

## Scenario:

At 7:00 am on November 30, 2012, a railcar displaying placard number 1086 derailed near Paulsboro, New Jersey. The vehicle came to rest in a creek and appeared to leaking liquid product, from a 1 x 3 gash located about halfway up one side of the railcar. There is no fire involved at present; but Incident Command wants to know your assessment of any fire potential for this leaking product, placard 1086. In addition, there are a number of damaged railcars leaking what appears to be any number of products, including gasoline, diesel fuel, hydraulic fluids, anti-freeze, and even possibly battery acid.

Current weather conditions are as follows:

Wind: from the NE; 4 mph with gusts to 10 mph (obtained from local airport)	
Ground Roughness: open country	Cloud Cover: Clear Skies
Air Temperature: 35° F	Stability Class: D
No Inversion Height	Relative Humidity: 66%

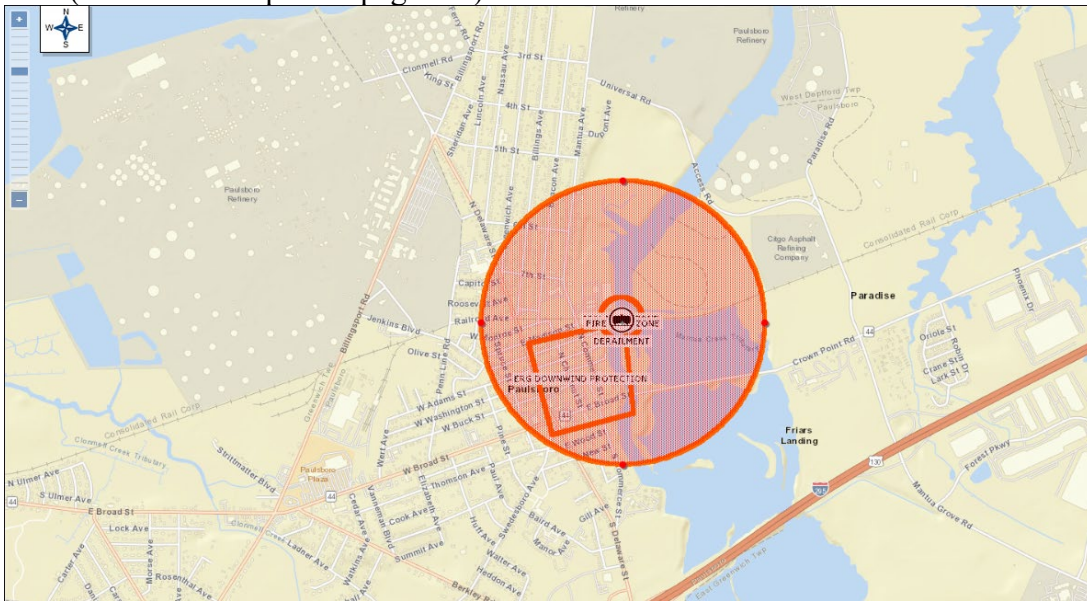
You are directed to operate CAMEO and supply information to Incident Command for the duration of this event.

