

# **Advances in Characterization: Continuous VOC data**

**MassDEP Waste Site Cleanup  
Advisory Committee**

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**FABER  
COLLEGE**

*"Knowledge is good."*

**MassDEP**

*"Data is good"*

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More Data = Better Characterization

More data is always helpful.....

...sometimes essential



# The New Frontier: Continuous VOC Data

How: automated gas chromatographs

Time per analysis:  $\leq 10$  minutes (typical)

Data points/day:  $6/\text{hr} \times 24 = 144$

Data points/project: do the math

Neat option: view data real-time via internet



# Why?

To characterize air with substantial temporal variability

## Such as?

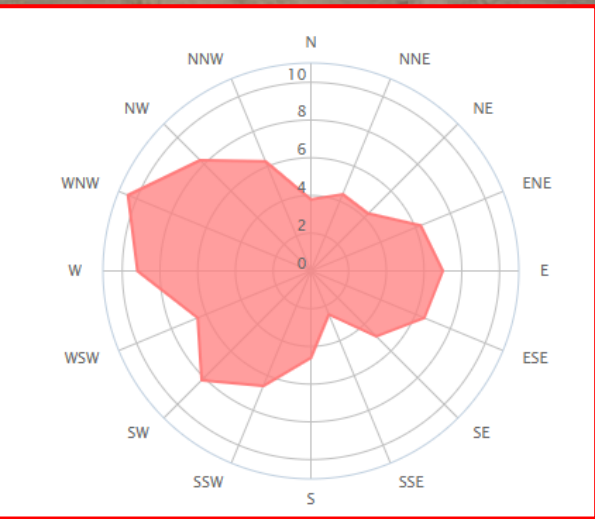
Indoor air (vapor intrusion)

Ambient/indoor air @ construction/remedial projects at highly contaminated sites near homes/school





TCE in soil  
@ 11,000 mg/kg



# Release Abatement Measure – Spring 2018

Take 1: PID monitoring only



Take 2: On-site Gas Chromatograph

(Periodic 1-Liter bag grab samples)



TCE @ fence-line  $> 24 \mu\text{g}/\text{m}^3$  = test school air



TCE in school  $> 24 \mu\text{g}/\text{m}^3$  = Imminent Hazard



# Release Abatement Measure – Spring 2018

Control vapors:

water/foams/poly sheeting



Shut down/button up site

< 40 minutes of exceeding  $24 \mu\text{g}/\text{m}^3$  TCE @ fenceline



# Release Abatement Measure – Spring 2018

**April 9<sup>th</sup>**

Excavation begins

**April 18<sup>th</sup>**

> 200  $\mu\text{g}/\text{m}^3$  of TCE detected at fence-line

**April 19<sup>th</sup>**

> 4000  $\mu\text{g}/\text{m}^3$  TCE detected at fence-line

> 600  $\mu\text{g}/\text{m}^3$  TCE detected outside school building





# Release Abatement Measure – Spring 2018

**April 19<sup>th</sup>**

MassDEP samples/analyzes air samples inside school

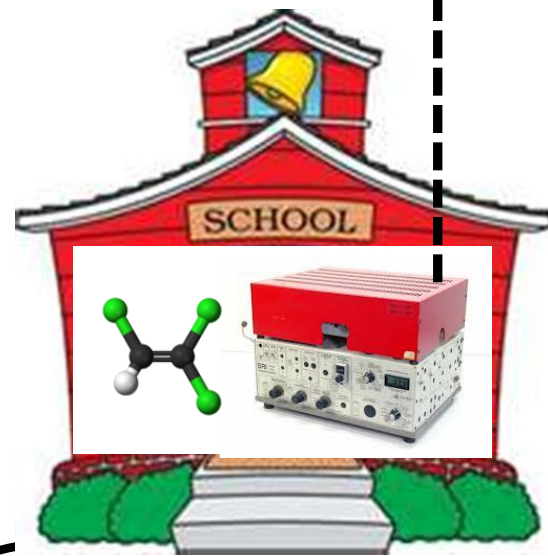
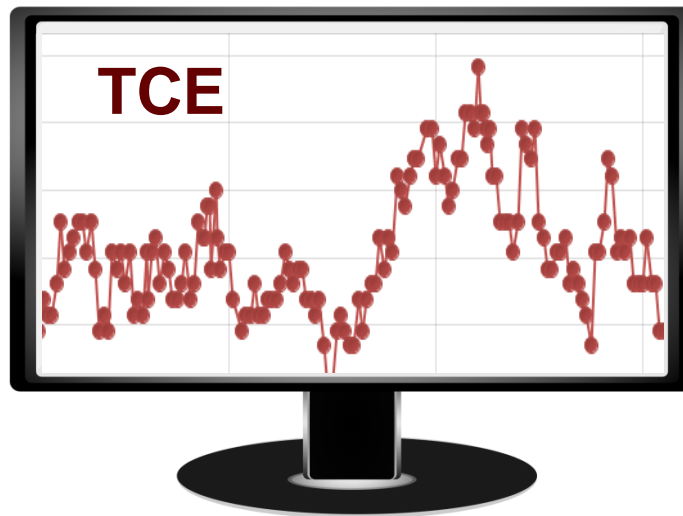
Up to 79  $\mu\text{g}/\text{m}^3$  TCE detected within school building

School building evacuated

Construction job shut down



# Plan B



# Continuous TCE Monitoring

GC/ECD (SRI)

8 minute sample run (looking only at TCE)

4 sampling ports:

- ❖ Cafeteria
- ❖ 3<sup>rd</sup> floor
- ❖ Outside air
- ❖ Calibration check standard (TCE @ 5.4  $\mu\text{g}/\text{m}^3$ )



# Continuous TCE Monitoring

## Less-conservative Action Levels:

- TCE concentrations inside high school cannot exceed  $8 \mu\text{g}/\text{m}^3$  over an 8 hour exposure period (which would constitute Significant Risk)
- No single concentration of TCE can exceed  $24 \mu\text{g}/\text{m}^3$  (due to concern of exceeding 8 hour average limit)



