

1. PUBLIC HEALTH STATEMENT

This public health statement tells you about 1,1,2,2-tetrachloroethane and effects of exposure.

The Environmental Protection Agency (EPA) identifies the most serious hazardous waste sites in the nation. These sites make up the National Priorities List (NPL) and are the sites targeted for long-term federal clean-up. 1,1,2,2-Tetrachloroethane has been found in at least 273 of the 1,430 current or former NPL sites. However, it's not known how many NPL sites have been evaluated for this substance. As more sites are evaluated, the sites with 1,1,2,2-tetrachloroethane may increase. This information is important because exposure to this substance may harm you and because these sites may be sources of exposure.

When a substance is released from a large area, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment. This release does not always lead to exposure. You are exposed to a substance only when you come in contact with it. You may be exposed by breathing, eating, or drinking the substance or by skin contact.

If you are exposed to 1,1,2,2-tetrachloroethane, many factors determine whether you'll be harmed. These factors include the dose (how much), the duration (how long), and how you come in contact with it. You must also consider the other chemicals you're exposed to and your age, sex, diet, family traits, life-style, and state of health.

1.1 WHAT IS 1,1,2,2-TETRACHLOROETHANE?

1,1,2,2-Tetrachloroethane is a man-made, colorless, dense liquid that does not burn easily. It is volatile and has a penetrating, sweet odor similar to chloroform. Its production has decreased significantly in the United States. In the past it was used in large amounts to produce other chemicals and as an industrial solvent. 1,1,2,2-Tetrachloroethane was also used to separate other substances, to clean and degrease metals, and in paints and pesticides. Other chemicals are now available to replace this solvent, and large-scale commercial production has

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stopped. Its present use appears to be as a chemical intermediate, and information about this use is limited. For more information, see Chapters 3 and 4.

1.2 WHAT HAPPENS TO 1,1,2,2-TETRACHLOROETHANE WHEN IT ENTERS THE ENVIRONMENT?

Most 1,1,2,2-tetrachloroethane released into the environment eventually moves into the air or ground water. If released on the land, it does not tend to attach to soil particles. When released to surface water, much of the chemical will evaporate back to the air while the remainder may break down due to reactions with water. Similar reactions can take place in soils and sediments. Breakdown of this chemical in both the air and ground water is slow. Half of the chemical is expected to disappear from ground water in 13 months and from air in about 2 months. 1,1,2,2-Tetrachloroethane slowly degrades by losing chlorine atoms. The resulting chemicals are toxic to humans, perhaps even more toxic than the compound itself. It has been estimated that 1,1,2,2-tetrachloroethane should not build up significantly in the bodies of fish or other aquatic organisms. For more information, please see Chapters 4 and 5.

1.3 HOW MIGHT I BE EXPOSED TO 1,1,2,2-TETRACHLOROETHANE?

Low levels of 1,1,2,2-tetrachloroethane can be present in both indoor and outdoor air. Test studies of city areas show that it is present in only a small number of air samples. Its average concentration in city air could be as high as 57 parts per billion (ppb) (57 parts in 1,000,000,000 parts). In rural areas, air concentrations are much lower, typical levels being about 5 parts per trillion (ppt) (5 parts in 1,000,000,000,000 parts) or less. The average concentrations of 1,1,2,2-tetrachloroethane in the indoor air of several homes was 1.8 ppb. Because the air outside these homes did not contain measurable amounts of 1,1,2,2-tetrachloroethane the chemical appears to come from products used within these homes.

1,1,2,2-Tetrachloroethane can also be present in water. A comprehensive survey of representative samples of surface water and ground water, conducted in highly industrialized

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areas of New Jersey in 1977-79, found 6% of ground water samples and 11% of surface water samples contaminated with 1,1,2,2-tetrachloroethane. The highest levels found were 2.7 ppb in ground water and 3 ppb in surface water. The New Jersey survey included water supplies used for drinking and water not used for drinking. Although individuals may be exposed to 1,1,2,2-tetrachloroethane from contaminated drinking water, this rarely happens, at least in larger community drinking water systems. A nationwide survey of public drinking water systems that rely on underground sources did not find any supplies containing this pollutant. In a few instances, 1,1,2,2-tetrachloroethane has been found in private well water that may have been used for drinking. 1,1,2,2-Tetrachloroethane has not been reported in food or soil. It is not expected to build up in the food chain.

