Module 5: Basic DAT File Construction in WinSLAMM

<u>Problem Description</u>

You are the stormwater engineer for a commercial site that must reduce its pollution load by 40 percent. The site is fully developed with silty soils. Your first task is to determine the site's pollution load using WinSLAMM. Instructions for inputting data into WinSLAMM begin on page 3.

How much runoff and pollution does the site generate (Answers to be filled in during the example)?

    i.   Runoff (cu ft): _____
    ii.   TSS (mg/L): _____
    iii.   TSS (lbs): _____
    iv.   Total Copper (lbs): _____
    v.   Particulate Lead (lbs): _____

An overview of the site is shown in Figure 1.

Steps:
1) Fill in the data regarding the site's source areas
2) Enter the site description and supporting parameter files
3) Enter the source area data
4) Enter the pollutants to be analyzed
5) Run the model
6) View the output
7) Save the output

<u>Problem</u>

<u>1) Fill in the data regarding the site's source areas (Answers can be found on page 2)</u>

Fill out the following information regarding the site's source areas. Source areas and acres are found on Figure 1. Assume all source areas are directly connected and streets have intermediate texture.

Roof:
    Area: _____
    Flat or Pitched Roof (circle one)
    Directly Connected or Drainage to Pervious Area (circle one)
Parking Lot:
    Area: _____
    Directly Connected or Draining to Pervious Area (circle one)
Driveway:
    Area: _____
    Directly Connected or Draining to Pervious Area (circle one)

Sidewalks:
    Area: _____
    Directly Connected or Draining to Pervious Area (circle one)
Streets:
    Area: _____

Total Street Length: _____
Texture: Smooth, Intermediate, Rough, or Very Rough (circle one)
Small Landscaped Areas:
    Area: _____
    Soil Type: Sandy or Silty or Clayey (circle one)
    Building Density: Low or Medium or High (circle one if applicable)
    Alleys Present: Yes or No (circle one if applicable)

Answers

a.   Source Areas.

