

Town of Falmouth

Annual Drinking Water Quality Report 2015

Mass DEP PWSID # 4096000

PUBLIC WATER SYSTEM INFORMATION: The Town of Falmouth's water system is operated by the Department of Public Works – Water Division, under the direction of Superintendent Stephen Rafferty. The Department and the Superintendent can be contacted by phone at 508-457-2544 or at srafferty@falmouthmass.us. Producing drinking water that meets all regulatory requirements today and in years to come requires timely investment in the infrastructure of the system with treatment upgrades, piping maintenance and replacement, and evaluation and development of secure sources of water for future needs. The investments required and the costs of operation are

supported through the water rates and debt financing for major capital projects. Please review this report carefully, it is intended to increase your awareness of our water issues and contains important information about our water system.

OPPORTUNITIES FOR PUBLIC PARTICIPATION: We welcome and encourage your input, participation and support on the implementation, planning and financing of system improvements. In 2015 we commenced with the construction of a water treatment plant for the Long Pond source, a project that will be complete in 2017. While that construction is on-going we are continuing with planning and implementing other necessary projects such as a system wide flushing of the water pipes, and identifying and securing additional sources of water. Planning also includes development of a program for the replacement of old and undersized water mains, in particular the original 1898 cast iron pipes. As we progress on these future initiatives we will be making presentations to citizen groups, Town Boards, the Board of Selectmen and at precinct and Town Meetings. The department's home page is <http://www.falmouthmass.us/depart.php?dekey=water> and contains additional information. We encourage you to attend informational meetings and to get involved.

REGULATORY COMPLIANCE: This report provides a snapshot of the quality of the drinking water and a summary of the water system. Included are details about where your water comes from, what it contains, and how it compares to state and federal standards. The Falmouth Water Department takes pride in ensuring delivery of a quality product. We have an extensive and ongoing program of sampling by independent labs to monitor the quality of the water from each of our six active sources of water. The system is also regulated by the Massachusetts Department of Environmental Protection (Mass DEP) who review our sampling results and monthly operating records. With six sources of water, each with its own unique raw quality necessitates that we use a variety of site specific treatment to achieve compliance. The system is overseen 24/7 by a team of Certified Operators trained in treatment operation as well as operation of the distribution system. The staff takes pride in achieving compliance with regulatory requirements and providing our customers safe, reliable drinking water. We intend to continue that tradition in 2016.

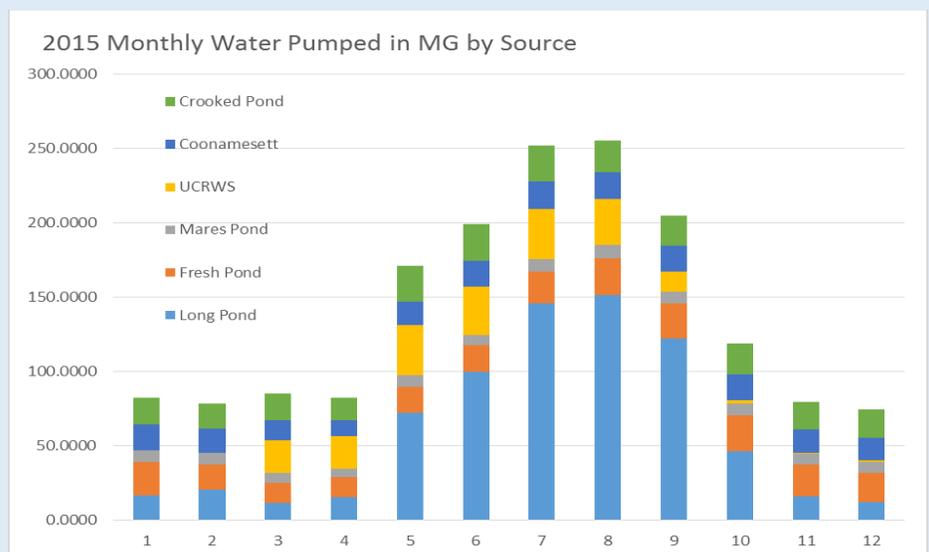
WATER CONSERVATION EFFORTS: The Town is allocated a finite amount of water each year under the provisions of the Water Management Act. The allocation is set by the State based on the number of system users, an expectation that there is minimal leakage, and that users are prudent and conservative in their consumption of water. With the seasonal water demands of our community, the variable population and the age of our pipes compliance with these regulations is an ongoing challenge. Our success in compliance will directly impact obtaining the approvals needed to develop additional supplies of water. Supplies that are necessary to sustain our community. Water conservation and prudent supply management is key to the long term availability of our water supplies. As part of management of usage, Voluntary Conservation Measures are necessary and have been implemented to achieve the goals of regulatory compliance and water conservation. A conscientious effort by everyone in the community is necessary for these conservative measures to have a positive effect. The Town therefore implemented the following Voluntary Conservation Measures:

- Watering of lawns is limited to odd / even days only (based on house address) between the hours of 7:00 p.m. and 7:00 a.m.
- Washing of sidewalks, patios and driveways is prohibited (excluding businesses for safety / health reasons).
- Pistol-grip nozzles are required for all hoses used for washing cars and all hoses at dockside facilities.
- Restaurants may only serve water when requested by patrons.

