



ANNUAL WATER
QUALITY
REPORT

REPORTING YEAR 2019

Presented By
**Town of Middleborough
Water Department**

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, 2019. Over the years, we have dedicated ourselves to producing drinking water that meets 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 for any questions relating to your drinking water, please call Michael Bumpus, Water Superintendent, at (508) 946-2482.

Water Treatment Process

In order to meet State and Federal requirements for public drinking water, we treat our source water before supplying it to customers. All of the well supplies are treated for pH adjustment with potassium hydroxide, and sodium hypochlorite is added for disinfection purposes. Additionally, the East Grove Street Well is filtered through a slow sand filter, and East Main Street #1, Satellite Wells #1A and #1B and #2 Well supplies are filtered through a biological filtration process for iron and manganese removal.

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.

Community Participation

The Middleborough Board of Selectmen oversee the operations of the Middleborough Water Department. During the months of September through May, the Middleborough Board of Selectmen meet weekly on Monday evenings at 7:00 p.m. Meetings are held twice a month during the months of June, July, and August. Meetings are held at the Town Hall in the Selectmen's Meeting Room. The public is encouraged to attend these open meetings. Meetings are also televised on the local public access station.

Where Does My Water Come From?

Town of Middleborough Water Department customers receive their water from 13 groundwater sources, which produced over 620 million gallons (or an average of 1.70 million gallons per day) of water in 2019. Maximum day pumpage was 2.50 million gallons. The East Grove Street, Rock #1 and #2, East Main Street #1, #1A, #1B, and #2, Tispaquin #1 (off-line) and #2, Cross Street, Plympton Street, Miller Street, and Spruce Street wells are located within the Taunton River basin.

To learn more about our watershed on the Internet, go to the U.S. EPA's Surf Your Watershed at www.epa.gov/surf.

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>.



Substances That Could Be in Water

To ensure that tap water is safe to drink, the Massachusetts Department of Environmental Protection (MassDEP) 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.

Source Water Assessment

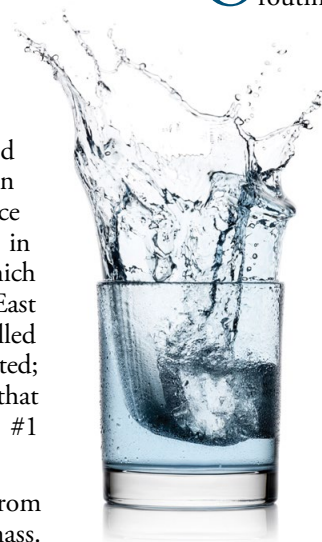
A Source Water Assessment has been completed for the Middleborough Water Department. The assessment has identified various activities to be monitored to maintain water quality. The Town has received high susceptibility ratings for 8 of 11 wells and moderate for the remaining 3 wells in town. These ratings are due to the absence of natural barriers to contamination in the aquifers that supply these wells, which makes them vulnerable. The two new East Main Street Satellite Wells were installed after the SWAP Report was completed; their susceptibility is high, similar to that of the original East Main Street Wells #1 and #2.

Copies of the assessment are available from the MassDEP site at <http://www.mass.gov/eea/docs/dep/water/drinking/swap/sero/4182000.pdf>.

Ground Water Sampling Update

On August 7, 2019, we were informed that one of our routine bacteria samples collected on August 6, 2019, was fecal contamination (*E. coli*) positive. In response, we sent notices to all of our customers within 24 hrs of learning of this positive sample. The Water Department is currently providing 4-log treatment at the Rock Wells #1 and #2 and has obtained MassDEP approval of 4-log treatment at the Rock Wells #1 and #2 and East Grove Street Well.

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. An application for 4-log certification is under review by MassDEP for East Main Street Wells #1 and #2 and Satellite Wells #1A and #1B.



Capital Improvement Program

Capital improvements to the water system include:

- 1) Construction of a new iron and manganese filtration plant at the East Main Street #1 and #2 Well supplies. (This new plant replaced the existing, aging treatment methods at these sites; it will ensure Middleborough continues to be supplied with high-quality water into the future).
- 2) Construction of a new well supply.
- 3) Construction of a new elevated storage tank to replace the existing Fire Tower Elevated Tank.

Construction of the treatment plant was completed in December of 2018. Construction of the new well supply pumping station and storage tank will commence in 2020. Construction of the water main to serve the new pumping station is ongoing. Other water main replacement projects (Forest and Bishop Streets) were completed, and the Myrtle Street project will be beginning the construction process shortly.



Radon

Our system monitored for radon at the new East Main Street Satellite Wells #1A and #1B and found levels of 748 to 904 pCi/L. The MassDEP MMCL is 10,000 pCi/L (ORSG).

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 from 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 Radon Hotline at (800) SOS-RADON.

Manganese

Manganese is a naturally occurring mineral found in rocks, soil, groundwater, and surface water. Manganese is necessary for proper nutrition and is part of a healthy diet, but it can have undesirable effects on certain sensitive populations at elevated concentrations. The U.S. EPA and MassDEP have set an aesthetics-based Secondary Maximum Contaminant Level (SMCL) for manganese of 50 ug/L (micrograms per liter), or 50 parts per billion. In addition, MassDEP's Office of Research and Standards (ORS) has set a drinking water guideline for manganese (ORSG), which closely follows the EPA public health advisory for manganese.

