

Overview of Vapor Mitigation



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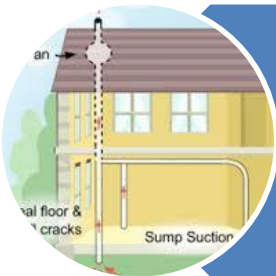
Three Mitigation Approaches



Source-Area Remediation



Institutional Controls (IC)



Building Controls (BC)



Source-Area Remediation

The source-area remediation goal is to reduce contamination below risk levels for all media.

Source-area remediation:

- Eliminates the VI pathway
- Permanent and long term remedy
- Generally a long term process
- Incorporate IC and/or BC for immediate VI risk



Source-Area Remediation

Common Remediation Techniques

- Soil Excavation
- Soil Vapor Extraction (SVE)
- Air sparge (AS)
- In-situ chemical oxidation
- In-situ bioremediation
- Pump and treat



Institutional Controls (IC)

IC definition: legally enforceable restrictions, conditions or controls on the use of real property, groundwater or surface water located at or adjacent to a facility where response actions are taken that are reasonably required to assure that the response actions are protective of public health, welfare and the environment (MERLA, 2014).

IC use legal measures that limit human exposure to vapors by restricting activity, use and access to properties with residual contamination.



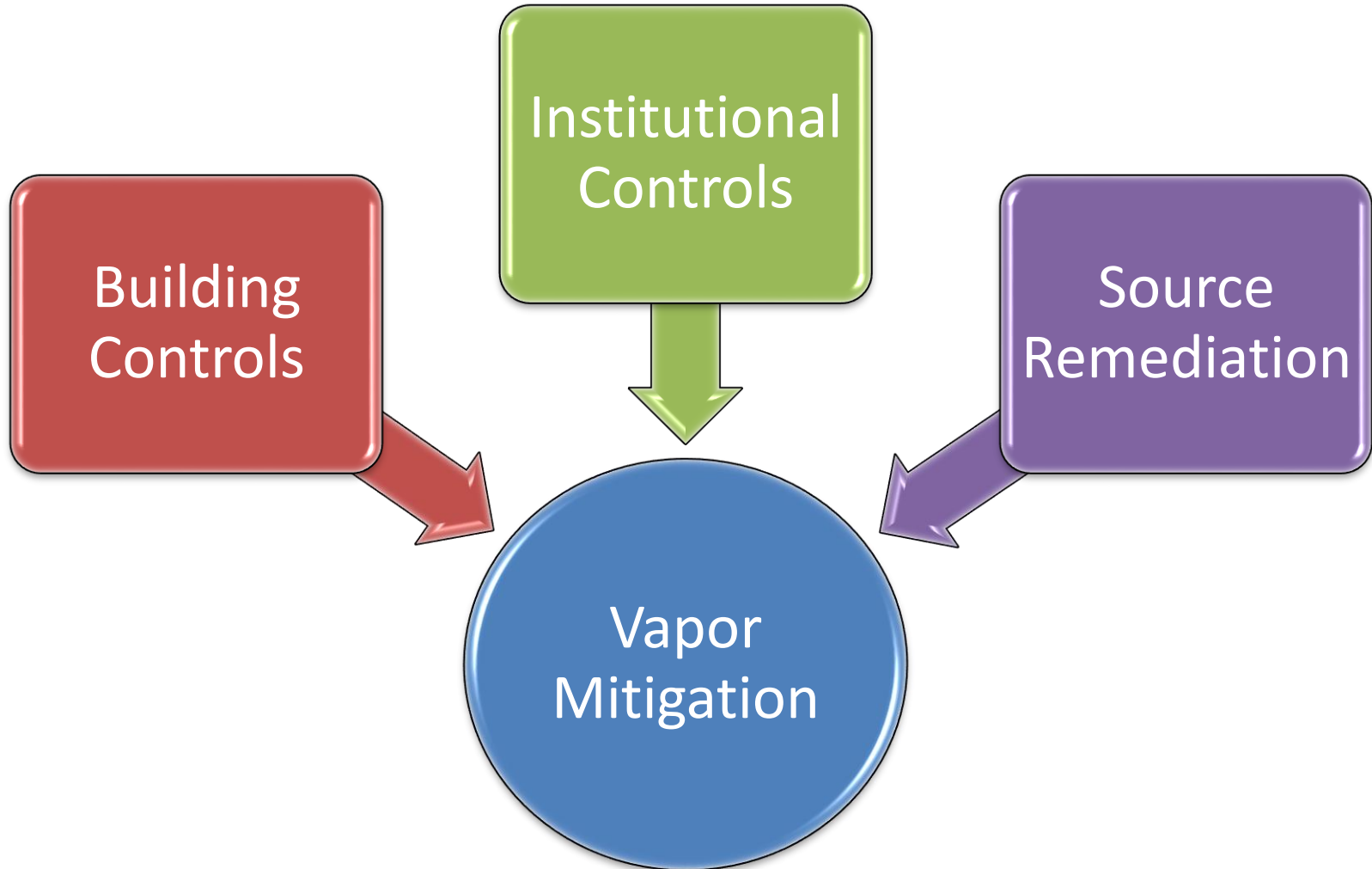
Institutional Controls

Types of IC

- **Proprietary controls** – easements, covenants, deed restrictions
- **Governmental controls** – zoning, building codes, land use restrictions
- **Enforcement & permit tools with IC components** – permits, consent decrees and administrative orders
- **Informational devices** – signs, markers or community outreach



Institutional Controls

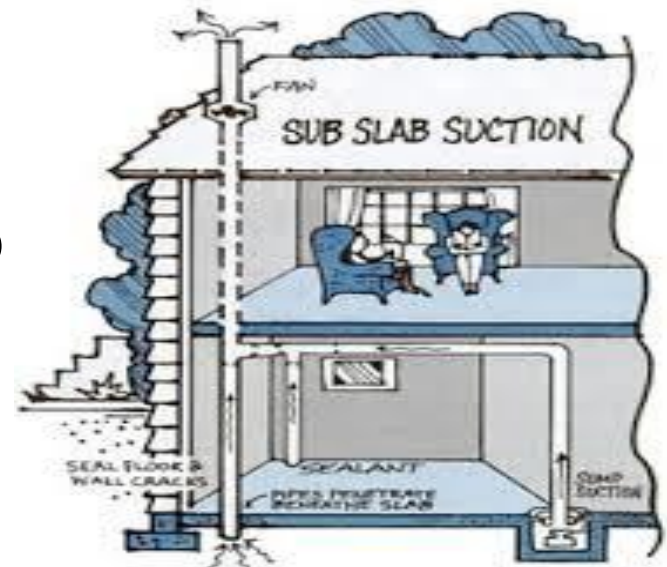


Building Controls

- ❑ Engineered technologies designed to eliminate completed VI pathways at a building

- ❑ Easier and more cost effective to install during new construction

- ❑ Used to rapidly respond to unacceptable vapor risks in existing occupied buildings