FALMOUTH'S WATER SUPPLY. There is a single body of water that underlies Cape Cod that we use for our water supply. The portion of that body of water that we draw our water from is called the Sagamore Lens. The Town has six sources, a combination of surface water and ground water. The piping system that distributes the water consists of over 400 miles of water main and over 21,000 water services. All water is treated with Sodium Hydroxide (equivalent to baking soda) to stabilize the pH. All water is disinfected before it goes into distribution with either Chlorine or Sodium Hypochlorite.

The Crooked Pond Well and the Coonamesett Well pump to the Crooked Pond Treatment Facility. The treatment process consists of air-stripping, activated carbon adsorption and manganese-greensand filtration followed by disinfection and pH adjustment. The resultant water is the highest quality water of all our sources. This plant provided an average of 1 MGD each day last year operating 24/7day.

The oldest and largest source is Long Pond. It has been a source of water since 1898. In 2015 it provided nearly 57% of the supply during the peak summer months. Currently this is an unfiltered source and seasonally the quality of the water, while safe, is less than optimum. The quality issues arise



from the chemical reactions of the chlorine disinfectant with the algae and vegetation present in the pond. To resolve these quality concerns the Town has allocated \$46 million and is constructing a water filtration plant on the eastern shore of Long Pond that will, when finished in 2017, produce water of the highest quality.

The water from the Mares Pond Well, Fresh Pond Well and the Upper Cape Regional Water Supply Cooperative is of excellent quality and requires no additional treatment. The Table to the left summarizes the sources and the quantity of water obtained from each last year.

Source Name	Mass DEP ID#	Source Type	2015 Pumpage in MG	% of 2015 Total
Long Pond	4096000-01S	Surface Water	731	43.4%
Crooked Pond Well	4096000-05G	Ground Water	240	14.3%
Mares Pond Well	4096000-04G	Ground Water	90	5.3%
Fresh Pond Well	4096000-02G	Ground Water	237	14.1%
Coonamesset Well	4096000-03G	Ground Water	193	11.5%
Water Supply	4261024	Ground Water	192	11.4%

IS OUR WATER SAFE TO DRINK? Some people may be more vulnerable to contaminants in drinking water than the general population. Immune-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 about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* are available from the Safe Drinking Water Hotline (800-426-4791). Our water system makes every effort to provide you with safe and pure drinking water. All surface waters and some ground water sources contain numerous microorganisms some of which can cause people to be sick. To eliminate disease carrying organisms it is necessary to disinfect the water. Disinfection does not sterilize the water, but it does destroy harmful organisms. The Falmouth Water Department uses chlorine gas at Long Pond and sodium hypochlorite at all other sources as its primary disinfectant. Chlorine destroys organisms by penetrating cell walls and reacting with enzymes. Disinfection with chlorine has been proven effective at ensuring that water is free of harmful organisms and safe to drink.

CORROSION OF INTERNAL HOUSEHOLD PLUMBING: Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing system. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested by a laboratory. Flushing your tap for 30 seconds to 2 minutes before using can reduce lead levels. Additional information is available from the Safe Drinking Water Hotline (800-426-4791). Thirty lead samples were taken during 2011. Two samples exceeded the AL. Note: Compliance is determined if the 90th percentile sample result does not exceed the Action Limit (AL). For the 2011 compliance period, the 90th percentile (or sample number 27 out of 30) result was 8.4 ppb. Thirty copper samples were taken during 2011. Zero (0) samples exceeded the AL. Note: Compliance is determined if the 90th percentile sample result does not exceed the AL. For the 2011 compliance period, the 90th percentile (or sample number 27 out of 30) result was 800.

SUBSTANCES FOUND IN TAP WATER: 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's Safe Drinking Water Hotline. 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 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 Safe Drinking Water Hotline. 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. The Environmental Protection Agency (EPA) and the state Department of Environmental Protection (DEP) prescribe regulations which limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) and the Massachusetts Department of Public Health regulations establish limits for contaminants in bottled water which must provide the same protection for public health. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800-426-4791).

