

CAMEOfm EXERCISES

CAMEOfm—CHEMICAL LIBRARY

- 1) Open the Chemical Library
- 2) Find the following chemical information:

Chemical Name : Endosulfan
CAS # : _____
UN/NA# : _____
NFPA RATINGS:
FIRE : _____
HEALTH : _____
REACTIVE : _____
SPECIAL : _____
IDLH : _____
ERPG -2 : _____
TEEL-2 : _____
OTHER INFO: _____

Chemical Name : _____
CAS # : _____
UN/NA# : 1280
NFPA RATINGS:
FIRE : _____
HEALTH : _____
REACTIVE : _____
SPECIAL : _____
IDLH : _____
ERPG-1 : _____
ERPG-2 : _____
AEGL : _____
OTHER INFO: _____

ALOHA

This ALOHA exercise must be performed using the new ALOHA version 5.3.

ALOHA 5.3 has the capacity to produce footprints for 3 different LOC simultaneously. This allows for many new options! The following exercise demonstrates a method for using UEL and LEL to predict the potential ignition area.

Open ALOHA and select Butane as your chemical.

Question 1: Review the Text Summary. What is different from previous versions of ALOHA?

Assume the following weather conditions:

Wind Speed	10 mph
Wind Direction	S
Ground Roughness	Open
Partly Cloudy	5
Temperature	50 degrees F
Relative Humidity	50%

Set the Source as: Direct / Instantaneous / 12,000 gallons / Liquid

Select Display / Footprint menu

Level of Concern
Select Level of Concern or Output Concentration:

Red Footprint
LOC: TEEL-3: 19000 ppm

Orange Footprint
LOC: TEEL-2: 4000 ppm

Yellow Footprint
LOC: TEEL-1: 2400 ppm

Show confidence lines:
 only for longest footprint
 for each footprint

OK Cancel Help

Click on the “Help” menu for more information regarding LOC defaults!

Question 2: What are the “preset” LOC values available for Butane? Are any of those values the UEL or LEL?

Question 3: Can you set the LOC values to UEL and LEL using the Display menu? Where do you find the UEL and LEL values?

Question 4: All ALOHA LOC values must be expressed as a “concentration”. Is % a “concentration”? Is % offered as a “unit” type for ALOHA LOC values? How can you “convert” % to ppm?

Question 5: Set the ALOHA LOC values as:

Red Footprint: UEL
Orange Footprint: LEL
Yellow Footprint: 10% LEL

Display the resulting footprint on MARPLOT.

Open a new MARPLOT Layer; use the “polygon” tool to “draw” the LEL area while excluding the UEL area. This ALOHA’s “predicted” potential ignition zone. **For safety purposes, you may elect to use 10% LEL instead.**

Use the MARPLOT Layer List to “Hide” the ALOHA Footprints. Your drawn “ignition zone” should be displayed.

ANSWERS

Chemical Name: ENDOSULFAN

CAS # : 115-29-7

UN/NA# : 2761

NFPA RATINGS:

 FIRE : BLANK

 HEALTH : BLANK

 REACTIVE : BLANK

 SPECIAL : BLANK

IDLH : none

TEEL-1 : 0.3 mg/m³

TEEL-2 : 0.8 mg/m³

TEEL-3 : 35 mg/m³

OTHER INFO: TOXIC BY INHALATION
ABSORPTION, & INGESTION; HEAVY GAS; SLIGHTLY
SOLUBLE IN WATER; RQ = 1 lb; EHS CHEMICAL; etc.

Chemical Name : PROPYLENE OXIDE

CAS # : 75-56-9

UN/NA# : 1280

NFPA RATINGS:

 FIRE : 4

 HEALTH : 3

 REACTIVE : 2

 SPECIAL : blank

IDLH : 400 ppm

ERPG-1 : 50 ppm

ERPG-2 : 250 ppm

AEGL : YES

OTHER INFO: FLAMMABLE OVER A WIDE
RANGE; VAPORS HEAVIER THAN AIR; EHS CHEMICAL;
TOXIC BY INHALATION AND INGESTION; etc.

