

Validation Report



pDsAUSMOD-Australian GUI for AERMOD

This report was produced for EPA, Victoria and submitted to
Principal Expert-Air Quality

By

pDs Consultancy, Australia

Validation was undertaken by

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Executive Summary

pDsAUSMOD is a Graphical User interface for the US EPA's AERMOD, which is now EPA, Victoria's regulatory air Dispersion model. This software package was developed in Australia, fulfilling air modelling requirements in Schedule C of the State Environment Protection Policy - Air Quality Management (SEPP(AQM)), as well as the specific requirements outlined in EPA, Victoria's publication #1551- Guidance Notes for using the regulatory air pollution model AERMOD in Victoria.

It has been validated following the validation process with 10 criteria, and this has been outlined in this document (Pages 5 and 6). This exercise comfortably verified that pDsAUSMOD satisfies all 10 criteria in the validation process. Five cases that cover/demonstrate all required performances were tested and results were documented.

pDsAUSMOD is recommended for use in running AERMOD (currently Version 12345) based on this vigorous validation process. pDs Consultancy, the developer of pDsAUSMOD assure its currency by upgrading its kernels and will also continually improve and enhance its functionalities.



Validation of the Australian Graphical User Interface (GUI) for AERMOD : -pDsAUSMOD

Introduction

This report is specifically produced to demonstrate that pDsAUSMOD functions properly and meets the requirements set in EPA, Victoria's guideline document "[Guidance Notes for using the regulatory air model AERMOD in Victoria](#)"

The AERMOD model software is structured with Path Ways. It has five basic pathways:

- CO – Control Pathway
- ME – Meteorological Pathway
- SO – Source Pathway
- RE – Receptor Pathway
- OU – Output Pathway

The graphical user interface in pDsAUSMOD basically has user input forms for each pathway. The additional sub forms are also built in to gather all the inputs required to run AERMOD. They are all linked appropriately. Novice user can navigate through the software following the logically set out sequential input prompts.

The pDsAUSMOD has been designed to have project folders on whichever device you install it on (Computer, Server or USB drive). All required input files as well as output files will be written to this project folder. You can gather (load) all required input files from various locations and AERMOD will automatically place them in a specified project folder. Here are the input and output files;

- Input files
 - Meteorological data files (.SFC,.PFL)
 - Receptor Elevation and Hill Height files (.REL)
 - Background Pollutant data files (.BGR)
 - Emission input files (.VRE) – Variable Emission



- Output files
 - AERMOD output (Generic name aermod.out as your model log file) file and error file
 - Top 100 Table (.RNK) as rank file
 - All required plot files with extensions (.PLT)
 - File with all the calculations (.POS)
 - BPIP input and output files



Validation Process

1. Software Kernels

pDsAUSMOD was built on the generic software components available from US EPA

(http://www.epa.gov/scram001/dispersion_prefrec.htm).

They are

- i. AERMOD V12345,
- ii. BPIP and
- iii. AERMAP.

In the validation process it will be checked whether the right versions were embedded into pDsAUSMOD

2. Check whether all basic pathways and sub-forms required for the main pathways are available in pDsAUSMOD.

- i. CO – Control Pathway
- ii. ME – Meteorological Pathway
- iii. SO – Source Pathway
- iv. RE – Receptor Pathway
- v. OU – Output Pathway

3. Check each pathway form to make sure all basic inputs and options required by EPA, Victoria (<http://www.epa.vic.gov.au/our-work/publications/publication/2013/october/1551>) are available.

- Check whether provisions are available
 - To input constant and variable background
 - Emission and Concentration units including Odour
 - Averaging time
 - Terrain Flat or Ignore
- Check whether provisions are available to incorporate basic type of sources: Point, Area and Volume
- Check whether provisions are available
 - to incorporate Emission profiles.
 - to input variable emission files



- to input particle size distributions.
4. Check whether provisions are available for source grouping
 5. Check whether provisions are available to design regular and irregular grids in Cartesian or Polar Coordinates
 - Does Google Mapping facility help to create grids in UTM ?
 - Check whether provisions are available to design Discrete Receptors in Cartesian or Polar Coordinates
 - Check whether provisions are available to design Flagpole Receptors.
 6. Check the interface for Building Information
 - Is user interface is appropriate to input all required information?
 - Is BPIP running without any Error?
 - Is BPIP output transferring to AERMOD input file?
 -
 7. Check the interface for Terrain Processing
 - Are input file options appropriate?
 - Is google mapping functionality helpful?
 - Is AERMAP run without any error?
 - Is AERMAP output transferring to AERMOD input file?
8. Check whether all input information and options input by the user are transferred to AERMOD input file (.inp)
9. Check the AERMOD runs without any errors once all the required information is input.
 10. Are the internal graphics useful?
 - Is SURFER automation working properly?



Form for Control Pathway (CO)

The screenshot shows the 'Model Control' window with several callout boxes highlighting specific features:

- Constant and Variable background:** Points to the 'Pollutant Background in Output Units' section, where 'Variable Background' is selected.
- Units and unit conversions:** Points to the 'Units' section, showing 'Emission Rate Units: OUV/second' and 'Concentration Units: Odour Units (OU)'.
- Averaging time:** Points to the 'Avg. Period <= 24 Hrs' section, where '1 Hour' is selected.
- Terrain:** Points to the 'Terrain' section at the bottom, where 'Flat' is selected.

The interface also includes sections for 'Simulation Title', 'Model Output' (Concentration/Deposition), 'Depletion Options' (Dry/Wet), 'Deposition Options' (Total/Dry/Wet), 'Other Options (BETA)' (Low Wind, LOWWIND1/2, Adjust friction Velocity, NOx conversion), and 'Pollutant' (Odour).

In addition, beta options like LOWWINDS, and Adjust friction velocity are available.
NOX conversion (OLM) is also incorporated.
Dry and Wet Depletion options are also in, though they are not in guidelines

Form for Meteorological Pathway

Input Meteorological Information

AERMOD MetFiles

Surface File C:\MyAUSMOD\MyProject2\MyCity.SFC

Profile File C:\MyAUSMOD\MyProject2\MyCity.PFL

Non sequential met data

Met Station Information

Base Elevation of Anemometer : 0 metres

Surface Station

Station Number: 0011 Year: 2010

Station Name: MyCity

Upperair Station

Station Number: 0099 Year: 2010

Station Name: MyCity

Modelling Period

Run all periods in MetFile

Specify Period

Start: 25/04/2010 End: 30/04/2010

Hint :Contact pDs Consultancy to get done metfiles for your domain

Provisions are given to input all required information including base elevation of anemometer. Non sequential met data option made default to satisfy local data coverage

Form for Source Pathway

Point Source

The screenshot shows a software window titled "Point Source" with a background image of a factory. The window is divided into several sections:

- Sources:** A list box containing "PS01" and a "Total" field with the value "1".
- Source ID:** A text field containing "PS01".
- Source Coordinates:** Three spinners for "X metres" (350893.6), "Y metres" (5800248.0), and "Z metres" (0.0).
- Emission Rate/Flux:** A dropdown menu set to "Constant", a "Constant Rate" spinner (1.00000), and a checkbox for "Vib Emission File". Below this is a tabbed interface with "Hour of Day" selected, showing a table with "Hour" and "E-RateFactor" columns. The table has 6 rows, with the first row (Hour 1) selected and having a value of 0. An "All Same" button is at the bottom.
- Deposition:** A button labeled "Particle Size Distribution".
- Source Characteristics:** Fields for "Height" (0.00 metres), "Diameter" (0.00 metres), "Temperature" (0.00 Centigrade), and "Exit Velocity" (0.00 metres/sec). There are radio buttons for "Fixed" (selected) and "Ambient".
- Building Wake Effect:** A checkbox labeled "Include".
- Buttons:** "Cancel" and "OK" buttons at the bottom right.

Three callout boxes with orange borders point to specific areas:

- "Coordinates" points to the Source Coordinates section.
- "Emission profiles" points to the Hour of Day table.
- "Source Characteristics" points to the Source Characteristics section.

A button to call the Particle Size Distribution form is available

Area Source

Area Source

Sources

Source ID	Total
POND1	1

Add
Delete

Source ID: POND1

Source Coordinates - SW Corner

X metres	Y metres	Z metres
100.0	150.0	0.0

Emission Rate/Flux

Profile: Constant OUVperSecond/m2

Constant Rate: 0.50000 Vrb Emission File

Hour of Day | Hour and Season | Month | Wind Cat

Hour	E-RateFactor
1	0
2	0
3	0
4	0
5	0
6	0

All Same

Deposition

Particle Size Distribution

Source Characteristics

Polygon Circular

Height: 0.00 metres

V.Spread: 3.00 metres

Polygon Shape

X	Y	Total
100	150	4
180	150	
180	270	

Add
Delete

Cancel OK

Shapes of Area Sources
Polygon/Circular

Polygon covers; Squares, rectangles
Circular source is available.
Avoids coordinates mix up with real-time graphics



Volume Source

Sources

Sources	Total
SHED	1

Add
Delete

Source ID: SHED

Source Coordinates - SW Corner

X metres	Y metres	Z metres
0.0	0.0	0.0

Emission Rate/Flux

Profile: Constant OUVperSecond

Constant Rate: 1000.00000 Vrb Emission File

Hour of Day | Hour and Season | Month | Wind Cat

Hour	E-RateFactor
1	0
2	0
3	0
4	0
5	0
6	0

All Same

Deposition

Particle Size Distribution

Source Characteristics

Release Height: 10.00 metres Width: 32.00 metres

Vertical Spread: 5.00 metres Horizontal Spread: 8.00 metres

Cancel OK

Volume source
specific source
characteristics

Sub Form-Particle Size Distribution

Gravitational Settling or Scavenging Parameters

Source ID:

Fraction No	Mass Fraction	Part. Size(micron)	Part Density (g/m3)
-------------	---------------	--------------------	---------------------

