



Chemicals in Private Drinking Water Wells Fact Sheet Florida Department of Health, Bureau of Environmental Health

This fact sheet discusses possible health risks from exposure to low levels of thallium typically found in drinking water wells.

Thallium

What is thallium?

The earth's crust contains trace amounts of pure thallium, a bluish-white metal. In the past, thallium came from byproducts from smelting other metals. Since 1984, the United States has not produced it. Currently, all the thallium comes from imports and past reserves.

In its pure form, thallium is odorless and tasteless. It sometimes combines with other substances like bromine, chlorine, fluorine, and iodine.

Manufacturing electronic devices, switches, and closures is the main use of thallium, primarily for the semiconductor industry. It also has limited use in the manufacture of special glass and for certain medical procedures. Thallium also exists in cigarette smoke.

How might exposure to thallium in drinking water occur?

- By living near hazardous waste sites where thallium has contaminated well water.
- Eating homegrown fruits and vegetables contaminated with thallium from well water.

What is the standard for thallium in drinking water?

The Florida Department of Environmental Protection drinking water standard for thallium is 2 micrograms per liter (2 ug/L). There is no required sampling of private drinking water wells.

How can thallium affect my health?

Drinking water standards are set at very low levels. Drinking water every day at or below the standard for your entire lifetime is unlikely to cause illness.

To set drinking water standards, scientists study reports of people exposed to chemicals at work. They also study reports of experiments with animals. From these reports, they determine a "no-effect level" or level that does not cause illness. Then, to be on the safe side, scientists set drinking water standards hundreds or thousands of times less than the "no-effect level." Therefore, drinking water with levels slightly above the standard for a short time does not significantly increase the risk of illness. The risk of illness, however, increases as the level of chemical increases and the length of time you drink the water increases.

The type and severity of health effects associated with exposure to a particular chemical depends on a number of factors:

- How much of the chemical was someone exposed to each time?
- How long did the exposure last?
- How often did the exposure occur?
- What was the route of exposure (eating, drinking, or breathing)?

How chemical exposures may affect someone can range widely from one person to the next. A number of personal factors also determine health effects. These include:

- How old are they?

- What gender are they?
- Is the person generally healthy or do they already have other health problems?
- What are their health habits? (For instance, do they drink alcohol or smoke tobacco?)
- How likely are chemical exposures to effect someone, in general?

No one knows what the effects are from ingesting low levels of thallium over a long time. No birth defects came in when children of mothers exposed to low levels of thallium in vegetables and fruits their mothers ate.

No studies have shown if breathing or ingesting thallium affects human reproduction. Studies showed rats that ingested thallium for several weeks had some adverse reproductive effects. Animal data suggest that the male reproductive system may be prone to damage by low levels of thallium.

How likely is thallium to cause cancer?

The U.S. Department of Health and Human Service, the International Agency for Research on Cancer, and the U.S. Environmental Protection Agency have not classified thallium as to whether it cause cancer in humans. No studies are available in people or animals on the carcinogenic effects of breathing, ingesting or touching thallium. The drinking water standard is set to protect against the risk of cancer.

Is there a medical test for thallium exposures?

There are medical tests available to measure levels of thallium in urine and hair. Blood tests can also measure thallium. Blood tests do not serve as a good marker of exposure since it only stays in blood a very short time. These tests are also not routinely available at the doctor's office because they require special equipment. They also cannot determine if adverse health effects will occur from exposure to thallium.

Is it safe to keep drinking water with thallium in it?

Levels of thallium less than the drinking water standard of 2 ug/L are not likely to cause illness. Drinking water with levels slightly above the standard for a short time does not significantly increase the risk of illness. However, because health risks increase as the levels of a chemical (or how long a person drinks it) increases, it is best to drink water that meets standards.

For additional health information, please call the Florida Department of Health at 850-245-4249 or visit us online at www.floridahealth.gov/environmental-health/drinking-water/Chemicals-HALs.htm

For more information about the health effects from exposure to thallium in different situations and at higher levels than those usually found in drinking water wells, please see the ATSDR ToxFAQs for thallium at www.atsdr.cdc.gov/toxfaqs/tfacts54.pdf