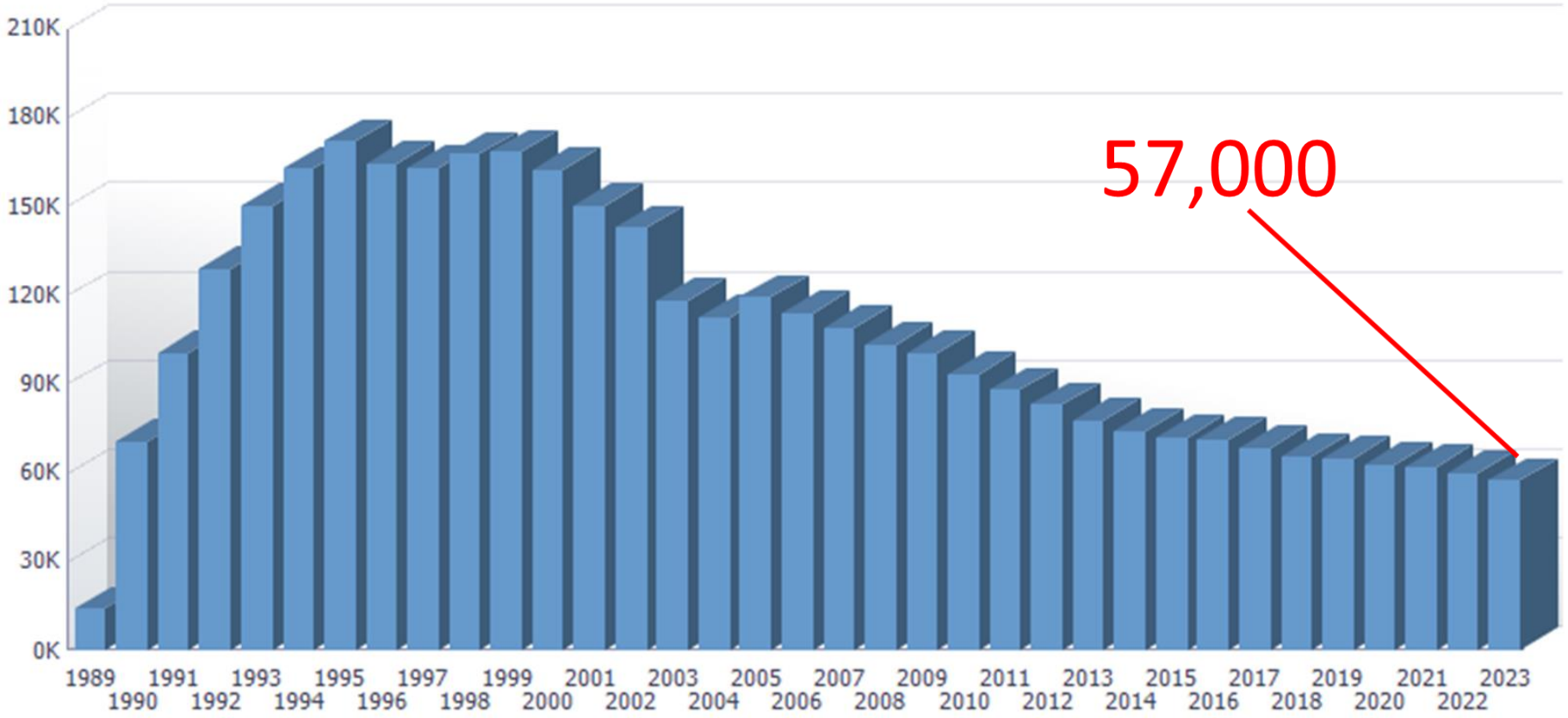
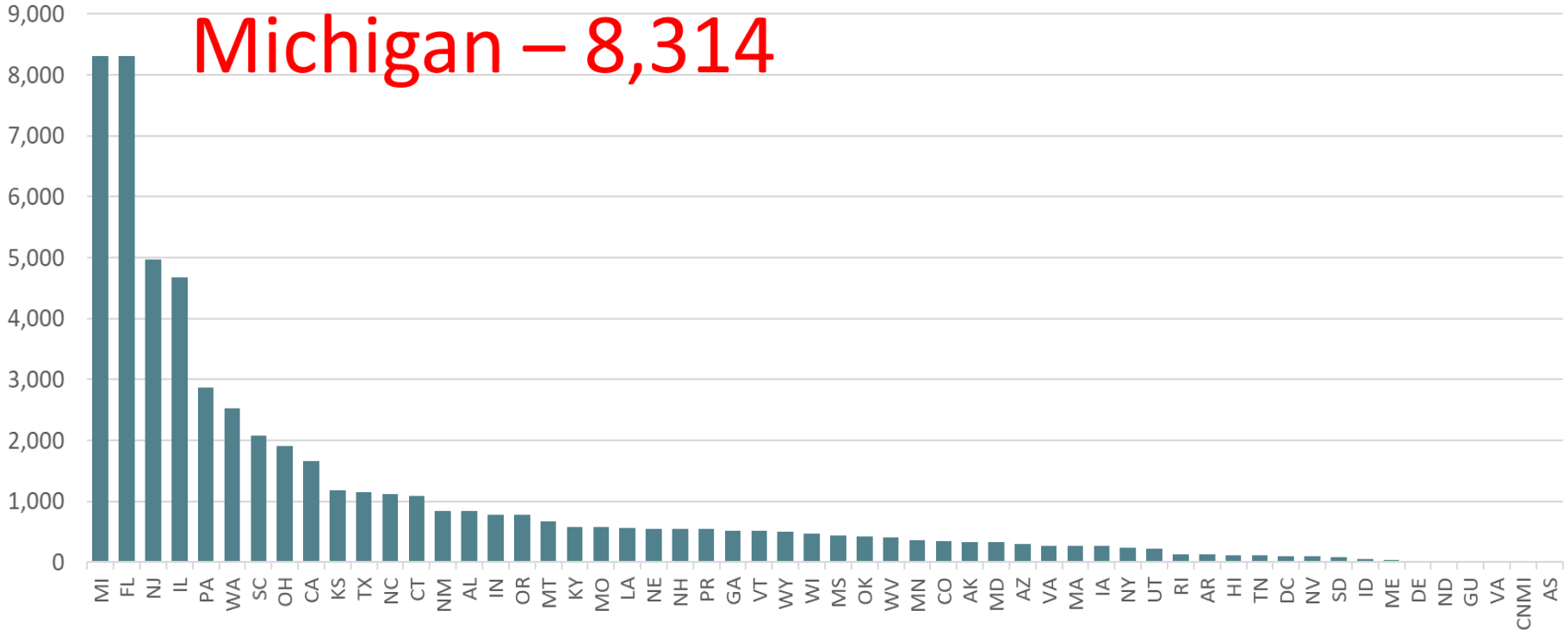
Addressing a Petroleum Release in Michigan

