

Modeling a No Management Condition

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The model file represents the project area without stormwater control measures applied. This file can be compared to the files with stormwater control measures to evaluate the runoff and pollution reduction from the measures.

This example will set up the "No Management Condition" WinSLAMM Model File. The project area is a 7.29 acre commercial development. The data on the following pages is the data needed to describe the land use and source areas for the project area in the WinSLAMM model. Figures of the project area and source areas are found at the end of the example text.

Enter the following data into a new WinSLAMM model file.

Note: You cannot save a file until at least one source area is entered.

Parameter Files:

Select "Current File Data"

Site Description: "No Controls, Commercial Development" (anything descriptive can be used)

Seed: -42 (a negative seed value disables the random pollutant generator and uses mean pollutant concentrations only)

Rain File: CA San Francisco WSO AP 4899.RAN (an Oakland rain file is not currently available, so this will do for these demonstrations)

Rain Start Date: 01/01/99

Rain End Date: 12/31/99

Winter Season Date Range: none, leave blank

The following parameter files are the most recently calibrated files available for the area:

Pollutant Probability Distribution File: Oakland Nov 9 2013.ppdx

Runoff Coefficient File: v10 Oakland Sept 12 2013.rsvx

Particulate Solids Concentration File: Oakland Nov 12 2013.pscx

Street Delivery File:

Residential LU: Oakland streets Nov 12 2013.std

Industrial LU: Oakland streets Nov 12 2013.std

Institutional LU: Oakland streets Nov 12 2013.std

Other Urban LU: Oakland streets Nov 12 2013.std

Commercial LU: Oakland streets Nov 12 2013.std

Freeways: Oakland streets Nov 12 2013.std

(you can select "Change all Street Delivery Files to Match the Current File" after the first one is selected as these are all the same)

Source Area PSD and Peak to Average Flow Ratio File: PSD source area TSS.csv (the flow data is not entered in this file as the model currently has not been modified completely to use this information)

Use cost estimation option Cost Data Bay Area.csv

Select "Continue" when finished to save your edits and leave the form.

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Note: Screen Captures of the entered data are found on the subsequent pages.

Current File Data

SLAMM Data File Name:
C:\WinSLAMM Files\Example Files\Oakland\commercial no controls.mdb

Site Descript.: Commercial area, no controls

Edit Seed: -42

Edit Rain File: C:\WinSLAMM Files\Rain Files\CA San Francisco\WSO AP 4899.RAN

Edit Start Date: 01/01/99 ☐ Winter Season Range
Edit End Date: 12/13/99 Start of Winter (mm/dd) End of Winter (mm/dd)

Edit Pollutant Probability Distribution File: C:\WinSLAMM Files\Example Files\Oakland\Oakland Nov 9 2013.ppd

Edit Runoff Coefficient File: C:\WinSLAMM Files\Example Files\Oakland\w10 Oakland Sept 12 2013.rsv

Edit Particulate Solids Concentration File: C:\WinSLAMM Files\Example Files\Oakland\Oakland Nov 12 2013.psc

Edit Street Delivery File (Select LU)
☒ Residential LU ☐ Other Urban LU
☐ Institutional LU ☐ Freeways
☐ Commercial LU
☐ Industrial LU
Change all Street Delivery Files to Match the Current File

Edit Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\PSD source area TSS.csv

☒ Use Cost Estimation Option **Select Cost Data File** C:\WinSLAMM Files\Example Files\Oakland\Cost Data Bay Area.csv

Replace Default Values with these Current File Data Values Use Default Values Replace all Particle Size Distribution Files with the Program Default file Cancel Continue

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Pollutants:

Select "Pollutants".

Check the box next to Total Phosphorus (Particulate Solids (or TSS) will always be checked).

Select "Continue" to exit the form.