Building Controls



TAKE HOME MESSAGE



**BUILDING CONTROLS ARE NOT
REMEDICATION SYSTEMS!**



Building Controls

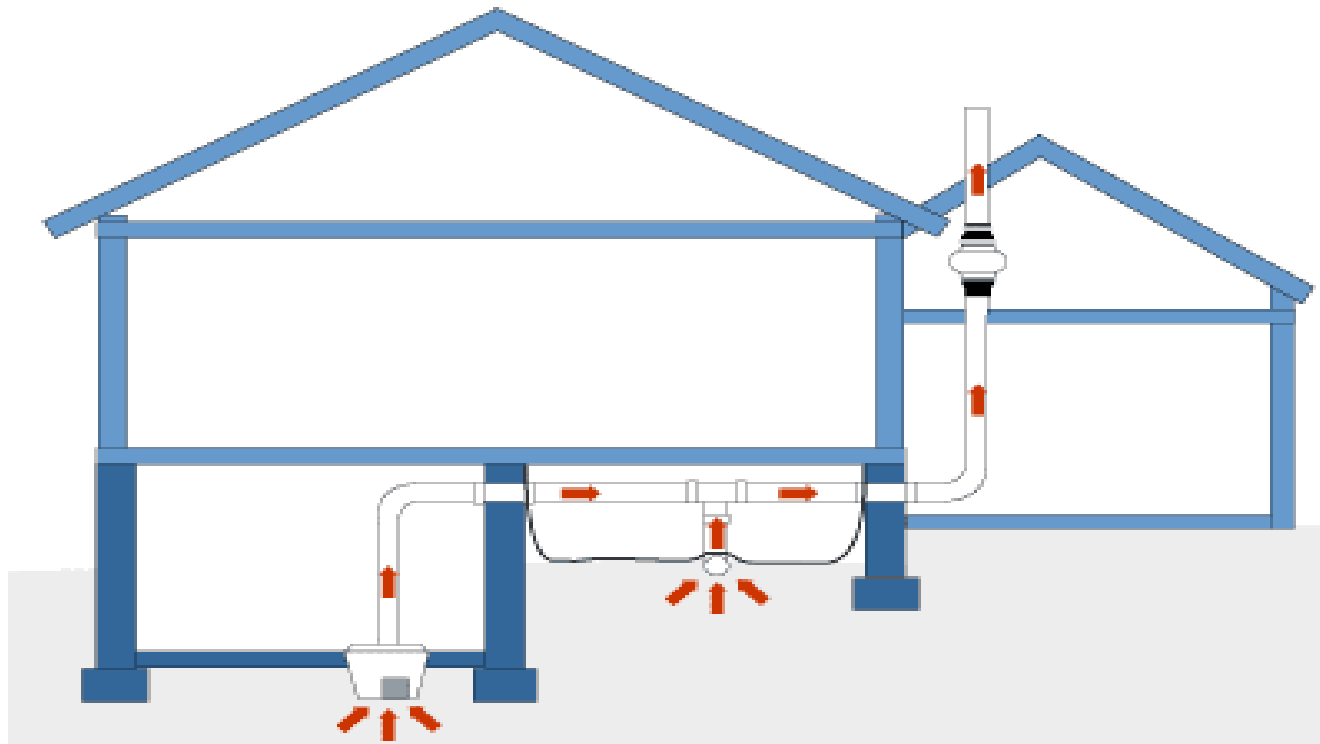
Active Mitigation

Passive Mitigation



Active Mitigation

Active mitigation systems use mechanical means (electric fans) to redirect subsurface vapors from around the building into the atmosphere.



Active Mitigation

Types of active mitigation:

- Sub-slab depressurization (SSD) - most common
- Sub-membrane depressurization (SMD)
- Block wall depressurization
- Building pressurization and ventilation
- Indoor Air Treatment (less common)



Active Mitigation

SSD works by creating a pressure difference between below the floor slab and the interior building space.



Fan is operating

Fan is not operating



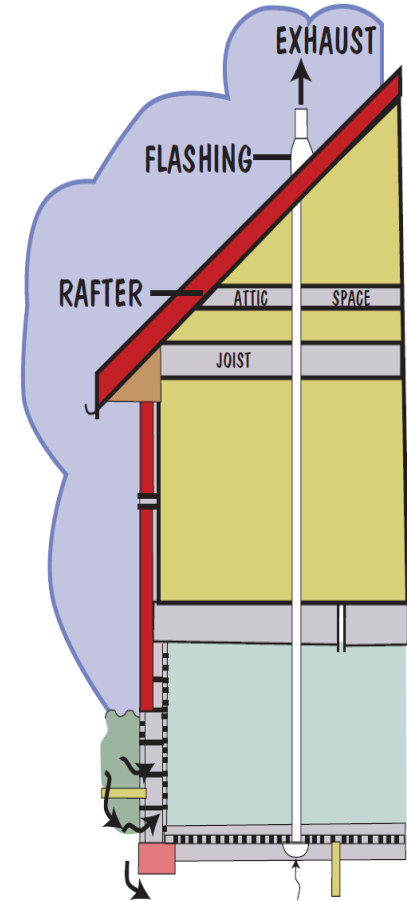
Photos courtesy of VSI Radon Reduction Corp



Passive Mitigation

- ❑ Passive mitigation can block the entry of chemical vapors into the building.

- ❑ Passive methods include:
 - Sealing openings (cracks in floor, utility penetrations, cold joint, sump baskets)
 - Vapor barrier below slab (new construction)
 - Passive vent system (no electric fan)



Passive New Construction



In Summary

Source-Area Remediation

- Permanently reduces VI Risk
- Long term remedy

Institutional Controls

- Legal measures restricting property use
- Short and long term remedy

Building Controls

- SSD is most common
- **NOT remediation systems!**
- Short or long term remedy



THANK YOU FOR LISTENING!

