ALOHA

Areal Location of Hazardous Atmospheres

- **Open up ALOHA**
  - Developed by the Office of Emergency Management (EPA) Environmental Protection Agency
  - And the Emergency response Division (NOAA) National Oceanic and Atmospheric Administration.

- **Limitations of ALOHA**.
  - It is unreliable when these conditions exist
  - Very Low Wind Speeds.
  - Stable Atmospheric Conditions.
  - Concentration Patchiness, particularly close to the source.

    IT DOES NOT INCORPORATE THE EFFECTS OF >

  - Chemical Reactions
  - Particulates
  - Chemical Mixtures
  - Terrains
  - Hazardous Fragments

    (**CLICK OK to Acknowledge this**)

- **Click on Site Data**
  - **Click on Location** -this opens another box that gives you Cities and States, not all cities are listed here so you may have to pick one that is close to your location.
  - Highlight Cincinnati, Ohio and hit Select. It should return you to the Text Summary screen and show Cincinnati, Ohio as the location.

➢ **Click on Site Data**
   o Click on Building type- This will take you to the Building Infiltration parameters box.
   o Click on the HELP BOX to show more info for these selections.
   o Use building types that are common to the chosen city.
   o Select either sheltered or unsheltered surroundings. *If you are not sure click the help button.*

➢ **Click on Date and Time under Site Data**.
   o Use the internal clock which is for current events that could be happening.
   o Select constant time for pre planning events.

➢ **Click on SET-UP**
   o Select Chemical-this opens up Chemical Information box.
   o Highlight Bromine and Select it. *You can quickly type the first 2 letters of the chemical which helps find it faster.*

You will notice on your text summary screen it gives you some other information about Bromine..

➢ **Click on Set-up**
   o **SAM Station**- *We will not use this but if you had your computer hooked to a SAM station it would enter this data automatically.*
   o **Select Atmospheric**- *we will use* **USER INPUT**

This takes you to the Atmospheric Options screen when you click on it.

   o **Wind speed**- if you know the wind speed you can enter it , but if it is not available you can click on the **Help button** in that section.

Estimating Wind Speed from Environmental Clues

(using the Beaufort Scale of Wind Force)

Meters Per Second	Knots (1 knot = 1.15 miles per hour)	International Description	Specifications
<1	<1	Calm	Calm; smoke rises vertically
<1-2	1-3	Light air	Direction of wind shown by smoke drift, but not by wind vanes
2-3	4-6	Light breeze	Wind felt on face; leaves rustle; ordinary vane moved by wind
4-5	7-10	Gentle breeze	Leaves and small twigs in constant motion; wind extends light flag
5-8	11-16	Moderate	Raises dust, loose paper; small branches are moved
8-11	17-21	Fresh	Small trees in leaf begin to sway; crested wavelets form on inland water
11-14	22-27	Strong	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty
14-17	28-33	Near gale	Whole trees in motion; inconvenience felt walking against wind
17-21	34-40	Gale	Breaks twigs off trees; generally impedes progress

Note: No specific **wind reference height** is associated with the wind speeds shown in the table.

Wind speed must be greater than 2.3 MPH and less than 134 MPH.

➤ **Wind direction**
- o Here you can enter the direction using N,E, NE, etc.
- o Here you can enter the degrees 0 – 360 if you know this information. _**Select the Help button to see how the values for degrees true correspond to the letter values for wind direction.**_

➢ **Measurement height**- We will leave this alone for all of our classes; we use 3 meters because that is down where the workers are at.

➢ **Ground roughness**- These selections are based on where the spill is and where it is headed.

  o Open Country
  o Urban Or Forest
  o Water

➢ **Cloud cover**- which has 5 different options. *If you are unsure you can hit the help button for further information.*

When you have this information entered click O K and it will take you to the Atmospheric Options 2 box.

➢ **Air Temperature**
  o Enter the temperature either in Fahrenheit or Celsius

➢ **Stability class -(DO NOTHING HERE)** *This is automatically generated using the information we have already entered.*

➢ **Inversion Height**- Does anyone know what Inversion Height is?

An inversion is an atmospheric condition in which an unstable layer of air near the ground lies beneath a very stable layer of air above. The height of the abrupt change of atmospheric stability is called the inversion height. An inversion can trap pollutant gases below the inversion height, causing ground-level concentrations to reach higher levels than would otherwise be expected.

