

## 1 Remediation

OAC 3745-300-11

Certified Professional  
8-Hour Training

## 2 Overview

- VAP remediation requirements
- Complete pathways to off-property receptors
- Types of remedies
- Documentation of remedies
- Changes to remedies
- Technical guidance documents

## 3 Background

- Phase II = identify COCs
- Applicable risk goals
  - Excess cancer =  $1 \times 10^{-5}$
  - Excess non-cancer = 1
- Decision for remedy if risk goals are exceeded

## 4 Conducted when COCs do not comply with:

- Generic standards (Rule 08)
- PSRA standards (Rule 09)
- Background levels (Rule 07)
- Any other applicable VAP standard

## 5 Pathway omission

- The statute specifies that the CNS covers all releases, including those that have left the property
- Volunteer must demonstrate diligent efforts to implement remedy to off-property receptor
- If unable, pathway can be omitted

## 6 Pathway omission process

- Determine off-property receptors
- Determine potential pathways
- Provide each property owner written notice of potential pathways and potential associated risks

## 7 Pathway omission process

- Explain to owner activities that may be employed as part of the investigation
- Offer to pay all costs
- Document all discussions/correspondence with owners where they refused the remedy
- Document any other reason that prevented installation of remedy

## 8 Requesting the pathway omission

- Must be done before NFA letter is issued
- Must document all the steps outlined in the process
- Must incur the costs of the agency review
- The agency will generally approve a request within ninety days after receipt

- 9  **Interim Measures**
- Property not meeting applicable standards prior to issuing an NFA letter
  - Conducted prior to remedy achieving applicable standards
  - Must be protective of human health and environment
- 10  **Types of remediation**
- Active remediation
  - Passive remediation
  - Institutional controls
  - Engineering controls
- 11  **Active Remediation**
- Reduces mass, toxicity, or mobility of COC
  - Most common is soil removal
- 12  **Passive Remediation**
- Remedial activities relied upon as in situ natural methods and documented in peer-reviewed scientific literature, which reduce the mass, toxicity, mobility or concentration of a chemical of concern over distance and time through natural attenuation processes
- 13  **Natural attenuation processes**
- Adsorption
  - Absorption
  - Advection
  - Dispersion
  - Diffusion
  - Dilution from recharge
  - Volatilization
- 14  **Other types of natural attenuation**
- Aerobic biodegradation
  - Anaerobic biodegradation
  - Chemical oxidation processes
  - Hydrolysis and other reactions
- 15  **Monitored natural attenuation**
- Natural attenuation conclusion must be supported
  - Standards met during a certain time frame
- 16  **Institutional Controls**
- Established by recording deed restriction
  - Transferable
  - Eliminates or mitigates exposure to hazardous substances or petroleum
  - Monitored, maintained, and enforced
- 17  **Engineering Controls**
- Relies on its ability to block a complete exposure pathway
  - Must be reliable for the climatic conditions and activities at the property to which the control will be applied
  - Monitored and maintained per operation and maintenance plan
- 18  **Examples of Engineering Controls**

- Pavements acting as barrier caps
- Soil caps to eliminate direct contact to chemicals or prevent groundwater contamination
- Foundations and building floor slabs
- Sub-slab vapor diversion systems

19  **Risk Mitigation Measures and Risk Mitigation Plans**

- Contained in risk mitigation plan
- Implemented as
  - Condition of covenant, or
  - Within O&M plan
- Must have periodic reporting

20  **Risk Mitigation Measures**

- Needed when there is potential exposure to construction workers before or after issuance of NFA
- Apply if POC is breached
- Safety precautions to mitigate or eliminate human exposure

21  **Risk Mitigation Measures**

- Documented in risk mitigation plan if measures are necessary for the property to meet applicable standards after issuance of the no further action letter

22  **Documentation of remedial activities**

- Environmental covenant
- Risk mitigation plan
- Operation and Maintenance Plan

23  **Environmental Covenant**

- Required for “environmental response projects” with institutional controls
- Applies to properties with NFA letters that request a CNS
- Institutional controls = Activity and Use Limitations (AULs)

24  **Environmental Covenant**

<http://epa.ohio.gov/derr/volunt/volunt.aspx>

25  **Environmental Covenant**

- CP must submit draft with NFA Letter
- Should discuss language with VAP prior to issuance of NFA
- CP should discuss implications of AULs with Volunteer
- Recordation of environmental covenant within 30 days of CNS issuance

26  **Risk Mitigation Plan**

- Required if the risk mitigation measures are necessary for the property to meet applicable standards after issuance of the NFA letter