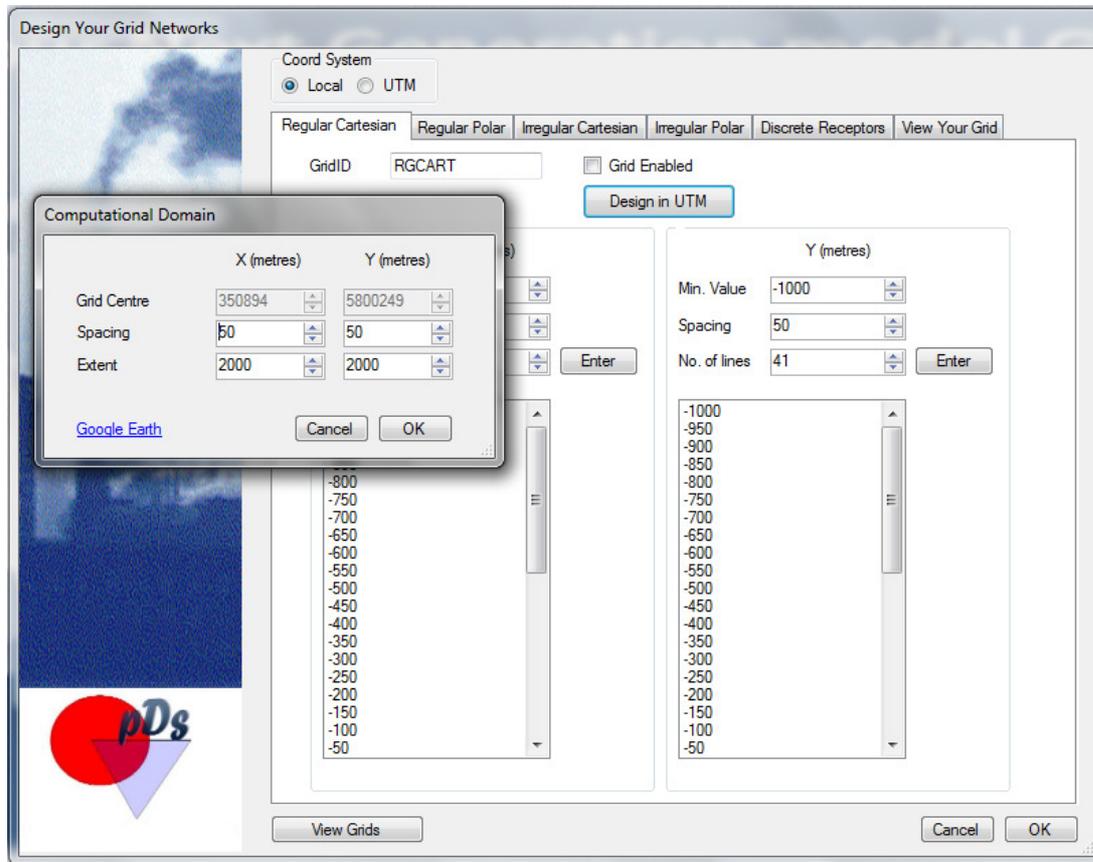
Your Entry

Total Fraction

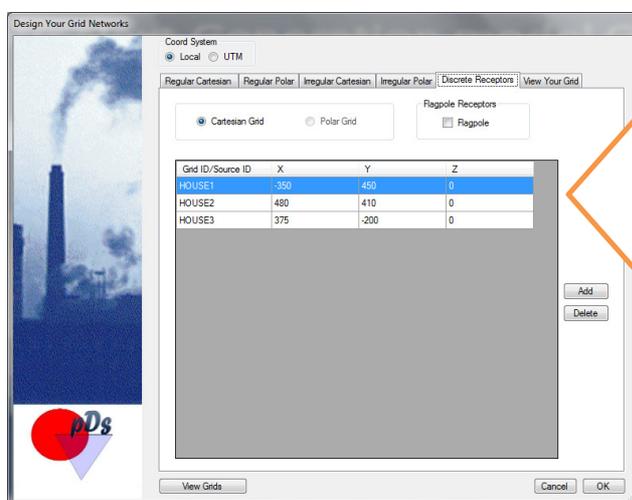
Fraction remaining

Provisions are available to input particle size distribution

Form for Receptor Pathway



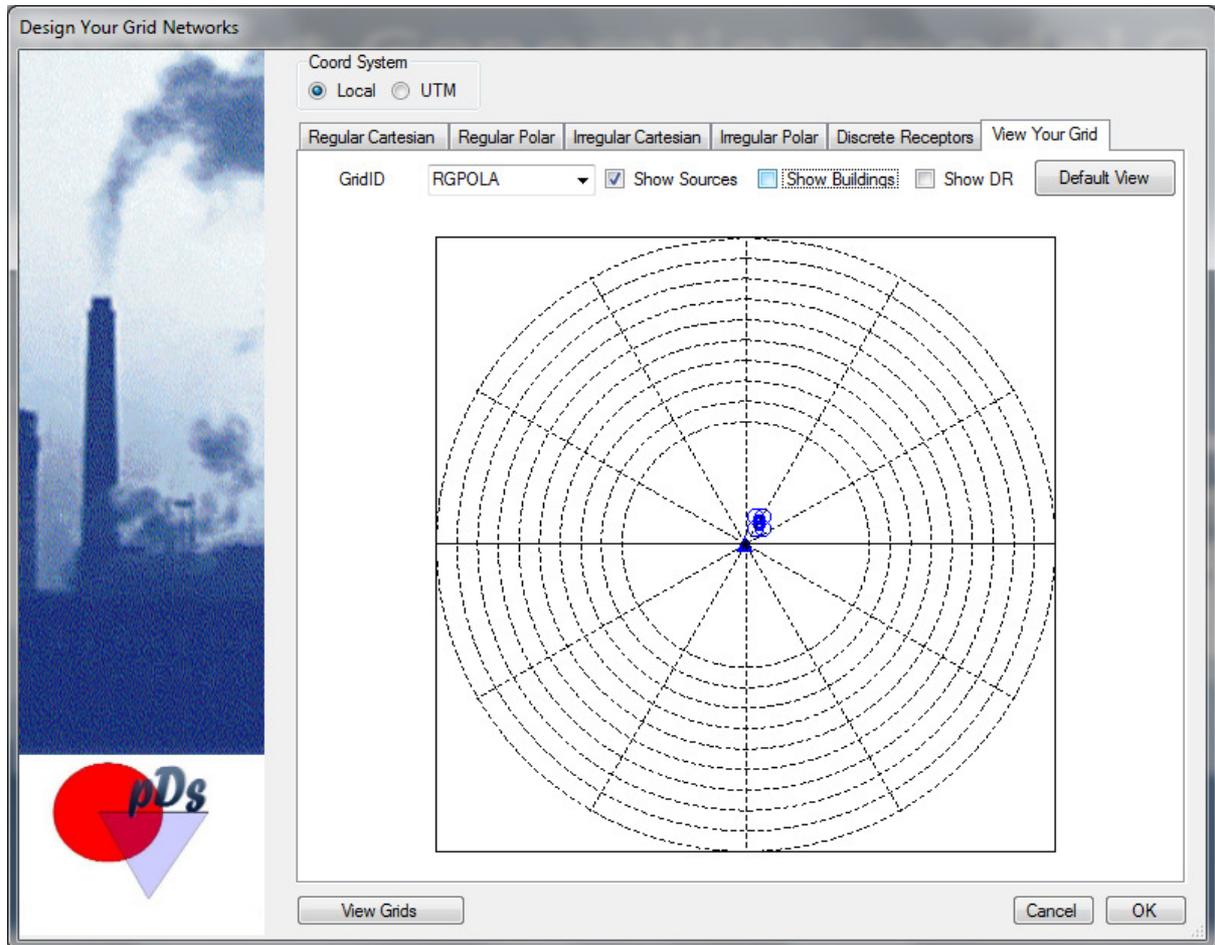
There are two types of Grids: Regular and Irregular in both Cartesian and Polar coordinate systems. The user can have their grid in the local or UTM coordinates system. These four grids and Discrete Receptor forms are available in Tab form. There is a separate Tab to view the designed grid(s).



There is an option for Flagpole receptors

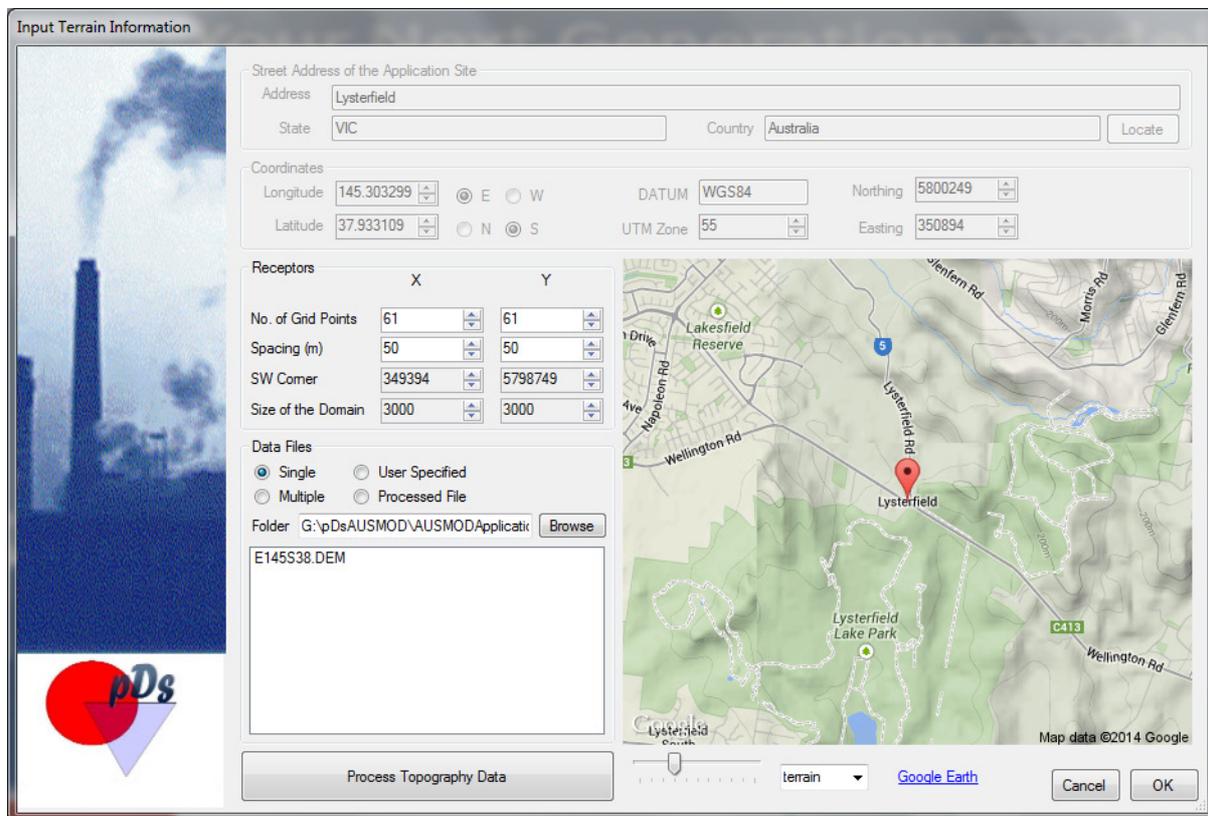


Grid View



The user can overlay sources and buildings on the grid. This functionality helps users ensure that sources are inside the designed grid and are all in the same coordinates system.

pDsAERMAP Interface



In this interface default grid size has been set to 3KM by 3KM. The grid centre is set to the UTM coordinates of the application site (internally linked to the MyDomain form which helps the user to determine geographical coordinates of the application site (Street address is required)).

