

Wisconsin DNR
Remediation and Redevelopment

Issues & Trends 2015

October 7, 2015

12:00 p.m. – 1:00 p.m.

Dial: 1-855-947-8255

Passcode: 6612 745#

Questions will be taken during the presentation or
can be submitted to DNRRRComments@wisconsin.gov

OM&M for Vapor Mitigation Systems

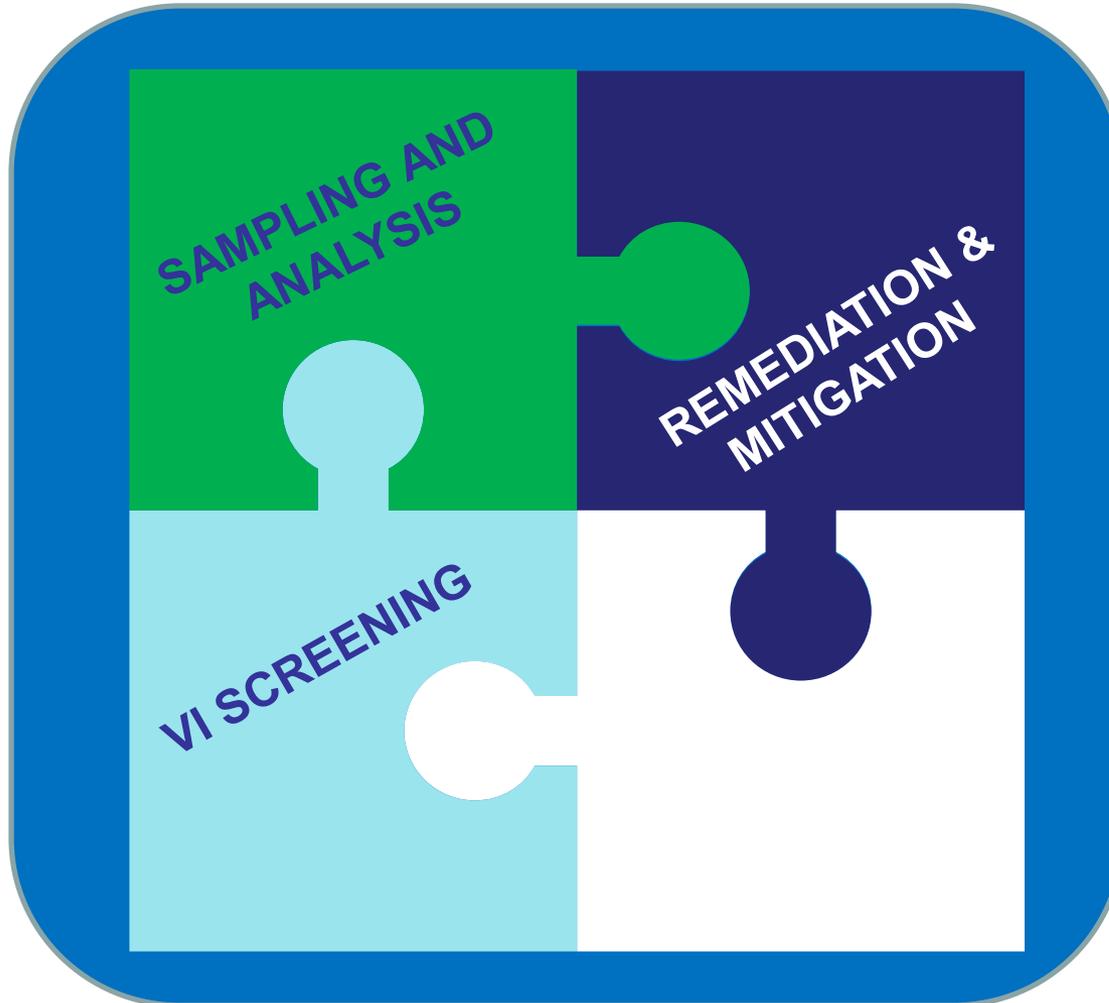
Alyssa Sellwood

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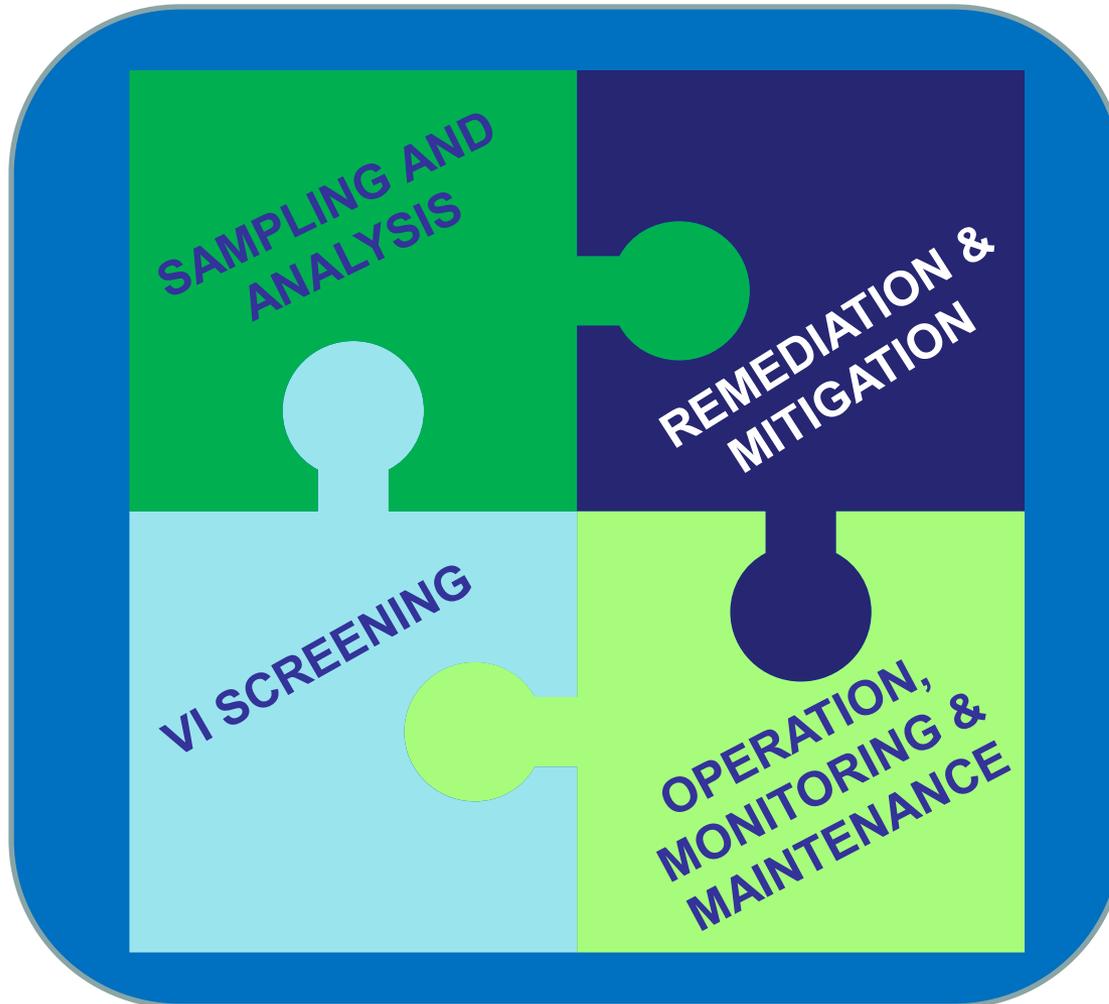
608.266.3084



Protection from Vapor Intrusion



Protection from Vapor Intrusion

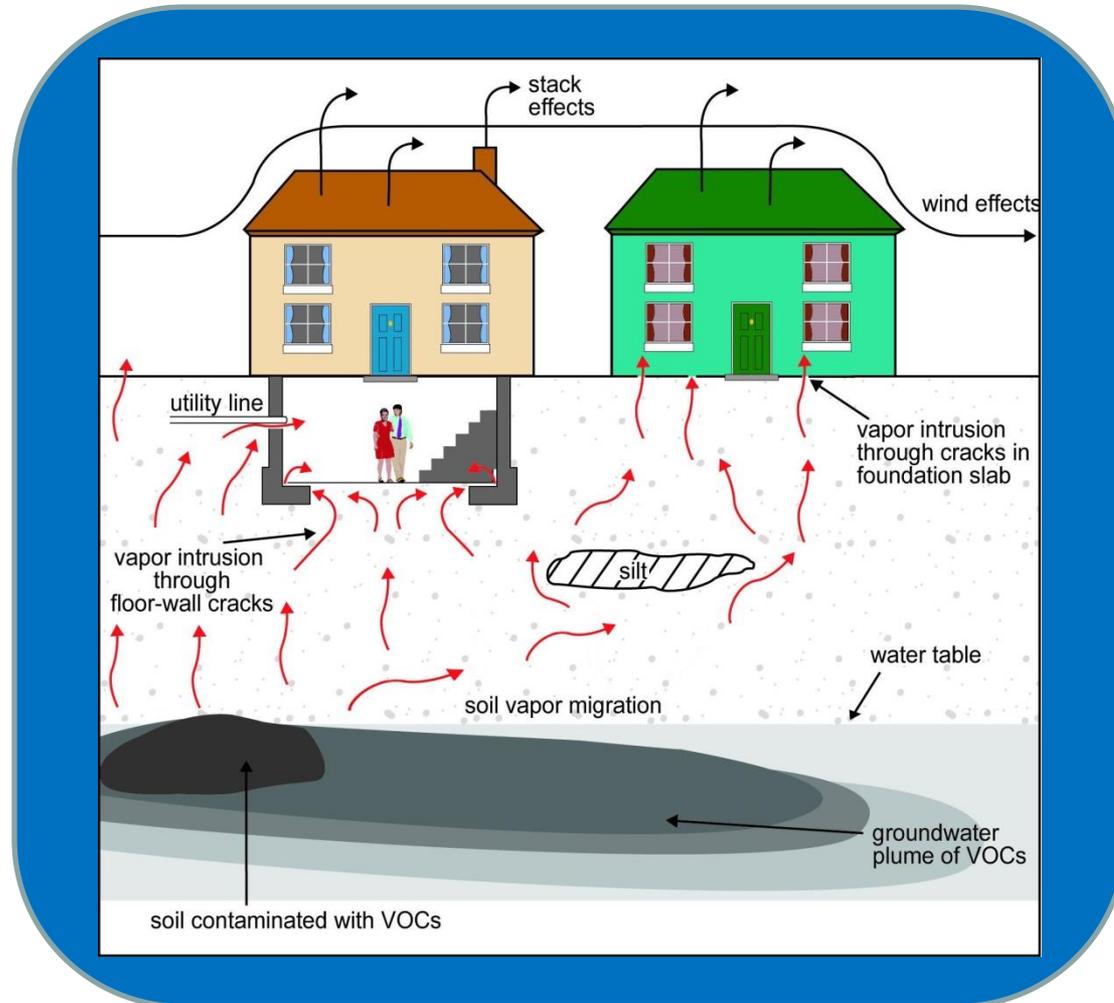
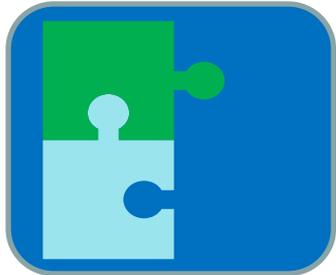