## CAMEO Chemicals

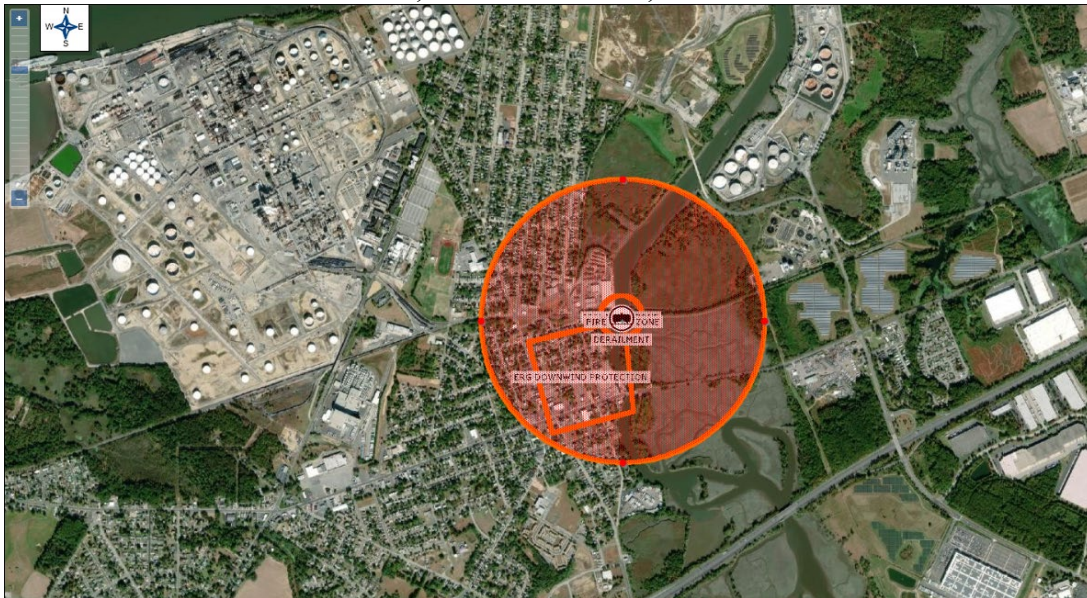
1. Use CAMEO Chemicals to gather information for placard number 1086.
  - a. Is this material liquid, solid, or gas?
  - b. Is it likely that this material is carried in Liquid Tankers or Pressurized Tankers?
  - c. What are the primary hazards associated with this material?
  - d. Is there any significant fire/explosion hazard associated with this material?
  - e. What are the exposure routes and recommended Protective Clothing for this material?
2. Is there a “green page” entry for this material in the ERG?
3. Use the CAMEO Chemicals “Predict Reactivity” module to evaluate the potential reactive hazards for this incident.
4. Determine the Initial Isolation Zone and Evacuation distances appropriate for this scenario.
5. Can this material be modeled using ALOHA? If so, what PAC (Protective Action Criteria) would you recommend using as the ALOHA Level of Concern (LOC)?

## MARPLOT

1. Launch MARPLOT
2. Select a location in your area to use as the incident site; or use the location at  
Latitude = 39.834881°N Longitude = 75.236661°W
3. Navigate to the incident location
4. Mark the incident location using the “Symbol Tool”
5. Use the “Circle” drawing tool to display the 330 FEET Immediate Isolation Zone on the map
6. Use the “Polygon” drawing tool to display the largest ERG-suggestion downwind evacuation area
7. Copy and paste a screenshot of the mapped area from MARPLOT to WORD.  
(CAMEO Companion pages 85)



330 foot Immediate Isolation Area; ERG Downwind; 1.0 mile Fire Evac area



330 foot Immediate Isolation Area; ERG Downwind; 1.0 mile Fire Evac area

## POPULATION ESTIMATES:

For 330 foot Isolation Zone: 0  
For Protection Area: 394  
For 1.0 mile Evac Area: 1212

## ALOHA

1. Use ALOHA to create a Threat Zone using your best estimates for Tank Dimensions, Leak Dimensions, and other information.
2. Use the following data:

## CHEMICAL DATA:

Chemical Name: VINYL CHLORIDE  
CAS Number: 75-1-4                      Molecular Weight: 62.50 g/mol  
AEGL-1 (60 min): 250 ppm   AEGL-2 (60 min): 1200 ppm   AEGL-3 (60 min): 4800 ppm  
LEL: 36000 ppm   UEL: 330000 ppm  
Carcinogenic risk - see CAMEO Chemicals  
Ambient Boiling Point: 7.0° F  
Vapor Pressure at Ambient Temperature: greater than 1 atm  
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