Pollutant Selection

	Particulate	Dissolved	Total
Solids	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phosphorus	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Nitrates		<input type="checkbox"/>	
TKN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fecal Coliform Bacteria		<input type="checkbox"/>	
Chromium			
Copper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lead	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Zinc	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other 1 (#/100 ml)		<input type="checkbox"/>	
Other 2			
Other 3			
Other 4			
Other 5			
Other 6			

The pollutants listed above are in the file
C:\WINSLAMM FILES\CENTRAL.PPDx

Select a pollutant to evaluate it.

Select All ☐
Clear All ☐

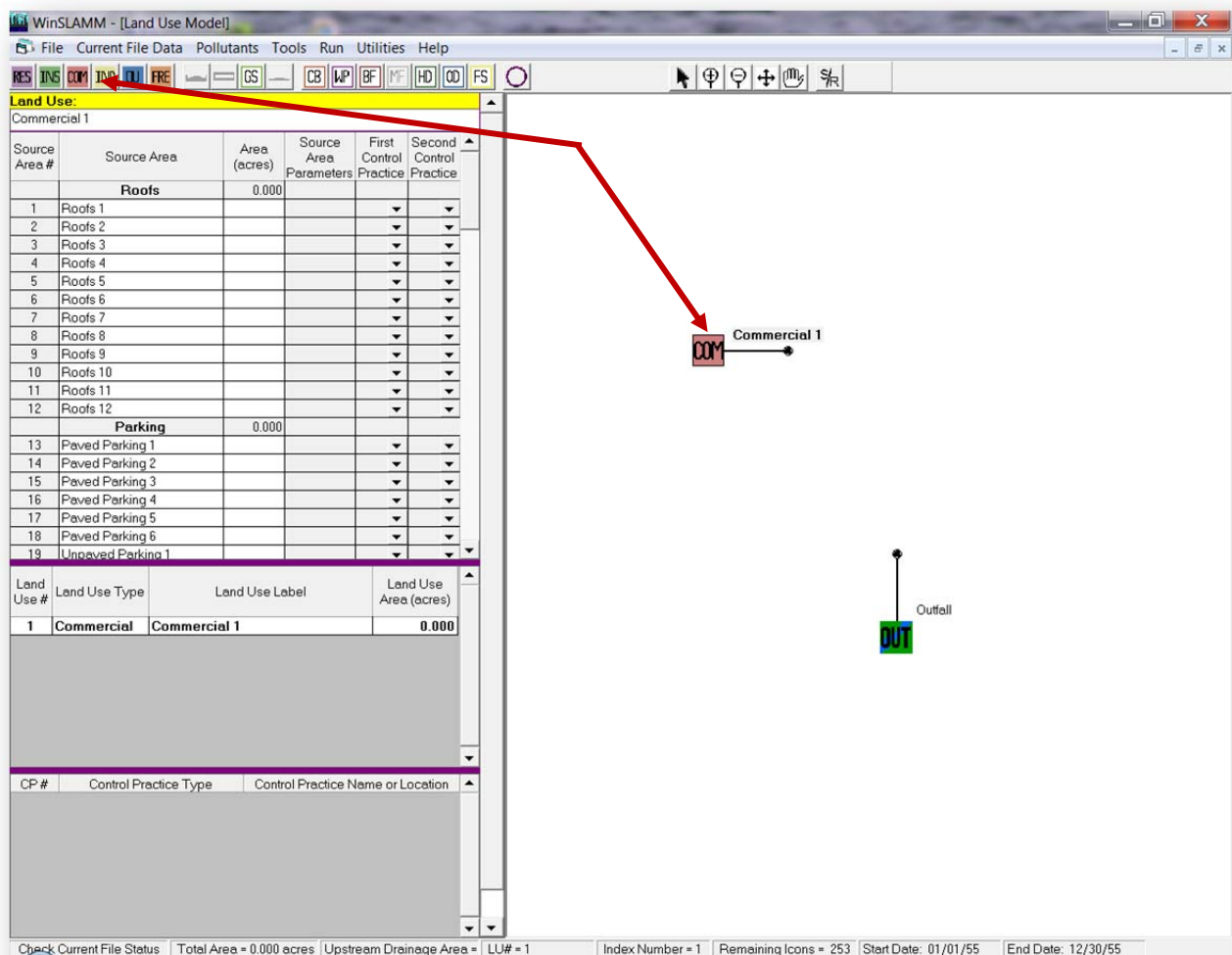
Continue

Modeling a No Management Condition

Next, set up the model network. Our project area has one land use and one drainage basin. Therefore, we will be setting up one modeled land use.