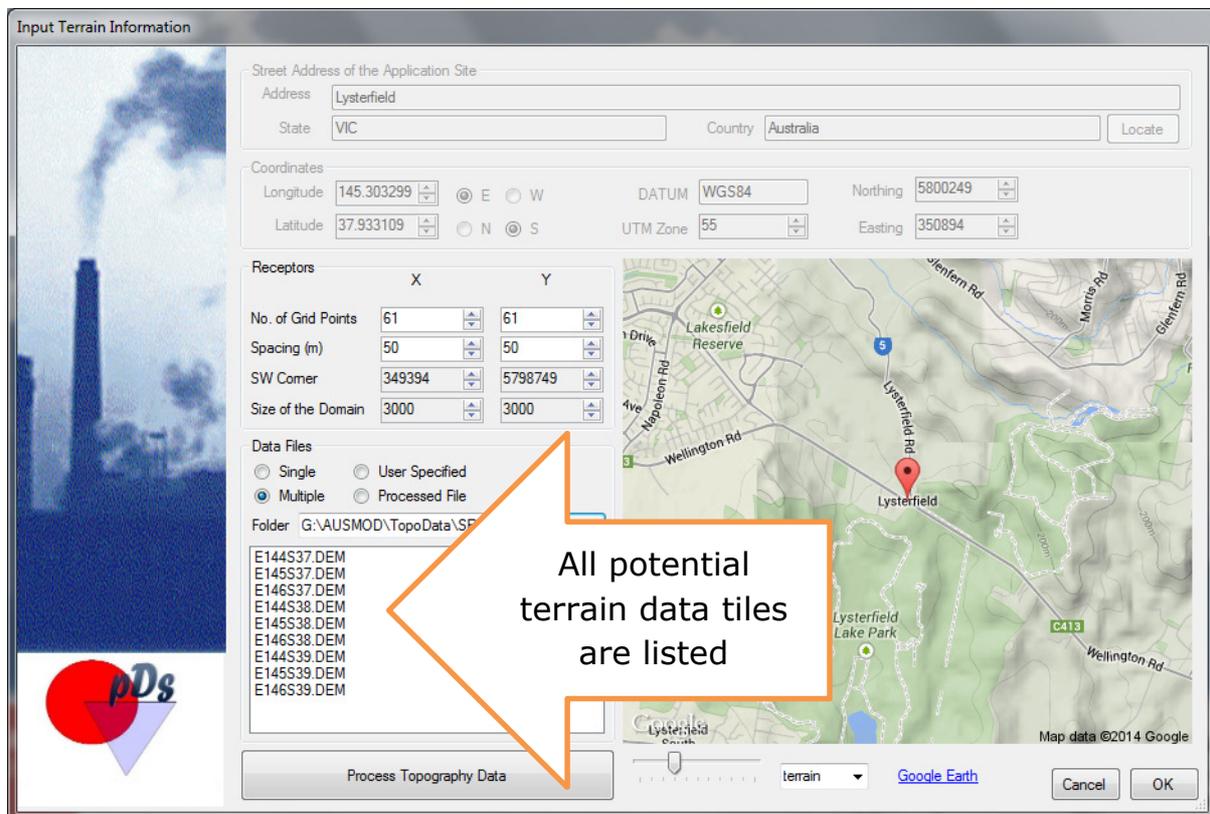
The interface is smart enough to show you the potential terrain data tiles required. These tiles should be in the US DEM format.

The user can change the grid resolution and the number of grid points. This helps the users to design the grid in their desired size.

If the user intends to use the terrain data tiles in the US DEM format, the multiple file option is recommended. If the users are capable of obtaining terrain data for the specific domain the option "User Specified" is also available.



There is an option to load “Processed file-Receptor elevation and hill height file” for your convenience. This file can be prepared by running pDsAERMAP separately.



Note: Modern GIS systems can produce this type of data tiles if high resolution (at least 90m) terrain data is available.

You can run AERMAP to produce the receptor elevation file (.REL) once you have gathered all of the required terrain data tiles. You have to make sure all coordinates are in UTM in this particular project.

Additional features like the ability to view your domain in Google Earth, as well as construction topography contours are also available (as a QA/QC).



Form for Output Pathway

Specify Output (Options and Files)

Specify output files needed

File with top 100 table S Groups: ALL Avg. Time: 01 File Name: ALL_01_100T.RNK

File with exceedances S Groups: ALL Avg. Time: 01 File Name: ALL_01_1.FRQ

Exceedance Level: 1

File with all calculations

Plot Files

File with 9th highest S Groups: ALL Avg. Time: 01 File Name: ALL_01_9H.PLT

File with highest

More Plot Files

	Src Group	Avg. Time	Rank	File Name
▶	GP01	01	9	GP01_01_9H.PLT
	GP02	01	9	GP02_01_9H.PLT

Add Delete

Cancel OK

Top 100 table

Plot file with the 9th highest

Creation of frequently demanding files such as

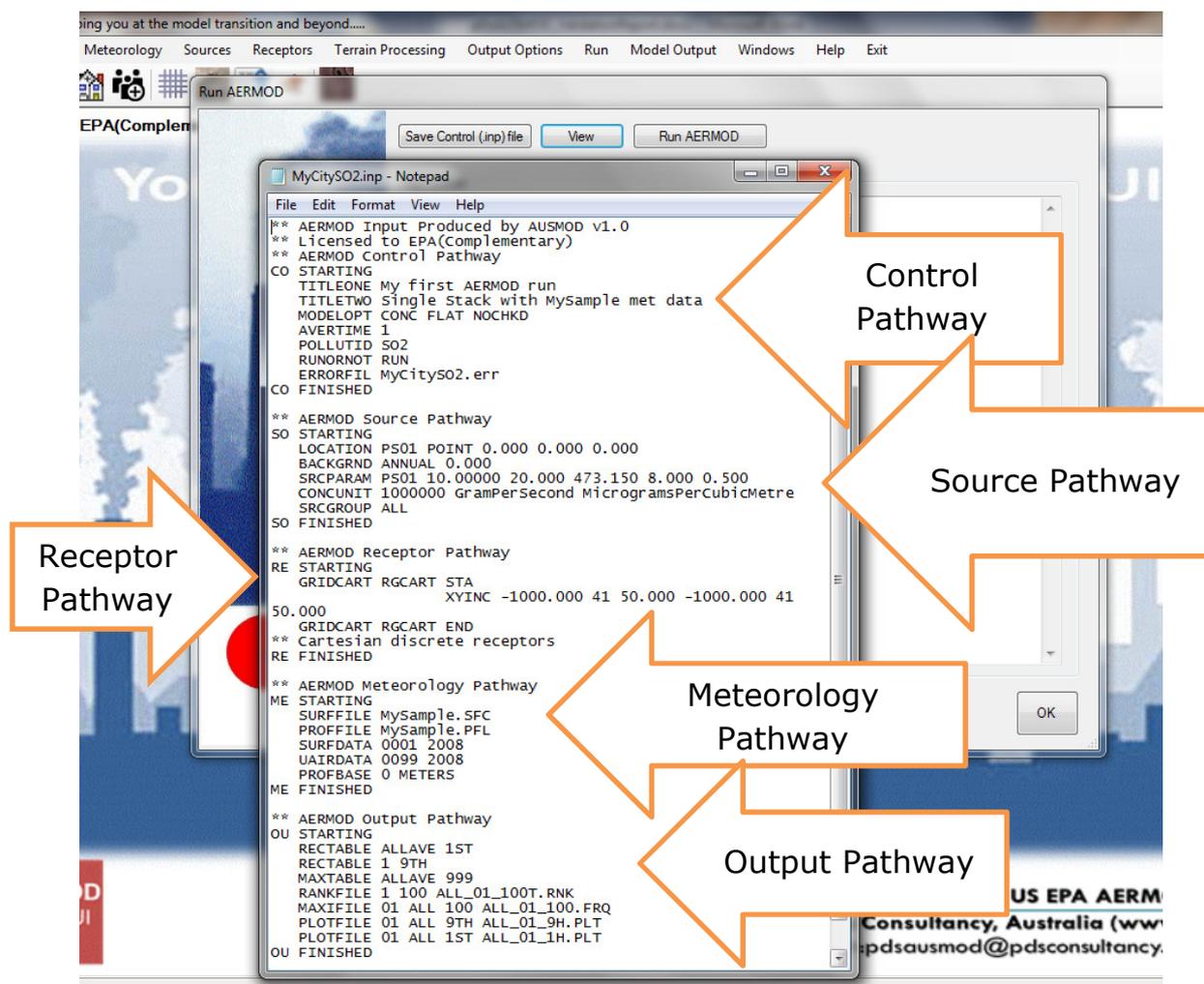
- The top 100 Table
- Plot file with 9th highest

These are made by default in pDsAUSMOD

The user can request other types of files; files can be written based on any combination of Grouping, averaging time and ranking.

Running AERMOD

The following file demonstrates the successful creation of a generic input file for AERMOD by pDsAUSMOD.



