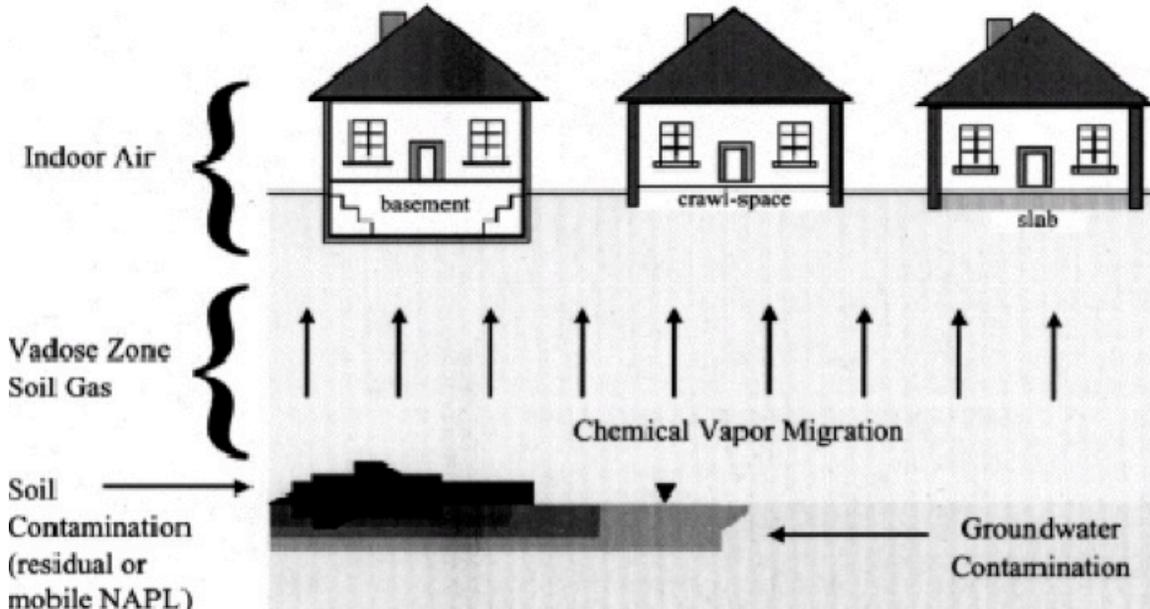


## A Protective Approach to Vapor Intrusion

Center for Public Environmental Oversight

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The migration of volatile toxic substances, such as trichloroethylene (TCE), from the soil and shallow groundwater into overlying buildings is called vapor intrusion. It occurs when such substances have been released on site or have flowed into the property along with the groundwater. The typically lower pressure in indoor air, compared to soil vapor, actually pulls contamination through holes, cracks, and permeable slabs or floors into the buildings, where it increases the risk of cancer and other diseases due to continuous inhalation. Vapor intrusion is difficult to measure because concentrations within buildings vary over time and space, and changes in structures or their ventilation system can open new pathways. Fortunately, once vapor intrusion is recognized, there are reliable, efficient ways to prevent exposure.



In 2002 U.S. EPA launched several vapor intrusion investigations in Mountain View. The Mountain View program is one of EPA's earliest, largest, and most innovative vapor intrusion responses. For example, Mountain View is one of the first places in the nation to implement EPA's 2011 TCE Toxicological Review as it applies to pregnant women. EPA and the companies and federal agencies responsible for the pollution have sampled more than 300 residential units and over 100 of non-residential structures, finding unacceptable levels of TCE in a small fraction.

EPA has repeatedly met with activists, neighborhood associations, commercial property owners, and city officials, and it has responded favorably to our concerns. We appreciate the commitment of EPA staff and contractors, but we still find room for improvement:

1. **EPA should lower its local TCE indoor air action level for residences to reflect the findings of the agency's national 2011 Toxicological Review.** Before the Review, EPA was using a target of 1 microgram per cubic meter ( $\mu\text{g}/\text{m}^3$ ) for residential exposure scenarios. In its Review, EPA headquarters found that exposures as low as  $.43 \mu\text{g}/\text{m}^3$  correspond to an excess lifetime cancer risk of one in a million. That is, if one million people are exposed at that level over 30 years, there is likely to be one additional cancer.

