

## INFORMATION SHEET ON ARSENIC

### What is arsenic?

Arsenic is a naturally occurring chemical element found throughout our environment and its living systems. Arsenic can enter groundwater through erosion and weathering of soils, minerals, and ores. Arsenic compounds are used in the manufacture of a variety of products and may enter our environment directly from industrial effluents and indirectly from atmospheric deposition.

Arsenic exists in different chemical forms, which can be classified into two groups: organic arsenic and inorganic arsenic. Inorganic arsenic is considered to be the most toxic to human health, while organic arsenic is considered to be non-toxic.

### Does it matter which type of arsenic I've been exposed to?

Arsenic in its pure state rarely exists in the natural environment. It often combines with other elements such as oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic also combines with carbon and hydrogen to form organic arsenic compounds.

Organic arsenic compounds tend to be less harmful to humans, as they are passed readily by the body when ingested. On the other hand, inorganic arsenic compounds tend to remain in the body and collect in human tissues. They are associated with adverse health effects.

### What health effects are related to exposure to inorganic arsenic?

Inorganic arsenic is not usually found at high levels in food. Long-term exposure (over many years or decades) to high levels of inorganic arsenic is known to contribute to the risk of human cancer and can affect the gastrointestinal tract, kidneys, liver, lungs and epidermis.

Short term exposure (days/weeks) to very high levels of inorganic arsenic can also cause various health effects including skin effects, nausea, diarrhea, vomiting and numbness in hands and feet. Current scientific evidence does not clearly indicate that infants and children are more susceptible than adults to the toxic effects of arsenic. However, due to the smaller body weights of infants and children, which can result in greater exposures to contaminants, a more precautionary approach is often taken when assessing the possible risks of chemical exposure to children, to help mitigate any possible risks.

### How does arsenic enter the body?

Arsenic is absorbed by the body when it is ingested, and distributed by the bloodstream. It does not

enter the body through the skin or by inhalation during bathing or showering. The highest levels of arsenic are found in nails and hair, which accumulate arsenic over time. Your body gets rid of arsenic mostly through urine, with smaller amounts removed through the skin, hair, nails and sweat.

### **Can arsenic be found in food?**

Arsenic can be found at very low levels (low parts per billion [ppb]) in many foods, including meat and poultry, milk and dairy products, bakery goods and cereals, vegetables, and fruits and fruit juices. These traces levels of arsenic generally reflect normal accumulation from the environment. Both organic and inorganic forms of arsenic can be found in food. While the levels of each depend on the type of food, inorganic arsenic is not usually found at high levels.

Higher levels of arsenic are generally found in fish and shellfish, but in the organic form, which is not of concern to human health.

### **What standards are in place for arsenic?**

Health Canada and Environment Canada work with the provinces and territories to establish the guidelines drinking water, soil, and air quality. The health guidelines are designed to ensure that Canadians have access to safe drinking water, soil, and air. It is safe to drink and play in water or soil that meets these guidelines. All jurisdictions in Canada use them as the basis for establishing provincial requirements.

The New Brunswick Department of Health has adopted the Health Canada guideline for arsenic in drinking water at 10 parts per billion (ppb). The Canadian Council of Ministers of the Environment has established a value of 12 parts per million (ppm) in soils for the following land uses: residential and park, agricultural, commercial and industrial. If arsenic is found at these levels, further study is required to determine whether they represent a risk to human health.

With respect to ambient air exposure, New Brunswick does not have a legislated standard for arsenic. New Brunswick refers to the Ontario Ministry of Environment standard (24-hr) for arsenic of 25 micrograms per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ).

### **What levels of arsenic have been found in New Brunswick?**

A surface soils survey conducted in the province by the Department of Agriculture found levels of arsenic in soils ranging from 2 ppm to 58 ppm, with 85% of samples testing below 15 ppm, and a median value of 7 ppm.

The New Brunswick Department of Environment maintains a database of private inorganic water quality. Please contact Environment for further information on water quality in your area.

## How can I reduce my exposure to arsenic?

Human exposure to organic arsenic is associated largely with food sources such as seafood and vegetables. Since levels of inorganic arsenic in food tend to be much lower than the levels of organic arsenic, food sources are not considered a health concern.

Exposure to inorganic arsenic has been closely associated with drinking well water from areas where levels of arsenic in the soil and rock are naturally high. Arsenic is tasteless and odourless, so you must rely on water quality tests to know if it is present in water you are consuming. If you are on a private well water supply and have not had inorganic chemical testing done, have the water tested. The Department of Health regularly recommends that all New Brunswickers have their private wells tested for bacteria and inorganic chemicals. Further information can be obtained from your regional Public Health office.

Arsenic in soils is a greater concern for young children, given that they are more prone to dust exposure and very young children may also ingest dirt. Recommendations to reduce exposure to arsenic in soil include:

- Washing hands before eating.
- Washing fruits and vegetables.
- Preventing dirt tracking into home and school (note: floor mats will reduce tracking).
- Vacuuming carpets regularly to reduce dust entrapment.
- Damp-mopping hard floor surfaces.
- Keeping children's toys as clean as possible.
- Testing private drinking water sources.

During winter, the risk of exposure to arsenic in soils is greatly reduced. Exposure to arsenic in ambient air is negligible when compared to intake from ingestion.

## What do I do if I think I've been exposed to Arsenic and am concerned about my health?

If you are concerned that you have been exposed to arsenic and have experienced symptoms related to arsenic intoxication, please contact a medical practitioner.

## Who can I call if I have general questions?

For additional information regarding Arsenic levels in your area, you may also contact your nearest Public Health office at:

Bathurst (North) ..... 547-2062  
Moncton (East)..... 856-2814

Fredericton (Central).... 453-2830  
Saint John (South)..... 658-3022

Some information is taken from the Health Canada Website.

**Related links:**

**Canadian Cancer Society - What is arsenic?**

<http://www.cancer.ca/Canadawide/>

[Prevention/Specific%20environmental%20contaminants/Arsenic%20in%20drinking%20water/  
Arsenic%20in%20depth%20info.aspx?sc\\_lang=en](http://www.cancer.ca/Canadawide/Prevention/Specific%20environmental%20contaminants/Arsenic%20in%20drinking%20water/Arsenic%20in%20depth%20info.aspx?sc_lang=en)

**Health Canada food and nutrition - arsenic**

<http://www.hc-sc.gc.ca/fn-an/securit/chem-chim/envIRON/arsenic-eng.php>

**Agency for toxic substance and disease registry – public health statement on arsenic**

<http://www.atsdr.cdc.gov/toxprofiles/phs2.html>