



Topsfield Water Department

279 Boston Street
Topsfield, MA 01983

November 1, 2013

Drinking Water Advisory - Important information about manganese in your drinking water

Manganese is a nutrient that is part of a healthy diet. Drinking water may naturally contain manganese and, when concentrations are greater than 50 micrograms per Liter ($\mu\text{g/L}$), the water may be discolored and taste bad. Over a lifetime, the United States Environmental Protection Agency (EPA) recommends that people drink water with manganese levels less than 300 $\mu\text{g/L}$ and over the short term, EPA recommends that people limit their consumption of water with levels over 1,000 $\mu\text{g/L}$, primarily due to concerns about possible neurological effects. Children up to 1 year of age should not be given water with manganese over 300 $\mu\text{g/L}$ nor should formula for infants be made with that water for longer than 10 days.

Both of our water sources have exceeded the 300 $\mu\text{g/L}$ threshold within the last year. The most recent test results show our source located on Perkins Row contains 359 $\mu\text{g/L}$ of manganese; levels have varied between 150 $\mu\text{g/L}$ and 370 $\mu\text{g/L}$ in 2013 with an average of 313 $\mu\text{g/L}$. The most recent test result for our source located on North Street contains 94 $\mu\text{g/L}$; levels have varied between 70 $\mu\text{g/L}$ and 1,270 $\mu\text{g/L}$ during 2013 with an average of 391 $\mu\text{g/L}$.

What should you do? What does this mean?

- Manganese is generally not harmful. ***However, infant formula should be prepared with bottled water or formula should be made with water from an alternative source with manganese levels below 300 $\mu\text{g/L}$ or as low as possible.***
- ***Do not boil the water.*** Boiling, freezing, filtering or letting the water stand does not reduce the manganese levels. Excessive boiling can make the manganese more concentrated, because manganese remains behind when the water evaporates.
- ***Children, one year of age or younger, should use bottled water or water from an alternative source with a manganese level below 300 $\mu\text{g/L}$.*** (See fact sheet on the following page for alternative sources of water.)
- If you have health related questions on manganese see the fact sheet or contact your health care provider.

What is being done? What is the next step?

Last year, the Town hired an engineering consultant to identify possible long term solutions for this type of contamination and to prepare capital and operating cost estimates. After reviewing several options, the Board of Water Commissioners decided to pursue the construction of a centralized water treatment plant capable of reducing source water manganese concentrations to 50 $\mu\text{g/L}$ or less. A warrant article was presented at Town Meeting in May 2013 that requested funding for engineering services needed to design, pilot test, permit and bid the construction of the plant. The article was not approved. The Board plans to request funding for a second time at Town Meeting in May 2014. You will receive information about the proposed treatment plant in a separate mailing later this winter.

What has changed? Why am I receiving this notice now?

The Massachusetts Department of Environmental Protection (MassDEP) has completed their review of several studies that raised concerns about health effects caused by elevated manganese levels in drinking water. Information about these concerns has appeared in our annual water quality report since 2011. Based on these studies, MassDEP has concluded that additional steps are needed to protect public health. This notice is the first step in a process that will ultimately require reductions in source water manganese levels.

MassDEP will require communities to comply with enhanced notification requirements for the next round of sampling in 2014 (Topsfield has been reporting manganese levels in its Consumer Confidence Reports). In an effort to keep our customers informed, the Town is choosing to be proactive in providing information about the sampling result as well as the important steps we are taking to identify and implement solutions.

Where can I get more information?

We will continue to monitor manganese levels and work with MassDEP to keep you informed of all current information on this issue. Monthly lab testing results will be posted on our website (www.topsfieldpublicworks.org). For more information on manganese please see the attached fact sheet or visit MassDEP's website (<http://www.mass.gov/eea/agencies/massdep/water/drinking/manganese-in-drinking-water.html>).

Where can I get more information? (continued)

If you have any questions for our Water Department please contact Greg Krom at (978) 887-1517, or at gkrom@topsfieldpublicworks.org or by mail at 279 Boston Street, Topsfield, MA 01983.

Please share this information with all other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand, mail or email. An electronic copy of this notice is available on our website (www.topsfieldpublicworks.org).

