Appendix A. EDMS TUTORIAL

A.1 INTRODUCTION

The purpose of this tutorial is to demonstrate the application of the Emissions and Dispersion Modeling System (EDMS). These sample scenarios are fictional and are used only to show the working of the model. Each "hands on" example problem has been included to demonstrate the many features of the EDMS model. After running the example problems, the user can check his or her results against the sample cases distributed with the EDMS software.

This document assumes a working knowledge of the Microsoft® Windows™ environment. Please refer to your Microsoft® Windows™ documentation for further guidance.

A.2 A SIMPLE EMISSIONS INVENTORY

A.2.1 Project Description

This example demonstrates the steps necessary to compute an airport emissions and dispersion inventory. For our example, we are going to look at a HAGERSTOWN REGIONAL-RICHARD A HENSON FIELD, HGR. The following tables contain all of the data necessary for the combined emissions and dispersion example. Users who are only interested in performing an emissions inventory using user-specified taxi times should ignore the data outlined in orange. **This example uses fictitious data; the results should not be used for any regulatory purposes.**

Table A-1-1: Gates

(Sequence modeling)

Gate	Point	x-coordinate	y-coordinate
FBO	1	603.67	721.78
	2	940.81	806.12
	3	918.53	1073.32
	4	1026.43	1087.88
	5	1003.01	1291.43
	6	734.13	1513.90
	7	586.88	1290.09
Main	1	-1263.12	-1053.15
	2	-716.17	-1186.54
	3	-636.83	-885.50
	4	-1187.66	-779.26

Table A-1-2: Taxiways
(Sequence Modeling)

Taxiway Name - Point	x-coordinate	y-coordinate	Elevation	Speed
A - 1	1682.23	289.86	702	17.26
A – 2	1610.27	791.08	703	17.26
A – 3	147.93	546.21	699	17.26
A – 4	-475.53	345.02	695	17.26
A – 5	-3525.21	-149.66	664	17.26
A – 6	-3557.15	-604.85	659	
B – 1	827.13	778.09	703	17.26
B – 2	849.74	633.20	702	17.26
B - 3	898.88	169.77	699	
C – 1	382.65	1480.49	704	17.26
C - 2	-75.46	1299.21	702	17.26
C – 3	-817.62	-1427.63	687	17.26
C – 4	-771.00	-1669.95	687	17.26
C – 5	-531.41	-1742.66	689	17.26
C – 6	-393.70	-1519.03	690	
D – 1	-1053.15	223.10	682	17.26
D – 2	-979.62	-133.69	683	17.26
D - 3	-1148.75	-794.21	685	
E – 1	-2673.88	-472.44	670	17.26
E – 2	-2610.57	-763.14	671	
F – 1	-3615.49	-610.24	659	17.26
F – 2	-3559.71	-918.64	661	17.26
F – 3	-97.92	-393.38	694	
W – 1	377.45	1428.74	703	17.26
W – 2	613.68	1305.16	703	

Table A-1-3: Runways (Sequence Modeling)

Runway	X	Y	Elevation	Glide Slope
2	-393.27	-1519.03	690	3
20	382.65	1480.49	704	3
9	-3615.49	-610.24	659	3
27	1682.23	289.86	702	3

Table A-1-4: Buildings (Dispersion)

Building	Height(ft)	Point	x-coordinate	y-coordinate
Top Flight Airpark	46	1	-85.30	-1896.33
		2	692.61	--2083.34
		3	909.15	-1271.64
		4	538.06	-1166.65
		5	571.99	-924.14
		6	344.49	-875.19
		7	360.89	-622.83
		8	255.91	-587.01
Hangars	32.81	1	-835.02	1167.98
		2	-403.47	1000.66
		3	-85.22	1613.56
		4	-669.29	1810.41

A.2.2 Procedures

Start EDMS by selecting EDMS from the Programs group in the start menu. If you are unfamiliar with the use of the mouse, icons, menus, or program groups, please refer to your Windows™ documentation.

A.2.3 Setting up the study

We will begin the tutorial by creating a new study, and entering basic descriptive information.

Action

When you first start EDMS, a message box will pop up with some information about the First-Order Approximation for estimating PM emissions from commercial jet-turbine aircraft engines. Click the OK button to close the message box.

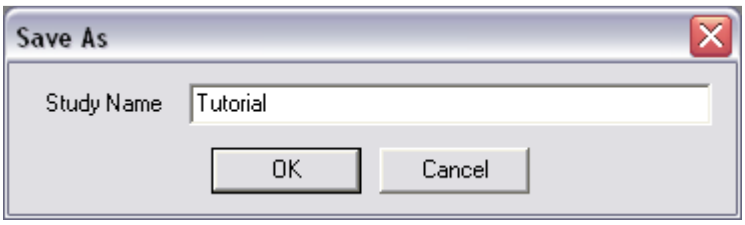
Next click on File on the menu bar in the upper left corner of the main EDMS window, and select New from the drop down menu.

Result

This brings up the Browse for Folder dialog. Here you can select where EDMS will create the directory to hold your data files.

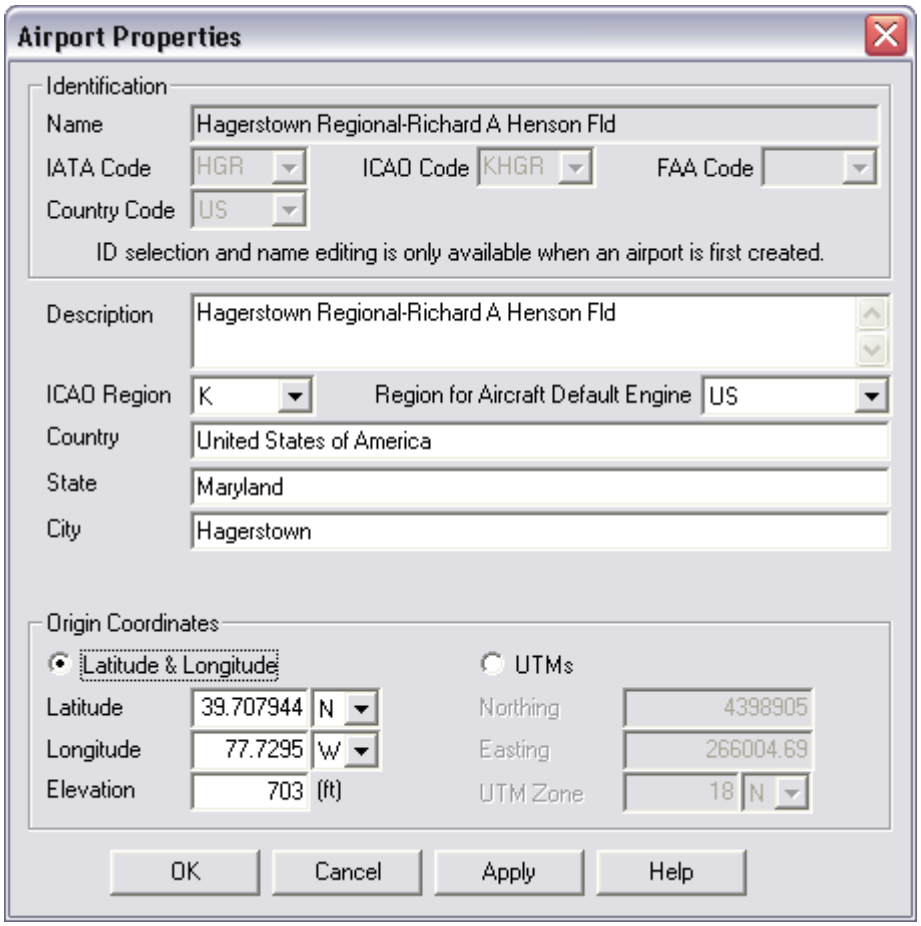
1. Select the directory where you wish to create your new study with its own subdirectory, then Press OK.

As with any Windows™ file selection box, you can choose where you wish to save your files.

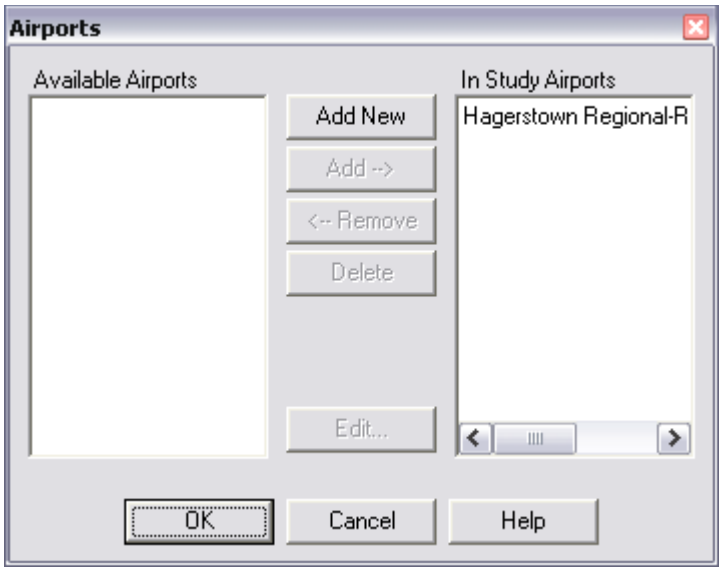


2. Type “Tutorial” in the Study Name box, and then press OK.

This action creates a directory called Tutorial at the selected location. All information relevant to the study will be saved under this directory. It also opens the Airport Properties dialog, because every study must have at least one airport defined.

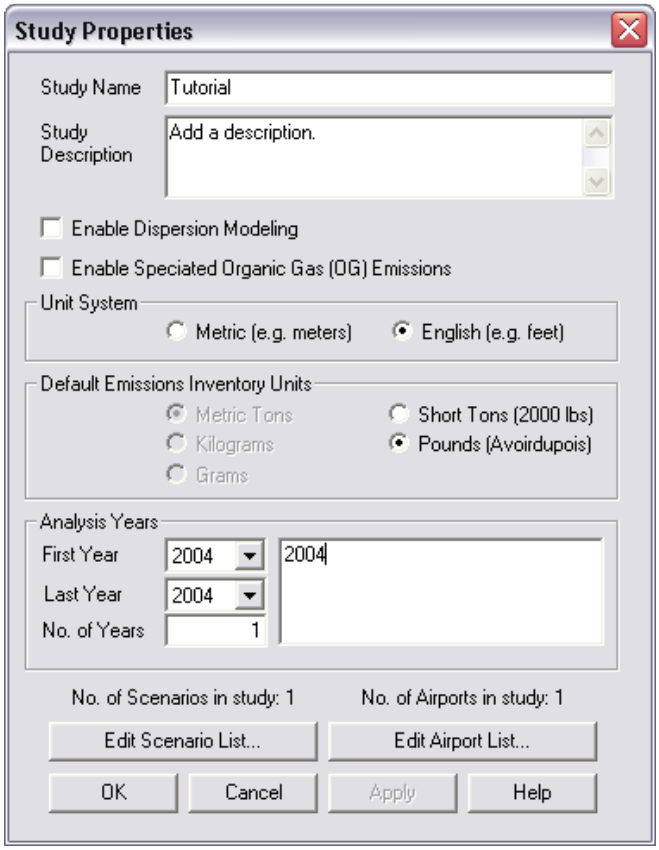


3. Type or select “HGR” in the IATA Code drop down list box.	This will be a fictitious sample of Hagerstown Regional-Richard A. Henson field in Maryland. This loads the default information for the selected airport.
4. Select US in the Region for Aircraft Default Engine.	This sets the default engine type for the airframe on the Aircraft Operations & Assignments dialog.
5. Press OK to remember the selected airport.	This closes the Airport Properties dialog and indicates the intention to save the airport, but the airport is not yet added to the study. It also opens the Airports dialog.



6. Press OK to remember the airport.

This closes the Airports dialog and indicates our intention to save the airport. It also opens the Study Properties dialog. If we intended to have more than one airport, we would press the Add New button now, and would return to the Airport Properties dialog. Our airport still has not been saved, but remains in memory.



7. The Study Properties dialog comes up in the state shown above. The default year is the current calendar year. Select English in the Unit System box.

The selected unit system will be used for all dialogs and reports, except for Stationary Sources, where the units depend on the source. Also, when viewing emissions we can override the units being used for the display.

8. Select English for the units.

The default units for displaying the emissions inventory results will be pounds.

9. Set the Last Year to 2004.

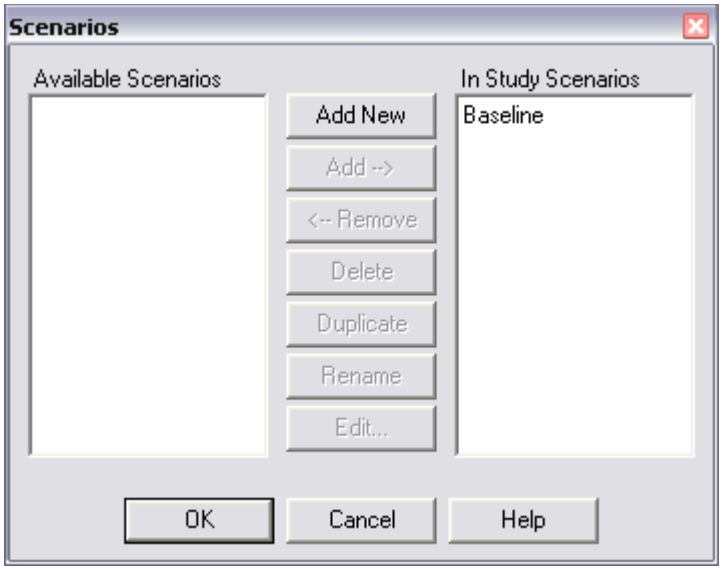
This will also force the First Year to be 2004, since the First Year is always less than or equal to the Last Year, and will change the year in the text box to be 2004 as well. Alternatively, we could have edited the 2007 in the text box to be 2004 with the same result.

10. Enter “Sample Emissions & Dispersion Study” into the Study Description field.

This field will be remembered here and will appear on some reports.

11. Press Edit Scenario List.

This opens the Scenarios dialog.

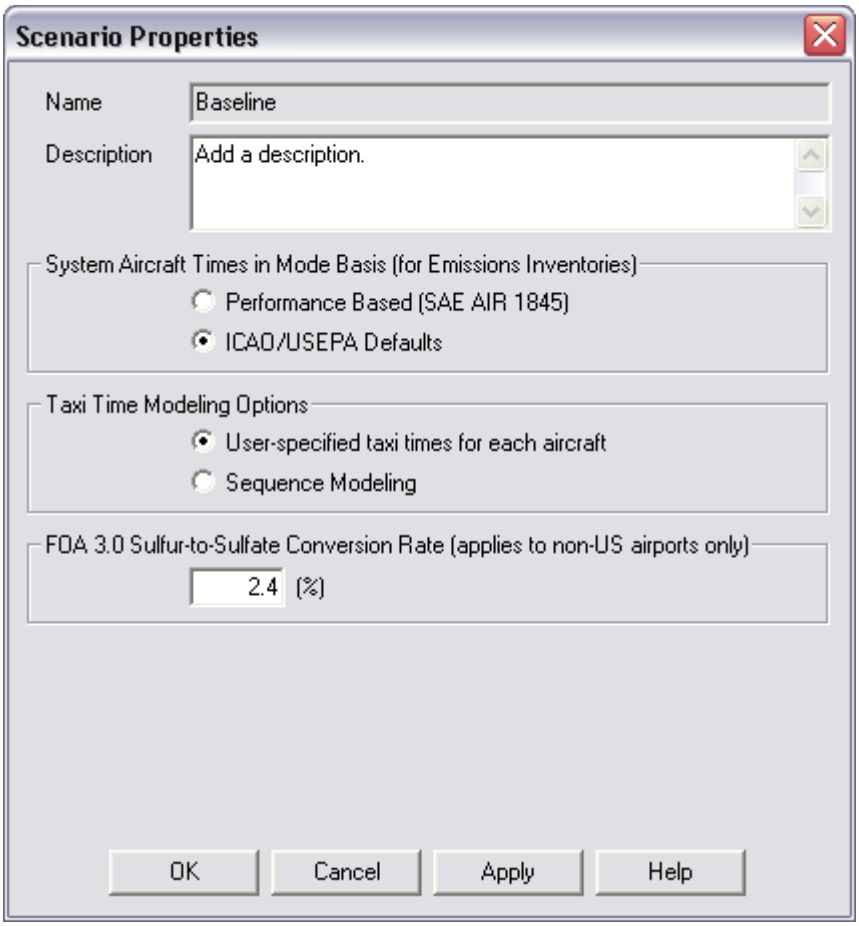


12. Select the scenario Baseline in the In Study Scenarios list.

Baseline is the name of the default scenario created when a new study is created. Selecting a scenario in the In Study Scenarios list activates the Duplicate, Rename and Edit buttons. If there is more than one scenario in the list it also actives the Remove button.

13. Press Edit.

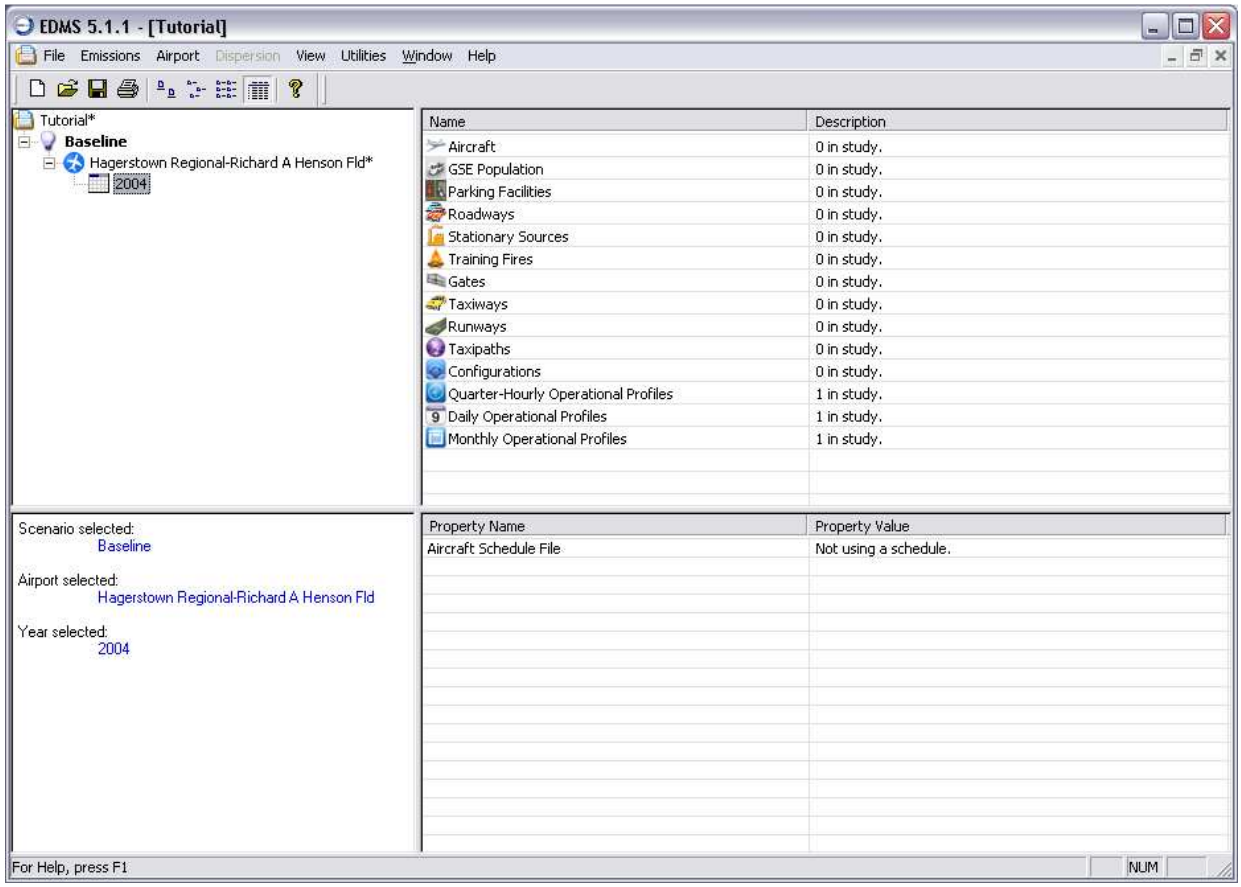
This opens the Scenario Properties dialog for the scenario Baseline.



14. Select ICAO/USEPA Defaults in the System Aircraft Times in Mode Basis box.	EDMS will read the times in mode from a table, rather than compute them dynamically.
15. Press the OK button.	Remember the change in Scenario options and close the Scenario Properties dialog.
16. Press the OK button on the Scenarios dialog.	Remember any changes to Scenarios and close the Scenarios dialog.
17. Press the OK button on the Study Properties dialog.	Closes the Study Properties dialog and finally applies all the changes made to airports and scenarios.

A.2.4 Adding Aircraft

For each of our sources, we must first provide EDMS with information to compute the emissions inventory. We begin by matching engines with aircraft and assigning them to the study.



Action

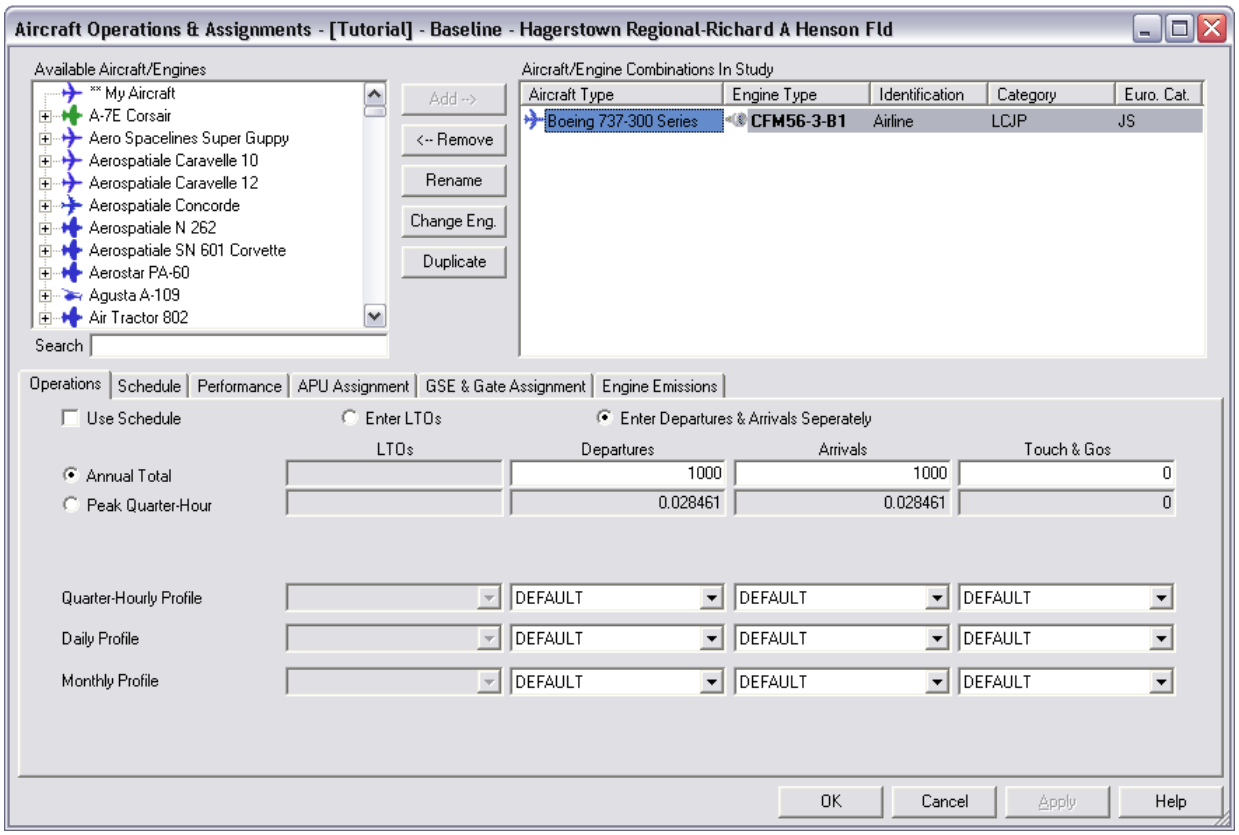
1. Select the year 2004 in the study tree in the left pane of the main study window.

2. Select *Aircraft* from the *Emissions* menu.

Result

EDMS knows to associate any data now entered to the Baseline scenario, Hagerstown Airport and year 2004 in whatever combination is appropriate to the data.

This brings up the *Aircraft Operations & Assignments window* with the Operations tab activated, which allows you to specify information about the aircraft included in the study, their associated activity rates, and their associated ground support equipment.



3. For each aircraft-engine combination to be added to the study, click on the + to the left of the aircraft to reveal the list of engines, then double-click on the engine (or select the engine and press the *Add* button) to add it. Provide identification by double-clicking the *Identification* field (or right-clicking and selecting *Rename*) and then typing the desired text.

   Since EDMS allows you to enter the same aircraft-engine combination more than once in a study, it is important to provide descriptive identifications.

   We will be using the aircraft-engine pair shown on the screen above for the tutorial. There are often multiple engines available for each aircraft type. For this tutorial it is important to use the engines shown.

4. After adding each aircraft, enter the number of yearly operations shown (*Departures*, *Arrivals*, and *Touch & Gos*) in the figure above.

   If the departure and arrival data for the aircraft are the same, we can select *Enter LTOs* and enter that operational information for the aircraft once. If after applying and closing the *Aircraft Operations and Assignments* dialog, we subsequently return to the dialog, we will see that the selection has returned to *Enter Departures & Arrivals Separately*.

5. We are not using a schedule file, so we can skip the *Schedule* tab. We will use the defaults on the all the other tabs, so we can skip those as well.

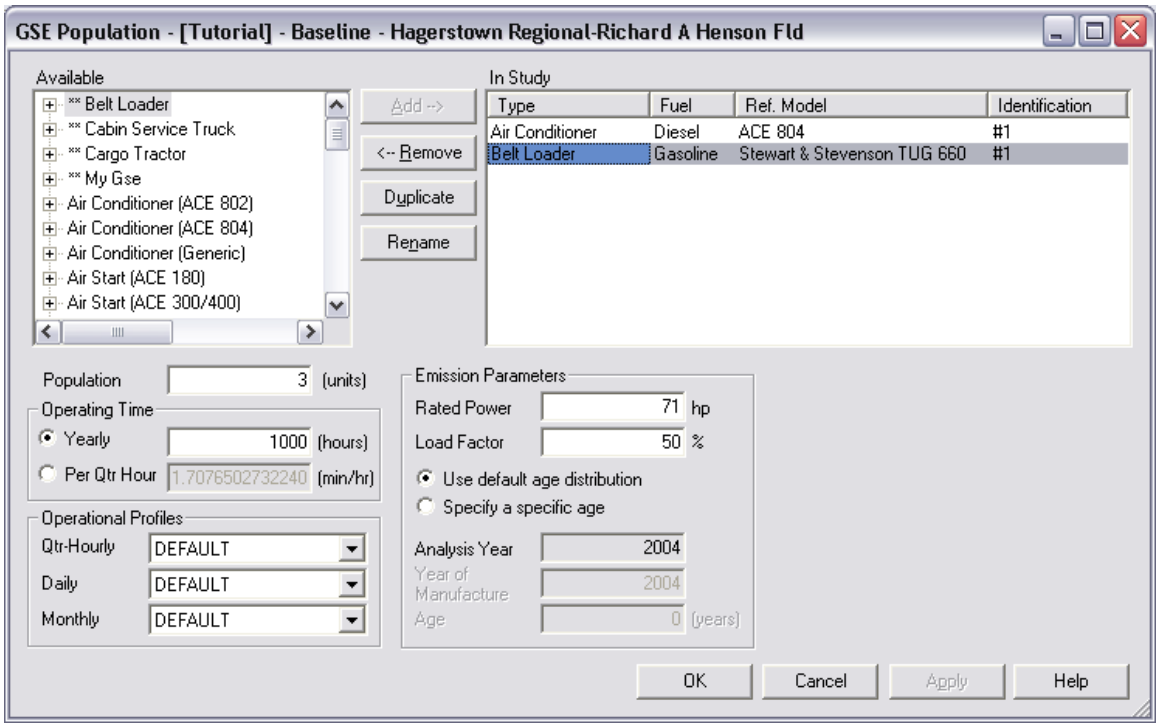
   Aircraft operations and assignments are complete.

6. Press OK apply all the aircraft data.	The Aircraft Operations & Assignments dialog will close.

A.2.5 GSE Population

We are going to add some GSE that are not assigned to aircraft to our airport.

Action	**Result**
1. Select *GSE Population* from the *Emissions* menu.	This brings up the *GSE Population* dialog where you can add GSE that are not assigned to specific aircraft types.
2. Click the + to the left of Air Conditioner (ACE 804).	This will expand the Air Conditioner to show its fuel options.
3. Select Diesel as the Air Conditioner's fuel.	This selection activates the *Add* button.
4. Press *Add.*.	The Diesel air conditioner is provisionally (the user can *Cancel*) added to the study. Its Identification field is ready to edit.
5. Press Enter to accept the default identification.	This leaves the air conditioner selected.
6. Change the Population to 5, and the Yearly Operating Time to 500 hours.	This sets the air conditioner's operational usage.
7. Click the + to the left of Belt Loader.	This will expand the Belt Loader to show its fuel options.
8. Select Gasoline as the Belt Loader's fuel.	This selection activates the *Add* button.
9. Press *Add.*.	The gasoline belt loader is provisionally added to the study. Its Identification field is ready to edit.
10. Press Enter to accept the default identification.	This leaves the belt loader selected.
11. Change the Population to 3, and the Yearly Operating Time to 1000 hours.	This sets the belt loader's operational usage.
12. Press *OK*. See the figure below for completed window.	The changes are all applied and the GSE Population dialog closes.



A.2.6 Parking Facilities

We are now going to include one parking facility in our tutorial with an annual traffic flow of 75,000 vehicles and an average speed of 10 mph.