Roof:
    Area: **1.48 acres**
    Flat or Pitched Roof
    Directly Connected or Drainage to Pervious Area
Parking Lot:
    Area: **2.56 acres**
    Directly Connected or Draining to Pervious Area
Driveway:
    Area: **2.35 acres**
    Directly Connected or Draining to Pervious Area
Sidewalks:
    Area: **0.06 acres**
    Directly Connected or Draining to Pervious Area (circle one)
Streets:
    Area: **0.31 acres**
    Total Street Length: **0.11 curb-miles**
    Texture: Smooth, **Intermediate**, Rough, or Very Rough (circle one)
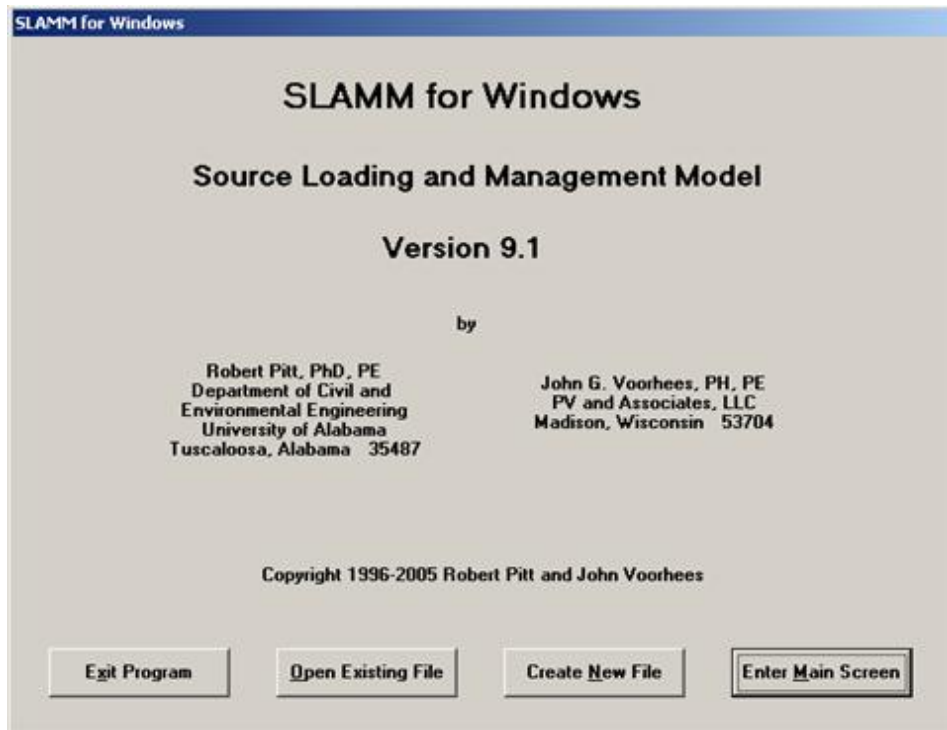Small Landscaped Areas:
    Area: **0.63 acres**
    Soil Type: Sandy or **Silty** or Clayey
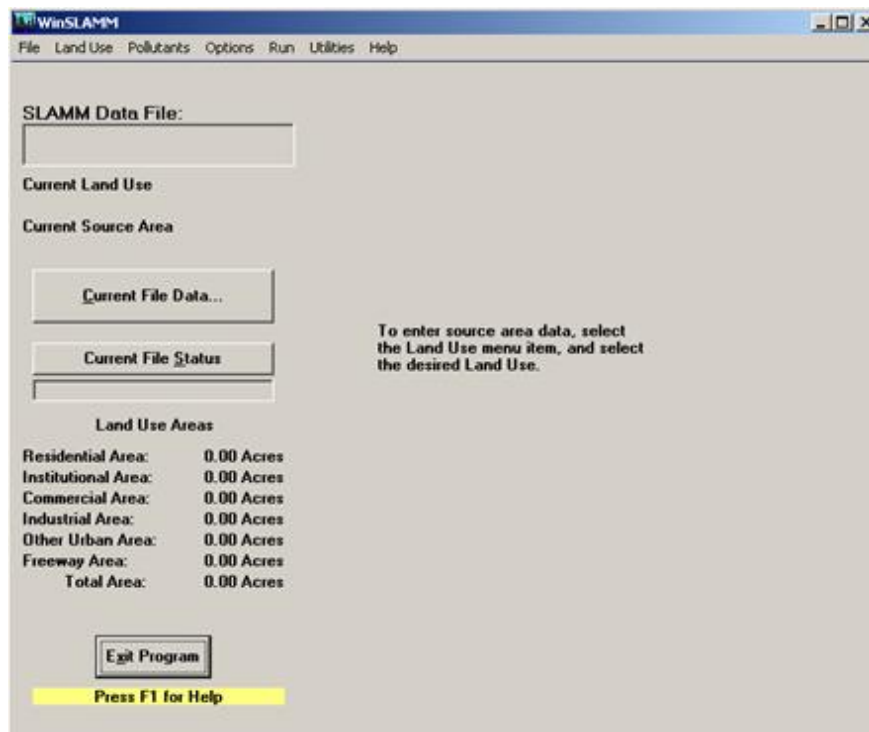   Building Density: Low or Medium or High
    Alleys Present: Yes or No

2) Fill in the data regarding the site's source areas

Open the program
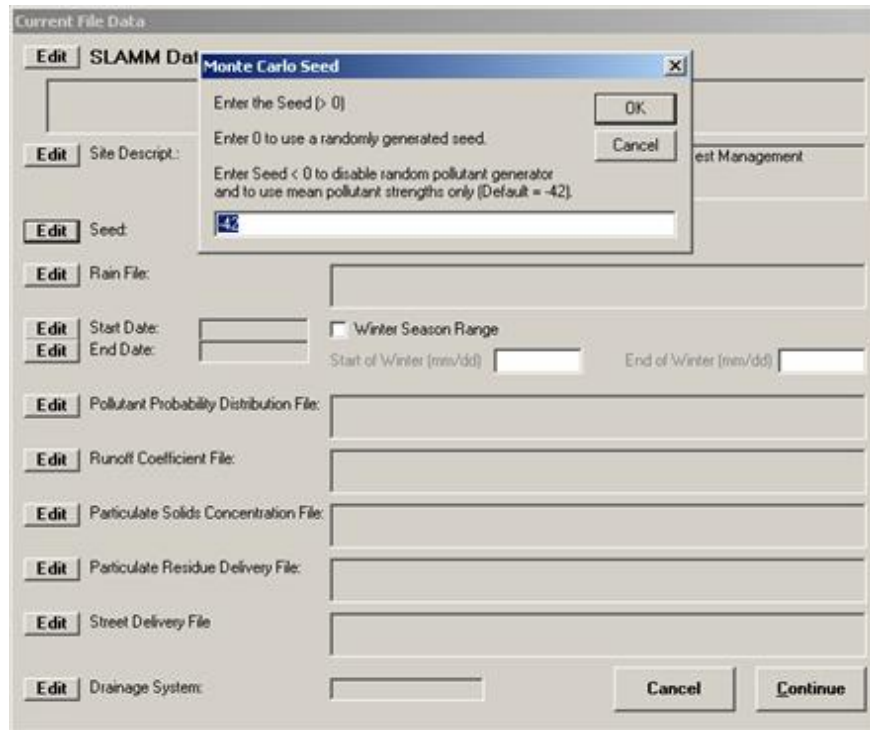
Click **Enter Main Screen**

