FACTS ON DRINKING WATER

Uranium

Uranium (U) is a naturally occurring radioactive element that exists in soil and rock throughout the world. Some areas of New Brunswick have a greater potential for elevated uranium levels in drinking water. For geographic distribution of uranium in New Brunswick, see New Brunswick's Groundwater Chemistry Atlas at http://www.gnb.ca/0009/0371/0014/index-e.asp.

Sources

Natural concentrations of uranium vary in New Brunswick, depending on the type of minerals in the soil or bedrock. Wells most likely to have high levels of uranium are those in areas with granite, sandstone, and shale bedrock.

Naturally occurring uranium in groundwater comes from the dissolving of minerals that contain uranium. Elevated levels of uranium are more likely to be found in drilled wells that obtain their water through cracks and fractures in bedrock, than in dug wells or surface water supplies.

Some human activities are also sources of uranium – mill tailings, emissions from the nuclear industry, and the combustion of coal and other fuels.

Health Risks

Guidelines for Drinking Water Quality are of two different types:

Maximum Acceptable Concentrations (MAC) are based upon potential adverse health effects (listed in this factsheet if applicable) but water test results that exceed these levels do not necessarily indicate any immediate health problem. This is because whenever possible MACs are developed to be low enough that years of exposure at this level would still only increase the health risk slightly.

However, corrective actions should be taken if water test results exceed the MAC in order to remove any potential for increased health risk.

Aesthetic Objectives (AO) are not based upon health effects, but water test results that exceed these levels may indicate that the water could have objectionable taste, odour, appearance or other factors.

Corrective actions are recommended if water test results exceed the AO but may not be necessary.

Maximum Acceptable Concentration for Drinking Water = 0.02 mg/L

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

The Canadian Drinking Water Quality Guideline for uranium is 0.02 milligrams per litre (mg/L).

Uranium levels in drinking water above 0.02 mg/L can increase the risk of kidney damage.

The risk to human health is through ingestion only – drinking, cooking, teeth brushing. Well water with uranium levels greater than 0.02 mg/L may be used for bathing, handwashing, and dishwashing.

Testing

Regularly test your well water for a standard suite of chemical parameters, including uranium. Use an SCC or CALA accredited water testing laboratory. Find a list of accredited laboratories at http://www.scc.ca or www.cala.ca.

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

For more information on water testing services, please see Department of Environment's water testing services at http://www.gnb.ca/environment. Cost of analysis will vary depending on the accredited laboratory and the number of parameters being tested.

Solutions

If uranium is present above 0.02 mg/L in the first test, get a second test to confirm the original results.

If uranium is confirmed to be present above 0.02 mg/L in the well water,

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

Treatment

Uranium cannot be removed from water through boiling.

We recommend purchasing a treatment system that has been certified to meet the current NSF standards. 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.

Although there are currently no treatment units certified specifically for uranium reduction, effective treatment methods for reducing uranium levels in drinking water include

- activated alumina
- anion exchange
- distillation
- reverse osmosis

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, please contact a private water treatment company.

Considerations for anion exchange method

Uranium is a negative ion (anion) in solution. When you use anion exchange treatment, the resin in the unit will remove certain anions more readily than others. Uranium is preferred over sulphate, arsenic, nitrate, nitrite, and fluoride. If you need to reduce the levels of these anions when uranium is present, the effectiveness of the unit may be reduced. The resin in the anion exchange unit may need to be regenerated more frequently. It is important that a detailed chemical analysis of your water be completed to determine if other substances are present that will affect treatment.

For more information, please contact the nearest regional Health Protection Branch office:

Bathurst
165 St- Andrew Street
(506) 549-5550

Grand Falls
131 Pleasant Street
(506) 737-4400

Shippagan
239B, boulevard J.D. Gauthier
(506) 336-3061

Campbellton
10 Village Avenue, Unit 15
(506) 789-2549

Miramichi
1780 Water Street
(506) 778-6765

St. Stephen
41 King Street
(506) 466-7615

Caraquet
295, boulevard St-Pierre Ouest
(506) 726-2025

Moncton
81 Albert Street
(506) 856-2814

Sussex
30 Moffett Avenue
(506) 432-2104

Edmundston
121 Church Street
(506) 737-4400

Perth-Andover
35 F Tribe Rd.
(506) 273-4715

Tracadie
3520, rue Principale
(506) 394-3888

Fredericton
300 St Mary's Street
(506) 453-2830

Saint John
55 Union Street
(506) 658-3022

Woodstock
200 King Street
(506) 325-4408

Adapted from Nova Scotia's The Drop on Water fact sheets