EPA points out that the  $1 \mu\text{g}/\text{m}^3$  level is already very low, but CPEO supports those residents whose homes contain somewhere between  $.43$  and  $1 \mu\text{g}/\text{m}^3$  who have asked for mitigation. TCE does not belong in their air at any level, and preventing intrusion at the small number of homes in this range would be inexpensive. In fact, because annual or semiannual indoor air sampling might miss elevated exposure levels, mitigation probably costs less than the amount of sampling necessary to prove that the indoor air is safe. The most common form of mitigation in residences is the installation of sub-structure depressurization systems or crawl-space ventilation systems.

2. **EPA should ensure that all new residents, homeowners or renters, of its vapor intrusion study areas are made aware that their homes are within the study area and provide them with sampling results before they move in.** Since EPA began sampling Mountain View's indoor air years ago, numerous people have moved into homes that were not sampled because previous owners did not allow EPA to go inside. EPA should provide those people the opportunity to have their homes tested. Within the Vapor Intrusion Study Area established by EPA, the Responsible Parties (electronics companies and their corporate descendents) pay for indoor air sampling and if need be, mitigation systems.

Many homeowners and landlords in the area consider the publication of sampling data or even identifying their homes as subject to EPA study to be an invasion of privacy that could lower their home values. CPEO believes that the solution is to make the homes safe, not to hide such information from prospective residents. EPA does not release the street addresses of sampled homes. This is a good solution as long as prospective buyers or tenants are made aware of these results.

Although mitigation systems may be perceived as a stigma, there are many homes throughout the U.S that have installed radon protection systems, essentially identical to those installed to prevent TCE exposure. There is no evidence that these radon protection systems have decreased home values. An EPA Fact Sheet explains, "Where radon problems have been fixed, home sales have not been blocked or frustrated. The added protection is some times a good selling point."

3. **EPA should ensure that occupants of non-residential buildings (offices, schools, etc.) subject to vapor intrusion are aware that their buildings have been evaluated and receive the results of such evaluations.** While EPA has found TCE

levels in most buildings in the area to be acceptably low, employees and others have a right to look at the data and make their own risk management decisions.

Google told most of the employees in its two North Whisman buildings with vapor intrusion, since mitigated, about sampling results showing elevated TCE concentrations. As a result, some of the pregnant women there chose to work from home. Similar notification should be required at the relatively small number of other local buildings with known or suspected vapor intrusion, even as EPA, the responsible parties, property owners, and corporate lessees work to prevent it.

4. **EPA, the California Department of Toxic Substances Control, and the Bay Area Regional Water Quality Control Board should systematically evaluate all known groundwater plumes (with TCE or other chlorinated volatile organic compounds) in Silicon Valley to determine whether vapor intrusion sampling is necessary.** A small number of sites in Mountain View have been studied, and EPA has asked the Water Board to investigate several Superfund sites under its jurisdiction. But tens of thousands of other people may work, live, or attend school or day care above other TCE plumes. Most of these were discovered two or three decades ago, so people often don't know that contamination is in the groundwater below them, let alone that there is a potential for indoor air exposure. Based on the Mountain View investigations, it's likely that only a fraction of these people are at risk, but the agencies should take steps to find out whom.

Terradex, a local company, has mapped these plumes throughout the area. To view a video explaining how to check on line for plumes in your area, see <https://www.youtube.com/watch?v=6sC2wumhUHQ>.

Largely due to the continuing oversight of people from the Mountain View community, EPA's vapor intrusion response here is a national model. We need to carefully examine each step to make sure it stays that way.



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