Test Case 1:

Assume that you have a source located in MyCity. You have been provided with a full year of meteorological data (.SFC and .PFL), pre-prepared for MyCity, to model the residual emission coming out of this stack.

Source Height :20m

Exit Temperature :200 C

Emission Rate :10 g/s

Diameter: 0.5m

Exit Velocity :8 m/s

Background :0

Use the local coordinate system with the Grid Size 2KM by 2KM

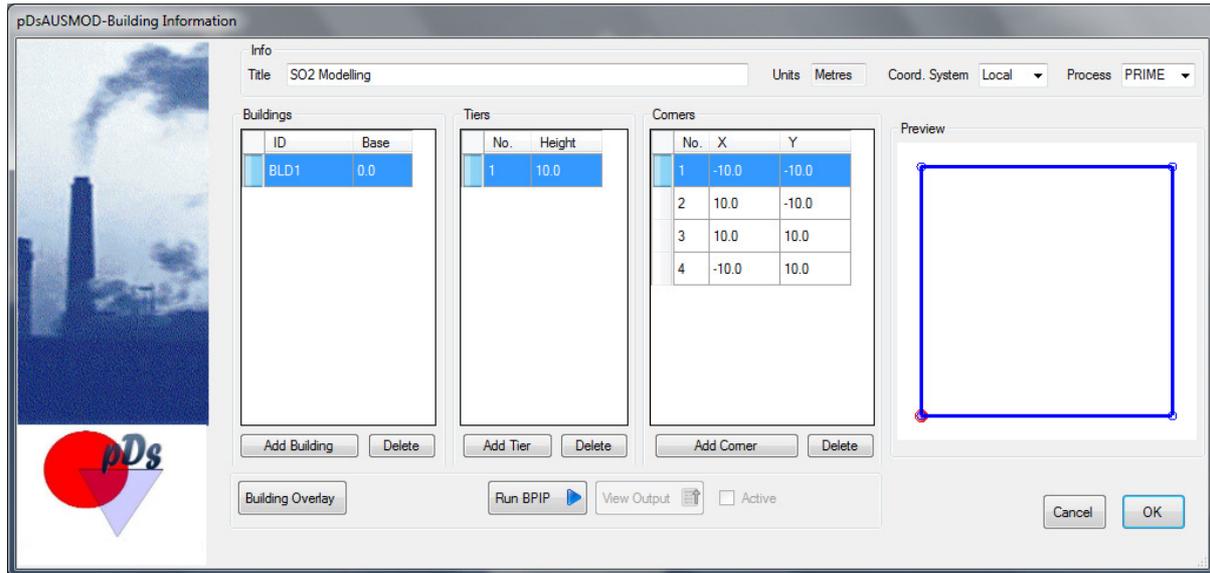


It is verified that all inputs and outputs were properly transferred to the AERMOD input by pDsAUSMOD.

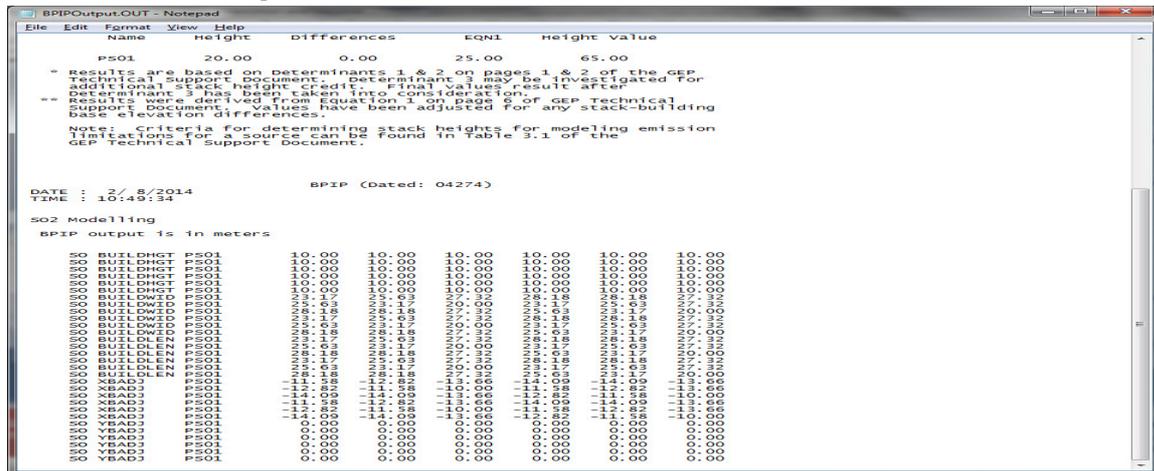
Test Case 2: Add building wake effect to Case 1

Assume that the stack is on the centre top of the 10m by 10m square building.

Input in the BPIP Interface



BPIP run :Output



It is verified that BPIP interface in pDsAUSMOD worked properly running US EPA's generic BPIP producing correct output required for AERMOD.



AERMOD input file for Test Case 2

```

MyCitySO2_wBld.inp - Notepad
File Edit Format View Help
SO STARTING
LOCATION PS01 POINT 0.000 0.000 0.000
BACKGRND ANNUAL 0.000
SRCPARAM PS01 10.00000 20.000 473.150 8.000 0.500
CONCUNIT 1000000 GramPerSecond MicrogramsPerCubicMetre
BUILDHGT PS01 10.00 10.00 10.00 10.00 10.00 10.00
BUILDWID PS01 23.17 25.63 27.32 28.18 28.18 27.32
BUILDWID PS01 25.63 23.17 20.00 23.17 25.63 27.32
BUILDWID PS01 28.18 28.18 27.32 25.63 23.17 20.00
BUILDWID PS01 23.17 25.63 27.32 28.18 28.18 27.32
BUILDWID PS01 25.63 23.17 20.00 23.17 25.63 27.32
BUILDWID PS01 28.18 28.18 27.32 25.63 23.17 20.00
BUILDLEN PS01 23.17 25.63 27.32 28.18 28.18 27.32
BUILDLEN PS01 25.63 23.17 20.00 23.17 25.63 27.32
BUILDLEN PS01 28.18 28.18 27.32 25.63 23.17 20.00
BUILDLEN PS01 23.17 25.63 27.32 28.18 28.18 27.32
BUILDLEN PS01 25.63 23.17 20.00 23.17 25.63 27.32
BUILDLEN PS01 28.18 28.18 27.32 25.63 23.17 20.00
XBADJ PS01 -11.58 -12.82 -13.66 -14.09 -14.09 -13.66
XBADJ PS01 -12.82 -11.58 -10.00 -11.58 -12.82 -13.66
XBADJ PS01 -14.09 -14.09 -13.66 -12.82 -11.58 -10.00
XBADJ PS01 -11.58 -12.82 -13.66 -14.09 -14.09 -13.66
XBADJ PS01 -12.82 -11.58 -10.00 -11.58 -12.82 -13.66
XBADJ PS01 -14.09 -14.09 -13.66 -12.82 -11.58 -10.00
YBADJ PS01 0.00 0.00 0.00 0.00 0.00 0.00
SRCGROUP ALL
SO FINISHED
  
```

It is verified that the building info. was written to the AERMOD input file by pDsAUSMOD correctly.

Test Case 3: Fugitive Emission (Volume Source)

In this case the odours emitted from a building (20m high) in flat rural terrain is considered. The building is 32 m wide and 20 m high. Assume that the source is located in the centre of the site. The odour emission rate is estimated to be 1000 OUV/s. Here a Polar Grid and Discrete Flagpole receptors were used.

Input in pDsAUSMOD

The screenshot shows the 'Volume Source' configuration window in pDsAUSMOD. The 'Sources' list contains one entry, 'SHED', with a total of 1. The 'Emission Rate/Flux' section is set to a 'Constant' profile with a rate of 1000.00000 OUV/second. The 'Source Characteristics' section shows a release height of 10.00 metres, a width of 32.00 metres, a vertical spread of 5.00 metres, and a horizontal spread of 8.00 metres. An orange arrow points to the 'Emission' rate field, and another orange arrow points to the 'Source Characteristics' section.

Hour	E-RateFactor
1	0
2	0
3	0
4	0
5	0
6	0

Source Characteristics
SigmaY and Z
1/4 of
Width/Height
(20)

Receptors in Polar

Design Your Grid Networks

Coord System
 Local UTM

Regular Cartesian Regular Polar Irregular Cartesian Irregular Polar Discrete Receptors View Your Grid

GridID RGPOLA Grid Enabled

Origin
 X 0.0 Y 0.0

Radius (metres)
 Min. Value 0
 Spacing 25
 No. of rings 20 Enter

Bearing (degrees)
 Min. Value 0
 Spacing 24
 No. of sectors 12 Enter

0
25
50
75
100
125
150
175
200
225
250
275
300
325
350
375
400
425
450
475

0
30
60
90
120
150
180
210
240
270
300
330

View Grids Cancel OK



Discrete Flagpole Receptors

Design Your Grid Networks

Coord System
 Local UTM

Regular Cartesian Regular Polar Irregular Cartesian Irregular Polar Discrete Receptors View Your Grid

Cartesian Grid Polar Grid

Flagpole Receptors
 Flagpole

Grid ID/Source ID	X	Y	Z
HOUSE1	-350	450	20
HOUSE2	480	410	30
HOUSE3	375	-200	40

Add
Delete

View Grids Cancel OK




AERMOD input file for Test Case 3

It is verified that the Volume Source info was transferred to the AERMOD input file correctly by pDsAUSMOD

