



Vision:

To be the Healthiest State in the Nation

ARSENIC

Arsenic is a naturally occurring element widely spread in the environment including water, soil, air, plants and animals. Arsenic cannot be eliminated in the environment. Individuals who are exposed to high levels of arsenic experience short-term or long-term health effects such as sore throat, lung irritation, nausea, vomiting, skin discoloration and cancer.

The purpose of this factsheet is to provide an overview of frequently asked questions regarding arsenic in the environment and its possible health effects, as well as regulatory guidance and biomonitoring information.

GENERAL FACTS

What is arsenic?

Arsenic, in its pure form, is a silver-gray, semi-metallic substance that tarnishes in air. It can be found in the environment in rocks and soil, water, air, plants and animals and in man-made products, such as pesticides, wood preservatives and products used in pigments, textiles and paper processing.

Arsenic exists in *organic* or *inorganic* forms. It cannot be eliminated from the environment, but it can change its form.

Inorganic and *organic* arsenic are both white in color and have no odor or taste.

Organic arsenic is usually considered to be non-toxic, or less toxic than inorganic arsenic and is found mainly in fish and shellfish.

Inorganic arsenic often occurs as a result of mining or when arsenic is used for other industrial purposes and can be highly toxic.

Why is arsenic a concern?

Arsenic is naturally present at high levels in groundwater and has been found in almost 70 percent of all United States (U.S.) National Priority List sites¹.

Prior to 2004, arsenic was widely used in a group of pesticides containing chromium, copper and/or arsenic (*Chromated Copper Arsenate—CCA*) that protects wood against termites, fungi and other pests. Contact with arsenic contaminated food,

water, air and/or soil can lead to harmful human health effects. Long-term exposure to arsenic can cause cancer.

Arsenic is listed as a hazardous air pollutant under the Clean Air Act by the U.S. Environmental Protection Agency (EPA).

How could I come in contact with arsenic?

Contact with arsenic could happen by:

- Drinking water containing arsenic.
- Eating food irrigated and/or prepared with water containing arsenic.
- Accidentally eating soil that contains arsenic.
- Coming into contact with arsenic that has leached from CCA pressure-treated wood.
- Breathing in arsenic contaminated air.
- Breathing in smoke from arsenic contaminated tobacco plants and/or wood treated with arsenic.
- Skin contact with arsenic contaminated dust, water, soil and/or sediment.

Only a small amount of arsenic enters the body through skin contact, so it typically causes less harm than if the chemical is swallowed or inhaled.

How can arsenic potentially affect health?

The severity and length of reported human health effects from contact to inorganic arsenic depend on the amount, duration, frequency and route of contact (eating, drinking, breathing and/or skin contact).

¹ NPL—National Priority List. The National Priorities is the list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants or contaminants throughout the United States and its territories.

Ingestion of organic arsenic compounds can cause diarrhea and kidney damage.

Contact with *low levels of inorganic arsenic*² can lead to:

- Abnormal heart rhythm
- Diarrhea
- Damage to blood vessels
- Decreased production of red and white blood cells
- Redness and/or swelling of the skin
- Nausea
- Stomachache
- Vomiting
- Sharp, tingling sensation in hands and feet

Contact with *high levels of inorganic arsenic*³ can lead to:

- Sore throat
- Irritated lungs
- Skin irritation including redness and swelling
- Death

Contact with inorganic arsenic over a long period of time can lead to:

- Corns and warts on palms and soles
- Diabetes
- Cancer
- Dangerous pregnancy outcomes (miscarriage and/or infant death)
- Skin darkening
- Developmental effects
- Lung and heart diseases

Can arsenic cause cancer?

The Department of Health and Human Services and the EPA as well as the International Agency for Research on Cancer have classified that inorganic arsenic can cause cancer to humans.

Sufficient evidence shows that long-term exposure to arsenic can increase the risk of some types of cancer, including bladder, lung, kidney and skin.

How could arsenic potentially affect the health of my child(ren)?

Children who are exposed to inorganic arsenic may have many of the same health effects as adults, including irritation of the stomach and intestines, blood vessel damage, skin changes and reduced nerve function.

Some evidence shows that long-term contact with arsenic could affect normal child development, resulting in lower intelligence quotient (IQ) scores and increased risk of death in young adults.

How can I protect my family from arsenic?

