



Public Health Goal for Arsenic

Office of Environmental Health Hazard Assessment
California Environmental Protection Agency

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The Office of Environmental Health Hazard Assessment (OEHHA) has prepared this fact sheet to provide general information about its Public Health Goal (PHG) of 4 parts per trillion (ppt) for arsenic in drinking water.

What Is Arsenic? Arsenic is an element that is found naturally in air, water, soil, rocks and minerals, food, and even living organisms in low concentrations. Arsenic compounds have many uses. Inorganic arsenic compounds are used in industry, most commonly as wood preservatives, but also as components of pesticides (particularly herbicides), paints, dyes, and semiconductors. Organic arsenic compounds, which are considerably less toxic, are found in small amounts in plants and animals.

Arsenic in Drinking Water and Soil. Erosion of rocks and minerals is believed to be the primary source of naturally occurring arsenic found in drinking water supplies and in soil. Other sources of arsenic in water and soil include urban runoff, pesticides, fly ash from power plants, treated wood, and smelting and mining wastes. Municipal and industrial waste disposal sites may be additional sources of arsenic contamination in water supplies.

Health Effects of Arsenic. Many scientific studies conclude that long-term exposure to inorganic arsenic through drinking water is associated with relatively high risks of cancer of the lungs and bladder and, to a lesser extent, with an increased risk of cancer of the skin, liver, and kidneys. Recent studies have also associated chronic arsenic exposure through drinking water with a number of other serious health effects, including developmental defects, stillbirth, and spontaneous abortion as well as heart attacks, strokes, diabetes mellitus, and high blood pressure. Arsenic can also cause liver damage, nerve damage, and skin abnormalities (e.g., discoloration and unusual growths, which may eventually turn cancerous). Some of these effects may take years to develop.

The PHG is based on a level that will result in not more than 1 excess cancer in 1 million people who drink 2 liters daily of this water for 70 years.

The International Agency for Research on Cancer has classified arsenic as a carcinogen since 1980, and, in 1987, arsenic was one of the first chemicals placed on California's Proposition 65 list of chemicals known to cause cancer or reproductive harm.

California's drinking water standard for arsenic. For many years, federal and California drinking water standards for arsenic were set at 50 parts per billion (ppb). In 2002, following a reassessment, the U.S. EPA established a federal drinking water standard of 10 ppb for arsenic. By 2006, states must adopt this standard, or they can develop their own more

stringent standard. The California Department of Health Services (DHS) will develop a new state drinking water standard for arsenic that is based on the PHG.

Establishing the PHG for Arsenic. Under the California Safe Drinking Water Act, OEHHA is required to develop PHGs for regulated chemical contaminants in California's publicly supplied drinking water. A PHG is the level of a chemical contaminant in drinking water that, based upon currently available data, does not pose a significant risk to health. It represents an optimal level that the state's drinking water providers should strive to achieve if it is possible to do so. State law requires DHS to set regulatory drinking water standards as close to the corresponding PHGs as is economically and technically feasible.

In developing the PHG for arsenic, OEHHA conducted an exhaustive analysis of available scientific studies on the health effects of arsenic. The PHG of 4 ppt for arsenic in drinking water is based upon lung and bladder cancer in studies of hundreds of thousands of people in communities in Taiwan, Chile, and Argentina associated with arsenic-contaminated drinking water. Exposure to the PHG level in drinking water results in a risk of less than one additional case of these forms of cancer in a population of one million people drinking two liters daily of the water for 70 years. While the PHG is based primarily on data from cancer studies, no other adverse health effects are expected to arise from arsenic at the level of the PHG.

The PHG of 4 ppt for arsenic is based on results of human health studies performed in Taiwan, Chile, and Argentina.