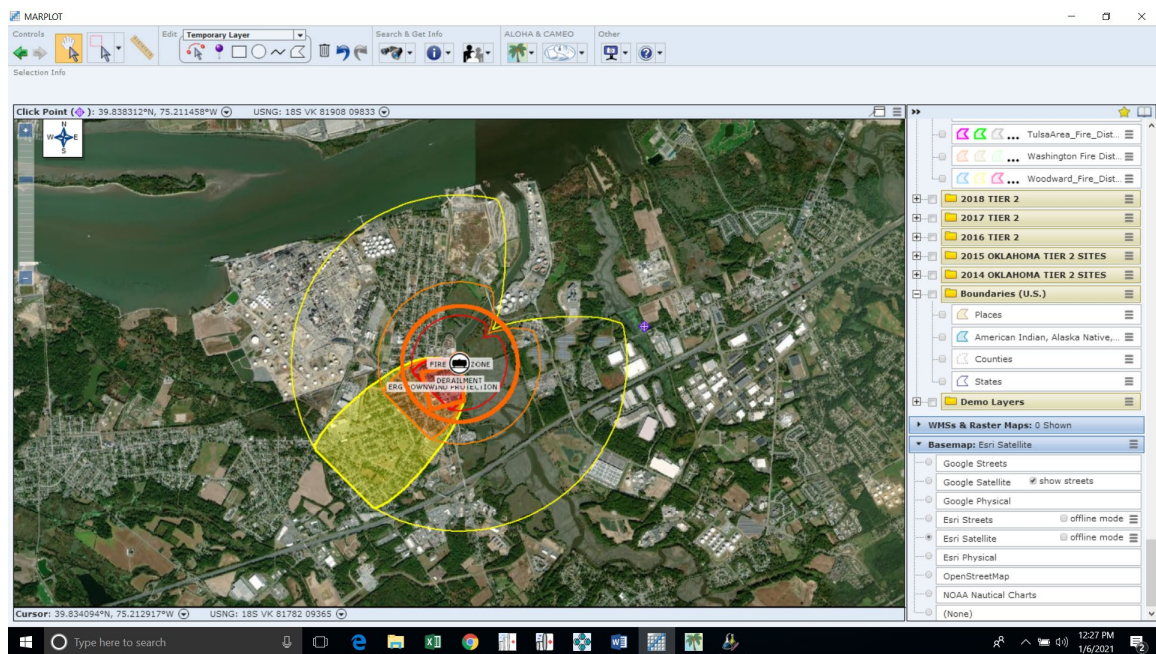
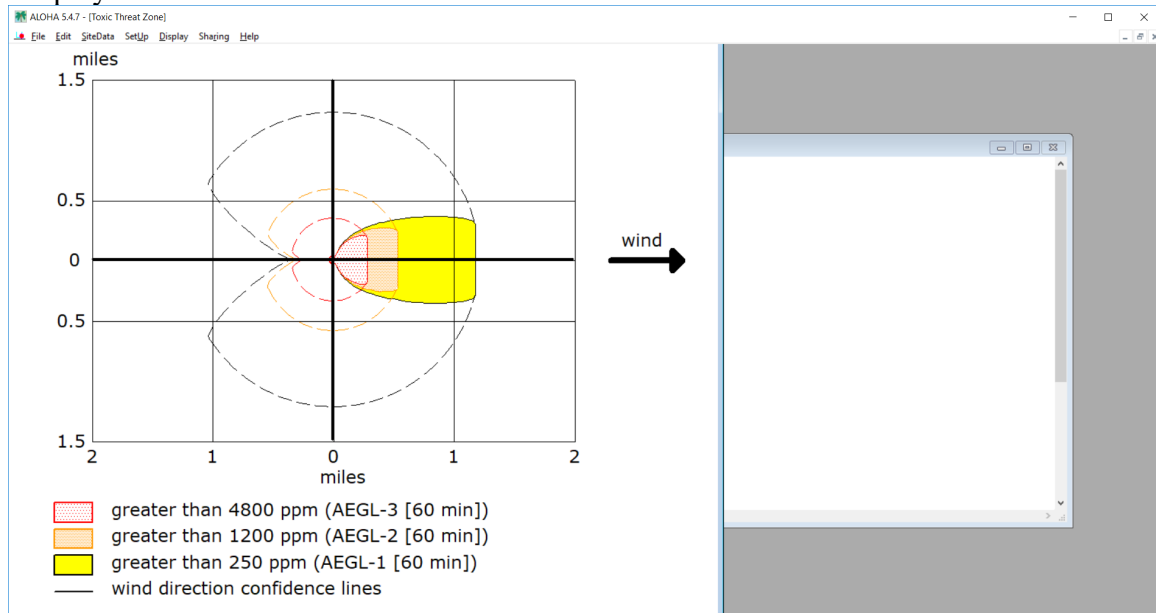
## ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)