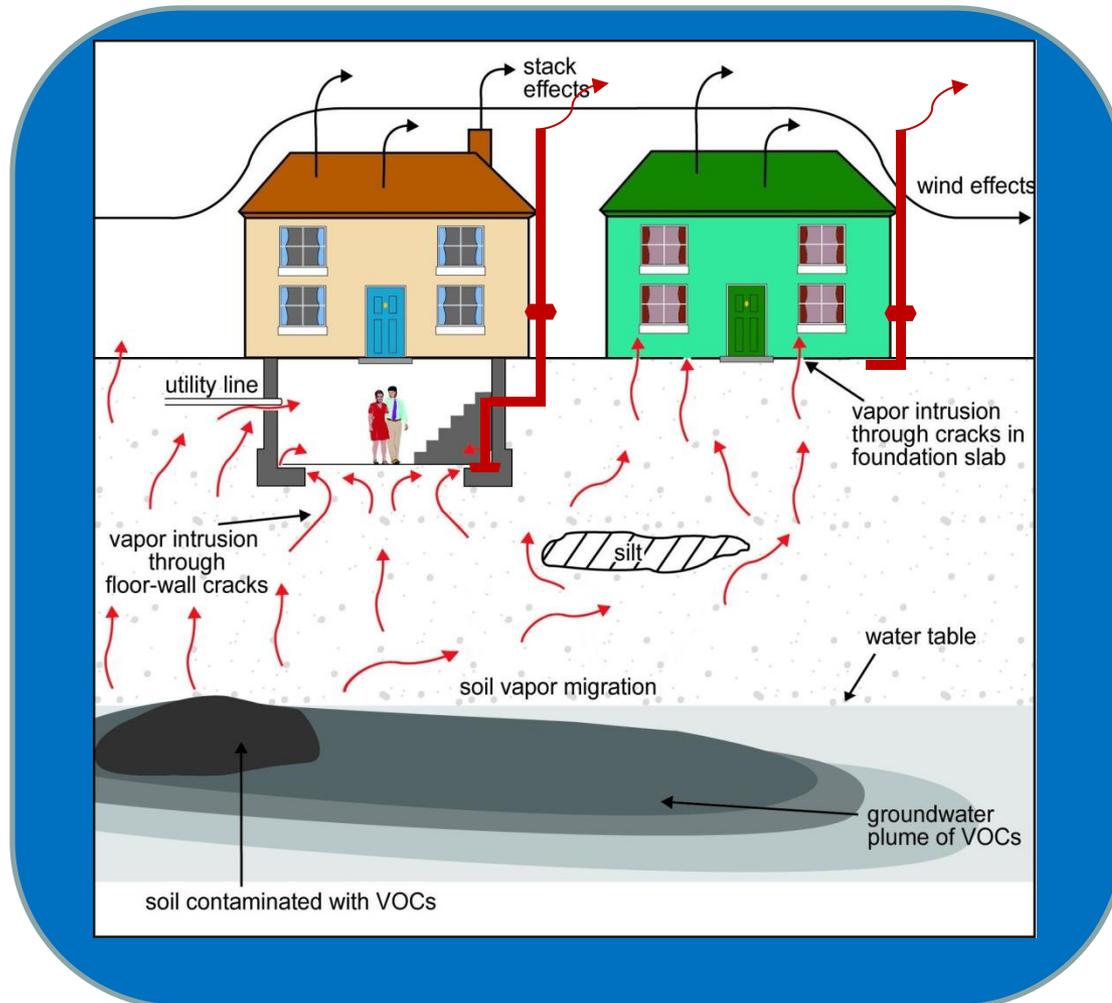
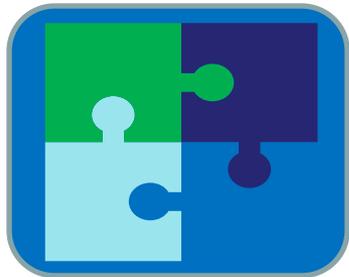
VI Mitigation Approaches

- **Active Sub-Slab Depressurization**
- Active Sub-Membrane Depressurization
- Building Pressurization
- HVAC Optimization
- Passive Ventilation and Barriers
- Indoor Air Filtering/Cleaning

