Module 5: Basic DAT File Construction in WinSLAMM

Problem Description

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):
- TSS (mg/L): _____ ii.
- TSS (lbš): iii.
- iv.
- Total Copper (lbs): _____ Particulate Lead (lbs): _____ V.

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

Problem

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

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

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Current Sour	ce Area					
Curre	ent File Da	ła				
Curre	ent File <u>S</u> ta	atus	1		To enter source area data, select the Land Use menu item, and select the desired Land Use.	
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Lar	nd Use Are	as				
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Institutional A	Area:	0.00 Ac	res			
Commercial A	luea:	0.00 Ac	res			
	NAC CAR	0.00 Ac	res			
Industrial Are		0.00 4-	res			
Industrial Are Other Urban	Area:	0.00 AC				
Industrial Are Other Urban Freeway Are	Area: a:	0.00 Ac	res			

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

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Lait SLAMM Data File Name:			
Edit Site Descript:			
Edit Seed 42			
Edit Rain File:			
Edit Start Date: Edit End Date:	Start of Winter (mm/dd)	End of Winter (mi	v/dd)
Edit Pollutant Probability Distribution File			
Edit Runoff Coefficient File:			
Edit Particulate Solids Concentration File			
Edit Particulate Residue Delivery File.			
Edit Street Delivery File			
	·		1.200

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

	Site Description	×
Edit Site Descript.:	Enter the Site Description (230 characters maximum): OK Cance	
Edit Seed	ectly Connected Drainage, Silly Soils, No Best Management Practic	es l
Edit Rain File:		
Edit Start Date: Edit End Date:	Start of Winter (mix/dd)	of Winter (mm/dd)
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Enter Seed – Click Edit next to "Seed" - Should be a negative number for reproducible results – Click OK

	Monte Carlo Seed	<u>×</u>
dit Site Descript.:	Enter the Seed (> 0) Enter 0 to use a randomly generated seed. Enter Seed < 0 to disable random pollutant generator and to use mean pollutant strengths only (Default = -42)	OK. est Management
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dit Rain File:		
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Enter Rain File – Click Edit next to "Rain File" - Select MSN1981.ran – Click OK

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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

Pollutant Probab	lilty Distributio	n File Name			<u>? ×</u>
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Enter the Runoff Coefficient File – Click **Edit** next to "Runoff Coefficient File" - Select WI-SL01.rsv – Click **OK**

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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 \mathbf{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.