



Vapor Intrusion Studies

U.S. EPA | SCIENCE AT THE EPA NEW ENGLAND REGIONAL LABORATORY

SCIENCE lies at the heart of the mission of the U.S. Environmental Protection Agency (EPA). The Agency must rely on cutting edge research, accurate measurements and effective technology to implement its programs to protect the environment and human health. Without sound science and credible data, EPA can not wisely set environmental and health standards, clean up contaminated sites, measure ambient air and water quality conditions, or identify the new technologies or practices that will reduce releases to the environment. These fact sheets share with you some of our EPA New England's laboratory capabilities and exemplify some of the very best science we do to meet our agency mission.

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GOAL:

In order to support risk assessments and clean-up decisions at hazardous waste sites, EPA's New England Regional Laboratory conducts studies to determine levels of indoor air contamination in buildings adjacent to these sites. Regional scientists are continuing to refine and improve vapor intrusion study methods and have expanded the use of these studies in New England in response to increased concerns about vapor intrusion and health risks to building occupants.

PROGRESS:

Vapor intrusion is the movement of volatile organic chemicals (VOCs) from contaminated groundwater and/or soils through the ground into the air contained in overlying buildings. EPA New England scientists conduct vapor intrusion studies to investigate the extent and severity of contamination associated with Superfund hazardous waste sites. Frequently, the contamination is associated with a dry cleaning business where tetrachloroethylene (PCE), a solvent used in the dry cleaning industry, has contaminated the groundwater. These chemicals are transported in the groundwater, released as vapors, travel through the soil and may migrate into buildings where they can adversely impact the health of occupants.

Indoor air sampling results can be misleading because it is difficult to eliminate or adequately account for contributions from "background" sources, including items stored or used by the homeowner, such as household solvents, gasoline, and cleaning products. Therefore, a combination of soil gas, indoor air and outdoor air sampling is necessary to make an appropriate evaluation of exposure and potential health risk to building occupants. The laboratory's scientists work with the Superfund project manager to review existing data on contaminated groundwater plumes, soils data, past indoor air testing data, if available, and any other relevant information to select properties for evaluation. The scientists then collect and analyze outdoor and indoor air samples, soil gas

samples, and vapor samples from below the basement floor or slab (by drilling holes through the floor). EPA's mobile laboratory conducts on-site analyses of soil gas and air grab samples, which help refine the sampling program as it progresses and help ensure the scientists will not need to return to the site for more samples at a later date. Samples are also returned to the regional laboratory where indoor air, ambient air and soil gas canister samples are analyzed to confirm field results.

Based on the findings of the laboratory's vapor intrusion studies, EPA takes mitigation actions to reduce potential health risks. Typically, the chemical concentration levels are low, and the main concern is whether the chemicals may pose an unacceptable health risk to occupants due to long-term exposure. When significant vapor intrusion is found, ventilation is likely the most appropriate response option. Affected homes and buildings often have soil gas mitigation systems installed to minimize exposure to vapors from actual or suspected water contamination incidents.

BENEFITS:

By providing timely and useful data on potential human health risks from indoor air contamination associated with hazardous waste sites, EPA New England scientists are helping protect the health of affected New England residents.