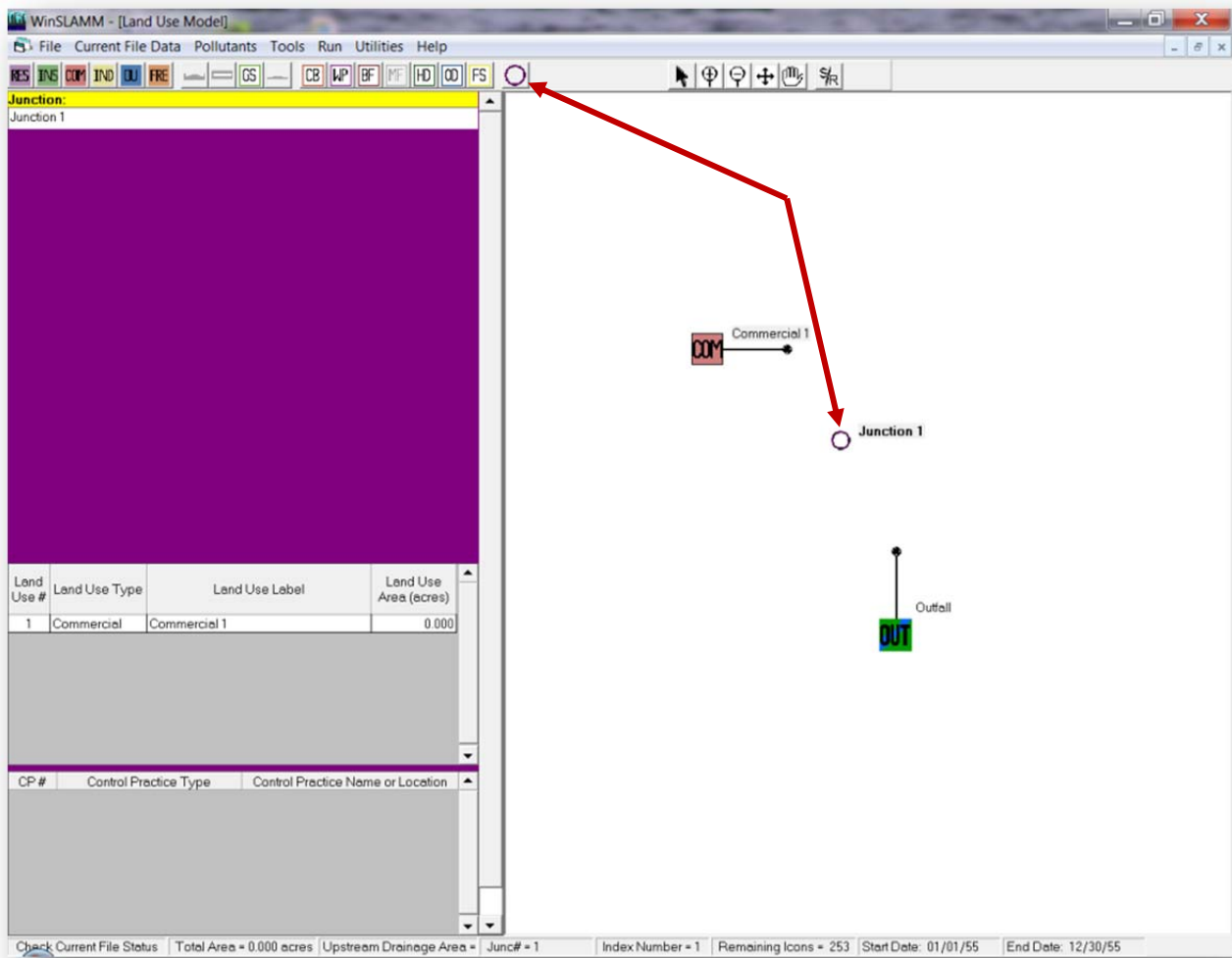
Select the land use the source areas are associated with by clicking on the land use icon. Because the project area is a commercial development, choose the Commercial Land Use Icon.