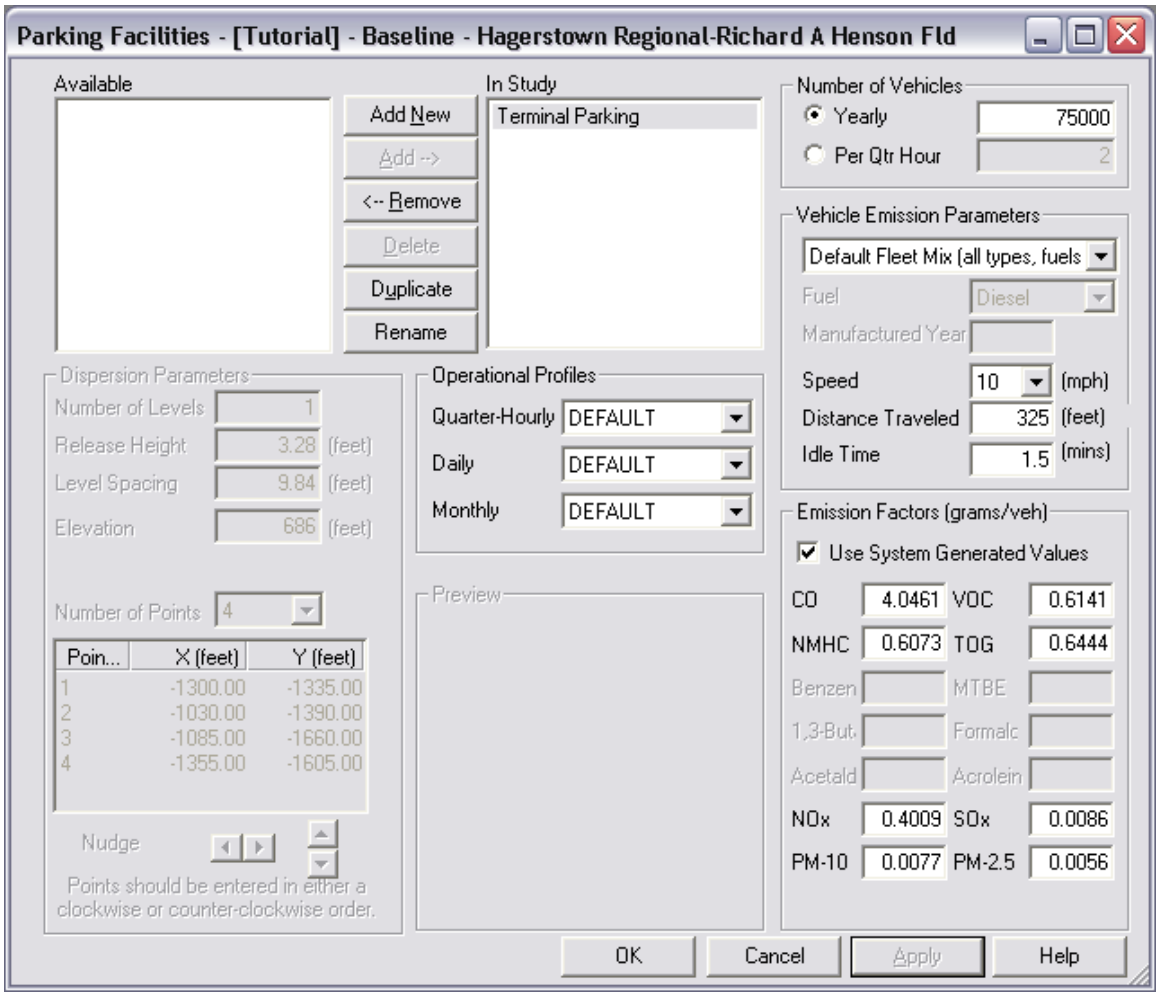
Action	**Result**
1. Select *Parking Facilities* from the *Emissions* menu.	This brings up the *Parking Facilities* window where we will specify all of the information about our parking lot.
2. Press *Add New* and create a new parking facility. Change the name to "Terminal Parking".	The default name for the new facility is Parking.
3. Set the *Yearly Number of Vehicles* to 75000.	This means that during the course of the entire year 75,000 vehicles will use the parking facility. The *Peak Qtr Hour* number of vehicles is automatically computed.
4. Set the *Speed* in the parking lot to 10 mph.	The speed of the traffic within the lot affects the emissions factors.
5. Leave the average *Idle Time* set to 1.5 minutes and set the average *Distance Traveled* in the lot to 325 feet.	The idle time and distance traveled also help determine the emissions.
6. Check the *Use System Generated Values* checkbox.	This tells EDMS that it should compute emission factors using MOBILE. Alternatively, we could have filled in emission factors manually.

Action

7. Press *OK*. See the figure below for completed window.

Result

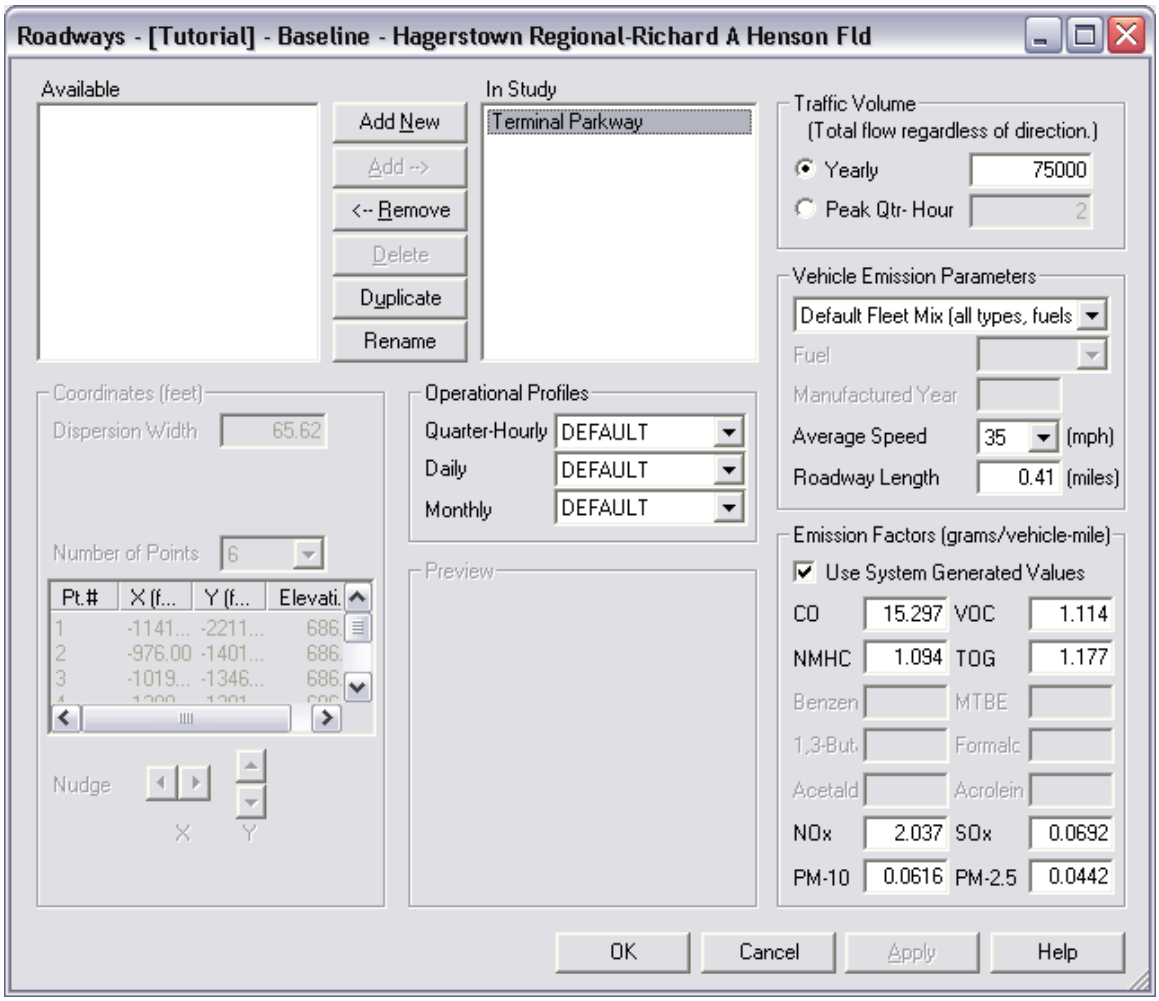
Since we have Use System Generated Values checked, this triggers the MOBILE calculation. Once MOBILE finishes, this saves the parking lot information and closes the window.



A.2.7 Roadways

We are now going to add an access road to the airport that will go around the parking lot and pass in front of the main terminal we will be adding later on.

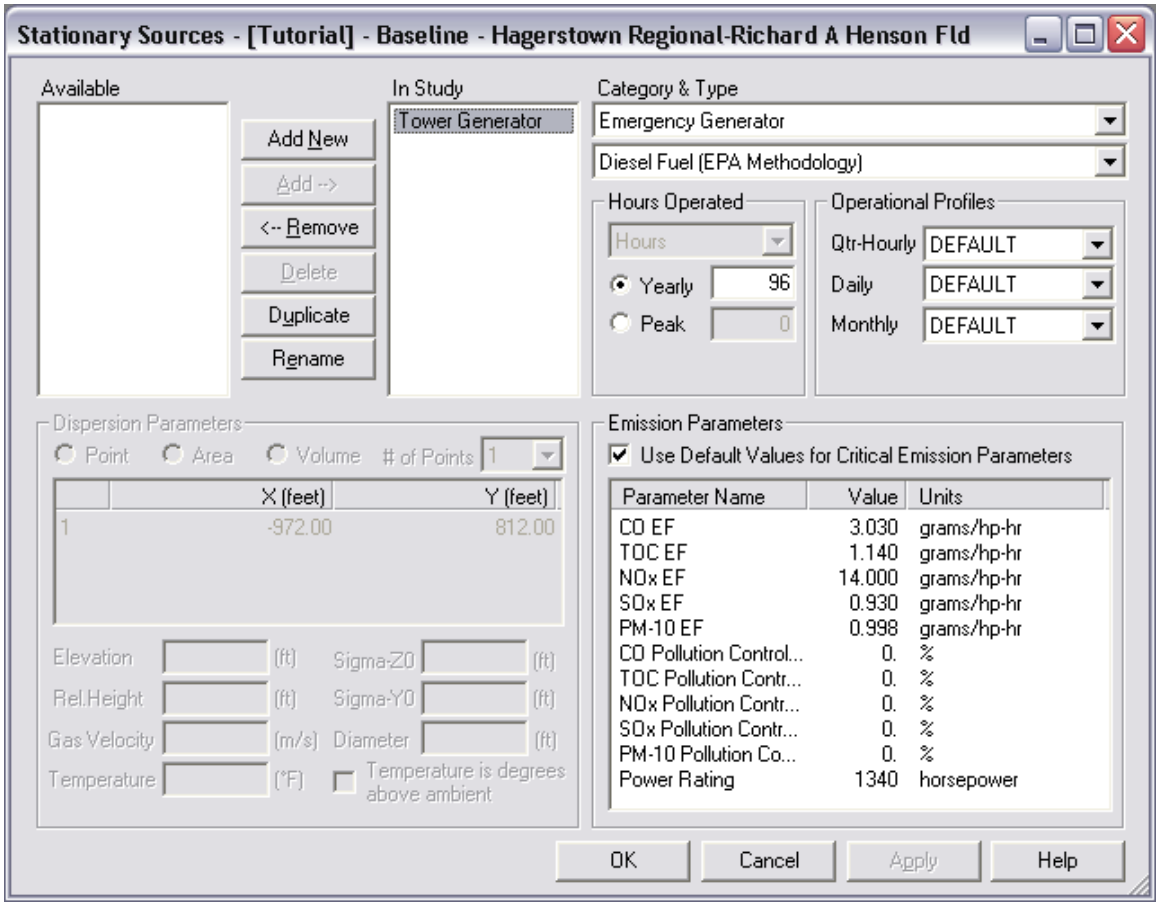
Action	**Result**
1. Select *Roadways* from the *Emissions* menu.	This brings up *Roadways* dialog, which is very similar to the *Parking Facilities* dialog.
2. Click *Add New* button and add a new roadway called "Terminal Roadway".	This will be our only road to and from the airport.
3. Set the Yearly number of vehicles to 75000, the Speed of vehicles on the roadway to 35.	These are required for computing an emissions inventory and as before the peak quarter hour value will be computed automatically.
4. Enter 0.41 miles for the *Roadway Length*.	This is needed for to compute the emission factors.
5. Check the *Use System Generated Values* checkbox.	This tells EDMS that it should compute emission factors using MOBILE. Alternatively, we could have filled in emission factors manually.
6. Press *OK*. See the figure below for completed window.	Since we have Use System Generated Values checked, this triggers the MOBILE calculation. Once MOBILE finishes, this saves the roadway information and closes the window.



A.2.8 Stationary Sources

We are going to add a natural gas Emergency Generator for our airport. We are assuming that it has been in use for 96 hours in the year.

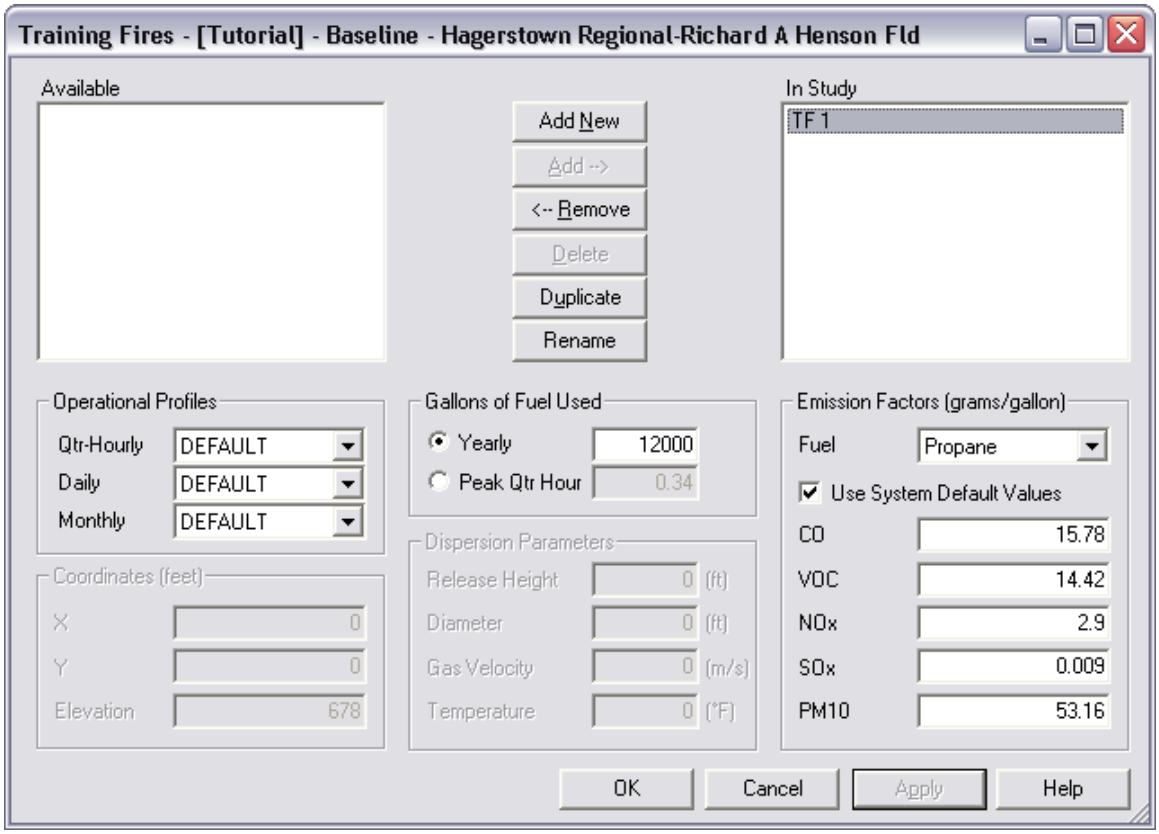
Action	**Result**
1. Select *Stationary Sources* from the *Emissions* menu.	This brings up the *Stationary Sources* dialog where you can add emissions information about stationary sources.
2. Click *Add New* button and add a new source called "Tower Generator" of category Emergency Generator.	This will be our airport Emergency Generator.
3. Select Type: Diesel Fuel (EPA Methodology).	The emission rates for this source type are expressed in grams/hp-hr and are displayed on the lower right.
4. Enter the *Yearly Hours Operated* as 96 hours, and press *Apply*.	Our generator will be added to the list.
5. Press *OK*. See the figure below for completed window.	The *Stationary Sources* dialog closes.



A.2.9 Training Fires

We are now going to add a training fire that burns 12,000 gallons of propane during the course of an entire year. .

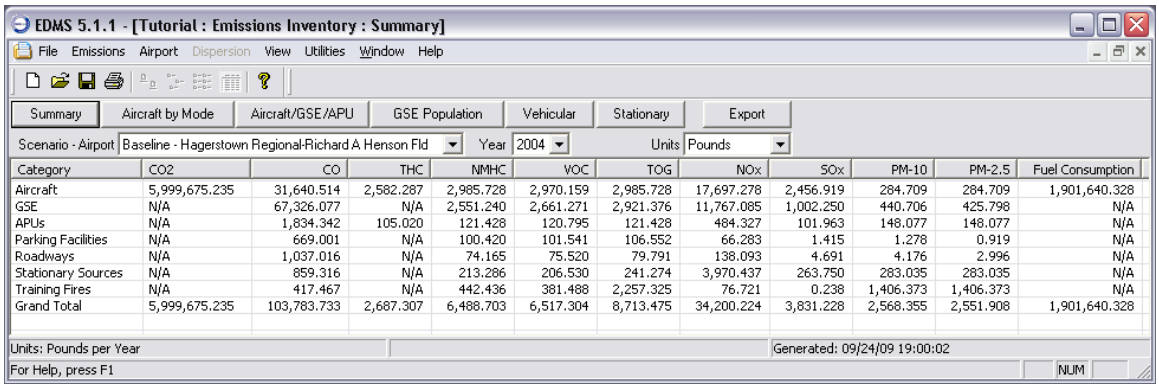
Action	**Result**
1. Select *Training Fires* from the Emissions menu.	This brings up the Training Fires window.
2. Add a new training fire called "TF 1", with a *Fuel* type of Propane, and *Yearly Gallons of Fuel Used* 12000.	We are specifying that a total of 12,000 gallons of fuel used will be used over the course of an entire year. As before, the peak quarter hour value will be computed automatically but this value will not be used for the emissions inventory.
3. Press *OK*. See the figure below for completed window.	The values are applied, and then the Training Fires dialog is closed.



A.2.10 Emissions Results

At this point all of the inputs necessary for the emissions inventory have been entered into the program. We are ready to run the emissions inventory for the scenario. You can compare the results you obtained against the scenario provided with the software.

Action	**Result**
1. Select *Update Emissions Inventory* from the *Emissions* menu.	This should run quickly, since our scenario is not very detailed. A window will appear when the emissions inventory is complete. The results will appear automatically and should be identical to those as shown below.



Category	CO2	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5	Fuel Consumption
Aircraft	5,999,675.235	31,640.514	2,582.287	2,985.728	2,970.159	2,985.728	17,697.278	2,456.919	284.709	284.709	1,901,640.328
GSE	N/A	67,326.077	N/A	2,551.240	2,661.271	2,921.376	11,767.085	1,002.250	440.706	425.798	N/A
APUs	N/A	1,834.342	105.020	121.428	120.795	121.428	484.327	101.963	148.077	148.077	N/A
Parking Facilities	N/A	669.001	N/A	100.420	101.541	106.552	66.283	1.415	1.278	0.919	N/A
Roadways	N/A	1,037.016	N/A	74.165	75.520	79.791	138.093	4.691	4.176	2.996	N/A
Stationary Sources	N/A	859.316	N/A	213.286	206.530	241.274	3,970.437	263.750	283.035	283.035	N/A
Training Fires	N/A	417.467	N/A	442.436	381.488	2,257.325	76.721	0.238	1,406.373	1,406.373	N/A
Grand Total	5,999,675.235	103,783.733	2,687.307	6,488.703	6,517.304	8,713.475	34,200.224	3,831.228	2,568.355	2,551.908	1,901,640.328

The values listed in this table should correspond to the values on your screen. If they do not, please check your inputs against those listed in the example.

A.2.11 Speciated Hydrocarbons

EDMS can also generate emissions for speciated hydrocarbons.

Action	**Result**
1. Right-click on the study name "Tutorial" in the study tree and select *Study Properties* on the popup menu.	This brings up the *Study Properties* dialog for the Tutorial study.
2. Check the *Enable Speciated Hydrocarbons* checkbox.	This allows EDMS to calculate emissions for Speciated Hydrocarbons
3. Press *OK*.	This applies the changes made to this dialog and closes it.
4. Select the year 2004 in the study tree in the left pane of the main study window.	We lost this selection when we opened the *Study Properties* dialog.
5. Select *Update Emissions Inventory* from the *Emissions* menu, to re-run the emissions.	The emissions inventory window will open. In addition to the emissions calculated before, there are additional speciated hydrocarbons emissions. Scroll the horizontal bar to the right to view all the pollutants.

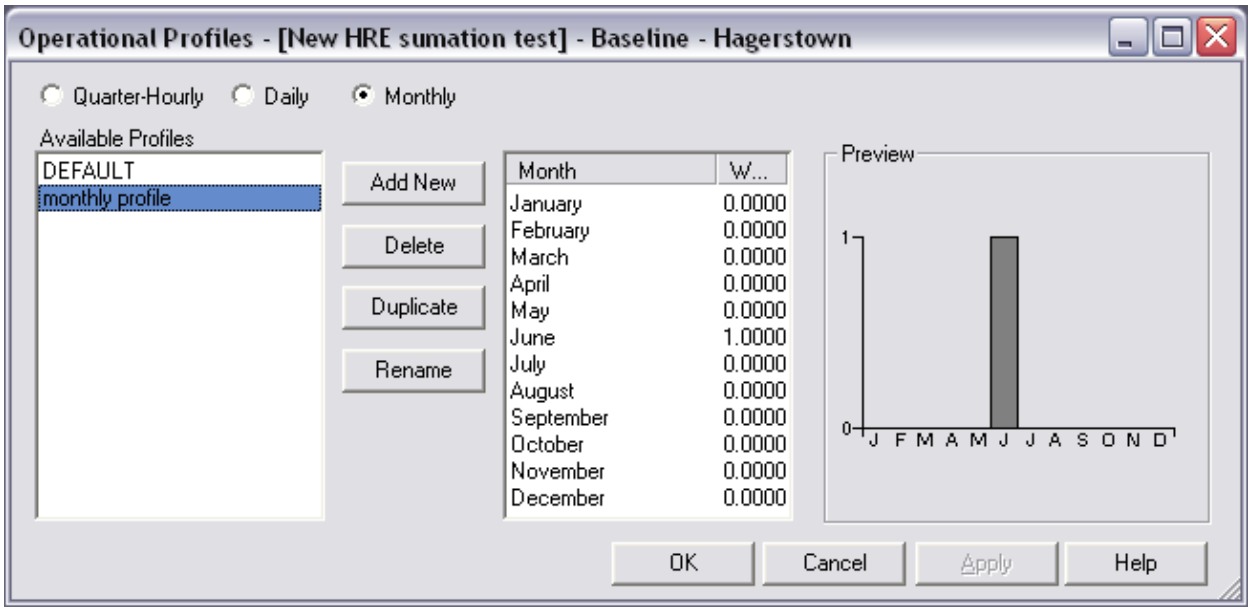
A.3 A MORE DETAILED EMISSIONS INVENTORY

A.3.1 Changing Scenario Options

Action	**Result**
1. Right-click on the scenario name "Baseline" in the study tree and select *Scenario Properties* on the popup menu.	This brings up the *Scenario Properties* dialog for the Baseline scenario.
2. Change the options to *Performance Based* and *Sequence Modeling*.	This changes the way EDMS will compute aircraft performance and taxi times from lookups do dynamic calculations.
3. Press *OK*.	This applies the changes made to this dialog and closes it.
4. Select the year 2004 in the study tree in the left pane of the main study window.	We lost this selection when we opened the *Scenario Properties* dialog.

A.3.2 Operational Profiles

Action	**Result**
1. Select *Operational Profiles* from the *Utilities* menu.	This brings up the *Operational Profiles* window.
2. Select the Monthly radio button.	This displays the list of existing monthly profiles for the selected scenario-airport combination in the Available Profiles lists. There is always at least one profile named DEFAULT.
3. Select the Add New button to create a new monthly profile.	The newly created profile is ready to have its default name edited and has an initial distribution of 1 for each month.
4. Press Enter to accept the default name.	



5. Double-click on the January Weight. Type "0" and press Enter. Continue entering the other values in the profile as shown.

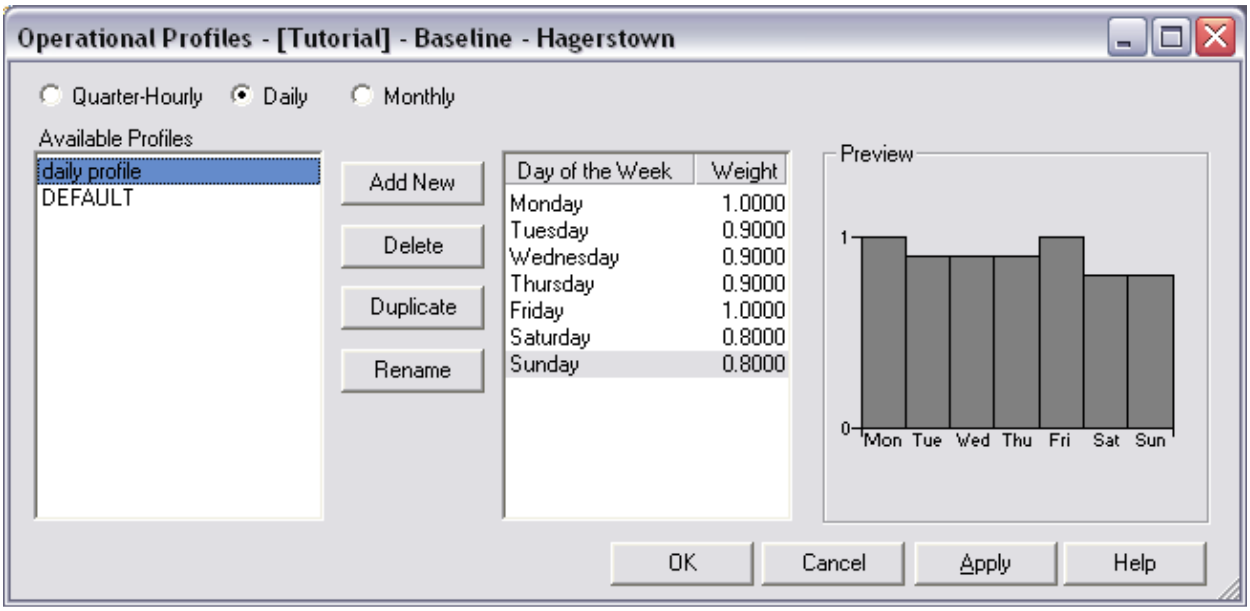
   The monthly profile is defined. We are restricting the time to reduce the execution time for dispersion.

6. Click the Daily radio button.

   Daily profiles are now displayed in the Available Profiles list.

7. Press the Add New button to create a new daily profile.

   The newly created profile is ready to have its default name edited and has an initial distribution of 1 for each day.



8. Double-click on the Tuesday Weight. Type ".9" and press Enter. Continue entering the other values in the profile as shown.

   The daily profile is defined.

9. Press OK to apply the profiles.

   The dialog is closed.

A.3.3 Apply Operational Profiles to Aircraft

Action	**Result**
1. Select *Aircraft* from the *Emissions* menu.	This reopens the Aircraft Operations & Assignments dialog.
2. Select the aircraft and the *Operations* tab.	The *Operations* tab is editable.
3. Select "daily profile"from the *Daily Profile* drop-down for both Arrivals and Departures.	This changes the distribution of aircraft operations throughout the week. This can in turn alter what weather is in effect and the sequencing of ground movement, thus affecting emissions and later, dispersion.
4. Select "monthly profile"from the *Monthly Profile* drop-down for both Arrivals and Departures.	This changes the distribution of aircraft operations throughout the year. As above, this can affect emissions and later, dispersion.
5. Press *OK* to apply changes.	This also closes the dialog.

A.3.4 Setting Weather

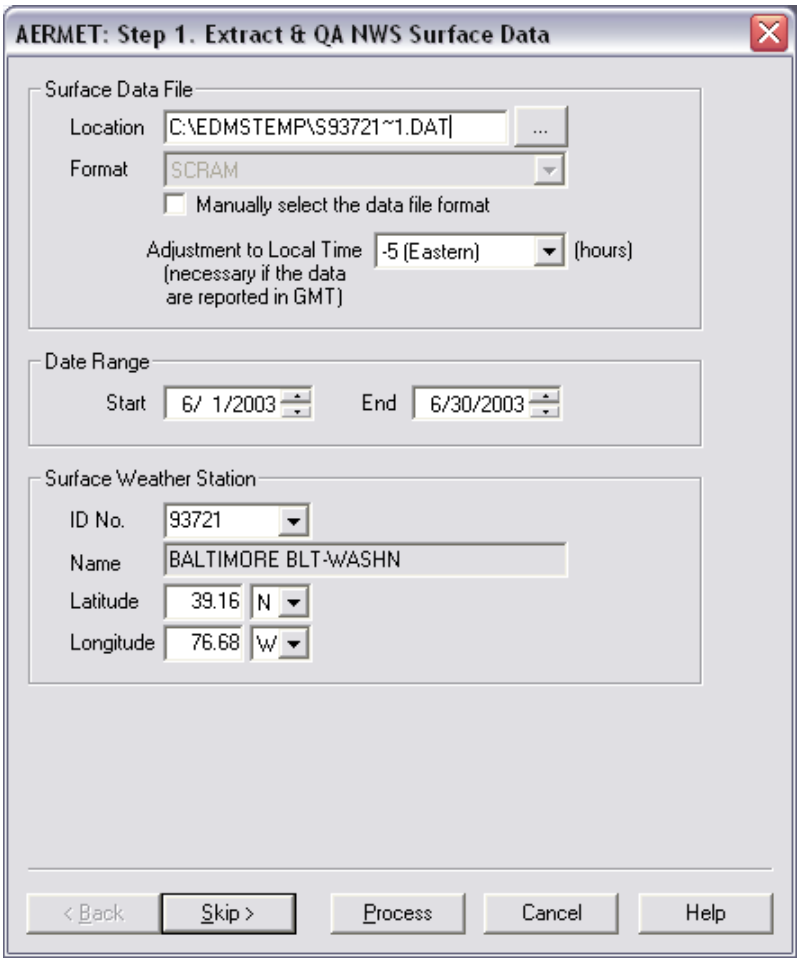
We need to use hourly weather data to get the optimal results from the aircraft performance and emissions modules, and to select active airport configurations.

Action	**Result**
1. Select *Weather* from the Airport menu.	This opens the *Weather* dialog for the Hagerstown airport.
2. Select the *Use Hourly Meteorological Data* radio button.	This tells EDMS to use historical weather data instead of average airport values.
3. Press the *AERMET Wizard* button..	This starts the *AERMET Wizard*, provides a step-by-step interface that takes surface and upper-air data and merges it for AERMOD use. EDMS also uses one of the intermediate files that AERMET generates to extract the hourly weather for use within EDMS.

A.3.4.1AERMET Wizard Step 1. Surface Weather Data

The first step in the AERMET Wizard is to extract the surface weather data that will be used in the study.

