

STATE OF COLORADO

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Dedicated to protecting and improving the health and environment of the people of Colorado

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Colorado Department
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ARSENIC FACT SHEET

What is Arsenic?

Arsenic is a naturally occurring, toxic element that is found in soil, bedrock, and water. It is used in a variety of industrial settings such as making metals, glass, electronic components and wood preserving. High arsenic levels can also be found as a contaminant in certain fertilizers and animal feeding operations. Arsenic is odorless and tasteless.

What are arsenic's health effects?

Arsenic is a known human carcinogen that causes skin, lung, liver, bladder and kidney cancer if given low doses over a long period of time. It can also cause skin lesions and organ failure at high doses.

How is arsenic regulated?

Arsenic levels are set to protect people who are exposed to arsenic by drinking the water and/or eating fish that live in the water (arsenic can accumulate in fish).

Arsenic is regulated at the federal level under multiple agencies and 7 different acts including two associated with the Colorado Department of Public Health and Environment:

Safe Drinking Water Act

Arsenic is regulated under the Safe Drinking Water Act, by the Environmental Protection Agency (EPA). EPA is supposed to set the standard to reflect a level at which no adverse health effects are expected. This is called the maximum contaminant level *goal* (MCLG). The MCLG for arsenic is 0 parts per billion. However, the enforceable level is set as close to the goal as possible, considering cost, benefits, and the ability of public water systems to detect and remove contaminants. EPA set the maximum contaminant *level* at 10 parts per billion, in recognition that while the goal is 0, the treatment difficulties make zero unattainable. This maximum contaminant level has been required since 2006. (It used to be 50 ppb before that).

Clean Water Act

The federal Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States. The CWA defines a list of priority pollutants for which EPA must establish water-quality criteria for the protection of aquatic life and human health in surface water. The initial list of priority pollutants was based on a 1977 consent decree that settled a legal challenge to EPA's program for controlling hazardous pollutants.

EPA established human health criteria for arsenic for two cases – one: where exposure is through drinking water (DW); the other, where exposure is through drinking water and eating fish that bioaccumulate arsenic (water + fish). EPA's criteria are calculated based on the cancer slope factor (derived through toxicological studies), an assumed water intake of 2 liters per day, 70-years of exposure and an acceptable cancer risk of 1 in 1,000,000. Calculation of the water + fish criterion also incorporates factors that account for the degree of bioaccumulation that can be expected for arsenic and the portion of arsenic that is actually toxic (for arsenic, the inorganic portion is the toxic, which is about 30% of the arsenic in fish flesh) with a 17.5 grams/ day intake level. There is no accommodation in the CWA system for relaxation of the criteria based on treatment difficulties. Colorado's W+F criterion is 0.02 ug/L.

The CWA directs states to develop water quality criteria at least as stringent as EPA's guidelines. Many states are currently struggling with setting appropriate and protective arsenic standards. Colorado's procedures are very similar to the national model except that we have a third use category. This category is 'fish ingestion' (or FI), which protects human health where the exposure is only through eating fish. The FI criterion uses the same fish factors as the W+F calculation. Colorado's FI criterion is 7.6 ug/L.

CWA criteria are met with state water quality standards and effluent limitations for specific industrial sources.