Advancing Environmental Solutions

Vapor Intrusion Mitigation Team

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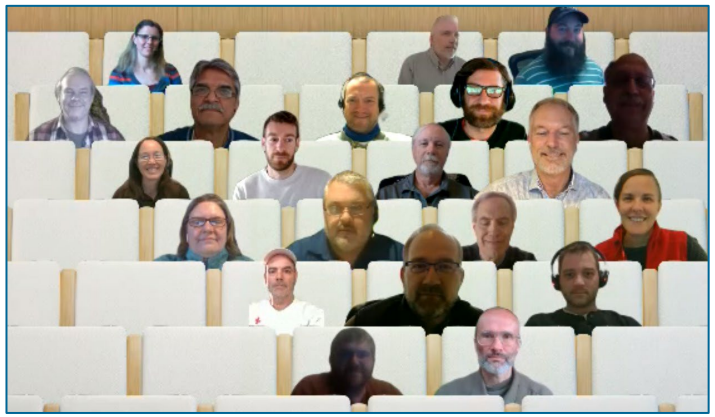

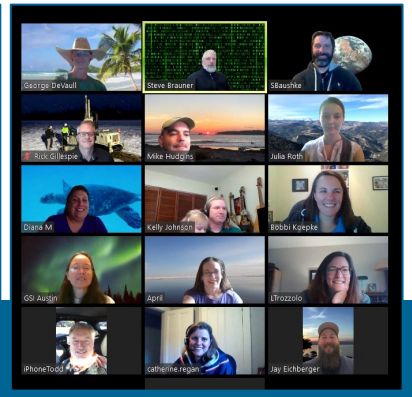

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What is ITRC?

- Mission
  To develop information resources and processes to break down barriers to the use of technically sound innovative solutions for healthy communities, economy and environment
- Membership
  - Federal, State, and Local Governments
  - Public/Tribal Stakeholders
  - Industry Affiliate Partners
  - International & Academic Communities

https://www.itrcweb.org/

ITRC Resources

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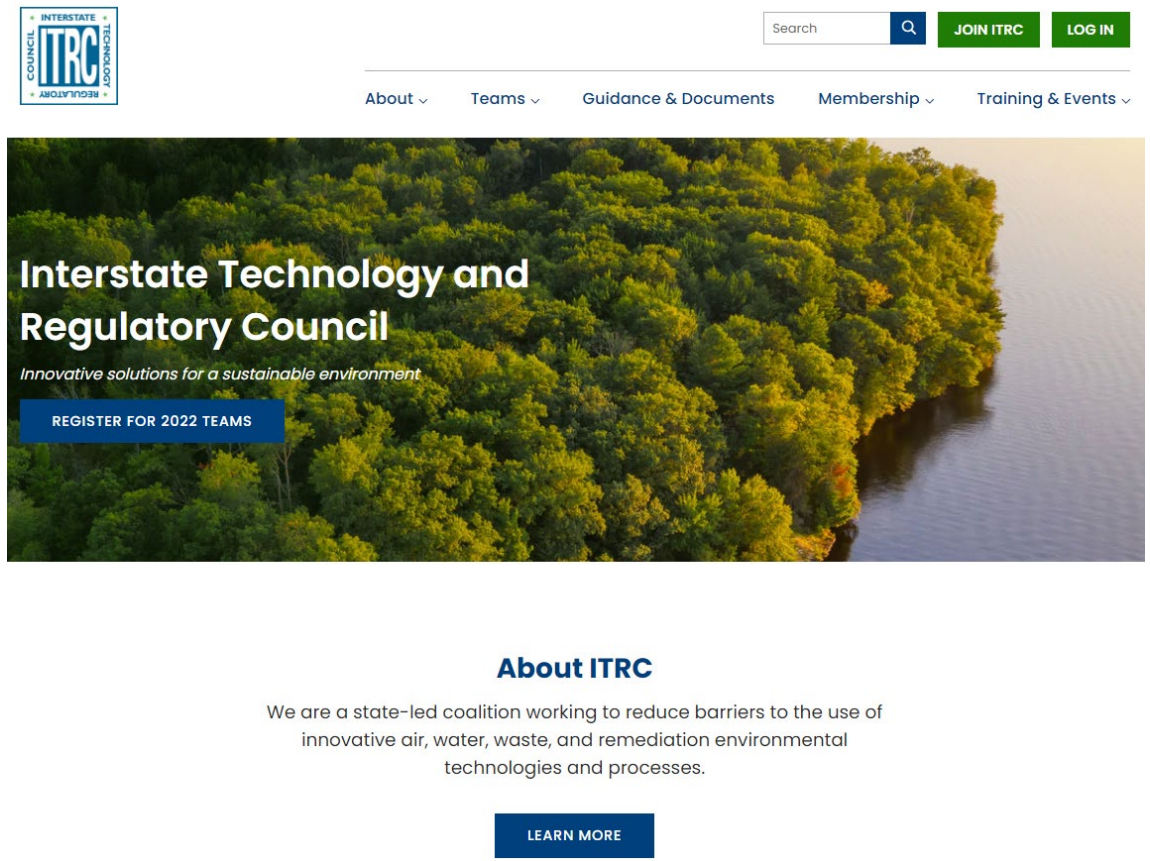

