



# Vapour Intrusion Risk Management Measures

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June 12, 2019



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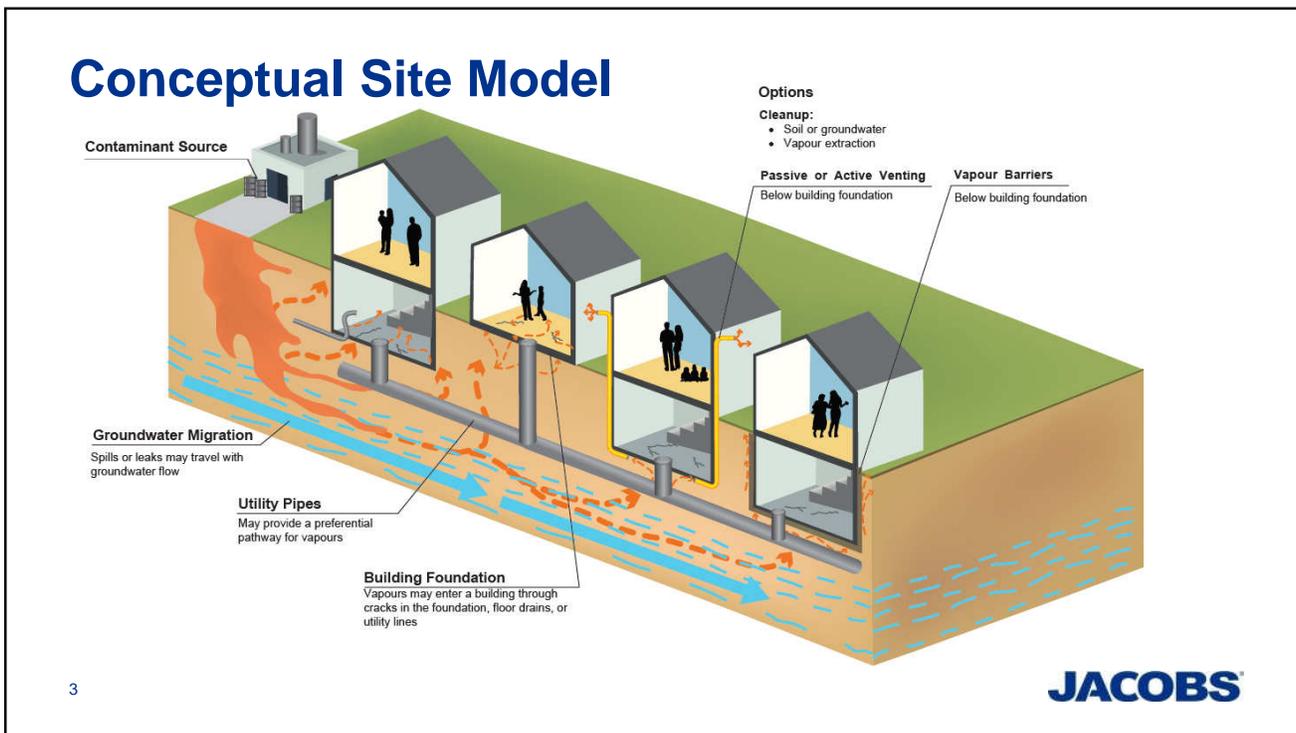
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## Overview

- Vapour intrusion (VI) conceptual site model
- VI risk management measures (RMMs) options:
  - Sub-slab venting or depressurization systems
  - HVAC modification
  - Indoor air treatment
  - Soil vapour extraction



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## Sub-Slab Venting or Depressurization

- Provide a pathway for soil gas to migrate to the exterior of the building
- Sub-slab or sub-membrane
- May be passive (venting) or active (depressurization)

Source:  
<https://www.nj.gov/dep/srp/guidance/vaporintrusion/subsurface.pdf>

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## Sub-Slab Venting or Depressurization

- Advantages
  - Simple, reliable, proven
  - May be economical (new build)
  - Less operational variability/vulnerability
- Challenges
  - Installation may be impractical
  - Monitoring and reporting requirements
  - Energy costs
  - May not be suitable for low permeability or saturated soil conditions