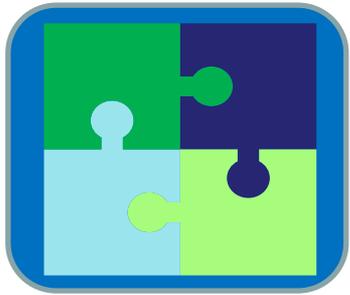
VI Assessment and Sampling



VI Mitigation



VI OM&M



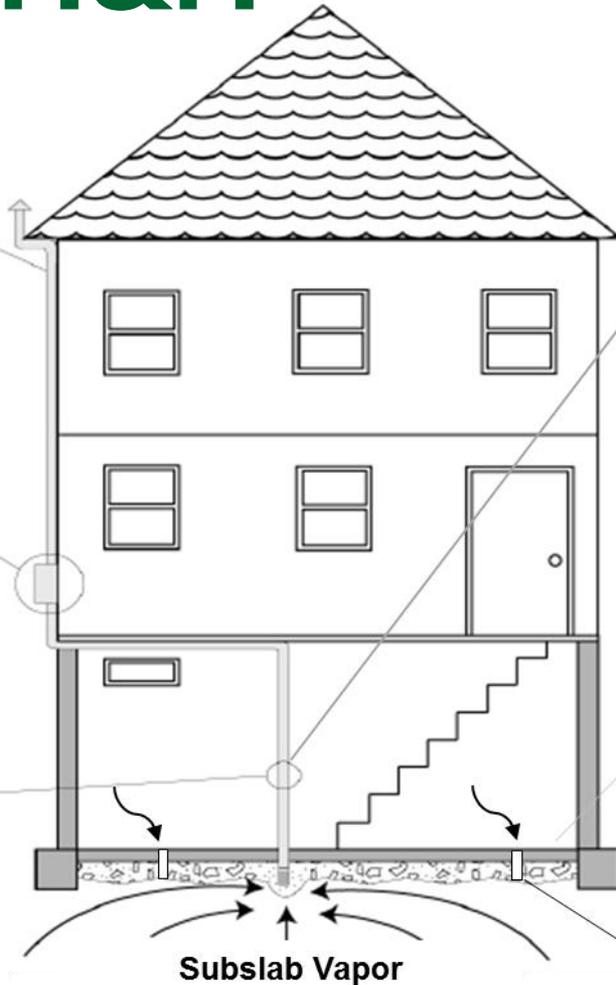
Vent Pipe



Fan



Manometer



Air Flow



Cracks



Pressure Field Extension



NR 724.13 OM&M Requirements

Vapor Mitigation Systems...

- “...shall be monitored at a frequency determined by the department, to measure whether the action taken has been effective in meeting the vapor action level” *NR 724.13(1)(d)*
- “...shall operate until no longer required by the department” *NR 724.13 (1)(c)*



National Standard for OM&M

America Association of Radon
Scientists and Technologists (AARST)

https://www.aarst.org/consortium_radon_standard.shtml

DRAFT National Standard

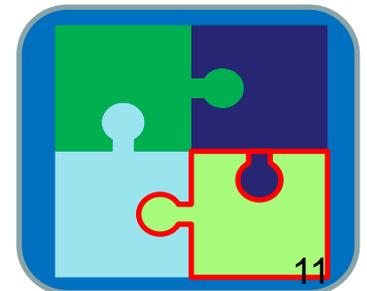
Soil Gas Mitigation Standards for Existing Homes - SGM-SF