Next, click anywhere on the white map area. The land use icon will appear.



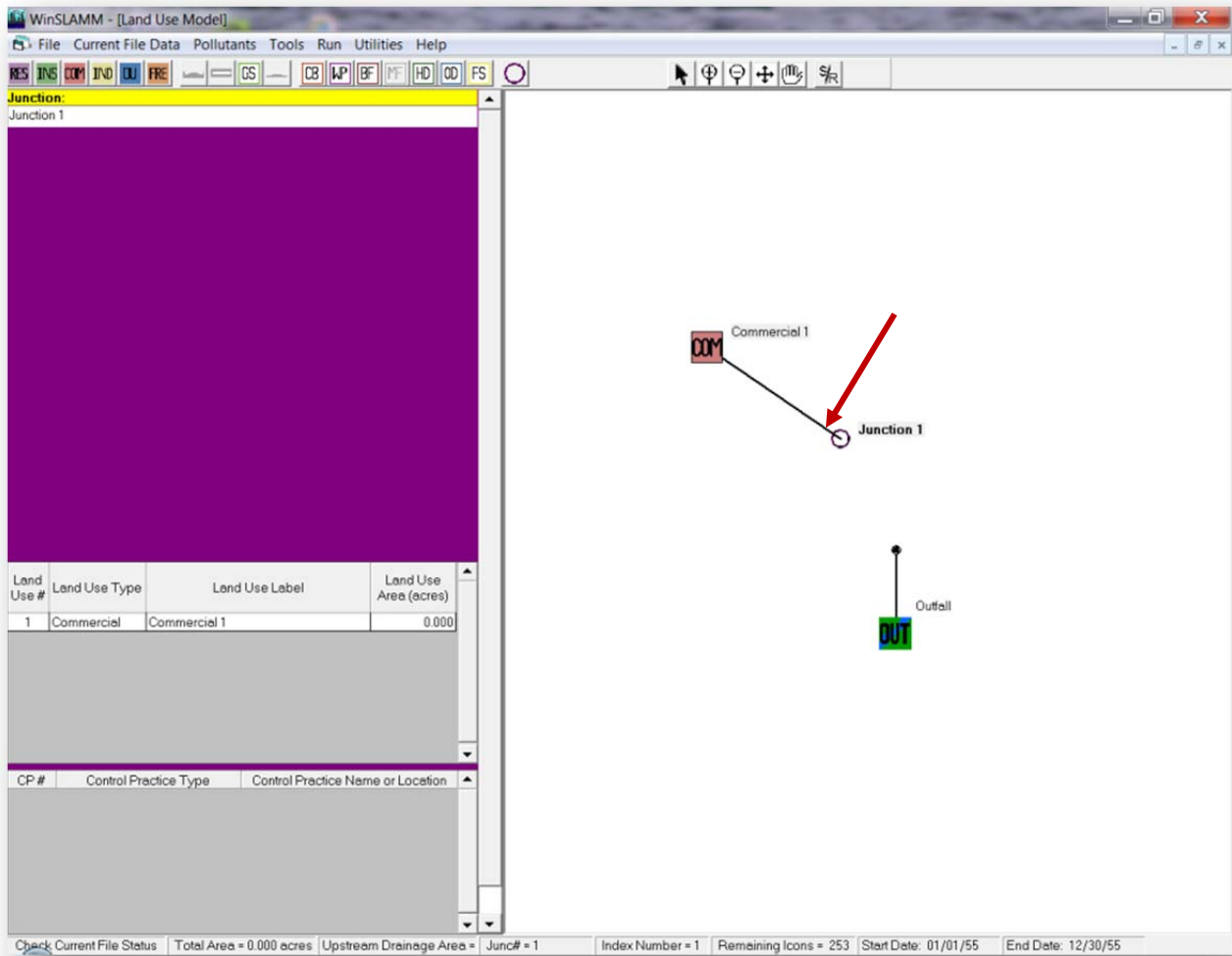
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Notice the “tails” or “handles” on the icons. All “handles” must be connected to Junctions. Junctions are represented by the “O” Icon on the main tool bar. Click on the “O”, then click anywhere in the white map space.



