



# *Community Update:* Rapid Response to the Norfolk Southern Chemical Spill and Chemical Fires in East Palestine, Ohio

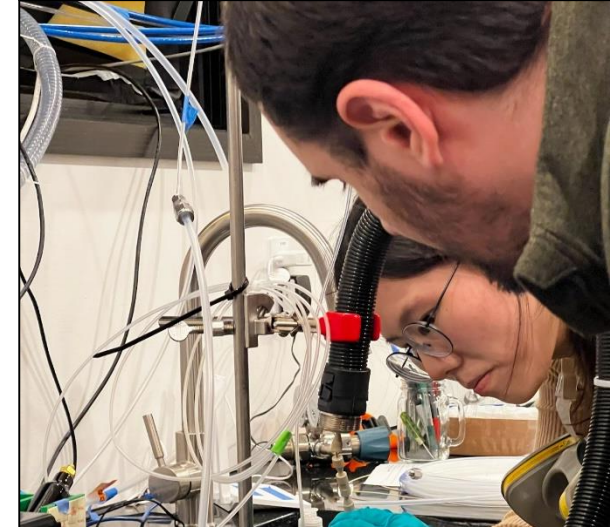
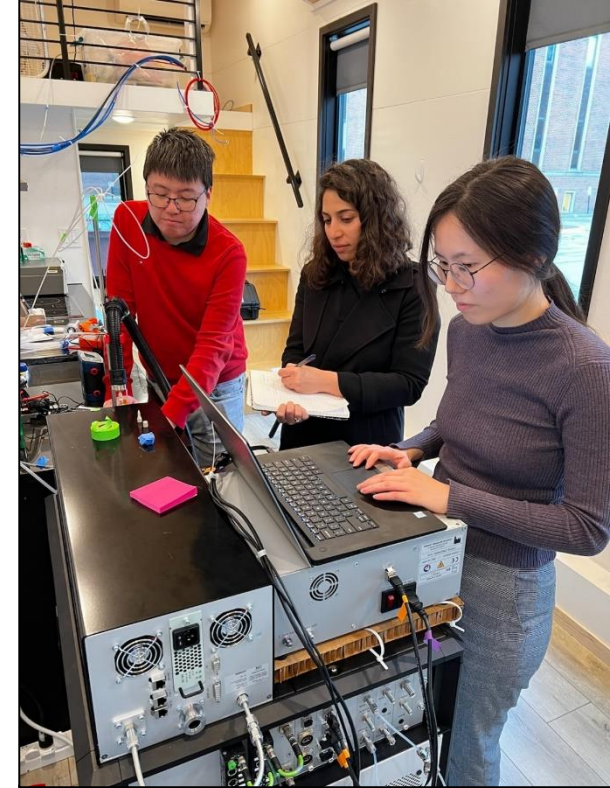
## Preliminary Results

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Aaron Bragg, and many more

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In collaboration  
with





## Rapid public health scientific support in response to disasters

*2014 Chemical Spill (WV)*

*2017 Tubbs Fire (CA)*

*2018 Camp Fire (CA)*

*2020 Oregon Fires (OR)*

*2021 Chemical Spill (HI)*

*2021 Marshall Fire (CO)*

*and others...*

### Key Questions:

1. What chemicals should be looked for?
2. Where did/do the chemicals go?
3. How do you return infrastructure/homes to safe use?
4. What were/are the chemical exposures?