Public Comment Due November 16, 2015

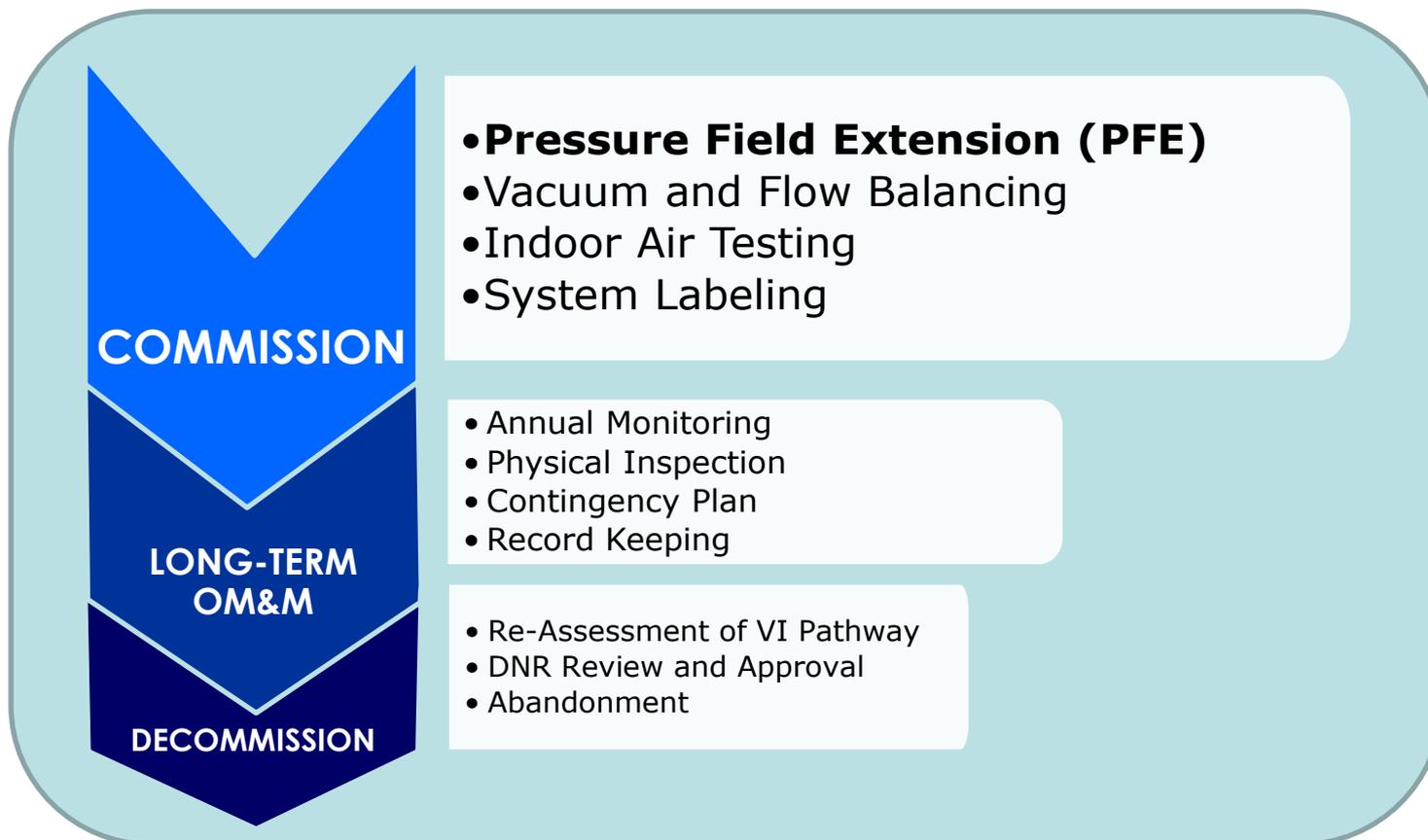
VMS OM&M Lifecycle

- 1. Commissioning:** Verify effectiveness. Establish baseline conditions.
- 2. Long-Term OM&M:** Confirm functioning within tolerable range of baseline conditions. Provide contingency plan.
- 3. Decommissioning:** Demonstrate VMS no longer needed.