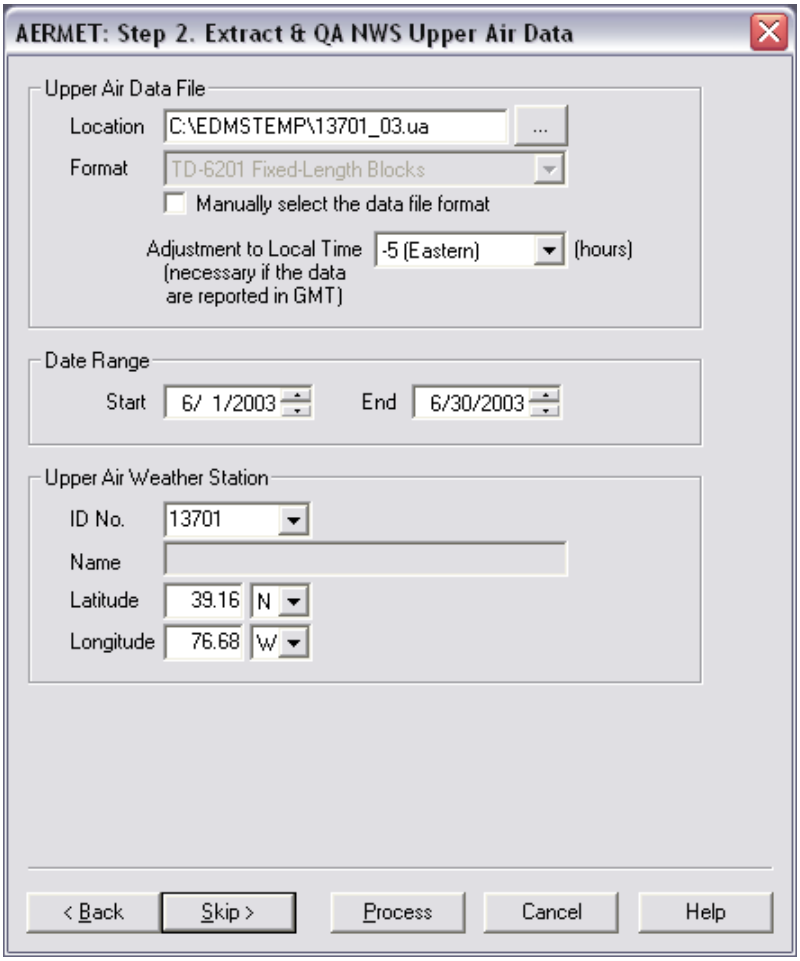
Action	**Result**
1. Press the button marked "…" (located after the Location input box) to select the surface weather file titled S93721_03.DAT	This selects the surface weather file that we will use for this study. **Note: This is a fictitious set of weather data. It should not be used for regulatory analyses.** This file is found under your EDMS install directory in **Data\Tutorial\weather files.** You may get a message asking if the file may be copied to the EDMSTEMP directory. If so, respond Yes.
2. Set the Adjustment to Local Time to -5 (Eastern), which is where Hagerstown is located.	The remaining necessary fields on the screen should be populated automatically.
3. Set the Date Range: Start 6/1/2003, End 6/30/2003.	Normally, you would run a full year, but we want to reduce execution time.
4. Press "Process".	The AERMET wizard will extract the surface weather data and the upper-air data screen will appear.



A.3.4.2AERMET Wizard Step 2. Upper Air Data.

The next step will be to extract the upper-air soundings that will be merged with the surface weather data.

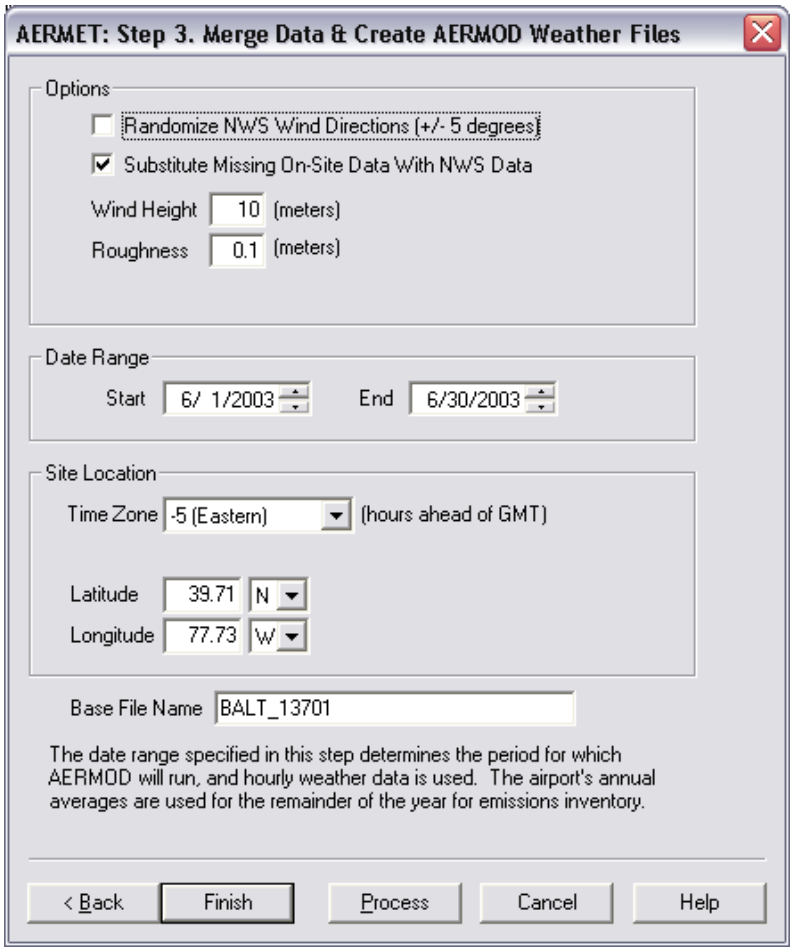
Action	**Result**
1. Press the button marked "…" to select the upper-air weather file titled 13701_92.ua.	This selects the upper-air weather file that we will use for this study. Note: This is a fictitious set of weather data. It should not be used for regulatory analyses.
2. Set the Adjustment to Local Time to -5 (Eastern).	This time we'll also need to enter the latitude and longitude.
3. Set the Date Range: Start 6/1/2003, End 6/30/2003.	Normally, you would run a full year, but we want to reduce execution time.
4. Enter 39.16 for the Latitude and 76.68 for the longitude.	Provide the location of the weather station.
5. Press "Process".	The AERMET wizard will extract the upper-air weather data and the merge screen will appear.



A.3.4.3AERMET Wizard Step 3. Merge data.

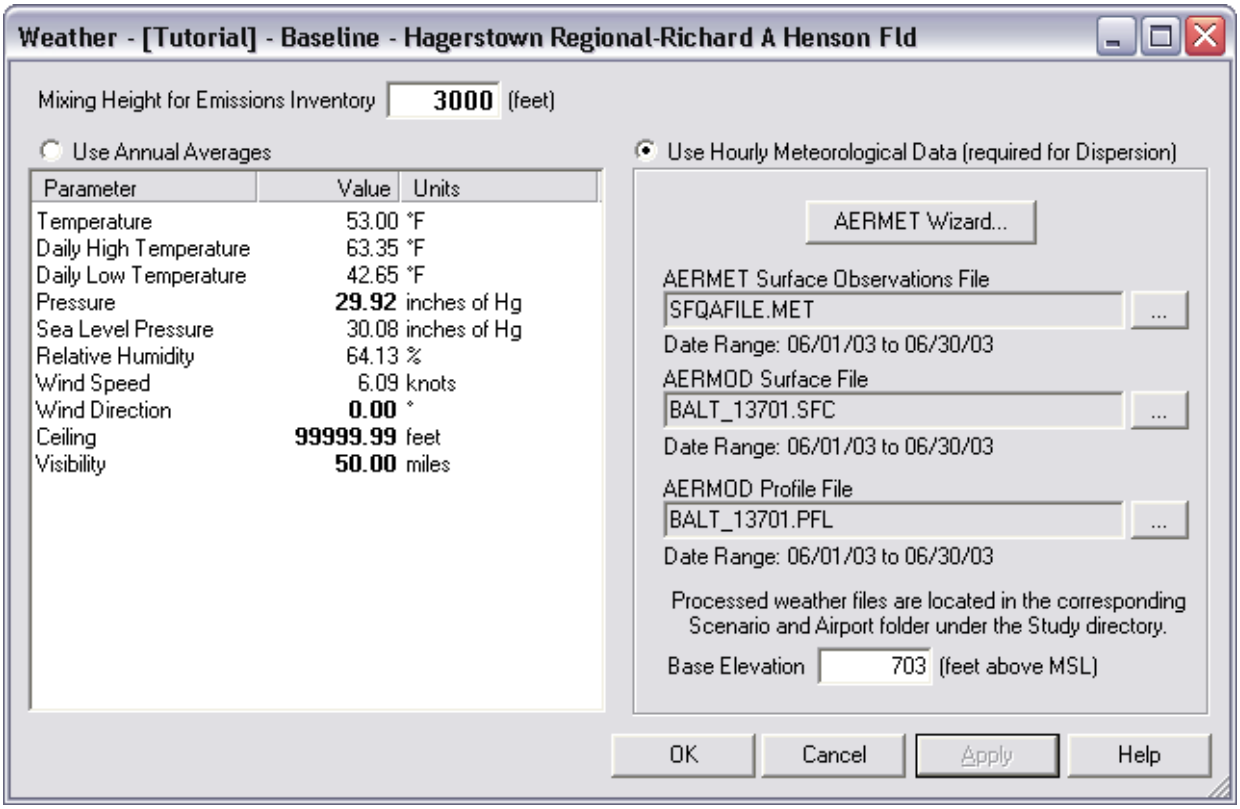
Next, we need to merge the surface and upper-air data and create AERMOD weather files by taking the merged surface and upper-air weather data and converting it into surface (.sfc) and profile (.pfl) weather files that AERMOD can read.

Action	**Result**
1. Uncheck the box labeled "Randomize NWS Wind Directions (+/- 5 degrees)".	We do not want to randomize the wind data by 5° to either side of the reported wind direction.
2. Make sure the box labeled "Substitute Missing On-Site Data with NWS Data" is checked.	Since we are not supplying any on-site data, we will have the AERMET Wizard use the surface data instead.
3. Set the Time Zone to -5.	
4. Set the Date Range: Start 6/1/2003, End 6/30/2003.	Normally, you would run a full year, but we want to reduce execution time.
5. Press "Finish".	The AERMET Wizard has finished. We now return to the Weather dialog.



A.3.4.4Finishing Weather

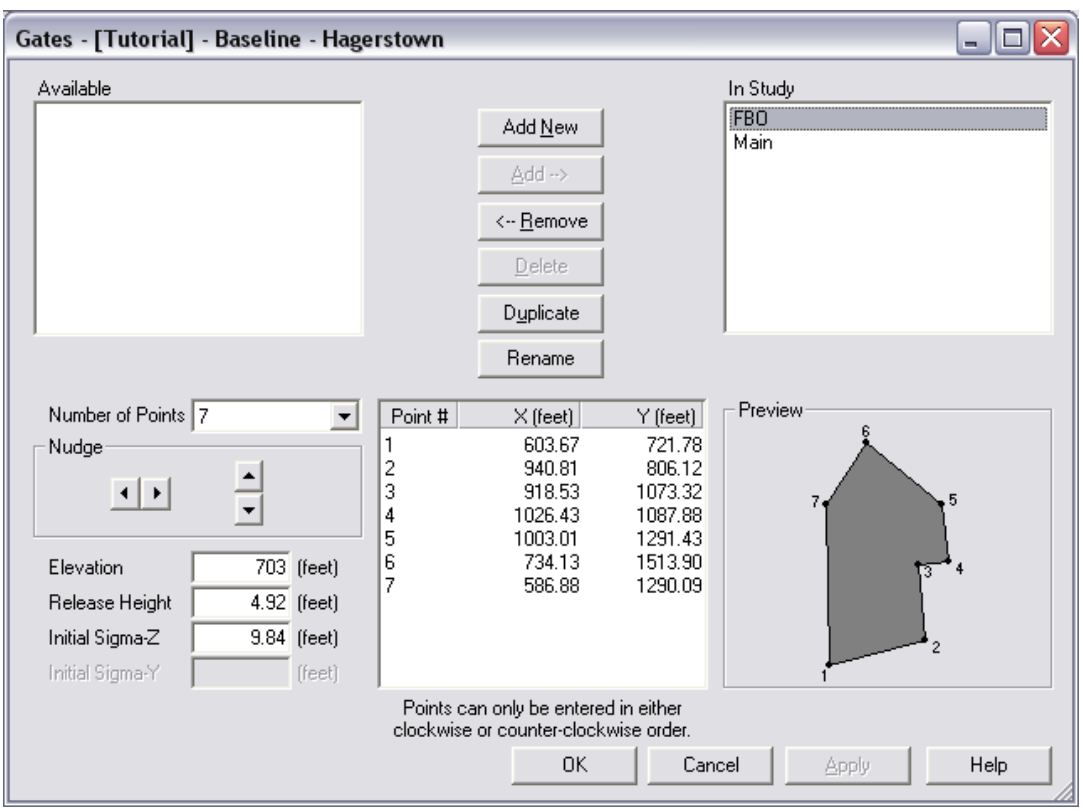
Action	**Result**
1. We could now adjust the *Mixing Height* or *Base Elevation*, but we will keep them as they are.	The mixing height determines how far up the performance-based flight profile generator extends its profiles.
2. Press *OK* to apply the weather settings.	The *Weather* dialog is closed.



A.3.5 Adding Gates

Gates are needed to define taxipaths, which are used with other data by the sequence modeler to determine the taxi times for individual aircraft. Gates are also considered to be the theoretical point where GSE and APUs are used.

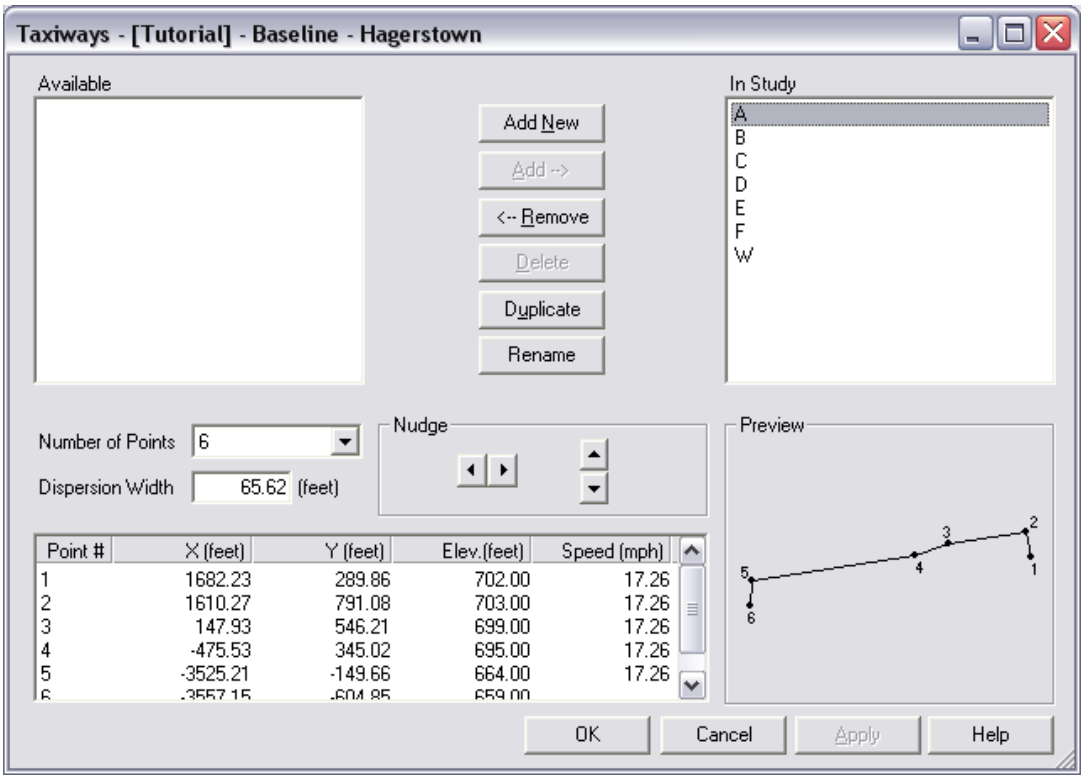
Action	**Result**
1. Select *Gates* from the *Airport* menu.	This brings up a window which allows you to specify information about the gates to be added to the study.
2. Press *Add New* and create a gate called "Main". Set the *Elevation* to 686 feet, *Release Height* to 4.92 feet, and *Initial Sigma-Z* to 9.84 feet.. Change the number of points to 4.	We will be creating two gates for this study.
3. Press *Add New* again and create another gate called "FBO". Set the *Elevation* to 703 feet, *Release Height* to 4.92 feet, and *Initial Sigma-Z* to 9.84 feet.. Change the number of points to 7.	
4. Set the coordinates for Main and FBO to the values listed in Table A-1-1.	This is the location for the gates called "Main" and "FBO".
5. Press" OK".	This applies all of the changes made in this dialog.



A.3.6 Aircraft Taxiways

Now we must define the taxiways that connect the gates to the runways.

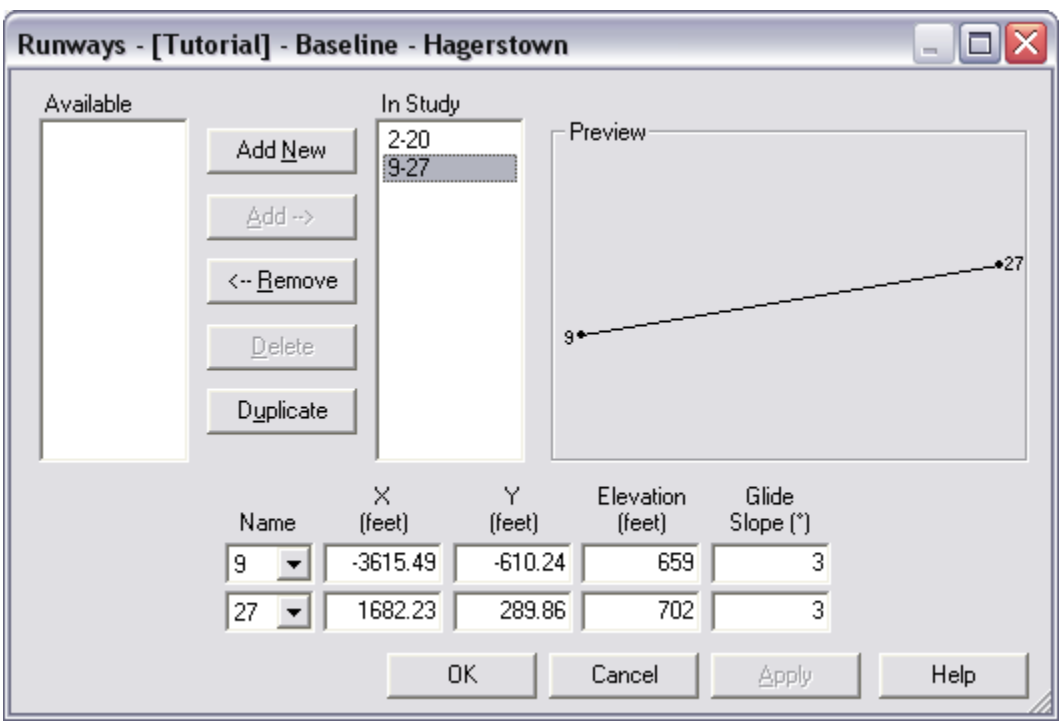
Action	**Result**
1. Select *Taxiways* from the *Airport* menu.	This brings up the Aircraft Taxiways window where we will specify the location of the taxiways that will be considered in our study.
2. Press *Add New* and create a new taxiway called "A".	This prompts you for the name taxiway. We'll call it "A".
3. Set the number of points to 6.	This taxiway has 5 segments, thus 6 points.
4. Set the coordinates of the taxiway to (1682.23, 289.86, 702.00), (1610.27, 791.08, 703.00), (147.93, 546.21, 699.00), (-475.53, 345.02, 695.00), (-3525.21, -149.66, 664), (-3557.15, -604.85, 659.00)	This specifies the location of the taxiway.
5. Repeat steps 2-4 for each of the taxiways listed in Table 1-2.	We need to add the remaining taxiways to the study. This defines the navigable connections between the gates and the runways.
6. Press "OK".	This applies all of the changes made in thisdialog.



A.3.7 Runways

We are now going to add the two runways at the airport.

Action	**Result**
1. Select *Runways* from the *Airport* menu.	This brings up the *Runways* dialog where we can specify the location and length of the runways in our study.
2. Add two new runways called “2-20” and “9-27”.	We are going to have two runways in the study.
3. Set the coordinates for runways 2-20 and 9-27 to the coordinates specified in Table A-1-3.	This creates two runway that run roughly north-south and east-west.
4. Set the elevations of the runway ends to the values specified in Table A-1-3.	Observe that runways do not have to be level.
5. Set the Glide Slopes for all runway ends to 3°.	These are the values used if *Use Runway Glide Slope* is selected for an aircraft on the *Performance* tab of the *Aircraft Operations & Assignments* dialog.
6. Press *OK*.	This applies the runway data and closes the Runways dialog.



A.3.8 Taxipaths

We are now going to add the two runways at the airport.

Action	**Result**
1. Select *Taxipaths* from the *Airport* menu.	This brings up the *Taxipaths* dialog where we can specify the sequence of taxiways used to get from gate to runway and runway to gate.
2. Press *Add New*.	When a new taxipath is created, it default to the first available taxipath that is both possible, given the airport layout, and not already in existence. The ordering for determining "first" is first, alphabetical by gate name, second, numerical order by runway, third, outbound before inbound, and fourth, alphabetical by runway exit. In our example, the first default taxipath is gate FBO, runway 2, outbound.
3. Select W in the *Available Taxiways* list and press *Add*.	W appears in the *Taxiways in Taxipath* list.
4. Select C in the *Available Taxiways* list and press *Add*.	C appears below W in the *Taxiways in Taxipath* list. Since FBO connects to W, which connects to C which connects to runway 2, we have a complete taxipath, so we move on to the next one.
5. Continue adding taxipaths from Table A-1.6.	The list of possible runway exits includes every taxiway that touch the runway, but since an aircraft travels a significant distance while decelerating enough that it can safely exit, not all of the exits are feasible. It is up to the user to omit the absurd taxipaths.
6. Press *OK*.	This applies the taxipath data and closes the *Taxipaths* dialog.
7. Select *Check Taxipaths* from the *Airport* menu.	This will test to see if all the taxipaths entered are valid. If not, it will list all the problems. If a problem exists, look back at the definitions for gates, runways, taxiways and the taxipaths to find the cause of the disconnect and fix it. When all taxipaths are valid proceed to configurations.

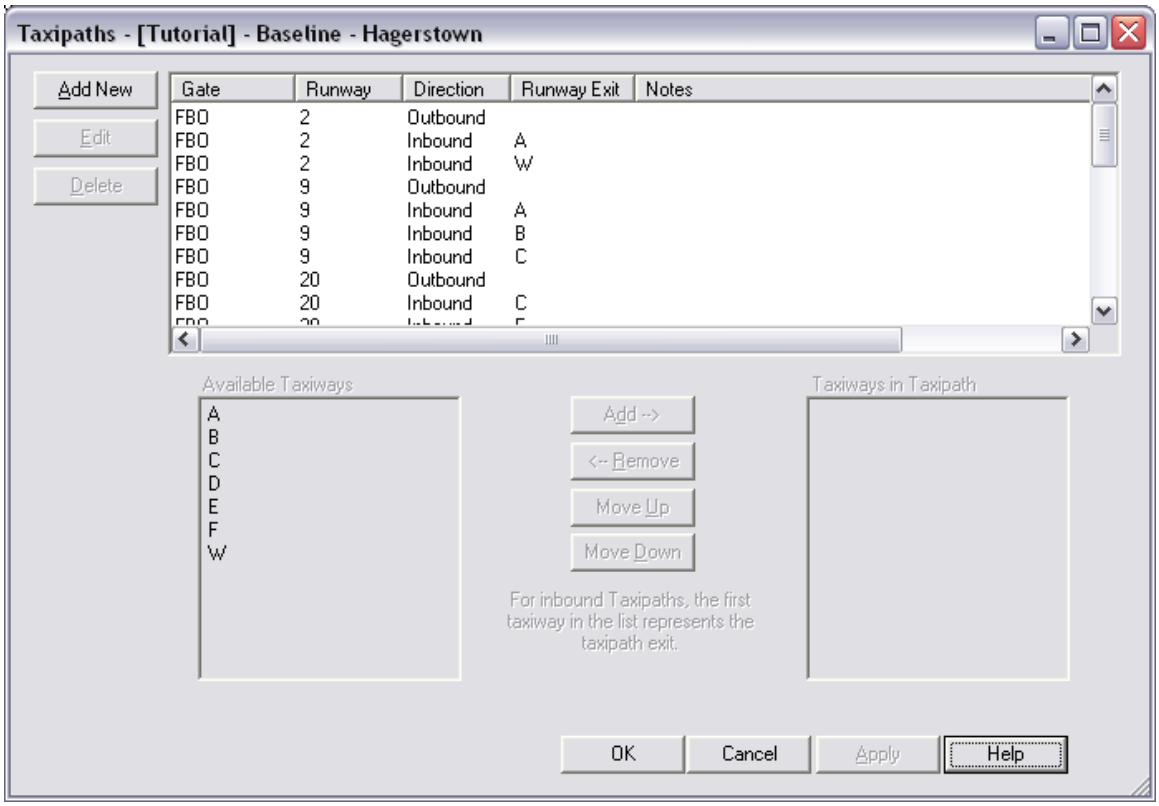


Table A - 1.6 Taxipaths

Gate	Runway	Direction	Taxiways in Taxipath	Taxipaths
FBO	2	Outbound	W - C	FBO - W - C - 2
FBO	20	Outbound	W	FBO - W - 20
FBO	27	Outbound	B - A	FBO - B - A - 27
FBO	9	Outbound	W - C - A	FBO - W - C - A - 9
Main	2	Outbound	C	Main - C - 2
Main	20	Outbound	C	Main - C - 20
Main	27	Outbound	C - A	Main - C - A - 27
Main	9	Outbound	D - F	Main - D - F - 9
FBO	2	Inbound	W	2 - W - FBO
FBO	2	Inbound	A - B	2 - A - B - FBO
FBO	20	Inbound	C - W	20 - C - W - FBO
FBO	20	Inbound	F - C - W	20 - F - C - W - FBO
FBO	27	Inbound	A - C - W	27 - A - C - W - FBO
FBO	27	Inbound	D - A - C - W	27 - D - A - C - W - FBO
FBO	9	Inbound	A - B	9 - A - B - FBO
FBO	9	Inbound	B	9 - B - FBO
FBO	9	Inbound	C - W	9 - C - W - FBO
Main	2	Inbound	C	2 - C - Main
Main	20	Inbound	C	20 - C - Main
Main	20	Inbound	F - D	20 - F - D - Main
Main	27	Inbound	A - C	27 - A - C - Main
Main	27	Inbound	F - D	27 - F - D - Main
Main	27	Inbound	E - F - D	27 - E - F - D - Main
Main	27	Inbound	D	27 - D - Main

Main	9	Inbound	A - C	9 - A - C - Main
Main	9	Inbound	B - A - C	9 - B - A - C - Main
Main	9	Inbound	C - A - D	9 - C - A - D - Main

A.3.9 Configurations

We are now going to add the two runways at the airport.

Action	**Result**
1. Select *Configurations* from the *Airport* menu.	This brings up the *Configurations* dialog where we can specify what airport configuration (allocation of runway usage) to use under what weather conditions.
2. Press *Add New* to add a new configuration. Name it North Wind.	When a new configuration is created, its default name is "configuration" (or "configuration(2)", etc.).
3. Set the *Wind Direction From* and *To* to 340° and 40°, respectively.	This is the activation condition for this configuration.
4. In the *Airport Capacity* box set *Number of Points* to 2.	Sets how many point will be used to bound the airport capacity curve.
5. For point 1, set Arrivals per Hour to 35 and Departures per Hour to 55. For Point 2 set Arrivals per hour to 55 and Departures per Hour to 35.	This defines the capacity curve for this configuration. We can view the curve by checking *View Graph* in the *Airport Capacity* box. Uncheck *View Graph* to return to the numeric display.
6. In the Runway Assignments box, for small aircraft, runway 2, set the arrival, departure, and TGO percentages to 80, 80 and 90, respectively. For small aircraft, runway 9, set the percentages to 20, 20 and 10.	This gives totals of 100% for small aircraft arrivals, departures and TGOs.
7. Finish filling in with the data from the tables below.	The configurations are defined.
8. Press *OK* to apply (make available to the rest of the program) the data.	The Configurations dialog closes.