27  **Risk Mitigation Plan Contents**

- Purpose of the plan, including summary of potential health risks
- Specific precautions against exposure
- Directions on how to handle environmental media
- Locations on property where plan will be implemented

28  **Risk Mitigation Plan Contents**

- Provisions for when the plan will be implemented
- Provisions for notifying construction workers
- Summary explanation of precautions
- Annual notification provisions
- Criteria for termination

29  **Operation and Maintenance Plan**

- Required when:
  - Engineering control is employed
  - Any remedial activity not completed prior to NFA issuance

30  **Operation and Maintenance Plan Contents**

- Summary of applicable standards
- Plan for implementation
- Plan for evaluating effectiveness
- Description of equipment
- Plan for adjustments

31  **Operation and Maintenance Plan Contents (cont.)**

- Address potential problems
- Placeholder for keeping records
- Plan for termination of remedial activities

32  **Operation and Maintenance Plan Reporting**

- At least annually
- Demonstrate efficacy of remedy
- Report on contingency measures
- Confirm remedy is still in place

33  **Operation and Maintenance Agreement**

- Generic template available through VAP
- O&M plan and agreement must be submitted with NFA Letter
- O&M agreement negotiated after submittal

34  **Changes to the remedy post-CNS**

- Volunteer may choose to change the remedy
- Collect data necessary to support new remedy
- Maintain existing remedy until the new remedy is implemented

35  **Remedy revision notice**

- Description of remedial activities
- Statement from CP that property meets applicable standards
- List of information used to justify new remedy
- Description of new remedy
- New environmental covenant or O&M plan, as applicable

36  **Remedy revision acknowledgment**

- Agency does not review remedy
- Property can be considered for compliance audit
- TA account must be opened if O&M plan, agreement or environmental covenant changes

- 37  **Remedy revision approval**
- Volunteer opens a TA account for the cost of agency review and approval letter
  - No compliance audit expectations
- 38  **Technical decisions relating to remedies**
- [http://epa.ohio.gov/portals/30/vap/tgc/TGC\\_Index.pdf](http://epa.ohio.gov/portals/30/vap/tgc/TGC_Index.pdf)
  - Archived decisions available for informational purposes only
  - Four relate to remedies
- 39  **Passive remedy for potential future exposure scenarios**
- Passive remedy can be implemented to protect on and off-property receptors
  - Requires O&M plan
  - CP must demonstrate that the remedy is appropriate for site
- 40  **Injection wells**
- Formal injection permit may not be necessary if fluids do not exceed standards
  - CP must apply and receive 5X26 exemption for remedial projects
  - More information found at: <http://epa.ohio.gov/ddagw/UIC.aspx>
- 41  **Hazardous Waste Reporting Requirements**
- Comply with annual reporting requirements found in 3745-52-41 if Volunteer:
    - Generates 1000 kg hazardous waste/month (or subject to 3745-52-34) and,
    - Ships hazardous waste off-site
- 42  **Hazardous Waste Reporting Requirements**
- Further information:
- <http://epa.ohio.gov/dmwm/Home/HWAnnualReportProgram.aspx>
  - Division of Materials and Waste Management – (614) 644-2917
- 43  **Fence as a Remedy**
- Q: Fence = engineering or institutional control?
  - A: Fence = engineering control
- 44  **Fence as a Remedy**
- CNS is void if fence is damaged or compromised and is part of AUL
  - Opportunity to cure if fence is damaged or compromised and is part of engineering control
- 45  **Fence as a Remedy**
- Numerous scenarios for fence to be compromised
  - Fence within engineering control allows volunteer to inspect and repair; avoiding CNS avoidance
- 46  **Remedy Top Mistakes List**
- ❖ No remedy implemented in absence of O&M plan
  - ❖ No O&M for engineering control
  - ❖ Slab or foundation omitted as engineering control
- 47  **Remedy Top Mistakes List**
- ❖ Construction worker risk not mitigated
  - ❖ No Risk Management Plan included
  - ❖ Effectiveness of remedy not documented
- 48  **Remedy Top Mistakes List**

- ❖ Disposal media not properly characterized
- ❖ Remedy implementation not documented

49  **Remedy Top Mistakes List**

- ❖ Deed restrictions not recorded
- ❖ Insufficient sampling data
- ❖ Financial assurance mechanism not included in O&M agreement

50  **Remedy Top Mistakes List**

- ❖ Failure to implement applicable response requirements
- ❖ USD not verified properly