Matt Williams, Volatilization to Indoor Air Specialist
Nick Swiger, Technical Support Unit Manager
Steve Beukema, Part 213 Program Specialist

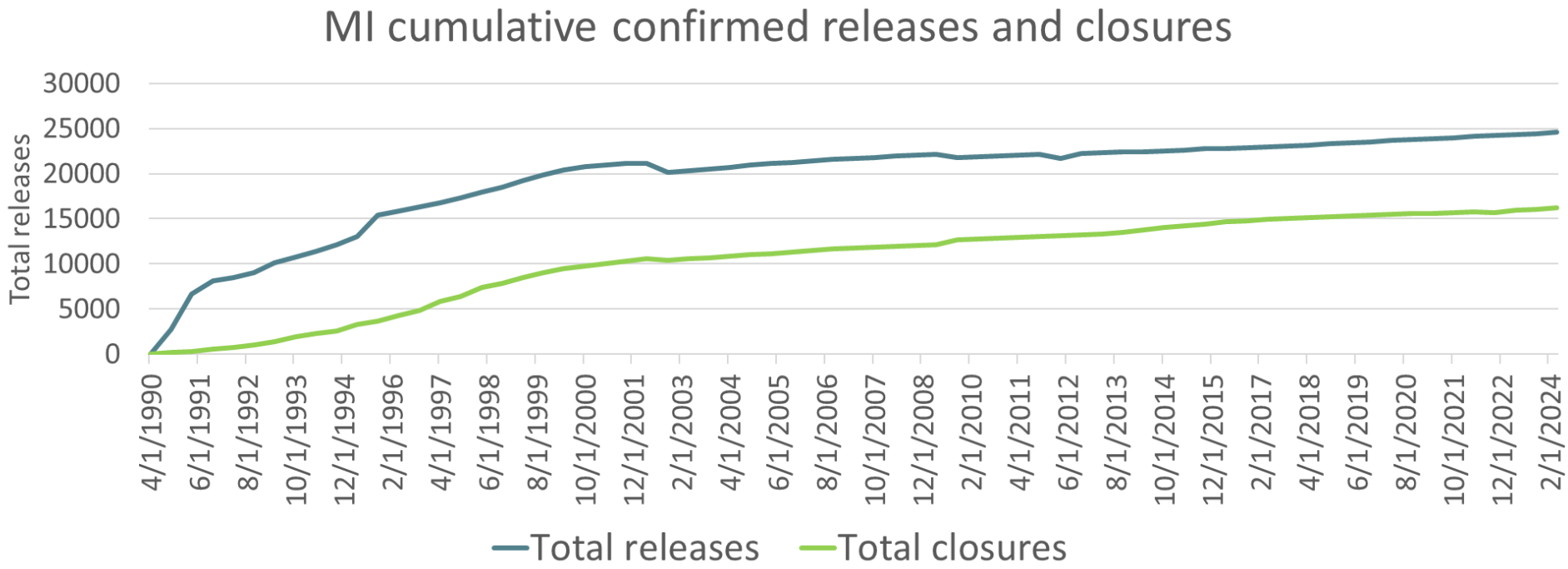
National LUST Backlog



National LUST Backlog



Michigan's LUST Backlog



Updating Policies and Guidance

Guidance updated based on:

- The most recent science
- Site data
- Protective of public health and environment
- Practical to implement

Developing RBCA guidance

- Current draft PVI written from 201 perspective

2024 VIAP Guidance Update

- Web based application
  - Allows for direct access to the information
  - Pulls out duplicate information and links appropriate document
  - PDF will still be available

- Developed to promote consistent and informed approach

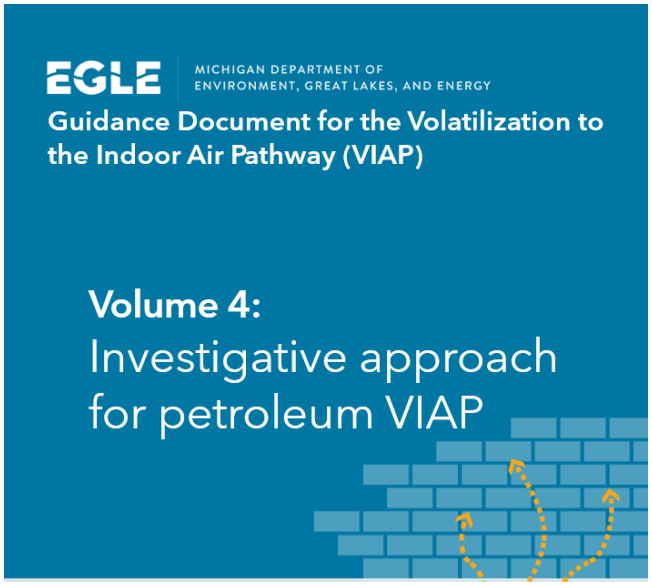
- Currently there are several volumes being drafted

2024 VIAP Guidance Update

Volume 1	Volatilization to the Indoor Air Pathway (VIAP) Overview
Volume 2	Investigation Methods for the VIAP
Volume 3	Investigation Approach for VIAP
Volume 4	Investigative Approach for Petroleum VIAP
Volume 5	Response Activity
Volume 6	Volatilization to Indoor Air Criteria
Volume 7	Updates

