

US EPA ARCHIVE DOCUMENT

## What is Vapor Intrusion?

Hazardous chemicals released into the ground as liquids or solids form hazardous gases (i.e., vapors) and migrate from contaminant sources, such as soil or groundwater, through the subsurface and into indoor air as a gas by seeping through cracks and gaps in basement floors and walls or foundations, including perforations due to utility conduits and any other openings. Vapor intrusion can occur in a broad range of land use settings (e.g., residential, commercial, industrial) and affect buildings with virtually any foundation type (i.e., with a basement or crawl space(s) or slab-on-grade). Vapor intrusion is similar to radon intrusion. Programs supported include Superfund, RCRA, Brownfields and Federal Facilities.

# Vapor Intrusion Assessment

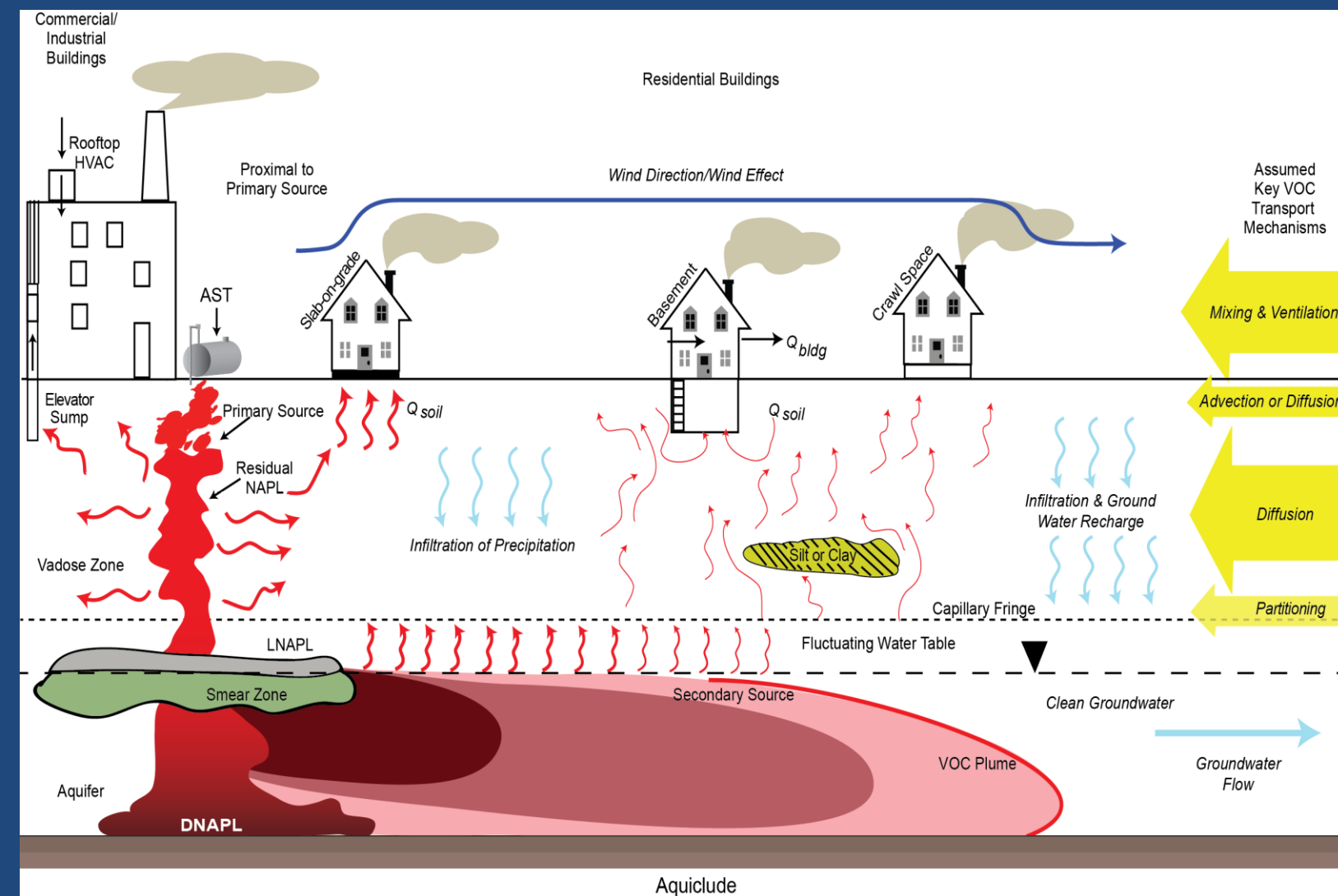
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## Vapor Intrusion Sampling and Analytical Procedures