Modeling a No Management Condition

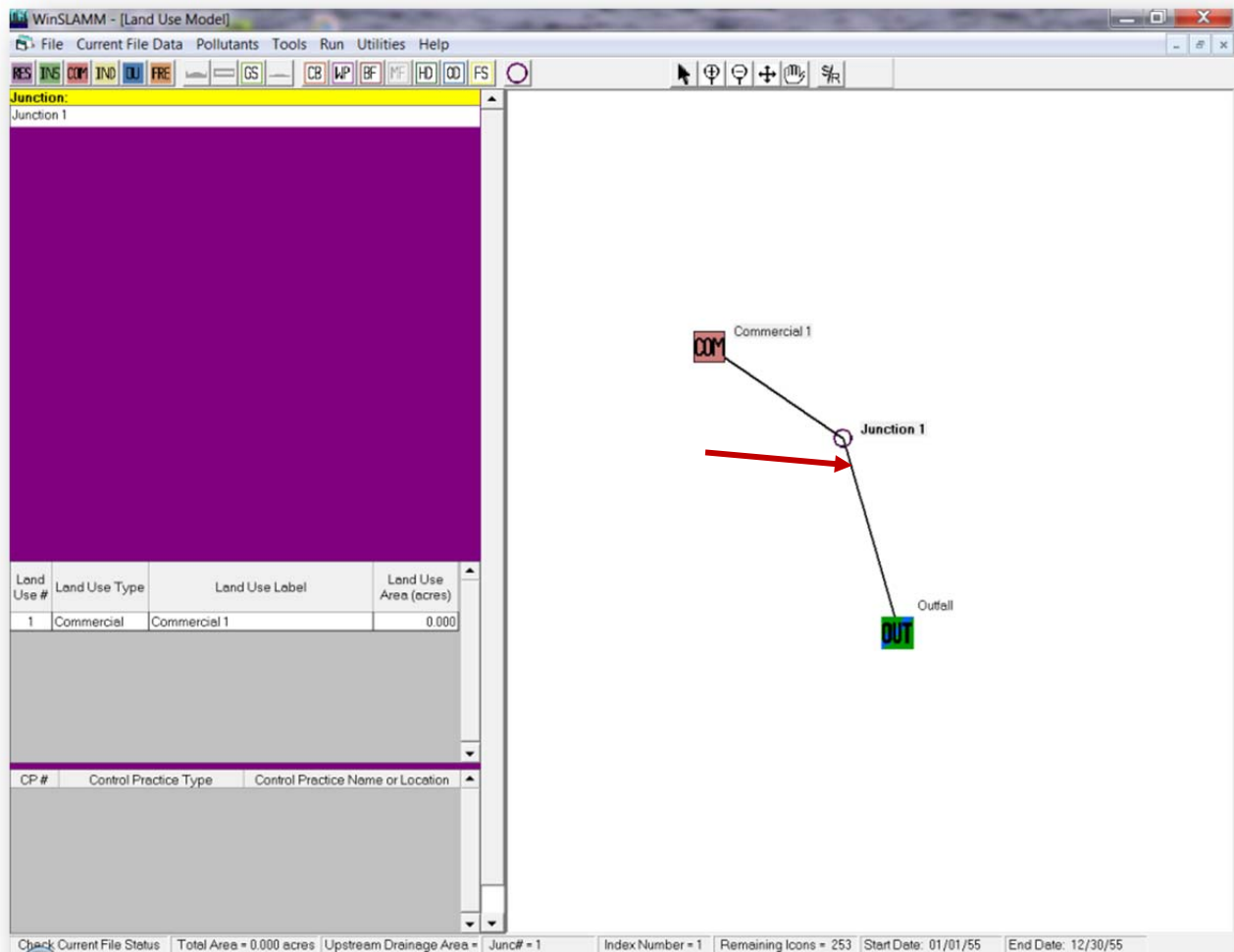
To connect the handle to the Junction, click the left mouse button on the Commercial Icon handle and drag the handle over to, and on top of, the Junction Icon. Release the hold. The Commercial Icon is now connected to the Junction.