First, enter all the parameter files in the "Current File Data" Screen
Click **Current File Data**

Enter Site Description – Click **Edit** *next to "Site Descript:" – Enter the site description then Click* **OK**

Enter Seed – Click **Edit** *next to "Seed" - Should be a negative number for reproducible results – Click* **OK**
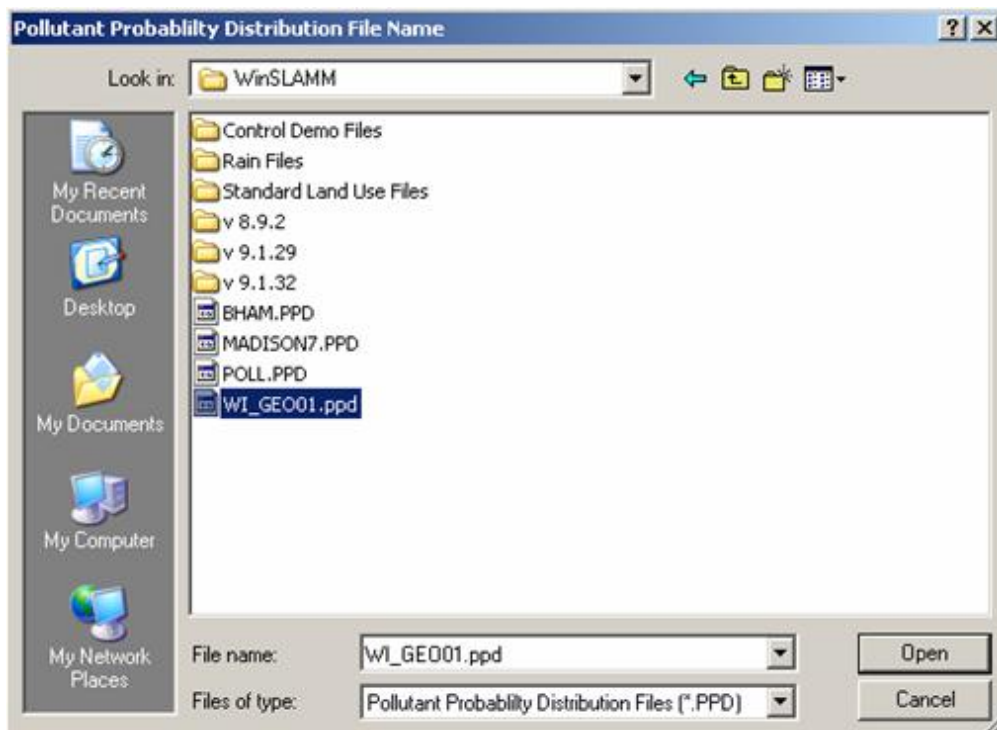
