

The drop on water

Selenium

Selenium (Se) is found naturally in small quantities in rocks and soils.

Sources

The presence of selenium in well water depends on the rock and soil type in the area. It may be more prevalent in areas underlain by certain shales. Weathering and erosion in these areas can lead to the presence of selenium in groundwater.

Other sources of selenium in groundwater include contamination from

- copper and lead refinery effluent
- municipal wastewater
- hazardous waste sites

For most people, food is one of the main sources of ingested selenium.

Maximum Acceptable Concentration in Drinking Water = 0.01 mg/L

In water, selenium has no taste, smell, or colour. It can only be detected through a chemical test.

The Canadian drinking water quality guideline for selenium is **0.01 milligrams per litre (mg/L)**.

QUICK FACTS

- Selenium is present in rock, soil, and the effluent of certain industries.
- Selenium in drinking water has no taste, smell, or colour.
- Selenium can only be detected through chemical testing.
- The Canadian drinking water quality guideline for selenium is **0.01 mg/L**.
- Exposure to very high levels of selenium (above 9 mg/L) in drinking water can cause fatigue and irritability, as well as damage to hair, fingernails, and liver tissue.
- Well water with selenium greater than **0.01 mg/L** should not be used for drinking, cooking, or teeth brushing. It may be used for bathing, handwashing, and dishwashing.
- If selenium is present above **0.01 mg/L** in drinking water, consider water treatment options or alternative sources of water.

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Health Risks

Selenium, at low levels, is an essential nutrient for human health.

Short-term exposure (over days or weeks) to selenium in drinking water at very high concentrations (above 9 mg/L) can cause nausea, diarrhea, vomiting, fatigue, and irritability.

Long-term exposure (over years or decades) to selenium concentrations above 0.01 mg/L in drinking water may cause

- hair and fingernail damage
- damage to liver tissue

The risk to human health is through ingestion only – drinking, cooking, teeth brushing. Well water with selenium levels greater than 0.01 mg/L may safely be used for bathing, handwashing, dishwashing.

Testing

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

Get the special sampling bottles and instructions on proper sampling from the laboratory.

The cost of analyzing water samples can range from \$15 for a single parameter to \$230 for a full suite of chemical parameters. The cost can vary depending on the lab and the number of parameters being tested.

REGULAR TESTING

Homeowners are responsible for monitoring the quality of their well water:

- 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.



Solutions

If selenium is present above 0.01 mg/L in the first test, get a second test to confirm the original results.

If selenium is confirmed to be present above 0.01 mg/L in the well water,

- Find an alternate source of water for drinking, cooking, and teeth brushing, such as bottled water or another well that has been tested and found to be safe.
- or
- Treat your current source of water to reduce selenium levels.

Treatment

Selenium cannot be removed from water through boiling.

Effective treatment methods include

- distillation
- reverse osmosis

Buy a treatment system that has been certified to meet the current NSF standards for selenium reduction. 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.

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 www.gov.ns.ca/nse/water/privatewells.asp.

FOR MORE INFORMATION

Contact

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


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