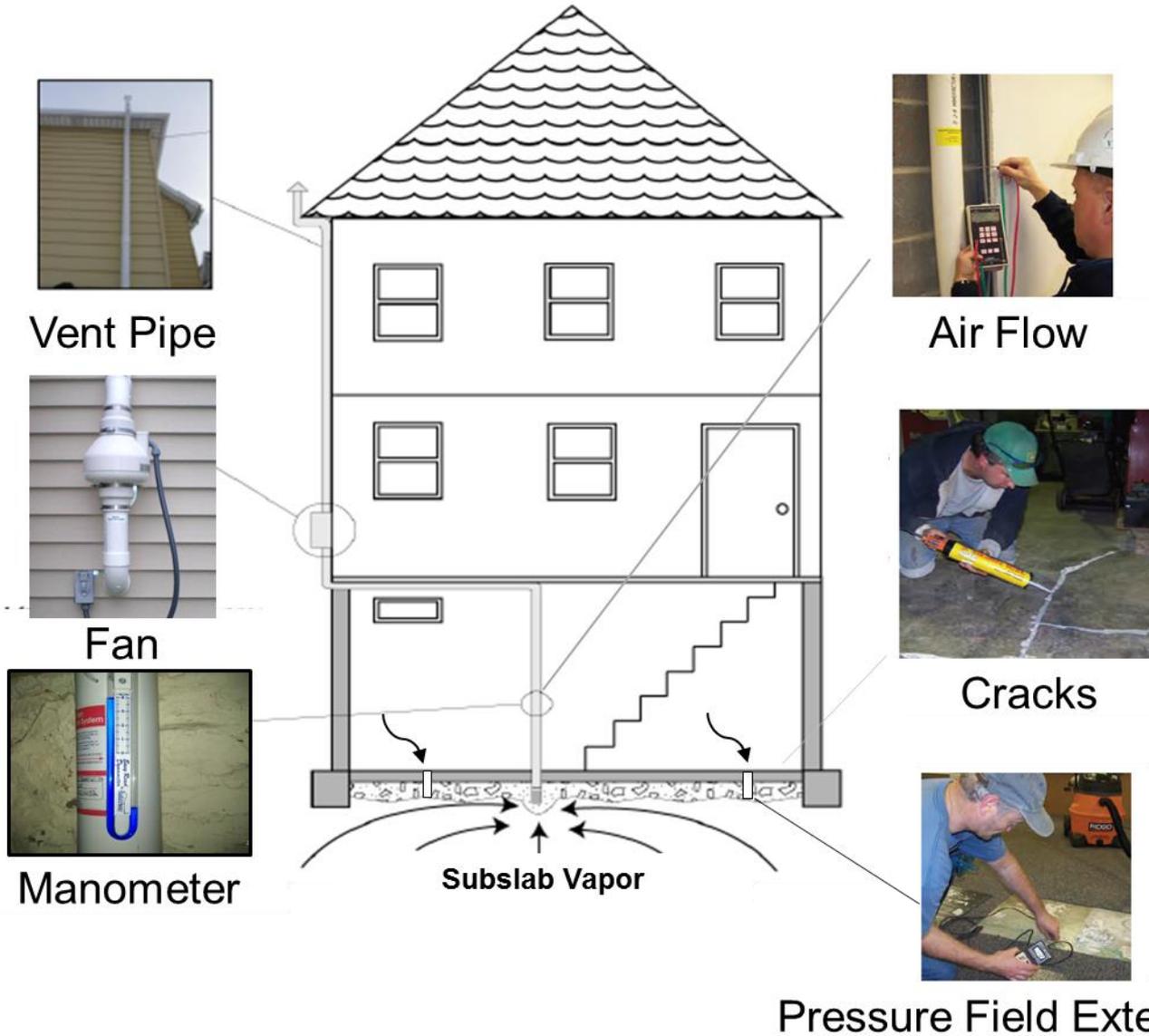
VMS = Vapor Mitigation System



VMS OM&M Lifecycle: Example



Example: Residential Active Subslab Depressurization



Example: Commissioning Residential Active Subslab Depressurization

PARAMETER	LOCATION	FREQUENCY	EQUIPMENT
Pressure Field Extension (PFE)	Multiple	<ul style="list-style-type: none"> At least 3 times in first year of operation. At least twice during Conservative Conditions 	Micromanometer
Vacuum	Blower/Fan		Manometer
Flow Rate	Blower/Fan		Pitot Tube
Indoor Air	Lowest Level		Summa Canister
Parts	Vent Pipe Concrete Floor	<ul style="list-style-type: none"> At Start Up 	Visual
Backdrafting	Combustion Appliances	<ul style="list-style-type: none"> Conservative Conditions 	CO Meter



Conservative Conditions

Cause building to be a “sink” & increase the likelihood for vapor intrusion.

PARAMETER	MOST CONSERVATIVE	LEAST CONSERVATIVE
Season	Winter / Early Spring	Summer
Temperature	Indoors 10°F > Outdoors	Indoor Temp < Outdoors
Wind	Steady, greater than 5 mph	Calm
Weather	Strong - Low Pressure	Fair - High Pressure
Ground/Soil	Frozen / Saturated	Dry
Doors/Windows	Closed	Open
Mechincal Heating System	On	Off
Exhaust Fans/Vents	On	Off



Example: Long-Term OM&M

Residential Active Subslab Depressurization

PARAMETER	LOCATION	FREQUENCY	EQUIPMENT
Pressure Field Extension (PFE)	Multiple	Annually to Biannually During Conservative Conditions	Micromanometer
Vacuum	Blower/Fan		Manometer
Flow Rate	Blower/Fan		Pitot Tube
Parts	Vent Pipe Concrete Floor		Visual

CONTINGENCY PLAN

- Repair if vacuum or flow out of range, or if motor fails on fan.
- Re-commission following repair or remodel affecting the building envelope. 16