In addition, Polar Grid and Discrete Flagpole Receptors were translated correctly by pDsAUSMOD

```

MyCountryOdourVol.inp - Notepad
File Edit Format View Help
** AERMOD Input Produced by AUSMOD v1.0
** Licensed to EPA(Complementary)
** AERMOD Control Pathway
CO STARTING
TITLEONE Volume Sources and fugitive emission
MODELOPT CONC FLAT NOCHKD
AVERTIME 1
POLLUTID ODOUR
FLAGPOLE 0.0
RUNORNOT RUN
ERRORFIL MyCountryOdourVol.err
CO FINISHED

** AERMOD Source Pathway
SO STARTING
LOCATION SHED VOLUME 0.000 0.000 0.000
BACKGRND ANNUAL 0.000
SRCPARAM SHED 1000.00000 10.000 8.000 5.000
CONCUNIT 1 ouvpersecond odourUnits
SRCGROUP ALL
SO FINISHED

** AERMOD Receptor Pathway
RE STARTING
GRIDPOLR RGPOLA STA
ORIG 0.000 0.000
DIST 0.000 25.000 50.000 75.000 100.000 125.000 150.000 175.000
250.000 275.000 300.000 325.000 350.000 375.000 400.000 425.000 450.000 475.000
GDIR 12 0.000 24.000
GRIDPOLR RGPOLA END

** Cartesian discrete receptors
DISCCART -350.000 450.000 20.000
DISCCART 480.000 410.000 30.000
DISCCART 375.000 -200.000 40.000
    
```

Flagpole

Volume Source

Polar Grid

Discrete Flagpole Receptors

```

ALL_01_9H.PLT - Notepad
File Edit Format View Help
-216.50635 -125.00000 0.00220 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-238.15699 -137.50000 0.00189 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-259.80762 -150.00000 0.00164 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-281.45826 -162.50000 0.00144 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-303.10889 -175.00000 0.00127 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-324.75953 -187.50000 0.00114 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-346.41016 -200.00000 0.00102 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-368.06080 -212.50000 0.00093 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-389.71143 -225.00000 0.00084 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-411.36207 -237.50000 0.00077 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
0.00000 0.00000 0.00000 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 0
-24.86305 -2.51321 0.04957 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042717
-49.72609 -5.22642 0.03152 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042717
-74.58914 -7.83963 0.01539 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10043014
-99.45219 -10.45285 0.00977 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10043006
-124.31524 -13.06606 0.00696 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10043006
-149.17828 -15.67927 0.00518 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10043006
-174.04133 -18.29248 0.00400 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10043006
-198.90438 -20.90569 0.00318 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10043006
-223.76743 -23.51890 0.00260 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-248.63047 -26.13212 0.00220 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-273.49352 -28.74533 0.00189 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-298.35657 -31.35854 0.00164 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-323.21962 -33.97175 0.00144 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-348.08266 -36.58496 0.00127 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-372.94571 -39.19817 0.00114 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-397.80876 -41.81139 0.00102 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-422.67181 -44.42460 0.00093 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-447.53485 -47.03781 0.00084 0.00 0.00 0.00 1-HR ALL 9TH RGPOLA 10042520
-350.00000 450.00000 0.00039 0.00 0.00 20.00 1-HR ALL 10042519
480.00000 410.00000 0.00859 0.00 0.00 30.00 1-HR ALL 10043006
375.00000 -200.00000 0.00383 0.00 0.00 40.00 1-HR ALL 10042524
    
```

Results



AERMOD input file for Test Case 4: Area source and Source Grouping

Emissions can also be emitted from diffuse area sources. Applications include odours from anaerobic lagoons, cattle feedlots or emissions from contaminated sites. We can model these sources as rectangles, circles or polygons.

Assume odours are emitted from the following rectangular lagoon:

- Corner 1: South west corner 100, 150
- Corner 2: 180,150
- Corner 3: 180,270
- Corner 4: 100,270

Source height: 0m

Emission flux 0.5 OUV/s/m² and vertical spread as 3. Add this source to case 3 model setup

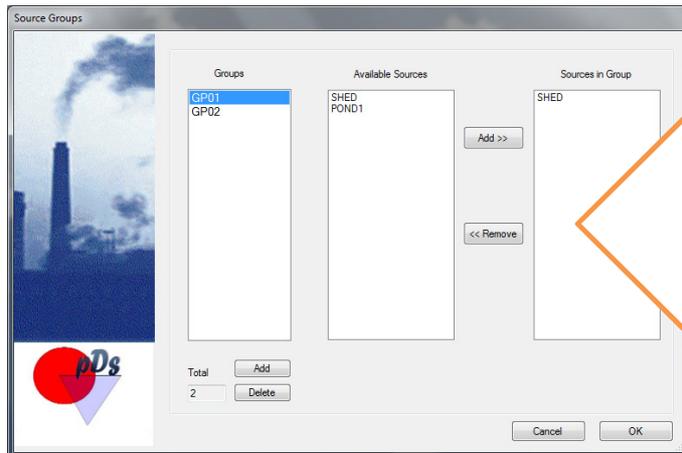
Input in pDsAUSMOD

The screenshot shows the 'Area Source' configuration window in pDsAUSMOD. The source is named 'POND1' and is located at X=100.0, Y=150.0, Z=0.0. The emission rate is set to 0.50000 OUVperSecond/m2. The source is defined as a polygon with a height of 0.00 metres and a vertical spread of 3.00 metres. The polygon vertices are listed as (100, 150), (180, 150), and (180, 270). A blue rectangle is shown on the right, representing the source area. An orange arrow points to the 'Emission Rate/Flux' field with the label 'Flux'.

Hour	E-RateFactor
1	0
2	0
3	0
4	0
5	0

X	Y	Total
100	150	4
180	150	
180	270	

Source Grouping



Pond and Shed grouped into 2

AERMOD input file for Test Case 4

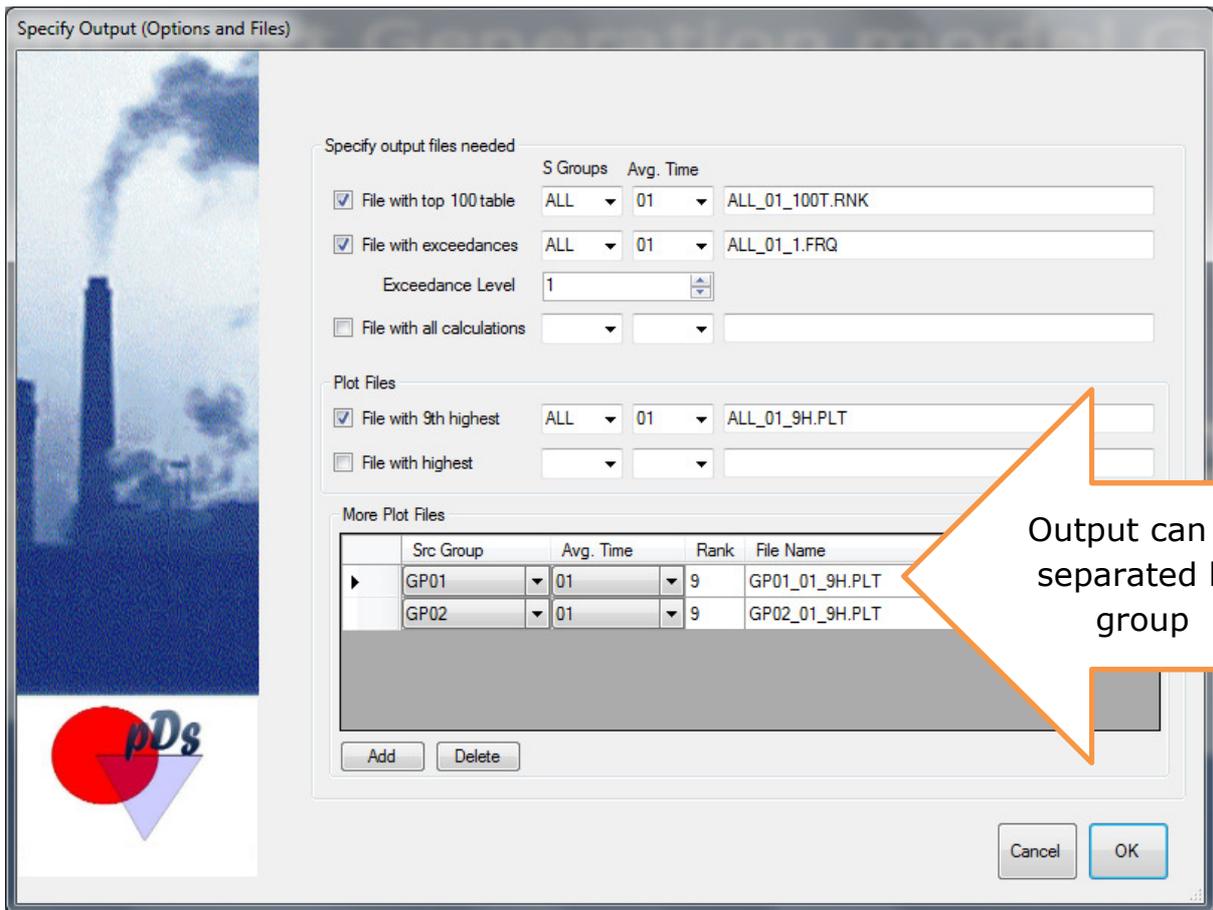
```
MyCountryOdour.inp - Notepad
File Edit Format View Help
** AERMOD Input Produced by AUSMOD v1.0
** Licensed to Binara
** AERMOD Control Pathway
CO STARTING
TITLEONE volume sources and fugitive emission
MODELOPT CONC FLAT NOCHKD
AVERTIME 1
POLLUTID ODOUR
FLAGPOLE
RUNORNOT RUN
ERRORFIL MyCountryOdour.err
CO FINISHED

** AERMOD Source Pathway
SO STARTING
LOCATION POND1 AREAPOLY 100.000 150.000 0.000
LOCATION SHED VOLUME 0.000 0.000 0.000
BACKGRND HOURLY
SRCPARAM POND1 0.50000 0.000 4 3.000
AREAVERT POND1 100.000 150.000 180.000 150.000
AREAVERT POND1 180.000 270.000 100.000 270.000
SRCPARAM SHED 1000.00000 10.000 8.000 5.000
CONCUNIT 1 OUVperSecond of ourUnits
SRCGROUP GP01 SHED
SRCGROUP GP02 POND1
SRCGROUP ALL
SO FINISHED

** AERMOD Receptor Pathway
RE STARTING
GRIDCART RGCART STA
```

