

# 2022 Annual Drinking Water Quality Report

## MWRA Bedford/Lexington – Hanscom AFB (Public Water System Identification (PWSID) #3023002)

This report is an annual summary of the drinking water quality provided by Hanscom AFB. Under the “Consumer Confidence Reporting Rule” of the Environmental Protection Agency’s Safe Drinking Water Act (SDWA), community water systems are required to report water quality information to the consuming public annually. Presented in this report is information on the source of our drinking water and where it comes from, its chemical composition and treatment, how its quality compares to state and federal standards, and the health risks associated with any contaminants present. If you are interested in opportunities for public participation in decisions that may affect the quality of the drinking water, please contact the personnel listed in section I. Meetings occur on a non-routine and as-needed basis.

*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 some infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/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.*

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### I. PUBLIC WATER SYSTEM INFORMATION

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#### **Address: Hanscom AFB**

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#### **Water System Improvements:**

Our water system is routinely inspected by a Massachusetts-certified operator in the 66th Civil Engineering Division (CE) Utilities Section and Bioenvironmental Engineering (BE) in the 66th Medical Squadron. CE and BE inspect our system for its technical, financial, and managerial capacity to provide safe drinking water to you.

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### II. YOUR DRINKING WATER SOURCE

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The water supplied to Hanscom AFB is purchased from the adjacent towns of Lexington and Bedford. Lexington receives its water from the Massachusetts Water Resource Authority (MWRA). In 2022, Bedford received all its water from MWRA. Prior to 2020, Bedford received a small quantity from the Shawsheen Groundwater Treatment Facility; these wells were shut down indefinitely on October 24, 2019. The MWRA water comes from the Quabbin Reservoir, located approximately 65 miles west of Boston, and the Wachusett Reservoir, located about 35 miles west of Boston. Water is transported from the Quabbin Reservoir through the Wachusett Reservoir to a water treatment plant prior to distribution to MetroWest and Greater Boston communities, including Hanscom AFB.

The Quabbin and Wachusett watersheds are under state-wide protection and governance of MWRA and the Massachusetts Department of Conservation & Recreation (DCR). Over 85 percent of the watersheds are covered in forest and wetlands that help purify water as it flows across the land to the reservoirs. MWRA and DCR control land use and access to the watersheds. DCR patrols watersheds daily and, MWRA scientists make sure the water quality in watersheds, streams, and reservoirs is tested regularly.

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### III. DRINKING WATER TREATMENT

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The source water is treated at the John J. Carroll Treatment Plant in Marlborough, Mass. The facility services 51 communities in the greater Boston and the MetroWest areas and three in Central Massachusetts. The plant averages treatment of up to 275 million gallons of water daily and up to 405 million gallons on a peak day.

Water is treated with ozone to achieve primary disinfection followed by ultraviolet (UV) light used as a secondary disinfectant. Ozone provides better disinfection than chlorine alone and reduces formation of disinfection by-products. UV light is used to supplement ozone treatment to breakdown the DNA of bacteria, viruses, and other pathogens. UV light also inactivates chemically resistant parasites such as *Cryptosporidium* and *Giardia*. The water chemistry is adjusted for corrosivity to minimize the leaching of lead and copper in home plumbing systems. Fluoride is added to promote dental health. Before water enters the MWRA distribution system, chloramines are added as a secondary disinfectant to provide longer-lasting disinfection as water moves through pipes to consumers. Based on the levels of total chlorine leaving the MWRA facility, Hanscom AFB does not supplement the distribution system with any additional disinfectant. In the event of a water quality emergency, the **Hanscom Contingency Response Plan, APPENDIX 4 to Annex H** will be implemented to provide adequate health and safety measures to water consumers.

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#### IV. SUBSTANCES FOUND IN TAP WATER

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Sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over land or through the ground, it dissolves naturally occurring minerals present in media, and in some cases, even naturally occurring radioactive material. It can absorb substances both naturally occurring in the environment and derived from animals and/or from human activity. Contaminants 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, and wildlife.

**Inorganic contaminants** - such as salts and metals, which can be naturally occurring or 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 agricultural or 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 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, the U.S. Environmental Protection Agency (EPA) prescribes regulations that limit the amount of certain contaminants in drinking water provided by public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water that must provide the same protection for public health. All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. 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 Safe Drinking Water Hotline at (800) 426-4791.

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#### V. IMPORTANT DEFINITIONS

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**Haloacetic Acids-5 (HAA5)** - a group of chemicals that are formed along with other disinfection byproducts when chlorine or other disinfectants used to control microbial contaminants in drinking water react with naturally occurring organic and inorganic matter in water.