In nature, all water contains some impurities. As water flows in streams, sits in lakes, and filters through layers of soil and rock in the ground, it dissolves or absorbs the substances that it touches. Most of these substances are harmless. In fact, some people prefer mineral water precisely because minerals give the water an appealing taste. However, at certain levels, minerals, just like man-made chemicals are considered contaminants that can make water unpalatable or even unsafe. In order to ensure that tap water is safe to drink, EPA prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and 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, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife. Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches. **Cryptosporidium:** Testing was performed in October, November and December of 2015 and the results were ND (non-detect). *Cryptosporidium* is a microbial parasite that has been found in surface water throughout the U.S. Ingestion of *cryptosporidium* may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals are able to overcome the disease within a few weeks. However, immunocompromised people have more difficulty and are at greater risk of developing severe, life-threatening illness. Immuno-compromised individuals are encouraged to consult their doctor regarding appropriate precautions to prevent infection. *Cryptosporidium* must be ingested for it to cause disease, and may be passed through other means than drinking water.

- **Inorganic contaminants** such as salts and metals, which can be naturally-occurring or result from urban storm 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, storm water runoff, and residential uses.
- **Organic chemical contaminants** including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff and septic systems.
- **Radioactive contaminants** which can be naturally occurring or be the result of oil and gas production and mining activities. **Radon** – No tests were performed for Radon. The United States Environmental Protection Agency sets drinking water standards and has determined that radon is a health concern at certain levels of exposure. Radon is a naturally occurring radioactive contaminant that occurs in groundwater. It is a gas and is released from water into household air during water use. Radon has been found in epidemiology studies to cause lung cancer in humans at high exposure levels. At lower exposure the risk of lung cancer is reduced. Presently EPA is reviewing a standard for radon in water. Radon is a radioactive gas that you cannot see, taste, or smell. It is found throughout the United States. 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 be (in most cases) 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. Fix your home if the level of radon in your air is 4 picocuries per liter of air (pCi/L) or higher. There are simple ways to fix a radon problem that aren't too costly. For additional information on radon, call the Massachusetts Department of Public Health, Radon Program at 413-586-7525 or call EPA's Radon Hotline, 800-SOS-RADON.
- **Unregulated contaminants** are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted. Unregulated contaminants were evaluated in 2013. Compounds detected in the Falmouth sources are tabulated on the right.

Name	Reported Level	Range
Strontium ppb	27	24-32
Vanadium ppb	0.10	ND-0.35
Hexavalent Chromium ppb	0.05	ND-0.09
Chlorate ppb	163	ND-330

CROSS CONNECTIONS: The purpose of this program is to protect the public potable water supply from the possibility of contamination or pollution by isolating such contaminants or pollutants which could backflow or back-siphon into the public water system. To promote the elimination or control of existing cross connections, actual or potential, between its customers in-plant potable water system, and non-potable systems. To provide for the maintenance of a continuing program of cross connection control which will effectively prevent the contamination or pollution of all potable water systems by cross connection. For information regarding our program please visit the Town's website @ www.falmouthmass.us

SOURCE WATER PROTECTION: Mass DEP has prepared a Source Water Assessment Program (SWAP) Report for the water supply source(s) serving this water system. The SWAP Report assesses the susceptibility of public water supplies to potential contamination by microbiological pathogens and chemicals. The report commends the Town for its proactive source protection efforts to reduce risks and promote water resource education. All of our water sources are considered highly susceptible (except Mares Pond Well = medium susceptibility) to contamination from a variety of sources such as: fuel spills, fertilizer use, MMR plume migrations and septic systems. The complete SWAP report is available on-line at <http://www.mass.gov/dep/water/drinking/swapreps.htm>. For more information contact the Massachusetts Department of Environmental Protection at (508) 946-2766. Residents can help protect sources by: Practicing good septic system maintenance, supporting water supply protection initiatives, taking hazardous household chemicals to hazardous materials collection days, and limiting pesticide and fertilizer use.



DEFINITIONS: **MCLG** – Maximum Contaminant Level Goal, or the level of a contaminant in drinking water below which there are no known or expected health risks. **MCL** – Maximum contaminant level, the highest level of a contaminant that is allowed in drinking water. **AL** - Action level, or the concentration of a contaminant which, when exceeded, triggers treatment or other requirements which a water system must follow. **TT** – Treatment technique, or required process intended to reduce the level of a contaminant in drinking water. **MRDLG** – Maximum residual disinfectant level goal or the level of drinking water disinfectants below which there is no known or expected health risk. **MRDL** – Maximum residual disinfectant level or the highest level of a disinfectant allowed in drinking water. Abbreviations: **NA** – not applicable, **ND** – none detected, **NR** – not regulated, **NTU** – Nephelometric Turbidity Units, **PPM** – parts per million, **PPB** – parts per billion, **PPT**- parts per trillion, **PPQ**- parts per quadrillion, **MFL** – million fibers per liter, **pCi/L** – pico curies per liter, a measurement of radioactivity. **CASRN** - Chemical Abstract Services Registry Number. **MDL**- maximum daily load.