Pond1 translated correctly

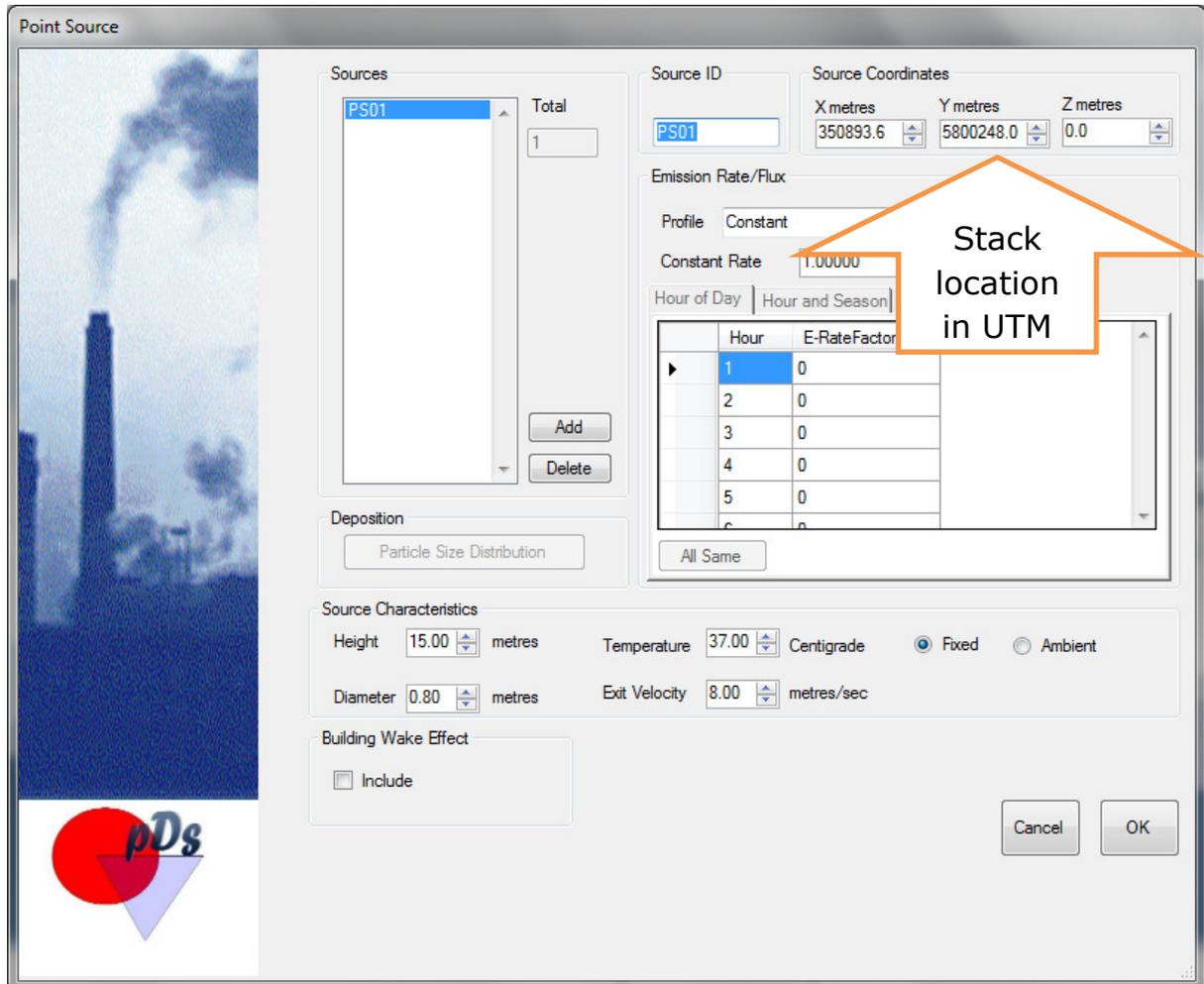
Grouping



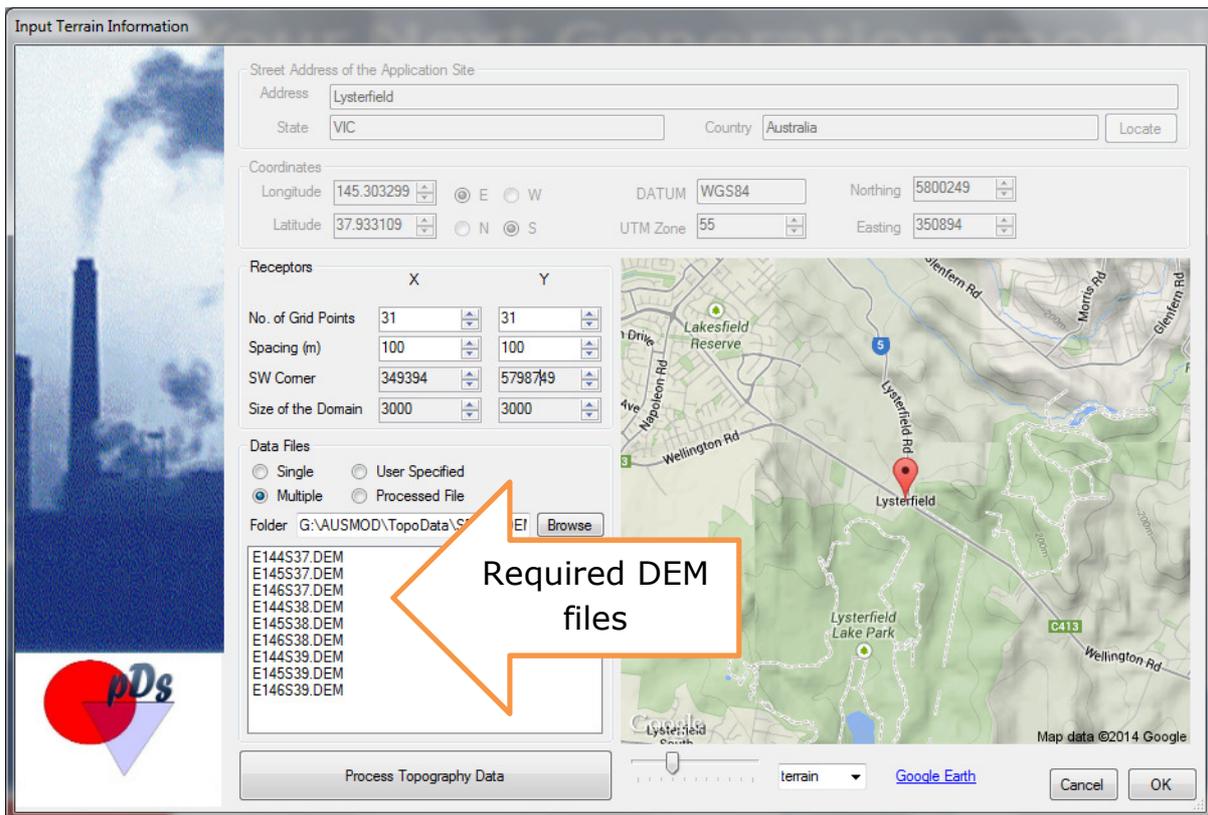
It is verified that the Area Source information as well as source grouping were correctly translated into the AERMOD input file by pDsAUSMOD.

Test Case 5: Incorporation of terrain effect

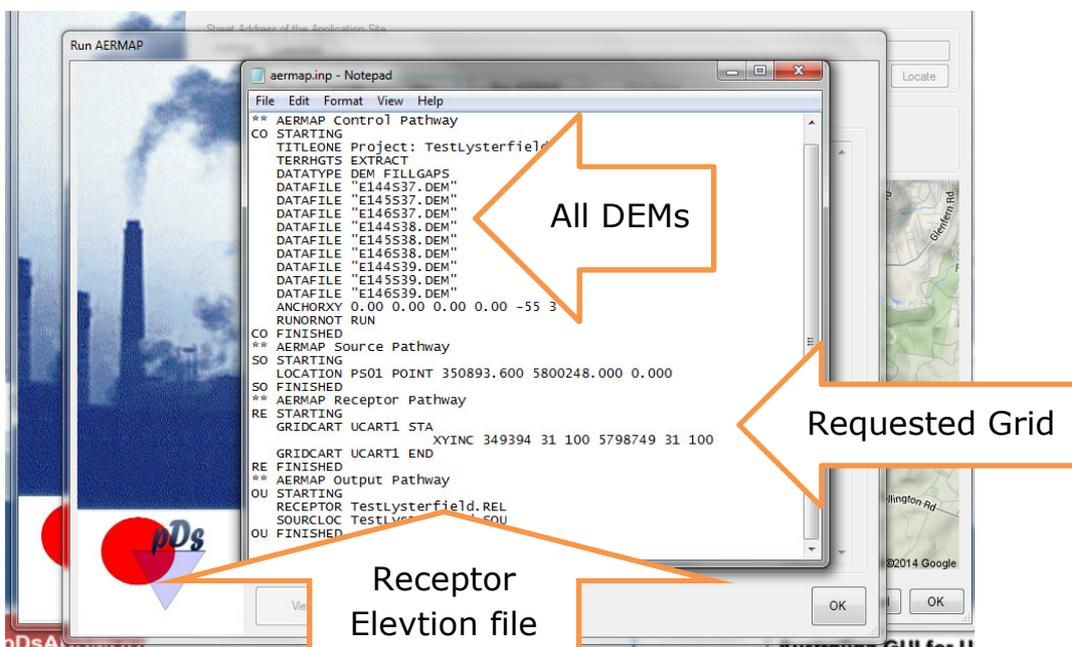
Assumed that there is a stack in Lysterfield Victoria. MyDomain in pDsAUSMOD helps to obtain the UTM coordinates for Lysterfield. These coordinates can be used as location coordinates of a stack there.