# **A LOT** of people are volunteering their time and resources to provide scientific support to the community



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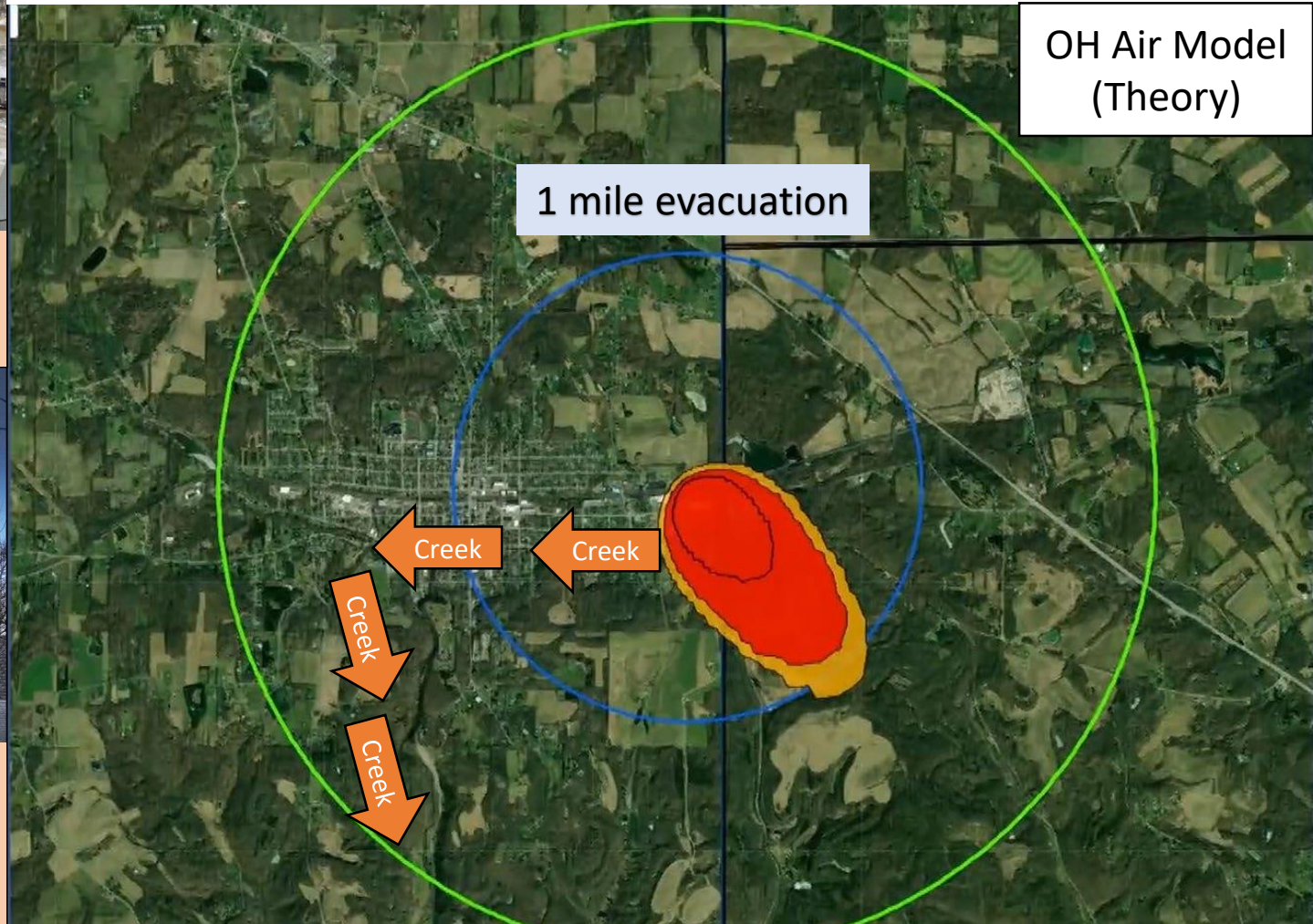


