



Maryville CSX Train Derailment



August 2015
Regional Response Team
Meeting
Knoxville, TN

Discussion Items

- Response Initiation
- Air Monitoring
- Response Actions
- Incident Management Team Actions



Response Initiation

- Around 11:00 p.m. a train derailment, and fire, occurred in Maryville, TN.
- Authorities issued an evacuation in a 0.5 mile radius of the site.
- During initial evacuation activities, the radius was increased to 1.5 miles. Including ~5,000 people.



Derailment Information

- Rail car carrying ~26,000 gallons of Acrylonitrile was breached and partially derailed.
- Acrylonitrile, highly flammable, caught fire as the railcar was leaking, providing a constant source of fuel and making extinguishing the fire dangerous and difficult.



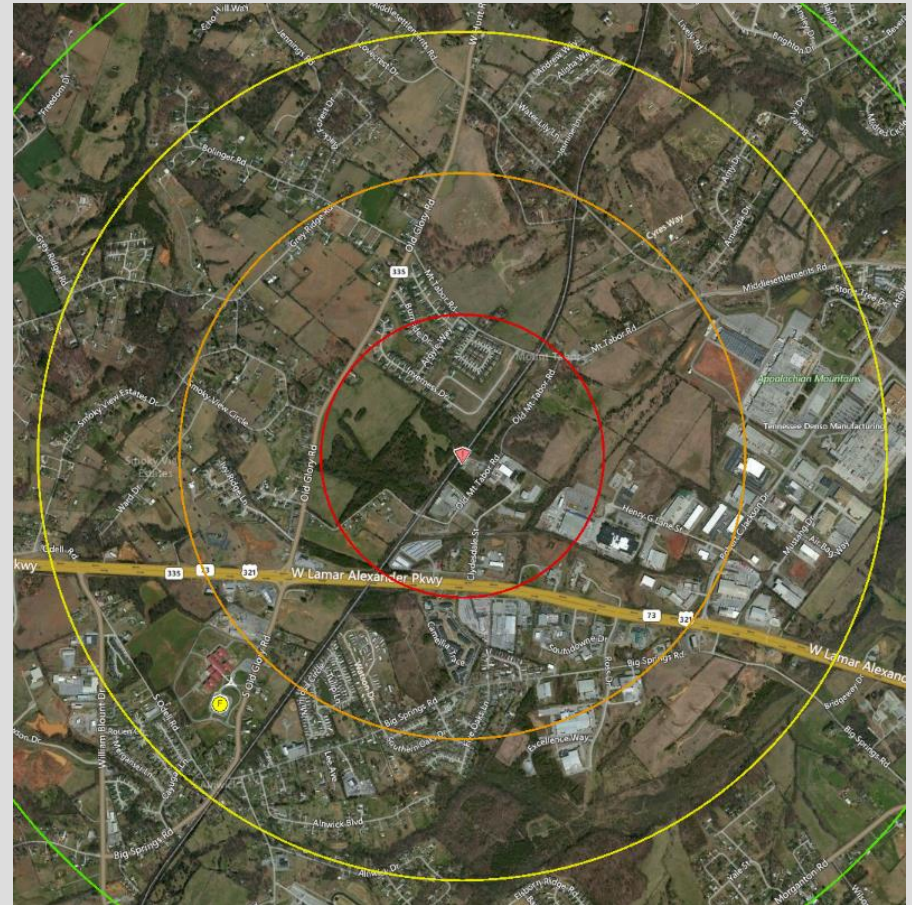
Firefighting Operations

- Firefighters utilized water spray to cool adjacent Acrylonitrile cars.
- Two buffer cars were between the Acrylonitrile cars and the LPG cars.



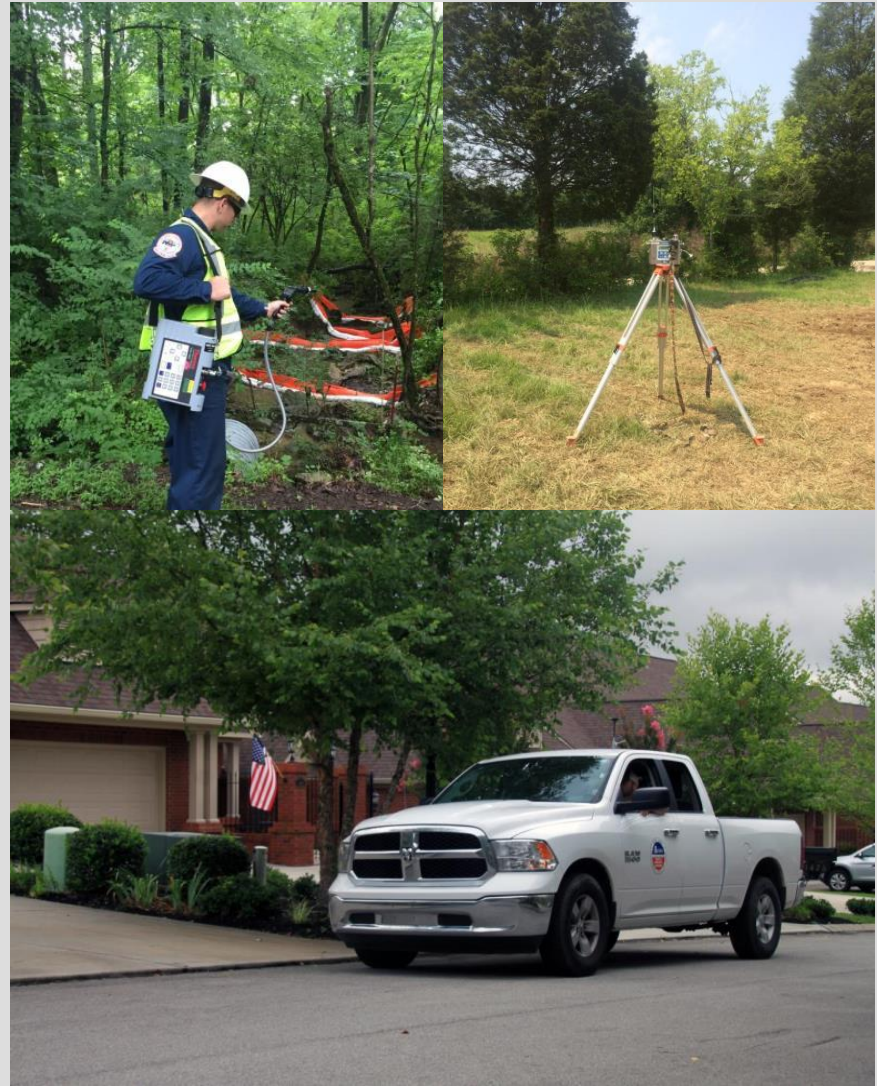
Evacuation Operations

- Residents were evacuated the morning of July 2 within 1.5 miles of the derailment
- Businesses were also shut down within the evacuation zone.
- Over 5,000 people were evacuated.
- Evacuation was lifted on July 3 at 12:00 pm, based on air monitoring results and response progress.



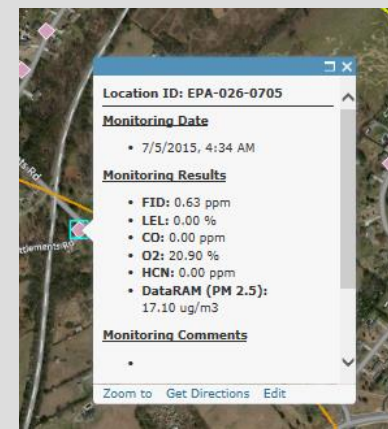
Air Monitoring Operations

- Air Monitoring occurred throughout the evacuation zone, in response to community calls from outside the evacuation zone, and in the exclusion zone to ensure worker health and safety.
- Acrylonitrile cannot be detected by a 10.6 eV PID.
- FIDs and 11.7 eV lamps were utilized.



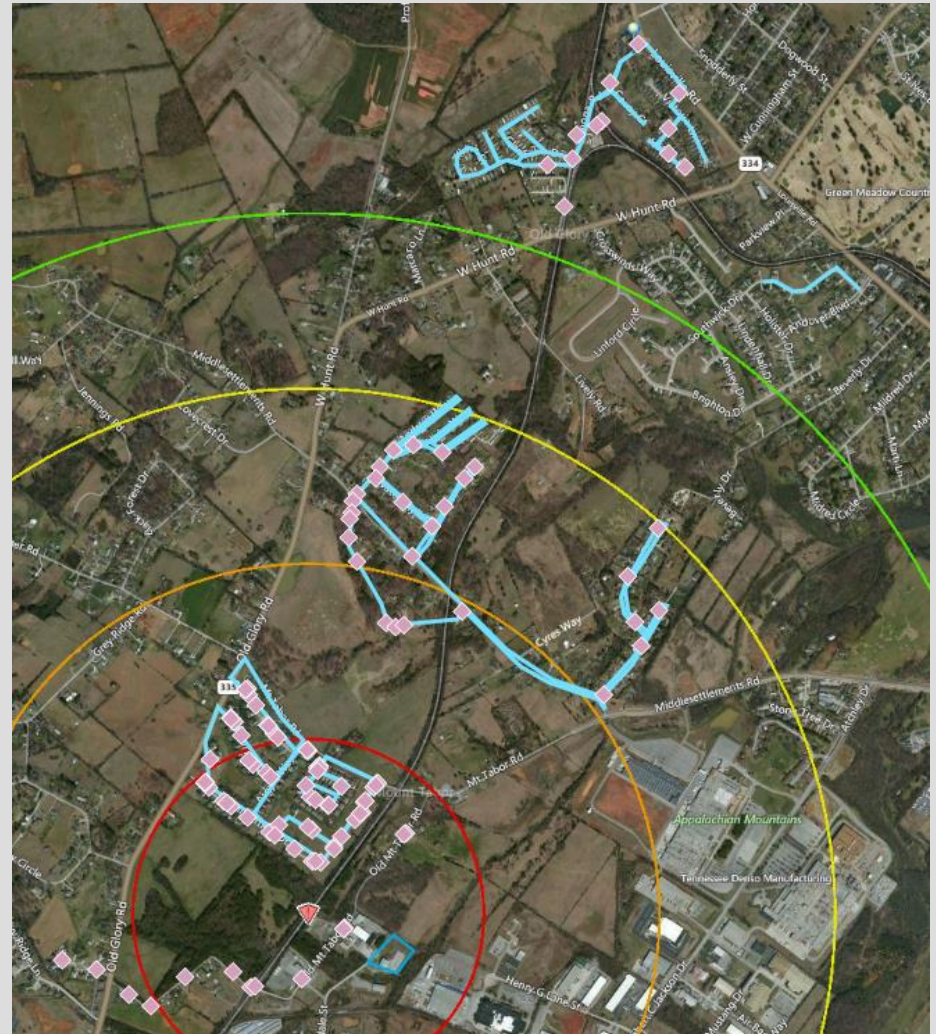
Air Monitoring Operations

- EPA and 45th CST focused their air monitoring efforts on the community, through mobile air monitoring.
- CSX focused on monitoring in the exclusion zone.
- EPA utilized a smart phone app to relay data in real-time back to the Unified Command.



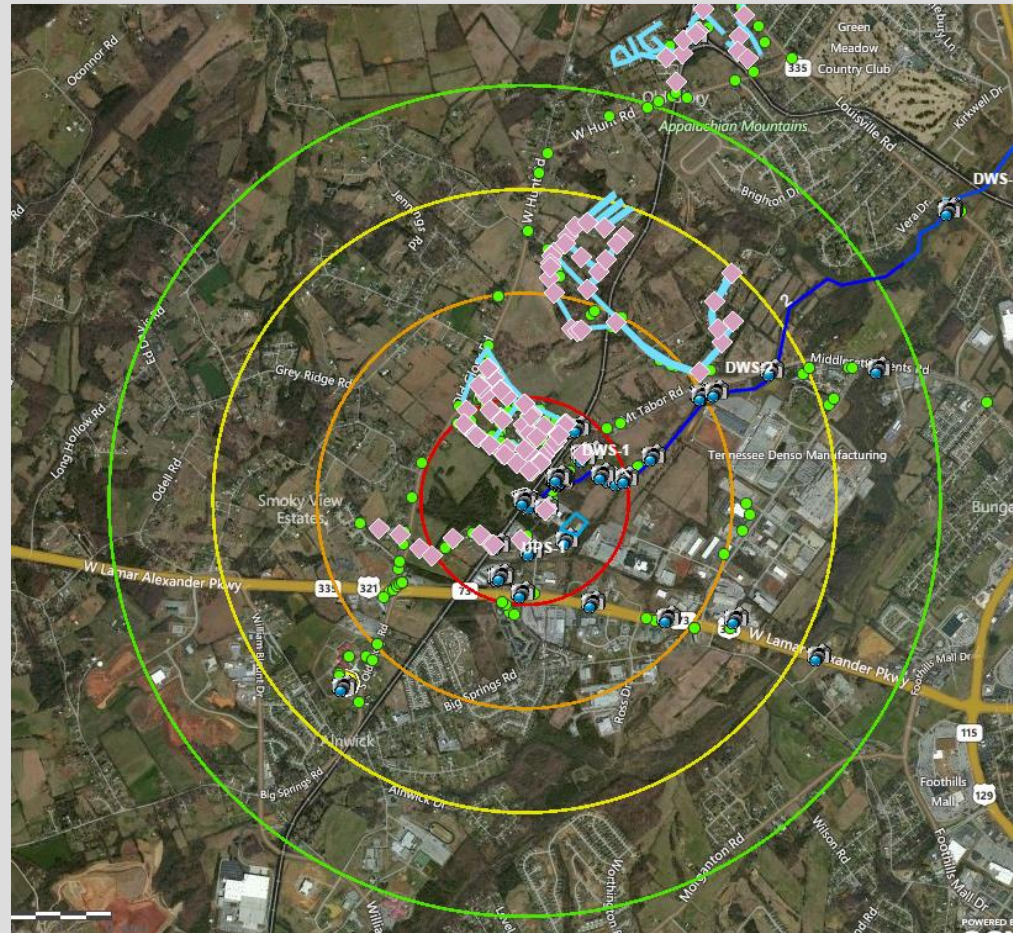
Community Air Monitoring Operations

- As odor complaints or concerned citizens contacted Unified Command, air monitoring teams could be dispatched immediately, through the same smart phone app.



GeoPlatform Web Map

- Site layout
- Air monitoring locations
- Air monitoring assignments
- Surface water sample locations
- NHD dataset
- DS trace analysis
- Location tracking





Viper Data Management System

- A system that accepts and processes data from multiple instrument manufacturers and displays data in one location accessible from the internet.
- Can be operated remotely.

The screenshot shows the Viper Deployment Manager web application. The browser address bar shows <http://viper.ert.org/Deploy>. The page title is "VIPER: DEPLOYMENT MANAGER" and it includes a user welcome message for "campbell.john@epa.gov".

Navigation tabs include "Deployments (44)", "Unassigned Runs (1)", "Admin", and "Help". The main content area displays details for a deployment titled "U.S. Finishing Cone Mills Deployment".

U.S. Finishing Cone Mills Deployment
 Start: 10/4/2011
 End:
 Description:

1375-17: U.S. Finishing Cone Mills
 Start: 11/30/2011 1:18:05 PM
 End:
 Description: 4-E-BAMs, 2 DataRAMs
 Location:

A satellite map shows the deployment location with several red pins. A link below the map says "View Recent Data in Google Earth".

Instruments and Latest Readings:

DataRAM DR-4000(s):

| Instrument ID | Connection | Location | CONC | TWA | Temp | RH | PM10 1-Hour Avg | Received |
|------------------------|------------|----------------------------|---------|-----------|------|------|-----------------|----------------------|
| [33] DataRam DR-4000 * | Unknown | 0.0000000, 0.0000000 | | | | | | |
| [39] DataRam DR-4000 * | Down | 34.8841400, -82.4251630 | 0 ug/m3 | 6.6 ug/m3 | 73 C | 23 % | 6.112750 ug/m3 | 12/6/2011 3:29 PM |

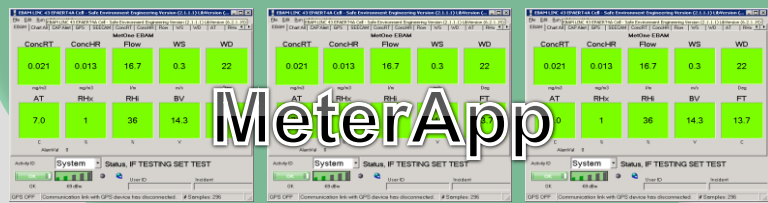
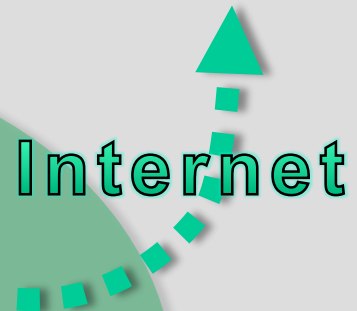
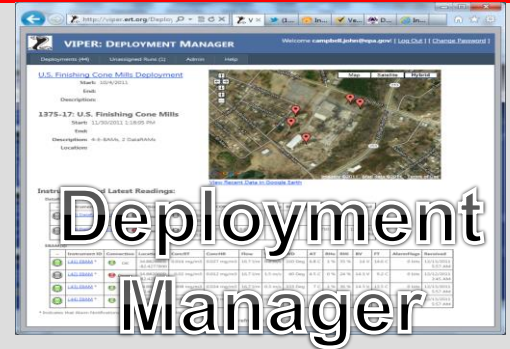
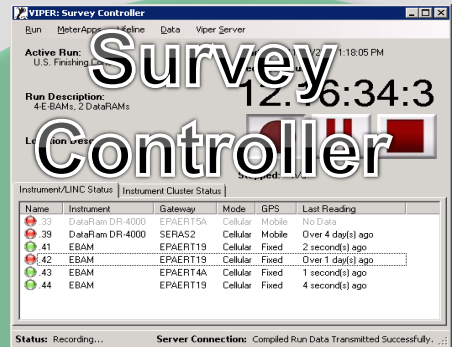
EBAM(s):

| Instrument ID | Connection | Location | ConcRT | ConcHR | Flow | WS | WD | AT | RHx | RHi | BV | FT | AlarmFlags | Received |
|---------------|------------|----------------------------|-------------|-------------|----------|---------|---------|-------|-----|------|--------|--------|------------|-----------------------|
| [41] EBAM * | OK | 34.8828860, -82.4277890 | 0.014 mg/m3 | 0.027 mg/m3 | 16.7 l/m | 0.4 m/s | 320 Deg | 6.8 C | 1 % | 35 % | 14 V | 14.6 C | 0 bits | 12/13/2011 5:57 AM |
| [42] EBAM * | Down | 34.8820600, -82.4271200 | 0.02 mg/m3 | 0.012 mg/m3 | 16.7 l/m | 1.5 m/s | 40 Deg | 4.5 C | 0 % | 24 % | 14.3 V | 9.2 C | 0 bits | 12/12/2011 3:45 AM |
| [43] EBAM * | OK | 34.8839030, -82.4247270 | 0.008 mg/m3 | 0.024 mg/m3 | 16.7 l/m | 0.3 m/s | 333 Deg | 7 C | 1 % | 36 % | 14.3 V | 13.5 C | 0 bits | 12/13/2011 5:57 AM |
| [44] EBAM * | OK | 34.8835220, -82.4275950 | 0.009 mg/m3 | 0.029 mg/m3 | 16.7 l/m | 0.6 m/s | 326 Deg | 6 C | 0 % | 33 % | 14.2 V | 11.3 C | 0 bits | 12/13/2011 5:57 AM |

* Indicates that Alarm Notifications have been Enabled for this Instrument

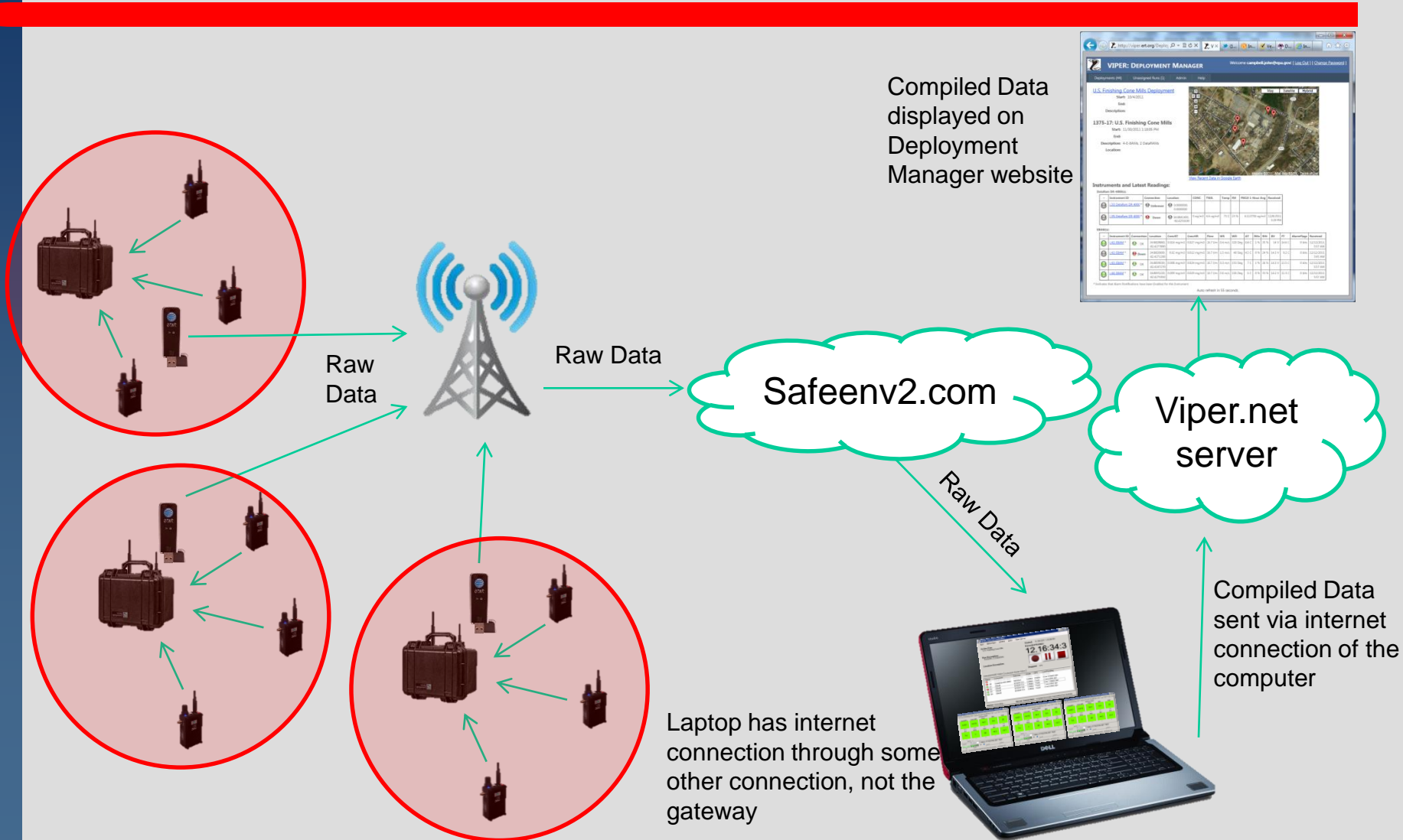
Auto refresh in 55 seconds.

Viper Data Management System

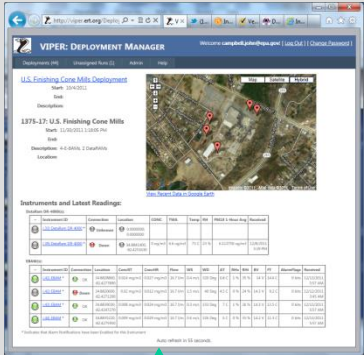


Host Computer

Viper Data Management System



Compiled Data displayed on Deployment Manager website



Laptop has internet connection through some other connection, not the gateway



Air Monitoring Readily Available

- EPA began collecting air monitoring data from within the evacuation zone, and displaying it on a web map, within 1.5 hours of being on site.



Other Response Actions

- Acrylonitrile Transfer
- Acrylonitrile Flaring
- Surface Water Sampling and Remediation
- Soil Excavation
- Groundwater Sampling
- Community Involvement Efforts



Acrylonitrile Transfer

- A second unbreached car, carrying Acrylonitrile was damaged by the fire but the contents were not lost.
- Acrylonitrile was transferred to a new car for shipment, via a closed-loop system.



Acrylonitrile Flaring

- Some residual remained in the breached car.
- Prior to being shipped off-site, all contents had to be purged. To limit possible exposure, CSX flared the volatiles.





Acrylonitrile Flaring



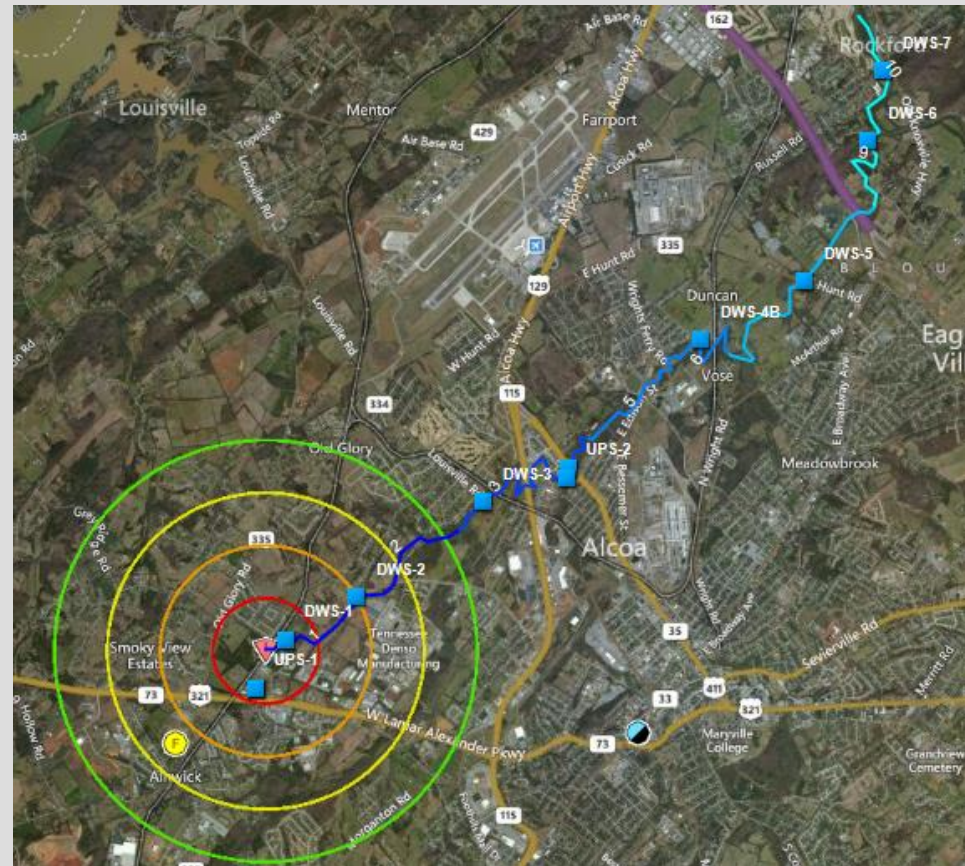
Rail Car Decontamination

- Following flaring, the rail car was further decontaminated prior to being shipped off-site.



Surface Water Sampling

- Following initial firefighting efforts, it was unclear if nearby Culton Creek was impacted by the release.
- Surface water samples revealed elevated levels of Acrylonitrile in the creek.



Fish Kill

- Results indicating contamination and discovery of a fish kill caused:
 - Additional water samples from further downstream
 - Installation of bubbling system at 3 points near the site
 - Issuance of a public advisory
 - Inventory of dead fish/animals



Biologists discover dead fish in Maryville creek after train derailment, public advisory issued

WATE 6 On Your Side Staff

Published: July 5, 2015, 7:11 pm | Updated: July 6, 2015, 12:00 pm



Surface Water Remediation

- Bubblers catalyze the natural breakdown of Acrylonitrile through additional volatilization and agitation.



Soil Removal

- Soil under the railway was determined to be contaminated with Acrylonitrile and had to be removed prior to opening the rail line.



Soil Stockpiles

- Two soil stockpiles were established near the derailment site.
- Air monitoring was conducted at each stockpile during response activities



Ground Water Contamination

- On the final day of the response, groundwater sample results from an on-site well, indicated elevated concentrations of Acrylonitrile in the groundwater.





Ground Water Contamination

- Private well testing was initiated immediately
- One private well at the derailment site was contaminated
- Completed a door to door survey to identify all wells.
- Established a private well advisory.
- Installed groundwater monitoring wells
- TDEC continued oversight of the remediation.

Community Involvement Center

- The community was informed throughout the response and when the evacuation was lifted, residents were encouraged to come to the Community Involvement Center to better understand what happened



Questions