Configuration	**Activation parameters**			**Capacity**		
	Parameter	**From**	**To**	**Pt.**	**Arrivals**	**Departures**
North Wind	Wind Dir.	340	40	1	35	55
	Wind Speed	no bound	no bound	2	55	35
	Hour of Day	no bound	no bound			
	Ceiling	no bound	no bound			
	Visibility	no bound	no bound			
	Temperature	no bound	no bound			
Northeast Wind	Wind Dir.	20	110	1	30	50
	Wind Speed	no bound	no bound	2	50	30

	Hour of Day	no bound	no bound			
	Ceiling	no bound	no bound			
	Visibility	no bound	no bound			
	Temperature	no bound	no bound			
Northwest Wind	Wind Dir.	270	0	1	30	50
	Wind Speed	no bound	no bound	2	50	30
	Hour of Day	no bound	no bound			
	Ceiling	no bound	no bound			
	Visibility	no bound	no bound			
	Temperature	no bound	no bound			
South Wind	Wind Dir.	160	220	1	35	55
	Wind Speed	no bound	no bound	2	55	35
	Hour of Day	no bound	no bound			
	Ceiling	no bound	no bound			
	Visibility	no bound	no bound			
	Temperature	no bound	no bound			
Southeast Wind	Wind Dir.	90	180	1	30	50
	Wind Speed	no bound	no bound	2	50	30
	Hour of Day	no bound	no bound			
	Ceiling	no bound	no bound			
	Visibility	no bound	no bound			
	Temperature	no bound	no bound			
Southwest Wind	Wind Dir.	200	290	1	30	50
	Wind Speed	no bound	no bound	2	50	30
	Hour of Day	no bound	no bound			
	Ceiling	no bound	no bound			
	Visibility	no bound	no bound			
	Temperature	no bound	no bound			

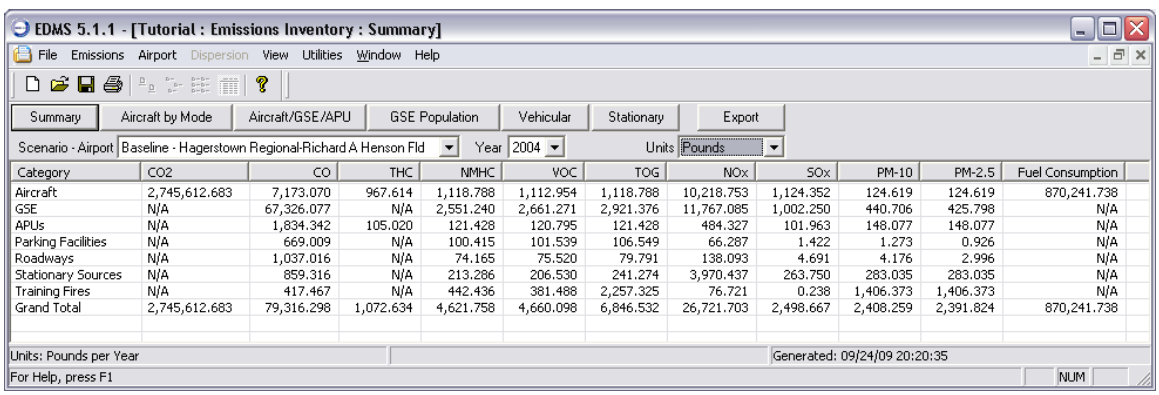
configuration	**a/c size**	**Runways**	**arrivals**	**departures**	**TGOs**
North Wind	S	2	80	80	90
	S	20	0	0	0
	S	27	0	0	0
	S	9	20	20	10
	L	2	10	10	0
	L	20	0	0	0
	L	27	0	0	0
	L	9	90	90	100
	H	2	0	0	0
	H	20	0	0	0
	H	27	0	0	0
	H	9	100	100	100
Northeast Wind	S	2	50	50	60
	S	20	0	0	0
	S	27	0	0	0
	S	9	50	50	40
	L	2	10	10	0
	L	20	0	0	0
	L	27	0	0	0
	L	9	90	90	100

	H	2	0	0	0
	H	20	0	0	0
	H	27	0	0	0
	H	9	100	100	100
Northwest Wind	S	2	50	50	60
	S	20	0	0	0
	S	27	50	50	40
	S	9	0	0	0
	L	2	10	10	0
	L	20	0	0	0
	L	27	90	90	100
	L	9	0	0	0
	H	2	0	0	0
	H	20	0	0	0
	H	27	100	100	100
	H	9	0	0	0
South Wind	S	2	0	0	0
	S	20	80	80	90
	S	27	20	20	10
	S	9	0	0	0
	L	2	0	0	0
	L	20	10	10	0
	L	27	90	90	100
	L	9	0	0	0
	H	2	0	0	0
	H	20	0	0	0
	H	27	100	100	100
	H	9	0	0	0
Southeast Wind	S	2	0	0	0
	S	20	50	50	60
	S	27	0	0	0
	S	9	50	50	40
	L	2	0	0	0
	L	20	10	10	0
	L	27	0	0	0
	L	9	90	90	100
	H	2	0	0	0
	H	20	0	0	0
	H	27	0	0	0
	H	9	100	100	100
Southwest Wind	S	2	0	0	0
	S	20	50	50	60
	S	27	50	50	40
	S	9	0	0	0
	L	2	0	0	0
	L	20	10	10	0
	L	27	90	90	100
	L	9	0	0	0
	H	2	0	0	0
	H	20	0	0	0
	H	27	100	100	100
	H	9	0	0	0

A.3.10Emissions Results

At this point all of the inputs necessary for the emissions inventory have been entered into the program. We are ready to run the emissions inventory for the scenario. You can compare the results you obtained against the scenario provided with the software.

Action	**Result**
1. Select *Update Emissions Inventory* from the *Emissions* menu.	Notice that this runs a little more slowly than the first emissions inventory, since taxi times and flight profiles are both being computed dynamically. The results will appear automatically and should be identical to those as shown below.



Category	CO2	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5	Fuel Consumption
Aircraft	2,745,612.683	7,173.070	967.614	1,118.788	1,112.954	1,118.788	10,218.753	1,124.352	124.619	124.619	870,241.738
GSE	N/A	67,326.077	N/A	2,551.240	2,661.271	2,921.376	11,767.085	1,002.250	440.706	425.798	N/A
APUs	N/A	1,834.342	105.020	121.428	120.795	121.428	484.327	101.963	148.077	148.077	N/A
Parking Facilities	N/A	669.009	N/A	100.415	101.539	106.549	66.287	1.422	1.273	0.926	N/A
Roadways	N/A	1,037.016	N/A	74.165	75.520	79.791	138.093	4.691	4.176	2.996	N/A
Stationary Sources	N/A	859.316	N/A	213.286	206.530	241.274	3,970.437	263.750	283.035	283.035	N/A
Training Fires	N/A	417.467	N/A	442.436	381.488	2,257.325	76.721	0.238	1,406.373	1,406.373	N/A
Grand Total	2,745,612.683	79,316.298	1,072.634	4,621.758	4,660.098	6,846.532	26,721.703	2,498.667	2,408.259	2,391.824	870,241.738

A.4 A SAMPLE DISPERSION ANALYSIS

This example demonstrates how to model concentrations for the same airport used in the emissions inventory example. If the dispersion data has already been entered completely, we can now begin dispersion calculations.

A.4.1 Changing Scenario Options

Action	**Result**
1. From the *File* menu select *Study Setup.*	This brings up the *Study Properties*.
2. Check *Enable Dispersion Modeling*.	This forces the scenario and weather options to what we used during the second emissions run.
3. Press *OK*.	This applies the changes made to this dialog and closes it.
4. Select the year 2004 in the study tree in the left pane of the main study window.	We lost this selection when we opened the *Study Properties* dialog.

A.4.2 Additional Information Needed for Emissions Sources

Action	**Result**
1. From the *Emissions* menu select *Aircraft.*	This brings up the *Aircraft Operations & Assignments* dialog.
2. Select the *GSE & Gate Assignment* tab. Select the Boeing 737-300 aircraft. From the *Gate Assignment* drop-down select Main.	This tells EDMS to use gate Main as the source location for the GSE and APU emissions associated with the Boeing 737-300.
3. Press *OK* to apply the gate assignment.	This applies the changes made to this dialog and closes it.
4. From the *Emissions* menu select *GSE Population.*	This brings up the *GSE Population* dialog.
5. For select Air Conditioner in the *In Study* list. In the *Gate Assignments* box, set both FBO and Main to 50%. Repeat for Belt Loader.	This tells EDMS how to distribution the emissions from the GSE population.
6. Press *OK* to apply the gate assignments.	This applies the changes made to this dialog and closes it.
7. From the *Emissions* menu select *Parking Facilities.*	This brings up the *Parking Facilities* dialog.
8. In the *Dispersion Parameters* box, set *Number of Levels* to 1, *Release Height* to 3.28 feet, *Elevation* to 686 feet.	This provides EDMS with the information it need to define the parking emissions sources.

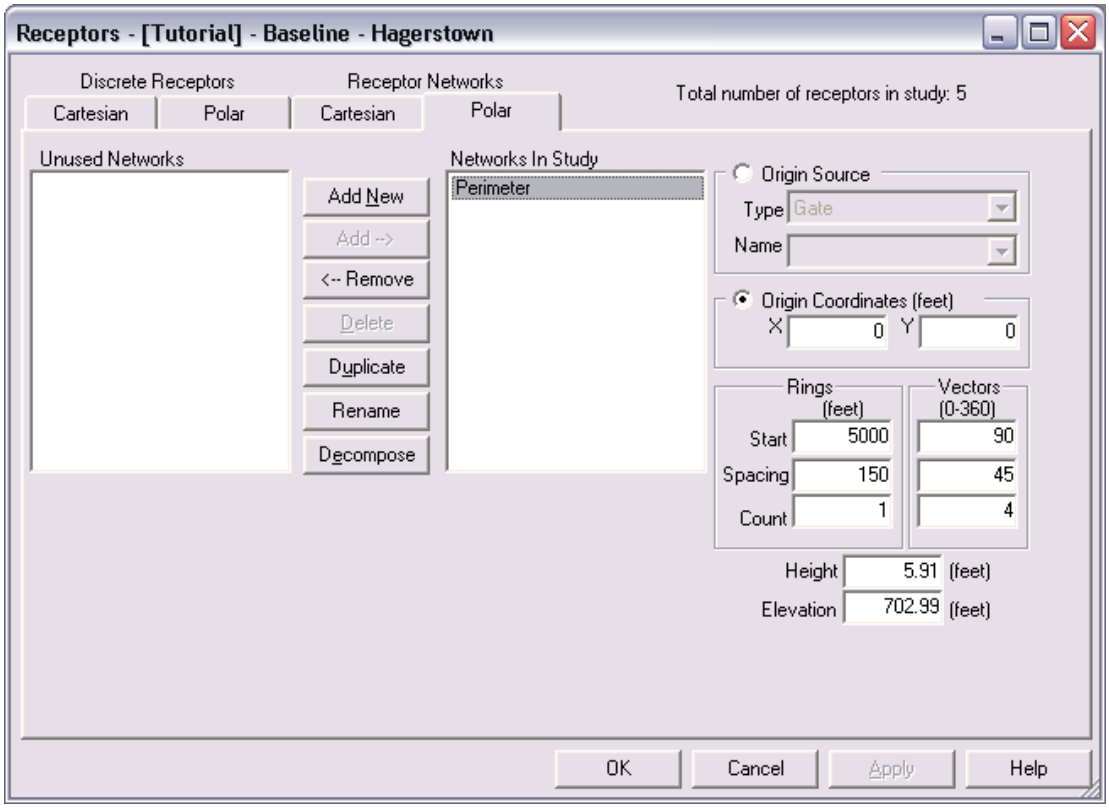
Action	Result
9. Set *Number of Points* to 4 and enter these coordinates: (-1300, -1335), (-1030, -1390), (-1085, -1660), (-1355, -1605).	
10. Press *OK* to apply the parking lot information.	This applies the changes made to this dialog and closes it.
11. From the *Emissions* menu select *Roadways.*	This brings up the *Roadways* dialog.
12. In the *Coordinates* box, set Dispersion width to 65.62 feet. Set *Number of Points* to 6 and enter these coordinates: (-1141, -2211), (-976, -1401), (-1019, -1346), (-1289, -1281), (-1354, -1324), (-1539, -2224), with all elevation 686 feet.	This provides EDMS with the information it need to define the roadway emissions sources.
13. Press *OK* to apply the roadway information.	This applies the changes made to this dialog and closes it.
14. From the *Emissions* menu select *Stationary Sources.*	This brings up the *Stationary Sources* dialog.
15. In the *Dispersion Parameters* box, select *Point*. Set (X, Y) to (-972, 812). Set *Elevation* to 695 feet, *Height* to 12 feet, *Velocity* to 15 (m/s), *Temperature* to 400 °F and *Diameter* to 3.28 feet.	This provides EDMS with the information it need to define the stationary emissions sources.
16. Press *OK* to apply the stationary sources information.	This applies the changes made to this dialog and closes it.
17. From the *Emissions* menu select *Training Fires.*	This brings up the *Training Fires* dialog.
18. In the *Coordinates* box, set *X* to -1974, *Y* to 1134 and *Elevation* to 678. In the *Dispersion Parameters* box, set *Release Height* to 13.12 feet, *Diameter* to 16.4 feet, *Gas Velocity* to 10 m/s and *Temperature* to 400 °F.	This provides EDMS with the information it need to define the training fire emissions sources.
19. Press *OK* to apply the training fire information.	This applies the changes made to this dialog and closes it.

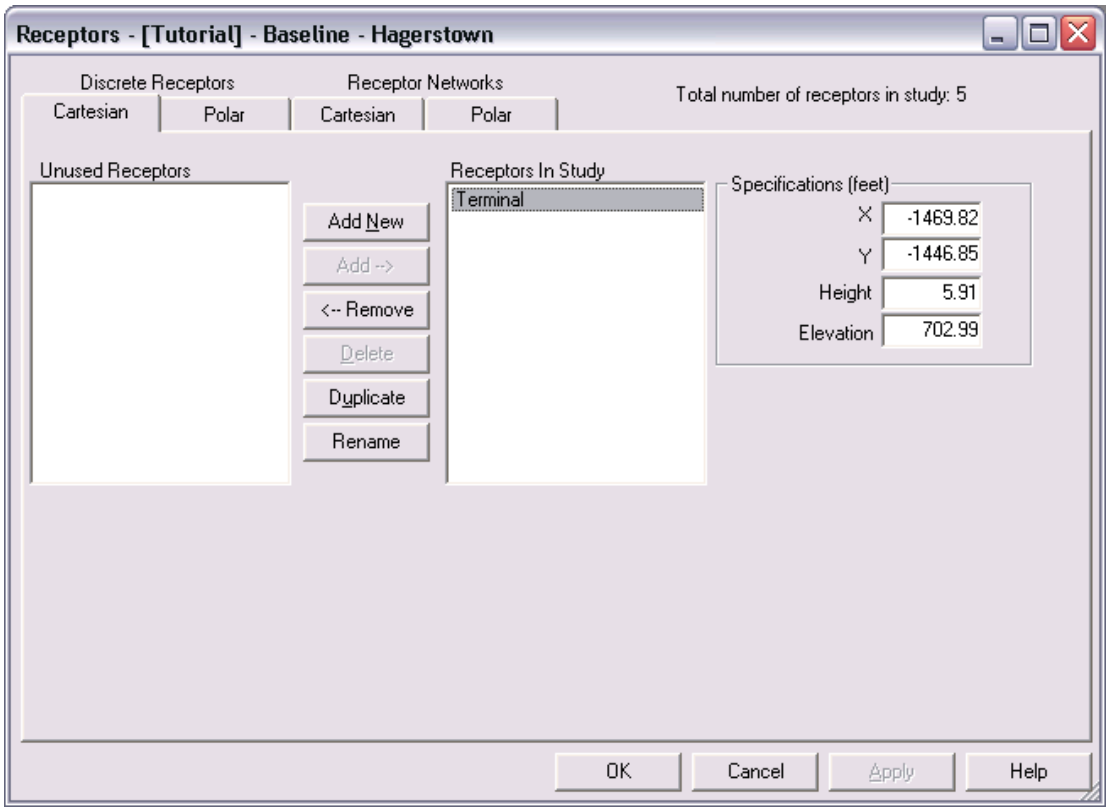
A.4.3 Receptors

Before we can complete the dispersion analysis, we must specify the location of the receptors. For this analysis we will use polar coordinates to specify a ring of receptors in the southeast corner of the airport.

Action	Result
1. Select *Receptors* from the *Dispersion* menu.	This brings up the *Receptors* menu.

Action	**Result**
2. Select the tab labeled *Cartesian* under the Discrete Receptors heading.	We are going to place a receptor near the main terminal.
3. Press *Add New* to create a Cartesian Receptor. Change its name to "Terminal"	This creates a receptor at the origin.
4. Enter the coordinates (-1469.82, -1446.85) for the receptors location.	This sets the receptor near to the gate "Main", and the parking lot.
5. Leave the default Height and Elevation as they are.	Height is 5.91 feet; elevation is 702.99 feet.
6. Select the *Polar* tab under *Receptor Networks*.	This allows us to enter Polar network.
7. Press *Add New* and create a receptor grid called "Perimeter".	This places the receptor grid in the In Study list and prepares it for input.
8. Select the *Origin Coordinates* radio button and enter (0, 0).	Establishes the center of our polar grid.
9. Set the *Rings Start* to 5000 ft, *Spacing* to 150, and *Count* to 1.	We'll have a single ring of receptors about a mile from our origin..
10. Set *Vectors Start* to 90, *Spacing* to 45 and *Count* to 4.	
11. Press *OK* to apply the Receptors	The receptors are now available for use in dispersion.

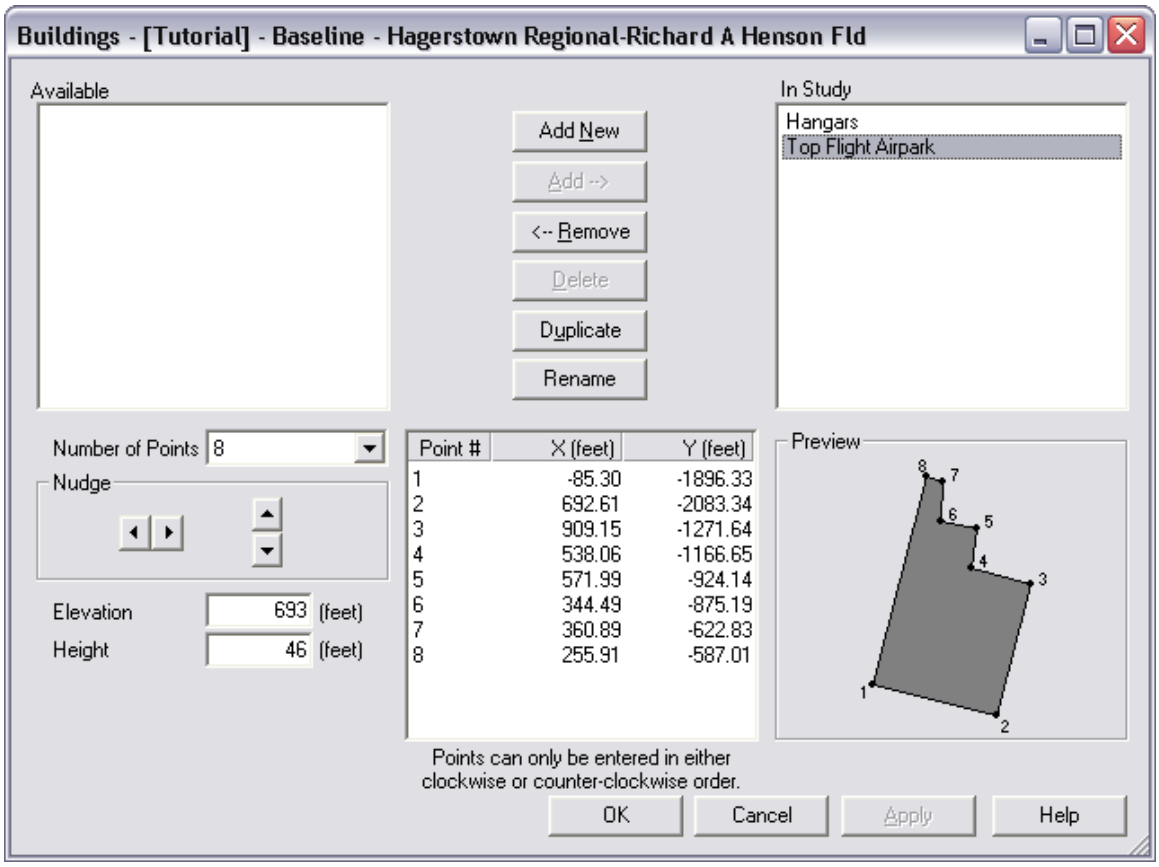




A.4.4 Buildings

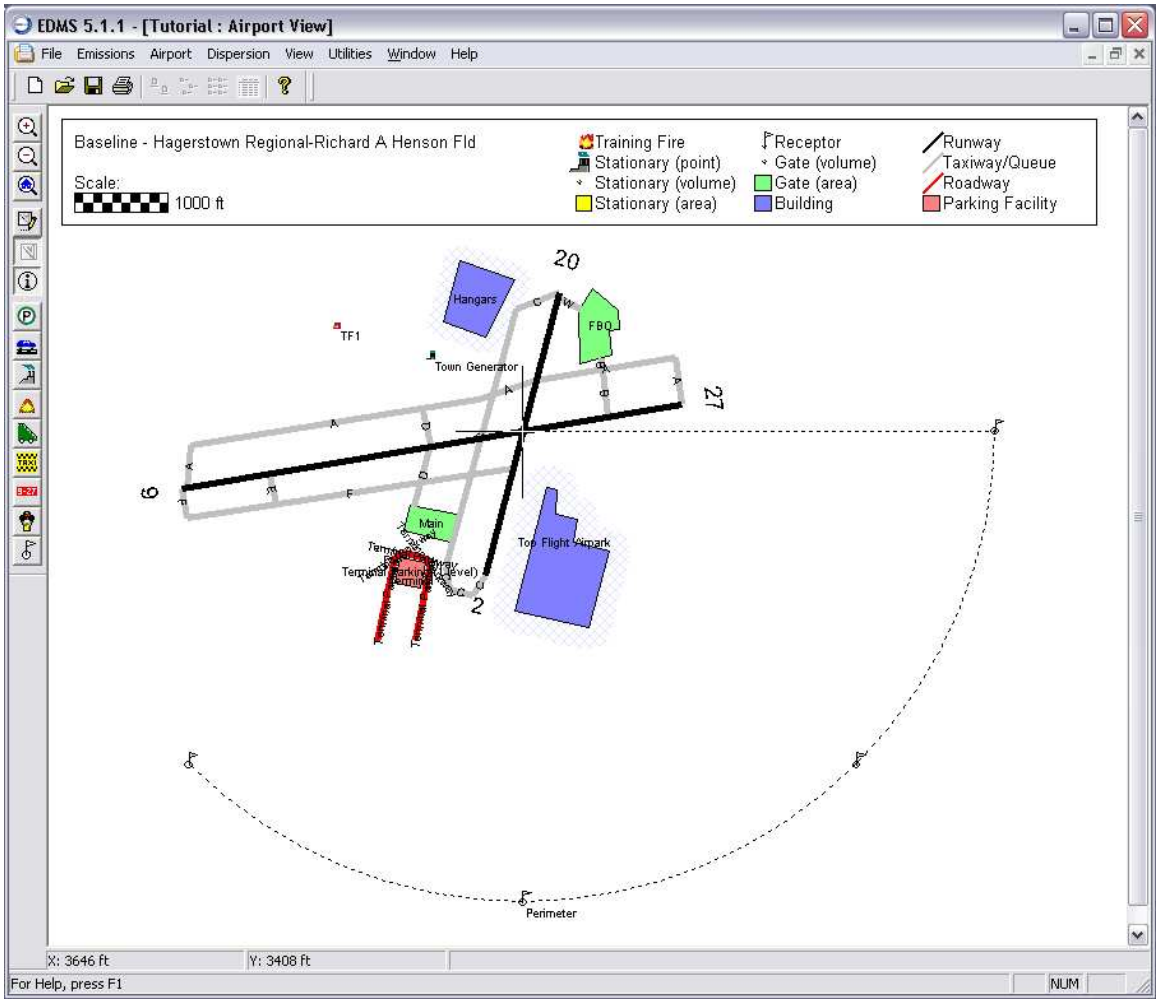
We are now going to add the two buildings to the airport.

Action	**Result**
1. Select *Buildings* from the *Airport* menu.	This brings up the *Buildings* window where we can specify the location of the buildings in our study.
2. Add two new buildings called "Top Flight Airpark" and "Hangars".	We are going to have two buildings in the study.
3. Set the coordinates for "Top Flight Airpark" and "Hangars" to those specified in Table A-1-4.	This specifies the location of the two buildings at the airport.
5. Press *OK*.	This applies the building data and closes the *Buildings* dialog.

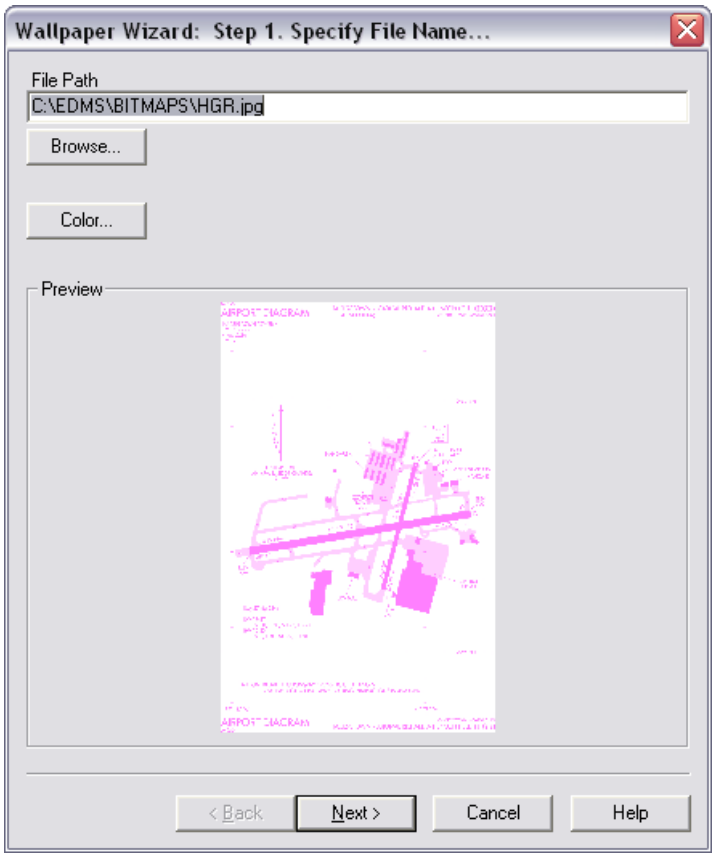


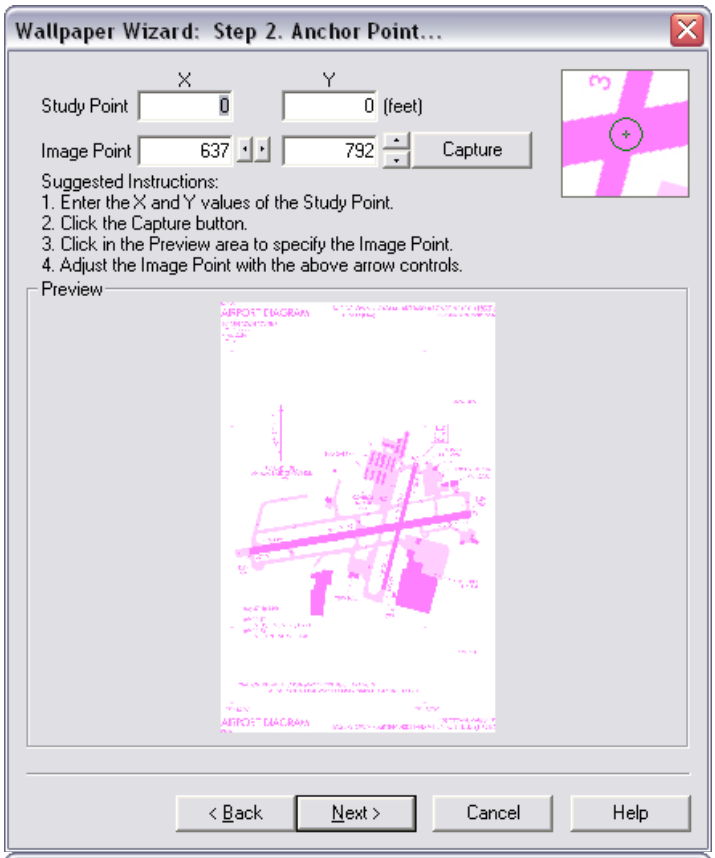
A.4.5 Airport View & Wallpaper

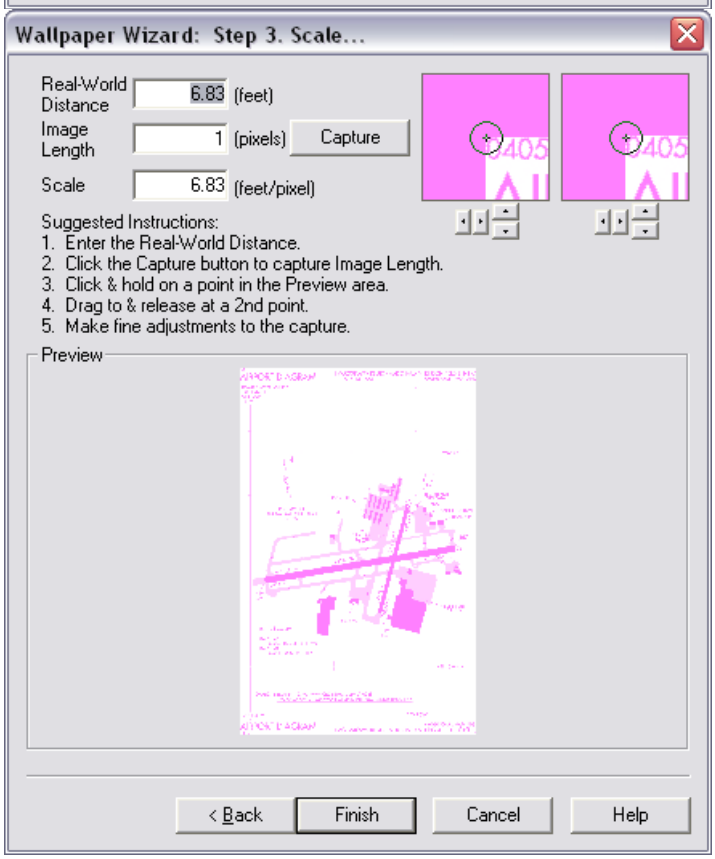
To verify that we have placed all of our sources in the appropriate location we can look at a view of the airport that we have created. By selecting *Airport* from the *View* menu, the sources and receptors are presented in a graphical format. The figure below shows the airport view for this example.

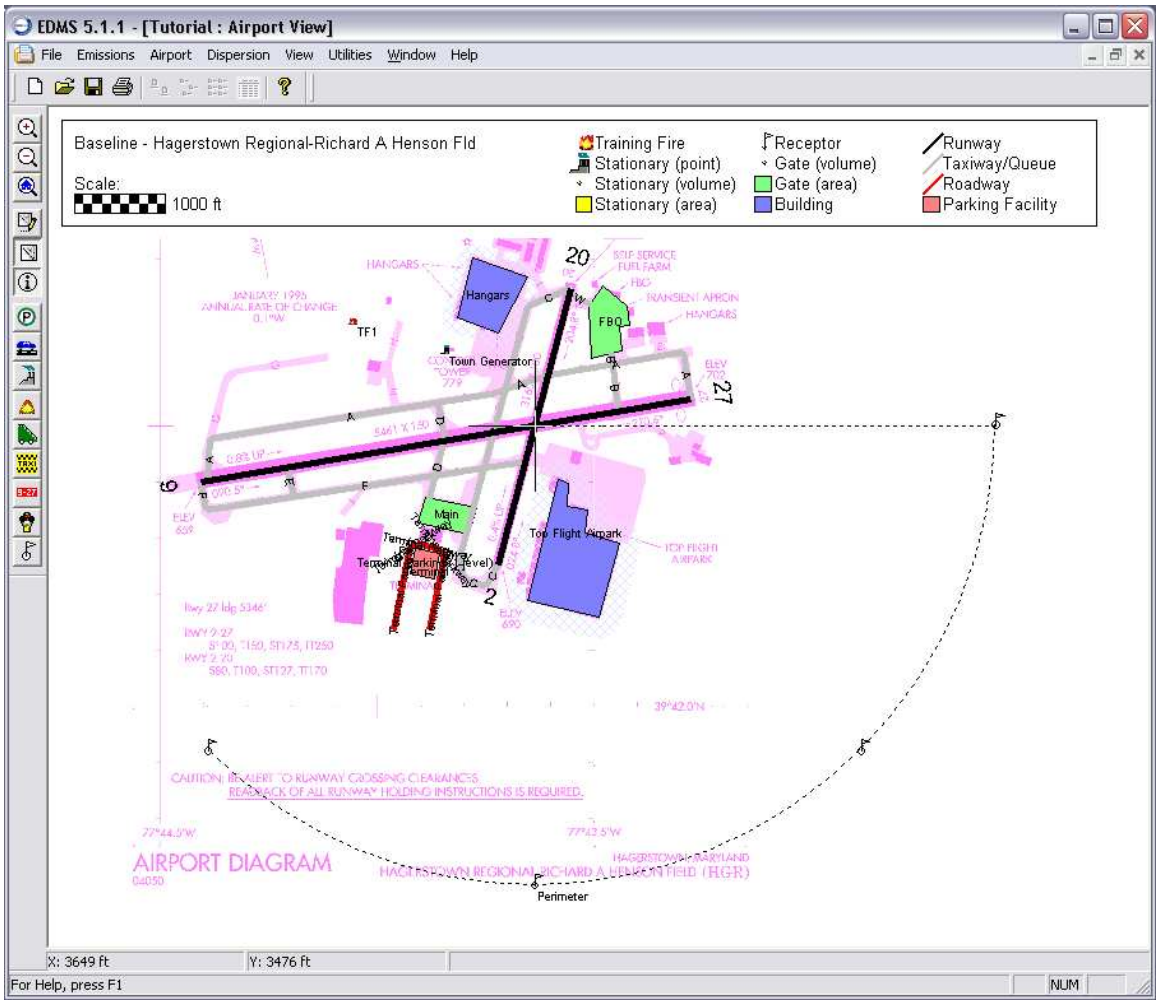


Action	**Result**
1. With the Airport View open select *Edit Wallpaper* from the view menu.	This brings up the wall paper wizard.
2. Specify the path of the bitmap file for Hagerstown airport. (HGR).	Locate the source of the airport bitmap.
3. Click Next.	Advances to step 2 to in the wallpaper wizard.
4. Enter (0, 0) for the study point coordinates.	This puts the origin at the intersection of the two runways.
5. Enter the coordinates (637, 792) for the image point coordinates as shown below.	
6. Click Next.	Advances to step 3 to in the wallpaper wizard.
7. Enter 6.84 ft/pixels for the scale, and an image length of 1 as shown below.	This provides a scale for the bitmap.
8. Click Finish. The airport bitmap is shown below.	


