



# Town of Topsfield

## 2012 Water Quality Report

### The Quality of Your Drinking Water

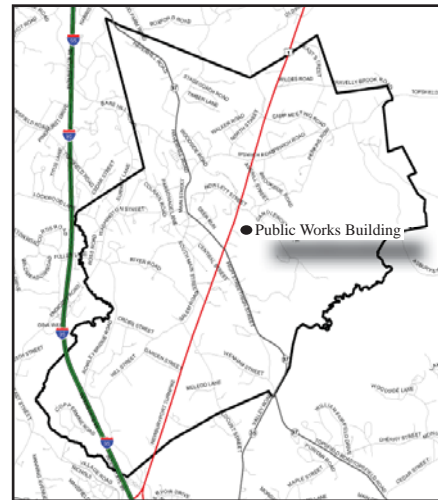
The Topsfield Water Department (PWS ID# 3298000) is committed to providing our customers with high quality drinking water that meets or surpasses state and federal standards for quality and safety. To ensure delivery of a quality product, we have made significant investments in treatment facilities, water quality monitoring and the distribution system. We are pleased to report the results of our calendar year 2012 water testing to inform you about your drinking water. Each year, we will be mailing you information about water quality.

### Topsfield's Water System

Our water system is supplied by two groundwater wellfields and pumping stations located at North Street (3298000-01G) and Perkins Row (3298000-02G). The system has two water storage tanks and approximately 50 miles of water main piping.

### Any Questions?

Want to know more about the Topsfield water supply system or interested in participating in the decision making-process? Please call Greg Krom, Superintendent, at the Topsfield Water Department at (978) 887-1517 with any questions, comments or concerns. We are located at the Public Works Facility, 279 Boston Street. You can also email us at [water@topsfildpublicworks.org](mailto:water@topsfildpublicworks.org) or visit our website: [www.topsfildpublicworks.org](http://www.topsfildpublicworks.org). We encourage all customers to attend and participate in the Board of Water Commissioners meetings which occur the 2nd Wednesday of every month at the Public Works Facility. If you would like to receive email notifications about water supply events such as hydrant flushing, water bans or water quality topics then please visit our website and subscribe to our email list.



### Topsfield's Water Treatment

In order to meet state and federal requirements for public drinking water, our source water receives treatment before it is supplied to our customers. We treat our water for corrosion control, disinfection, sequestration and add fluoride.

Many drinking water sources in New England are naturally corrosive. So, the water they supply has a tendency to corrode and dissolve the metal piping it flows through. This not only damages pipes but can also add harmful metals, such as lead and copper, to the water. For this reason it is beneficial to add chemicals that make the water neutral or slightly alkaline. This is done by adding one, or a combination of several, approved chemicals. The Topsfield Water Department adds potassium hydroxide to its water. This adjusts the water to a non-corrosive pH. Testing throughout the water system has shown that this treatment has been effective at reducing lead and copper concentrations.

All reservoirs and some groundwater sources contain numerous microorganisms, some of which can cause people to become sick. To eliminate disease-carrying organisms, it is necessary to disinfect the water. Disinfection does not sterilize the water; it removes harmful organisms. Sterilization is too costly and kills all organisms, even though most are not harmful. The Topsfield Water Department uses sodium hypochlorite 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.

Iron and Manganese are often present in groundwater at levels that can discolor the water, or cause it to take on an unpleasant odor or taste. Even though the water may still be safe to drink, treatment is often desirable. Treatment consists of adding a orthophosphate/polyphosphate blend to the water. This results in a chemical reaction, known as sequestration, which prevents the iron and manganese from forming nuisance particles. All chemicals used for sequestration are approved for water treatment by one of the following organizations: National Sanitation Foundation (Now known as NSF International) or UL, both accredited by the American National Standards Institute (ANSI). Chemicals must also meet standards established by the American Water Works Association (AWWA).

In addition, fluoride is added to the water to promote strong, healthy teeth.

