On April 11, 2011 the Environmental Protection Agency (EPA) released the final version of AERSCREEN which is the recommended screening model. AERSCREEN was created as a component of the AERMOD modeling system and replaces the previous screening model, SCREEN3. Similar to SCREEN3, AERSCREEN is meant to produce more conservative results than a refined analysis but is more user friendly to applicants.

AERSCREEN will produce a worst case 1-hour concentration at varying distances for a single source. If the applicant has multiple sources, complex terrain or a complex source configuration the facility will need to conduct a refined modeling analysis. Once a max 1-hour concentration is calculated, the model will apply scaling ratios in order to obtain the concentration for the 3-hour, 8-hour, 24-hour and annual averaging times. AERSCREEN also interfaces with the MAKEMET program which generates a meteorological matrix for the model. This enables the applicant to run a conservative version of a model analysis without having to obtain meteorological data as well as site specific data such as building information or terrain data. AERSCREEN will also use more specific data if the project deems necessary.

The State of Missouri’s Air Pollution Control Program (APCP) has developed a list of default values for the questions asked of the applicants from the model to compile an AERSCREEN run. These inputs were chosen to be both conservative in nature less taxing on the applicant. If an applicant would like to use any other values or options in AERSCREEN please contact the APCP before doing so.

Please note, prior to executing the AERSCREEN model, the user will have to download the MAKEMET and AERMOD executables from EPA’s website. Without them the AERSCREEN will not run.

The AERSCREEN executable is user friendly in the DOS prompt mode where it will simply ask the user a series of questions that it uses to compile the inputs it needs to successfully run the model. The following paragraphs summarize the default parameters that should be input into the initial screening analysis.

**Question 1:** The model request the applicant title the AERSCREEN run.

**Question 2:** The model will then ask if the user would like to input data in either English or Metric units.

*This would be the applicant’s choice; the model will perform any conversion it needs.*

**Question 3:** The model will then ask which type of source you would like to run. Point (P), Volume (V), Area (A), AreaCirc (C), Flare (F), Pointcap (S), or PointHor (H).

*Please note that if your stack has a rain cap or vents horizontally please choose either the Pointcap for a rain cap or Pointhor for a horizontal stack option.*
Source Information (questions may vary depending on type of emission point chosen above)

**Point Source**

**Question 4:** Enter Emission Rate

**Question 5:** Enter Stack Height

**Question 6:** Enter Stack Diameter  *(make sure to read units carefully)*

**Question 7:** Enter Stack Temperature

**Question 8:** Enter Option for Flow Rate or Exit Velocity

1.) Exit Velocity (m/s)
2.) Exit Velocity (ft/s)
3.) Flow Rate (ACFM)

*Choose the number for the units for which the user would like to input your flow rate or velocity.*

**Question 9:** Rural or Urban (R or U)

*If the user chooses urban it will ask for the population of the urban area. This is only an issue when dealing with SO2 and in extremely large urban areas such as St. Louis or Kansas City, otherwise choose rural.*

**Question 10:** Enter minimum Distance to Ambient Air or default (3.3ft)

*The User may choose a minimum distance or use the default value.*

**Question 11:** Enter an Option for Modeling NO2 Chemistry:

1.) No Chemistry or Pollutant is not NO2
2.) Use Ozone Limiting Method (OLM)
3.) Use Plume Volume Molar Ratio Method (PVMRM)

*The APCP would request that the user chooses option 1, No Chemistry or Pollutant is not NO2*

**Volume Source**

**Question 4:** Enter Emission Rate
**Screen Model Analysis**

**Question 5:** Enter Center of Volume Height

*For example, if you are modeling a conveyor, the center of the volume would be half the drop distance between the conveyor and the top of the storage pile plus the height of the storage pile. If you are modeling a silo vent, the center of volume would be half the distance of the vent plus the distance to the ground from the bottom of the vent.*

**Question 6:** Enter Initial Lateral Dimension

To calculate the initial lateral dimension use the width of the opening divided by the constant 4.3. For example the width of the conveyor divided by 4.3.

**Question 7:** Enter Initial Vertical Dimension

1.) Surface-Based Source - use the height of the opening divided by 2.15
2.) Elevated Source on or Adjacent to a Building – height of the opening divided by 2.15
3.) Elevated Source not on or Adjacent to a Building – height of the opening divided by 4.3

**Question 8:** Rural or Urban (R or U)

*If the user chooses urban it will ask for the population of the urban area. This is only an issue when dealing with SO₂ and in extremely large urban areas such as St. Louis or Kansas City, otherwise choose rural.*

**Question 9:** Enter Minimum Distance to Ambient Air or default (3.3ft)

*The user may choose a minimum distance or use the default value.*

**Question 10:** Enter an Option for Modeling NO₂ Chemistry:

1.) No Chemistry or Pollutant is not NO₂
2.) Use Ozone Limiting Method (OLM)
3.) Use Plume Volume Molar Ratio Method (PVMRM)

*The APCP would request that the user choose option 1, No Chemistry or Pollutant is not NO₂*

**Area Source (Haul Roads or Storage Piles)**

**Question 4:** Enter Emission Rate

**Question 5:** Release Height above ground

*Release Height = 0.5 x Top of Plume*
Screen Model Analysis

Top of Plume = 1.7 x Height of Vehicle  (if vehicle height is not known a value of 3 meters may be used as a default value)

Question 6: Max Horizontal Dimension

Enter in the max horizontal dimension of your road. The APCP recommends that this distance not be great than 100 meters. The user may need to run multiple segments and add the results together.

