

Cadmium and Drinking Water

Cadmium is a contaminant that has been found in waters that could be used as drinking water sources in Minnesota. New information suggests that too much cadmium from drinking water may not be good for our health. This information sheet discusses the Minnesota Department of Health (MDH) health-based guidance value for cadmium in drinking water and its possible health effects.

What is cadmium?

Cadmium is an element found naturally in the earth's crust and soil. It is used in batteries, paints, pigments, coatings and some types of inexpensive jewelry.

Has cadmium been found in Minnesota waters?

A low level of cadmium is found naturally in surface and groundwater throughout the United States. In Minnesota, the amount of cadmium in groundwater varies. It has only been detected at levels greater than 0.1 parts per billion (ppb) in about 1 percent of samples of public drinking water supplies.¹

Higher levels of cadmium in water can result from the use and disposal of items containing cadmium. For example, water draining from a landfill could have higher levels of cadmium. Most water samples collected in the past ten years from public drinking water systems have not contained cadmium at detectable levels. When tests indicate high levels of cadmium, actions are taken to ensure that people are not drinking contaminated water.

What is the MDH guidance value for cadmium in drinking water?

Based on available information, MDH developed a guidance value of 0.5 ppb for cadmium in drinking water.

Can cadmium in drinking water affect my health?

Low level exposure to cadmium decreases bone density and disrupts bone composition. Rapidly growing bones are the most sensitive to these effects, so children are at an increased risk. Cadmium does not easily leave our bodies and tends to build up in the kidney. As a result, both shorter, higher exposures and lifetime low level exposures to cadmium can cause kidney disease in older adults. Although cadmium can cause cancer when inhaled, there is little evidence to support that it can cause cancer when ingested.

At a Glance

Cadmium is...

- a naturally occurring metal.
- used primarily in batteries, paints, and pigments and some jewelry.

Cadmium enters your body from...

- inhalation from tobacco smoking or occupational settings where fossil fuels are burnt.
- eating certain foods that are high in cadmium.
- mouthing objects containing cadmium (babies and children).
- drinking contaminated water.

Your exposure to cadmium can be reduced by....

- not smoking.
- preventing children from mouthing products that contain high amounts of cadmium.
- proper handling of batteries and inexpensive jewelry that contains cadmium.

Cadmium in drinking water is safe if...

the level is lower than the MDH guidance value of 0.5 ppb.

How am I exposed to cadmium?

Minnesotans may be exposed to cadmium through foods such as leafy vegetables, sunflower seeds, peanuts, potatoes, organ meats, or shellfish. Leafy plants, like tobacco and lettuce, take up cadmium from soil as they grow.² Smoking tobacco products, including cigarettes, can also be a major source of cadmium exposure. Other sources of cadmium exposure are drinking water, certain types of jewelry, and cadmium pigments used on pottery finishes or in cheap plastics. Infants and children may have an increased risk of exposure to cadmium if they frequently put things in their mouth. Children and infants are also they are more likely to accidentally swallow small toys, jewelry, or small batteries that could contain cadmium.

How can I safely use products containing cadmium?

People who get their drinking water from a private well should contact their county authorities if they have questions about cadmium in the water. Nickel-cadmium or “Ni-Cd” batteries should be properly recycled. If you buy inexpensive jewelry for a child, look for a label about the intended age range for the product’s user. Eating a well-balanced diet with adequate iron intake can help to protect you from exposure to cadmium because iron can block absorption of cadmium into the body. Avoiding smoking can also reduce your exposure to cadmium.

How does cadmium get into the environment?

Natural events like volcanic eruptions or forest fires, and human activities like mining, manufacturing, disposal of wastes, use of phosphate fertilizers, and fossil fuel combustion, release cadmium into air, water, and soil.²

What are the potential environmental impacts of Cadmium?

Cadmium is toxic to fish and other aquatic life. Cadmium bioaccumulates (builds up) in plants, fish, and other wildlife that live in water and on land. Cadmium also interferes with the normal endocrine function in fish and may affect fish behavior.

What Minnesotans Need to Know . . .

Cadmium is a natural element that is sometimes found in drinking water. Public water systems are monitored for cadmium, but private well owners should have their wells tested if they are concerned about cadmium. Cadmium can be found in tobacco products and some foods. Proper handling of batteries and inexpensive jewelry will reduce exposure to cadmium.

For more information contact:

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The Health Risk Assessment Unit...

evaluates the health risks from contaminants in groundwater. MDH works in collaboration with the Minnesota Pollution Control Agency and the Minnesota Department of Agriculture to understand the occurrence and environmental effects of contaminants in water..

References

1. Minnesota Pollution Control Agency. 1999. <http://www.pca.state.mn.us/index.php/view-document.html?gid=6312>.
2. Agency for Toxic Substances and Disease Registry (ATSDR) 2012. <http://www.atsdr.cdc.gov/phs/phs.asp?id=46&tid=15>