Wallpaper Wizard: Step 1. Specify File Name...
File Path
C:\EDMS\BITMAPS\HGR.jpg
Browse...
Color...
Preview
< Back
Next >
Cancel
Help


Wallpaper Wizard: Step 2. Anchor Point...
X
Y
Study Point
0
0
(feet)
Image Point
637
792
Capture
Suggested Instructions:
1. Enter the X and Y values of the Study Point.
2. Click the Capture button.
3. Click in the Preview area to specify the Image Point.
4. Adjust the Image Point with the above arrow controls.
Preview
< Back
Next >
Cancel
Help


Wallpaper Wizard: Step 3. Scale...
Real-World Distance
6.83
(feet)
Image Length
1
(pixels)
Capture
Scale
6.83
(feet/pixel)
Suggested Instructions:
1. Enter the Real-World Distance.
2. Click the Capture button to capture Image Length.
3. Click & hold on a point in the Preview area.
4. Drag to & release at a 2nd point.
5. Make fine adjustments to the capture.
Preview
< Back
Finish
Cancel
Help

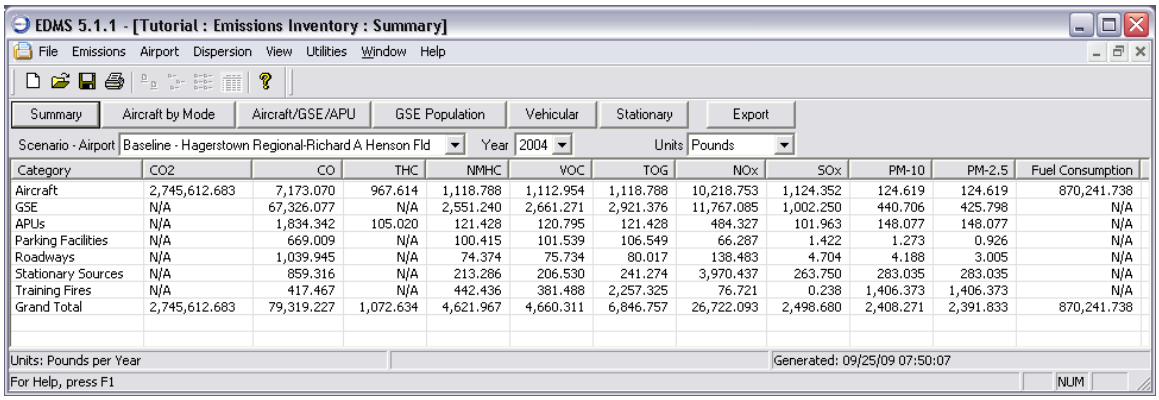


A.4.6 Emissions Results

At this point all of the inputs necessary for the emissions inventory have been entered into the program. We are ready to run the emissions inventory for the scenario, while having dispersion enabled. In addition to the emissions inventory, EDMS will create hourly emission files to be used by AERMOD. You can compare the results you obtained against the scenario provided with the software.

Action	**Result**
1. Select *Update Emissions Inventory* from the *Emissions* menu.	This brings up the *Select Pollutants for Dispersion* window.
2. Select *CO and NOx* as the pollutants for dispersion.	This will generate the hourly emissions (.HRE) files for *CO and NOx.* Annual Emissions are going to be calculated for all pollutants.

Action	Result
3. Press *OK*	Notice that this runs a quite a bit slower than the previous emissions inventory, since dispersion is enabled. The results will appear automatically and should be identical to those as shown below.

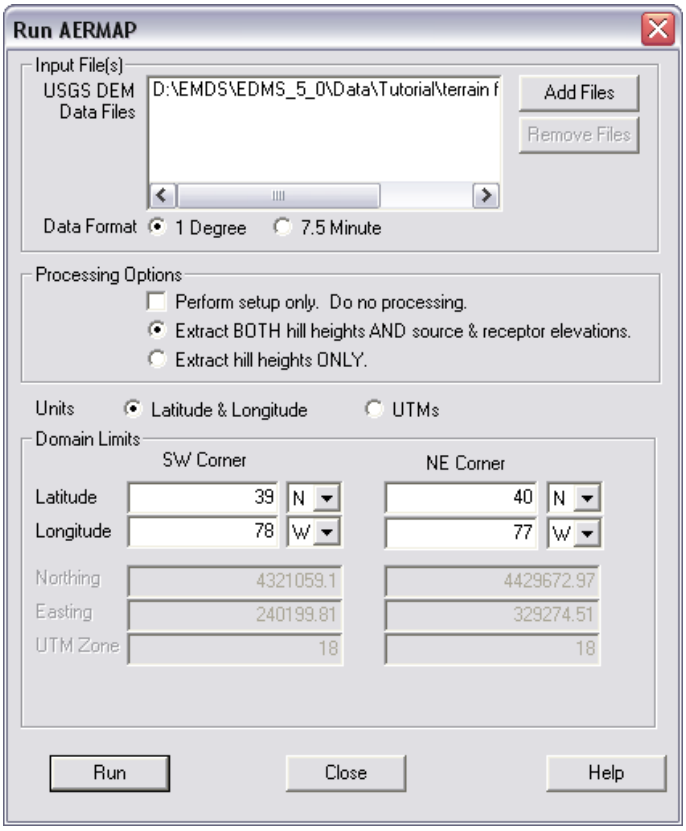


Category	CO2	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5	Fuel Consumption
Aircraft	2,745,612.683	7,173.070	967.614	1,118.788	1,112.954	1,118.788	10,218.753	1,124.352	124.619	124.619	870,241.738
GSE	N/A	67,326.077	N/A	2,551.240	2,661.271	2,921.376	11,767.085	1,002.250	440.706	425.798	N/A
APUs	N/A	1,834.342	105.020	121.428	120.795	121.428	484.327	101.963	148.077	148.077	N/A
Parking Facilities	N/A	669.009	N/A	100.415	101.539	106.549	66.287	1.422	1.273	0.926	N/A
Roadways	N/A	1,039.945	N/A	74.374	75.734	80.017	138.483	4.704	4.188	3.005	N/A
Stationary Sources	N/A	859.316	N/A	213.286	206.530	241.274	3,970.437	263.750	283.035	283.035	N/A
Training Fires	N/A	417.467	N/A	442.436	381.488	2,257.325	76.721	0.238	1,406.373	1,406.373	N/A
Grand Total	2,745,612.683	79,319.227	1,072.634	4,621.967	4,660.311	6,846.757	26,722.093	2,498.680	2,408.271	2,391.833	870,241.738

A.4.7 Run AERMAP

Our next step is to run the AERMOD terrain processor AERMAP.

Action	Result
1. From the *Dispersion* menu, choose the *Process Terrain (AERMAP)*.	This brings up the AERMAP interface window.
2. Select *Add Files* and choose Data\Tutorial\terrain files\baltimore-w.dem.	This instructs EDMS to include terrain data for our AERMOD processing.
3. Press “Run”.	This begins the terrain data processing.
4. Press “Close” to close the AERMAP dialog.	This exits the AERMAP processor.

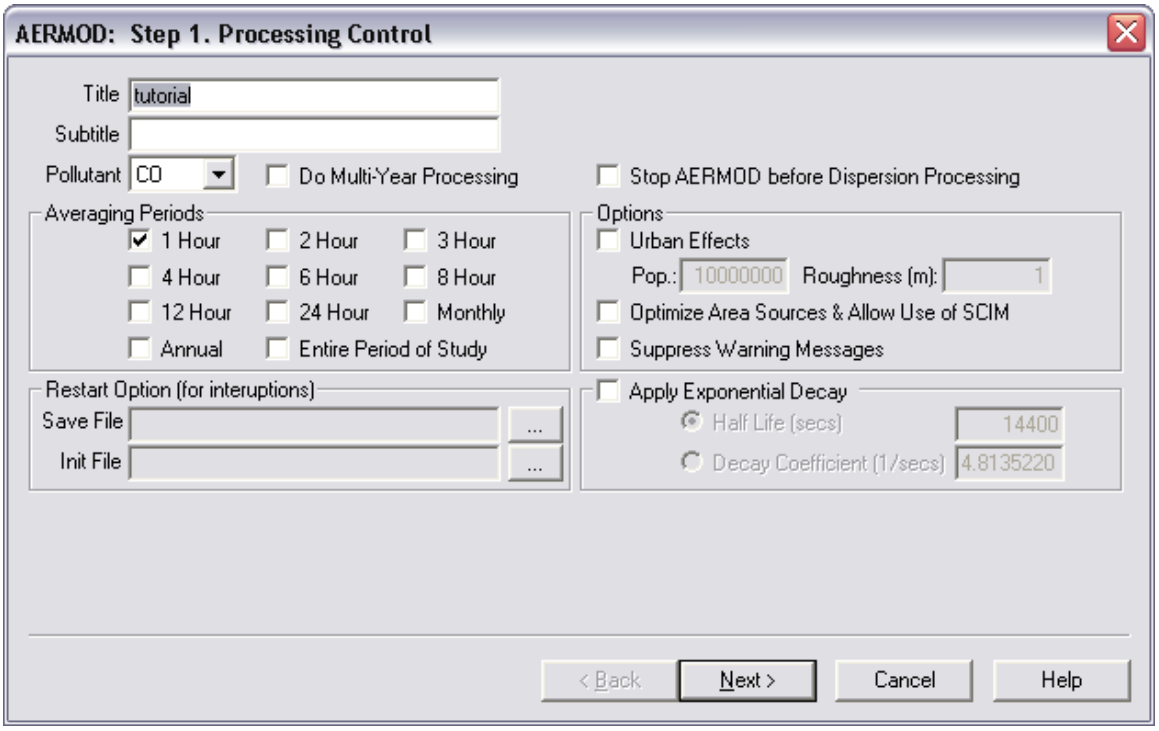


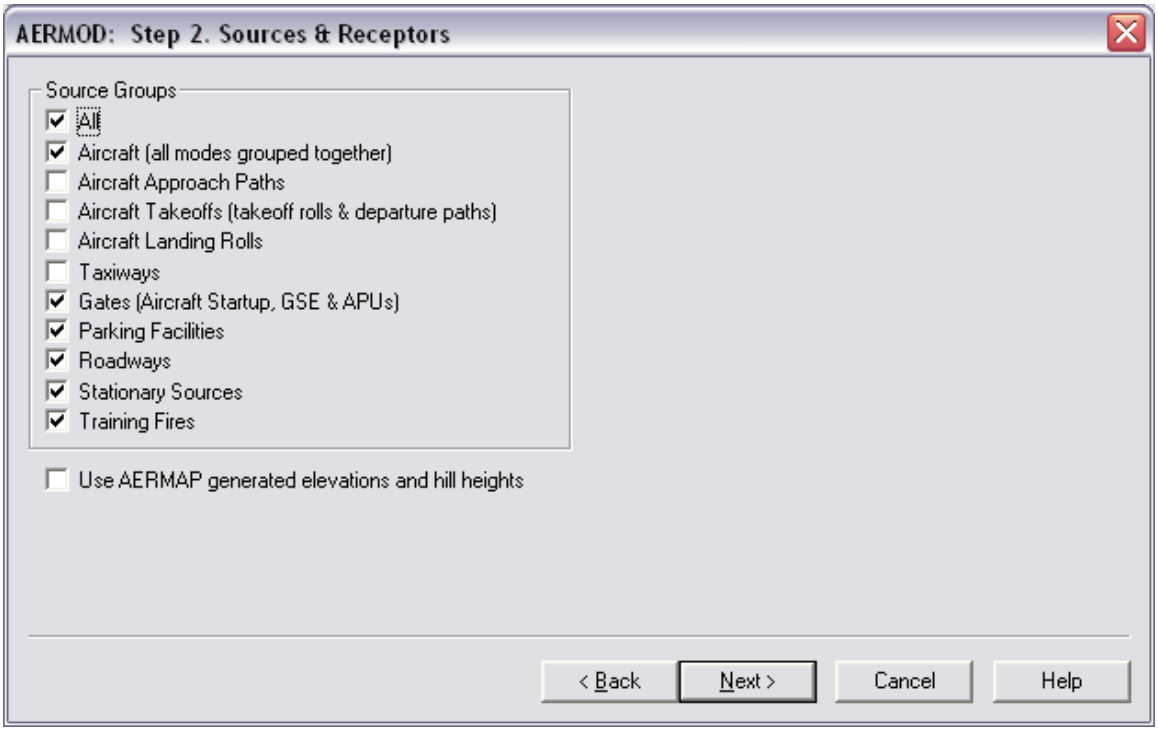
A.4.8 Generating AERMOD Input Files

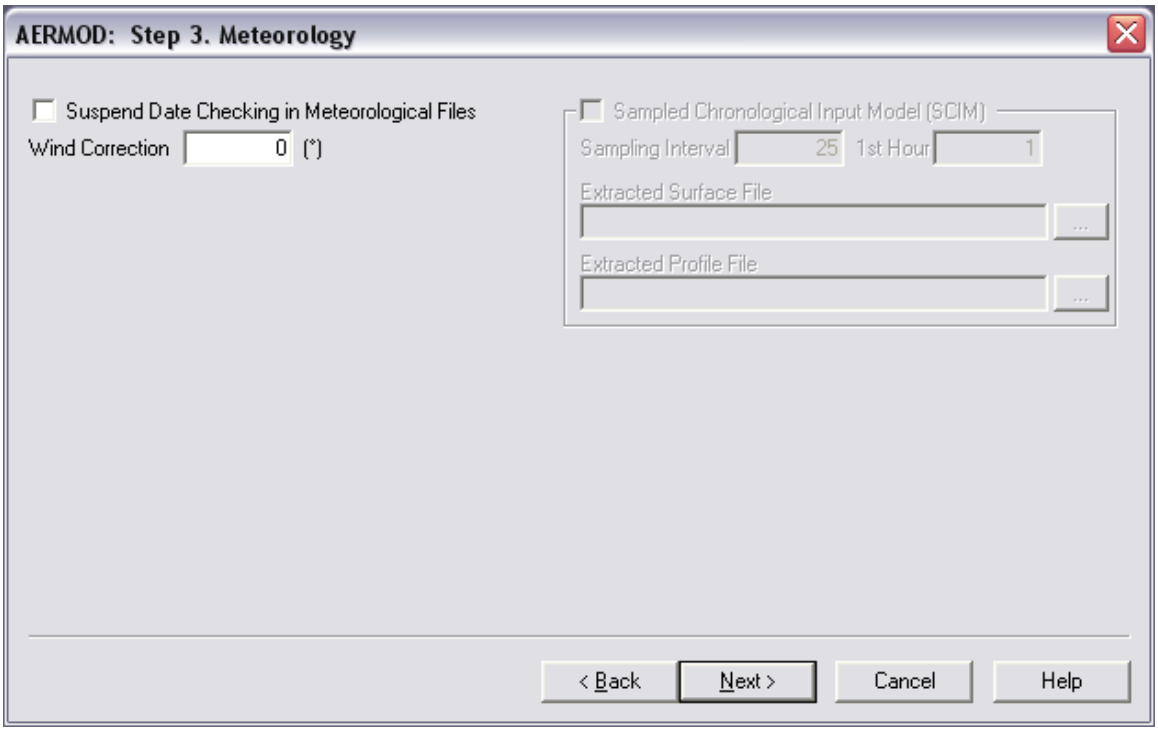
Our next step is to generate the input files that will be used by AERMOD to calculate our concentrations.

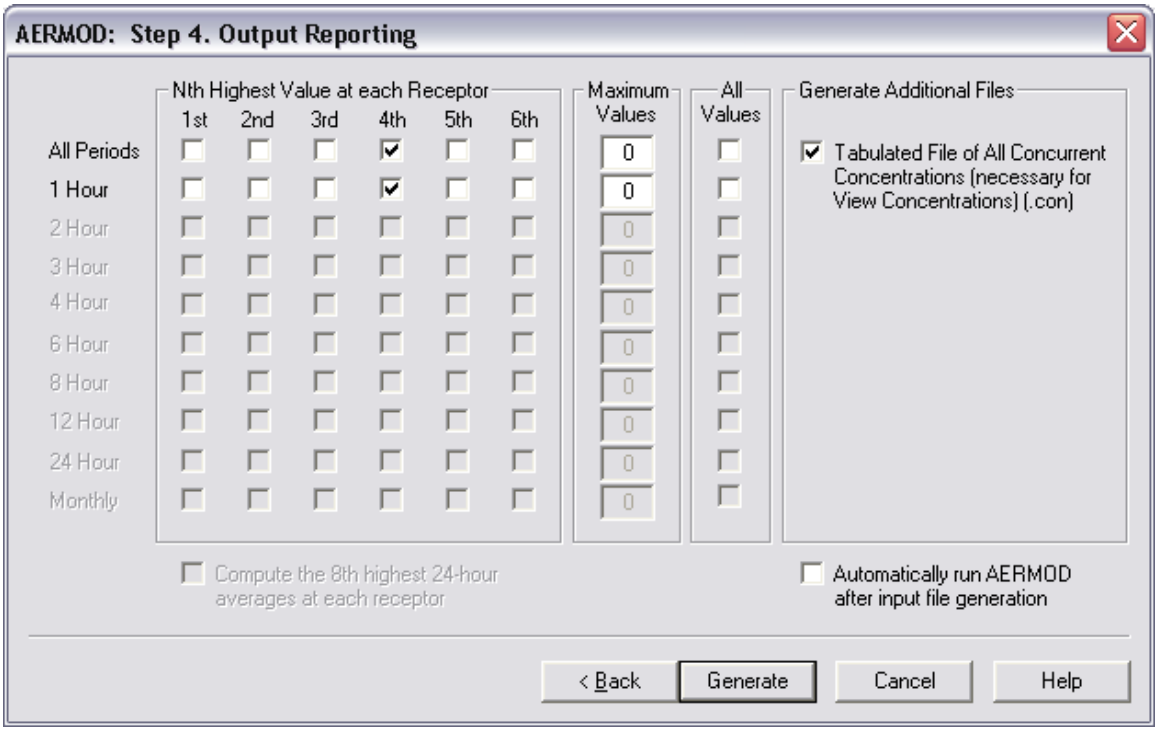
Action	**Result**
1. From the *Dispersion* menu, choose the *Generate AERMOD Input Files* option.	This brings up the generate AERMOD input files wizard.
2. Set the Title to "tutorial".	This instructs EDMS to generate a series of input files for AERMOD called sample with different extensions (e.g. tutorial.inp, tutorial.hre, etc.).
3. Set the pollutant to CO and the averaging period set to 1 hour.	We are interested in 1-hour CO concentrations, so we will not change these settings. Please note that only the pollutants selected for dispersion appear on the dropdown list.
4. Press *Next*.	Advance to Step 2 of AERMOD processing.
5. Select the desired *Source Groups* and press *Next*.	We will keep the default *Source Groups* settings. The AERMOD run will not include AERMAP terrain data (we just ran it to illustrate the process) and we are ready to move to Step 3 of AERMOD processing.

Action	**Result**
6. Press "Next"	Advance to Step 4 of AERMOD processing.
7. Select 4th highest for *All Periods* and check *Tablulate File of All Concurrent Concentrations*.	We have select which outputs we want to see.
8. Press "Generate".	The AERMOD input files will be generated and the window will be closed.




AERMOD: Step 2. Sources & Receptors
Source Groups
All
Aircraft (all modes grouped together)
Aircraft Approach Paths
Aircraft Takeoffs (takeoff rolls & departure paths)
Aircraft Landing Rolls
Taxiways
Gates (Aircraft Startup, GSE & APUs)
Parking Facilities
Roadways
Stationary Sources
Training Fires
Use AERMAP generated elevations and hill heights
< Back
Next >
Cancel
Help


AERMOD: Step 3. Meteorology
Suspend Date Checking in Meteorological Files
Wind Correction
0
(°)
Sampled Chronological Input Model (SCIM)
Sampling Interval
25
1st Hour
1
Extracted Surface File
Extracted Profile File
< Back
Next >
Cancel
Help



A.4.9 Running AERMOD

Now we are ready to run AERMOD and generate concentrations.

Action	**Result**
1. From the *Dispersion* menu, choose the *Run AERMOD* option.	EDMS asks that we confirm we wish to run AERMOD for CO for all analysis years for this scenario-and airport. Respond *Yes*.

A.4.10 Viewing Results

Now that AERMOD has finished running, we are ready to look at the results.

Action	**Result**
1. Select *View Concentrations* from the *View* menu option.	After AERMOD has finished running, the results are saved in the output file that we previously specified. Select *View Concentrations* to access it.
2. Select the "2004CO.CON" file and press the button labeled "Query".	This populates the table for viewing the concentrations from AERMOD.

EDMS 5.1.1 - [Concentrations : Baseline\Hagerstown Regional-Richard A Henson Fld\2004CO.CON]

File Emissions Airport Dispersion View Utilities Window Help

File Name Baseline\Hagerstown Regional-Richard A Henson Fld\2004CO. Averaging Period (Show All) Group (Show All) Query Stop

Receptor Name	X (m)	Y (m)	Concentration (µg/m³)	Elevation (m)	Hill (m)	Height (m)	Averaging Period	Source Group	Date/Time
PERIMETE	1524.00000	0.00002	344.31100	214.27	214.27	1.80	1-HR	ALL	06/01/2003 12:00AM
PERIMETE	1077.63074	-1077.63074	0.00008	214.27	214.27	1.80	1-HR	ALL	06/01/2003 12:00AM
PERIMETE	0.00004	-1524.00000	0.00008	214.27	214.27	1.80	1-HR	ALL	06/01/2003 12:00AM
PERIMETE	-1077.63074	-1077.63074	0.00009	214.27	214.27	1.80	1-HR	ALL	06/01/2003 12:00AM
receptor	-448.00113	-440.99988	0.00005	214.27	214.27	1.80	1-HR	ALL	06/01/2003 12:00AM
PERIMETE	1524.00000	0.00002	8.59289	214.27	214.27	1.80	1-HR	AIRCRAFT	06/01/2003 12:00AM
PERIMETE	1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	AIRCRAFT	06/01/2003 12:00AM
PERIMETE	0.00004	-1524.00000	0.00000	214.27	214.27	1.80	1-HR	AIRCRAFT	06/01/2003 12:00AM
PERIMETE	-1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	AIRCRAFT	06/01/2003 12:00AM
receptor	-448.00113	-440.99988	0.00000	214.27	214.27	1.80	1-HR	AIRCRAFT	06/01/2003 12:00AM
PERIMETE	1524.00000	0.00002	335.40204	214.27	214.27	1.80	1-HR	GATES	06/01/2003 12:00AM
PERIMETE	1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	GATES	06/01/2003 12:00AM
PERIMETE	0.00004	-1524.00000	0.00000	214.27	214.27	1.80	1-HR	GATES	06/01/2003 12:00AM
PERIMETE	-1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	GATES	06/01/2003 12:00AM
receptor	-448.00113	-440.99988	0.00000	214.27	214.27	1.80	1-HR	GATES	06/01/2003 12:00AM
PERIMETE	1524.00000	0.00002	0.16119	214.27	214.27	1.80	1-HR	PARKING	06/01/2003 12:00AM
PERIMETE	1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	PARKING	06/01/2003 12:00AM
PERIMETE	0.00004	-1524.00000	0.00000	214.27	214.27	1.80	1-HR	PARKING	06/01/2003 12:00AM
PERIMETE	-1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	PARKING	06/01/2003 12:00AM
receptor	-448.00113	-440.99988	0.00000	214.27	214.27	1.80	1-HR	PARKING	06/01/2003 12:00AM
PERIMETE	1524.00000	0.00002	0.15477	214.27	214.27	1.80	1-HR	ROADWAYS	06/01/2003 12:00AM
PERIMETE	1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	ROADWAYS	06/01/2003 12:00AM
PERIMETE	0.00004	-1524.00000	0.00000	214.27	214.27	1.80	1-HR	ROADWAYS	06/01/2003 12:00AM
PERIMETE	-1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	ROADWAYS	06/01/2003 12:00AM
receptor	-448.00113	-440.99988	0.00000	214.27	214.27	1.80	1-HR	ROADWAYS	06/01/2003 12:00AM
PERIMETE	1524.00000	0.00002	0.00013	214.27	214.27	1.80	1-HR	STATSRCS	06/01/2003 12:00AM
PERIMETE	1077.63074	-1077.63074	0.00008	214.27	214.27	1.80	1-HR	STATSRCS	06/01/2003 12:00AM
PERIMETE	0.00004	-1524.00000	0.00008	214.27	214.27	1.80	1-HR	STATSRCS	06/01/2003 12:00AM
PERIMETE	-1077.63074	-1077.63074	0.00009	214.27	214.27	1.80	1-HR	STATSRCS	06/01/2003 12:00AM
receptor	-448.00113	-440.99988	0.00005	214.27	214.27	1.80	1-HR	STATSRCS	06/01/2003 12:00AM
PERIMETE	1524.00000	0.00002	0.00000	214.27	214.27	1.80	1-HR	FIRES	06/01/2003 12:00AM
PERIMETE	1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	FIRES	06/01/2003 12:00AM
PERIMETE	0.00004	-1524.00000	0.00000	214.27	214.27	1.80	1-HR	FIRES	06/01/2003 12:00AM
PERIMETE	-1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	FIRES	06/01/2003 12:00AM
receptor	-448.00113	-440.99988	0.00000	214.27	214.27	1.80	1-HR	FIRES	06/01/2003 12:00AM
PERIMETE	1524.00000	0.00002	50.05418	214.27	214.27	1.80	1-HR	ALL	06/01/2003 01:00AM
PERIMETE	1077.63074	-1077.63074	0.00203	214.27	214.27	1.80	1-HR	ALL	06/01/2003 01:00AM
PERIMETE	0.00004	-1524.00000	0.00002	214.27	214.27	1.80	1-HR	ALL	06/01/2003 01:00AM
PERIMETE	-1077.63074	-1077.63074	0.00001	214.27	214.27	1.80	1-HR	ALL	06/01/2003 01:00AM
receptor	-448.00113	-440.99988	0.00029	214.27	214.27	1.80	1-HR	ALL	06/01/2003 01:00AM
PERIMETE	1524.00000	0.00002	36.72511	214.27	214.27	1.80	1-HR	AIRCRAFT	06/01/2003 01:00AM
PERIMETE	1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	AIRCRAFT	06/01/2003 01:00AM
PERIMETE	0.00004	-1524.00000	0.00000	214.27	214.27	1.80	1-HR	AIRCRAFT	06/01/2003 01:00AM
PERIMETE	-1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	AIRCRAFT	06/01/2003 01:00AM
receptor	-448.00113	-440.99988	0.00028	214.27	214.27	1.80	1-HR	AIRCRAFT	06/01/2003 01:00AM
PERIMETE	1524.00000	0.00002	13.28446	214.27	214.27	1.80	1-HR	GATES	06/01/2003 01:00AM
PERIMETE	1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	GATES	06/01/2003 01:00AM
PERIMETE	0.00004	-1524.00000	0.00000	214.27	214.27	1.80	1-HR	GATES	06/01/2003 01:00AM
PERIMETE	-1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	GATES	06/01/2003 01:00AM
receptor	-448.00113	-440.99988	0.00000	214.27	214.27	1.80	1-HR	GATES	06/01/2003 01:00AM
PERIMETE	1524.00000	0.00002	0.00000	214.27	214.27	1.80	1-HR	PARKING	06/01/2003 01:00AM
PERIMETE	1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	PARKING	06/01/2003 01:00AM
PERIMETE	0.00004	-1524.00000	0.00000	214.27	214.27	1.80	1-HR	PARKING	06/01/2003 01:00AM
PERIMETE	-1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	PARKING	06/01/2003 01:00AM
receptor	-448.00113	-440.99988	0.00000	214.27	214.27	1.80	1-HR	PARKING	06/01/2003 01:00AM
PERIMETE	1524.00000	0.00002	0.00000	214.27	214.27	1.80	1-HR	ROADWAYS	06/01/2003 01:00AM
PERIMETE	1077.63074	-1077.63074	0.00201	214.27	214.27	1.80	1-HR	ROADWAYS	06/01/2003 01:00AM
PERIMETE	0.00004	-1524.00000	0.00000	214.27	214.27	1.80	1-HR	ROADWAYS	06/01/2003 01:00AM
PERIMETE	-1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	ROADWAYS	06/01/2003 01:00AM
receptor	-448.00113	-440.99988	0.00000	214.27	214.27	1.80	1-HR	ROADWAYS	06/01/2003 01:00AM
PERIMETE	1524.00000	0.00002	0.04401	214.27	214.27	1.80	1-HR	STATSRCS	06/01/2003 01:00AM
PERIMETE	1077.63074	-1077.63074	0.00002	214.27	214.27	1.80	1-HR	STATSRCS	06/01/2003 01:00AM
PERIMETE	0.00004	-1524.00000	0.00002	214.27	214.27	1.80	1-HR	STATSRCS	06/01/2003 01:00AM
PERIMETE	-1077.63074	-1077.63074	0.00001	214.27	214.27	1.80	1-HR	STATSRCS	06/01/2003 01:00AM
receptor	-448.00113	-440.99988	0.00000	214.27	214.27	1.80	1-HR	STATSRCS	06/01/2003 01:00AM
PERIMETE	1524.00000	0.00002	0.00061	214.27	214.27	1.80	1-HR	FIRES	06/01/2003 01:00AM
PERIMETE	1077.63074	-1077.63074	0.00000	214.27	214.27	1.80	1-HR	FIRES	06/01/2003 01:00AM

For Help, press F1 NUM

Appendix B. Import/Export File Formats

B.1. Introduction

This appendix details the import and export formats used by EDMS 5.1.1. EDMS 5.1.1 is only able to import files in this format, therefore study data exported from EDMS 4.5 (or earlier version) must be re-formatted to match those listed below. This information is also contained in the on-line help for your convenience.