### Water System Improvements

Our water system is routinely inspected by the Department of Environmental Protection (DEP). The DEP inspects our system for technical, financial and managerial capacity to provide safe drinking water to you. To ensure that we provide the highest quality of water available, your water system is operated by a Massachusetts certified operator who oversees the routine operations of our system. As part of our ongoing commitment to you, last year we made the following improvements to our system:

- Water mains on Central Street, from Main Street to Summer Street, and on Main Street, from Washington Street to Ipswich Road, were replaced. The old mains were installed in 1949 as part of the original water system and were prone to frequent failure.
- A new water main was installed on Bare Hill Road, from Haverhill Road to Parsonage Lane. The new pipe segment eliminates two long dead end mains which will improve water quality in the area, increase fire flow and provide an additional route for water to travel from our sources to the center of town and the storage tanks.
- The feasibility of various water supply and treatment alternatives were examined to determine the best option for either removing manganese from our source water or purchasing treated water from another city, town or the Massachusetts Water Resources Authority. A green-sand manganese removal plant situated at the Public Works Building was deemed the most viable option.

## Water Quality Summary

Listed below are 14 contaminants detected in Topsfield's drinking water in 2012. *The presence of contaminants does not necessarily indicate that the water poses a health risk.* Not listed are over 100 other contaminants for which we tested but were not detected.

Samples Collected from Our Wellfields							
Substance	Units	Highest Level Detected	Range Detected	Highest Level Allowed (EPA's MCLs)	Ideal Goals (EPA's)	OSRG	Possible Sources of Contaminant
<b>INORGANIC CHEMICALS</b>							
Arsenic	ppb	2	ND - 2	10	10		Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Barium	ppm	0.052	0.052 - 0.028	2	2		Erosion of natural deposits; runoff from orchards
Nitrate	ppm	1.85	1.81 - 1.85	10	10		Runoff from fertilizer use; leaching from septic systems; erosion of natural deposits.
Perchlorate	ppb	163	153 - 163	2000			Rocket propellants, fireworks, munitions. flares, blasting agents
<b>RADIONUCLIDES</b>							
Alpha Emitters <sup>I</sup>	pCi/L	1.7	1.0 - 1.7	15	0	-	Erosion of natural deposits
Combined Radium <sup>I</sup>	pCi/L	0.4	ND - 0.4	5	0	-	Erosion of natural deposits

Samples Collected from Your Faucets							
Substance	Units	Highest Level Detected	Range Detected	Highest Level Allowed (EPA's MCLs)	Ideal Goals (EPA's MCLGs)	Possible Sources of Contaminant	
<b>MICROBIOLOGY</b>							
Total Coliform Bacteria (Highest number detected per month)		0	0	1	0	Naturally present in the environment	
Fecal Coliform Bacteria (Highest number detected per month)		0	0	0	0	Human and animal fecal waste	
<b>INORGANIC CHEMICALS</b>							
Fluoride	ppm	1.1	0.6 - 1.1	4 (MRDL)	4	Water additive that promotes strong teeth	
<b>DISINFECTION BY-PRODUCTS</b>							
Total Tri-Halomethanes (TTHMs)	ppb	40	25.9 - 40.0	80	-	By-product of drinking water chlorination	
Haloacetic Acids (HAA5)	ppb	ND	ND	60	-		
<b>DISINFECTANT</b>							
Substance	Units	Highest Quarterly Average	Range Detected	MRDL	MRDLG	Possible Sources of Contaminant	
Free Chlorine	mg/L	0.37	0.20 - 0.37	4	4	Water additive to inactivate harmful organisms.	
<b>LEAD &amp; COPPER</b>							
Substance	Units	90th Percentile	Range Detected	Action Level (EPA's MCLs)	Ideal Goals (EPA's MCLGs)	Possible Sources of Contaminant	
Copper	ppm	0.180	0.046 - 0.660	1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits	
(0 samples exceeded action level)							
Lead	ppb	12	ND - 12	15	0	Corrosion of household plumbing systems	
(0 samples exceeded action level)							

## Unregulated Contaminants

Substance	Units	Range Detected	Average Detected	Suggested MCL	Health Advisory	Possible Sources of Contaminant
Manganese <sup>2,4</sup>	ppb	10 - 150	74	50 <sup>4</sup>	300	Erosion of natural deposits
Sodium <sup>2,3</sup>	ppm	26.2 - 35	31	20		Naturally present in the environment

### Definitions

**Maximum Contaminant Level (MCL)** - This is 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 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. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.