Volume 4
Investigative Approach for Petroleum VIAP

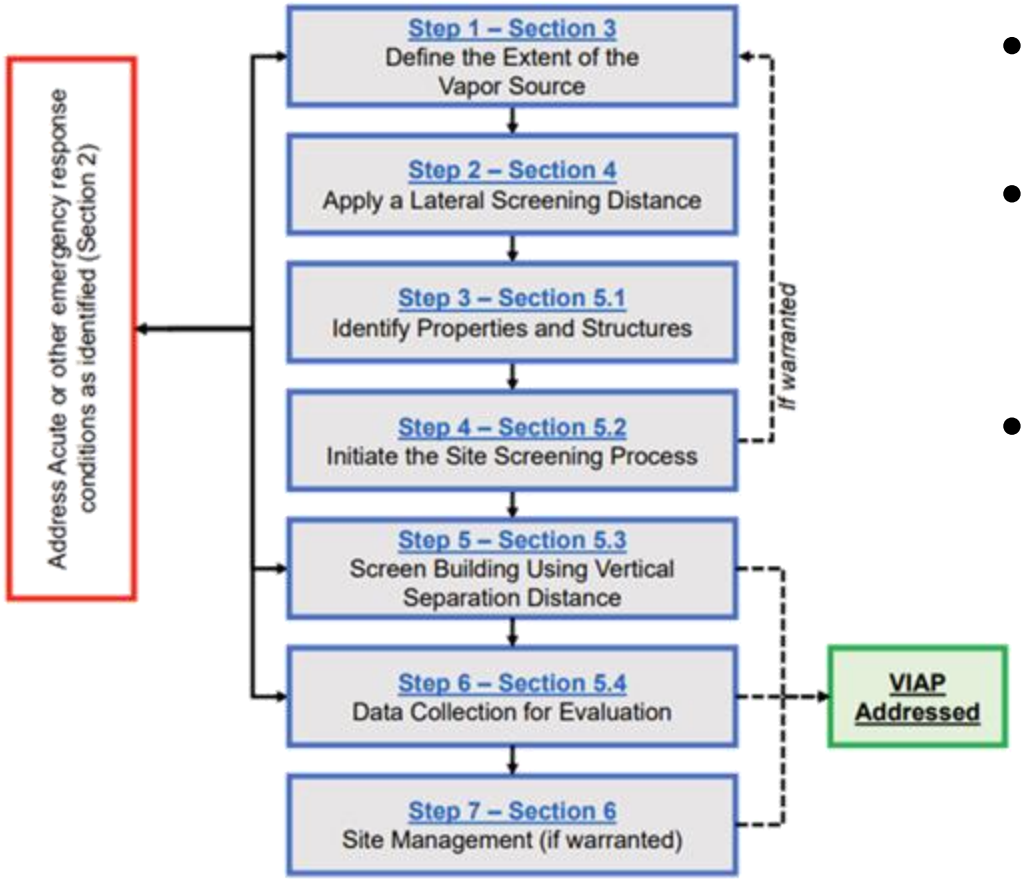
- External review April 22 – May 10
  - 200 comments
  - Mostly for clarification
- Final will be released mid June



"The guidance is a nice piece of work and should greatly improve VI risk assessment at petroleum UST sites"

Volume 4

Investigative Approach for Petroleum VIAP



- "BLUF"
- Identifies a step-wise approach
- Links NAPL and other key information
  - Rules and Statute
  - Recommended Criteria

PVI Focus

Unacceptable risks are typically associated with:

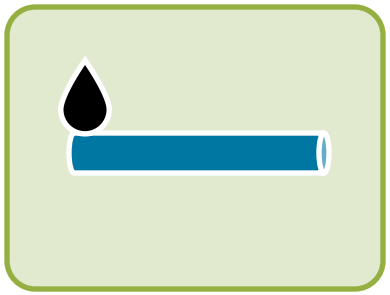
1. Non-aqueous phase liquid (NAPL) is near or entering structure
2. NAPL has entered a utility that is connected to a structure or
3. Contaminated groundwater is entering a structure

Attachment C

Data Collection and Evaluation for Petroleum Sites

Structure over a Vapor Source, in contact and not in contact (Section C.1.0)

Structure adjacent to a Vapor Source (Section C.1.2)



Conduit in Contact with mobile NAPL (Section C.2.3)

