DIVISION OF WATER QUALITY FACTSHEET

Vapor Intrusion: Understanding Indoor Air Test Results

JUNE | 2026

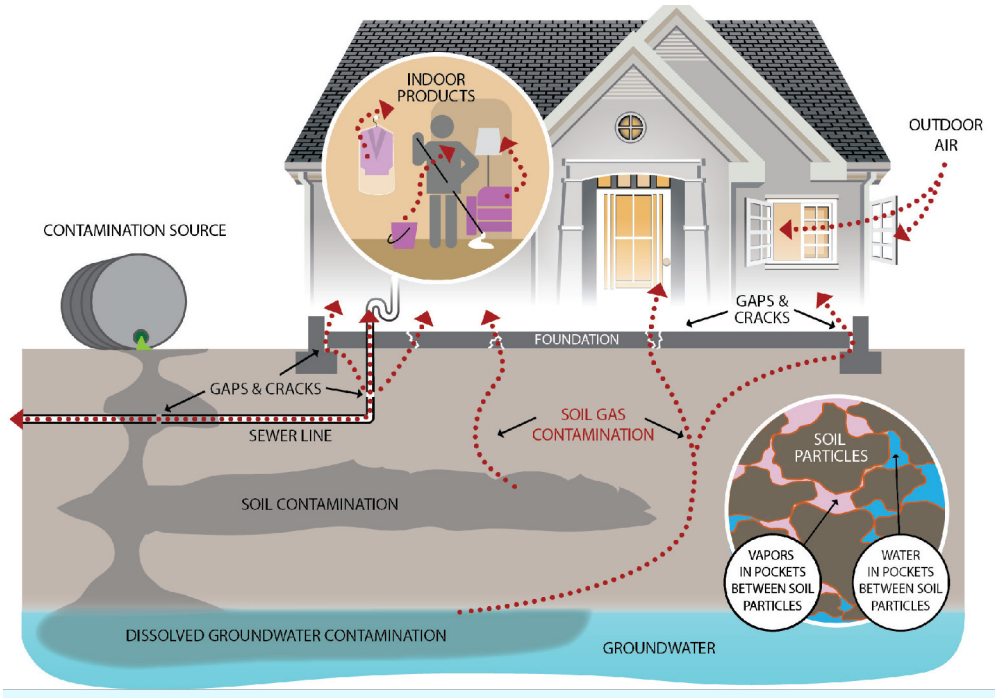
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STATE WATER RESOURCES CONTROL BOARD | 1001 I Street, Sacramento, CA 95814 | Mailing Address: P.O. Box 100, Sacramento, CA 95812-0100 | www.waterboards.ca.gov

What can affect indoor air quality?

The air inside our homes, schools, and workplaces can be affected by chemicals both inside and outside the building. Outdoor pollution, cigarette smoke, and vapors from products like cleaners or paint can harm our health. Indoor air can also be affected by vapors moving up into a building from underground. This is called vapor intrusion.

Vapor intrusion happens when chemicals are spilled or dumped on the ground or in groundwater and turn into vapors. These vapors move through the soil, gather under buildings, and may move into the indoor air. They can enter buildings through cracks in foundations, utility pipes, and/or sewer lines.





Summa Canister

Why test indoor air?

When vapor intrusion could be a health risk, we test the air inside buildings. When we do this, we check for two main things:

- Are chemical vapors from the ground moving into the air inside homes or buildings?
- Is the amount (or concentration) of these chemicals high enough to hurt the health of the people who live or work there?

In the end, we use these test results to decide if we need to take steps to protect the health of everyone inside the building.

How do we test for vapor intrusion?

We often collect samples of indoor air by placing special containers called summa canisters inside a building for up to 24 hours. We can also use passive sampler devices to collect samples over a longer time period.

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Sometimes, we test the indoor air more than once. This helps us understand the results better and observe if there are changes to indoor air over time.

When we test a building, we collect several types of samples at the same time:

- Indoor air samples
- Outdoor air samples
- Samples from under the building or ground (called sub-slab, crawl space, or soil vapor samples)

By looking at the results from all these samples, scientists can tell if the chemicals they find in the indoor air are coming from the soil and groundwater, from the outside air, or from products used inside the home or building.

Finally, all the samples are sent to a certified lab. The lab tests each sample to find out what kind of chemicals are present and how much of each chemical is in the sample.

How much of a chemical is a health concern?

To understand if the amount of a chemical (or concentration) can be harmful to health, the measured concentrations are compared to screening levels. Screening levels are health-protective concentrations in air, soil, and water. Screening levels are set to protect even the most sensitive people, like children and those with health problems. If the sample test results are higher than screening levels, more information is needed.

