1. PUBLIC HEALTH STATEMENT

This Statement was prepared to give you information about methyl mercaptan and to emphasize the human health effects that may result from exposure to it. The Environmental Protection Agency (EPA) has identified 1,300 sites on its National Priorities List (NPL). Methyl mercaptan has been found in at least 2 of these sites. However, we do not know how many of the 1,300 NPL sites have been evaluated for methyl mercaptan. As EPA evaluates more sites, the number of sites at which methyl mercaptan is found may change. This information is important for you to know because methyl mercaptan may cause harmful health effects and because these sites are potential or actual sources of human exposure to methyl mercaptan.

When a chemical is released from a source, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment as a chemical emission. This emission, which is also called a release, does not always lead to exposure. You can be exposed to a chemical only when you come into contact with the chemical. You may be exposed to it in the environment by breathing, eating, or drinking substances containing the chemical or from skin contact with it.

If you are exposed to a hazardous chemical such as methyl mercaptan, several factors will determine whether harmful health effects will occur and what the type and severity of those health effects will be. These factors include the dose (how much), the duration (how long), the route or pathway by which you are exposed (breathing, eating, drinking, or skin contact), the other chemicals to which you are exposed, and your individual characteristics such as age, sex, nutritional status, family traits, life style, and state of health.

1.1 WHAT IS METHYL MERCAPTAN?

Methyl mercaptan, also known as methanethiol, is a colorless gas with a smell like rotten cabbage. It is a natural substance found in the blood, brain, and other tissues of humans and other animals, and it is released from animal feces. It occurs naturally in certain foods such as some nuts (filberts) and cheese (Beaufort).

Methyl mercaptan is released from decaying organic matter in marshes and is present in the natural gas of certain regions of the United States, in coal tar, and in some crude oils. Methyl mercaptan is manufactured for use in pesticides, as a jet fuel additive, in the plastics industry, and in making methionine, a nutrient that is added to poultry feed. Methyl mercaptan is also released as a decay product of wood in pulp mills.

We know very little about what happens to methyl mercaptan after it is released to the environment. Because it is a gas, most of it probably goes into the air. Sunlight can break it down into other substances. If methyl mercaptan is released to soil, it probably then goes into the air or is

carried through the soil by rain or any other water that contacts it. More information on the properties and uses of methyl mercaptan and how it behaves in the environment can be found in Chapters 3, 4 and 5.

1.2 HOW MIGHT I BE EXPOSED TO METHYL MERCAPTAN?

Methyl mercaptan is always present in your body and in your urine and feces. It can also be present in the breath of persons with liver damage. You can be exposed to methyl mercaptan in the air if you live near a natural source of this gas, such as a marsh, an underground gas pocket, or a dump site that releases it. We have no information on the levels of methyl mercaptan that come from these sources.

Methyl mercaptan has not been found in drinking water, so you would probably not be exposed to it in this way. Methyl mercaptan is a natural part of certain foods, such as nuts and cheeses. It has also been approved for use as a food additive. Because of its unpleasant smell, very little can be added to food. You could be exposed to small amounts of methyl mercaptan by eating foods that contain it. However, we have no information on the levels of methyl mercaptan in food.

You can be exposed to methyl mercaptan if you work at a wood-pulp mill or sewage treatment plant or if you work in a factory that uses it to make other products such as jet fuel, pesticides, or poultry feed. Measurements of methyl mercaptan in the air inside these mills were lower than 4 ppm (4 parts of methyl mercaptan per million parts of air). Methyl mercaptan has been found in the environmental air at 4 ppb (4 parts of methyl mercaptan per billion parts of air).

Levels of methyl mercaptan in soil are probably very low. Even at hazardous waste sites, the levels were about 83 ppb. More information on how you might be exposed to methyl mercaptan is given in Chapter 5.

1.3 HOW CAN METHYL MERCAPTAN ENTER AND LEAVE MY BODY?

Methyl mercaptan can enter your body when you breathe in air or eat food that contains this chemical. We do not know if methyl mercaptan can enter your body through the skin or what happens to it after it enters your body. Studies in rats suggested it leaves the body quickly. After methyl mercaptan reaches the blood, it is either breathed out unchanged or is broken down to other substances (within one hour). These substances may be breathed out from the lungs or leave the body with the urine within a few hours.

More information on how methyl mercaptan enters and leaves the body is given in Chapter 2.

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1.4 HOW CAN METHYL MERCAPTAN AFFECT MY HEALTH?

We have very little information on the health effects of exposure to methyl mercaptan. A worker exposed to very high levels (exact amount unknown) of this compound for several days when he opened and emptied tanks of methyl mercaptan went into a coma (became unconscious), developed anemia (a blood disorder) and internal bleeding. He died within a month after this incident.

We do not know whether long-term exposure of humans to low levels of methyl mercaptan can result in harmful health effects such as cancer, birth defects, or problems with reproduction.

Methyl mercaptan can be smelled and recognized in air when it is there at a level of about 1.6 ppb (1.6 parts of methyl mercaptan per billion parts of air). It can be smelled when it is present in water at a level far lower than 1 ppb.

More information on the health effects of methyl mercaptan in humans and animals can be found in Chapter 2.

1.5 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO METHYL MERCAPTAN?

Methyl mercaptan is always present in your body. There is a test that can be used to find out if it is present in your blood at levels that are higher than normal, which may happen if you are exposed to high levels of this substance. This test requires special equipment and is not usually available in a doctor's office. It can be done in a special laboratory. However, this test cannot be used to find out how much methyl mercaptan you were exposed to or to predict whether harmful health effects will occur.

More information on how methyl mercaptan can be measured in exposed humans is given in Chapters 2 and 6.

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

The federal government has set certain regulations and guidelines to help protect people from the possible harmful health effects of methyl mercaptan in the environment. When more than 100 pounds of methyl mercaptan is released to the environment (such as during an industrial accident or spill), the EPA National Response Center must be notified. The Food and Drug Administration (FDA) allows methyl mercaptan to be used as a food additive but does not set specific limits on the levels that can be used. The Occupational Safety and Health Administration (OSHA) has set an average limit of 0.5 ppm for exposure to this chemical in workplace air. The American Conference of

Governmental Industrial Hygienists (ACGIH) has recommended that the average concentration of airborne methyl mercaptan should not be more than 0.5 ppm for each 8-hour exposure (time-weighted average) in a 40-hour work week.

More information on governmental rules for methyl mercaptan can be found in Chapter 7.

1.7 WHERE CAN I GET MORE INFORMATION?

If you have any more questions or concerns not covered here, please contact your state health or environmental department or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road, E-29
Atlanta, Georgia 30333

This agency can also provide you with information on the location of the nearest occupational and environmental health clinic. Such clinics specialize in recognizing, evaluating, and treating illnesses that result from exposure to hazardous substances.