Structures are Not Currently Present (Section C.2.4)

Attachment C

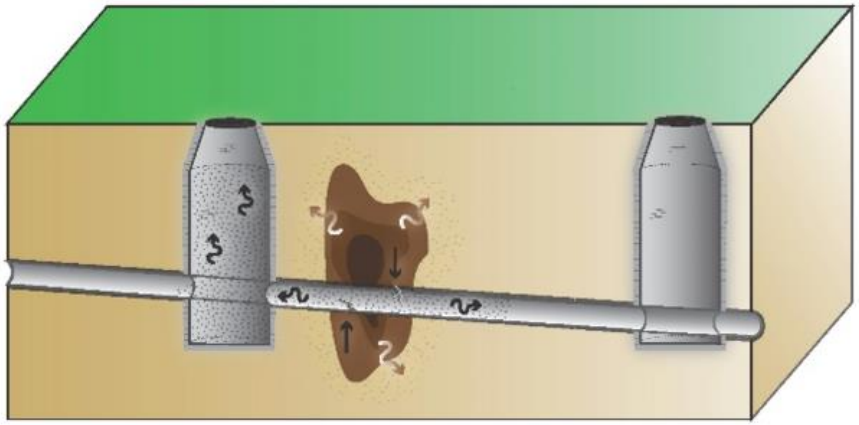
Data Collection and Evaluation for Petroleum Sites

- Types of soil gas samples
  - Advantages and disadvantages
- Number of sampling locations and events

Potential Vapor Source and Distance to Receptor	Soil Gas Sample Results	Minimum Number of Rounds
NAPL ≤5-feet	< VIAC	4
NAPL 5 – 10-feet	< VIAC	3
NAPL 10 – 15-feet	< VIAC	2
Dissolved Groundwater Source	< VIAC	1

Building Size	Sample Density	Minimum Number of Sampling Locations
Less than 1,000-ft^2	Not Applicable	2
1,000-feet – 10,000-ft^2	3 + one additional sample per 1,500 ft^2 of building over 1,000 ft^2	3
Greater than 10,000-ft^2	9 + one additional sample per 2,500 ft^2 of building over 10,000 ft^2	9

Conduit Vapor Intrusion for Petroleum



- Not all utilities have the potential
- Associated with mobile NAPL
  - Not migrating vapors into a utility
- Conceptual Site Models are key

Known or Suspected	Sampling Frequency	Response Action
Not in Contact	None	Not applicable
In contact and determined to not be entering	None	Response Actions may be needed to ensure vapor source will not enter in the future.
Suspected but unconfirmed	• Quarterly for 1 year – mobile NAPL • One Sampling Event – contaminated groundwater	Any detection above the SSVIAC moves the utility into the known vapor source entering into an underground conduit
Known – Occurring This occurs through response action to prevent the entry of the vapor source into the conduit	Progress sampling weekly until the vapor source is controlled. Structures connected to the utility should be evaluated for the entry of vapors and explosive conditions.	Implement immediate response activity
Known – post corrective or response action	Sample monthly for 3 months then quarterly for 3 additional quarters	Any detection above the SSVIAC requires sampling to return to the *Known – Occurring* sampling frequency

Attachment C

Data Collection and Evaluation for Petroleum Sites

- Sampling for Vapor Source entering an Underground Conduit

Attachment D

Site Management for Petroleum

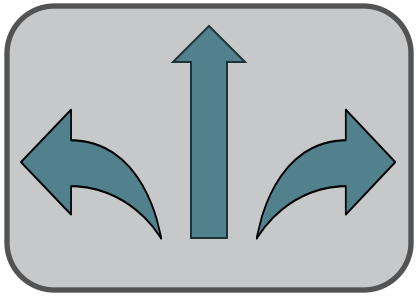
- Approach is geared toward managing and preventing when an unacceptable risk has the highest potential
- General guide for the evaluation of when land or resource use restrictions or controls, or an alternate evaluation, will be necessary
- More detailed information will be provided on specific approaches in Volume 5 – Response Activity