Government agencies, like California Environmental Protection Agency's (Cal/EPA's) Water Resources Control Boards, Cal/EPA's Department of Toxic Substances, California Office of Environmental Health Hazard Assessment, and the United States Environmental Protection Agency develop screening levels for many vapor forming chemicals, based on studies of how the chemicals affect animals or people.

How much vapor can get into a home or building? Can it change?

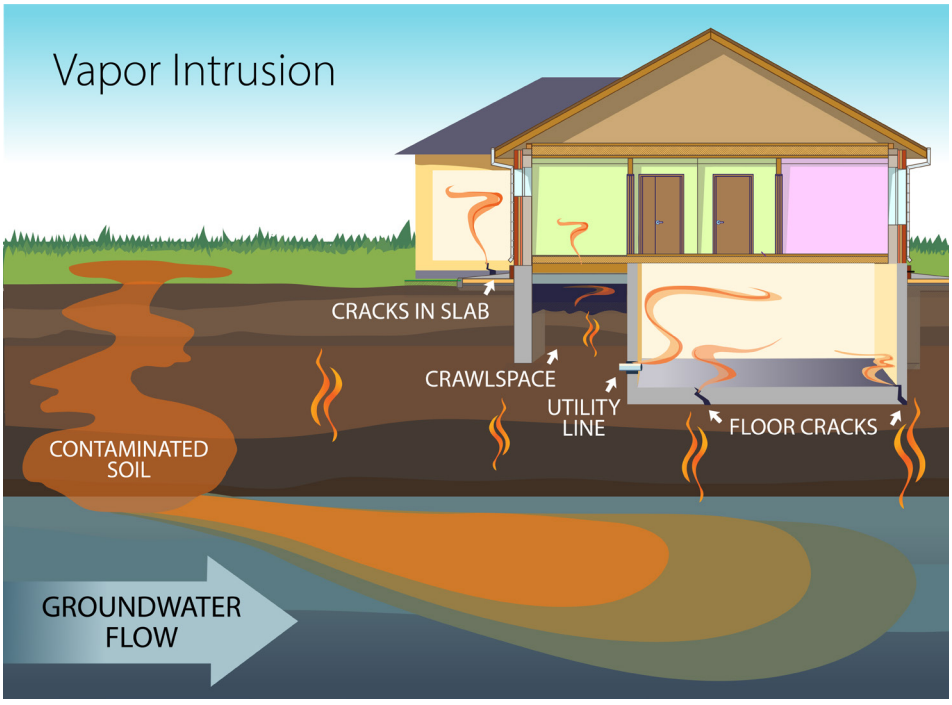
The amount of vapor that can enter a building may be affected by many factors, including:

- Condition of the foundation or slab
- A pipe or sewer line intersecting contamination
- Outdoor temperature, pressure, and wind
- Changes to venting, heating, and cooling systems
- Overall building construction

These factors can cause vapor concentrations in the building to change over time. For example, hotter weather may increase vapor intrusion into the building, as the ground warms up.

Vapors that enter a sewer pipe, bathroom drainpipe, or other pathway can move directly into the home and cause indoor air concentrations to increase. These pathways are called "vapor conduits" or preferential pathways.

All this information is evaluated when collecting indoor air samples and analyzing indoor air test results.



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Do indoor air test results only show chemicals from vapor intrusion?

Indoor air test results don't just show chemicals from vapor intrusion. Vapors from chemicals used in dry cleaning clothes, furniture, new carpets, cleaning products, cigarette smoke, candles, markers, fuels, and other household products may also affect indoor air quality. Additionally, outdoor air pollution can contribute to indoor air contamination. These items are often referred to as background sources during a vapor intrusion investigation.

To ensure the accuracy of the testing process, as many background sources as possible should be removed before indoor air is tested. However, test results may still appear elevated due to the detection of background sources. Therefore, regulatory agencies review information on background sources to understand their potential impact on indoor air results.

The final interpretation of indoor air test results comes after understanding all the factors that impact vapor intrusion. Regulatory agencies will review all these factors and information before making any decisions.

Learn about improving indoor air quality using the links below:

www.epa.gov/indoor-air-quality-iaq/indoor-pollutants-and-sources

www.lung.org/clean-air/indoor-air

https://www.whatsinproducts.com/

Additional Resources:

State Water Resources Control Board Contact:
dwq-vaporintrusion@waterboards.ca.gov

https//www.waterboards.ca.gov/water_issues/programs/scp/vapor_intrusion

Vapor Intrusion Fact Sheet:
https://www.waterboards.ca.gov/water_issues/programs/site_cleanup_program/vapor_intrusion/docs/2023/VI-Basics-Fact-Sheet-Feb2023.pdf

U.S. Environmental Protection Agency OSWER Vapor Intrusion Guidance, See Indoor Air Sampling Section 6.4.1:
https://www.epa.gov/sites/default/files/2015-09/documents/oswer-vapor-intrusion-technical-guide-final.pdf

