NJDEP VAPOR INTRUSION GUIDANCE: INDOOR AIR INVESTIGATION

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November 2005
General VI Investigative Procedures

- Recommend collecting indoor air and sub-slab soil gas samples concurrently, but not required.
- Consider preferential pathways when designing an investigative approach.
Pre-Sample Walkthrough & Building Survey

• Complete the *Indoor Air Building Survey & Sampling form* to identify potential background sources of indoor air contamination
• Conduct walkthrough ideally 1 week BEFORE sampling event
• Remove potential background sources
• Identify sample locations in the basement based on likely vapor intrusion points (sump, utility lines entering structure) and appropriate areas within the living space.
• Discuss *Instructions for Occupants* sheet with the occupants.
Instructions to Occupants - IA Sample Event

- Close windows, doors, and vents
- Do not smoke or use fireplace
- Do not use cleaning products
- Do not use paints or varnishes
- Avoid bringing freshly dry-cleaned clothes into the building
- Do not use hair spray, nail polish, perfume, cosmetics, etc.
Indoor Air Sampling Procedures

For both Method TO-15 & TO-17:

• Collect one sample each on ground floor and basement for typical residential house.

• Collect ground floor samples from breathing zone height and basement (crawl space) samples close to source (sumps, cracks, etc.).

• Collect air samples over a 24-hour period (minimum of 8 hours).

• Include one ambient (outdoor) air sample per sampling event.

• Determine barometric pressures readings, ambient and interior temperatures
Indoor Air Sampling Procedures (continued)

Method TO-15 Requirements:

• Employs a whole air sample where volatile organic compounds (both polar and non-polar) are concentrated on a solid multisorbent trap, refocused on a second trap, separated on a gas chromatograph column, and passed to a mass spectrometer (operated in SCAN mode) for identification and quantitation.

• Collect indoor air samples using 6 liter stainless steel canisters (Summa®) and analyze for VOCs using USEPA Method TO-15

• Air filters are recommended for canisters to prevent clogging

• All results are to be reported in µg/m³ and also in ppbv
Indoor Air Sampling Procedures (continued)

Method TO-17 Requirements:

- TO-17 uses sorbent tubes for the collection of air samples
- For each sampling point, collect two sorbent tubes for each sampling point in parallel. The sorbent material in each tube must be the same material.
- The pump rate must be set so that the final calculated reporting limit used by the laboratory shall be less than or equal to 0.5 ppb
- There is a large selection of sorbents that can be matched to the contaminants of concern
- All results are to be reported in $\mu g/m^3$ and also in ppbv
Additional Indoor Air Sampling Procedures

• Full parameter list for initial round(s) of indoor air sampling

• When initial IA results that exceed RAL, confirmation samples should be collected immediately to verify these exceedances.

• Avoid collecting IA samples in situations where elevated concentrations are expected based on operations

• Generally, 2 rounds of IA samples is necessary (with 1 round during the worst case months of November through March) **EXCEPTION:** 1 round acceptable when IA results are an order of magnitude below screening levels for COCs.
1- and 6-Liter Stainless Steel Canisters
Typical Canister Components

- Pre-Filter
- Vacuum Gauge
- Flow Controller
- Canister Valve
- Canister Inlet
Quality Assurance Issues

• Utilize lab with NJ Laboratory Certification for appropriate air method
• Full deliverables format with original and summary data packages
• Field and Trip Blanks are NOT required for indoor air samples
• Electronic Deliverables include:
  1) Hazsites Diskette
  2) Electronic data deliverable format
  3) Method TO-15 (or TO-17) Units Conversion Table

Contact Kathy Grimes (ODQ) for further information
Converting Analytical Results

Formulas are chemical-specific:

\[
\text{ppbv} = \frac{\mu g/ m^3 \times 24.45}{MW}
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\[
\mu g/ m^3 = \frac{\text{ppbv} \times MW}{24.45}
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MW - Molecular weight of the compound