EXERCISE:

Question 1: Review the Text Summary. What is different from previous versions of ALOHA?

Answer 1: Notice 3 “default” LOC values are offered, and are “TEEL” values. Previous version of ALOHA offered only 1 default LOC that was based on IDLH.

Question 2: What are the “preset” LOC values available for Butane? Are any of those values the UEL or LEL? Where do you find the UEL and LEL values?

Answer 2: The preset values are the 3 TEEL levels.
For more information on TEEL definition and methodologies, use the ALOHA Help menu, and the CAMEOfm Help menu Glossary.

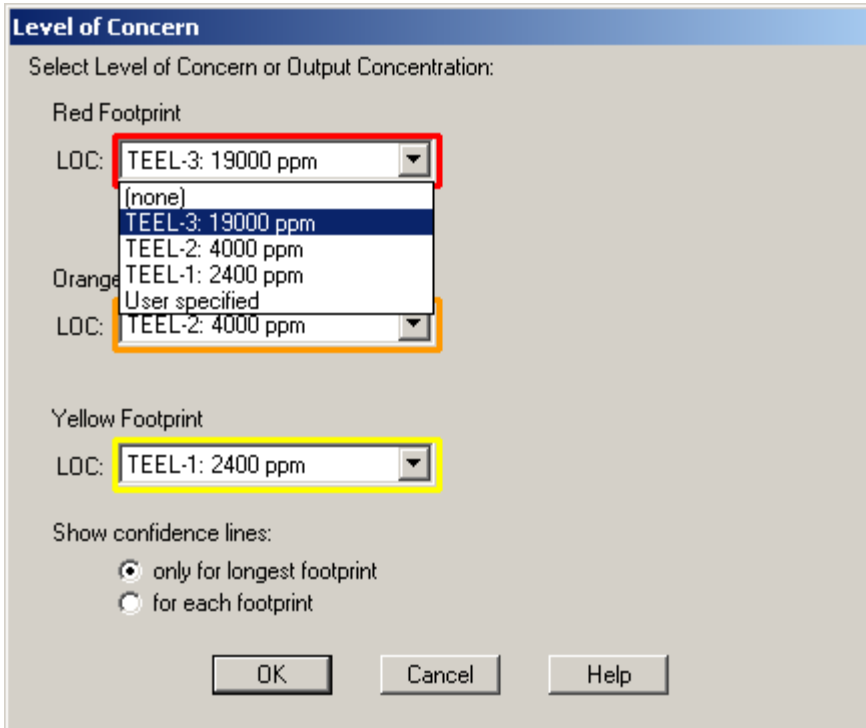
To discover if any of the TEEL values are related to UEL / LEL, you must first obtain the UEL / LEL values from the CAMEOfm Chemical Library. For Butane, the values are:

LEL: 1.9%
UEL: 8.5%

It does turn out that TEEL-3 is 19,000 ppm, which is the same value as the LEL (1.9%) for Butane. It is not unusual for IDLH, ERPG, or TEEL values to be related to LEL values for Flammable substances.

Question 3: Can you set the LOC values to UEL and LEL using the Display menu?

Answer 3. Yes. Click on the “down arrow” for any of the LOC boxes; ALOHA allows both “user specified” and “none”.



Question 4: All ALOHA LOC values must be expressed as a “concentration”. Is % a “concentration”? Is % offered as a “unit” type for ALOHA LOC values? How can you “convert” % to ppm?

Answer 4. % is a concentration value, just like ppm and mg/m³ are concentration values. However, % is NOT offered as an ALOHA “unit” for LOC input. Conversion of % to ppm is:

$$1\% = 10,000 \text{ ppm}$$

Thus:

$$1.9\% * 10,000 \text{ ppm/percent} = 19,000 \text{ ppm}$$

$$8.5\% * 10,000 \text{ ppm/percent} = 85,000 \text{ ppm}$$

Question 5: Set the ALOHA LOC values as:

*Red Footprint: UEL
Orange Footprint: LEL
Yellow Footprint: 10% LEL*

Display the resulting footprint on MARPLOT.