Example: Decommissioning Residential Active Subslab Depressurization

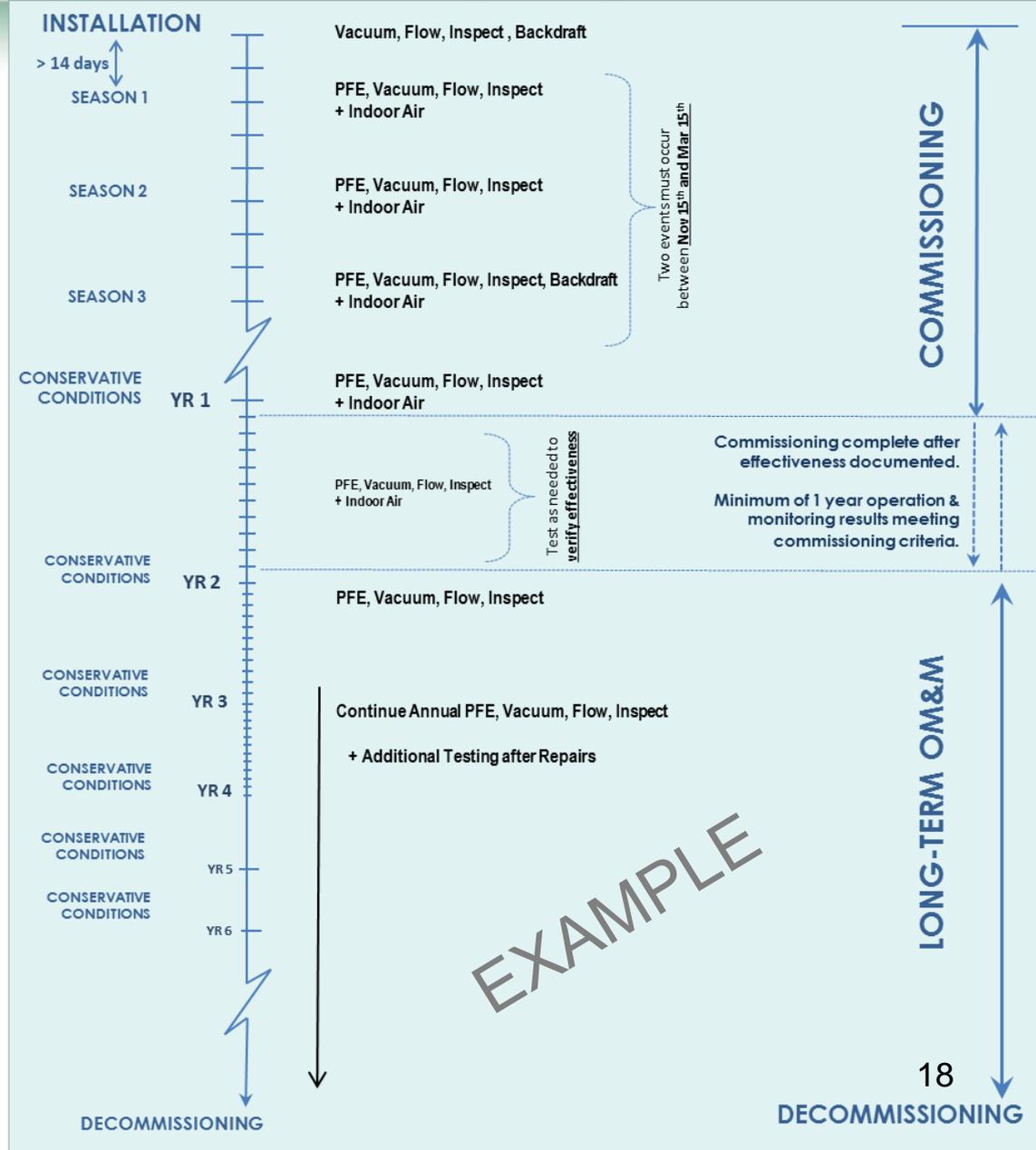
DECOMMISSIONING PLAN

1. Re-assess VI pathway
 - Turn system off for 30 days
 - Collect indoor air and subslab vapor samples
 - Restart system after sampling
 - Repeat (conservative conditions)
2. Submit Post-Closure Modification to DNR with fees
3. Turn system off following DNR approval

Example: OM&M Program

CONSERVATIVE CONDITIONS

- Most likely from Nov 15 – Mar 15
- Long-term OM&M must occur under conservative conditions
- The Yr 1 event may occur more than one year after installation to satisfy this requirement



Other VMS OM&M Plans



Key Objectives

- ✓ Meet NR 724.13
- ✓ Show Advection & Diffusion of Subslab Vapor Prevented
- ✓ Show Indoor Air* < VAL
- ✓ Contingency Plan

* Indoor Air not applicable to all sites

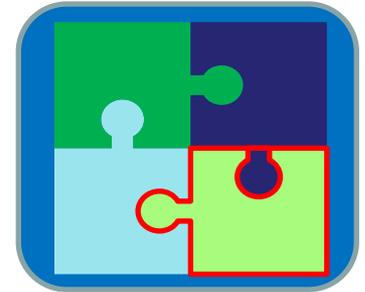


Links to OM&M Guidance

- Naval Facilities VI Mitigation Fact Sheets (2011)
http://www.navfac.navy.mil/navfac_worldwide/specialty_centers/exwc/products_and_services/ev/erb/vi.html
- EPA Engineering Issue (2008)
Indoor Air Vapor Intrusion Mitigation Approaches; EPA 600r08115
<http://www.clu-in.org/download/char/600r08115.pdf>
- MN Pollution Control Agency (2015)
Diagnostic testing, installation and confirmation sampling for active vapor mitigation systems in single-family residential buildings
<http://www.pca.state.mn.us/index.php/view-document.html?gid=22333>
- IN Mitigation Guidance (2014)
http://www.in.gov/idem/landquality/files/remediation_tech_guidance_vapor_mitigation.pdf
- NJ Guidance (2013)
http://www.nj.gov/dep/srp/guidance/vaporintrusion/vig_main.pdf