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Now, connect the Outfall handle to the Junction just as you connected the Commercial Land Use to the Junction. You can move the screen icons around the map with the mouse (left click and hold on the icon symbol and drag it to the desired location).

Note: All model files can only have one Outfall and all Icons must eventually be routed to the Outfall.



This model file will not include Control Practices. Therefore, there are no other Icons to add.

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Source Area Data:

Next, enter the data describing the source areas in the model. The Table 1 describes the source areas.

Table 1 - Project Source Areas

Source Area	Area (acres)	Description	Directly connected?	Other needed information
Roof 1	0.68	Flat Roof	Directly connected or draining to a directly connected area	
Paved Parking 1	2.85		Directly connected or draining to a directly connected area	
Driveway 1	0.17		Directly connected or draining to a directly connected area	
Sidewalk 1	0.32		Drainage to a Pervious Area	Silty soil (normal compaction)
Large Landscaped 1	2.14			Silty soil (normal compaction)
Small Landscaped 1	0.63			Silty soil (moderately compacted, next to building and affected by construction compaction)
Small Landscaped 2 (Islands)	0.50			Silty soil (normal compaction)
Total	7.29			

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To enter the commercial source area data, click on the Commercial Land Use Label next to the Commercial Icon.

When the Label is clicked on (or selected), the Land Use name becomes bold and the source areas available in the land use appear in the Source Area Grid on the left side of the screen.

WinSLAMM - [Land Use Model]

File Current File Data Pollutants Tools Run Utilities Help

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Land Use: Commercial 1

Source Area #	Source Area	Area (acres)	Source Area Parameters	First Control Practice	Second Control Practice
Roofs					
1	Roofs 1	0.000			
2	Roofs 2				
3	Roofs 3				
4	Roofs 4				
5	Roofs 5				
6	Roofs 6				
7	Roofs 7				
8	Roofs 8				
9	Roofs 9				
10	Roofs 10				
11	Roofs 11				
12	Roofs 12				
Parking					
13	Paved Parking 1	0.000			
14	Paved Parking 2				
15	Paved Parking 3				
16	Paved Parking 4				
17	Paved Parking 5				
18	Paved Parking 6				
19	Unpaved Parking 1				

Source Area Grid

Land Use # Land Use Type Land Use Label Land Use Area (acres)

1	Commercial	Commercial 1	0.000
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CP # Control Practice Type Control Practice Name or Location

Commercial 1

Junction 1

Outfall

Check Current File Status Total Area = 0.000 acres No Upstream Source Areas LU# = 1 Index Number = 1 Remaining Icons = 253 Start Date: 01/01/55 End Date: 12/30/55

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Next, click on the cell that intersects the Source Area name row and Area (acres) column.