WATER QUALITY SUMMARY: Each year, your water is collected and tested for over 100 possible impurities. The following Table provides information about substances that have been detected in the most recent water quality testing. In total, over 2,000 samples were taken throughout 2015. Over 100 other contaminants were tested for in 2015 but not detected.

2015 Water Quality Results

Contaminant/Unit of Measure	Number Of Samples	Average Level Detected	Range of Detection	MCL	Violation Y/N	MCGL	Likely Source of Contamination and Health Effects
Radionuclides - data represents values from prior years sampling							
Gross Alpha pCi/l	NA	0.43	0.24-0.61	15	N	0	Erosion of Natural deposits. Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.
Radium 226 pCi/l	NA	0.06	0.05-0.08	5	N	0	Erosion of Natural deposits. Some people that drink water containing radium 226 in excess of the MCL over many years may have an increased risk of getting cancer
Radium 228 pCi/l	NA	0.44	ND-0.80	5	N	0	Erosion of Natural deposits. . Some people that drink water containing radium 228 in excess of the MCL over many years may have an increased risk of getting cancer
Inorganic Contaminants							
Nitrate ppm	5	0.51	0.05 – 1.47	10	N	10	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits. Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and if untreated may die. Symptoms include shortness of breath and blue baby syndrome.
Perchlorate ppb	8	0.56	ND-1.2	2.0	N	NA	Rocket propellants. Fireworks, munitions, flares, blasting agents. Perchlorate interferes with normal function of the thyroid gland and thus has the potential to affect growth and development causing brain damage and other adverse effects, particularly in fetuses and infants. Pregnant women, the fetus, infants, and children up to the age of 12 and people with hypothyroid condition are particularly susceptible to perchlorate toxicity.
Microbiological							
Total coliform Disinfected water samples	732	0	0	***	N	0	Naturally Present in the environment. Bacteria that are used as an indicator that other potentially harmful bacteria may be present. ***Presence of coliform bacteria in 5% of monthly samples for systems that collect 40 or more samples/month is a violation
E. coli Sampled at Long Pond Raw Water prior to disinfection	260	0	0-16	***	N	0	Human and Animal fecal waste. Bacteria whose presence indicates that the water may be contaminated with human or animal waste. Microbes in these waters 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 and people with severely compromised immune systems.*** Presence of coliform bacteria in 5% of monthly samples for systems that collect 40 or more samples/month is a violation
Turbidity NTU Sampled at Long Pond	365 (daily)	0.81	0.36-1.51	TT	N/A	TT	Turbidity measures the cloudiness of water. We monitor it because it is a good indicator of water quality. Turbidity has no health effects, however, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease causing organisms. These include bacteria viruses and parasites that cause symptoms such as diarrhea, cramps, nausea, headaches. Soil run off.
Stage 2 Disinfection By-Products							
TTHM ppb Total Trihalomethanes	32	38.8	5.86-80.7	80	Y	NA	By product of Chlorination Process. Some people who drink water containing trihalomethanes in excess of the MCL over many years, experience problems with their liver, kidneys or central nervous system and may have an increased risk of getting cancer. Compliance for TTHM's is determined as an "annual running average" of all samples. The detected levels shown are the highest average of (4) quarterly averaged values.
HAA5 ppb Haloacetic Acids	32	21.8	0.9-41.0	60	N	NA	By product of Chlorination Process. Some people who drink water containing haloacetic acid in excess of the MCL over many years, experience problems with their liver, kidneys or central nervous system and may have an increased risk of getting cancer. Compliance for HAA5's is determined as an "annual running average" of all samples. The detected levels shown are the highest average of (4) quarterly averaged values.
Volatile Organic Compounds							
Chlorodibromomethane ppb	4	0.28	ND-1.13	none	N	none	Trihalomethane, By-product of drinking water chlorination. Some people who drink water containing Chlorodibromomethane at high concentrations for many years could experience liver and kidney problems. It is an unregulated contaminate.
Bromodichloromethane ppb	4	0.71	ND-2.82	none	N	none	Trihalomethane, By-product of drinking water chlorination. Some people who drink water containing Bromodichloromethane at high concentrations for many years could experience liver and kidney problems. It is an unregulated contaminate.
Chloroform ppb	4	1.68	0.82-4.14	none	N	none	Trihalomethane, By-product of drinking water chlorination. Some people who drink water containing Chloroform at high concentrations for many years could experience liver and kidney problems. It is an unregulated contaminate
Synthetic Organic Compounds							
Tetrachoroethylene (PCE), ppb	14	0	ND	5.0	N	5.0	Distribution system samples and do not represent source water quality. PCE likely source is the lining adhesive within certain AC pipelines.