Conclusions

1. OM&M Critical Piece
in Addressing VI



2. Meet NR 724.13 Requirements



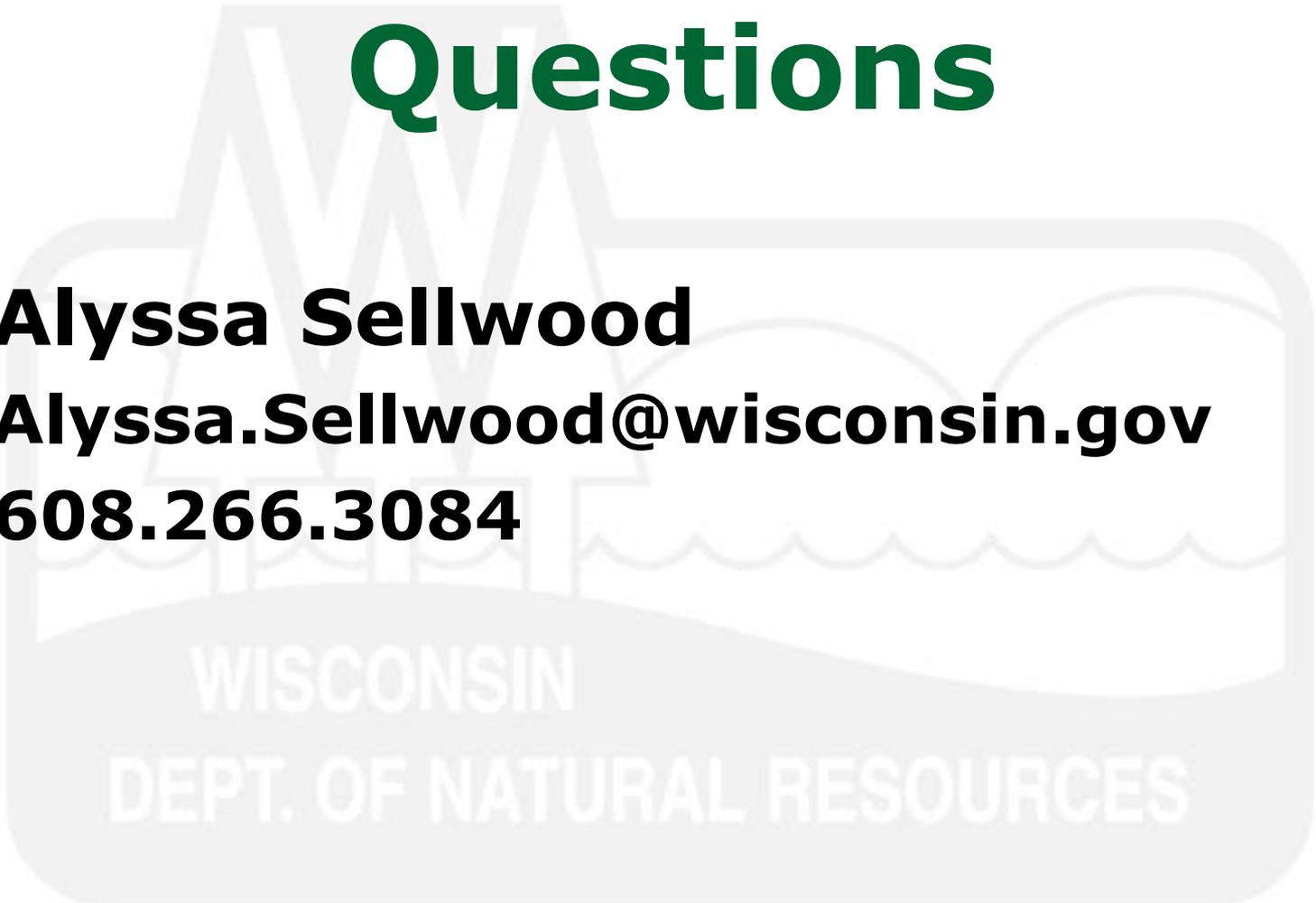


Questions

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WISCONSIN
DEPT. OF NATURAL RESOURCES



Issues & Trends 2015

**November 18, 2015
12:00 – 1:00 p.m.**

LNAPL Evaluation

**David Swimm
Wisconsin DNR Hydrogeologist**

Audio from today's presentation and information about this and future *Issues & Trends Series* can be found on the RR Program Training Webpage at:
dnr.wi.gov/topic/Brownfields/Training.html

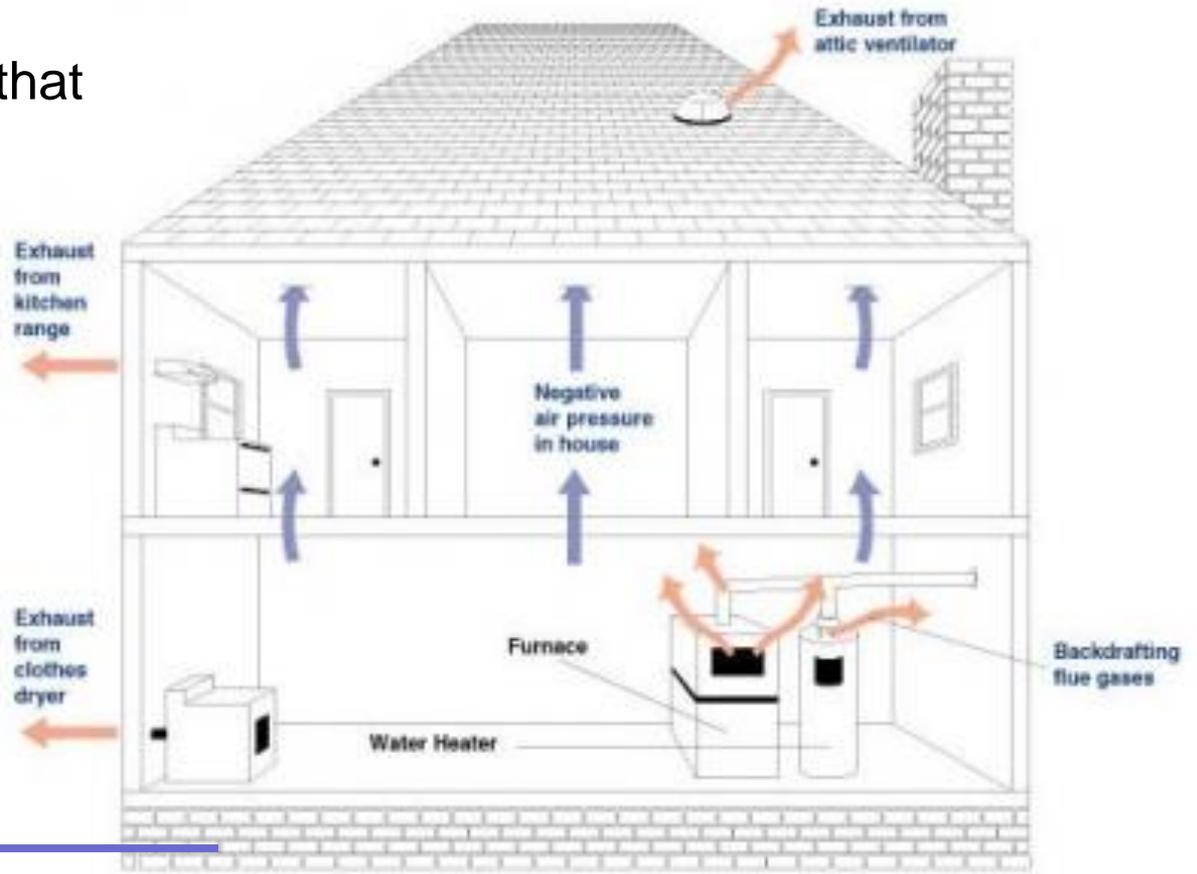
Questions / Comments / Suggestions regarding the
Issues & Trends Series can be submitted to:

DNRRRComments@wisconsin.gov

Thank you

Appendix: Backdrafting

Improper venting of combustion appliances that may create a carbon monoxide risk.



Subslab depressurization systems may compete with proper venting of combustion appliances

How to Check?

CO Meter or Smoke Test