Kyle Doudrick, Ph.D  
Civil & Env. Engineering

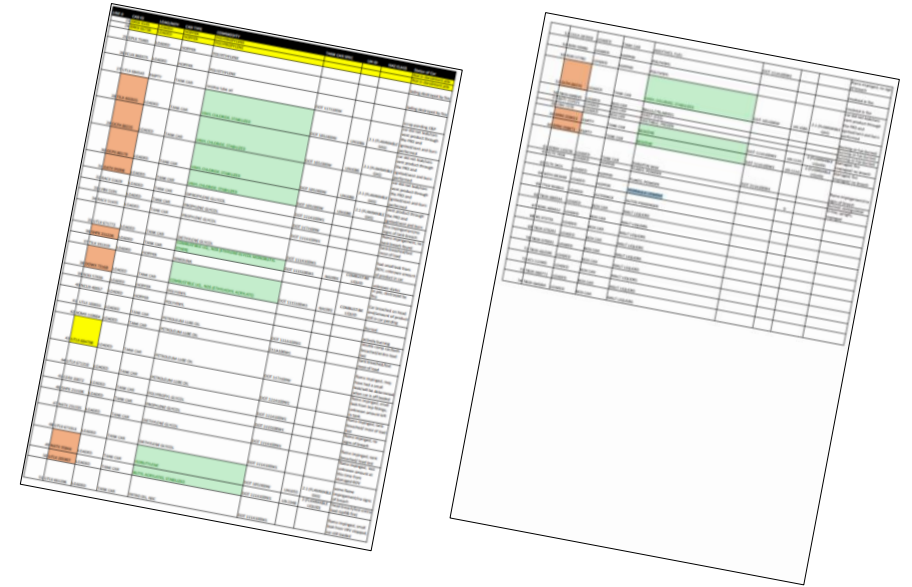
# East Palestine, Ohio Chemical Spill and Chemical Fires



149 rail cars, 38 derailed  
11 derailed were combustible liquids,  
flammable liquids, and flammable gas.



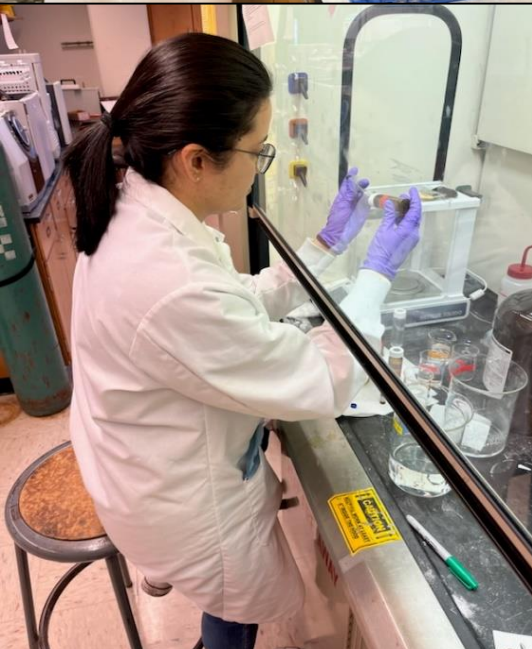
# What was on the train according to the Norfolk Southern document posted by the U.S. EPA ...



Ethylhexyl acrylate  
Vinyl chloride  
Butyl acrylate  
PVC resin  
PE resin  
Frozen vegetables  
Powder flakes  
Paraffin wax

Propyl glycol  
Diethylene glycol  
Petro oil, NEC  
Petroleum lube oil  
Semolina  
Balls  
Fuel additives  
Malt liquors

Benzene  
Residue lube oil  
Isobutylene  
Sheet steel  
Hydraulic cement  
Passenger autos  
Ethylene glycol methyl butyl  
ether [2-butoxyethanol]