**Maximum Contaminant Level (MCL)** – the highest level of a contaminant in drinking water. MCLs are set as close to the Maximum Contaminant Level Goals (see below) as feasible using the best available treatment technology.

**Maximum Contaminant Level Goal (MCLG)** – 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.

**Maximum Residual Disinfectant Level (MRDL)** – The highest level of a disinfectant (chlorine, chloramines, chlorine dioxide) allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

**Maximum Residual Disinfectant Level Goal (MRDLG)** – The level of a drinking water disinfectant (chlorine, chloramines, chlorine dioxide) 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.

**Action Level (AL)** – the concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.

**90<sup>th</sup> Percentile** – means that out of every 10 homes, 9 were at or below this level.

**Treatment Technique (TT)** – a required process intended to reduce the level of a contaminant in drinking water.

**Total Trihalomethanes (TTHM)** - a group of volatile and potentially toxic chemicals formed during water treatment with disinfectants, such as chlorine.

**Variations and Exemptions** – State or EPA permission not meeting an MCL or a treatment technique under certain conditions.

**Secondary Maximum Contaminant Level (SMCL)** – standards developed to protect the aesthetic qualities of drinking water which are not health based.

**Level 2 Assessment** – a very detailed study of the water system to identify potential problems and determine (if possible) why an E. coli MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.

## VI.

## WATER QUALITY TESTING RESULTS

EPA and state regulations require testing of water quality after treatment. MWRA performs necessary testing and even goes beyond federal and state standards with the frequency and sensitivity of tests. The EPA has identified 120+ contaminants which must be tested in drinking water. A complete list can be found at the [www.mwra.com](http://www.mwra.com) website. During 2022, the MWRA reported finding 7 EPA identified contaminants (listed in the table below) in the Hanscom AFB distribution system. None of the contaminant levels detected exceeded the EPA’s MCLs. The link below hosts water quality testing results for the towns of Lexington and Bedford:

<https://www.mwra.com/annual/waterreport/2021results/2021results.htm>

**Table 1. MWRA – Sampling Results**

Test Results After Treatment Compound	Units	(MCL) Highest Level Allowed	(We Found) Detected Level-Average	Range of Detections	(MCLG) Ideal Goal	Violation	How it Gets into Water
Barium	ppm	2	0.009	0.008 - 0.010	2	No	Common mineral in nature
Monochloramine	ppm	4 - MRDL	2.00	0.05 – 3.50	4 - MRDLG	No	Water disinfectant
Fluoride	ppm	4	0.679	0.385 – 0.828	4	No	Additive for dental health
Nitrite <sup>^</sup>	ppm	1	0.007	ND – 0.007	1	No	Atmospheric Deposition
Nitrate <sup>^</sup>	ppm	10	0.55	0.032 – 0.55	10	No	Atmospheric Deposition
Total Trihalomethanes	ppb	80	19.8	9.08 – 20.7	NS	No	Byproduct of water disinfection
Haloacetic Acids-5	ppb	60	19.9	4.4 – 24.4	NS	No	Byproduct of water disinfection

Hanscom has one system interconnection with Bedford that is used to supply the Fam Camp. Bedford used to derive some of its drinking supply from the groundwater wells prior to 2020; however, since then most of the water is sourced from MWRA and purchased from Lexington. In 2022, the entire system was provided with water by the MWRA.

MWRA also tests reservoir source water for pathogens – such as fecal coliform, bacteria, viruses, and the parasites *Cryptosporidium* and *Giardia*. They can enter the water from animal or human waste. All test results were well within state and federal testing and treatment standards. If detected however, *Cryptosporidium* and *Giardia* can

cause gastrointestinal illness, with symptoms that include diarrhea, nausea, and/or stomach cramps. People with severely weakened immune systems (that is, severely immuno-compromised) are likely to have more severe and more persistent symptoms than healthy individuals. Immuno-compromised individuals should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the EPA's Safe Drinking Water Hotline (1-800-426-4791).

Hanscom AFB provides quality drinking water by maintaining the local distribution system, flushing the system, and testing regularly. Along with the routine water analysis performed by the MWRA, the base's BE office monitors the temperature, chlorine, and pH levels at the time of samples collection twice monthly at eleven locations on the base and at the Fam Camp, the samples are analyzed by an independent laboratory.