B.2. Format

The file to be imported should be a semicolon-delimited text file with the following format rules:

1. If the first character of a line is the pound sign, "**#**", the line is ignored as a comment.
2. If the first character of a line is an exclamation point, "**!**", or bang, EDMS assumes that a keyword will immediately follow.
3. Any lines not beginning with "#" or "!" are assumed to be data to be imported (if the last keyword was selected for import).
4. All files to be imported must begin with "!VERSION" followed by the EDMS version on the next line.
5. When a study element has variable geometry, it is possible to enter only a subset of the total field count. For instance, supplying only three out of a possible twenty x/y/z roadway points is valid. In all other instances, EDMS expects empty fields to be explicitly entered.

B.3. Keywords

Table B-1 lists all of the keywords available in EDMS 5.1.1. Detailed import formats for each of the keywords follows the table.

Keywords highlighted in bold are required in every input file.

Table B-1. EDMS 5.1.1 import keywords.

Keyword	Data Description
VERSION	**The EDMS version of the file to be imported. Should be set to "5.1.1".**
SCENARIOS	**Scenarios stored in the study.**
AIRPORTS	**Airports stored in the study.**
YEARS	**Years stored in the study.**
SETTINGS	General information about the modeled airport
PROPERTIES_FOR_SCENARIO-AIRPORT_COMBINATIONS	Properties for Scenario-Airport combinations
PROPERTIES_FOR_SCENARIO-AIRPORT-YEAR_COMBINATIONS	Properties for Scenario-Airport-Year combinations
AIRCRAFT_OPERATIONS	Aircraft operations entered into the study.
AIRCRAFT_GSE_ASSIGNMENTS	GSE-to-Aircraft assignments
AIRCRAFT_DEFINITIONS	Aircraft defined in the study.
ROADWAYS	Roadways.
PARKING_FACILITIES	Parking facilities.
TRAINING_FIRES	Training Fires

STATIONARY_SOURCES	Stationary sources.
GSE_POPULATION_GATE_ASSIGNMENTS	GSE population gate assignments.
GSE_POPULATION	GSE population.
QUARTER_HOURLY_PROFILES	Defined quarter-hourly profiles.
DAILY_PROFILES	Defined daily profiles.
MONTHLY_PROFILES	Defined monthly profiles.
BUILDINGS	Buildings.
GATES	Gates.
RUNWAYS	Runways.
TAXIWAYS	Taxiways.
TAXIPATHS	Taxipaths.
DISCRETE_CARTESIAN_RECEPTORS	Discrete Cartesian receptors.
DISCRETE_POLAR_RECEPTORS	Discrete polar receptors.
NETWORK_CARTESIAN_RECEPTORS	Network Cartesian receptors.
NETWORK_POLAR_RECEPTORS	Network polar receptors.
USER-CREATED_APUS	User-created APUs.
USER-CREATED_GSE	User-created GSEs.
USER-CREATED_AIRCRAFT	User-created aircraft.

VERSION

This keyword is required for all import files.

Number of fields: 1.

Field #	Description	Optional?
1	EDMS Version Number (should always be 5.1.1)	No

Example

```
!VERSION
5.1.1
```

AIRPORTS

Number of fields: 20

Field #	Description	Format	Optional?
1	In the study?	"F" = This airport is in the available list (not in the study) "T" = This airport is in the study	Yes; defaults to “F”.
2	Airport name	Text; up to 100 characters.	No
3	System airport ID	Text; up to 9 characters.	No
4	IATA ID	Text; up to 3 characters.	No
5	Country code	Text; up to 2 characters.	No
6	ICAO ID	Text; up to 4 characters.	No
7	FAA ID	Text; up to 4 characters.	No
8	ICAO Region	Text; up to 1 character.	No
9	Engine region	Positive integer.	No
10	City name	Text; up to 50 characters.	No
11	State name	Text; up to 50 characters.	No
12	Country name	Text; up to 25 characters.	No

13	Elevation (Ft)	Numeric value with 2 decimal places.	No
14	Is in latitude/longitude?	"T" if coordinates are expressed as Latitude/Longitude. "F" if expressed in UTM.	If blank, UTM coordinates are assumed.
15	Latitude (°)	Numerical value. Positive values are north. Negative values are south.	No, if latitude/longitude coordinates are selected.
16	Longitude (°)	Numerical value. Positive values are east. Negative values are west.	
17	Northing (m)	Numerical value. Positive values are north. Negative values are south.	No, if UTM coordinates are selected.
18	Easting (m)	Numerical value. Positive values are east. Negative values are west.	
19	UTM Zone	Positive integer.	
20	Description	Text; up to 1000 characters.	Yes

Example

```
!AIRPORTS
T ; Hagerstown ; 40078KHGR ; HGR ; US ; KHGR ; ; K ; 1 ; ; Maryland ;
United States of America ; 703.00 ; T ; 39.707944 ; -77.729500 ;
4398905.00 ; 266004.69 ; 18 ; Hagerstown Regional-Richard A Henson Fld
```

SCENARIOS

Number of fields: 7

Field #	Description	Format	Optional?
1	In the study?	"F" = This scenario is in the available list (not in the study) "T" = This scenario is in the study	Yes; will default to "F"
2	Scenario name	Text; up to 40 characters.	No
3	Is baseline?	Boolean - T/F.	Yes; empty will revert to non-baseline
4	Time-in-mode basis [Performance=0|ICAO=1]	Positive integer.	Yes; empty will revert to Performance
5	Taxi model [User=0|Delay=1|Sequencing=2]	Positive integer.	Yes; empty will revert to User
6	Sulfur conversion rate	Numeric value with 4 decimal places.	Yes; will default to 0.
7	Description	Text; up to 1000 characters.	Yes

Example

```
!SCENARIOS
T ; Baseline ; T ; 1 ; 0 ; 0.0050 ; Baseline Scenario.
```

PROPERTIES_FOR_SCENARIO-AIRPORT_COMBINATIONS

Number of fields: 20

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Scenario name	Text; up to 40 characters.	No

3	Airport name	Text; up to 100 characters.	No
4	Mixing height (Ft)	Numeric value with 2 decimal places.	No
5	Use hourly met data?	Boolean - T/F.	Yes
6	Avg. temperature (°F)	Numeric value with 2 decimal places.	Yes
7	Daily high temp. (°F)	Numeric value with 2 decimal places.	Yes
8	Daily low temp. (°F)	Numeric value with 2 decimal places.	Yes
9	Pressure	Numeric value with 2 decimal places.	Yes
10	Pressure MSL	Numeric value with 2 decimal places.	Yes
11	Humidity (%)	Numeric value with 2 decimal places.	Yes
12	Wind Speed	Numeric value with 2 decimal places.	Yes
13	Wind Direction (°)	Numeric value with 2 decimal places.	Yes
14	Ceiling (ft)	Numeric value with 2 decimal places.	Yes
15	Visibility	Numeric value with 2 decimal places.	Yes
16	Aermet run?	Boolean - T/F.	Yes
17	AERMET output surface filename	Text; up to 250 characters.	Yes
18	AERMET output profile filename	Text; up to 250 characters.	Yes
19	AERMET intermediate output surface	Text; up to 250 characters.	Yes
20	Profile file base elevation (m)	Numeric value with 2 decimal places.	Yes

Example

```
!PROPERTIES_FOR_SCENARIO-AIRPORT_COMBINATIONS
1 ; Baseline ; Hagerstown ; 3000.00 ; T ; 53.00 ; 63.35 ; 42.65 ; 29.92 ;
30.08 ; 64.13 ; 6.09 ; 0.00 ; 0.00 ; 0.00 ; F ; BALT_13701.SFC ;
BALT_13701.PFL ; SFQAFILE.MET ; 214.00
```

PROPERTIES_FOR_SCENARIO-AIRPORT-YEAR_COMBINATIONS

Number of fields: 8

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	Yes
2	Analysis year	Positive integer.	Yes
3	Default total taxi in time (min)	Numeric value with 2 decimal places.	Yes
4	Default total taxi out time (min)	Numeric value with 2 decimal places.	Yes
5	Default unimpeded taxi in time (min)	Numeric value with 2 decimal places.	Yes
6	Default unimpeded taxi out time (min)	Numeric value with 2 decimal places.	Yes

7	Use schedule?	Boolean - T/F.	Yes
8	Schedule filename	Text; up to 250 characters.	Yes

Example

```
!PROPERTIES_FOR_SCENARIO-AIRPORT-YEAR_COMBINATIONS
1 ; 2004 ; 7.00 ; 19.00 ; 0.00 ; 0.00 ; F ;
```

YEARS

Number of fields: 1

Field #	Description	Format	Optional?
1	Analysis year	4-digit integer 1990-2050	No

Example

```
!YEARS
2005
```

QUARTER_HOURLY_PROFILES

Number of fields: 99

Field #	Description	Format	Optional?
1	Scenario Airport ID	Positive integer.	No
2	Profile ID	Positive integer.	No
3	Quarter-Hourly Operational Profile Name	Text; up to 20 characters.	No
4	Temporal factor for the first quarter-hour: (midnight - 12:15 am)	Number from 0 to 1 with up to 4 decimal places.	Yes
. . .	. . .	. . .	. . .
99	Temporal factor for the last quarter-hour: (11:45 pm - midnight)	Number from 0 to 1 with up to 4 decimal places.	Yes

Notes

0 will be entered if a numerical field is left blank or is a negative value.

1 will be entered if the value in the field is greater than 1.

Example

```
! QUARTER_HOURLY_PROFILES
1 ; 0 ; DEFAULT ; 1.0000 ; … ; 1.0000
```

DAILY_PROFILES

Number of fields: 10

Field #	Description	Format	Optional?
1	Scenario Airport ID	Positive integer.	No
2	Profile ID	Positive integer.	No
3	Daily Operational Profile Name	Text up to 20 characters	No
4	Temporal factor for Monday	Number from 0 to 1 with up to 4 decimal places	Yes
. . .	. . .	. . .	. . .
10	Temporal factor for Sunday	Number from 0 to 1 with up to 4 decimal places	Yes

Notes

0 will be entered if a numerical field is left blank or is a negative value.

1 will be entered if the value in the field is greater than 1.

Example

```
!DAILY_PROFILES
1 ; 0 ; DEFAULT; 1.0000; 0.9000; 0.8000; 0.7500; 0.5000; 0.3000; 0.0000
```

MONTHLY_PROFILES

Number of fields: 15

Field #	Description	Format	Optional?
1	Scenario Airport ID	Positive integer.	No
2	Profile ID	Positive integer.	No
3	Monthly Operational Profile Name	Text up to 20 characters	No
4	Temporal factor for January	Number from 0 to 1 with up to 4 decimal places	Yes
. . .	. . .	. . .	. . .
15	Temporal factor for December	Number from 0 to 1 with up to 4 decimal places	Yes

Notes

0 will be entered if a numerical field is left blank or is a negative value.

1 will be entered if the value in the field is greater than 1.

Example

```
!MONTHLY_PROFILES
1 ; 0 ; DEFAULT ; 1.0000 ; 0.9000 ; 0.8000 ; 0.7500 ; 0.5000 ; 0.3000 ;
0.0000 ; 0.9000 ; 0.8000 ; 0.7500 ; 0.5000 ; 0.3000
```

AIRCRAFT_DEFINITIONS

Number of fields: 19

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Aircraft identifier	Positive integer.	No
3	ICAO aircraft code	Text; up to 15 characters.	Yes
4	ICAO Engine UID	Text; up to 10 characters.	Yes
5	User ID	Text; up to 40 characters.	Yes
6	Is User Created?	Boolean - T/F.	Yes
7	User aircraft name	Text; up to 40 characters.	Yes
8	Use annual ops	Boolean - T/F.	Yes
9	Departure Weight (lbs)	Positive integer.	Yes
10	Arrival Weight (lbs)	Positive integer.	Yes
11	Use runway glideslope	Boolean - T/F.	Yes
12	Glideslope angle (°)	Numeric value with 1 decimal places.	Yes
13	Use default APU	Boolean - T/F.	Yes
14	APU ID	Positive integer.	Yes
15	APU time - departures (min)	Numeric value with 2 decimal places.	Yes
16	APU time - arrivals (min)	Numeric value with 2 decimal places.	Yes
17	Use default GSEs	Boolean - T/F.	Yes
18	Gate name	Text; up to 20 characters.	Yes
19	Fuel sulfur content	Numeric value with 6 decimal places.	Yes

Example

```
!AIRCRAFT_DEFINITIONS
1 ; 1 ; B737-3 ; 1CM004 ; Airline ; F ; ; T ; 119900 ; 102600 ; F ; 3.0 ;
T ; 20 ; 13.00 ; 13.00 ; T ; Main ; 0.000680
```

AIRCRAFT_OPERATIONS

Number of fields: 18

Field #	Description	Format	Optional?
1	Scenario Airport ID	Positive integer.	No
2	Aircraft identifier	Positive integer. Must match an aircraft ID in the AIRCRAFT_DEFINITIONS section.	No

Field #	Description	Format	Optional?
3	Analysis year	Positive integer.	No
4	Taxitime-outbound (min)	Numeric value with 2 decimal places.	Yes (set to 0 if blank)
5	Taxitime-inbound (min)	Numeric value with 2 decimal places.	Yes (set to 0 if blank)
6	Departures count	Numeric value with 6 decimal places.	Yes (set to 0 if blank)
7	Departures profile - quarter-hourly	Positive integer. Must match a quarter-hourly profile ID, or the default will be used.	Yes (set to DEFAULT if left blank)
8	Departures profile - daily	Positive integer. Must match a daily profile ID, or the default will be used.	Yes (set to DEFAULT if left blank)
9	Departures profile - monthly	Positive integer. Must match a monthly profile ID, or the default will be used.	Yes (set to DEFAULT if left blank)
10	Arrivals count	Numeric value with 6 decimal places.	Yes (set to 0 if blank)
11	Arrivals profile - quarter-hourly	Positive integer. Must match a quarter-hourly profile ID, or the default will be used.	Yes (set to DEFAULT if left blank)
12	Arrivals profile - daily	Positive integer. Must match a daily profile ID, or the default will be used.	Yes (set to DEFAULT if left blank)
13	Arrivals profile - monthly	Positive integer. Must match a monthly profile ID, or the default will be used.	Yes (set to DEFAULT if left blank)

Field #	Description	Format	Optional?
14	TGOs count	Numeric value with 6 decimal places.	Yes (set to 0 if blank)
15	TGOs profile - quarter-hourly	Positive integer. Must match a quarter-hourly profile ID, or the default will be used.	Yes (set to DEFAULT if left blank)
16	TGOs profile - daily	Positive integer. Must match a daily profile ID, or the default will be used.	Yes (set to DEFAULT if left blank)
17	TGOs profile - monthly	Positive integer. Must match a monthly profile ID, or the default will be used.	Yes (set to DEFAULT if left blank)

Example

```
!AIRCRAFT_OPERATIONS
1 ; 1 ; 2004 ; 19.00 ; 7.00 ; 1000.000000 ; 0 ; 1 ; 1 ; 1000.000000 ; 0 ;
1 ; 1 ; 0.000000 ; 0 ; 0 ; 0
```

AIRCRAFT_GSE_ASSIGNMENTS

Number of fields: 10

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Aircraft identifier	Positive integer.	No
3	System GSE ID	Positive integer.	No
4	Fuel type (GDCLE)	1 character: "G" = Gasoline "D" = Diesel "C" = Compressed Natural Gas "L" = Liquid Propane Gas "E" = Electric	No
5	Operation departure time (mins/LTO)	Number from 0 to 480 with 2 decimal places allowed.	Yes. 0 will be used if this field is left blank.
6	Operation arrival time (mins/LTO)	Number from 0 to 480 with 2 decimal places allowed.	Yes. 0 will be used if this field is left blank.

7	GSE Horsepower (bhp)	Number appropriate to the equipment type and fuel burned, 0 to 10000 allowed. Blank for APUs.	Yes. 0 will be used if this field is left blank.
8	Loadfactor	Number from 0 to 1 with 4 decimal places allowed. Blank for APUs.	Yes. 0 will be used if this field is left blank.
9	Manufacture year	A 4-digit year or zero. Zero means the default average year of manufacture.	Yes. 0 will be used if this field is left blank.
10	Reference Model	Text; up to 100 characters.	Yes. 0 will be used if this field is left blank.

Notes

The first 4 fields must form a unique combination; otherwise, the record is skipped.

Default values for operating time, brake horsepower and load factor will be assigned if all three of these fields are left blank. If the user intends to set zero emissions for a particular GSE assignment, only the operating time should be set to zero.

Example

```
! AIRCRAFT_GSE_ASSIGNMENTS
1 ; 1 ; 8 ; D ; 8.00 ; 0.00 ; 88 ; 0.8000 ; 0 ; Stewart & Stevenson TUG
GT-35, Douglas TBL-180
```

GSE_POPULATION

Number of fields: 19

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Analysis year	Positive integer.	No
3	System GSE ID	Positive integer. Must match the ID of a system GSE.	No
4	Fuel type (GDCLE)	1 character: "G" = Gasoline "D" = Diesel "C" = Compressed Natural Gas "L" = Liquid Propane Gas "E" = Electric	No
5	User ID	Text; up to 40 characters.	No
6	GSE type	Text up to 30 characters. This name must match a GSE type in the system or user-created tables exactly.	No

7	Reference model	Text; up to 100 characters.	Yes
8	Population	Numeric; 0 to 10000	Yes; blank means 0.
9	Use annual figures?	"F" = hours per year "T" = minutes per peak hour	Yes (blank = "F")
10	Annual operations	Number between 0 and 8760.	Yes (this field can be left blank if peak hour minutes is specified)
11	Peak operations	Number from 0 to 60.	Yes (this field can be left blank if annual hours is specified)
12	Quarterly profile	Text up to 20 characters. This must match a Hourly Profile ID exactly.	Yes (set to DEFAULT if left blank)
13	Daily profile	Text up to 20 characters. This must match a Daily Profile ID exactly.	Yes (set to DEFAULT if left blank)
14	Monthly profile	Text up to 20 characters. This must match a Monthly Profile ID exactly.	Yes (set to DEFAULT if left blank)
15	Nonroad version	Positive integer.	Yes
16	Horsepower (bhp)	Integer 0 to 10000.	Yes (blank = 0)
17	Loadfactor	Number 0 to 1 with 4 decimal places.	Yes (blank = 0)
18	Use nonroad?	"T" = use Draft Nonroad Emission Factors "F" = use System Emission Factors	Yes (blank = "F")
19	Manufacture year	A 4-digit year.	Yes, if the Use NONROAD May 2004 draft data flag is "F".

Notes

If the annual hours/peak hour minutes flag is left blank or "F" and the annual hours is blank or 0, then the default annual usage will be assigned.

If both the brake horsepower and load factor are blank, zero or a combination of the two, then default values will be assigned to them.

Example

```
!GSE_POPULATION
1 ; 2004 ; 14 ; G ; #1 ; Belt Loader ; Stewart & Stevenson TUG 660 ; 3 ;
T ; 1000 ; 1.71 ; 0 ; 0 ; 0 ; ; 71 ; 0.5000 ; F ; 2004
```

GSE_POPULATION_GATE_ASSIGNMENTS

Number of fields: 6

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	System GSE ID	Positive integer. This must match a GSE in the study.	No

3	Fuel type (GDCLE)	1 character: "G" = Gasoline "D" = Diesel "C" = Compressed Natural Gas "L" = Liquid Propane Gas "E" = Electric	No
4	User ID	Text; up to 40 characters.	No
5	Gate Name	Text up to 20 characters. This must match a gate name in the study.	No
6	Fraction assigned to gate	Number from 0 to 1.	Yes (blank = 0).

Example

```
!GSE_POPULATION_GATE_ASSIGNMENTS
1 ; 2 ; D ; #1 ; Main ; 0.50
```

ROADWAYS

Number of fields: 37-95

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Analysis year	Positive integer.	No
3	Roadway name	Text; up to 40 characters.	No
4	In the study?	"F" = This roadway is in the available list (not in the study) "T" = This roadway is in the study	Yes (blank = "F")
5	Use annual figures?	T (for true) if the annual value is to be used. F (for false) if the peak hour value is to be used.	Yes (blank = "F")
6	Vehicle type	Integer from 0 to 16. 0 = Default Fleet Mix. 1 = Light Duty Vehicles (Passenger Cars) 2 = Light Duty Trucks 1 (0-6,000 lbs. GVWR, 0-3750 lbs. LVW) 3 = Light Duty Trucks 2 (0-6,000 lbs. GVWR, 3751-5750 lbs. LVW) 4 = Light Duty Trucks 3 (6,001-8500 lbs. GVWR, 0-3750 lbs. LVW) 5 = Light Duty Trucks 4 (6,001-8500 lbs. GVWR, 3751-5750 lbs. LVW)	Yes (blank = 0)

Field #	Description	Format	Optional?
		6 = Class 2b Heavy Duty Vehicles (8501-10,000 lbs. GVWR) 7 = Class 3 Heavy Duty Vehicles (10,001-14,000 lbs. GVWR) 8 = Class 4 Heavy Duty Vehicles (14,001-16,000 lbs. GVWR) 9 = Class 5 Heavy Duty Vehicles (16,001-19,500 lbs. GVWR) 10 = Class 6 Heavy Duty Vehicles (19,501-26,000 lbs. GVWR) 11 = Class 7 Heavy Duty Vehicles (26,001-33,000 lbs. GVWR) 12 = Class 8a Heavy Duty Vehicles (33,001-60,000 lbs. GVWR) 13 = Class 8b Heavy Duty Vehicles (>60,000 lbs. GVWR) 14 = School Busses 15 = Transit and Urban Busses 16 = Motorcycles	
7	Fuel type (GDCLE)	1 character: "G" = Gasoline "D" = Diesel	Yes (blank = "G")
8	Manufacture year	A 4-digit year.	Yes, if the Vehicle Type Index is zero.
9	Number of vehicles per year	Number from 0 to 1000000000	One of these must be specified
10	Number of vehicles in a peak hour	Number from 0 to 100000	
11	Speed (mph)	Integer multiple of 5 from 5 to 65, inclusive, or 2.5	Yes (blank = 35 mph)
12	Round trip vehicle distance (miles)	Number from 0 to 4000 with 3 decimals allowed	Yes (only needed for emissions inventory only studies).
13	Quarter-hourly profile	Positive integer.	Yes (default will be used if this is left blank)
14	Daily profile	Positive integer.	
15	Monthly profile	Positive integer.	

Field #	Description	Format	Optional?
16	User edited?	T (for true) if emissions factors are meant to override the MOBILE values F (for false) if MOBILE is to automatically generate the emission factors	Yes (blank = "F"). Leave blank or "F" to automatically assign MOBILE values.
17	CO (g/vehicle-mile)	Number from 0 to 2000.	Yes; if the user-edited emissions factors flag is "F", then MOBILE will assign the value.
18	THC (g/vehicle-mile)	Number from 0 to 200.	
19	NMHC (g/vehicle-mile)	Number from 0 to 200.	
20	VOC (g/vehicle-mile)	Number from 0 to 200.	
21	TOG (g/vehicle-mile)	Number from 0 to 200.	
22	NOx (g/vehicle mile)	Number from 0 to 20.	
23	SOx (g/vehicle mile)	Number from 0 to 2.	
24	PM-10 (g/vehicle mile)	Number from 0 to 2.	
25	PM-2.5 (g/vehicle mile)	Number from 0 to 2.	
26	Benzene (g/vehicle mile)	Number	
27	MTBE (g/vehicle mile)	Number	
28	1,3 Butadiene (g/vehicle mile)	Number	
29	Formaldehyde (g/vehicle mile)	Number	
30	Acetaldehyde (g/vehicle mile)	Number	
31	Acrolein (g/vehicle mile)	Number	
32	Sigma Z0 (m)	Number	
33	Width (in meters)	Number from 0 to 99.999999.	Yes (blank = 1 meter)
34	Point count	Positive integer.	Yes
35	x-coordinate 1 (meters)	Number within +/- 999999.999999	Yes (Dispersion only)
36	y-coordinate 1 (meters)	Number within +/- 999999.999999	Yes (Dispersion only)
37	z-coordinate 1 (meters)	Number within +/- 999999.999999	Yes (Dispersion only)
	. . .	. . .	. . .

Field #	Description	Format	Optional?
93	x-coordinate 20 (meters)	Number within +/- 999999.999999	Yes (if fewer than 20 points are used to define the parking lot)
94	y-coordinate 20 (meters)	Number within +/- 999999.999999	Yes (if fewer than 20 points are used to define the parking lot)
95	z-coordinate 20 (meters)	Number within +/- 999999.999999	Yes (if fewer than 20 points are used to define the parking lot).

Example

```
!ROADWAYS
1 ; 2004 ; Terminal Parkway ; T ; F ; T ; 0 ; G ; 2008 ; 35 ;  0.062137 ;
2008 ;  0 ;   0 ; 0 ; 0 ;   0 ; F   ;   9.9710 ;   -1.0000 ;  0.7500 ;
0.7600 ; 0.8020 ; 1.4040 ; 0.0112 ;   0.0472 ; 0.0307 ;   0.024509 ;
0.000000 ;   0.003398 ;  0.009340 ;  0.006693 ; 0.000414 ; 3.000000 ;
20.000000 ;  2 ; 0.000000 ; 0.000000 ; 0.000000 ;  100.000000 ; 0.000000
; 0.000000
```

PARKING

Number of fields: 40-78

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	Yes
2	Analysis year	Positive integer.	Yes
3	Name	Text; up to 40 characters.	Yes
4	In the study?	"F" = This parking lot is in the available list (not in the study) "T" = This parking lot is in the study.	Yes
5	Use distribution?	Boolean - T/F.	Yes
6	Use annual figures?	T (for true) if the annual value is to be used. F (for false) if the peak hour value is to be used.	Yes (blank = "F")
7	Vehicle type	Integer from 0 to 16. 0 = Default Fleet Mix 1 = Light Duty Vehicles (Passenger Cars) 2 = Light Duty Trucks 1 (0-6,000 lbs. GVWR, 0-3750 lbs. LVW) 3 = Light Duty Trucks 2 (0-6,000 lbs. GVWR, 3751-5750 lbs. LVW)	Yes (blank = 0)

Field #	Description	Format	Optional?
		4 = Light Duty Trucks 3 (6,001-8500 lbs. GVWR, 0-3750 lbs. LVW) 5 = Light Duty Trucks 4 (6,001-8500 lbs. GVWR, 3751-5750 lbs. LVW) 6 = Class 2b Heavy Duty Vehicles (8501-10,000 lbs. GVWR) 7 = Class 3 Heavy Duty Vehicles (10,001-14,000 lbs. GVWR) 8 = Class 4 Heavy Duty Vehicles (14,001-16,000 lbs. GVWR) 9 = Class 5 Heavy Duty Vehicles (16,001-19,500 lbs. GVWR) 10 = Class 6 Heavy Duty Vehicles (19,501-26,000 lbs. GVWR) 11 = Class 7 Heavy Duty Vehicles (26,001-33,000 lbs. GVWR) 12 = Class 8a Heavy Duty Vehicles (33,001-60,000 lbs. GVWR) 13 = Class 8b Heavy Duty Vehicles (>60,000 lbs. GVWR) 14 = School Busses 15 = Transit and Urban Busses 16 = Motorcycles	
8	Manufacture year	A 4-digit year.	Yes, if the Vehicle Type Index is zero.
9	Average number of vehicles per year	Number 0 to 1000000000.	Yes (only needed if the peak hour value is not specified).
10	Number of vehicles in a peak hour	Number from 0 to 100000	Yes (only needed if the annual value is not specified).
11	Average speed in lot (MPH)	Integer multiple of 5 from 5 to 65, inclusive, or 2.5	Yes (blank = 10 mph)
12	Average distance traveled (meters)	Number 0 to 10000 with 6 decimals allowed	Yes (blank = 0)
13	Average Idle Time (minutes)	Number 0 to 30 with 1 decimal allowed	Yes (blank = 0)
14	Fuel type	1 character: "G" = Gasoline "D" = Diesel	Yes (blank = "G")
15	Quarter-hourly profile	Positive integer.	Yes (default will be used if this is left blank)
16	Daily profile	Positive integer.	
17	Monthly profile	Positive integer.	

Field #	Description	Format	Optional?
18	User edited?	T (for true) if emission factors are provided to override the MOBILE values; otherwise F (for false)	Yes (blank = "F")
19	CO output (g/vehicle)	Number from 0 to 9999.99.	Yes
20	THC output (g/vehicle)	Number from 0 to 2000.	Yes
21	NMHC output (g/vehicle)	Number from 0 to 2000.	Yes
22	VOC output (g/vehicle)	Number from 0 to 2000.	Yes
23	TOG output (g.vehicle)	Number from 0 to 2000.	Yes
24	NOx output (g/vehicle)	Number from 0 to 200.	Yes
25	SOx output (g/vehicle)	Number from 0 to 20.	Yes
26	PM-10 output (g/vehicle)	Number from 0 to 20.	Yes
27	PM-2.5 output (g/vehicle)	Number from 0 to 20.	Yes
28	Benzene (g/vehicle mile)	Number	Yes
29	MTBE (g/vehicle mile)	Number	Yes
30	1,3 Butadiene (g/vehicle mile)	Number	Yes
31	Formaldehyde (g/vehicle mile)	Number	Yes
32	Acetaldehyde (g/vehicle mile)	Number	Yes
33	Acrolein (g/vehicle mile)	Number	Yes
34	Number of Levels	Integer from 1 to 20, inclusive.	Yes
35	Top Release Height (m)	Number from 0 to 99.999999, inclusive.	Yes
36	Spacing (m)	Number from 1 to 99.999999, inclusive.	Yes
37	Elevation (m)	Numeric value with 6 decimal places.	Yes
38	Number of points used to define the parking lot	Integer 3 to 20.	Yes (Dispersion only)

Field #	Description	Format	Optional?
39	x-coordinate 1 (meters)	Number within +/- 999999.999999	Yes (Dispersion only)
40	y-coordinate 1 (meters)	Number within +/- 999999.999999	Yes (Dispersion only)
	. . .	. . .	. . .
77	x-coordinate 20 (meters)	Number within +/- 999999.999999	Yes (if fewer than 20 points are used to define the parking lot)
78	y-coordinate 20 (meters)	Number within +/- 999999.999999	Yes (if fewer than 20 points are used to define the parking lot).