Question 7: Minimum Horizontal Dimension

Enter in the minimum horizontal dimension or your road.

Question 8: Initial Vertical Dimension

Initial Vertical Dimension = Top of Plume /2.15

Top of Plume = 1.7 x Height of Vehicle  (if vehicle height is not known a value of 3 meters may be used as a default value)

Question 9: Rural or Urban (R or U)

If the user chooses urban it will ask for the population of the urban area. This is only an issue when dealing with SO₂ and in extremely large urban areas such as St. Louis or Kansas City, otherwise choose rural.

Question 10: Enter Minimum Distance to Ambient Air or default (3.3ft)

The user may choose a minimum distance or use the default value.

Question 11: Enter an Option for Modeling NO₂ Chemistry:

1.) No Chemistry or Pollutant is not NO₂
2.) Use Ozone Limiting Method (OLM)
3.) Use Plume Volume Molar Ratio Method (PVMRM)

The APCP would request that the user choose option 1, No Chemistry or Pollutant is not NO₂

Flare

Question 4: Enter Emission Rate

Question 5: Enter Stack Height

Question 6: Enter Total Heat Release Rate (cal/sec)
Screen Model Analysis

Question 7: Enter Radiative Heat Loss Fraction or default (0.55)

The user may use the default value of 0.55.

Question 8: Rural or Urban (R or U)

If the user chooses urban it will ask for the population of the urban area. This is only an issue when dealing with SO₂ and in extremely large urban areas such as St. Louis or Kansas City, otherwise choose rural.

Question 9: Enter Minimum Distance to Ambient Air or default (3.3ft)

The user may choose a minimum distance or use the default value.

Question 10: Enter an Option for Modeling NO₂ Chemistry:

1.) No Chemistry or pollutant is not NO₂
2.) Use Ozone Limiting Method (OLM)
3.) Use Plume Volume Molar Ratio Method (PVMRM)

The APCP would request that the users choose option 1, No Chemistry or Pollutant is not NO₂

Building Downwash Information

Question 12: Include Building Downwash? (y/n)

The APCP does not recommend including building downwash for a screening analysis.

Terrain Height Information

Question 13: Include Terrain Height? (y/n)

The APCP does not recommend including terrain data for a screening analysis. This will allow the model to assume the terrain is flat.

Question 14: Enter Maximum Distance to probe or default (5000m)

The users may choose a maximum distance at which the model will report a concentration or use the default value of 5000 meters.

Question 15: Include up to 10 discrete receptors? (y/n)

Discrete receptors are not required unless the applicant has a specific point at which they would like a concentration.
Screen Model Analysis

Question 16: Use Flagpole receptors? (y/n)

*The APCP does not recommend the use of Flagpole receptors for a screening analysis.*

Question 17: Enter Source Elevation or default (0m)

*If the user has an elevation for the applicant's site the APCP would recommend the users use it, if not use the default value of 0 meters.*

Makemet Meteorology

Question 18: Enter Minimum and Max Ambient Temperatures (K) or default (-10 & 100)

*The APCP recommends the use of the default values.*

Question 19: Enter Minimum Wind Speed or default (0.5 m/s)

*The APCP recommends the use of the default value.*

Question 20: Enter Anemometer Heights or default (10m)

*The APCP recommends the use of the default value.*

Question 21: Enter Surface Characteristics Option:

1.) Single use specified values
2.) AERMET seasonal tables
3.) External file

*The APCP recommend that the users choose option No. 2 AERMET season tables.*

Question 22: Enter Dominant Surface Profile:

1.) Water
2.) Deciduous forest
3.) Coniferous forest
4.) Swamp
5.) Cultivated land
6.) Grassland
7.) Urban
8.) Desert Shrubland

*The APCP suggest that you choose a dominant surface profile by looking at an aerial photo of the facility site to determine which of the above surface characteristics is most prevalent.*
**Screen Model Analysis**

**Question 23:** Enter Dominant Climate Profile:

1.) Average Moisture  
2.) Wet Conditions  
3.) Dry Conditions

*The APCP would recommend that the users choose No. 1 Average Moisture for the State of Missouri.*

After the list of questions AERSCREEN will prompt the user to enter an output file name. The user will need to include the extension “.out” to the end of the filename or AERSCREEN will prompt the user to include it.