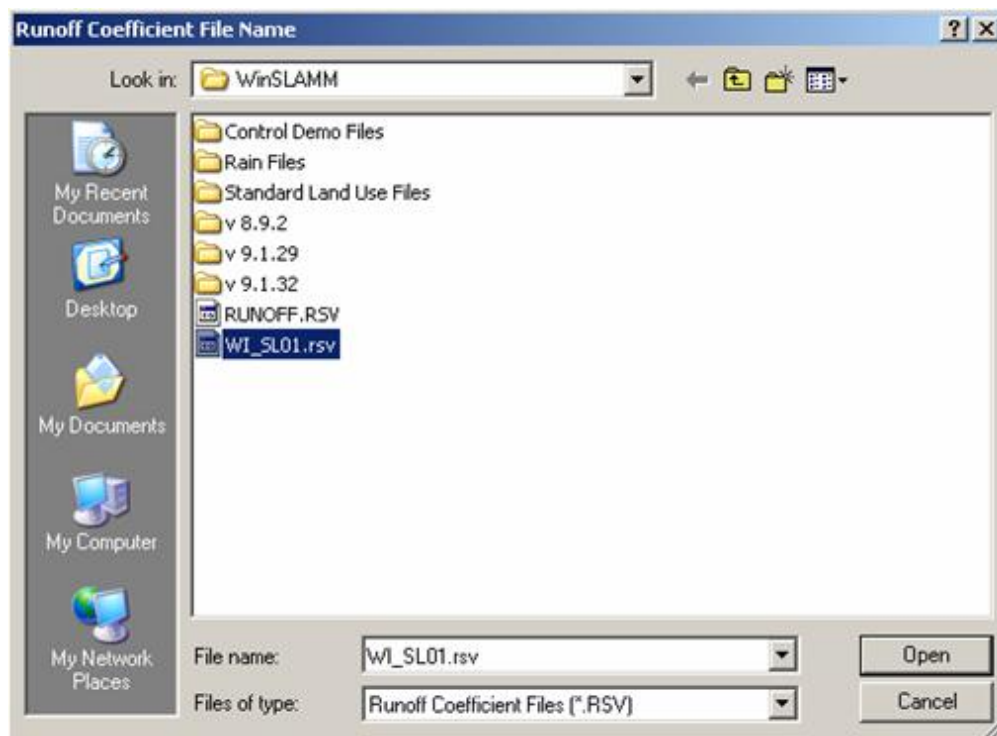*Enter Rain File – Click* **Edit** *next to "Rain File" - Select MSN1981.ran – Click* **OK**
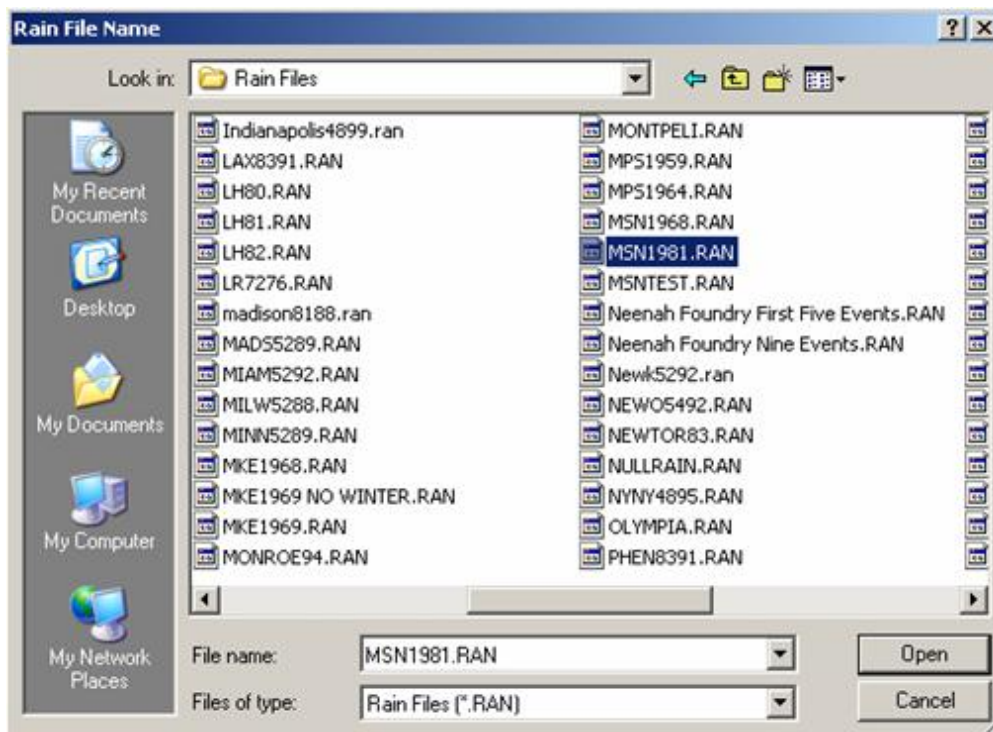
Start and End Date for Rain File will fill in automatically

Enter Pollutant Probability Distribution File – Click **Edit** *next to "Pollutant Probability Distribution File" - Select WI_GEO01.ppd – Click* **OK**