Wind: 4 miles/hour from NE at 10 meters  
Ground Roughness: open country                      Cloud Cover: 0 tenths  
Air Temperature: 35° F                      Stability Class: F  
No Inversion Height                      Relative Humidity: 66%

## SOURCE STRENGTH:

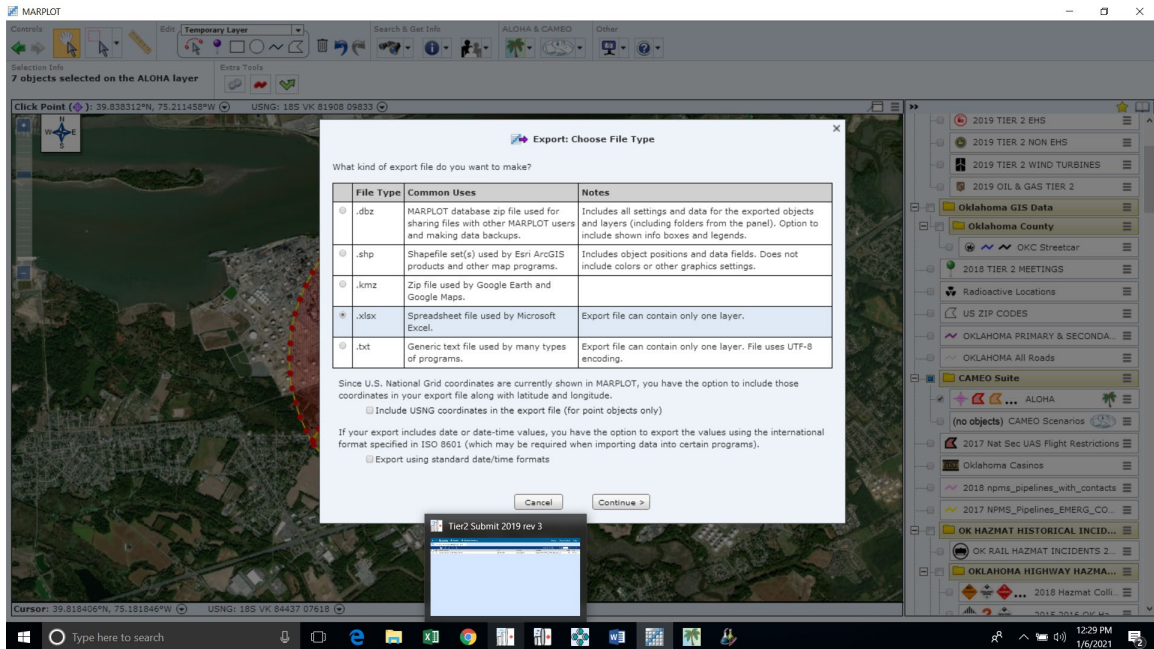
Leak from hole in horizontal cylindrical tank  
Flammable chemical escaping from tank (not burning)  
Tank Diameter: 9.72 feet                      Tank Length: 54 feet  
Tank Volume: 30000 gallons  
Tank contains liquid                      Internal Temperature: 35° F  
Chemical Mass in Tank: 94.5 tons                      Tank is 80% full  
Opening Length: 1 inches                      Opening Width: 3 inches  
Opening is 4.86 feet from tank bottom  
Release Duration: ALOHA limited the duration to 1 hour  
Max Average Sustained Release Rate: 2,030 pounds/min  
(averaged over a minute or more)  
Total Amount Released: 102,352 pounds  
Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