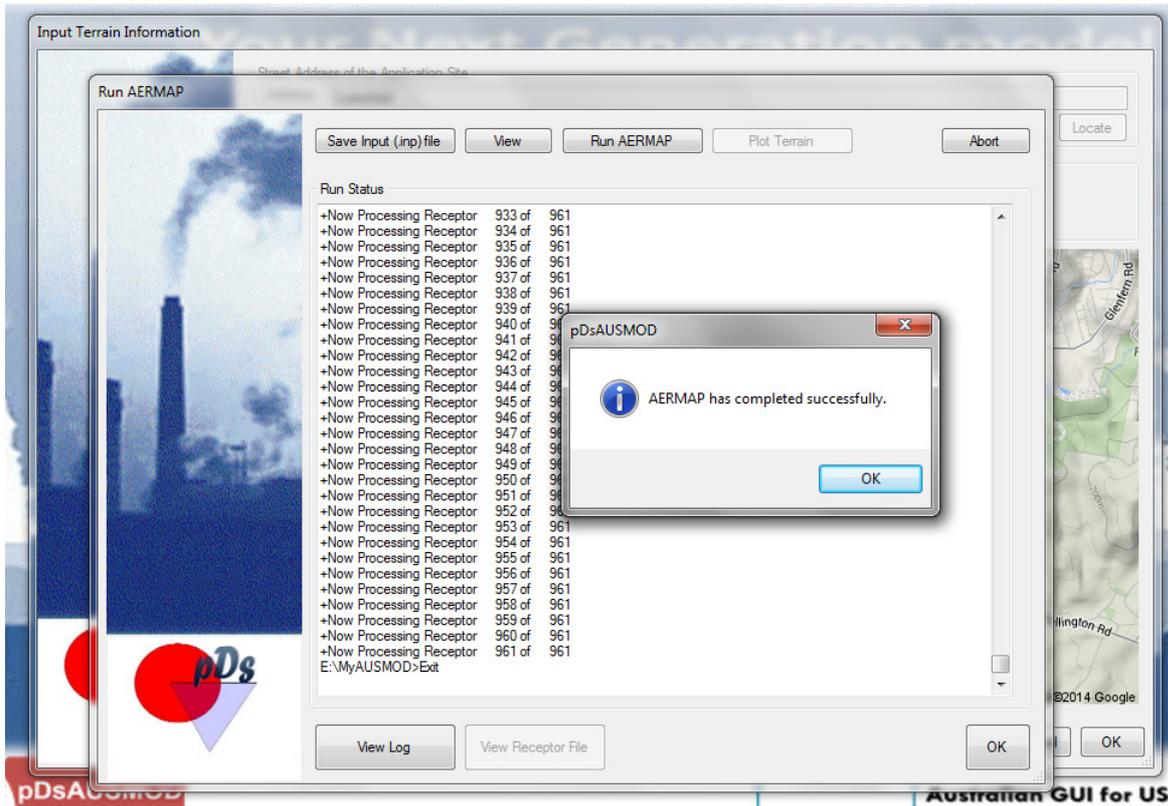


AERMAP interface in pDsAUSMOD



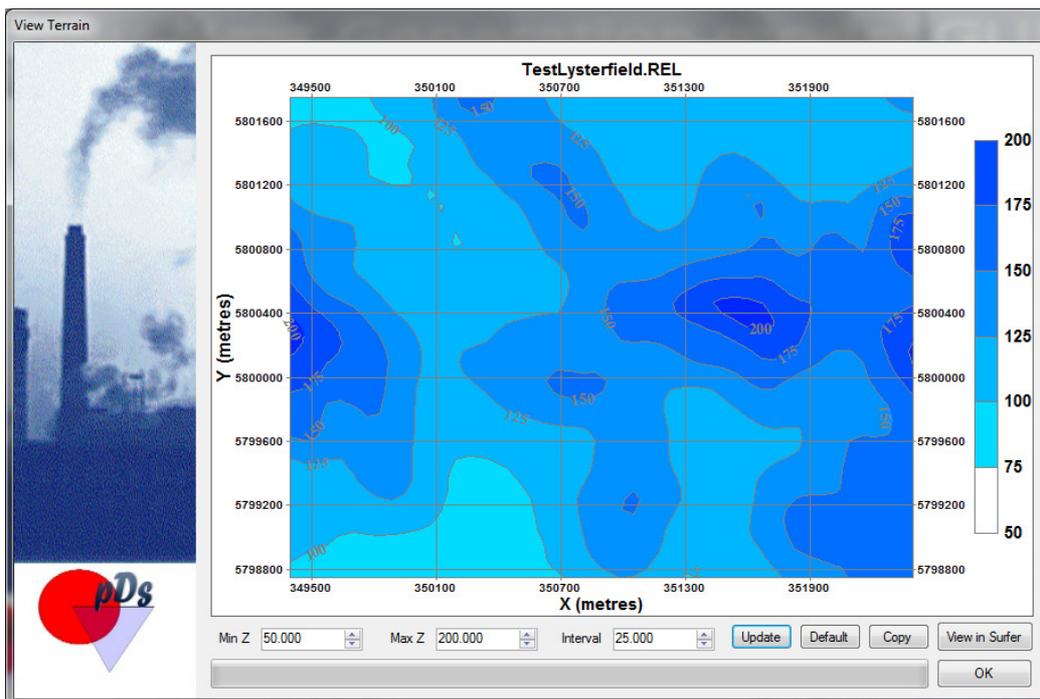
AERMAP Run





This test verifies that the pDsAERMAP interface translates input info. properly and is capable of running generic AERMAP correctly.

Furthermore, this interface helps you to plot the terrain produced for your domain.



Summary of Validation

1. pDsAUSMOD Kernels

Program	Version	Verification	Comments
BPIP	V04274	Available with pDsAUSMOD	Building Profile Input Program for PRIME (BPIP-PRM) is the same as BPIP but includes an algorithm for calculating downwash values for input into the PRIME algorithm which is contained in such models as AERMOD.
AERMAP	V11103	Available with pDsAUSMOD	Recommended latest version
AERMOD	V12345	Available with pDsAUSMOD	AERMOD V13350 is the US EPA's latest. This upgrade do not affect to Victoria and V12345 is appropriate

2. Forms and sub forms for Basic Pathways including all options are available with pDsAUSMOD –Verified.
3. Verified that all required inputs can be entered via the available forms.
4. Verified that the Source Grouping is available.
5. Verified that the Receptor Pathway is complete and working as desired. Supporting graphics and design are satisfactory.
6. The Interface for Building Information is appropriate to input required information for BPIP and the BPIP is running producing desired output to run AERMOD.
7. The Interface for AERMP is meeting local requirements and capable of running AERMAP by producing required receptor elevation and hill height file for AERMOD.
8. Verified that input information and options, input by the user are transferred to AERMOD input file (.inp).
9. Tested and verified that AERMOD is running without any errors.
10. Internal graphics and SURFER automation are satisfactory.

Conclusion

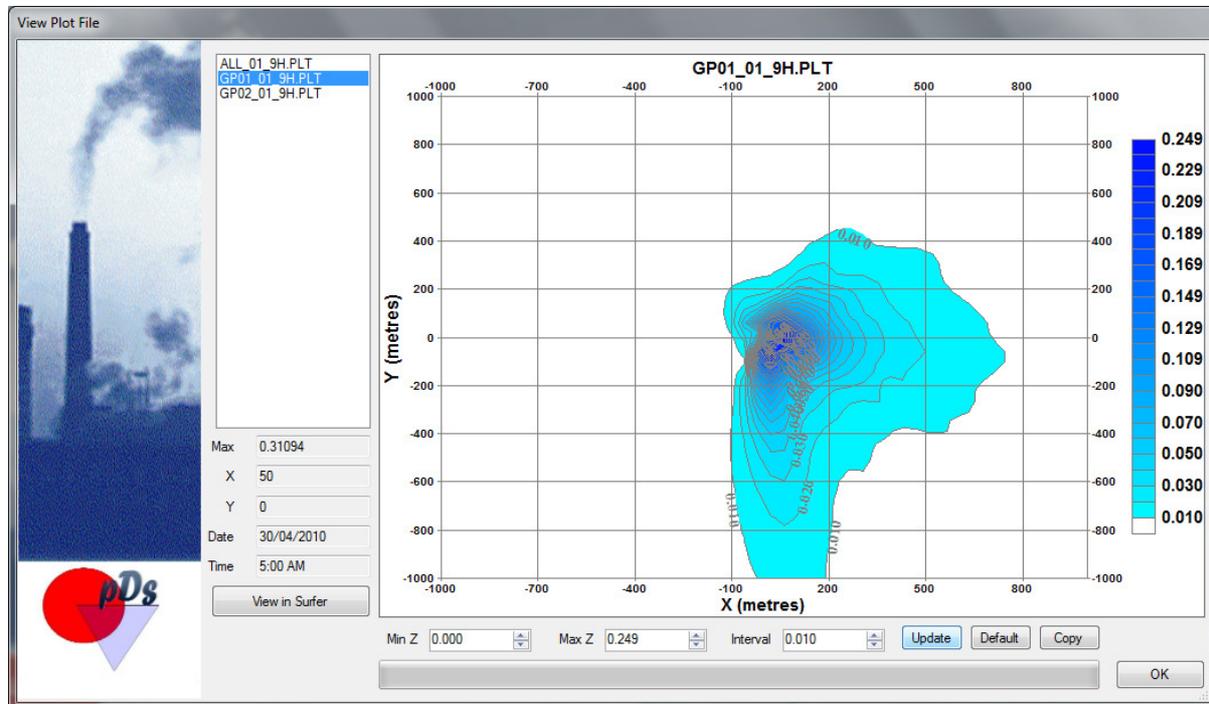
The five test cases comfortably verified that pDsAUSMOD satisfies all 10 criteria in the validation process.

pDsAUSMOD is recommended for use in running AERMOD (currently Version 12345) based on this vigorous validation process. pDs Consultancy, the developer of pDsAUSMOD can assure its currency by upgrading its kernels and will also continually improve and enhance its functionalities.



