



# Environmental Health Information

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## TCE in Drinking Water

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*Trichloroethylene (TCE) is a commonly used chemical that can be in air, soil, or water. Exposure to trichloroethylene (also known as trichloroethene) in large amounts or over a long period of time can be harmful to people. This information sheet discusses trichloroethylene in water and its possible health effects.*

### What is TCE?

Trichloroethylene, or TCE, is a colorless solvent with a slightly sweet odor. TCE is used primarily in industrial processes to remove grease from metal parts. Some household and consumer products – such as correction fluid, paint removers, parts cleaners, adhesives, and spot removers -- may also contain TCE. Because it was so widely used, it is one of the more common man-made chemicals found in the environment.

Because TCE is very volatile (it evaporates quickly), it is not usually present in surface soils or in open surface water. But TCE spilled on the ground can move down through the soil and into groundwater where it can contaminate private and public drinking water wells. It can also move from groundwater into rivers or lakes and then quickly volatilize into the air.

### Is TCE harmful?

Any substance or chemical that enters your body can be harmful if you take in too much during a certain length of time. Whether your health will be affected by contact with a chemical depends on several factors:

- How much of the substance you take in;
- How long you come in contact with it;
- Whether you are eating, drinking, breathing, or touching it;
- Your age, general health, and other individual traits that determine how susceptible you are;
- Other contact you have with the same or similar substances; and
- How toxic the substance is.

When TCE is in water, you can come into contact with it in several ways. One is through drinking the water. Because TCE is volatile, it will move from the water to the air when you bathe, shower, wash dishes or flush a toilet. Breathing in TCE in the air is another way TCE enters your body. When MDH looks at people's contact with TCE through water, it considers both drinking and breathing in TCE.

### What are possible health effects from exposure to TCE?

People may experience headaches, drowsiness and eye, nose, or skin irritation from exposure to high levels of TCE. At very high levels, people can lose consciousness. Behavior changes have been observed in animals after exposure to high levels of TCE. These types of exposures in people are typically only seen in industrial accidents or intentional incidents.



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Minnesota Department of Health ♦ Division of Environmental Health ♦ Site Assessment and Consultation Unit

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Long-term exposure to high levels of TCE in drinking water can damage the liver, kidney, immune system, and the nervous system. TCE may also harm a developing fetus if the mother consumes water containing high levels of TCE. Some studies suggest that exposure to low levels of TCE over many years may also be linked to an increased risk of several types of cancer. It is likely that the adverse health effects that can result from TCE come not from the TCE itself, but from other compounds that are made when the body breaks down TCE. These same breakdown products can also be made when the body is exposed to other chemicals, such as dry cleaning solvent.

### **What amount of TCE in water is safe?**

The scientific information we have about the health effects from TCE comes from studies of animals and people exposed to high levels in the course of their work. The Environmental Protection Agency (EPA) began reevaluating the scientific information on TCE in 2001. MDH's current Health Risk Limit (HRL) of 5 micrograms per liter is based on a federal number used to regulate public drinking water. A HRL is the concentration of a groundwater contaminant that can be safely consumed daily for up to a lifetime. MDH toxicologists will continue to follow the revision of EPA's TCE risk assessment and emerging science.

### **What can I do if I have TCE in my drinking water?**

Water that has less than 5 micrograms of TCE per liter is very unlikely to pose any long-term health concerns. However, if people consume water that contains much higher levels of TCE over a long period of time, their risk of cancer or other health effects may increase. MDH recommends that women who are pregnant or may become pregnant limit their exposure to TCE.

To minimize exposure, it is best to obtain your drinking water from a safe, reliable source. You can do this by connecting to a public water supply system, or by drilling a new well (assuming that a clean underground source of water is available). Use of bottled water for drinking and cooking can also help minimize exposure on a short-term basis, as can running a vent fan while bathing or showering.

If these options are not possible, the most effective method for removing TCE from a drinking water supply is treatment with an activated carbon filtration system. These systems are available from water treatment/conditioning contractors, or home supply stores. Filter systems are of two types: those that supply one sink or appliance (such as a refrigerator) and those that are capable of filtering all of the water that enters the home.

A whole-house system filters all of the water coming into the home, not just the water from one sink or appliance. This type of system, while more expensive and difficult to install, has the added benefit of ensuring that bathing and other uses of water will not expose people to TCE through breathing in of TCE that evaporates from the water. When choosing a water treatment system, select one that is certified to meet NSF/ANSI Standard 53 for reduction of TCE. In order to effectively reduce TCE, all types of filter systems should be properly installed, operated and maintained; following the manufacturer's specifications.

#### **For more information contact:**

MDH/Site Assessment and Consultation: (651) 201-4897 or 1 (800) 657-3908, press "4" and leave a message. By email: [hazhealth@health.state.mn.us](mailto:hazhealth@health.state.mn.us)

To request this document in another format, call (651) 201-5000, TDD, or (651) 201-5797.

This information sheet was prepared with partial support from the Agency for Toxic Substances and Disease Registry (ATSDR). This does not imply that ATSDR has endorsed this information sheet.