## Key Questions:

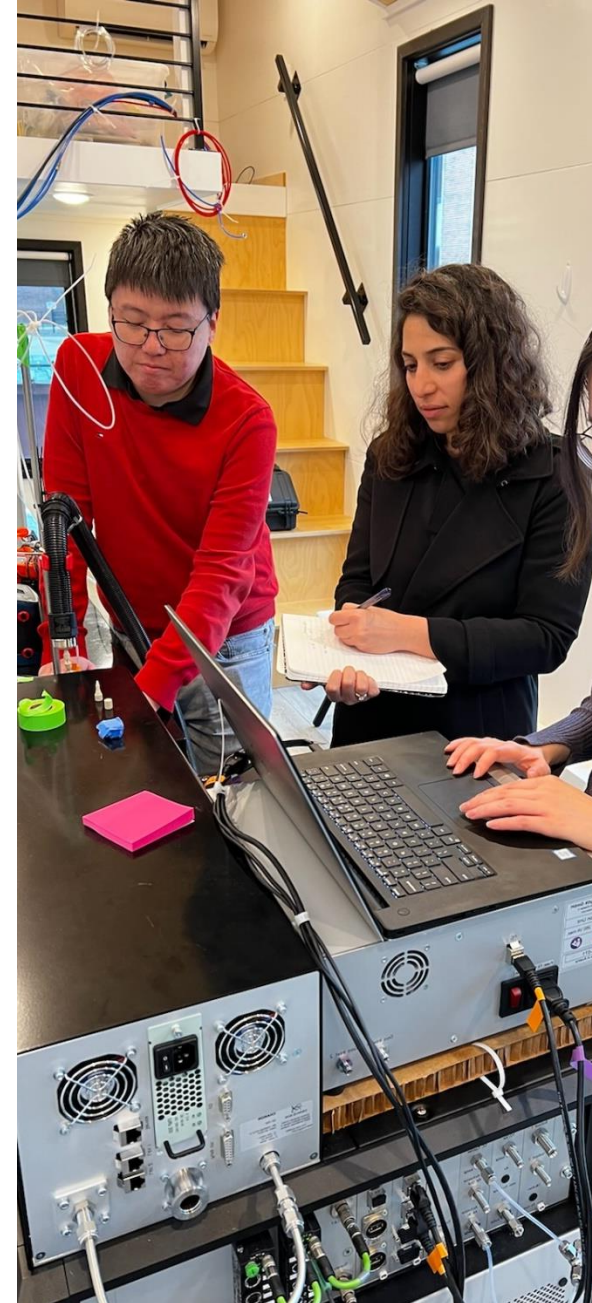
1. What chemicals should be looked for?
2. Where did/do the chemicals go?
3. How do you return infrastructure/homes to safe use?
4. What were/are the chemical exposures?

### Site visits so far

February 25-27      March 3-4  
March 17-19      March 23-25

Creek water sampling (18 locations)  
Creek soil sampling  
Well water sampling (15 wells)  
Outdoor home wipe sampling  
Interviews with homeowners

*Study is approved by the Purdue University Human Research Protection Program, Internal Review Board (IRB)-2023-422*

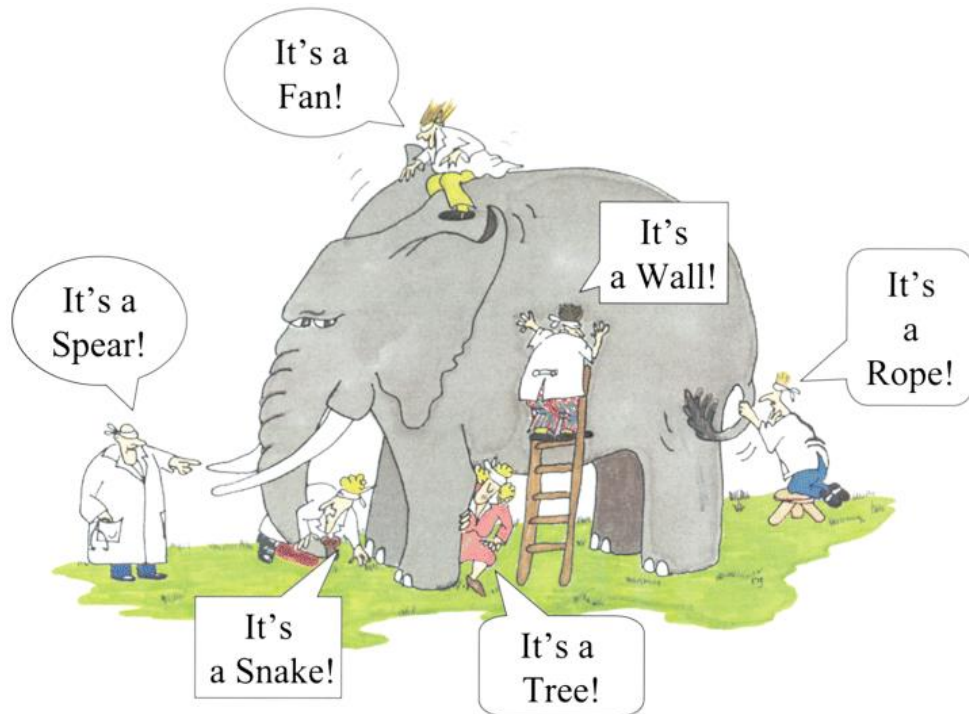


# Our Approach: 3 weeks after the incident, barely any data was publicly available despite “safety” claims

**Critical** scientific decisions right after a chemical spill are

1. What do you test for?
2. Where and how do you test?

Review public agency data  
Household interview  
Home and private well investigation  
Creeks investigation



