

Manganese

Maximum acceptable concentration for drinking water = 0.120 mg/L

Manganese (Mn) is a naturally occurring essential element found widely in air, water and soil. It is prevalent across Nova Scotia in surface water and groundwater.

Sources

Manganese is likely to be found in groundwater and surface water throughout Nova Scotia at variable concentrations depending on the rock and soil in the area.

The most common sources of manganese in drinking water are naturally occurring and can be attributed to weathering of manganese bearing rocks and soils. Other less common sources of manganese can be attributed to human activities including mining and industrial activities, leachate from landfills and sewage effluent.

Acceptable Concentration

The Guidelines for Canadian Drinking Water Quality has established a **maximum acceptable concentration (MAC) of 0.120 milligrams per litre (mg/L) and an aesthetic objective (AO) of 0.020 mg/L.**

Health Risks

Current evidence indicates that consumption of manganese in drinking water above the MAC over a prolonged period of time can adversely affect neurologic development in children, and memory, attention and movement in adults.

QUICK FACTS

- Manganese occurs naturally in groundwater and surface water throughout Nova Scotia
- Manganese can be detected through chemical testing
- The Guidelines for Canadian Drinking Water Quality Maximum Acceptable Concentration (MAC) for manganese is **0.120 mg/L.**
- Prolonged consumption of water with manganese above MAC levels may result in adverse neurological health effects
- The presence of manganese at concentrations above Aesthetic Objective levels of **0.020 mg/L** may affect the taste, smell or colour of water and possibly cause staining of laundry and bathroom fixtures.

Regular Testing

Homeowners are responsible for monitoring the quality of their private water supply:

- Test for bacterial quality every 6 months.
- Test for chemical quality every 2 years.
- Test more often if you notice changes in physical qualities – taste, smell, or colour.

Regular testing alerts you to problems with your drinking water.

Aesthetic Objective

The Aesthetic Objective (AO) for manganese is 0.020 mg/L, based on objectionable taste, smell and colour of the water as well as possible staining of laundry and bathroom fixtures.

Testing

Regularly test your well water for a standard suite of chemical parameters, including manganese. Use an accredited water testing laboratory. Find a list of accredited water testing laboratories at <https://www.novascotia.ca/nse/water/waterlabs.asp> or see the Yellow Pages under “laboratories.”

The cost for the bacterial and chemical contaminant tests vary depending on the laboratory and the contaminants you choose to test for.

Special bottles and instructions on proper sampling should be obtained directly from the laboratory selected to complete the analysis.

Solutions

If manganese is present above 0.120 mg/L it is recommended that a second confirmatory test is completed.

If manganese is confirmed to be present above the MAC consider the following actions:

- Inspect and properly maintain the well
- Find an alternate source for drinking, cooking, and teeth brushing, such as bottled water, or
- Treat your current source to reduce manganese levels.

If the concentration is above the AO, consider treatment to improve the aesthetic quality of the water.

Treatment

Manganese cannot be removed from water through boiling. Boiling water may increase the concentration of manganese.

Treatment systems include point-of-entry systems and point-of-use systems.

Effective treatment methods for reducing manganese levels in drinking water include

- cation exchange
- distillation
- catalyzed oxidation / filtration
- reverse osmosis
- some pitcher-style filtration units that incorporate the above methods may be effective.

Treatment systems certified by NSF for the applicable parameter are recommended when available. NSF International is a not-for-profit, non-governmental organization that sets health and safety standards for manufacturers in 80 countries. See its website at www.nsf.org.

The effectiveness of treatment depends on the type of manganese present, the pH of the water, and the parameter’s relative concentration.

Once installed, re-test your water to ensure the treatment system is working properly. Maintain the system according to the manufacturer’s instructions to ensure a continued supply of safe drinking water.

For more information on water treatment, see our publications *Water Treatment Options and Maintaining Your Water Treatment*, part of the Your Well Water booklet series at <https://www.novascotia.ca/nse/water/privatewells.your.wellwater.asp>.

Considerations

The concentration of manganese in well water can fluctuate seasonally and vary with the depth and location of well and the geology in the area.

Drinking Water Interpretation Tool (DWIT)

You can compare guidelines for many common drinking water quality parameters by entering your well water test results in the NSE Drinking Water Interpretation Tool at: novascotia.ca/nse/dwit

FOR MORE INFORMATION CONTACT

Nova Scotia Environment at
1-877-9ENVIRO
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www.novascotia.ca/nse/water