Trichloroethylene (TCE)
Vapor Intrusion Mitigation Systems

Frequently Asked Questions

- What sub-slab screening values are used to determine if a home is to receive a mitigation system?:
  Trichloroethylene (TCE) concentrations of 2 μg/m³ and 20 μg/m³ are used to determine if the installation of a mitigation system is necessary in the home. If the sub-slab sample is measured at or above 20 μg/m³, the Minnesota Department of Health (MDH) and the Minnesota Pollution Control Agency (MPCA) advise that a mitigation system is required. If the sub-slab sample is measured between 2 μg/m³ and 20 μg/m³, another sample needs to be taken. If the sample measured at or below 2 μg/m³, MDH and MPCA advise that no further action is required in the home. These screening values are used for measuring the amount of TCE that is present directly below the foundation of a home.

- Where did the screening value of 20 μg/m³ come from?:
  The screening value of 20 μg/m³ is used to determine if a home was to receive a mitigation system; homes with a sub-slab sample of 20 μg/m³ and above received a mitigation system. As TCE migrates from the soil under the foundation to the indoor air, it mixes with the soil and air, which causes the concentration of TCE to be reduced. Other factors that may reduce the concentration of TCE in the indoor air are: heating and cooling systems in the home, weather changes, or the type of foundation in the home. The EPA determined that 0.1 is an acceptable factor for predicting the indoor air concentration based on the sub-slab sample. Applying the factor of 0.1 to 20 μg/m³ predicts an indoor air concentration of 2 μg/m³ (20 multiplied by 0.1 equals 2), which is considered safe even without a mitigation system. In other words, 20 μg/m³ was chosen to allow for more homes to receive mitigation, to err on the side of caution.

- Why was 20 μg/m³ chosen for a screening value?:
  Studies done by the Environmental Protection Agency (EPA) revealed that levels of TCE found below the slab were often 100 to 1,000 times larger than the indoor air concentrations of TCE. In other words, TCE may be more concentrated below the foundation or slab while only a fraction of the TCE will enter into the indoor air if allowed through porous materials or cracks. To increase the margin of safety, the sub-slab value of 20 μg/m³ was used because this value is only 10 times greater than 2 μg/m³, a level considered safe in the indoor air.

- Where did the screening value of 2 μg/m³ come from?:
  The EPA considers that all people are safe breathing 2 μg/m³ of TCE 24 hours a day for a lifetime. See the Health Effects Fact Sheet to find more information on the screening value of 2 μg/m³.

- How do we know the mitigation systems are working?:
  During the installation of the mitigation systems, a number of measurements are taken to establish that the mitigation system is creating the necessary amount of vacuum underneath the slab. Multiple points of suction are installed where needed and repairs to the floors and walls made where needed to establish the required vacuum under the basement floor. When the installation is completed, a “u” shaped gauge filled with red liquid is installed on the mitigation system piping. This provides a visual indication that the system is operating. If the gauge does not show a vacuum, the system should be inspected.

- I had a mitigation system installed but I am concerned about my indoor air.: You can contact the MPCA or MDH directly (at the numbers listed in the left-hand column) to discuss your specific questions or concerns.

- If the sub-slab measurement in my home was less than 2,000 μg/m³ and I did not receive an indoor air sample, how do I know that my indoor air levels are safe to breathe?:
  The mitigation system will help protect from both TCE exposure and radon exposure in the home. There are robust requirements of the mitigation systems and when they are functioning, the soil gas will be redirected from beneath the slab to the outside of the home.

Unless there are other sources of TCE in the home, the indoor air levels of TCE should not reach or exceed the safe level of 2 μg/m³. It is important to remember that even though great experience has been gained through the design and testing of these mitigation systems, understanding indoor air vapor data is very difficult due to many other possible sources of contaminants.

Glossary of Terms:
- Concentration: the amount of a substance dissolved in a volume of solvent
- Mitigation: the action of reducing severity, seriousness or painfulness of something
- Sub-slab: below the foundation of a building
- Vapor Intrusion: the movement of gas from groundwater into buildings through cracks in the floors or walls

References: