

# Tracking Emissions from Emergency Releases

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# Toxic Combustion Products

Table 6: Hazardous combustion products generated with respect to the material involved.

Material Involved	Fire Zone	CO	HCN	HCl / HBr / HF	NO <sub>x</sub>	SO <sub>2</sub>	P <sub>2</sub> O <sub>5</sub>	Organic Irritants, eg, Acrolein / Formaldehyde	Inorganic Irritants, eg, Phosgene / Ammonia	PAHs	Complex / Exotic, eg, PCDDs / PCDFs / Isocyanates / PFIB	PM
Polymeric Materials	1	+++	+++	+++	++	+	+	++	+	++	++	+++
	2	±	±	+	+	±	-	++	+	±	++	++
Wood	1	++	-	-	+	-	-	++	-	+	+	+++
	2	-	-	-	±	-	-	+	-	±	+	±
Rubber / Tyres	1	+++	+	+	+	+++	+	++	+	++	++	+++
	2	±	±	+	±	+++	±	++	±	±	++	++
Oil / Petrol	1	++	-	-	-	±	-	++	-	++	++	+++
	2	-	-	-	-	±	-	++	-	±	+	++

Zone 1 relates to the immediate vicinity / compartment of the fire. Zone 2 relates to the location immediately outside the source of the fire.

Key:

+++	Likely to be present in very high quantities
++	Likely to be present in high quantities
+	Likely to be present
±	May be present at low level
-	Unlikely to be present

Source: J.C. Wakefield. A Toxicological Review of the Products of Combustion. 2010

# Identify Your Source

## ITC Tanks Burning or Damaged

- Naptha
- Xylene
- Toluene
- Pyrolysis Gasoline  
aka Pygas (may  
contain 25-45%  
benzene)



*Members of the 2nd 80's Response Unified Command continue to remove product from damaged tanks at the ITC Deer Park facility on March 27, 2019 near La Porte, Texas. Since March 19, 2019, more than 1,100 federal, state and local first responders, agencies, and environmental cleanup contractors have been on scene and actively assessing, booming and removing product from affected areas.*

*U.S. Coast Guard photo by PA2 Johanna Strickland*

Source: <https://itcresponse.com/page/7/>

# Air Monitoring Tools

- Stationary Monitors
  - TCEQ regulatory network
  - Facility monitors
  - Nonprofit/Citizen networks (e.g., Purple Air)
- Ground Level Mobile Monitoring
  - Handheld monitors
  - Mobile Vans (MAAML, TAGA)
- Flyovers/Plume mapping (ASPECT)

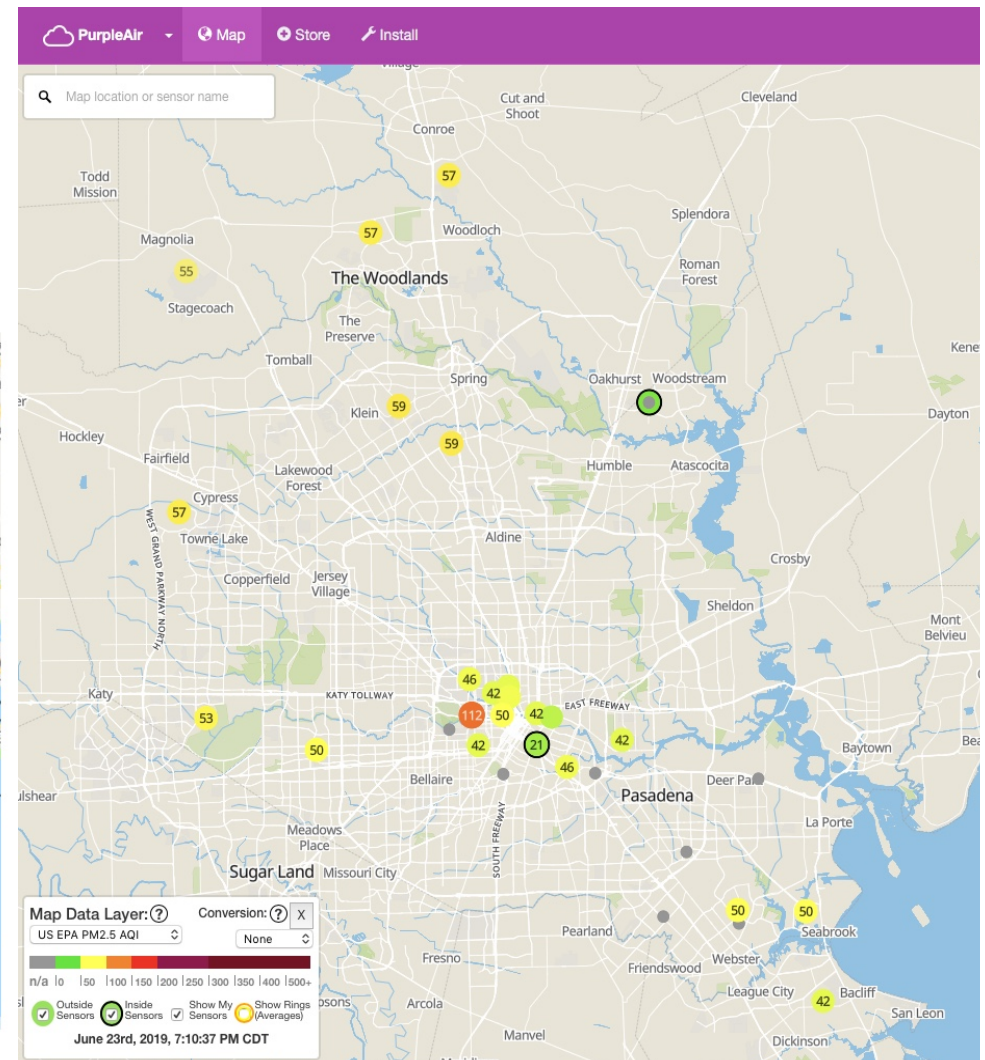
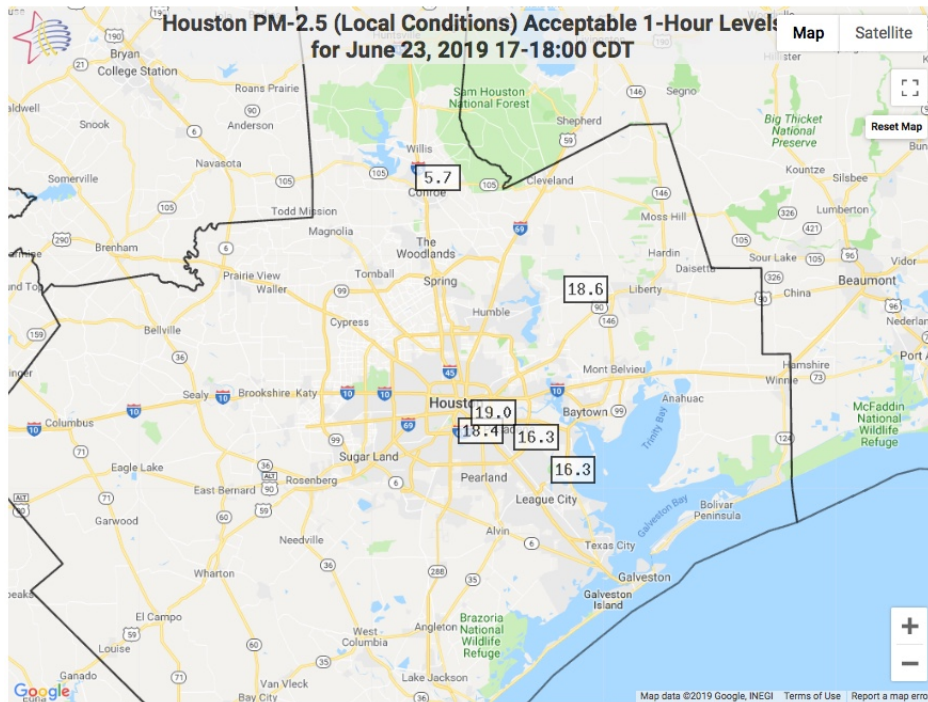
# TCEQ has 5 monitors for PM-2.5 Citizen networks help fill voids

## Current PM-2.5 (Local Conditions) Acceptable 1-Hour Levels for Houston Metropolitan Area

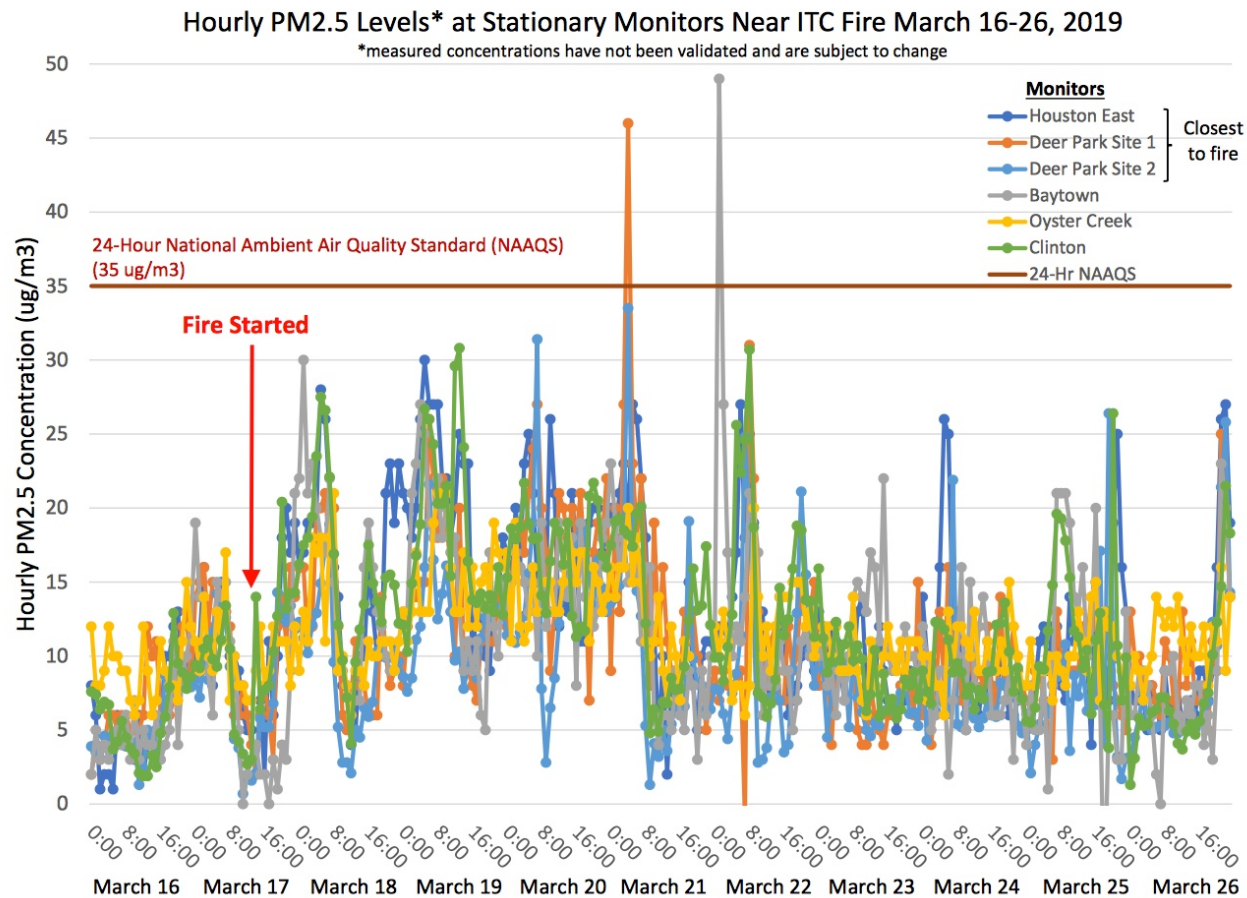
The map below shows the latest 1-hour PM-2.5 (Local Conditions) Acceptable average for each monitoring site in the Houston Metropolitan Area measured in micrograms per cubic meter (local conditions) ( $\mu\text{g}/\text{m}^3$  LC). The background color in each box represents the relative quality of the air based on the level of PM-2.5 (Local Conditions) Acceptable that is being measured at each site. To see all of today's measurements from a site click on it's box.

The latest imagery available is for **Sunday June 23, 2019 17-18:00 CDT**.

Sites outside the Houston Metropolitan Area will appear dimmer than sites within the area. You can still select these sites to see data collected at them.

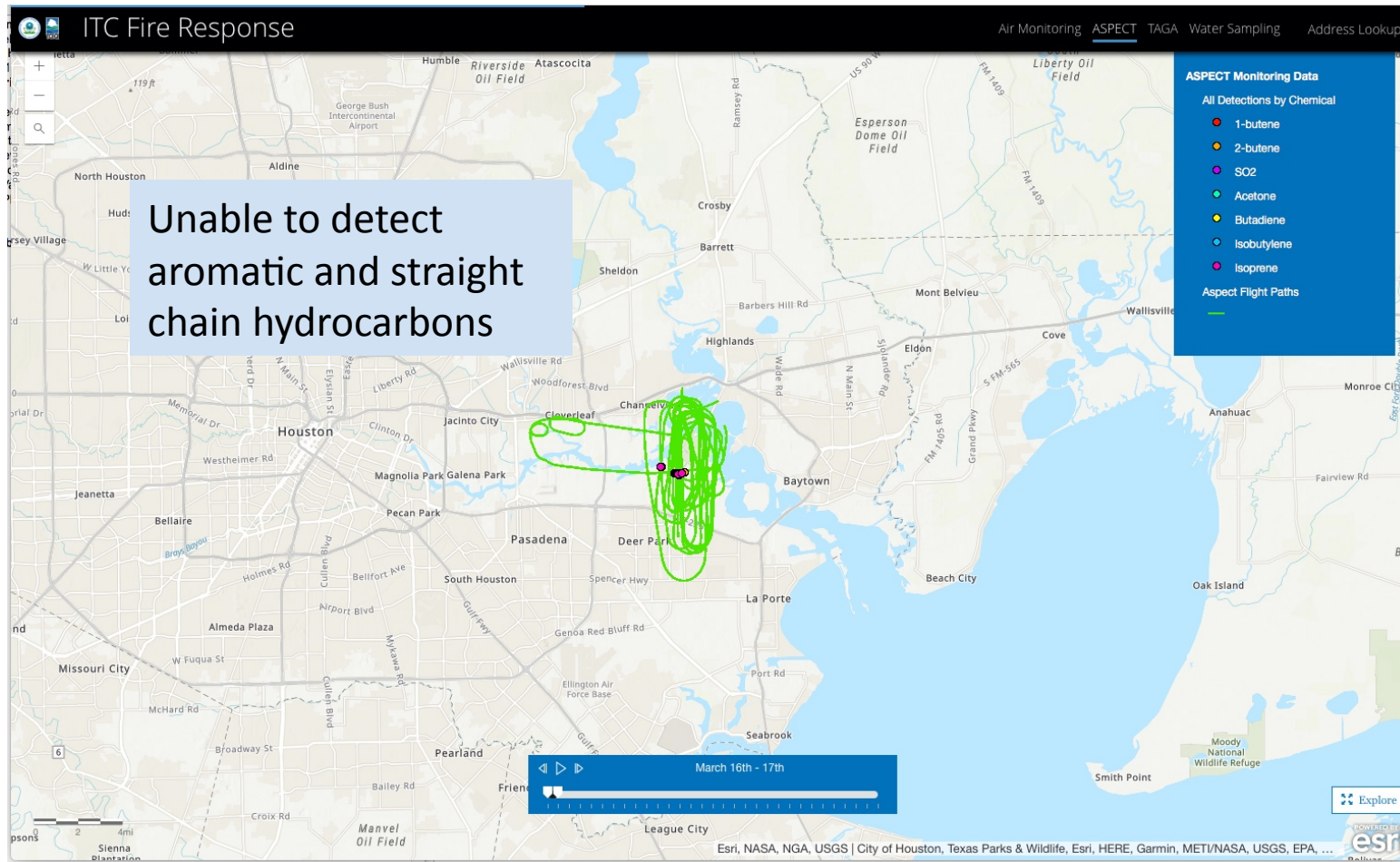


# TCEQ PM data for ITC Fire Week 1



<https://www.tceq.texas.gov/assets/public/response/smoke/air/graphs/ITC-fire-monitor-data-PM.pdf>

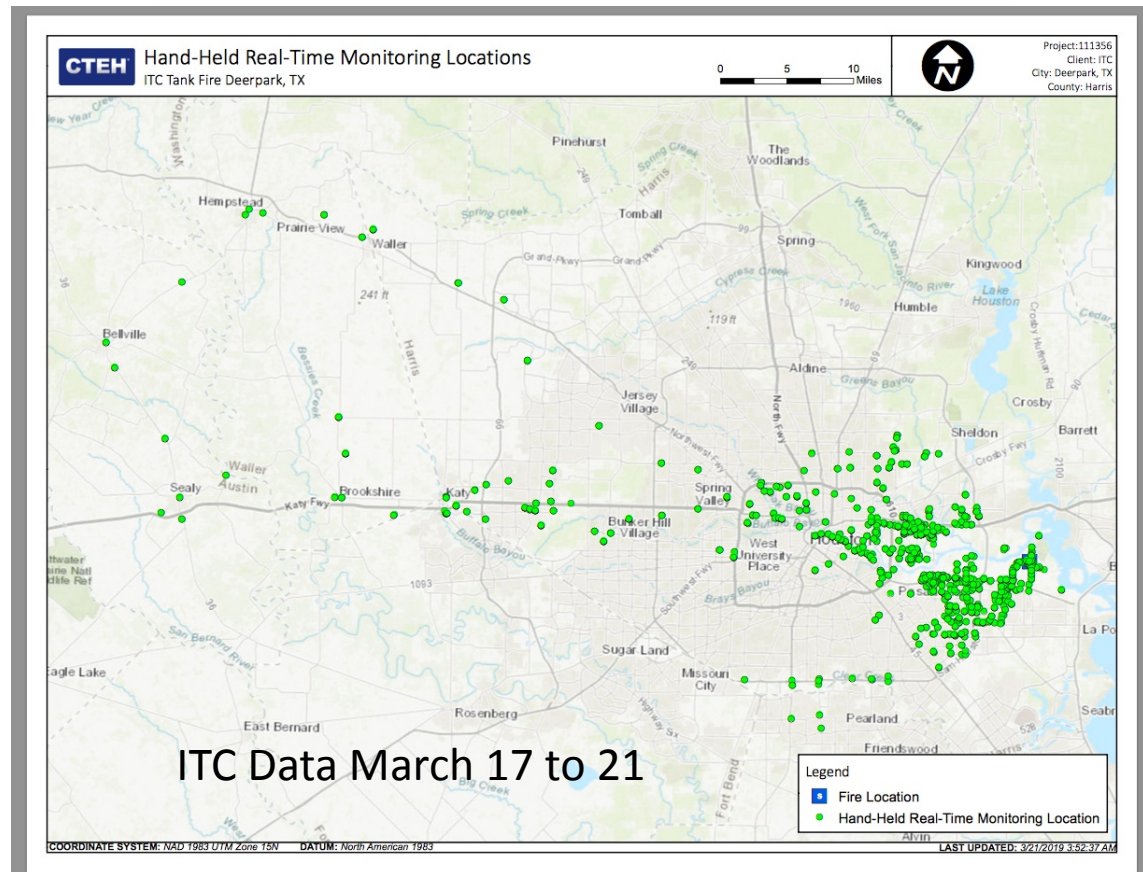
# ASPECT Maps Plume with Limited Speciation Capability



# Mobile Monitoring with Acute Exposure Action Levels

## Parameters Analyzed

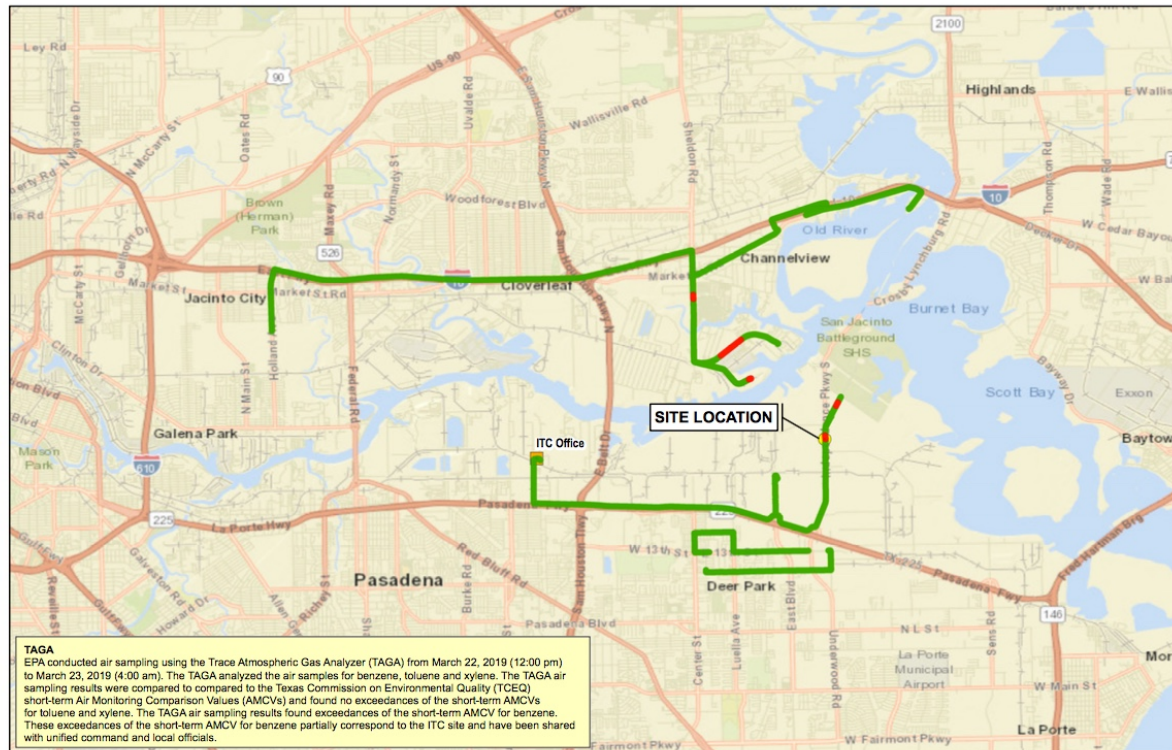
Naptha  
Benzene  
Carbon Monoxide  
Formaldehyde  
Hexane  
Hydrogen Sulfide  
LEL  
Napthalene  
Nitrogen Dioxide  
Oxygen  
PM2.5  
Sulfur Dioxide  
Toluene  
VOCs  
Xylene



PM-2.5 Action level 138 ug/m<sup>3</sup>; Wildfire standard  
Benzene Action level 2250 ppb; ¼ EPA 8 hr AEGL-1



# EPA Trace Atmospheric Gas Analyzer Maps Benzene Spikes



**TAGA**  
EPA conducted air sampling using the Trace Atmospheric Gas Analyzer (TAGA) from March 22, 2019 (12:00 pm) to March 23, 2019 (4:00 am). The TAGA analyzed the air samples for benzene, toluene and xylene. The TAGA air sampling results were compared to the Texas Commission on Environmental Quality (TCEQ) short-term Air Monitoring Comparison Values (AMCVs) and found no exceedances of the short-term AMCVs for toluene and xylene. The TAGA air sampling results found exceedances of the short-term AMCV for benzene. These exceedances of the short-term AMCV for benzene partially correspond to the ITC site and have been shared with unified command and local officials.

Substance	CAS #	Short-term AMCV Health (ppb)
benzene	71-43-2	180
m/p-xylene	179601-23-1	1700
o-xylene	95-47-6	1700
toluene	108-88-3	4000

- Legend**
- 📍 ITC OFFICE LOCATION
  - 📍 SITE LOCATION
  - RESULTS BELOW AMCVs
  - RESULTS ABOVE AMCVs

**TAGA MONITORING MAP**  
**INTERCONTINENTAL TERMINALS**  
**COMPANY FIRE**  
**1943 INDEPENDENCE PARKWAY**  
**LA PORTE, HARRIS COUNTY, TEXAS**

**REPORTING PERIOD**  
3/22/2019 12:00 - 3/23/2019 04:00

SCALE IN MILES

EPA GIS  
Printed: 9:15:26 AM 3/23/2019

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