- Latest News
- Upcoming Events
- Training Opportunities
- Team Information & Registration
- Guidance Documents
- Membership Information

VIM Training Team Leadership

- ITRC Team Leaders (TLs)

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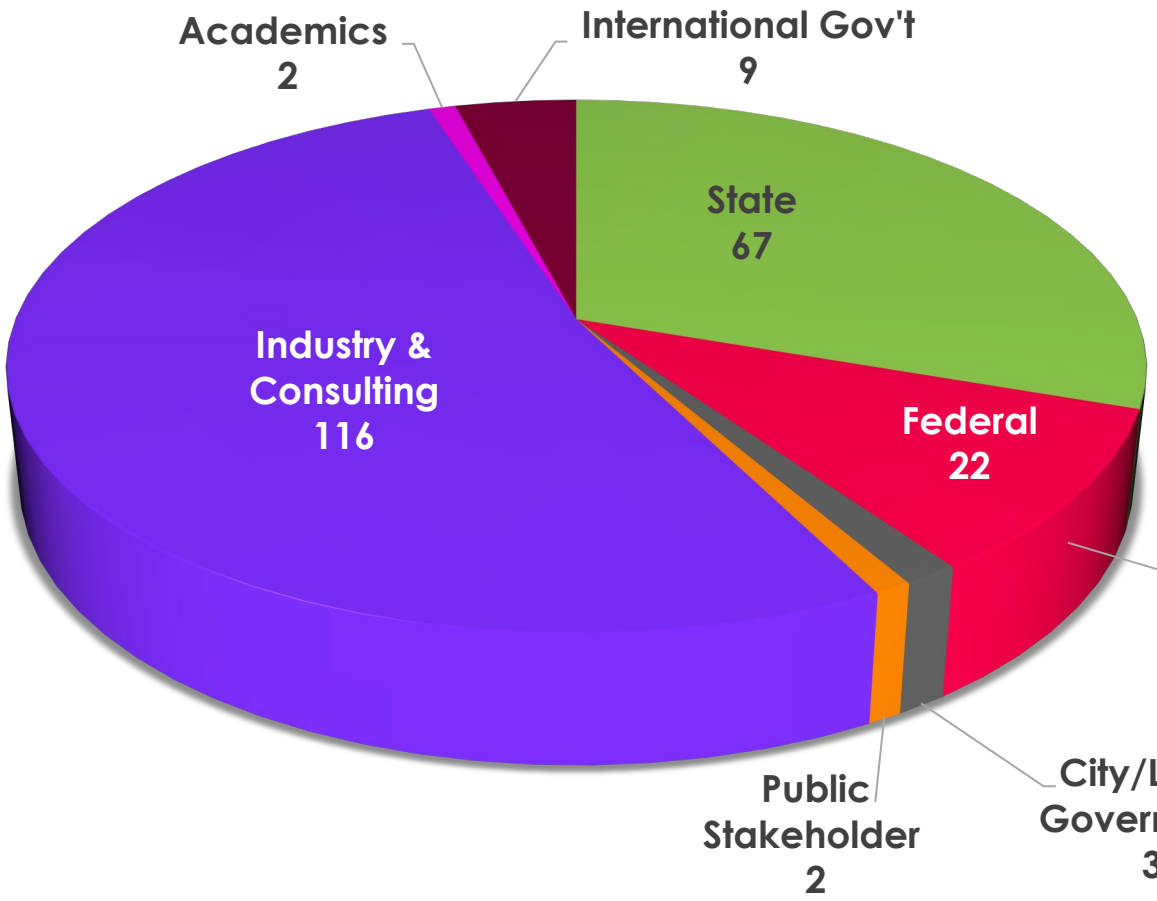
- 14 Material Subgroup leaders
- 7 Training Subgroup Leaders