## Display the Threat Zone for the Toxic Area

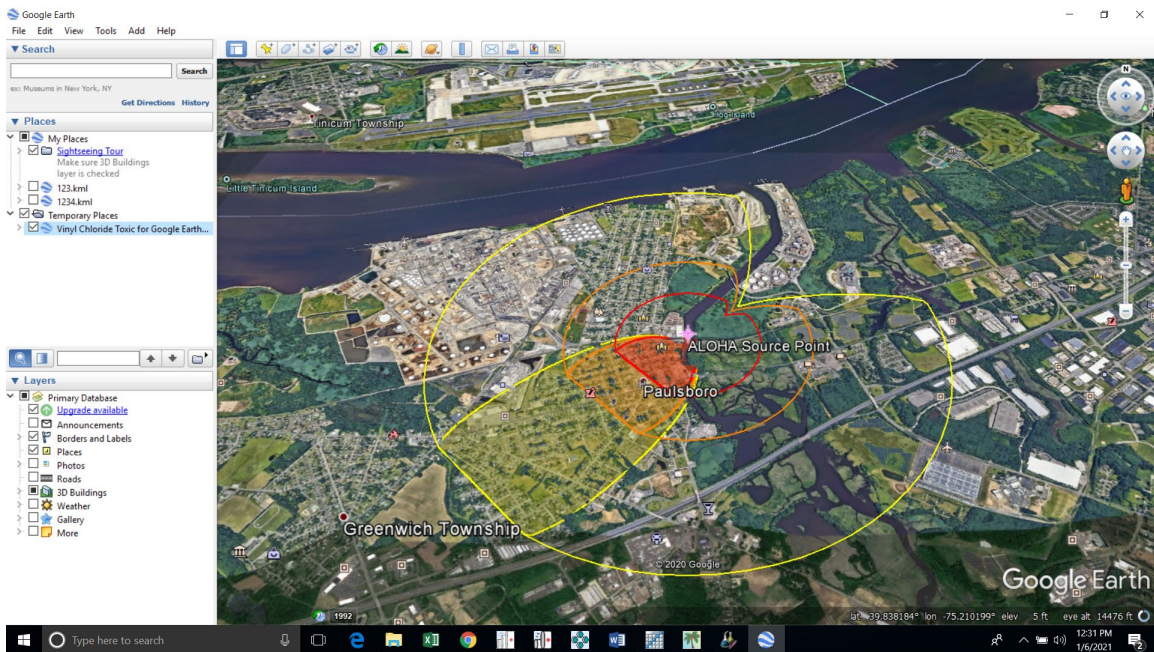


*Notice that for this incident, the ALOHA Toxic Threat Zones correspond fairly well to the “user-drawn ERG-suggested” zones.*

Select the ALOHA Layer menu in MARPLOT  
 3. Choose “Export Layer”