Table D-1: Vapor Source, Depth, and Common Site Management for Closure

Scenario – Assuming Vapor Source Not in Contact	Data Required	Outcome	Actions for Closure of the VIAP for petroleum releases
	Soil gas samples from	Soil gas sampling with the appropriate	ICs required to ensure that land use changes don't result in exposure scenario

EGLE

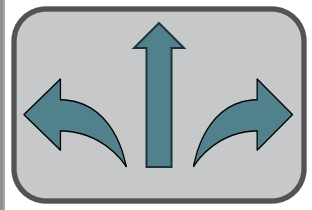
Attachment E
Petroleum Site Conditions and CSMs that May Warrant Site-Specific Evaluations

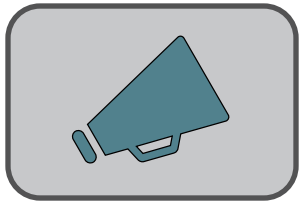


- There are many different alternate approaches that may be utilized for evaluation of VIAP
  - May be more representative and cost effective
- Should be considered if site doesn't screen out using steps outlined in document

Attachment E
Petroleum Site Conditions and CSMs that May Warrant Site-Specific Evaluations

- Alternate approaches are site-specific and are not likely to be implemented statewide, which is why they are not described





- Sometimes a remedial action is required

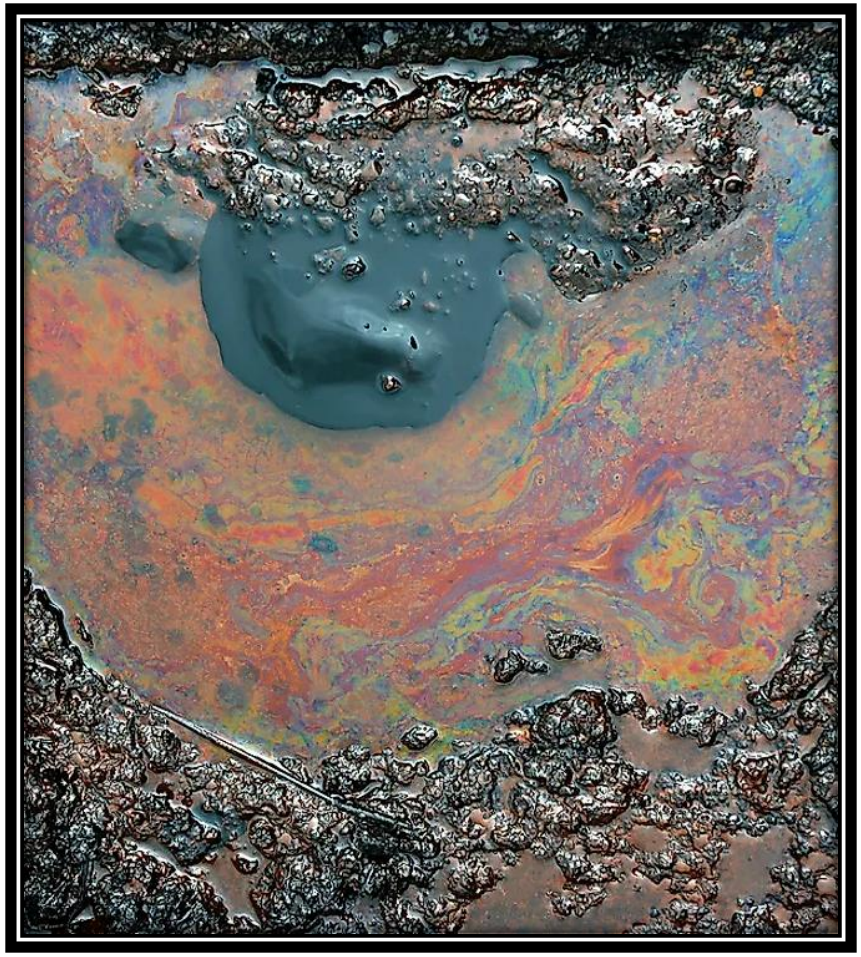
Volume 4 – 4 Quick Takes

- **Step-wise approach to petroleum**
  - There are other approaches that may be appropriate
- **Need to understand the extent of NAPL**
  - NAPL definition includes residual, mobile, and migrating
- **Conduits**
  - Focus on those utilities that can transport vapors and are in contact with mobile NAPL

Read Attachments C, D, and E

NAPL Evaluation

- Increased importance on understanding where NAPL is and is not
- Not just mobile NAPL for VIAP – residual and mobile NAPL can act the same



Multiple Lines of Evidence (MLE)

- A single line of evidence can be utilized to **infer** the **presence** of NAPL.
- 5 lines of evidence are needed to **confirm** NAPL is **absent**.
- Releases > 5 years old AND no continuing sources:
  - 3 lines of evidence are needed to **confirm** NAPL is **absent**.