**Action Level** - The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

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

**90th Percentile** - Out of every 10 homes sampled, 9 were at or below this level.

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

**Massachusetts Office of Research and Standards Guideline (ORSG)** - This is the concentration of a chemical in drinking water, at or below which, adverse health effects are unlikely to occur after chronic (lifetime) exposure. If exceeded, it serves as an indicator of the potential need for further action.

**ppm** - One part of contaminant per million parts of water.

**ND** - Substance not detected in the sample

**ppb** - One part of contaminant per billion parts of water.

**pCi/L** - Picocuries per liter is a measure of the radioactivity in water.

**UR** - Unregulated contaminant

### Notes:

- The state allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though representative, are more than one year old.
- 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 their occurrence in drinking water and whether future regulation is warranted.
- The Massachusetts Office of Research and Standards has set a guideline of 20 ppm for sodium.
- EPA has established a lifetime health advisory (HA) of 300 ppb for manganese to protect against concerns of potential neurological effects, and a one-day and 10-day HA of 1000 ppb for acute exposure.

## Concerns about Manganese in Drinking Water

Manganese is a naturally occurring mineral found in rocks, soil and groundwater, and surface water. Manganese is necessary for proper nutrition and is part of a healthy diet, but can have undesirable effects on certain sensitive populations at elevated concentrations. The United States Environmental Protection Agency (EPA) and MassDEP have set and an aesthetics-based Secondary Contaminant Level (SMCL) for manganese at 50 micrograms per Liter (ug/L), or 50 parts per billion (ppb), and health advisory levels. In addition, EPA and MassDEP have also established public health advisory levels.

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, EPA recommends that people drink water with manganese levels less than 300 ug/L and over the short term, 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. For more information please see:

[http://www.epa.gov/ogwdw/cc1/pdfs/reg\\_determine1/support\\_cc1\\_magnese\\_dwreport.pdf](http://www.epa.gov/ogwdw/cc1/pdfs/reg_determine1/support_cc1_magnese_dwreport.pdf)

## Concerns about Lead in Drinking Water

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 Topsfield 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 the 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 or at <http://www.epa.gov/safewater/lead>.

## Help To Protect Our Water Supply!

The Department of Environmental Protection (DEP) has prepared a Source Water Assessment Program (SWAP) Report for our water supply sources. The SWAP report assesses the susceptibility of public water supplies. A copy of the SWAP report is available at the Public Works Facility. Our SWAP report has indicated that our groundwater is highly susceptible to contamination from residential activities adjacent to the wells; residential land uses; accidental spills from local roadways and Route 1; hazardous materials storage; existing contamination sites; auto repair shops and service stations; cemeteries; and agricultural activities. As a consumer, you have an impact on the quality of our water supply sources, and therefore, the quality of the water you drink. The land around our groundwater wells is mainly forested and residential with lesser amounts zoned as commercial. When rain falls or snow melts, the seemingly small amounts of chemicals and other pollutants around your property may be transferred by groundwater or overland flow to the wells.

## **The Substances Found in Your Tap Water**

The sources of drinking water (both tap water and bottled water) include rivers, lakes, reservoirs, streams and wells. As water travels over the land's surface or through the ground, it dissolves naturally-occurring minerals and radioactive material, and can be polluted by animals or human activity. Contaminants that might be expected in untreated water include: biological contaminants, such as viruses and bacteria; inorganic contaminants, such as metals and salts; pesticides and herbicides; organic chemicals from industrial or petroleum use; and radioactive materials. In order to ensure that tap water is safe to drink, the Environmental Protection Agency (EPA) prescribes regulations which limit the amount of certain contaminants in water provided by public water systems.

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 (800-426-4791).

## **Is Our Water Safe for Everyone?**

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 (800-426-4791).

## **Help Prevent Cross Connections!**

Do you know what a cross connection is? It is an actual or potential connection between a potable water line and any waste pipe, soil pipe, sewer, drain or other unapproved source. In a residential setting, cross connections include filling a swimming pool with a garden hose's outlet submerged in the water or even below the flood rim of the pool. If the hose outlet were submerged during a water main break, the pool water could be siphoned back into the home plumbing and/or water distribution system. Once normal pressure is restored, the contaminated water may exit the plumbing system through a tap used for potable water. Please call the Water Department at (978) 887-1517 or visit our website, [www.topsfieldpublicworks.org](http://www.topsfieldpublicworks.org), if you would like more information about how to prevent cross connections and the danger they pose to the distribution system and public health.