Appendix A

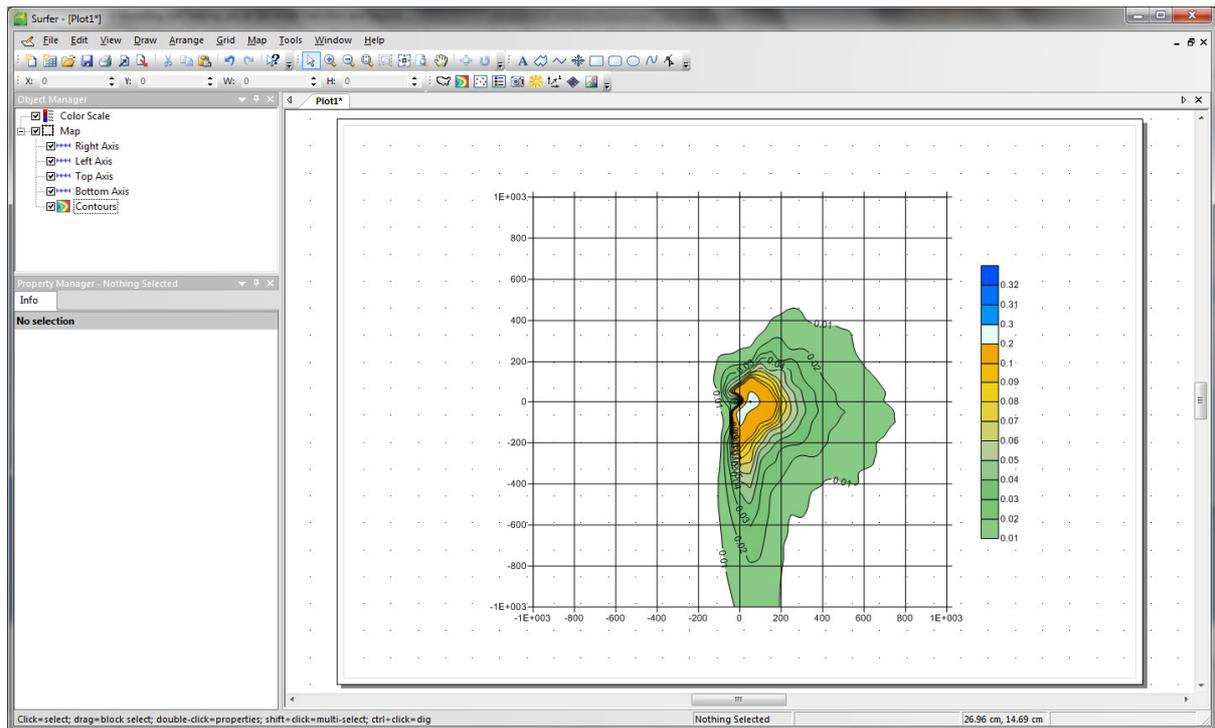
pDsAUSMOD Internal Graphics



Internal graphics help to view the special distribution of predicted concentrations. You can view all output files (.plt) via this graphic package.

Importantly, Maximum predicted value, where it occurred when it occurred is also there.

The view in SURFER button helps you to view the unmodified output on SURFER (If SURFER V10 or above is available on your computer).



SURFER Automation is available in pDsAUSMOD.

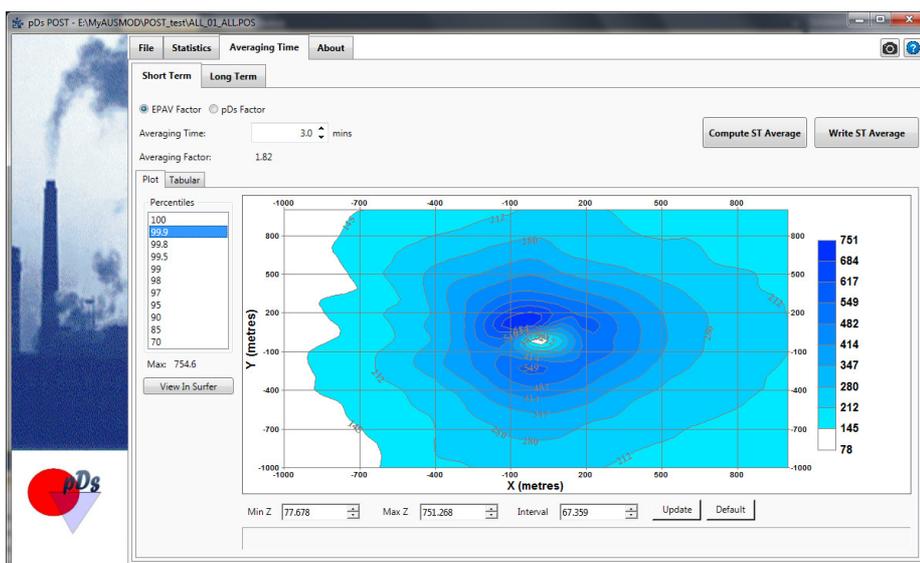
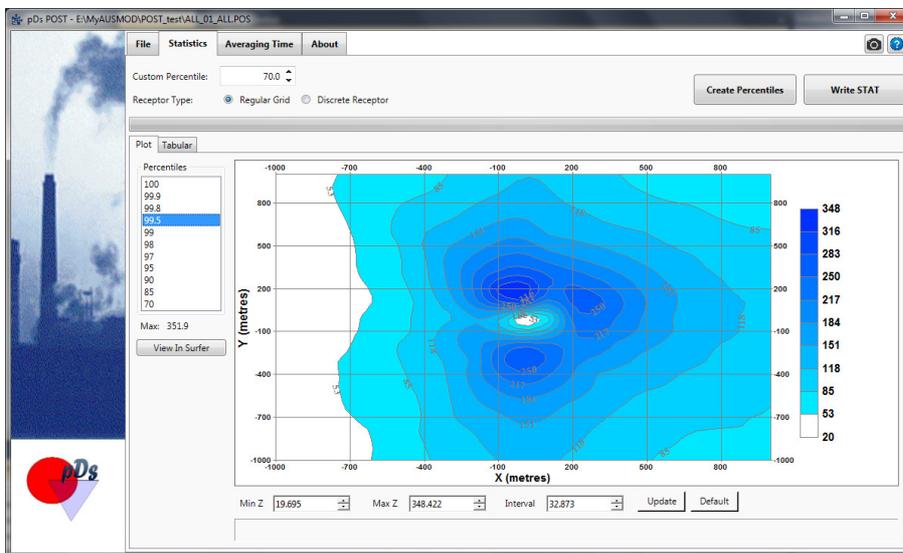


Appendix B

pDsPOST – Post processing AERMOD output

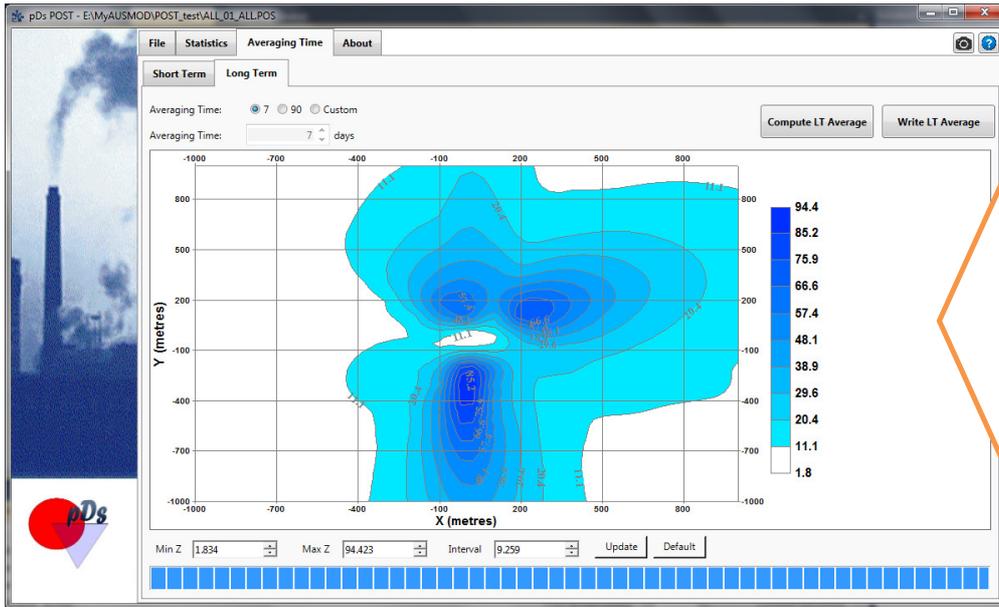
You can run AERMOD with an option to “Write all calculations”. This option will produce a file (.POS) with all calculations. pDs has developed processing software which helps you post-process AERMOD output producing such output as

1. 3 minute/7 day/90 day averages
2. Standard Percentiles as well as user defined percentiles

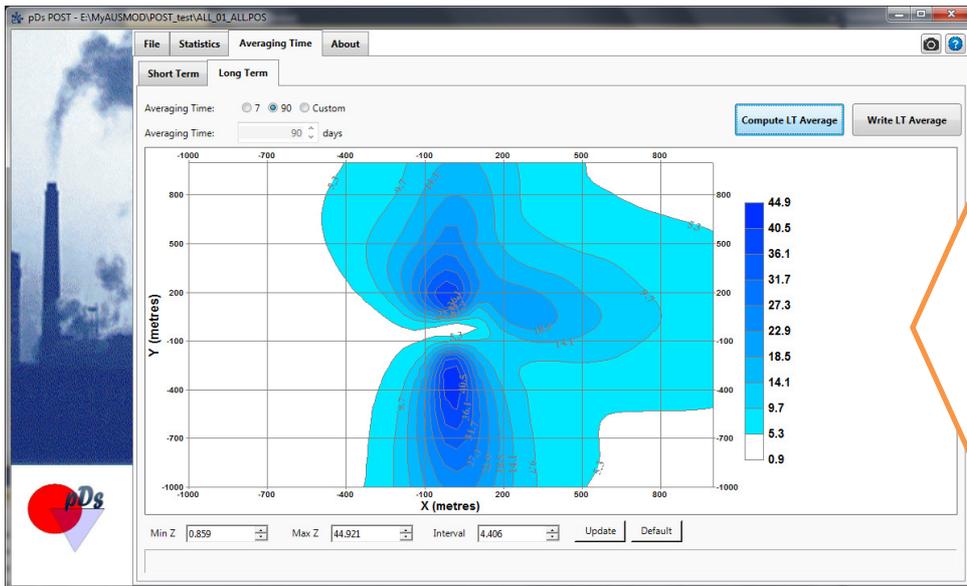


99.9 PC
with
3min Avg





7 Day Average



90 Day Average



Appendix C

pDsWindRoses

The **pDsWindRoses** software basically depicts the frequency of occurrence of winds in each of the 16 direction sectors (every 22.5 degrees) and 6 wind speed classes for a given location and time period specified by the user.

This package accepts all files in specific formats such as

1. AERMOD (.sfc)
2. AUSPLUME (.met)
3. TAPM (.csv)
4. CALMET (.dat)
5. Raw data prepared in .csv format