VIM Training Team Composition
(November 2020)



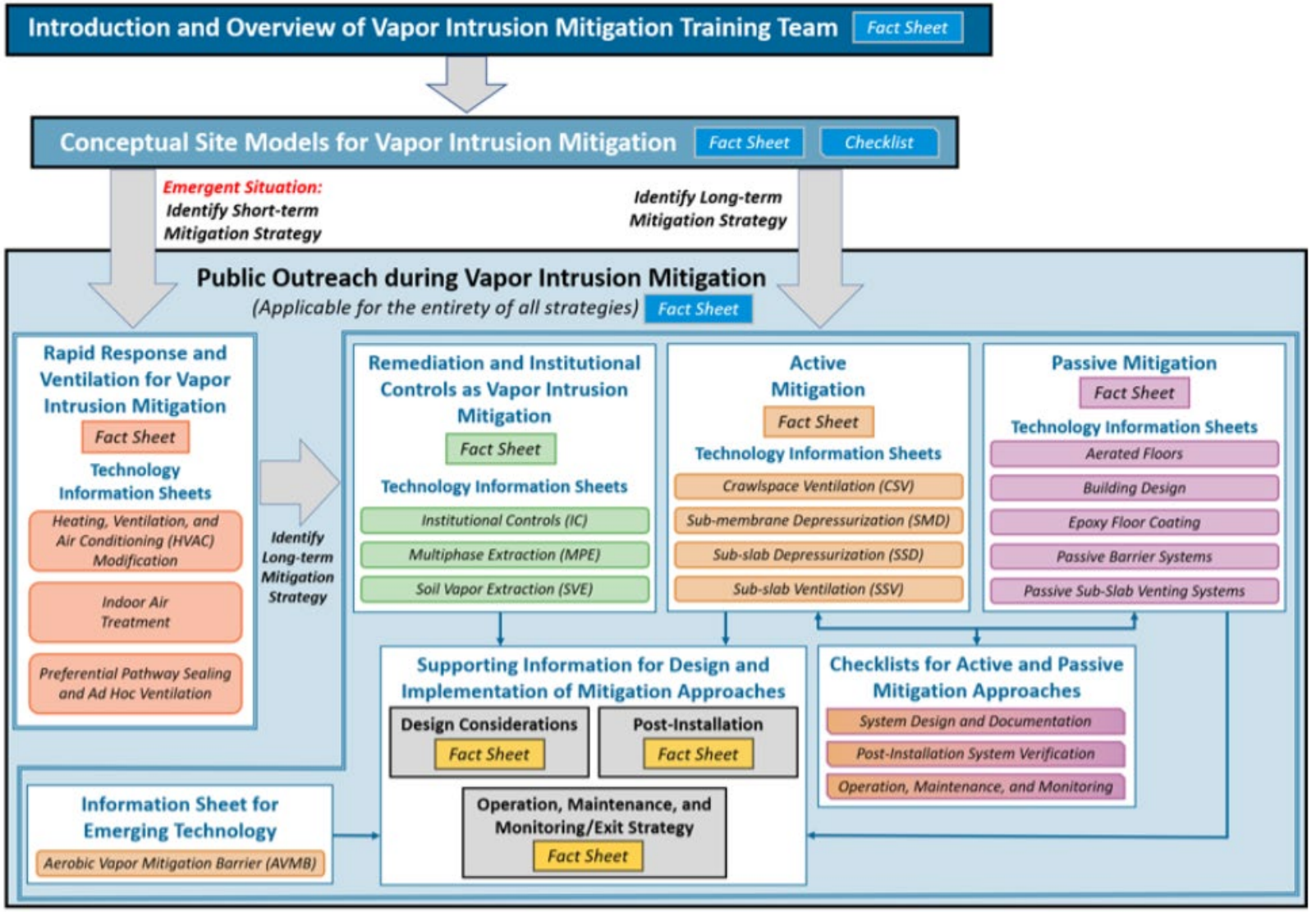
Total Team Membership = 232

States with Agency Representation = 30 + DC

Federal Breakdown	
U.S. EPA	9
U.S. DOD	8
U.S. DOE	3
USBR	1
HUD	1

Interactive Directory (Document Map)