Drinking water may naturally have manganese and, when concentrations are greater than 50 ug/L, the water may be discolored and taste bad. Over a lifetime, the EPA recommends that people drink water with manganese levels less than 300 ug/L, and, over the short term, the EPA recommends that people limit their consumption of water with levels over 1000 ug/L, primarily due to concerns about possible neurological effects. Children up to 1 year of age should not be given water with manganese concentrations over 300 ug/L, nor should formula for infants be made with that water for longer than 10 days. The ORSG differs from the EPA's health advisory because it expands the age group to which a lower manganese concentration applies from children less than 6 months of age to children up to 1 year of age to address concerns about children's susceptibility to manganese toxicity.

See:

The EPA's Drinking Water Health Advisory for Manganese: http://www.epa.gov/safewater/ccl/pdfs/reg_determine1/support_cc1_magnese_dwreport.pdf

and MassDEP Office of Research and Standards Guideline (ORSG) for Manganese: <http://www.mass.gov> and search for "ORSG Manganese".



Test Results

Our water is monitored for many different kinds of substances on a very strict sampling schedule. Also, the water we deliver must meet specific health standards. Here, we show only those substances that were detected in our water. (A complete list of all our analytical results is available upon request.) Remember that detecting a substance does not mean the water is unsafe to drink; our goal is to keep all detects below their respective maximum allowed levels.

The State recommends monitoring for certain substances less often than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

Although *E. coli* was detected, the water system is not in violation of the *E. coli* MCL. Rock Wells #1 and #2 and the E. Grove Street Well have received 4-log certification from MassDEP. An application for 4-log certification is under review by MassDEP for East Main Street Wells #1 and #2, and Satellite Wells #1A and #1B.

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

REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Combined Radium (pCi/L)	2019	5	0	1.59	ND–1.59	No	Erosion of natural deposits
Haloacetic Acids [HAAs] (ppb)	2019	60	NA	20.6	2.6–34.0	No	By-product of drinking water disinfection
Nitrate (ppm)	2019	10	10	1.20	ND–2.05	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Perchlorate (ppb)	2019	2	NA	0.205	0.090–0.290	No	Inorganic chemicals used as oxidizers in solid propellants for rockets, missiles, fireworks, and explosives
TTHMs [Total Trihalomethanes] (ppb)	2019	80	NA	51.5	8.6–63.0	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)	2019	1.3	1.3	0.56	0/152	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2019	15	0	3	3/152	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)	2019	250	NA	116.5	19.8–262.0	No	Runoff/leaching from natural deposits
Iron (ppb)	2019	300	NA	145	3–600	No	Leaching from natural deposits; Industrial wastes
Manganese (ppb)	2019	50	NA	66	6–431	No	Leaching from natural deposits
pH (Units)	2019	6.5–8.5	NA	7.61	6.20–8.00	No	Naturally occurring

UNREGULATED SUBSTANCES ¹

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Bromodichloromethane (ppb)	2019	4.8	ND–11.5	By-product of drinking water disinfection
Bromoform (ppb)	2019	0.3	ND–1.2	By-product of drinking water disinfection
Chloroform (ppb)	2019	11.1	ND–51.3	By-product of drinking water disinfection
Dibromochloromethane (ppb)	2019	2.4	ND–7.9	By-product of drinking water disinfection
Sodium (ppm)	2019	94.9	41.5–141	Naturally occurring in the environment

UNREGULATED AND OTHER SUBSTANCES ¹

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH
Bromochloroacetic Acid (ppb)	2018	2.101	ND–3.850
Bromodichloroacetic Acid (ppb)	2018	1.398	ND–2.320
Chlorate (ppb)	2014	78	ND–430
Chlorodibromoacetic Acid (ppb)	2018	0.903	0.359–1.160
Chromium [Total] (ppb)	2014	0.23	0.2–0.5
Chromium-6 (ppb)	2014	0.1	ND–0.22
Cobalt (ppb)	2014	1.2	ND–4.6
Dibromoacetic Acid (ppb)	2019	0.75	ND–1.9
Dichloroacetic Acid (ppb)	2019	6.08	1.6–14.0
Germanium (ppb)	2018	0.015	ND–0.301
Molybdenum (ppb)	2014	<1.0	ND–1.1
Monochloroacetic Acid (ppb)	2019	0.425	ND–2.4
Perfluorobutanesulfonic Acid (PFBS) (ppb)	2014	<0.09	NA
Perfluoroheptanoic Acid (PFHpA) (ppb)	2014	<0.01	NA
Perfluorohexanesulfonic Acid (PFHxS) (ppb)	2014	<0.03	NA
Perfluorononanoic Acid (PFNA) (ppb)	2014	<0.02	NA
Perfluorooctanesulfonate Acid (PFOS) (ppb)	2014	<0.02	NA
Perfluorooctanoic Acid (PFOA) (ppb)	2014	<0.02	NA
Strontium (ppb)	2014	66	ND–140
Trichloroacetic Acid (ppb)	2019	8.325	1.0–22.8
Vanadium (ppb)	2014	0.1	ND–0.22

¹ 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 that, if exceeded, triggers treatment or other requirements that 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.

Level 2 Assessment: A Level 2 assessment is 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.

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.

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): These standards are developed to protect aesthetic qualities of drinking water and are not health based.