



## Arsenic in Drinking Water

Arsenic is an odourless and tasteless natural element found widely in the earth's crust and in trace amounts in all living matter. Arsenic is used when manufacturing electronic devices, in glass processing, in some wood preservatives, for agricultural use (pesticides and feed additives), in metal production, and in other industrial processes. It is often found naturally in groundwater, through erosion and weathering of soils, minerals, and ores. Exposure to high levels of arsenic can cause adverse health effects.

For most Canadians, the primary source of exposure to arsenic is food, followed by drinking water, soil and air. Drinking water would only be the major source of exposure for people living near a source of arsenic (either a natural geological source or a contaminated site).

### ***How does arsenic get into my water?***

Arsenic may enter lakes, rivers or underground water through rocks, minerals, ores, industrial wastes, and by the deposit of arsenic particles in dust. Arsenic can also get into water from rain or snow, run-off and leaching. Arsenic can leach into groundwater from sources such as compost and animal waste, sewage sludge, pesticides with arsenic, industrial by-products, reclaimed and enhanced soils, fertilizer and soil amendments, and chemically treated wood.

### ***How can arsenic affect my health?***

Health Canada and the International Agency for Research on Cancer consider arsenic a human carcinogen. Drinking water with very high levels of arsenic over a lifetime can increase the risk of cancer in skin, bone, and internal organs such as the bladder, liver and lungs.

Long-term exposure (over many years or decades) to high levels of arsenic in drinking water may cause:

- thickening and discoloration of the skin;
- nausea and diarrhea;
- decreased production of blood cells;
- abnormal heart rhythm and blood vessel damage; or
- numbness in the hands and feet.

Other adverse health effects that may be associated with long-term ingestion of arsenic include developmental effects in children, neurotoxicity, increased complications from diabetes, pulmonary and cardiovascular disease, negative pregnancy outcomes, and increased infant mortality.

Acute exposure from ingesting elevated levels of arsenic may lead to abdominal pain, vomiting and diarrhea, muscular pain or weakness, numbness, burning or tingling sensation or pain in hands and feet, loss of movement and sensory responses. This type of exposure is highly unlikely in drinking water.

***What is the Maximum Acceptable Concentration for arsenic in drinking water?***

The *Guidelines for Canadian Drinking Water Quality* established by Health Canada has set the maximum acceptable concentration (MAC) of arsenic in drinking water at 0.010 milligrams per litre (mg/L). The guideline is based on lifetime exposure to arsenic from drinking water, and will continue to be reviewed to reflect new treatment methods and new information on health risks as they become available.

***How do I know if there is arsenic in my drinking water?***

As arsenic is both tasteless and odourless, you won't be able to tell if it is in your drinking water. Private water supplies can be tested by an accredited laboratory to determine arsenic levels. All public water supplies are regularly tested for total arsenic.

***What if there are high levels of arsenic in my drinking water?***

Boiling water with elevated arsenic levels will not make the water safe. An alternate safe water source, or water treated with an appropriate treatment device must be used for drinking, cooking, making juice, drinks, ice or infant formula, brushing teeth or soaking dentures, washing fruits and vegetables, and making soup, tea or coffee. Water with elevated arsenic levels may still be used for handwashing, washing dishes, bathing, and laundry.

Because arsenic can cause cancer, every effort should be made to keep arsenic levels in drinking water as low as possible. If high concentrations of arsenic are found in your drinking water:

- Look for an alternate water source with low arsenic concentrations for drinking, cooking, and brushing teeth. Where possible, connect to a public water distribution system.
- Install an in-home water treatment device that can reduce the level of arsenic. Look for treatment devices that have been certified by an accredited certification organization as meeting the appropriate NSF International (NSF)/American National Standards Institute (ANSI) drinking water treatment unit standards for removing arsenic.
  - Distillation systems (NSF/ANSI standard 62)
  - Reverse osmosis drinking water treatment systems (NSF/ANSI standard 58)
  - Residential water filters approved for arsenic removal (NSF/ANSI standard 53)

After the system is installed, have the treated water tested for total arsenic at a private accredited lab to make sure your system is working properly. Monitor and maintain your water treatment equipment according to manufacturer instructions.

If you are concerned about health risks from the consumption of water containing arsenic, please contact your doctor.

For more information about arsenic in drinking water, contact your local Environmental Health Officer.

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