- 10 Fact Sheets
- 16 Technology Information Sheets
- 4 Checklists



Example Fact Sheets

Vapor Intrusion Mitigation (VIM) HOME

Active Mitigation Fact Sheet

ITRC has developed a series of fact sheets that summarizes the latest science, engineering, and technologies regarding vapor intrusion (VI) mitigation. This fact sheet describes the most common active vapor mitigation technologies and summarizes the considerations that go into design, installation, post-installation verification, and operation, maintenance, and monitoring (OM&M). More detailed information on the considerations related to each step of the mitigation implementation process can be found in ITRC's *Design Considerations Fact Sheet*, *Post-installation Verification Fact Sheet*, and *Operation, Maintenance, and Monitoring/Exit Strategy Fact Sheet*

1 Introduction

Active mitigation of the VI pathway involves interception, dilution, or diversion of soil gas entry into a building using mechanical means that are powered by electricity. The performance of active mitigation systems is quantifiable by measurement of vacuum, area of influence, flow rates, mass flux, etc. This fact sheet presents information on the design, installation, and OM&M of active mitigation technologies for both new construction and existing buildings that range from small (i.e., residential) to large (i.e., commercial/industrial) structures. Active mitigation for new construction can be significantly different than for existing buildings due to components of new buildings and control of construction of the system during construction of the building. Details and differences between active mitigation for new construction and existing buildings is listed in this fact sheet and in the *Design Considerations*, *Post-installation Verification*, and *Operation, Maintenance, & Monitoring/Exit Strategy* Fact Sheets where appropriate.

As presented in the *Conceptual Site Models (CSM) for VI Mitigation Fact Sheet*, the mitigation technologies presented in this fact sheet assume the primary means for soil gas entry is via advection, rather than diffusion. Except for situations where very high sub-slab vapor source concentrations (e.g., millions of micrograms per cubic meter [µg/m^3]) are present, diffusion through the slab is not considered a significant transport pathway. Vapor mitigation systems that are "active" are designed to achieve either depressurization of the sub-slab soil or granular fill relative to indoor air or some degree of air flow and dilution

Vapor Intrusion Mitigation (VIM) HOME

Design Considerations Fact Sheet

ITRC has developed a series of fact sheets that summarizes the latest science, engineering, and technologies regarding the mitigation of vapors associated with vapor intrusion (VI). This fact sheet describes the most common design

Table 1-1 Summary of design considerations and impact on mitigation approach.

Design consideration	Active approaches	Passive approaches	Remediation	Rapid response
VI CSM considerations				
Vapor source and concentration				
Vapor source and concentration	●	●	●	◐
Geology and hydrogeology				
Subgrade soil type	●	◒	●	◒
System integrity testing	◒	●	◒	–
System effectiveness and reliability				
System effectiveness and reliability	●	●	●	●
Operation, maintenance, and monitoring considerations				
Operation, maintenance, and monitoring plans	◐	◐	●	●
Exit strategies				
Exit strategies	◐	◒	●	◐

Key | High impact ● | Medium impact ◐ | Low impact ◒ | Not applicable – |

Example Technology Sheet and Checklist

Vapor Intrusion Mitigation (VIM) HOME

Sub-slab Depressurization (SSD) Tech Sheet

***Sub-slab** Depressurization (SSD)*

Active Mitigation Systems (uses electric fan)

This ITRC Technology Information Sheet provides basic information when using a fan to depressurize the sub-slab environment to mitigate the potential for vapor intrusion at a given building. SSD is the most common engineering control installed in buildings at or near vapor intrusion sites. The operational objective for SSD systems is to create a negative pressure below the building slab. Depressurization occurs when the pressure below the slab is less than that of indoor air.

