

Vapor Intrusion in Child Care Spaces



Past chemical spills can affect the quality of air you breathe indoors, even if there is no odor. That's because some of the chemicals can leak into the ground and stay there for many years. Some of these chemicals, such as **volatile organic compounds (VOCs)**, can turn into vapor, moving through the soil and along or through underground utility lines to nearby buildings. These chemical vapors can enter buildings through cracks in the foundation or other openings and impact the air you breathe. This is called **vapor intrusion**.

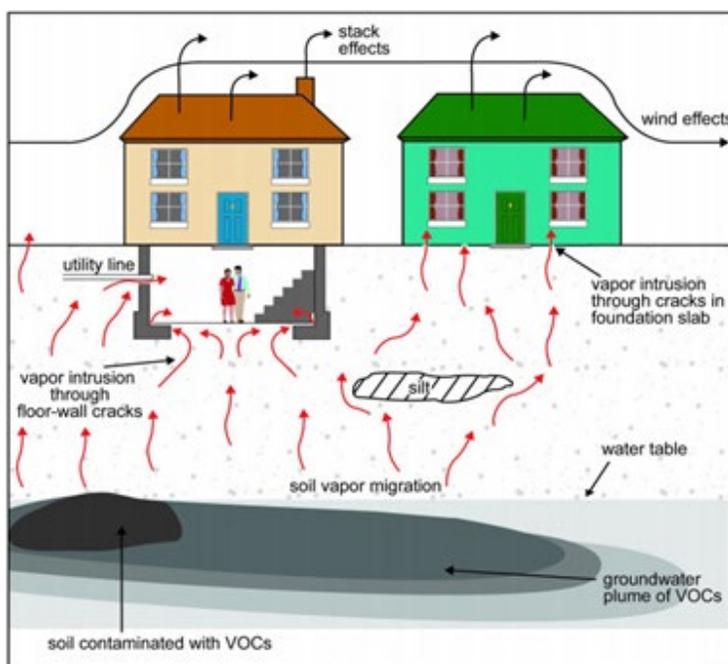


Image courtesy of Environmental Protection Agency (EPA).

How is vapor intrusion different than radon gas intrusion?

The process of vapor intrusion is similar to how radon gas enters buildings. The difference is that while radon is a natural gas that escapes from the Earth's crust, chemical vapors come from human-caused chemical spills. The most common sources of past chemical spills that lead to vapor intrusion include dry cleaners, foundries or factories that made, processed, or cleaned metals, auto repair shops, and gas stations.

How is vapor intrusion harmful to health?

Vapor intrusion can lead to negative health effects for people who breathe in harmful chemical vapors. Health effects from vapor intrusion depend on the specific chemical, the concentration of vapors in the indoor air, and how long someone is exposed. Breathing in low concentrations of vapors over a long amount of time may cause cancer or impact organ function. Breathing in medium to high concentrations of vapors over a short amount of time may cause:



Headache



Sleepiness



Dizziness



Nausea



Exposure to a VOC called **trichloroethylene, or TCE**, can harm the developing fetus. Avoid exposure to TCE if you are pregnant or plan to become pregnant.



Why is testing your center for vapor intrusion important?

Children are more sensitive to the effects of VOCs than adults are because they breathe faster and take in more air relative to their body size. This results in children breathing in higher amounts of vapors in the air. They also tend to spend most of their time close to the floor, where vapor concentrations could be higher. Testing your child care center for chemical vapors can help you understand whether past chemical spills are impacting the safety of air inside your center.

What does testing indoor air for vapor intrusion involve?

If there is a potential vapor intrusion concern at your child care center, public health workers or environmental consultants will ask to hang **organic vapor monitors** in your center. These small monitors collect VOCs in your center, usually for one to two weeks. They are hung in places where children and staff spend the most time and where utilities enter the building. The monitors are then sent to a laboratory and tested for VOCs. The most common VOCs tested for are tetrachloroethylene (also known as PCE or PERC) and trichloroethylene (TCE). The types of VOCs tested for will depend on which chemicals were spilled. **There are no costs to you when public health workers test your indoor air in response to a past chemical spill.**

What should I do if chemical vapor levels in my air are too high?



If test results show vapor concentrations are above Wisconsin's Vapor Action Levels, public health workers will guide you on next steps. This guidance may include:

- ▶ Providing template letters for notifying parents and guardians.
- ▶ Opening windows for clean air to circulate inside your center, if the weather and outdoor air quality allow.
- ▶ Setting up air purification units that will clean the indoor air until a more permanent solution can be found.
- ▶ Follow-up testing to confirm there is a vapor intrusion problem or to confirm that a vapor mitigation system is working.

Vapor mitigation systems prevent vapor intrusion.

If vapor intrusion is affecting your center, the best solution is likely the installation of a **vapor mitigation system (VMS)**, which looks and operates similar to a radon mitigation system.

- ▶ Vapor mitigation systems prevent both chemical vapors and radon from entering the building.
- ▶ Radon mitigation systems will need an evaluation by a professional to determine if they will be effective at preventing chemical vapors from entering the building.

Public health workers will connect you with funding that may be available to help pay for vapor mitigation system installation.

Photo: A VMS installed on a home. The arrows show how contaminated air from under the home is moved away to prevent vapors from building up indoors.