**Bacteriological Testing:** Hanscom AFB tests the quality of drinking water twice a month. Eleven samples are collected across the base which are then tested for Total Coliform and Fecal Coliform. 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. Testing conducted in September of 2022 detected coliforms indicating the need to evaluate potential problems or irregularities in water distribution system. When this occurs, the base is required to conduct regulatory assessments to identify any problems that may have contributed to coliform detection. A Total Coliform positive from the laboratory is an alert to check for *E. coli*, which is a fecal coliform harmful to human consumption. The MCL (a permissible regulatory limit) for Hanscom AFB is 2 (two) positive coliform samples a month.

Three samples tested positive for total coliform, all in September 2022, are shown in Table 2, below. In addition, there were elevated levels of chlorine in January and February of 2022. No disease-causing bacteria (i.e., *E. coli*) was detected for the calendar year 2022.

**Table 2: Hanscom AFB Total Coliform Results**

Contaminant	Highest # Positive in a Month	Date	MCL	MCLG	Violation (Yes/No)	Possible source of contamination
Total Coliform	3	Sep 22	1	0	Yes	Naturally present in the environment

**Disinfection By-Products:** Disinfection by-products (DBPs) are formed when disinfectants like chlorine interact with natural organic materials in water, such as in chlorinated drinking water and chlorine-treated swimming pools. DBPs can be found in the air during activities such as showering, bathing, dishwashing, and swimming. Chronic exposure to DBPs may increase risk of cancer. Humans exposed to unusually large amounts of some DBPs could experience liver damage and decreased nervous system activity.

Hanscom AFB samples for disinfection by-products on a quarterly basis in conjunction with reviewing the average chlorine levels (disinfection) in the distribution system and reports the results to MassDEP. All sampling results can be seen in the below Table 3. Note, none of the samples exceeded the MCL for both TTHM and HAA5 in calendar year 2022.

**Table 3: Disinfection-by-Products Quarterly Sampling Results**

Sample Location	Sample Date	Quarter	TTHM (ppb) Results	MCL (ppb)	HAA5 (ppb) Results	MCL (ppb)	Exceeded MCL?
Bldg. 1425 (Kitchen)	8-Feb-22	Q1	9.4	80	11	60	No
Bldg. 1425 (Kitchen)	4-May-22	Q2	16		4.9		No
Bldg. 1425 (Kitchen)	20-Aug-22	Q3	15		5		No
Bldg. 1425 (Kitchen)	2-Nov-22	Q4	15		2.4		No

**PFAS/PFOA:** The per- and polyfluoroalkyl substances (PFAS) are a group of chemicals used to make fluoropolymer coatings and products that resist heat, oil, stains, grease, and water. Fluoropolymer coatings can be in

a variety of products. These include clothing, furniture, adhesives, food packaging, heat-resistant non-stick cooking surfaces, and the insulation of electrical wire. Many PFAS, including perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), are a concern because they do not break down in the environment, can move through soils and contaminate drinking water sources, and build up (bioaccumulate) in fish and wildlife.

Initial sampling of PFAS/PFOA was required by MWRA in 2015. Sampling was conducted on the two distribution systems that feed into Hanscom AFB for the eight main PFAS/PFOA related chemicals. Both samples from each system were non-detect, as seen in Table 4. Additionally, the Air Force published guidance to conduct expanded baseline sampling of sixteen PFAS/PFOA related chemicals at all Air Force owned drinking water distribution systems in 2021. Sampling was conducted at two locations on Hanscom AFB; results of which can be seen in Table 4, below. The results were below a lifetime drinking water Health Advisory Level (HAL) of 70 parts per trillion (ppt) limits. Based on these results Hanscom AFB is required (as per the Air Force published guidance) to sample for PFAS/PFOA every 3 years. The next sampling event will occur in 2024.

**Table 4: Hanscom AFB PFAS/PFOA Sampling Results**

Date	Location	PFOS (ppt)	PFOA (ppt)	Total	Exceeds 70 ppt MCL?
27 Oct 2015	Bedford, MA	Non-Detect	Non-Detect	0.00	No
17 Nov 2015	Lexington, MA	Non-Detect	Non-Detect	0.00	No
9 Nov 2021	Bldg. 1118	0.81	1.3	2.18	No
9 Nov 2021	Bldg. 1435	0.96	1.5	2.46	No

**Fluoride:** Hanscom AFB tests the fluoride levels twice a month at the eleven sites where bacteriological sampling is conducted. At low levels, fluoride can help prevent cavities, but drinking water containing more than 2 milligrams per liter (mg/L) of fluoride may develop tooth discoloration (dental fluorosis) as per EPA.

Drinking water containing more than 4 mg/L of fluoride (the MCL established by U.S. Environmental Protection Agency) can increase your risk of developing bone disease. Hanscom AFB’s drinking water did not contain more than 4 mg/L of fluoride in 2022. From March to June of 2022, average fluoride levels did however exceed SMCL of 2.0 mg/L which can be observed in Table 3, below. All other months in calendar year 2022 were below SMCL of 2.0 mg/L.

**Table 5: Hanscom AFB Elevated Fluoride Results**

Month	Average Fluoride Concentration (mg/L)	Exceeded SMCL (2.0 mg/L)?	Exceeded MCL (4.0 mg/L)?
March	2.12	Yes	No
April	2.15		
May	2.55		
June	2.82		

**Lead & Copper:** Elevated levels of lead and copper can cause serious health problems, especially for pregnant women and young children. The primary source of lead and copper in drinking water is associated with aging distribution and home plumbing systems.

High copper and lead levels are most harmful to adolescents/children and adults with pre-existing conditions, but it can cause adverse conditions in healthy adults. Signs and symptoms associated with short-term exposure to elevated copper or lead levels include nausea, vomiting, diarrhea, stomach irritation and headaches.

MWRA water is lead-free when it leaves the treatment plant. The pipes and distribution system that carry the water to communities are made mostly of iron and steel and do not contain lead. However, locally aging water pipes and home plumbing service lines may contain lead and copper material that, when corroded, may leach into water, and affect water quality at your tap. When water remains stagnant in the system for prolonged period due to inactivity, flushing the tap for 30 seconds to 2 minutes is recommended before using water for drinking or cooking. If you are concerned about lead in your water, you may request BE office to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure to lead is available from the Safe Drinking Water Hotline at (800) 426-4791 or at <http://www.epa.gov/safewater/lead>.

Hanscom AFB tests for lead and copper triennially. In 2022, testing was conducted at 30 random locations, including schools and childcare centers, throughout Hanscom AFB and the Fam Camp to determine compliance with established guidelines. The 90<sup>th</sup> percentile results for both lead and copper were below the EPA established

action levels (Table 6). This puts our system in compliance with federal regulation requirements. The next lead and copper compliance sampling period is scheduled for September 2025.

**Table 6: Hanscom AFB Average Lead and Copper Sampling Results**

Compound	Units	EPA 90% Compliance Value	EPA 90% Value Detected	Range of Detected Levels	(MCLG) Ideal Goal	Violation (Yes/No)
Lead	mg/L	0.015	0.0088	0.001 – 0.0671	0.0	No
Copper	mg/L	1.3	0.2160	0.0291 – 7.95	1.3	No

Additionally, two water samples were also collected and tested at the School Age Program locations (Bldg. 1994 & Bldg. 1999) in 2022. Both samples were non-detect for lead and below action limit (AL) of 1.3 mg/L for copper as shown in Table 7, below. The Department of Defense (DOD) requires all faucets at the Child Development center (Bldg. 1994) and Youth Center (Bldg. 1999) be tested initially to ensure that the facilities’ water is lead free. These studies as part of the Lead Contamination Control Act (LCCA) were initially accomplished in 2016, 2018, and 2019. All locations that exceeded the action level initially for either lead or copper have been remediated at this time. The MassDEP (as per 310 CMR 22.06B (7)(a)9) requires collection of lead and copper samples from at least two schools (must rotate through the list of schools) every three years. Based on the continued sampling results, the School Age Programs at Hanscom AFB are on a reduced monitoring schedule that requires each location to collect and test two samples for lead and copper every three years.

**Table 7: Hanscom AFB School Age Program DOD Lead/Copper Sampling Results**

Sample Location	Sampling Date	Lead Results (mg/L)	Action Level (mg/L)	Copper Results (mg/L)	Action Level (mg/L)
CDC (Bldg. 1994) – Rm #9	9/27/2022	Non-Detect	0.015	0.0291	1.3
CDC (Bldg. 1994) – Kitchen	9/27/2022	Non-Detect		0.0663	
School Age Program (Bldg. 1999) – Rm #7	9/27/2022	Non-Detect		0.1380	
School Age Program (Bldg. 1999) – Kitchen	9/27/2022	Non-Detect		0.1830	

## VII. COMPLIANCE WITH DRINKING WATER REGULATIONS

**Does My Drinking Water Meet Current Health Standards?** We are committed to providing you with the best water quality available. All contaminants that were tested last year met all applicable health standards regulated by the state and federal government.