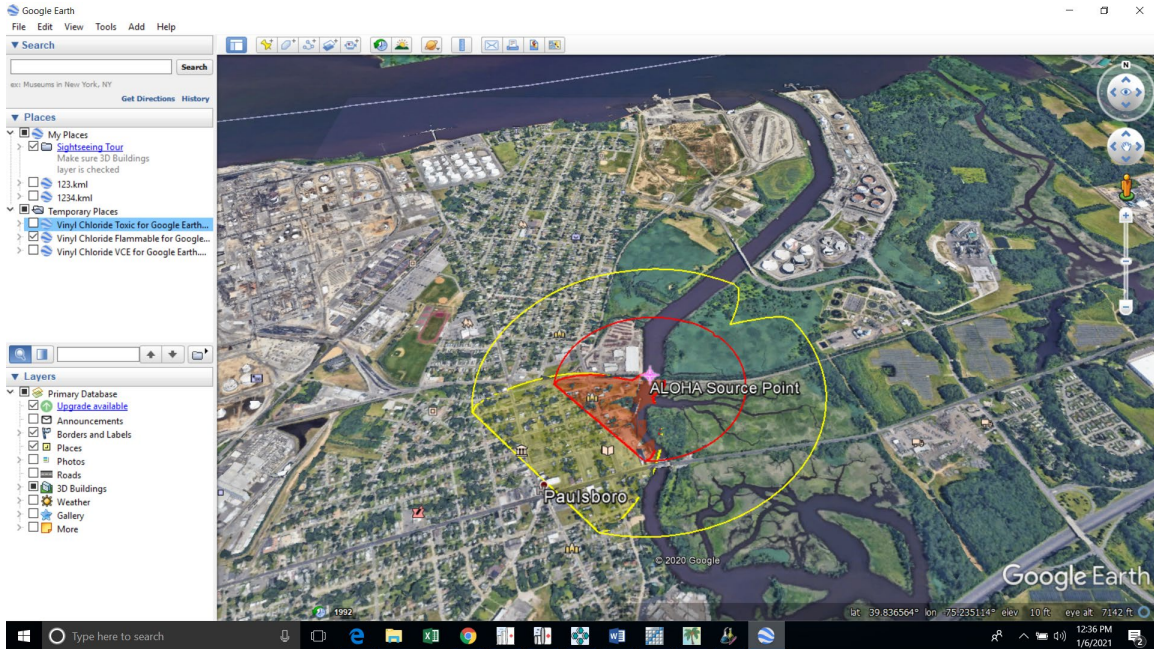


4. Select “kmz” file type; name the file “Vinyl Chloride Toxic for Google Earth.KMZ”; save to your computer desktop.
5. Go to your computer desktop and “double-click” on the KMZ file, this should automatically open Google Earth and display the Threat Zone

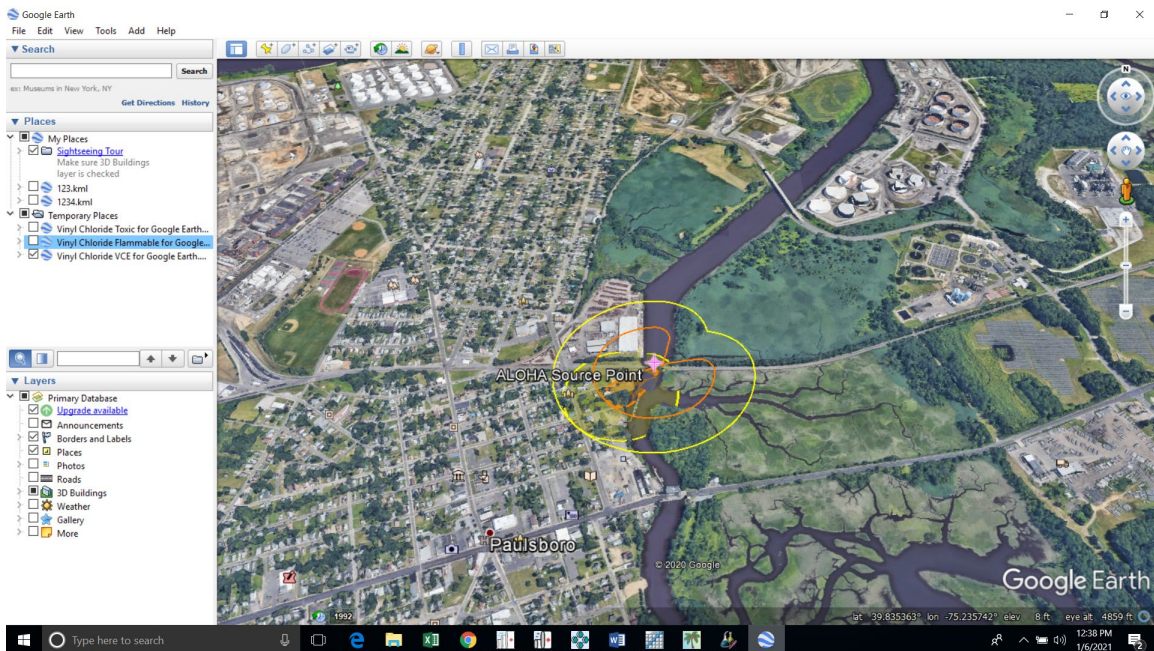


*Vinyl Chloride TOXIC Threat Zone*

6. Repeat the above processes for Flammable and VCE Threat Zones in ALOHA; at the conclusion of the steps, your Google Earth map should display all three Threat Zones and you may toggle each of them on/off from the left side of the Google Earth screen



*Vinyl Chloride FLAMMABLE Threat Zone*



*Vinyl Chloride VCE Threat Zone*