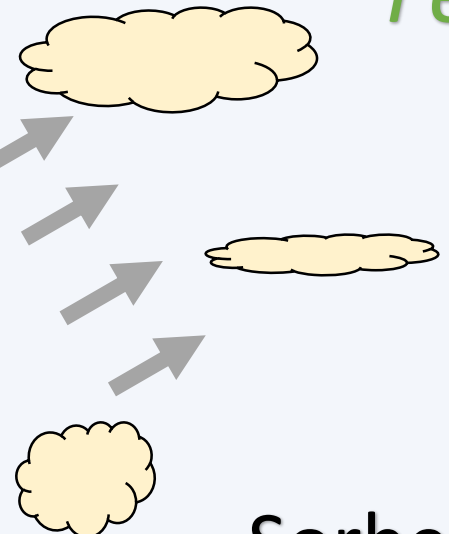
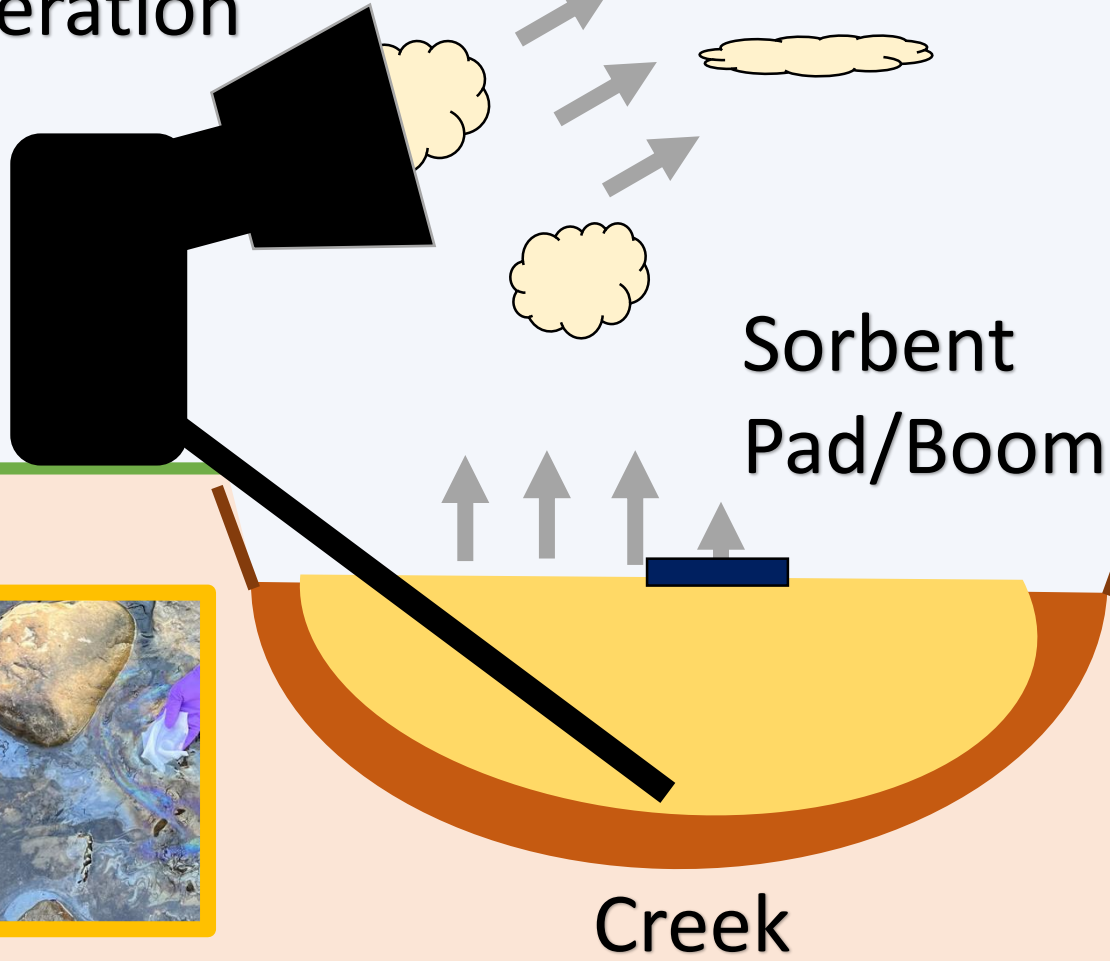
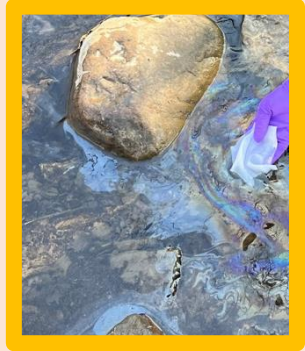
What are we screening for?