Overview

SSD uses an electric fan to create a pressure gradient across the subgrade portion of the building to mitigate the potential for vapor intrusion from the subsurface into the building. When a negative pressure is present within the building envelope relative to surrounding soil, advective gas flow from the soil into the indoor air can occur. Soil gas entry pathways can be cracks through the slab or wall(s), improperly sealed utilities, etc. Depressurizing the soils below the slab with an SSD system will create a low pressure that reverses or alters the direction of soil gas flow, thus mitigating vapor intrusion. The types of fans/blowers used for SSD can vary depending on sub-slab material permeability, as well as the building type, construction quality, and size of the building being mitigated. SSD may be limited to the portion of the floor slab where volatile organic compounds (VOC) vapor concentrations exceed generic or building-specific screening action levels for VI.

General Design

SSD suction points can be constructed by coring through the slab

Vapor Intrusion Mitigation (VIM) HOME

Vapor Intrusion Mitigation System

Post-Installation Verification Checklist

The purpose of this checklist is to provide the user with a selection of tools to verify that the appropriate system components for the vapor intrusion mitigation system (VIMS) were installed and the system is operating as designed. This information

- Slab conditions should be verified/inspected for cracks/voids/utility penetrations/potential preferential pathways (if known/observed) and identified on a diagram, sealed to the extent practical, and visually inspected during post-installation verificatio — ☐ Yes ☐ No ☐ NA

A testing procedure used to show that something is functioning properly after an initial installation or an upgrade

4.2 Extraction Point(s) — ☐ **Not applicable**

- Suction point location, diameter, and sealing are documented. — ☐ Yes ☐ No ☐ NA
- Pipe and manifold location, materials, diameter, slope, and sealing are documented. — ☐ Yes ☐ No ☐ NA
- Sample port, shutoff valve, and access have been identified. — ☐ Yes ☐ No ☐ NA

What is not covered in the VIM Training materials

- Emergency response actions – Immediately contact first responders if
  - Reports of strong petroleum odors
  - Evidence of combustible, explosive, or oxygen-deficient conditions inside the building
- Methane mitigation or hazardous substances that have a high explosive potential
- Radon

Figure from ITRC's 2014 Petroleum Vapor Intrusion Fundamentals of Screening, Investigation, and Management.

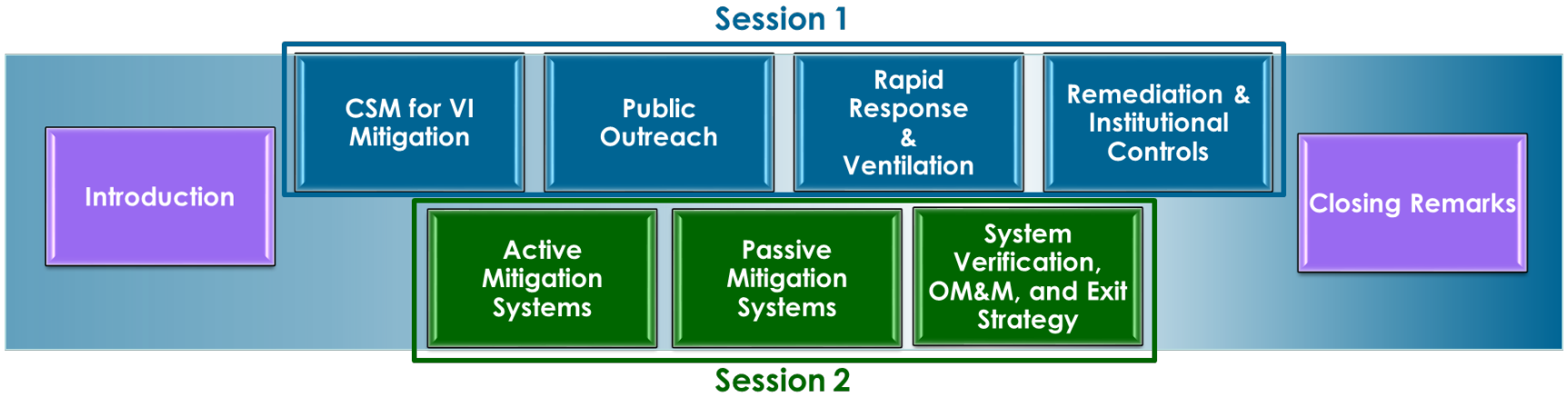
Upcoming Internet Based Training (IBT) Dates

Class Offering 2022

- Session 1 – Nov 3
- Session 2 – Nov 15

Class Offerings 2023

- Feb 14 / 21
- Jun 1 / 8



Registration is available thru clu-in.org

Thank You!

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