social media!

At the Cambridge Water Department, we love to share how we produce the highest quality water and communicate with our customers:

- Learn all about the Water Department, from source to treatment to distribution, through our beautiful brochure: *cambridgema.gov/Water/administration/watertreatmentplanbrochure*
- Our staff loves what they do and wants to tell you about it! Learn more about our system as our staff talks water: *cambridgema.gov/Water/aboutus/newaskthecityandtapingintothesource*
- Check out our Geographic Information System (GIS) maps: *cambridgema.gov/Water/watershedmanagementdivision/watershedpointsofinterestmap*
- Enjoyed the outdoor space around Fresh Pond recently? Get involved with the Fresh Pond Reservation: *cambridgema.gov/Water/freshpondreservation*
- Take a virtual tour of Fresh Pond through the photo galleries: *cambridgema.gov/Water/freshpondreservation/freshpondphotos*

MassDEP Notification: We are required to monitor your drinking water for specific contaminants on a regular basis and report the results to MassDEP. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. During the second quarter of 2019, the results for Synthetic Organic Contaminants (SOC) compliance monitoring were reported to MassDEP just after the required deadline, resulting in a Notice of Non-Compliance and Return to Compliance.

This report contains very important information about your drinking water. Please translate it, or speak with someone who understands it.

本报告含有关于您所在社区的水质的重要信息。
请您找人翻译一下或请能看懂这份报告的朋友给您解释一下。

Este informe contiene información muy importante acerca de su agua potable. Pídale a alguien que traduzca esta información a usted o hablar con alguien que entiende esta información.

Ce rapport contient des renseignements très importants sur votre eau potable. Demander à quelqu'un pour traduire cette information à vous ou à parler avec quelqu'un qui comprend cette information.

If you have any additional questions about your water supply, please contact Ed Dowling, Director of Water Operations at 617-349-4773

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