



## ARSENIC

### Fact Sheet

Arsenic is a natural element found widely in the earth's crust. It may be found in some drinking water supplies, including wells. Exposure to high levels of arsenic can cause health effects. Arsenic is also a by-product of acid mine drainage and of neutral pH leaching of mining waste from many precious and base metal ore deposits.

#### SOURCES AND USES OF ARSENIC

- ❖ Burning of fossil fuels (especially coal)
- ❖ Mining of gold and base metal
- ❖ Pesticides and agricultural feed additives
- ❖ Waste burning

#### ARSENIC IN THE ENVIRONMENT

**AIR:** Arsenic settles to the ground or is washed out of air by rain.

**WATER:** Normal/average concentration is 1 ppb for surface and ground water, but can be up to more than 1,000 ppb in mining areas. Ground water is likely to have higher levels than surface water, as many compounds do dissolve in water.

**SOIL:** Average concentration of Arsenic in soil is 5 ppm, but is much higher in mining areas.

Arsenic cannot be destroyed in the environment, it can only change its form. Its compounds are soluble in water. Arsenic does bioaccumulate in fish and shellfish.

(See *Bioaccumulation of Contaminants* Factsheet)

#### ARSENIC AND MINING

- ❖ Arsenic is a by-product of acid mine drainage and of neutral pH leaching of mining waste.
- ❖ Arsenic is found associated with copper, gold, silver, and lead/zinc mining.

#### ENVIRONMENTAL MANAGEMENT CRITERIA FOR ARSENIC

- ❖ Health Canada and the International Agency for Research on Cancer consider arsenic a human cancer-causing agent (*carcinogenic*).
- ❖ Arsenic is one of the many chemicals for which Health Canada has set guidelines. A new guideline has been established at 0.010 milligrams per litre, and will continue to be reviewed to reflect new treatment methods and new information on health risks. The guideline is based on lifetime exposure to arsenic from drinking water, and takes into consideration the ability to measure arsenic and to remove it from drinking water supplies.
- ❖ Arsenic is listed as a "deleterious substance" on the federal *Metal Mining Effluent Regulations*.

#### HUMAN HEALTH EFFECTS

Arsenic is toxic and can cause numerous health effects in humans, including cancer. Arsenic in fish or meat is generally not a concern as they are often in a form that is not absorbed in the gut. Arsenic in water or plants like berries are more of concern because they can be absorbed.

- Humans can be exposed to arsenic through drinking water.
- Arsenic in water is tasteless and odorless.



## First Nations Environmental Health Innovation Network

- Arsenic in drinking water is absorbed by the body when you swallow it, 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.

Short-term exposure to high-levels of Arsenic can cause:

- ❖ Abdominal pain, vomiting, diarrhea.
- ❖ Muscular cramping or pain.
- ❖ Weakness and flushing of skin.
- ❖ Skin rashes.
- ❖ Numbness or tingling sensations in hands and feet.
- ❖ Thickening of the skin on palms of hands and soles of feet.
- ❖ Loss of movement and sensory responses.

Long-term exposure to high-levels of Arsenic can cause:

- ❖ Thickening and discoloration of the skin.
- ❖ Nausea, diarrhea.
- ❖ Decreased production of blood cells.
- ❖ Abnormal heart rhythm and blood vessel damage.
- ❖ Numbness in hands and feet.

Laboratories with specialized equipment can conduct tests to measure arsenic in your body. Testing for arsenic in urine will indicate recent exposure. If you have concerns over elevated Arsenic in your environment and food, contact your regional public health office.

### SOURCES/FOR MORE INFORMATION

Health Canada

[http://www.hc-sc.gc.ca/hl-vs/alt\\_formats/pacrb-dgapcr/pdf/iyh-vsv/environ/arsenic-eng.pdf](http://www.hc-sc.gc.ca/hl-vs/alt_formats/pacrb-dgapcr/pdf/iyh-vsv/environ/arsenic-eng.pdf)

Safe Drinking Water Foundation

<http://www.safewater.org/PDFS/resourcesknowthefacts/Mining+and+Water+Pollution.pdf>

Agency for Toxic Substances & Disease Registry

<http://www.atsdr.cdc.gov/>

CSP2 Fact Sheets Health & Environmental Effects of Trace Elements in Metal Mining Wastes

[http://209.85.173.104/search?q=cache:5H-msLUonIJ:www.csp2.org/reports/Fact Sheets+=Trace Elements in Mining Waste.pdf+CSP2+FACT+SHEETS&hl=en&ct=clnk&cd=2&gl=ca&client=firefox-a](http://209.85.173.104/search?q=cache:5H-msLUonIJ:www.csp2.org/reports/Fact+Sheets+=Trace+Elements+in+Mining+Waste.pdf+CSP2+FACT+SHEETS&hl=en&ct=clnk&cd=2&gl=ca&client=firefox-a)

Metal Mining Effluent Regulations

<http://www.ec.gc.ca/nopp/docs/regs/mmer/mer.pdf>

Call us Toll-Free at 1-866-960-5223 for more environmental health resources.

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<http://www.phac-aspc.gc.ca/> (Public Health Agency of Canada).

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