Enter the Runoff Coefficient File – Click **Edit** *next to "Runoff Coefficient File" - Select WI-SL01.rsv – Click* **OK**

Enter the Particulate Solids Concentration File – Click **Edit** *next to "Particulate Solids Concentration File - Select WI_AVG01.psc – Click* **OK**

Enter the Particulate Residue Delivery File – Click **Edit** *next to "Particulate Residue Delivery File" – Select WI_DLV01.prr – Click* **OK**

Enter the Street Delivery File – Select the **Commercial LU** *circle beneath "Edit" – Click* **Edit**

Select WI_Com Inst Indust May05.std – Click **Open**

Click **Change all Street Delivery Files to Match the Current File**

Enter the Drainage System – Click **Edit** *next to "Drainage System" – Enter a "1" next to "Curb and Gutters, Valleys, or Sealed Swales in fair condition" – Click* **Continue**

Click **Continue** *again - All Parameter File Data is now entered*

3) Enter the source area data

Now, enter Source Area Data describing your site – Select **Land Use** *– then*
Commercial

The Commercial Source Area screen will appear.

Enter the Roof data – Double click on **Roofs 1** *– Enter the Roof area and click* **OK**

Enter remaining data regarding the Roofs and click **Continue**

Enter the Parking Lot data – Double click on **Paved Parking/Storage 1** *– Enter the Parking Lot area and click* **OK**

Enter remaining data regarding the Parking Lots and click **Continue**

Enter the Driveway data – Double click on **Driveways 1** *– Enter the Driveway area and click* **OK**

Enter remaining data regarding the Driveways and click **Continue**

Enter the Sidewalk data – Double click on **Sidewalks/Walks 1** *– Enter the Sidewalk area and click* **OK**

Enter remaining data regarding the Sidewalks and click **Continue**

Enter the Street data – Double click on **Street Area 1** *– Enter the Street area and click*
OK

Enter remaining data regarding the Streets and click **Continue** *– Let the program calculate the Street Dirt Accumulation and Initial Street Dirt Loading for you.*

Enter the Landscaped Area data – Double click on **Small Landscaped Area 1** *– Enter the Landscaped Area and click* **OK**

Enter remaining data regarding the Landscaped Areas and click **Continue**

All Source Area data is now entered.

Select Pollutants to analyze – Click **Pollutants**

4) Enter the pollutants to be analyzed

Check the boxes of the pollutants you want to analyze and Click **Continue**

Save your file – Click **File** *- Click* **Save As** *– Find the location to save the file in – Name file "Example 1a"*

The Dat file is complete, you are now ready to run the model

5) Run the model

To run your single Dat file, Click **Run***, then* **Calculation Module**

Click **Save File and Execute**

The program will run and the 1ˢᵗ screen showing output will appear.

6) View the output

How much runoff and pollution does the site generate (Fill in the table on page 1)?

     i.   Runoff (cu ft):   ***561,484 cu. ft.***
    ii.   TSS (mg/L): ***125.3 mg/L***
   iii.   TSS (lbs): ***4,390 lbs***

To get to the other Pollutants in units of pounds, click on the **Pollutants** tab, then the **Yield** tab. Scroll down to find the requested Pollutant.

   iv.   Total Copper (lbs): ***0.6765 lbs***

      v.   Particulate Lead (lbs): **_1.128 lbs_**

7) Save the output

To save the output file Click **File** *then* **Print**

Select Send to **File** *and Select the Items to Print to the File, Click* **OK**

A message will appear telling you the file has been saved and the location it has been saved to. The file output is saved as a comma separated file type.

*Select OK and then close out the output window (Click the **X** in the upper right hand corner) to get back to the main screen.*

Alternative Scenarios (if available time)

a.   Question - Change soil type from silty to clayey for all source areas. What
      happens to the runoff and pollution results? Why?

      *Answer - The runoff and pollution increase because clayey soils have less
      infiltration capacity than silty soils. More runoff equals more pollution.*

b.   Question - Change roofs and parking lots to Draining to Pervious Area and select
      silty soil for all source areas (including Small Landscaped). What happens to the
      runoff and pollution results? Why?

      *Answer - The runoff and pollution decrease because impervious areas are now
      routed to pervious areas where they can infiltrate instead of being routed directly to
      the storm sewer system.*