Source: <https://clu-in.org/>

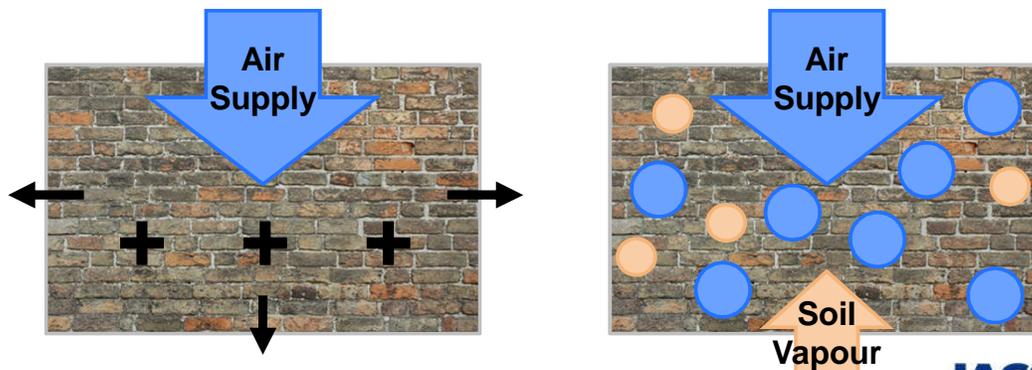
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## HVAC Modification

- Maintain positive pressure relative to subslab or other entry pathways
- Maintain a continuous active outdoor air exchange



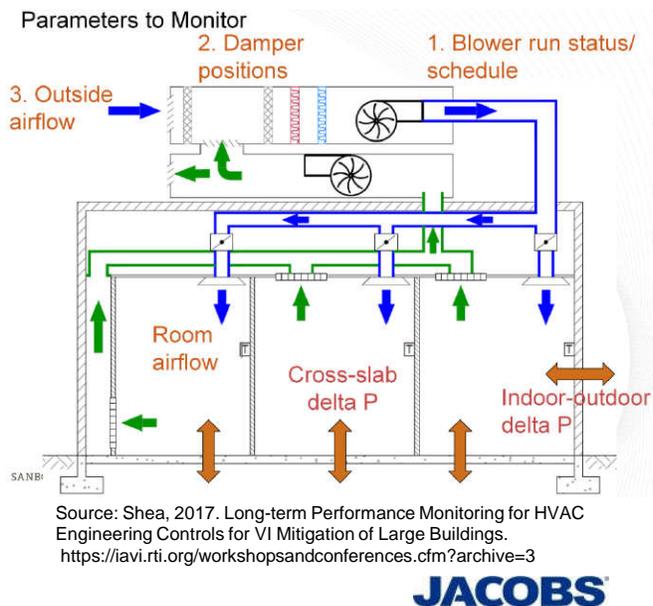
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## HVAC Modification

- Advantages
  - May be less disruptive/costly
  - Can provide a short-term/interim option
- Challenges
  - Cost to operate; energy
  - Best for tight buildings
  - Complex



## Indoor Air Treatment

- Options include:
  - Standalone systems
  - HVAC-integrated systems
- Commonly use a sorbent layer to remove VOCs
- “Reactive” air treatment use chemical reactions to change or break down VOCs



Source: <https://austinair.com/>

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## Indoor Air Treatment

- Advantages
  - May be useful as a temporary or interim solution
  - Ease of use
- Challenges
  - Limited research on effectiveness
  - Limited range
  - Generally not suitable for long-term use
  - May be expensive to operate and maintain
  - Waste generation
  - Ongoing monitoring



Source: <https://www.carrier.com/>

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## Soil Vapour Extraction

- Advantages
  - Contaminant removal
  - Can be a good option for multiple buildings and large source areas
  - May decrease/limit need for other VI RMMs
- Challenges
  - Dependent on soil conditions
  - May not be able to remove all contamination



Source: <https://clu-in.org/>

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## Conclusion

- Appropriate technology depends on a number of factors:
  - Building configuration and construction
  - Nature and extent of contaminants
  - Soil and groundwater conditions
  - Monitoring and maintenance requirements
- Alternate technologies exist and may need to be combined to achieve appropriate level of risk reduction

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# Thank you

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