The type of inversion of concern for dispersion modeling is a low-level inversion that could trap a pollutant cloud near the ground. Sea smoke and low ground fog are good indicators of the presence of this type of inversion. A low-level inversion is different from the inversion that causes smog. That type of inversion is typically thousands of feet above the ground—much too high to affect a dispersing gas cloud.

  o Select No inversion

- ➢ **Humidity**-This allows you to choose 5 predetermined selections or you can enter the numerical value in percentages.
  - o Select the current humidity for the day from MARPLOT

Once you click OK it will return you to your Text Summary page.

- ➢ **Click SET UP**
  - o Move your mouse to **SOURCE**. This opens up the drop down giving you 4 more choices.
    - ▪ DIRECT
    - ▪ PUDDLE
    - ▪ TANK
    - ▪ GAS PIPELINE
  - o **Select TANK and Orientation**
    - ▪ Select a Tank orientation- *Horizontal, Vertical, or Sphere*
  - o **Enter Tank size**
    - ▪ Enter the diameter, length or volume. *If you enter 2 of the 3 values it will automatically calculate the third.*

The size of the tank for our scenario has a **diameter of 8 feet** and a length of **43 feet long**. Note: Point out that the volume was calculated once the other two values were entered.

CLICK OK

- ➢ **Chemical State and Temperature**- This is where you select if the state of the chemical.
  - o **Liquid**
  - o **Gas**
  - o **Unknown**

- ➢ **Temperature**- what is the temperature inside the tank?

- o Chemical stored at ambient temperature
- o Chemical stored at a certain temperature *(you can enter the temperature in Fahrenheit or Celsius)*

Click OK

➤ **Liquid Mass or Volume**
  - o Enter the mass in the tank (if you have that information)
  - o Enter liquid level or volume

Since we don't know what the mass is, we will assume that the tank is 100% full. **Note:** *Once you adjust the volume it will automatically calculate the mass in the tank.*

CLICK OK

➤ **Area and Type of Leak**-select the shape that best represent the shape of the opening through which the pollutant is exiting.
  - o **Opening type**
    - ▪ **Circular opening**
    - ▪ **Rectangle opening**

  - o **Opening diameter**-enter in inches, feet, centimeters, or meters

  - o **Height of the Tank Opening-**This is where we determine where the hole is on the tank.

    - ▪ Use the slider bar
    - ▪ Enter in a measurement
    - ▪ Enter a percentage

Note: *If you adjust one of these values it will automatically calculate the other values.*

Click Ok

➢ **Puddle Parameters**-

    o **Select ground type**-Select the one that best fits the situation.

    o **Ground temp**- Unless you know the ground temperature just use the Air temperature.

    o **Puddle diameter**- Select unknown (who is really going to measure it?)

Click OK

You should now be back at the Text Summary page and we see all the information that we have entered.

Note: *Point out the amount inside the tank, duration of release, sustained release rate, and puddle size.*

➢ **Click on Display**

    o **Click Threat Zone**- This opens up our Toxic Level of Concerns
        ▪ **AEGL 3**-Severe health effects including death
        ▪ **AEGL 2**- Some type of lasting or irreversible health effects
        ▪ **AEGL 1**- May show some health effects

Click OK

The Toxic Threat Zone window should now be on the screen showing us the plume cloud.

Note: *ALOHA will only project out 6 miles and a 1 hour time limit.*

Note: *Have them close out the program*

ALOHA

(Wednesday Morning)

➢ **CAMEO Chemicals exercise**

➢ **Open up ALOHA**
- o Re-enter all the data from previous days ERG plume

<u>How to save your information</u>

➢ **Click File**
- o Click Save As (this opens up another window)
- o Select Desktop (This designates where this file is going to be saved)
- o Type in the name you want to name the file and click OK

Note*: Have the participants minimize the ALOHA program to verify that their ALOHA file is saved on their desktops under an .ALO file. Once all files are verified have them close out the ALOHA program.*

➢ **Open up ALOHA again**
- o **Click file**
- o **Click open** (this opens up a response/planning mode window)
  - ▪ **Click on Planning mode**
  - ▪ **Click OK** (this opens up available files)
  - ▪ **Select the ALO file** that we just saved (Another box will open; click OK)

Note: *All the information we had saved will be back in our Text Summary page.*

<u>Leave ALOHA open</u>