Example

```
!PARKING
1 ; 2004 ; Terminal Parking ; T ; F ; T ; 0 ; 2004 ; 75000 ; 2 ; 10 ;
99.060000 ; 1.50 ; D ; 0 ; 0 ; 0 ; F ; 9.9710 ;   -1.0000 ;  0.7500 ;
0.7600 ; 0.8020 ; 1.4040 ; 0.0112 ;   0.0472 ; 0.0307 ;   0.024509 ;
0.000000 ;   0.003398 ;  0.009340 ;  0.006693 ; 0.000414 ; 1 ; 0.999744 ;
3.000000 ; 209.092800 ; 4 ; -396.240000 ; -406.908000 ; -313.944000 ; -
423.672000 ; -330.708000 ; -505.968000 ; -413.004000 ; -489.204000
```

STATIONARY_SOURCES

Number of fields: 60 - 100

Notes

If not using category **Other** and using system defaults, emissions parameters will be automatically set to the appropriate values and therefore the user may leave all the emissions factors fields blank.

Operational Parameter Fields

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Analysis year	Positive integer.	No
3	Stationary source name	Text; up to 40 characters.	No
4	In the study?	"F" = This source is in the available list (not in the study) "T" = This source is in the study	Yes (blank = "F")
5	Substance	Positive integer.	Yes
6	Yearly operations	Number from 0 to 20000000 with 2 decimals	Yes (blank = 0)
7	Hourly operations	Number from 0 to 200000 with 2 decimals	Yes (blank = 0)
8	By peak hour?	"F" = Annual "T" = Peak Hour	Yes (blank = "F", Annual)

9	Quarter-hour profile	Text up to 20 characters. This must match the name of an hourly profile exactly.	Yes (blank = "DEFAULT")
10	Daily profile	Text up to 20 characters. This must match the name of a daily profile exactly.	Yes (blank = "DEFAULT")
11	Monthly profile	Text up to 20 characters. This must match the name of a monthly profile exactly.	Yes (blank = "DEFAULT")

Emission Parameter Fields

Most emission parameter fields only apply to certain categories and types. Those that only apply to certain categories have been colored.

Field #	Description	Format	Optional?
12	Category code		
13	Type code	Text; up to 20 characters.	Yes
14	User edited?	"F" = use system defaults "T" = user edited values	Yes (blank = "F"). Is set to "T" if using category Other.
15	CO (kg/unit)	Number from 0 to 1000 with 4 decimals	Yes (blank = 0)
16	HC (kg/unit)	Number from 0 to 1000 with 4 decimals	
17	NOx (kg/unit)	Number from 0 to 1000 with 4 decimals	
18	SOx (kg/unit)	Number from 0 to 1000 with 4 decimals	
19	PM-10 (kg/unit)	Number from 0 to 1000 with 4 decimals	
20	PM-10 (1/unit)	Number from 0 to 1000 with 4 decimals	
21	Fuel Sulfur content (%)	Number from 0 to 99.99.	
22	Calcium-Sulfur ratio	Number from 0 to 9.9999	
23	Fuel ash content (%)	Number from 0 to 99.99.	
24	CO (%)	Number from 0 to 100.	
25	HC (%)	Number from 0 to 100.	
26	NOx (%)	Number from 0 to 100.	
27	SOx (%)	Number from 0 to 100.	
28	PM-10 (%)	Number from 0 to 100.	
29	Horsepower (hp)	Integer from 0 to 9999	
30	Time at 30% power (min)	Number from 0 to 999.99 (in minutes)	
31	Time at 85% power (min)		
32	Time at 100% power (min)		
33	Time at 7% power (min)		
34	Tank height (m)	Number from 0 to 999.99.	

35	Tank diameter (m)		
36	Maximum solution level (m)		
37	Average solution level (m)		
38	Reid Vapor Pressure (PSI)	Integer from 6 to 13, inclusive.	Yes (blank = 6)
39	Solution Density (g/L)	Number from 0 to 1999.9	Yes (blank = 0)
40	Solution Concentration (%)	Number from 0 to 99.99	
41	Surface area m²	Number from 0 to 9999	
42	Mass per Disturbance (Metric tons)	Number from 0 to 999.999	
43	Moisture (%)	Number from 0.01 to 99.99	Yes (blank = 0.01)
44	Mean wind speed (m/s)	Number from 0 to 99.99	Yes (blank = 0)
45	Fast mile (m/s)		
46	Friction speed (m/s)		
47	Roughness (cm)	Number from 0.01 to 99.99	Yes (blank = 0.01)
48	Surface to approaching wind speed ratio	Number from 0 to 1, inclusive	Yes (blank = 0)
49	ICAO Engine UID	Text up to 40 characters. This name must match an engine in the system or user-created tables.	One must be entered if Aircraft Engine Testing is selected.
50	User aircraft name	Text up to 40 characters. This name must match an engine in the system or user-created tables.	

Dispersion Parameter Fields

Field #	Description	Format	Optional?
52	Base Elevation (meters)	Number within +/- 999999.999999	Yes (blank = 0)
53	Release Height (meters)	Number from 1 to 100, with 6 decimals	
54	Sigma-Z0 (meters)	Number from 0.1 to 100.	
55	Sigma-Y0 (meters)		
56	Stack Diameter (m)	Number from 0.1 to 10 with 2 decimals	Yes (blank = 0.1 m)
57	Gas velocity (m/s)	Number from 1 to 30 with 2 decimals	Yes (blank = 1 m/s)
58	Temperature (°F)	Number from 32 to 600 with 2 decimals	Yes (blank = 32°F)
59	Above ambient temperature flag	"F" = temperature is absolute "T" = temperature is relative to current ambient temperature	Yes (blank = "F")

60	AERMOD Source Type	0 = POINT 1 = AREA 2 = VOLUME	Yes (blank = 0)
61	Number of Points	Number from 3 to 20, if AREA source. Must be 1, otherwise.	Yes (blank = 1).
62	x-coordinate 1 (meters)	Number within +/- 999999.999999	Yes (blank = 0)
63	y-coordinate 1 (meters)	Number within +/- 999999.999999	Yes (blank = 0)
. . .	. . .	. . .	. . .
99	x-coordinate 20 (meters)	Number within +/- 999999.999999	Yes (blank = 0)
100	y-coordinate 20 (meters)	Number within +/- 999999.999999	Yes (blank = 0)

Example

```
!STATIONARY_SOURCES
1 ; 2004 ; Tower Generator ; T ; 3 ; 96.00 ; 0.00 ; T ; 0 ; 0 ; 0 ; 2 ; 2
; F ; 3.0300 ; 1.1400 ; 14.0000 ; 0.9300 ; 0.9980 ; ; ; ; ; 0.00 ; 0.00 ;
0.00 ; 0.00 ; 0.00 ; 1340 ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;
211.840000 ; 3.660000 ; 1.000000 ; 1.000000 ; 1.000000 ; 15.00 ; 400.00 ;
F ; 0 ; 1 ; -296.265600 ; 247.497600
```

TRAINING_FIRES

Number of fields: 24

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Name	Text; up to 40 characters.	No
3	Analysis year	Positive integer.	No
4	In the study?	"F" = This training fire is in the available list (not in the study) "T" = This training fire is in the study	Yes (blank = "F")
5	User edited?	"F" = system emission factors "T" = edited by the user	Yes (blank = "F")
6	Elevation (m)	Number from 1 to 15 with 6 decimals	Yes (blank = 1)
7	x-coordinate (meters)	Number within +/- 999999.999999	Yes
8	y-coordinate (meters)	Number within +/- 999999.999999	Yes

9	Quarter-hourly profile	Positive integer.	Yes; blank means use default
10	Daily profile	Positive integer.	
11	Monthly profile	Positive integer.	
12	Gallons per year (gal)	Number from 0 to 999999999 with 2 decimals	Yes (blank = 0)
13	Gallons per hour (gal)	Number from 0 to 999999 with 2 decimals	
14	Use hourly operations?	Boolean - T/F.	Yes
15	Fuel type	"JP-4", "JP-5", "JP-8", "Propane" or "Tekflame"	No
16	Temperature (°F)	Number from 100 to 600 with 2 decimals	Yes (blank = 100°F, see note.)
17	Diameter (m)	Number from 1 to 15 with 2 decimals	Yes (blank = 1 m, see note.)
18	Velocity (m/s)	Number from 1 to 30 with 2 decimals	Yes (blank = 1 m/s, see note.)
19	Release height (m)	Numeric value with 6 decimal places.	Yes
20	CO Emission Factor (grams/gallon)	Number from 0 to 3000	Yes (blank = 0). If the User-Edited Emission Factor flag is "F", then these are set to the values for the specified fuel.
21	HC Emission Factor (grams/gallon)	Number from 0 to 100	
22	NOx Emission Factor (grams/gallon)	Number from 0 to 100	
23	SOx Emission Factor (grams/gallon)	Number from 0 to 10	
24	PM-10 Emission Factor (grams/gallon)	Number from 0 to 1000	

Notes

If temperature is blank or 100, then it is set to the default value of 400°F.

If diameter is blank or 1 then it is set to the default value of 5 meters.

If velocity is blank or 1, then it is set to the default value of 10 m/s.

Example

```
!TRAINING_FIRES
1 ; TF 1 ; 2004 ; T ; F ; 206.654400 ; -601.680000 ; 345.643200 ; 0 ; 0 ;
0 ; 12000.00 ; 0.34 ; T ; Propane ; 400.00 ; 5.000000 ; 10.00 ; 4.000000
; 15.780000 ; 14.420000 ; 2.900000 ; 0.009000 ; 53.160000
```

GATES

Number of fields: 10 - 48

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	In the study?	"F" = This gate is in the available list (not in the study) "T" = This gate is in the study	Yes (blank = "F")
3	Gate name	Text; up to 40 characters.	No
4	Elevation (m)	Numeric value with 6 decimal places.	Yes
5	Release height (m)	Number 0 to 100 with 6 decimals allowed	Yes (blank = 0)
6	sigmay0 (m)	Numeric value with 6 decimal places.	Yes
7	sigmaz0 (m)	Numeric value with 6 decimal places.	Yes
8	Number of points	Positive integer.	Yes (blank = 1). If set to 2, it is reset to 1.
9	x-coordinate 1 (meters)	Number within +/- 999999.999999	Yes (blank = 0)
10	y-coordinate 1 (meters)	Number within +/- 999999.999999	Yes (blank = 0)
. . .	. . .	. . .	. . .
47	x-coordinate 20 (meters)	Number within +/- 999999.999999	Yes (if fewer than 20 points are used to define the gate)
48	y-coordinate 20 (meters)	Number within +/- 999999.999999	Yes (if fewer than 20 points are used to define the gate).

Example

```
!GATES
1 ; T ; Main ; 209.092800 ; 1.499616 ; 16.000000 ; 3.000000 ; 4 ; -
384.998976 ; -321.000120 ; -218.288616 ; -361.657392 ; -194.105784 ; -
269.900400 ; -361.998768 ; -237.518448
```

TAXIWAYS

Number of fields: 13 - 84

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	In the study?	"F" = This taxiway is in the available list (not in the study) "T" = This taxiway is in the study	Yes (blank = "F")
3	Taxiway name	Text; up to 20 characters.	No
4	Point count	Positive integer.	No, must be at least 2.
5	Width (m)	Number from 1 to 99.99	Yes (blank = 1)
6	x-coordinate 1 (m)	Number within +/- 999999.999999	Yes (blank = 0)
7	y-coordinate 1 (m)		
8	z-coordinate 1 (m)		
9	Point #1 to #2 speed (mph)	Number from 0 to 60 with 2 decimals allowed	Yes (blank = 30)
. . .	. . .	. . .	. . .
82	x-coordinate 20 (m)	Number within +/- 999999.999999	Yes (blank = 0)
83	y-coordinate 20 (m)		
84	z-coordinate 20 (m)		

Note

The last point in the points list has x, y, and z components, but no speed defined.

Example

```
!TAXIWAYS
1 ; T ; A ; 6 ; 20.000000 ; 512.743704 ; 88.349328 ; 213.969600 ; 17.26 ;
490.810296 ; 241.121184 ; 214.274400 ; 17.26 ; 45.089064 ; 166.484808 ;
213.055200 ; 17.26 ; -144.941544 ; 105.162096 ; 211.836000 ; 17.26 ; -
1074.484008 ; -45.616368 ; 202.387200 ; 17.26 ; -1084.219320 ; -
184.358280 ; 200.863200
```

RUNWAYS

Number of fields: 12

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	End1 name	Must be a valid pair or runway end names. 1 to 3 characters for each runway end named appropriately (i.e., 1-36 + L,C, or R)	No
3	End2 name		
4	x-coordinate of end 1 (m)	Number within +/- 999999.999999	Yes (blank = 0)
5	y coordinate of end 1 (m)		
6	x-coordinate of end 2 (m)		
7	y coordinate of end 2 (m)		
8	Glideslope 1 (°)	Numeric value with 6 decimal places.	Yes; blank = 0
9	Glideslope 2 (°)	Numeric value with 6 decimal places.	Yes; blank = 0
10	In the study?	"F" = This runway is in the available list (not in the study) "T" = This runway is in the study	Yes (blank = "F")
11	Elevation 1 (m)	Numeric value with 6 decimal places.	Yes; blank = 0
12	Elevation 2 (m)	Numeric value with 6 decimal places.	Yes; blank = 0

Example

```
!RUNWAYS
1 ; 2 ; 20 ; -119.868696 ; -463.000344 ; 116.631720 ; 451.253352 ;
3.000000 ; 3.000000 ; T ; 210.312000 ; 214.579200
```

BUILDINGS

Number of fields: 12 - 46

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Building Name	Text; up to 40 characters.	No
3	In the study?	"F" = This building is in the available list (not in the study) "T" = This building is in the study	Yes (blank = "F")
4	Elevation (m)	Numeric value with 6 decimal places.	Yes (blank = 0)
5	Height (m)	Numeric value with 6 decimal places.	
6	Number of points	Positive integer.	Yes (blank = 3).

7	x-coordinate 1 (meters)	Number within +/- 999999.999999	Yes (blank = 0)
8	y-coordinate 1 (meters)		
	. . .	. . .	. . .
45	x-coordinate 20 (meters)	Number within +/- 999999.999999	Yes (if fewer than 20 points are used to define the gate)
46	y-coordinate 20 (meters)		

Example

```
!BUILDINGS
1 ; Hangars ; T ; 212.750400 ; 10.000488 ; 4 ; -254.514096 ; 356.000304 ;
-122.977656 ; 305.001168 ; -25.975056 ; 491.813088 ; -203.999592 ;
551.812968
```

RUNWAY_CONFIGURATIONS

Number of fields: 36

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Configuration name	Text; up to 40 characters.	No
3	In the study?	"F" = available "T" = in-study	Yes (blank = "F")
4	Use distribution?	“T” – use capacity distribution curve. “F” – do not.	Yes (blank = “F”)
5	Fraction used	Proportion of time the configuration is used. (0 to 1, four decimal points)	Yes (blank = 0)
6	Minimum wind angle (°)	Integer from 1 to 360, inclusive	Yes (blank = 1)
7	Maximum wind angle (°)		
8	Use minimum wind angle?	Boolean value – “T” or “F”.	Yes (blank = “F”)
9	Use maximum wind angle?		
10	Minimum windspeed	Number from 0 to 99.99 with 2 decimals allowed	Yes (blank = 0)
11	Maximum windspeed		
12	Use minimum windspeed?	Boolean value – “T” or “F”.	Yes (blank = “F”)
13	Use maximum windspeed?		
14	Minimum hour (hrs)	Number from 0 to 24 with 2 decimals allowed	Yes (blank = 0)
15	Maximum hour (hrs)		
16	Use minimum hour?	Boolean value – “T” or “F”.	Yes (blank = “F”)
17	Use maximum hour?		
18	Minimum ceiling (ft)		Yes (blank = 0)
19	Maximum ceiling (ft)		

20	Use minimum ceiling?	Boolean value – “T” or “F”.	Yes (blank = “F”)
21	Use maximum ceiling?		
22	Minimum visibility		Yes (blank = 0)
23	Maximum visibility		
24	Use minimum visibility?	Boolean value – “T” or “F”.	Yes (blank = “F”)
25	Use maximum visibility?		
26	Minimum temperature (°F)		Yes (blank = 0)
27	Maximum temperature (°F)		
28	Use minimum temperature?	Boolean value – “T” or “F”.	Yes (blank = “F”)
29	Use maximum temperature?		
30	Number of points	Numer of points in the capacity distribution (1 to 3)	Yes, if “Use Distribution” is “F”
31	Arrivals capacity 1	Number of arrivals possible in the first capacity point.	Yes (blank = 0)
32	Departures capacity 1	Number of departures possible in the first capacity point.	Yes (blank = 0)
33	Arrivals capacity 2	Number of arrivals possible in the second capacity point.	Yes (blank = 0)
34	Departures capacity 2	Number of departures possible in the second capacity point.	Yes (blank = 0)
35	Arrivals capacity 3	Number of arrivals possible in the third capacity point.	Yes (blank = 0)
36	Departures capacity 3	Number of departures possible in the third capacity point.	Yes (blank = 0)

Notes

The wind angle range used by a configuration will be the clockwise arc from the start angle to the end angle. The wind angle is the direction from which the wind is blowing. For example, winds out of the north correspond to 360 degrees. Wind angles for configurations should be thought of as discrete vectors with 360 possible directions, as opposed to having the continuity of a complete circle.

Example

```
!RUNWAY_CONFIGURATIONS
1 ; North Wind ; T ; F ; 0.4000 ; 340 ; 40 ; T ; T ; 0.00 ; 0.00 ; F ; F
; 0 ; 0 ; F ; F ; 0 ; 0 ; F ; F ; 0 ; 0 ; F ; F ; 0 ; 0 ; F ; F ; 2 ; 35
; 55 ; 55 ; 35 ; ;
```

TAXIPATHS

Number of fields: 6

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Gate name	Text; up to 20 characters. Must exactly match defined gate.	No
3	Runway name	Text; up to 20 characters. Must exactly match defined runway.	No

4	Runway exit	Text; up to 20 characters. Must exactly match a defined taxiway that connects to the selected runway.	No
5	Is outbound?	T=true, represents a path from gate->runway. F=false, represents a path from runway->gate	Yes; defaults to inbound
6	Taxiway name	Text; up to 20 characters. Must exactly match defined taxiway.	No

Notes

The first 5 fields are used to identify a record as being a segment in a specific taxipath.

Example

```
!TAXIPATHS
1 ; Main ; 2 ; ; T ; C
```

CONFIGURATION_RUNWAYS

Number of fields: 7

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Configuration name	Text up to 20 characters. This name must match the name of a configuration in the study exactly.	No
3	Aircraft size	Text; 1 character.	No
4	Runway end name	Text up to 3 characters. This must match a runway end name in the study.	No
5	Fraction of the aircraft's LTOs to use the runway for landings	Number from 0 to 1, inclusive.	Yes. EDMS sets this to 0 if left blank.
6	Fraction of the aircraft's LTOs to use the runway for takeoffs		
7	Fraction of the aircraft's TGOs to use the runway		

Example

```
!CONFIGURATION_RUNWAYS
1 ; North Wind ; S ; 2 ; 0.8000 ; 0.8000 ; 0.9000
```

NETWORK_CARTESIAN_RECEPTORS

Number of fields: 11

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Receptor network name	Text; up to 40 characters.	No

3	In the study?	"F" = This receptor is in the available list (not in the study) "T" = This receptor is in the study	Yes (blank = "F")
4	Start x-coordinate (meters)	Number within +/- 999999.999999	Yes (blank = 0)
5	Start y-coordinate (meters)		
6	X-count	Integer from 1 to 100	Yes (blank = 1)
7	Y-count		
8	X-delta (m)	Number from 1 to 1000 with 6 decimals allowed	
9	Y-delta (m)		
10	Height (m)	Number 0 to 10 meters with 6 decimals allowed	Yes (blank = 0)
11	Elevation (m)	Numeric value with 6 decimal places.	Yes (blank = 0)

Example

```
!NETWORK_CARTESIAN_RECEPTORS
1 ; CARTGRID ; T ; 0.000000 ; 0.000000 ; 1 ; 1 ; 45.720000 ; 45.720000 ;
1.800000 ; 214.270000
```

NETWORK_POLAR_RECEPTORS

Number of fields: 16

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Receptor name	Text; up to 40 characters.	No
3	In the study?	"F" = This receptor is in the available list (not in the study) "T" = This receptor is in the study	Yes (blank = "F", not in study)
4	Is source based?	T (for True), if the network of receptors is centered around a source. F (for False), if coordinates for the center will be specified.	Yes (blank = "F", not source based)
5	Source type	Text, must be one of the following values: "Gate", "Parking Lot", "Roadway", "Runway", "Stationary Source",	Yes (Should not be blank for source based networks, but should be blank it not source based).

		"Taxiway", or "Training Fire"	
6	Source name	Text up to 40 characters. Must match the origin source name exactly.	Yes (This field can be left blank if not source based).
7	X-origin (m)	Number from -999999.999999 to 999999.999999	Yes (This field can be left blank if source based).
8	Y-origin (m)		
9	R-start (m)	Number from 1 to 999999.999999	Yes (blank = 1)
10	D-start (°)	Numeric value with 6 decimal places.	Yes (blank = 0)
11	R-count	Number from 1 to 100	Yes (blank = 1)
12	D-count	Number from 1 to 36	
13	R-delta (m)	Number from 1 to 1000	
14	D-delta (°)	Number from 1 to 90	
15	Height (m)	Number 0 to 10 with 6 decimals allowed	Yes (blank = 0)
16	Elevation (m)	Numeric value with 6 decimal places.	Yes

Example

```
!NETWORK_POLAR_RECEPTORS
1 ; Perimeter ; T ; T ; Gate ; Main ; -581.000616 ; -1157.002512 ;
1524.000000 ; 60.000000 ; 1 ; 4 ; 45.720000 ; 30.000000 ; 1.801368 ;
214.271352
```

DISCRETE_CARTESIAN_RECEPTORS

Number of fields: 5

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Name	Text; up to 40 characters.	No
3	In the study?	"F" = This receptor is in the available list (not in the study) "T" = This receptor is in the study	Yes (blank = "F", not in study)
4	X (m)	Number within +/- 999999.999999	Yes (blank = 0)
5	Y (m)		
6	Height (m)	Number 0 to 10 with 6 decimals allowed.	
7	Elevation (m)	Numeric value with 6 decimal places.	

Example

```
!DISCRETE_CARTESIAN_RECEPTORS
1 ; Terminal ; T ; -448.001136 ; -440.999880 ; 1.801368 ; 214.271352
```

DISCRETE_POLAR_RECEPTORS

Number of fields: 7

Field #	Description	Format	Optional?
1	Scenario Airport	Positive integer.	No
2	Receptor name	Text; up to 40 characters.	No
3	In the study?	"F" = This receptor is in the available list (not in the study) "T" = This receptor is in the study	Yes (blank = "F", not in the study)
4	Source type	Text, must be one of the following strings: "Gate", "Parking Facility", "Roadway", "Runway", "Stationary Source", "Taxiway" or "Training Fire"	No
5	Source name	Text; up to 40 characters. Must match a source name of a specified source exactly.	No
6	Direction (°)	Integer from 0 to 360	Yes (blank = 0)
7	Distance (m)	Number from 0 to 999999.999999	
8	Height (m)	Number 0 to 10 with 6 decimals allowed	

Example

```
!DISCRETE_POLAR_RECEPTORS
1 ; Polar Receptor ; T ; Gate ; Main ; 107 ; 1326.692504 ; 1.800000
```

USER-CREATED_AIRCRAFT

Number of fields: 41

Field #	Description	Format	Optional?
1	Aircraft name	Text; up to 40 characters.	No
2	Category	Text; up to 4 characters.	Yes (blank = "HCJP")
3	Air taxi?	Boolean - T/F.	Yes
4	European group category	Text; up to 2 characters.	Yes
5	Engine count	Integer from 1 to 8, inclusive.	Yes (blank = 1)

Field #	Description	Format	Optional?
6	Use system emissions?	"T" = use system fuel flow and emission indices, "F" = user-edited fuel flow and/or emission indices.	Yes (blank = "F")
7	Emissions model aircraft code	Text; up to 15 characters.	Yes
8	Emissions model engine ICAO UID	Text; up to 10 characters.	Yes
9	Performance model aircraft code	Text; up to 15 characters.	Yes
10	Performance model engine ICAO UID	Text; up to 10 characters.	Yes
11	Bypass Ratio	Numeric value with 2 decimal places.	Yes
12	Default SOx (g/kg)	Numeric value with 6 decimal places.	Yes
13	Taxi out time (min)	Number from 0 to 120 with 2 decimals allowed	Yes (blank = 0)
14	Taxi out Fuel (kg/s)	Number from 0 to 10 with 6 decimals allowed	
15	Taxi out CO (g/kg)	Number from 0 to 2333 with 6 decimals allowed	
16	Taxi out HC (g/kg)	Number from 0 to 1000 with 6 decimals allowed	
17	Taxi out NOx (g/kg)	Number from 0 to 1000 with 6 decimals allowed	
18	Taxi out PM (g/kg)	Number from 0 to 1000 with 6 decimals allowed	
19	Taxi out SN (SN)		
20	Takeoff time (min)	Number from 0 to 120 with 2 decimals allowed	Yes (blank = 0)
21	Takeoff fuel (kg/s)	Number from 0 to 10 with 6 decimals allowed	
22	Takeoff CO (g/kg)	Number from 0 to 2333 with 6 decimals allowed	
23	Takeoff HC (g/kg)	Number from 0 to 1000 with 6 decimals allowed	
24	Takeoff NOx (g/kg)	Number from 0 to 1000 with 6 decimals allowed	
25	Takeoff PM (g/kg)	Number from 0 to 1000 with 6 decimals allowed	
26	Takeoff SN (SN)		
27	Climb time (min)	Number from 0 to 120 with 2	Yes (blank = 0)

Field #	Description	Format	Optional?
		decimals allowed	
28	Climb fuel (kg/s)	Number from 0 to 10 with 6 decimals allowed	
29	Climb CO (g/kg)	Number from 0 to 2333 with 6 decimals allowed	
30	Climb HC (g/kg)	Number from 0 to 1000 with 6 decimals allowed	
31	Climb NOx (g/kg)	Number from 0 to 1000 with 6 decimals allowed	
32	Climb PM (g/kg)	Number from 0 to 1000 with 6 decimals allowed	
33	Climb SN (SN)		
34	Approach time (min)	Number from 0 to 120 with 2 decimals allowed	Yes (blank = 0)
35	Approach fuel (kg/s)	Number from 0 to 10 with 6 decimals allowed	
36	Approach CO (g/kg)	Number from 0 to 2333 with 6 decimals allowed	
37	Approach HC (g/kg)	Number from 0 to 1000 with 6 decimals allowed	
38	Approach NOx (g/kg)	Number from 0 to 1000 with 6 decimals allowed	
39	Approach PM (g/kg)	Number from 0 to 1000 with 6 decimals allowed	
40	Approach SN (SN)		
41	Taxi in time (min)	Numeric value with 2 decimal places.	Yes

Example

```
!USER-CREATED_AIRCRAFT
My Aircraft ; LCJP ; F ; JM ; 2 ; F ; A300F4-6 ; 1PW048 ; A109 ; 250B17 ;
4.60 ; 1.360000 ; 19.00 ; 0.211 ; 20.990000 ; 1.780000 ; 4.800000 ;
0.000000 ; 2.430 ; 0.70 ; 2.481 ; 0.400000 ; 0.090000 ; 30.200000 ;
0.000000 ; 8.100 ; 2.20 ; 2.004 ; 0.540000 ; 0.020000 ; 23.700000 ;
0.000000 ; 7.290 ; 4.00 ; 0.682 ; 1.880000 ; 0.140000 ; 11.800000 ;
0.000000 ; 2.430 ; 7.00
```

USER-CREATED_GSE

Number of fields: 31

Field #	Description	Format	Optional?
1	Name	Text; up to 30 characters.	No

2	User GSE ID	Positive integer.	No
3	System GSE ID	Positive integer. Must match a system GSE ID.	Yes, if emissions factors are user-edited.
4	System type	Text; up to 30 characters.	Yes
5	Type year	A year from "1990" to "2020" inclusive.	Yes, if emissions factors are user-edited.
6	Default horsepower	Integer from 0 to 10000	Yes (blank = 0)
7	Default load factor	Number from 0 to 1 with 4 decimals	Yes (blank = 0)
8	Default operating time per LTO (minutes)	Number from 0 to 120 with 2 decimals allowed	Yes (blank = 0)
9	Operating time-departures (mins/LTO)	Number from 0 to 120 with 2 decimals allowed	Yes (blank = 0)
10	Operating time-annual (mins/LTO)	Integer from 0 to 8760	Yes (blank = 0)
11	User emissions?	"F" = use default system emission factors from specified system GSE, "T" = user-edited emissions factors	Yes (blank = "F")
12	Diesel CO emission factor (g/hp/hr)	Number from 0 to 1000 with 6 decimals allowed	Yes (blank = 0)
13	Diesel HC emission factor (g/hp/hr)		
14	Diesel NOx emission factor (g/hp/hr)		
15	Diesel SOx emission factor (g/hp/hr)		
16	Diesel PM emission factor (g/hp/hr)		
17	Gas CO emission factor (g/hp/hr)		
18	Gas HC emission factor (g/hp/hr)		
19	Gas NOx emission factor (g/hp/hr)		
20	Gas SOx emission factor (g/hp/hr)		
21	Gas PM emission factor (g/hp/hr)		
22	CNG CO emission factor (g/hp/hr)		
23	CNG HC emission factor (g/hp/hr)		
24	CNG NOx emission factor (g/hp/hr)		
25	CNG SOx emission factor (g/hp/hr)		
26	CNG PM emission factor (g/hp/hr)		
27	LPG CO emission factor (g/hp/hr)		

28	LPG HC emission factor (g/hp/hr)		
29	LPG NOx emission factor (g/hp/hr)		
30	LPG SOx emission factor (g/hp/hr)		
31	LPG PM emission factor (g/hp/hr)		

Example

```
!USER-CREATED_GSE
1006 ; Belt Loader ; 389 ; Belt Loader ; 2006 ; 0 ; 0.0000 ; 10.00 ; 1.00
; 0 ; F ; 2.597231 ; 0.525237 ; 5.467359 ; 0.901992 ; 0.488823 ;
241.064100 ; 10.025060 ; 7.243273 ; 0.175686 ; 0.057770 ; 33.361250 ;
37.196310 ; 12.176980 ; 0.013270 ; 0.056752 ; 33.361250 ; 2.536112 ;
12.176980 ; 0.013270 ; 0.056752
```

USER-CREATED_APUS

Number of fields: 11

Field #	Description	Format	Optional?
1	APU ID	Positive integer. Must be unique.	No
2	APU name	Text; up to 40 characters.	No
3	Default time - arrivals (min)	Number from 0 to 1000 with 2 decimals allowed	Yes (blank = 0)
4	Default time - departures (min)	Number from 0 to 1000 with 2 decimals allowed	Yes (blank = 0)
5	User emissions?	"F" = use default system emission factors from specified system GSE, "T" = user-edited emissions factors	Yes (blank = "F")
6	CO (kg/hr)	Number from 0 to 1000 with 6 decimals allowed	Yes (blank = 0)
7	HC (kg/hr)		
8	NOx (kg/hr)		
9	SOx (kg/hr)		
10	PM (kg/hr)		
11	System APU ID	Positive integer. Must exactly match a system APU ID.	Yes, if emissions factors are user-edited.