Concerning your drinking water; Hanscom AFB CE and BE are committed to providing you with the best water quality available through regular monitoring and corrective actions. In addition, Hanscom AFB has contingency plans in place to both notify and protect you in the event monitoring results indicate a potential concern.

### Water Quality Exceedances during 2022:

Some samples that were tested last year did not meet all applicable standards regulated by the state and federal government. Due to the detection of Total Coliform in September 2022, base officials took the following corrective actions as part of the Level 2 Assessment:

- Additional samples were collected, and all samples were analyzed for E. coli
- The affected system segments were flushed daily

Additionally, Hanscom AFB had SMCL exceedance for Fluoride in its drinking water system for the period of March – June. Due to this exceedance, Tier III public notices were sent out with suggested ways to limit exposure to the elevated levels of Fluoride.

### Health Effects Statements

**Total Coliform:** Coliforms are bacteria that are naturally present in the environment and are used as an indicator of other potentially harmful bacteria that may be present. As noted previously, officials found coliforms in more samples than permissible, and this was a warning of potential problems. Upon identifying coliforms, officials analyzed the same samples for harmful bacteria (E. coli) and no detections were reported. Therefore, there were no potential health effects due to this issue.

**Fluoride:** Excessive levels of fluoride can lead to dental fluorosis. In its moderate or severe forms, this may result in a brown staining and or pitting of the permanent teeth. This problem occurs only in developing teeth, before they erupt from the gums. Children under nine should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their permanent teeth. You may also want to contact your dentist about proper use of fluoride-containing products by young children. Older children and adults may safely drink the water. During 2022, average levels of fluoride did not exceed MCL of 4 mg/L at any point within the Public Water System. Hence, based on the results no potential health effects are anticipated.

## VIII.

## EDUCATIONAL INFORMATION

### Frequently asked questions

**Q.** How would I know about a problem with the water supply?

**A.** BE and Water Utilities regularly test and inspect the water supply and the distribution system. If a problem were found, all affected people would be notified via leaflets, email, and the base website. BE works with CE to ensure that all drinking water is turned over in routinely all buildings as outlined in the installation flushing plan.

**Q.** My water tastes and smells funny. Is it safe to drink?

**A.** According to MWRA, you can safely drink and cook with the water. Algae can cause water to have a “funny” smell and odor. Algae are normal, harmless plants that appear in the reservoirs at certain times of the year. On occasion, customers may also taste or smell the low levels of chlorine compounds added to disinfect the water. Fill a jug with tap water and put it in the refrigerator to get rid of the taste and odor.

**Q.** My water is cloudy sometimes but then clears up. Can I drink it?

**A.** According to MWRA, you can safely drink and cook with the water. Water travels under pressure throughout the system causes air bubbles to get trapped under water which leads to cloudy water, also known as white water. Occasionally, air can become trapped in the water in tiny bubbles causing water to look cloudy. This is only temporary, and the water should clear up in a short time.

**Q.** My water is discolored. Can I drink it?

**A.** According to MWRA, you can safely drink and cook with the water. Old iron pipes in your building can cause a red, brown, or yellow color in the water. A yellow color is from iron that is absorbed by water that has been sitting in pipes for a long time. A red or brown color is caused by very small specks of iron. These specks of iron can enter the water if there is quick change in water speed or direction in your local pipes. Such changes can result from valve repair, flushing the system, or the testing and use of fire hydrants.

**If you have any questions or concerns about anything contained in this report, please contact one of the following numbers for assistance. Hanscom AFB does not hold regularly scheduled board meetings for public participation in decisions that may affect the quality of the water.**

Hanscom AFB Bioenvironmental Engineering	(781) 225-6366
State of Massachusetts Water Resource Authority	(617) 242-5323
Environmental Protection Agency Safe Drinking Water Hotline	(800) 426-4791
Hanscom AFB Public Affairs Office	(781) 225-1686
Town of Bedford Department of Public Works	(781) 275-7605
Town of Lexington Department of Public Works	(781) 274-7300

**Additional information can be obtained by viewing the following websites:**

<a href="http://www.mwra.state.ma.us">http://www.mwra.state.ma.us</a>
<a href="http://www.mass.gov/water-supplier-operations">http://www.mass.gov/water-supplier-operations</a>
Source water assessment reports for the MWRA: <a href="http://www.mwra.com/sourcewater.html">http://www.mwra.com/sourcewater.html</a>