*Open a new MARPLOT Layer; use the “polygon” tool to “draw” the LEL area while excluding the UEL area. This ALOHA’s “predicted” potential ignition zone. **For safety purposes, you may elect to use 10% LEL instead.***

Use the MARPLOT Layer List to “Hide” the ALOHA Footprints. Your drawn “ignition zone” should be displayed.

Answer 5.

Red Footprint: UEL = 85,000 ppm
Orange Footprint: LEL = 19,000 ppm
Yellow Footprint: 10% LEL = 1,900 ppm

Level of Concern
Select Level of Concern or Output Concentration:

Red Footprint
LOC: User specified 85000
ppm (selected)
milligrams/cubic meter
milligrams/liter
grams/cubic meter

Orange Footprint
LOC: User specified 19000
ppm (selected)
milligrams/cubic meter
milligrams/liter
grams/cubic meter

Yellow Footprint
LOC: User specified 1900
ppm (selected)
milligrams/cubic meter
milligrams/liter
grams/cubic meter

Show confidence lines:
only for longest footprint (selected)
for each footprint

OK Cancel Help

Image with ALOHA Footprints displayed

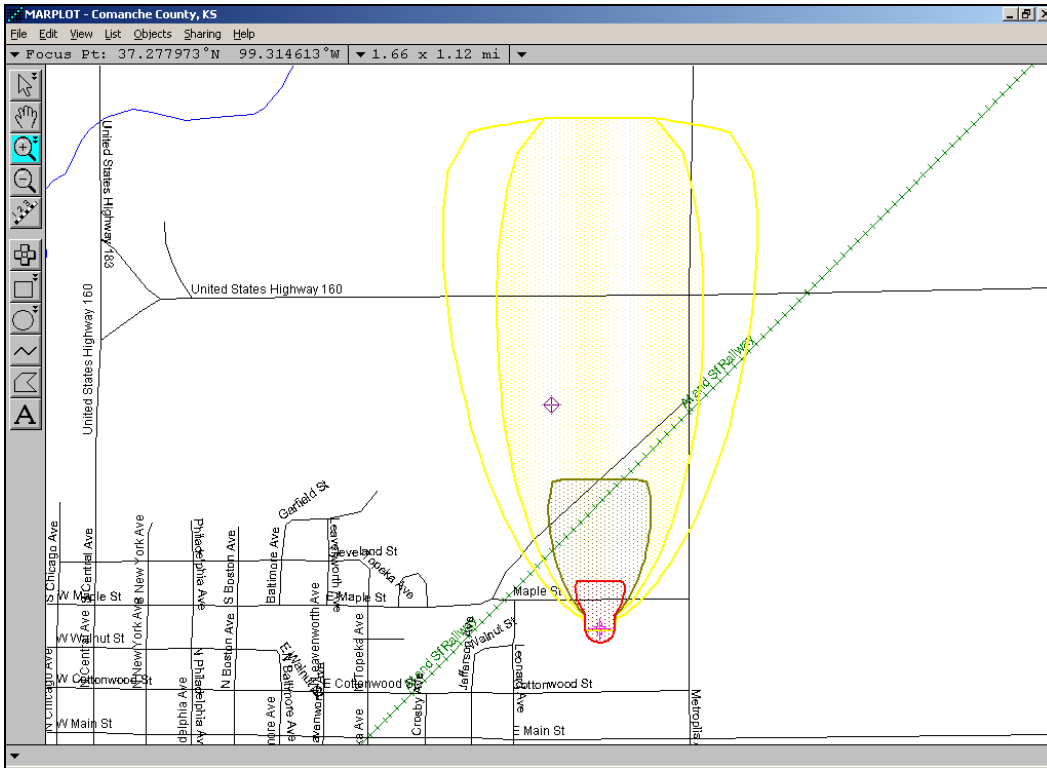


Image with ALOHA Footprints & User-Drawn Zone displayed

