Air guidance for trans-1,2-Dichloroethylene use at Water Gremlin

Trans-1,2-dichloroethylene (t-1,2-DCE) is a chemical primarily used as a degreasing agent in many commercial and industrial processes. It is the principal component in commercially available FluoSolvWS® degreaser, which is currently used as the alternative to trichloroethylene (TCE) at the Water Gremlin Plant in White Bear Township.

At the request of the Minnesota Pollution Control Agency (MPCA), the Minnesota Department of Health (MDH) developed a guidance value in air for t-1,2-DCE of 70 µg/m³ (µg/m³ is a microgram of a chemical per cubic meter of air volume), which is expected to be protective of public health for long-term exposure. The guidance is being used by MPCA to drive site actions until pollution control equipment is installed at the Water Gremlin facility later this spring. This value was developed for this specific situation and is not intended for application to other sites or circumstances without further review.

What happens to t-1,2-DCE after it is released from Water Gremlin?

- During coating operations t-1,2-DCE is released into the outdoor air through vents stacks on the roof.
- Once airborne, t-1,2-DCE will diffuse and will be carried by air movement away from the facility.
- Because it is a volatile chemical, it will not settle out of the air or accumulate in soil or surface water.
- Any t-1,2-DCE that might wash out, in rain for example, would readily evaporate again into the air.
- Once in the open atmosphere, t-1,2-DCE breaks down in days to weeks.

Basis of the t-1,2-DCE guidance value

MDH evaluated available information to develop a guidance value for t-1,2-DCE in air of 70 µg/m³. This value is protective for continuous long-term exposures. Breathing t-1,2-DCE that is above 70 µg/m³ does not mean health effects will occur; however, the risk for effects hypothetically may increase as the amount of exposure increases (i.e., greater concentration of chemical in air and/or greater duration or frequency of exposures).

Information from studies of people breathing t-1,2-DCE are limited.

To determine a safe level of exposure to contaminants, scientists must often rely on studies where animals in a laboratory (e.g., rodents) are exposed to large quantities of a chemical of interest. Scientists err on the side of caution when determining a safe level for people. This is done in part by dividing the levels where test animals are shown to experience an effect by an additional safety factor, to derive a safe exposure level for which health effects are extremely unlikely, even for sensitive populations such as children and pregnant women.

The air guidance value for t-1,2-DCE that MDH derived was based on an evaluation of a study of mice that were shown to have an immune system response after exposure to t-1,2-DCE in drinking water. A safety factor of 3,000 was used to ensure protectiveness and the study data was converted from an oral exposure to an air exposure to arrive at 70 µg/m³.
The air guidance value does not include an assessment of cancer risk because there are no studies available to determine if t-1,2-DCE has the potential to cause cancer. Currently, the US EPA categorizes t-1,2-DCE as “inadequate information to assess carcinogenic potential” under their Guidelines for Carcinogenic Risk Assessment framework.