When a chemical such as 1,1,2,2-tetrachloroethane is used in making other chemicals, it is generally contained in closed automatic systems which are not open to the air. Therefore, workers are not usually exposed to high levels of 1,1,2,2-tetrachloroethane. A national survey conducted in 1981-83 estimated that 4,143 workers were exposed to 1,1,2,2-tetrachloroethane. However, the use of this chemical has decreased since 1983, so the number of exposed workers may now be much lower.

In addition to exposures in air and drinking water, people may be exposed to 1,1,2,2-tetrachloroethane from spills and other accidents or normal operations in workplaces. The compound has been used as a solvent for many operations. If you are exposed to such spills or involved in such work, you are most likely to be exposed by breathing in vapors of the chemical or from skin contact.

1,1,2,2-Tetrachloroethane was found in at least 273 of the 1,430 current or past hazardous waste sites on the National Priorities List (NPL). For more information, see Chapter 5.

1.4 HOW CAN 1,1,2,2-TETRACHLOROETHANE ENTER AND LEAVE MY BODY?

1,1,2,2-Tetrachloroethane can enter the body when a person breathes air containing the chemical or when the chemical comes into contact with a person's skin. If you accidentally

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drank water containing it, 1,1,2,2-tetrachloroethane would be absorbed into your body. 1,1,2,2-Tetrachloroethane is converted to more harmful products in animals and probably in humans. Most of it leaves the body within a few days through the breath or through the urine. For more information, see Chapter 2.

1.5 HOW CAN 1,1,2,2-TETRACHLOROETHANE AFFECT MY HEALTH?

1,1,2,2-Tetrachloroethane is not life-threatening unless you intentionally or accidentally drink more than a few spoonfuls at one time or spill a large amount so that you breathe it and get it on your skin.

Breathing concentrated fumes of 1,1,2,2-tetrachloroethane (enough so that you notice its sickeningly sweet smell) can rapidly cause fatigue, vomiting, dizziness, and possibly unconsciousness. Most people recover from these effects once they are in fresh air. Breathing, drinking, or having 1,1,2,2-tetrachloroethane come into contact with your skin may cause liver damage, stomachaches, or dizziness if you are exposed long enough to high amounts. The health effects on people from long-term exposure to small amounts of 1,1,2,2-tetrachloroethane are not known.

It is not known whether 1,1,2,2-tetrachloroethane causes cancer in people. In a long-term study, 1,1,2,2-tetrachloroethane caused an increase in liver tumors in mice, but not in rats. The International Agency for Research on Cancer (IARC) has determined that 1,1,2,2-tetrachloroethane cannot be classified as to its ability to cause cancer in humans, while the Environmental Protection Agency (EPA) has determined that the chemical is a possible human carcinogen. Not enough information is available to determine whether exposure to the chemical will cause reproduction problems or birth defects in people. For more information on health effects, see Chapter 2.

1.6 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO 1,1,2,2-TETRACHLOROETHANE?

There are no specific medical tests to determine whether you have been exposed to 1,1,2,2-tetrachloroethane. The symptoms of 1,1,2,2-tetrachloroethane poisoning (stomach-

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aches, fatigue, and dizziness) are common to many diseases, and so these symptoms are not very useful in determining whether you were exposed to this particular chemical.

1,1,2,2-Tetrachloroethane can affect the liver and medical tests can determine whether the liver is working properly. However, liver disease may have many causes; therefore the presence of liver disease is not a reliable indicator for exposure to 1,1,2,2-tetrachloroethane. For more information, see Chapters 2 and 6.

1.7 WHAT RECOMMENDATIONS HAS THE FEDERAL GOVERNMENT MADE TO PROTECT HUMAN HEALTH?

The EPA has decided that no more than 0.17 micrograms of 1,1,2,2-tetrachloroethane per liter of water (or 0.17 ppb or less than 1 drop in a gallon) should be in lakes and streams. To protect workers during an 8-hour shift, the U.S. Occupational Safety and Health Administration (OSHA) has set a limit of 1 part per million (ppm) (1,000 ppb) of 1,1,2,2-tetrachloroethane in workroom air. The National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienists (ACGIH) also recommend that the amount in workroom air be limited to 1 ppm in an 8- to 10-hour work shift.

1.8 WHERE CAN I GET MORE INFORMATION?

If you have any more questions or concerns, please contact your community or state health or environmental quality department or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, E-29
Atlanta, Georgia 30333
(404) 639-6000

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This agency can also provide you with information on the location of occupational and environmental health clinics. These clinics specialize in the recognition, evaluation, and treatment of illness resulting from exposure to hazardous substances.