This advisory is being sent to you by the Topsfield Water Department
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MassDEP Fact Sheet

Manganese In Drinking Water: Information for Consumers

Introduction

This fact sheet is intended to inform you about the nature of manganese in drinking water, typical concentrations, its contribution to manganese exposure in humans, especially infants and children, and provide guidance on health protection limits in drinking water.

What is manganese and where does it come from?

Manganese is a common naturally-occurring element found in rocks, soil, groundwater and surface water. In certain geological formations and under certain conditions, the concentration of manganese in water can become quite high.

Why is there Manganese in drinking water?

Water that is used as a source for drinking water invariably has some manganese in it. After the water passes through a distribution plant (with or without treatment to reduce manganese concentrations), it flows through the distribution system of water mains to your tap. Minerals, including manganese, settle out and build up fine sediments in water pipes, so that the amount of manganese that reaches customers' taps is usually less than that which was in the well or at the treatment facility. When there is a disturbance in the system, such as a water main break, use of fire hydrants, or a flushing operation to clean the pipes, sediment may get stirred up and drawn into home plumbing. This water will have higher than normal levels of manganese and may appear visibly discolored.

What health effects are associated with exposure to manganese?

Manganese is an essential trace mineral required for appropriate health and nutrition including metabolism and as a cofactor in many enzymes. It is also necessary for normal immune system function, digestion and bone strength.

Most exposure to manganese comes from the diet, typically between 2 and 5 milligrams per day (mg/d) in adults. However, infant formulas contain manganese, and if prepared with water that also contains manganese, the infant may get a higher dose than the rest of the family. In addition, young children appear to absorb more manganese than older age children but excrete less. This adds up to a greater potential for exposure in the very young. Some studies suggest that early childhood exposures to manganese can have effects on learning and behaviour. Thus, it is very important to know what the levels in drinking water are when using it to make baby formula.

What are the levels of concern?

The United States Environmental Protection Agency (EPA) and MassDEP currently list manganese as a secondary contaminant because of aesthetic concerns including unacceptable taste, staining of fixtures and dark, cloudy water at levels greater than 50 micrograms per liter ($\mu\text{g/L}$). In addition, both EPA and MassDEP have established public health advisory levels.

Manganese is a nutrient that is part of a healthy diet. Drinking water may naturally have manganese and, when concentrations are greater than 50 $\mu\text{g/L}$, the water may be discolored and taste bad. Over a

lifetime, the EPA recommends that people drink water with manganese levels less than 300 µg/L and over the short term, EPA recommends that people limit their consumption of water with levels over 1000 µg/L, primarily due to concerns about possible neurological effects. Children up to 1 year of age should not be given water with manganese over 300 µg/L, nor should formula for infants be made with that water for longer than 10 days. See:

http://www.epa.gov/safewater/ccl/pdfs/reg_determine1/support_cc1_manganese_dwsreport.pdf

What options are available when manganese in drinking water is elevated?

You may use:

- ✓ Bottled water. If you choose to use bottled water check the Massachusetts Department of Health (MDPH) web page DPH Bottled Water (<http://www.mass.gov/eohhs/gov/departments/dph/programs/environmental-health/food-safety/bottled-water/>) to locate bottled water that is free of manganese.
- ✓ Water from another MassDEP approved public water system that does not have elevated levels of manganese.
- ✓ A water pitcher filter or home water filter unit that is capable of removing dissolved metals. For more information on water pitcher filters and home water filter units please visit the National Sanitation Foundation (NSF) at NSF Consumer Information (<http://www.nsf.org/consumer-resources/>) or call 1-800-673-8010.

Do not boil the water. Boiling will concentrate the levels of manganese. If infants and children may be exposed to manganese in drinking water greater than 300 µg/L, for example in daycare facilities, schools or other venues, then alternative sources of water are an option to reduce the levels of exposure.

Please note: Only a Massachusetts state certified laboratory or another party who complies with Massachusetts General Law Chapter 111 Section 160D should test your water for manganese.

Where can I get more information on manganese?

For more information on manganese in public drinking water please visit the MassDEP webpage at <http://www.mass.gov/eea/agencies/massdep/water/drinking/manganese-in-drinking-water.html>. You may also contact the MassDEP Drinking Water Program at program.director-dwp@state.ma.us.

For questions related to manganese exposure and health you may contact the MDPH Bureau of Environmental Health (BEH) at (617) 624-5757. You may also contact your local Board of Health and/or your healthcare provider.