- Water pH, temperature
- Volatile organic compounds (VOC)
- Semi-volatile organic compounds (SVOC)
- Per- and polyfluoroalkyl substances (PFAS)
- Total petroleum hydrocarbons (TPH)
- Heavy metals (Iron, lead, zinc, etc.)
- Ions (Sulfur, phosphorous, etc.)

# February Field Observations



Aeration



Sorbent Pad/Boom

Groundwater

Well

Home



# What have we found? Inconsistent testing by government agencies for chemicals of concern

USEPA Outdoor Air	OH Surface Water	OH Municipal Water	OH Private Well Water	
Acrolein	<b>Not tested</b>	<b>Not tested</b>	<b>Not tested</b>	
<b>Not tested</b>	Butyl acrylate	Butyl acrylate	Butyl acrylate (not confirmed)	
<b>Not tested</b>	2-Ethylhexanol	<b>Not tested</b>	<b>Not tested</b>	
<b>Not tested</b>	2-Ethylhexyl acrylate	2-Ethylhexyl acrylate	2-Ethylhexyl acrylate (not confirmed)	
<b>Not tested</b>	2-Butoxyethanol	<b>Not tested</b>	<b>Not tested</b>	
Vinyl chloride	Vinyl chloride	Vinyl chloride	Vinyl chloride	
Benzene	Benzene	Benzene	Benzene	
Xylenes	Xylenes	Xylenes	Xylenes	PA DATA NOT SHOWN
Naphthalene	Naphthalene	Naphthalene	Naphthalene	
1,3-Butadiene	<b>Not tested</b>	1,3-Butadiene	1,3-Butadiene	
1,1,2-Trichloroethane	1,1,2-Trichloroethane	1,1,2-Trichloroethane	1,1,2-Trichloroethane	NS DATA NOT SHOWN
Trichloroethylene	<b>Not tested</b>	Trichloroethylene	<b>Not tested</b>	
Phosgene	<b>Not tested</b>	<b>Not tested</b>	<b>Not tested</b>	
<b>Ethylene glycol (Not tested)</b>	<b>Not tested</b>	<b>Not tested</b>	<b>Not tested</b>	
Purdue Surface Water Detections (Mar 7 Letter to US Senate): <b>Acrolein</b> , <i>n</i> -Butyl ether, Butyl acrylate, 2-Butoxyethanol, 1,3-Butadiene, 2-Ethylhexyl acrylate, <b>Ethylene glycol</b>				

# Preliminary results for creek samples collected in Feb. 26 and 27, 2023

**Legend**

- Spill site
- Sample locations
- Sulphur Run
- Leslie Run

**C4-sheen**

	Purdue (ppb)	Ohio EPA (ppb)
Butyl acrylate	23.9	67
2-Butoxyethanol	520.8	911
2-Ethylhexanol	198.3	-
2-Ethylhexylacrylate	467.6	165

**C5-sheen**

	Purdue (ppb)	Ohio EPA (ppb)
Butyl acrylate	0	3.7
2-Butoxyethanol	0	225
2-Ethylhexanol	0	-
2-Ethylhexylacrylate	27.5	16.4