Example Lines of Evidence

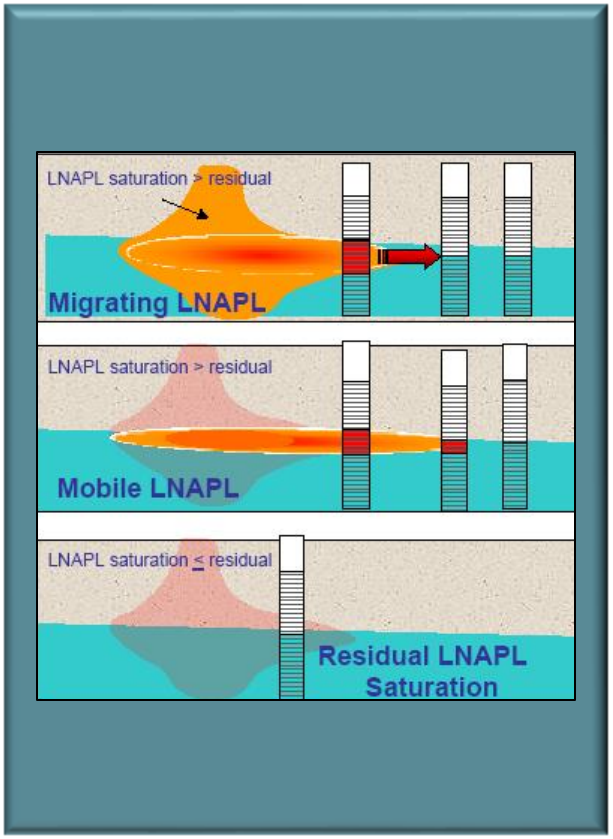
Visual Observations

Photoionization Detector (PID)

Dye Tests

MLE NAPL Evaluation

- Use MLE table to assist in evaluation
- Not necessarily a binary exercise as the MLE table suggests (we need to fix that)
  - use weights and professional judgement!!



MLE Table

Site Name: _____

Facility ID: _____

Address: _____

Release ID: _____

			General		Soil							
Sample Location / Depth	**NAPL Present / Absent**	**Total LOE used**	**Distance from Release Location**	**Current or Historical Presence of NAPL**	**Visual or Observed NAPL**	**UV Fluorescence**	**LIF**	**TPH (mg/Kg)**	**Benzene Concentration (ug/Kg)**	**PID or FID**	**Petrophilic Dye Test**	**Shake Tests**
	If there are more "YES" responses, select Present; if there are more "NO" responses, select Absent	Minimum of 5	Is the location less than 20 feet from the release?	Historic presence of mobile NAPL, visual NAPL (from borings, etc.), and/or sheens and not removed, indicator of NAPL presence remaining	Is NAPL visually detected or other observations like staining and olfactory evidence present?	UV Light screening with fluorescence detected?	LIF conducted and responses generally **greater than 5%RE?**	TPH-GRO, TPH -DRO, **OR** TPH-ORO greater than **250,000 mg/kg?**	Benzene in the soil greater than **10,000 ug/kg?**	Release less than 5 years old and PID or FID greater than **500 ppm?**	Positive Dye Test, including stryofoam bead staining	Shake tests with observable NAPL

Questions?

Matt Williams
williamsm13@michigan.gov
517-881-8641

Nick Swiger
swigern@michigan.gov
231-429-8926

Steve Beukema
beukemas@michigan.gov
269-547-0125

Thank You!

Michigan Department of
Environment, Great Lakes, and Energy

800-662-9278
Michigan.gov/EGLE