### 1. Sub-slab Soil Gas Sampling Technique

- Used to obtain soil gas sample below concrete slab.
- Probes placed along center line of building foot print.
- Use hammer drill, 3/8 and 1 inch diameter drill bits, 1/4 inch stainless steel tubing and fittings, tee fitting with septum, vacuum pump, magnehelic gauge, modeling clay, and anchoring cement.



Purge sampling probe with vacuum pump before taking samples with either a syringe or canister.



### 3. Soil Gas and Air Grab Sample On-Site Analysis

Soil gas and air grab samples are collected with a glass syringe or Tedlar bag and then immediately analyzed using a GC equipped with ECD/PID detectors on-site in EPA's Mobile Lab.



## Characterizing the Vapor Intrusion Pathway

Characterize the nature and extent of potential sources of vapors (i.e., groundwater and/or soil sources).

Characterize the migration paths between vapor sources and buildings (potential receptors).

Determine whether the building is susceptible to soil gas entry.

Confirm the presence of site-related contaminants in the indoor environment and, if found, assess whether concentrations are greater than the level deemed acceptable from a health risk perspective.

Assess the contributions of indoor sources or ambient air (i.e., 'background' sources) to concentrations of hazardous vapors in indoor air.

Determine whether the vapor intrusion pathway poses an unacceptable health risk to building occupants using data collected and the following link:

EPA OSWER Vapor Intrusion Screening Level (VISL)

Calculator, Version 3.0 Nov. 2012 RSLs

<http://www.epa.gov/oswer/vaporintrusion/guidance.html>

Go to Vapor Intrusion Screening Levels.

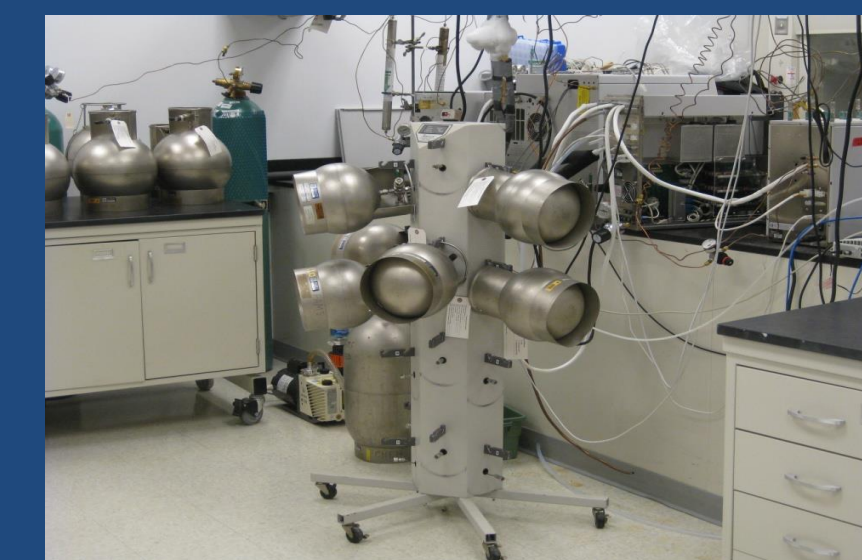
### 2. Indoor and Ambient Air Sampling

Canister samples are collected over a 24-hour period inside residential properties from the basement and first floor; over 8-hours inside commercial buildings. Samples are also collected outside at the same time indoor air samples are collected to obtain background data.



### 4. Canister Sample Laboratory Analysis

Canister indoor, ambient air and sub-slab soil gas samples are analyzed at the OEME Laboratory using a GC/MS.



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