**C6-sheen**

	Purdue (ppb)	Ohio EPA (ppb)
Butyl acrylate	0	4.8
2-Butoxyethanol	0	228
2-Ethylhexanol	1.74	-
2-Ethylhexylacrylate	41.0	10.7

**C1-sheen**

	Purdue (ppb)	Ohio EPA (ppb)
Butyl acrylate	3.72	1.3
2-Butoxyethanol	10,460	150
2-Ethylhexanol	177.0	-
2-Ethylhexylacrylate	70.2	23.3

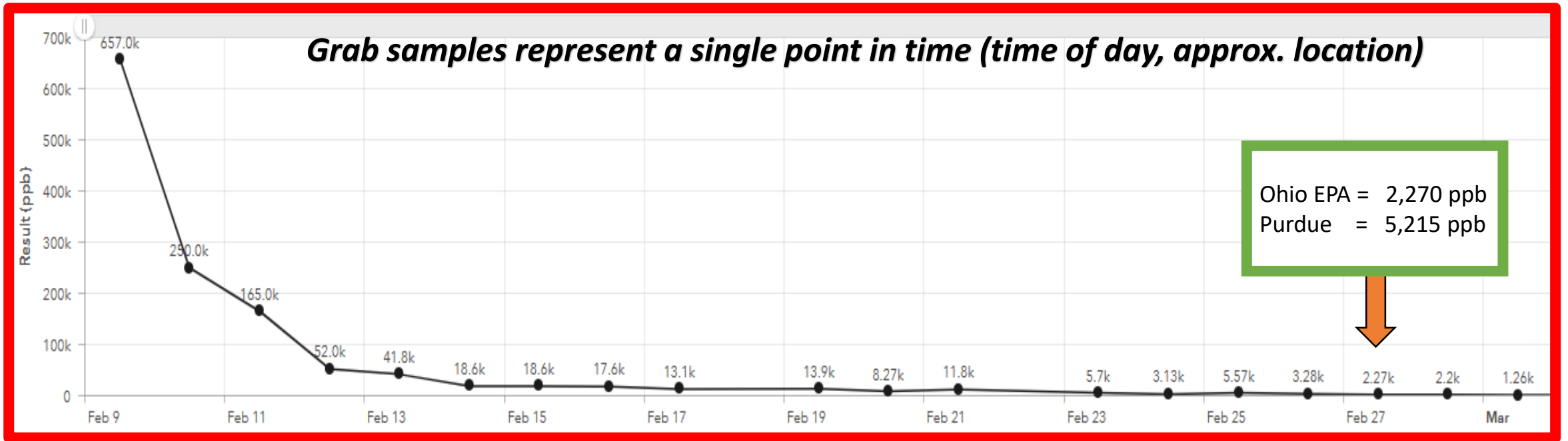
**C2-sheen**

	Purdue (ppb)	Ohio EPA (ppb)
Butyl acrylate	0	20.2
2-Butoxyethanol	5,215	2,270
2-Ethylhexanol	13.7	-
2-Ethylhexylacrylate	60.0	19.6

**C3-sheen**

	Purdue (ppb)	Ohio EPA (ppb)
Butyl acrylate	10.16	136
2-Butoxyethanol	4,455	5,540
2-Ethylhexanol	41.09	-
2-Ethylhexylacrylate	7.86	89.7

Sheen composition unclear



- Data posted by Ohio EPA represents a single point(s) in time.
- Approach for Ohio EPA creek sampling not well described online.
- Time of day, sampling location, rainfall, creek turbulence may influence results.

*Many more results coming from us in the coming days to weeks*

**Files and results available  
at [www.PlumbingSafety.org](http://www.PlumbingSafety.org)**

- ❖ Letter to OSHA with results and asking for worker safety investigation
- ❖ Letter to the U.S. Senate E&PW Committee with results
- ❖ Testimony to the PA Senate VA&EP Committee
- ❖ Letter to the PA Governor with results
- ❖ Letter to the U.S. House of Representatives with results
- ❖ FOIA to the CDC about East Palestine illness incident

*Visit our website to learn more.  
All efforts are currently funded  
by donations.*



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*Volunteer scientific support team*

*Crowdfunding site here:*

*<https://crowdfunding.purdue.edu/project/36991>*