# Continuous TCE Monitoring

Work resumed 6/21/18 and continued until 8/23/18

Continuous 24/7 analyses

each port sampled every 8 minutes

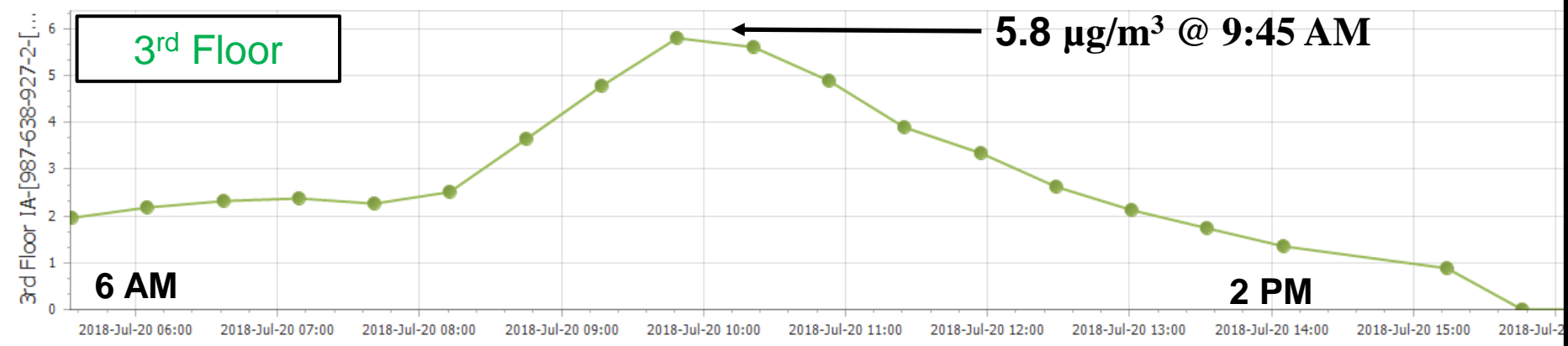
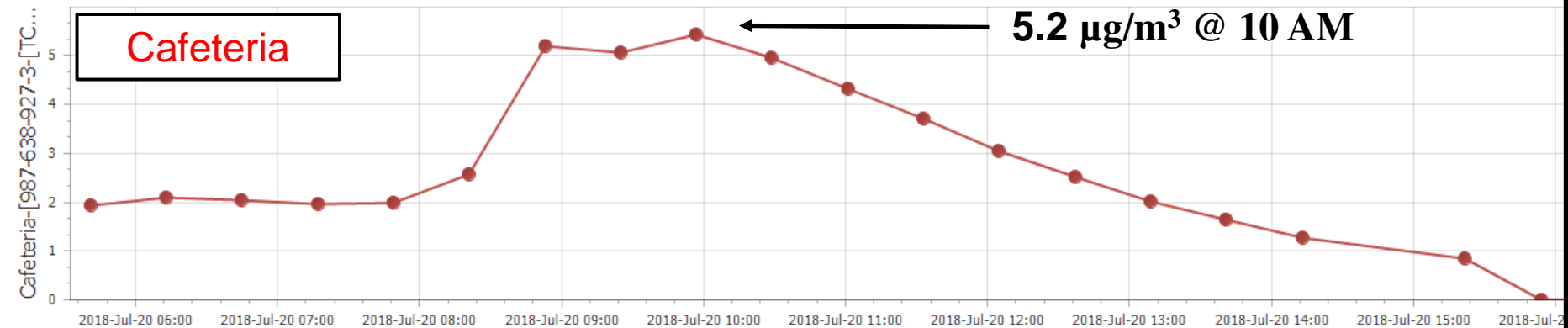
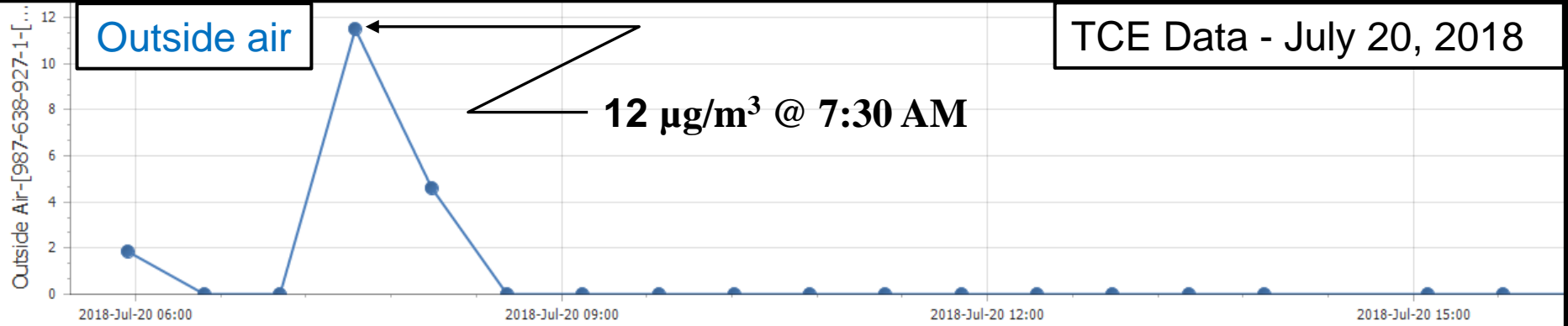
**Over 8000 TCE data points**

Work was halted on a number of occasions due to rising TCE concentrations in the outdoor and indoor air

TCE levels in school never posed an Imminent Hazard  
– and the data log proves it!



TCE Data - July 20, 2018



# Advantages of Continuous Air Monitoring

- Early-warning of rising contaminant levels in outdoor and indoor air, to allow job modifications or shut down prior to exceeding safe levels
- Piece-of-mind for building occupants (and regulators!) who can access data 24/7 via the internet, and view real-time and logged data
- Eliminates need to set conservative shut-down and evacuation levels based on only a few data points