The following precautions can be made to protect yourself and your family from harmful health effects caused by contact with high levels of arsenic:

- Do not drink water that contains high arsenic levels.
- Limit contact with arsenic-contaminated soil.
- Wear protective gear, such as long sleeve clothes, gloves, face masks and face shields while working (for example, sanding, sawing) with CCA pressure-treated wood.
- Thoroughly wash hands with soap and water after playing on or handling arsenic-treated wood.
- Wear personal protective equipment if you work in an environment that exposes you to arsenic. Before leaving work, change your clothes and shower to prevent carrying arsenic home.

REGULATION AND ADVISORY

What are the current federal and state standards for arsenic in the environment?

EPA currently regulates a federal arsenic level of 10 micrograms per liter (µg/L) in drinking water.

The Florida Department of Environmental Protection (FDEP) regulates arsenic levels in groundwater and

soil as published in Chapter 62-780, *Florida Administrative Code*:

Groundwater (µg/L)	Soil (mg/kg)	
	Residential	Commercial
10	2.1	12

µg/L = microgram per liter

mg/kg = milligram per kilogram

² Lower levels of arsenic: 300 to 30,000 parts per billion (ppb) in water, which is 100 to 10,000 times higher than most U.S. drinking water levels.

³ Higher levels of arsenic: above 60,000 ppb in water, which is 10,000 times higher than 80% of U.S. drinking water arsenic levels; OR, more than 100 micrograms per cubic meter via air for a brief period.

FDEP developed an irrigation water screening level for arsenic of 63 µg/L (residential) and 100 µg/L (commercial).

The Occupational Safety and Health Administration (OSHA) enforces an arsenic permissible exposure

limit for workers of 10 micrograms per cubic meter (µg/m³) as an 8-hour total-weighted average. This means that workers should not be exposed to more than 2 µg/m³ of arsenic in the air for more than 15 minutes.

BIOMONITORING AND BLOOD TESTING

Can a test determine if I have come in contact with arsenic?

Yes, arsenic can be tested in urine, fingernails and hair. A urine test can estimate the amount of arsenic that has entered a person's body within the past two or three days. A test from fingernails and hair can estimate the amount of arsenic that has entered a person's body within the past 6–12 months.

Medical test results can not indicate when, where, how and for how long a person came in to contact with arsenic. Also, a medical test cannot determine whether a person will develop adverse health effects

from coming into contact with arsenic nor what the potential health effects from contact with the chemical would be.

Testing for arsenic can be useful to scientists, physicians and public health officials for health investigations or health studies. These data can be helpful to determine if people have come into contact with higher levels of arsenic than those found in the general population. They can also be used to determine how often and at what levels the chemical is found in the population.

COMMUNITY CONCERNS

Can I shower, bathe and/or swim in my pool if my water is contaminated with arsenic above 10 µg/L?

Swimming in water contaminated with arsenic poses a low risk of developing harmful health effects because the chemical does not easily get into a person's body through their skin. There is a small chance that a person could breathe in the chemical. Drinking water containing the chemical is more dangerous, so you should take precautions to avoid drinking the pool water if it is contaminated with arsenic.

Can I use water containing arsenic above FDEP irrigation water screening level of 63 µg/L to water my lawn and home garden?

If your water is contaminated with arsenic above 63 µg/L, you should temporarily stop using it for irrigation or gardening. Even though the uptake of arsenic in plants is small, it is important to take precautions to avoid accidentally eating arsenic on plants or from contaminated soil. Please note that the FDEP level of 63 µg/L is a screening level, which means that further investigation is needed to fully understand potential impacts to your health.

If my water is above 10 µg/L for drinking water, should my pets/farm animals drink it?

No. Pets should be given the same drinking water that you drink. If drinking water contains arsenic levels above the enforced standards, an alternative water source should be used. Animals may come into contact with chemicals from grass, weeds and foliage treated with arsenic-containing herbicides and/or soils that have been contaminated with arsenic.

I drank water that exceeded 10 µg/L while I was pregnant and lactating. What impact could it have on my child?

Animal studies have shown that contact with inorganic arsenic can cause illness in pregnant women as well as low birth weight, fetal malformations and, in some cases, fetal death/miscarriage. Evidence from human studies show that arsenic may be harmful to pregnant women and their unborn babies. More studies need to be conducted, however, to determine potential risk.

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This publication was made possible by Grant Number 6 NU61TS000310-02-01 from the Agency for Toxic Substances and Disease Registry. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Agency for Toxic Substances and Disease Registry or the Department of Health and Human Services.

If you have questions or comments about this factsheet, we encourage you to contact us.

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