Example

```
!USER-CREATED_APUS
101 ; My Apu ; 13.00 ; 13.00 ; T ; 0.564450 ; 0.042790 ; 0.115660 ;
4.000000 ; 0.000000 ; 0
```

Appendix C. GSE Reference Models

EDMS 5.0 includes ground support equipment (GSE) reference models that are representative of the equipment types in the EPA draft NONROAD model. The following table lists, for each GSE type, the available reference models and a picture of the equipment, if available. Users are not limited to selecting available GSE reference models, which are merely provided as a convenience. The user can override the horsepower and/or operating time of any GSE in a study to improve modeling fidelity.

GSE Name	Reference Model	Picture
Air Conditioner	ACE 802	Source: www.fsm-vienna.at
Air Conditioner	ACE 804	Source: www.fsm-vienna.at
Air Start	ACE 180	***Picture Not Available***
Air Start	ACE 300/400	Source: www.fsm-vienna.at
Aircraft Tractor	Stewart & Stevenson TUG GT-35	Source: www.ssss.com

GSE Name	Reference Model	Picture
Aircraft Tractor	Stewart & Stevenson TUG MC	Source: www.ssss.com
Aircraft Tractor	Douglas TBL-180	Source: www.douglas-tugmaster.co.uk
Aircraft Tractor	Douglas TBL-400	Source: www.douglas-tugmaster.co.uk
Aircraft Tractor	Stewart & Stevenson TUG GT-50H	Source: www.ssss.com
Aircraft Tractor	Stewart & Stevenson TUG T-750	Source: www.ssss.com
Baggage Tractor	Stewart & Stevenson TUG MA 50	Source: www.ssss.com

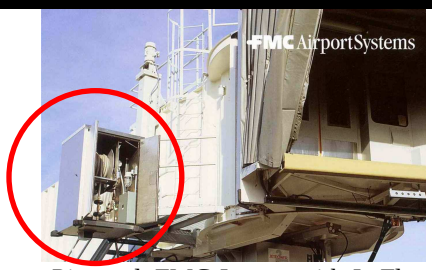
GSE Name	Reference Model	Picture
Belt Loader	Stewart & Stevenson TUG 660	Source: www.ssss.com
Bobtail	Eagle Bobtail / F350	Source: www.eagleindustrialtruck.com
Cabin Service Truck	Hi-Way / TUG 660 chasis	Source: www.tescohilift.com
Cabin Service Truck	Hi-Way F650	Source: www.tescohilift.com
Cargo Loader	FMC Commander 15	Source: www.fsm-vienna.at
Cargo Loader	FMC Commander 30	Source: www.airport-technology.com

GSE Name	Reference Model	Picture
Cargo Tractor	Stewart & Stevenson TUG MT	Source: www.ssss.com
Cart	Taylor Dunn	Source: www.taylor-dunn.com
Catering Truck	Hi-Way / TUG 660 chasis	Source: www.tescohilift.com
Catering Truck	Hi-Way F650	Source: www.tescohilift.com
Deicer	FMC LMD, Dual engines in GSE	Source: www.airport-technology.com
Deicer	FMC Tempest II, Single engine in GSE	Source: www.fsm-vienna.at

GSE Name	Reference Model	Picture
Fork Lift	Toyota 5,000 lb	Source: www.loadstarmhe.com
Fuel Truck	F350	***No Picture Available.***
Fuel Truck	F750, Dukes Transportation Services, DART 3000 to 6000 gallon fuel truck	Source: www.dukestransportation.com
Fuel Truck	Dukes Transportation Services / DART 8000 to 10,000 gallon fuel truck	Source: www.dukestransportation.com
Generator	(None.)	Pictured: MD-3 Source: www.victorygse.com
Ground Power Unit	TLD	Source: www.tld-gse.com

GSE Name	Reference Model	Picture
Ground Power Unit	TLD, 28 VDC	Source: www.tld-gse.com
Ground Power Unit	TLD, 400 Hz AC	Source: www.tld-gse.com
Hydrant Cart	Dukes Transportation Services THS-400	Source: www.dukestransportation.com
Hydrant Truck	F250 / F350	***No Picture Available.***
Lavatory Truck	TLD 1410	Source: www.tld-gse.com
Lavatory Truck	Wollard TLS-770 / F350	Source: www.gseservices-llc.com

GSE Name	Reference Model	Picture
Lift	None.	 Pictured: ML15-20 Source: www.tescohilift.com
Passenger Stand	Wollard CMPS170 / CMPS228	 Source: www.nmc-wollard.com
Service Truck	F250 / F350	 Source: www.contentedits.com
Sweeper	Tennant	 Source: www.tennantco.com
Water Service	Wollard TWS-402 F250 / F350	 Source: www.nmc-wollard.com

GSE Name	Reference Model	Picture
Water Service	Gate Service	 Pictured: FMC Jetway with JetFlo Source: www.jetwaysystems.com

Appendix D. Speciated Organic Gases

A list of the airport-related OG species that EPA identifies as HAPs and/or those included in the IRIS database is provided in this Appendix. This list also identifies the airport-related source(s) from which each OG species is emitted.

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																					Fire Training
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings									Emergency Generators					
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner	Solvent Degreasers	Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG	Incinerators	De-icing	
T	T	71556	1,1,1-trichloroethane																					x						x	
T	T	106990	1,3-butadiene	x	x	x																			x	x					
T	T	540841	2,2,4-trimethylpentane				x																		x						
F	T	110805	2-ethoxyethanol (cellosolve) (egee)																											x	
F	T	91576	2-methylnaphthalene		x	x																									
T	T	75070	Acetaldehyde	x	x	x		x																	x			x			
F	T	67641	Acetone	x	x	x				x						x		x			x	x		x						x	
T	T	107028	Acrolein (2-propenal)	x	x	x																			x						
F	T	100527	Benzaldehyde	x	x	x		x															x		x						
T	T	71432	Benzene	x	x	x	x		x			x		x	x		x							x	x	x		x	x		x
F	T	111762	Butyl cellosolve (2-butoxyethanol) (egbe)													x				x										x	
F	T	108907	Chlorobenzene												x																
F	T	110827	Cyclohexane									x				x		x						x	x			x			
T	T	75092	Dichloromethane (methylene chloride)														x						x	x							
F	T	141786	Ethyl acetate													x		x				x								x	
T	T	75003	Ethyl chloride														x														
F	T	60297	Ethyl ether																					x							
T	T	100414	Ethylbenzene	x	x	x	x		x						x	x		x					x		x			x			
T	T	106934	Ethylene dibromide																				x								

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																					
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings								Solvent Degreasers	Emergency Generators				Incinerators	De-icing	Fire Training
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner		Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG			
T	T	107211	Ethylene glycol														x													x	
T	T	50000	Formaldehyde	x	x	x		x		x	x	x													x		x	x			
T	T	1330207	Isomers of xylene													x		x	x	x				x				x		x	
T	T	98828	Isopropylbenzene (cumene)		x	x									x									x							
T	T	108383 106423	M & p-xylene	x	x	x			x						x																
T	T	67561	Methyl alcohol		x	x																									
T	T	74873	Methyl chloride														x														
T	T	78933	Methyl ethyl ketone (2-butanone)													x		x			x	x	x	x						x	
T	T	108101	Methyl isobutyl ketone													x		x			x	x								x	
T	T *	108383	M-xylene				x																x					x			
T	T	91203	Naphthalene	x	x	x									x									x							
F	T	71363	N-butyl alcohol														x														
F	T	142825	N-heptane	x	x	x	x		x		x		x	x	x	x		x	x	x		x	x	x	x			x			
T	T	110543	N-hexane				x		x	x	x			x	x									x	x			x			
T	T	95476	O-xylene	x	x	x	x		x						x	x		x	x	x				x	x			x			
F	T	127184	Perchloroethylene																					x							
T	T	108952	Phenol (carbolic acid)	x	x	x																									
F	T	85449	Phthalic anhydride																				x								
T	F	123386	Propionaldehyde	x	x	x		x																	x						
T	T *	106423	P-xylene																				x	x	x						
T	T	100425	Styrene	x	x	x									x																

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																					Fire Training
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings								Solvent Degreasers	Emergency Generators				Incinerators	De-icing	
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner		Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG			
T	T	108883	Toluene	x	x	x	x		x			x		x	x	x		x	x	x		x	x	x	x			x		x	
T	T	79016	Trichloroethylene																					x							
F	T	76131	Trichlorotrifluoroethane-F113																					x							
T	T	108054	Vinyl acetate														x														
F	F	135988	(1-Methylpropyl) benzene				x																		x						
F	F	538932	(2-methylpropyl) benzene																						x						
F	F	3073663	1,1,3-trimethylcyclohexane												x	x			x	x				x							
F	F	526738	1,2,3-trimethylbenzene		x	x	x																		x			x			
F	F	95636	(1,2,4 and 1,3,4) trimethylbenzene		x	x	x																		x			x			
F	F	135013	1,2-diethylbenzene (ortho)				x																		x						
F	F	463490	1,2-propadiene				x																		x						
F	F	108678	1,3,5-trimethylbenzene		x	x	x																		x			x			
F	F	141935	1,3-diethylbenzene (meta)				x																		x						
F	F	106989	1-butene	x	x	x	x		x						x										x	x					
F	F	872059	1-decene	x	x	x			x																						
F	F	1569024	1-Ethoxy-2-propanol														x														
F	F	592416	1-hexene	x	x	x	x		x																x						
F	F	611143	1-Methyl-2-ethylbenzene (o-ethyltoluene)		x	x																			x			x			
F	F	620144	1-Methyl-3-ethylbenzene (m-ethyltoluene)		x	x	x																		x			x			
F	F	535773	1-Methyl-3-isopropylbenzene																						x						

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																					
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings								Solvent Degreasers	Emergency Generators				Incinerators	De-icing	Fire Training
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner		Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG			
F	F	1074437	1-Methyl-3-propylbenzene				x																		x						
F	F	622968	1-Methyl-4-ethylbenzene (p-ethyltoluene)		x	x																									
F	F	693890	1-Methylcyclopentene				x								x										x						
F	F	90120	1-Methylnaphthalene		x	x																									
F	F	124118	1-nonene	x	x	x									x													x			
F	F	111660	1-octene	x	x	x																						x			
F	F	109671	1-pentene	x	x	x	x																		x			x			
F	F	74997	1-propyne				x																		x						
F	F	821954	1-undecene				x																								
F	F	112345	2-(2-butoxyethoxy)ethanol (butyl carbitol)														x													x	
F	F	3522949	2,2,5-trimethylhexane				x																		x						
F	F	16747323	2,2-Dimethyl-3-ethylpentane														x														
F	F	75832	2,2-dimethylbutane				x																		x			x			
F	F	590738	2,2-dimethylhexane																						x						
F	F	560214	2,3,3-trimethylpentane				x																		x						
F	F	565753	2,3,4-trimethylpentane				x																		x						
F	F	1069530	2,3,5-trimethylhexane				x																		x						
F	F	79298	2,3-dimethylbutane				x								x										x						
F	F	7146603	2,3-dimethyloctane				x																								
F	F	565593	2,3-dimethylpentane																						x						
F	F	107391	2,4,4-trimethyl-1-pentene				x																								
F	F	20278846	2,4,5-trimethylheptane																						x						

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																					
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings								Solvent Degreasers	Emergency Generators				Incinerators	De-icing	Fire Training
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner		Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG			
F	F	2213232	2,4-dimethylheptane				x																		x						
F	F	589435	2,4-dimethylhexane				x									x			x	x					x						
F	F	4032944	2,4-dimethyloctane																						x						
F	F	108087	2,4-dimethylpentane				x		x							x				x					x			x			
F	F	2216300	2,5-dimethylheptane				x																		x						
F	F	2051301	2,6-dimethyloctane				x																								
F	F	N/A	2-Butyltetrahydrofuran														x														
F	F	104767	2-Ethyl hexanol														x														
F	F	592438	2-hexenes																						x						
F	F	563462	2-methyl-1-butene		x	x																									
F	F	763291	2-methyl-1-pentene		x	x																						x			
F	F	513359	2-methyl-2-butene	x	x	x	x																		x			x			
F	F	625274	2-methyl-2-pentene				x																		x						
F	F	78853	2-methyl-2-propenal (methacrolein)		x	x																									
F	F	7379126	2-Methyl-3-hexanone													x		x													
F	F	6975980	2-methyldecane				x																		x						
F	F	592278	2-methylheptane				x																		x						
F	F	3221612	2-methyloctane				x																		x						
F	F	107835	2-methylpentane	x	x	x	x																		x						
F	F	2531842	2-methylphenanthrene												x																
F	F	123046	3-(Chloromethyl)-heptane														x														
F	F	15869928	3,4-dimethyloctane																						x						

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																						Fire Training
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings								Solvent Degreasers	Emergency Generators				Incinerators	De-icing	
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner		Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG			
F	F	619998	3-ethylhexane												x									x								
F	F	563451	3-methyl-1-butene		x	x	x																		x							
F	F	589811	3-methylheptane				x																		x			x				
F	F	589344	3-methylhexane																						x			x				
F	F	2216333	3-methyloctane				x																									
F	F	96140	3-methylpentane				x																		x			x				
F	F	691372	4-methyl-1-pentene		x	x																										
F	F	589537	4-methylheptane				x																		x							
F	F	2216344	4-methyloctane				x																									
F	F	768569	4-Phenyl-1-butene				x																									
F	F	74862	Acetylene	x	x	x	x		x																x	x		x				
F	F		Alkene ketone																				x									
F	F	1678939	Butylcyclohexane																					x								
F	F	123728	Butyraldehyde	x	x	x																										
F	F	N/A	C-1 Compounds					x																								
F	F	N/A	C10 Aromatic																						x			x				
F	F	N/A	C-10 Compounds					x																								
F	F	N/A	C10 Olefins												x								x	x				x				
F	F	N/A	C10 Paraffinss																						x							
F	F	N/A	C10H12												x																	
F	F	N/A	C-11 Compounds					x																								
F	F	N/A	C11 Olefins												x									x								
F	F	N/A	C-12 Compounds					x																								

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																					Fire Training
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings								Solvent Degreasers	Emergency Generators				Incinerators	De-icing	
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner		Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG			
F	F	N/A	C12 Olefins																					x								
F	F	N/A	C-13 Compounds					x																								
F	F	N/A	C-14 Compounds					x																								
F	F	N/A	C-14 Alkane		x	x																										
F	F	N/A	C14-Branched alkane																													
F	F	N/A	C-15 Compounds					x																								
F	F	N/A	C-15 Alkane		x	x																										
F	F	N/A	C15-Branched alkane																													
F	F	N/A	C16 Branched alkane	x	x	x																										
F	F	N/A	C-16 Compounds					x																								
F	F	N/A	C-17 Compounds					x																								
F	F	N/A	C-18 Alkane		x	x																										
F	F	N/A	C-18 Compounds					x																								
F	F	N/A	C-19 Compounds					x																								
F	F	N/A	C-2 Compounds					x																								
F	F	N/A	C2 Cyclohexane																				x									
F	F	N/A	C-20 Compounds					x																								
F	F	N/A	C-21 Compounds					x																								
F	F	N/A	C-22 Compounds					x																								
F	F	N/A	C-23 Compounds					x																								
F	F	N/A	C-24 Compounds					x																								
F	F	N/A	C-25 Compounds					x																								
F	F	N/A	C-26 Compounds					x																								

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																						Fire Training
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings								Solvent Degreasers	Emergency Generators				Incinerators	De-icing	
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner		Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG			
F	F	N/A	C-27 Compounds					x																							
F	F	N/A	C-28 Compounds					x																							
F	F	N/A	C-29 Compounds					x																							
F	F	N/A	C2-Alkylnaphthalene												x																
F	F	N/A	C-3 Compounds					x																							
F	F	N/A	C3 Cyclohexane																				x								
F	F	N/A	C3/C4/C5 Alkylbenzenes																									x			
F	F	N/A	C-30 Compounds					x																							
F	F	N/A	C-31 Compounds					x																							
F	F	N/A	C-32 Compounds					x																							
F	F	N/A	C-33 Compounds					x																							
F	F	N/A	C-34 Compounds					x																							
F	F	N/A	C-35 Compounds					x																							
F	F	N/A	C-36 Compounds					x																							
F	F	N/A	C-37 Compounds					x																							
F	F	N/A	C-38 Compounds					x																							
F	F	N/A	C-39 Compounds					x																							
F	F	N/A	C-4 Compounds					x																							
F	F	N/A	C4 Substituted cyclohexane																				x								
F	F	N/A	C-40 Compounds					x																							
F	F	N/A	C-41 Compounds					x																							
F	F	N/A	C-42 Compounds					x																							
F	F	N/A	C-43 compounds					x																							

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																						
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings									Emergency Generators						
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner	Solvent Degreasers	Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG	Incinerators	De-icing	Fire Training
F	F	N/A	C4-Alkylphenols																					x							
F	F	N/A	C4-Alkylstyrenes												x																
F	F	N/A	C4-Benzene + C3 Aroald		x	x																									
F	F	N/A	C-5 Compounds					x																							
F	F	N/A	C5 Cyclohexane																				x								
F	F	N/A	C5 Ester													x		x													
F	F	N/A	C5-Alkylbenzenes												x									x							
F	F	N/A	C5-Alkylbenzenes (Unsat.)												x																
F	F	N/A	C5-Alkylphenols																					x							
F	F	N/A	C5-Benzene + C5-Aroald		x	x																									
F	F	N/A	C5-Olefin												x																
F	F	N/A	C5-Paraffin												x																
F	F	N/A	C5-Paraffin/olefin												x																
F	F	N/A	C-6 Compounds					x																							
F	F	N/A	C6-Alkylbenzene												x																
F	F	N/A	C6H18O3SI3	x																											
F	F	N/A	C-7 Compounds					x																							
F	F	N/A	C-7 Cycloparaffinss												x																
F	F	N/A	C7 Paraffins												x																
F	F	N/A	C7-C16 Paraffins	x																											
F	F	N/A	C7H12O												x																
F	F	N/A	C-8 Compounds					x																							
F	F	N/A	C-8 Olefins												x									x							

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																						Fire Training
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings								Solvent Degreasers	Emergency Generators				Incinerators	De-icing	
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner		Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG			
F	F	N/A	C8 Paraffin												x																
F	F	N/A	C8H24O4SI4	x																											
F	F	N/A	C-9 Compounds					x																							
F	F	N/A	C9 Olefins												x													x			
F	F	N/A	C9 Paraffin												x																
F	F	624293	Cis-1,4-dimethylcyclohexane				x																								
F	F	15890401	Cis-1,trans-2,3-trimethylcyclopentane												x	x			x					x							
F	F	590181	Cis-2-butene	x	x	x	x																		x			x			
F	F	7688213	Cis-2-hexene				x																								
F	F	627203	Cis-2-pentene		x	x	x		x																x						
F	F	4170303	Crotonaldehyde		x	x		x																	x						
F	F	110838	Cyclohexene				x								x																
F	F	287923	Cyclopentane				x								x										x			x			
F	F	142290	Cyclopentene				x								x										x						
F	F	N/A	Cyclopentylcyclopentane				x																								
F	F	91178	Decalins																					x							
F	F	123422	Diacetone														x													x	
F	F	142961	Dibutyl ether														x														
F	F	1331437	Diethylcyclohexane																				x	x							
F	F	111466	Diethylene glycol																		x										
F	F	N/A	Dihydronaphthalene												x																
F	F	109875	Dimethoxymethane														x														

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																						
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings								Solvent Degreasers	Emergency Generators				Incinerators	De-icing	Fire Training
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner		Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG			
F	F	28804888	Dimethyl napthalene		x	x																									
F	F	N/A	Dimethylbutene												x																
F	F	N/A	Dimethylcyclohexane												x	x				x				x							
F	F	28729524	Dimethylcyclopentane												x									x							
F	F	N/A	Dimethylcyclopentenes												x																
F	F	36473071	Dimethyldecane												x																
F	F	31902940	Dimethylethylcyclohexane												x																
F	F	30498669	Dimethylheptanes												x	x				x				x							
F	F	N/A	Dimethylhexadiene												x																
F	F	N/A	Dimethylhexanes												x									x							
F	F	N/A	Dimethylhexene																						x						
F	F	N/A	Dimethylindans												x																
F	F	N/A	Dimethylindene												x																
F	F	N/A	Dimethylnaphthyridine												x																
F	F	N/A	Dimethylnonanes																					x							
F	F	N/A	Dimethyloctanes												x									x							
F	F	N/A	Dimethylpentane												x																
F	F	N/A	Dimethylpentene												x																
F	F	74840	Ethane	x	x	x	x		x					x											x	x		x	x		x
F	F	N/A	Ethylbicycloheptane												x																
F	F	1678917	Ethylcyclohexane												x	x			x	x				x							
F	F	1640897	Ethylcyclopentane													x			x												
F	F	N/A	Ethylcyclopentene												x																

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																						
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings								Solvent Degreasers	Emergency Generators				Incinerators	De-icing	Fire Training
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner		Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG			
F	F	N/A	Ethyldimethylbenzene												x																
F	F	N/A	Ethyldimethylcyclohexane																					x							
F	F	86571393	Ethyldimethylpentane												x																
F	F	74851	Ethylene	x	x	x	x																		x	x		x	x		x
F	F	60004	Ethylenediaminetetraacetic Acid												x																
F	F	N/A	Ethylheptane												x								x								
F	F	N/A	Ethylheptene																					x							
F	F	N/A	Ethylindan												x																
F	F	625547	Ethylisopropyl ether														x														
F	F	30677340	Ethylmethylcyclohexanes												x									x							
F	F	N/A	Ethylmethylcyclopentane												x									x							
F	F	79004878	Ethylmethylhexane												x																
F	F	N/A	Ethylmethyloctane												x									x							
F	F	208038453	Ethyloctane																					x							
F	F	N/A	Ethyloctene																					x							
F	F	N/A	Ethylpentene												x																
F	F	N/A	Ethylpropylcyclohexanes																					x							
F	F	25550145	Ethyltoluenes (methylethylbenzenes)												x																
F	F	98000	Furfuryl alcohol	x																											
F	F	107222	Glyoxal	x	x	x																									
F	F	629787	Heptadecane	x																											
F	F	5910859	Heptadienal												x																

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																					Fire Training
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings								Solvent Degreasers	Emergency Generators				Incinerators	De-icing	
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner		Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG			
F	F	25339564	Heptene	x	x	x			x						x													x			
F	F	544763	Hexadecane	x	x	x																									
F	F	142836	Hexadienal												x																
F	F	66251	Hexaldehyde	x				x																							
F	F	25264931	Hexene												x																
F	F	107415	Hexylene glycol (2-methyl-2,4-pentanediol)														x														
F	F	N/A	Hexyne				x																								
F	F	496117	Indan				x								x										x						
F	F	75285	Isobutane				x		x		x			x	x										x			x			
F	F	115117	Isobutylene												x													x			
F	F	78842	Isobutyraldehyde																									x			
F	F	N/A	Isomers of butene																									x			
F	F		Isomers of butylbenzene												x									x							
F	F	N/A	Isomers of C10H18																				x								
F	F	N/A	Isomers of C9H16												x									x							
F	F		Isomers of decane												x								x	x				x			
F	F		Isomers of diethylbenzene												x																
F	F		Isomers of dodecane	x											x									x							
F	F	N/A	Isomers of ethyltoluene													x		x													
F	F	N/A	Isomers of heptane											x														x			
F	F	N/A	Isomers of hexane								x	x		x	x													x			
F	F	N/A	Isomers of nonane								x					x			x	x			x					x			

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																					
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings								Solvent Degreasers	Emergency Generators				Incinerators	De-icing	Fire Training
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner		Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG			
F	F	N/A	Isomers of octane											x														x			
F	F	N/A	Isomers of pentadecane	x							x																				
F	F	N/A	Isomers of pentane								x	x		x														x			
F	F	N/A	Isomers of pentene	x																											
F	F	N/A	Isomers of propylbenzene												x									x							
F	F	N/A	Isomers of tetradecane	x											x									x							
F	F		Isomers of tridecane																					x							
F	F		Isomers of undecane												x		x						x	x							
F	F	78784	Isopentane				x		x																x						
F	F	78795	Isoprene				x																		x						
F	F	67630	Isopropyl alcohol																			x	x							x	
F	F	590863	Isovaleraldehyde		x	x																									
F	F	74828	Methane	x			x			x		x		x											x	x	x	x	x		x
F	F	110430	Methyl amyl ketone													x	x	x													
F	F	111773	Methyl carbitol (2-(2-methoxyethoxy)ethanol) (degme)																											x	
F	F	N/A	Methyl naphthalenes	x											x																
F	F	112390	Methyl palmitate														x														
F	F	25013154	Methyl styrene (mixed) (vinyl toluene)												x																
F	F	N/A	Methylbutadiene												x																
F	F	N/A	Methylbutene												x																
F	F	30640461	Methylcyclohexadiene												x																
F	F	108872	Methylcyclohexane				x								x	x			x	x			x	x	x			x			

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																						
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings								Solvent Degreasers	Emergency Generators				Incinerators	De-icing	Fire Training
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner		Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG			
F	F	N/A	Methylcyclohexene												x																
F	F	N/A	Methylcyclooctane				x																								
F	F	N/A	Methylcyclopentadiene												x																
F	F	96377	Methylcyclopentane				x		x						x										x			x			
F	F	28258891	Methyldecalins																					x							
F	F	N/A	Methyldecanes												x									x							
F	F	73752144	Methyldecene																					x							
F	F	N/A	Methyldihydronaphthalene												x																
F	F	N/A	Methyldodecane																					x							
F	F	78988	Methylglyoxal		x	x																									
F	F	N/A	Methylheptane												x																
F	F	N/A	Methylheptene													x			x												
F	F	N/A	Methylheptyne												x																
F	F	N/A	Methylhexadiene												x																
F	F	N/A	Methylhexanal												x																
F	F	N/A	Methylhexane												x									x							
F	F	N/A	Methylhexenes												x									x							
F	F	N/A	Methylindans												x																
F	F	N/A	Methylisopropylcyclohexane																					x							
F	F	N/A	Methylnonane												x									x							
F	F	N/A	Methylnonene																					x							
F	F	N/A	Methyloctanes												x									x							
F	F	N/A	Methylpentane												x																

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																						
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings									Emergency Generators						
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner	Solvent Degreasers	Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG	Incinerators	De-icing	Fire Training
F	F	N/A	Methylpentenes												x																
F	F	N/A	Methylpropylcyclohexanes																					x							
F	F	N/A	Methylpropylnonane																					x							
F	F	N/A	Methylundecane																					x							
F	F	106978	N-butane				x		x	x	x	x		x											x			x			
F	F	123864	N-butyl acetate													x		x	x	x			x							x	
F	F	104518	N-butylbenzene	x			x																	x							
F	F	124185	N-decane	x	x	x	x						x				x								x			x			
F	F	112403	N-dodecane	x	x	x							x																		
F	F	629787	N-heptadecane		x	x																									
F	F	111842	N-nonane	x	x	x	x						x											x	x			x			
F	F	111659	N-octane	x	x	x	x						x												x			x			
F	F	71030529	Nonadiene																					x							
F	F	109660	N-pentane	x	x	x	x		x		x	x		x											x			x			
F	F	538681	N-pentylbenzene	x																											
F	F	29949277	N-pentylcyclohexane																					x							
F	F	103651	N-propylbenzene		x	x	x								x									x	x						
F	F	629505	N-tridecane	x	x	x							x																		
F	F	1120214	N-undecane	x	x	x	x						x				x						x		x			x			
F	F	496106	Octahydroindenes																					x							
F	F	N/A	Octatriene												x																
F	F	529204	o-Tolualdehyde		x	x																									
F	F	629629	Pentadecane	x	x	x							x																		

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																						
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings									Emergency Generators						
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner	Solvent Degreasers	Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG	Incinerators	De-icing	Fire Training
F	F	N/A	Pentyne				x																								
F	F	74986	Propane	x	x	x			x		x	x		x										x			x			
F	F	5364830	Propenylcyclohexane																				x								
F	F	115071	Propylene	x	x	x	x		x															x	x		x	x		x
F	F	104870	p-Tolualdehyde		x	x																x									
F	F	78922	Sec-butyl alcohol																				x						x	
F	F	N/A	Substituted C9 ester (C12)														x													
F	F	N/A	T-1-Phenylbutene				x																							
F	F	6434782	T-2-Nonene				x																							
F	F	629594	Tetradecane	x	x	x							x																	
F	F	25619607	Tetramethylbenzene												x															
F	F	N/A	Tetramethylcyclobutene												x															
F	F	67784412	Tetramethylcyclopentane																				x							
F	F	2782914	Tetramethylthiourea																				x							
F	F	620235	Tolualdehyde		x	x																								
F	F	624646	Trans-2-butene				x																	x			x			
F	F	4050457	Trans-2-hexene		x	x																								
F	F	646048	Trans-2-pentene		x	x	x																	x			x			
F	F	13269528	Trans-3-hexene																					x						
F	F	25551137	Trimethylbenzenes (mixed)												x	x		x					x							
F	F	N/A	Trimethyldecane												x															
F	F	N/A	Trimethylheptanes												x								x							
F	F	95461544	Trimethylhexene												x															

Identified in CAA ?	Identified in IRIS?	CAS	Species Name	Aircraft		APU	GSE		Stationary Sources																						Fire Training
									Boilers/Space Heaters				Fuel Storage Tanks			Surface Coatings								Solvent Degreasers	Emergency Generators				Incinerators	De-icing	
				Piston	Turbo		Natural Gas, Gas and LPG	Diesel	Coal	Residual Fuel	Distillate Fuel	Natural Gas and LPG	JP-4	Jet Kerosene, Distillate and Residual Oil	Gasoline	Solvent Base	Water Base	Enamel	Lacquer	Primer	Varnish / Shellac	Adhesives	Thinner		Gasoline	Diesel	Kerosene / Naphtha	Natural Gas and LPG			
F	F	N/A	Trimethylindan												x																
F	F	98060527	Trimethyloctanes												x									x							
F	F	N/A	Trimethylpentadiene												x																
F	F	29222488	Trimethylpentane												x																
F	F	217594	Triphenylene												x									x							
F	F	N/A	Unidentified		x	x	x																		x						
F	F	110623	Valeraldehyde		x	x																									
F	F	111159	2-ethoxyethyl acetate (cellosolve acetate)																											x	
F	F	111900	Carbitol (degee) (2-(2-ethoxyethoxy)ethanol)																											x	
F	F	34590948	Di(propylene glycol) methyl ether																											x	
F	F	64175	Ethyl alcohol																											x	
F	F	78831	Isobutyl alcohol																											x	
F	F	N/A	Ketones - general																											x	
F	F	64475850	Mineral spirits																											x	
F	F	N/A	Oxygenates																											x	
F	F	109604	Propyl acetate																											x	
F	F	107982	Propylene glycol methyl ether (1-methoxy-2-propanol)																											x	
F	F	108656	Propylene glycol monomethyl ether acetate (2-(1-methoxy)propyl acetate)																											x	
F	F	N/A	UNC peaks to CBM xylene																											x	

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