Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

Fact Sheet: Soil Gas Sampling

What is soil gas?

Soil gas is the vapors in the air spaces between soil particles. Soil is made up of small particles of sand, clay, and organic materials such as leaves. These particles have small spaces between them which fill up with water (groundwater) or air and vapors (soil gas).

Why is soil gas at your home or building being tested?

The soil gas is being tested to find out if gaseous chemicals are present in soil near or below your home. Chemicals have been detected in nearby soil or groundwater that could produce vapors that may move through the spaces between soil particles and enter buildings through openings or cracks in the foundation. This process is called "vapor intrusion".

Why is soil gas a concern?

While people are not exposed directly to soil gas, chemicals in the soil gas can enter a home or building. Exposure to chemicals by inhaling them in indoor air can pose a risk to human health. The potential for health effects depends on the length of exposure, the amount and toxicity of the chemical, and an individual's sensitivity to the chemical.

How is soil gas sampling done?

Soil gas can be tested in different ways. The most common method uses a hollow metal rod that is inserted into the soil. To measure the soil gas directly below the building holes are drilled in the floor of the basement and the rod is pushed into the soil beneath the floor. A pump draws the soil gas through the hollow rod into a sampling container or canister. The gas is then either analyzed by the testing equipment on-site or the sampling container is brought to an off-site laboratory for analysis.

What contaminants might be in the soil gas?

Contaminants that volatilize, or produce vapors, are a concern for soil gas. Volatile organic compounds (VOCs) are a group of chemicals found in petroleum products like gasoline or home heating oil and the chemicals used for dry cleaning and industrial processes. VOCs are usually found in soil gas when they have been spilled or leaked to soil or groundwater nearby.

What will the results of the laboratory tests show?

The results of the tests will show the levels of VOCs present in the soil gas. If VOCs are found in soil gas, then there is a potential for them to enter nearby buildings. Contaminated soil or groundwater is usually the source of VOCs in soil gas, so the soil gas test results can help to link the source of VOC contamination with elevated levels in the indoor air of nearby buildings.

What happens if there is contamination at levels of health concern?

If soil gas and indoor air data indicate that VOC levels of health concern are present in the indoor air of your building, measures can be taken to stop the contaminants from entering. These measures may include clean-up of soil or groundwater, sealing cracks in the foundation, covering sumps, adjusting the building heating system, and/or installing a ventilation system under the basement floor.

Where can I find more information?

The MassDEP Vapor Intrusion Fact Sheet has more information about soil gas and indoor air. The United States Environmental Protection Agency (USEPA) also has more information about managing indoor air, risk, and household hazardous products.