The screenshot displays the WinSLAMM - [Land Use Model] software interface. The left pane contains a data table with the following sections:

Source Area #	Source Area	Area (acres)	Source Area Parameters	First Control Practice	Second Control Practice
Roofs					
1	Roofs 1	0.000			
2	Roofs 2				
3	Roofs 3				
4	Roofs 4				
5	Roofs 5				
6	Roofs 6				
7	Roofs 7				
8	Roofs 8				
9	Roofs 9				
10	Roofs 10				
11	Roofs 11				
12	Roofs 12				
Parking					
13	Paved Parking 1	0.000			
14	Paved Parking 2				
15	Paved Parking 3				
16	Paved Parking 4				
17	Paved Parking 5				
18	Paved Parking 6				
19	Unpaved Parking 1				

Land Use #	Land Use Type	Land Use Label	Land Use Area (acres)
1	Commercial	Commercial 1	0.000

CP #	Control Practice Type	Control Practice Name or Location
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The right pane shows a diagram with a red box labeled 'Commercial 1' connected by a line to a circle labeled 'Junction 1', which is then connected to a green box labeled 'Outfall'. A red arrow points from the 'Area (acres)' cell for 'Roofs 1' in the table to the 'Commercial 1' box in the diagram.

At the bottom of the window, the status bar displays: Check Current File Status | Total Area = 0.000 acres | No Upstream Source Areas | LU# = 1 | Index Number = 1 | Remaining Icons = 253 | Start Date: 01/01/55 | End Date: 12/30/55

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Enter the area of the Source Area in acres. Select “Enter” on your keyboard to move to the next cell under “Source Area Parameters”. Select “Enter” again to enter the Source Area Parameter data. The project source area parameter data is shown on the Table on Page 8.

WinSLAMM - [Land Use Model]

File Current File Data Pollutants Tools Run Utilities Help

Land Use: Commercial 1

Source Area #	Source Area	Area (acres)	Source Area Parameters	First Control Practice	Second Control Practice
	Roofs	0.680			
1	Roofs 1	0.680			
2	Roofs 2				
3	Roofs 3				
4	Roofs 4				
5	Roofs 5				
6	Roofs 6				
7	Roofs 7				
8	Roofs 8				
9	Roofs 9				
10	Roofs 10				
11	Roofs 11				
12	Roofs 12				
	Parking	0.000			
13	Paved Parking 1				
14	Paved Parking 2				
15	Paved Parking 3				
16	Paved Parking 4				
17	Paved Parking 5				
18	Paved Parking 6				
19	Unpaved Parking 1				

Land Use # Land Use Type Land Use Label

CP #	Control Practice Type	Control Practice Name or Location
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Source Area Parameters

Land Use: Commercial 1 Total Area: 0.680 acres

Source Area: Roof 1

Roofs: ☒ Flat Roof ☐ Pitched Roof

Is the Source Area:

☒ Directly Connected or Draining to a Directly Connected Area

☐ Draining to a Pervious Area (partially connected impervious area)

Soil Type: ☐ Sandy ☐ Silty ☐ Clayey

Building Density: ☐ Low ☐ Medium or High

Alleys present: ☐ Yes ☐ No

Continue

Check Current File Status Total Area = 0.680 acres No Upstream Source Areas LU# = 1 Index Number = 1 Remaining Icons = 253 Start Date: 01/01/55 End Date: 12/30/55

Enter the remaining data listed in the table for the source area. Select “Continue” to leave the form.

Enter the remaining data for the project area.

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When you are finished entering data, check that the land use totals in the Land Use grid match and that the Total Area in the Status Bar matches.

WinSLAMM - [Land Use Model]

File Current File Data Pollutants Tools Run Utilities Help

RES INS COM JNO LU FRE GS CB WP BF MF HD OD FS

Land Use:

Commercial 1

Source Area #	Source Area	Area (acres)	Source Area Parameters	First Control Practice	Second Control Practice
	Roofs	0.680			
	Parking	2.850			
	Driveways/Sidewalks	0.490			
	Streets	0.000			
	Landscaped Areas	3.270			
	Other Areas	0.000			

Land Use #	Land Use Type	Land Use Label	Land Use Area (acres)
1	Commercial	Commercial 1	7.290

CP # Control Practice Type Control Practice Name or Location

Check Current File Status Total Area = 7,290 acres No Upstream Source Areas LU# = 1 Index Number = 1 Remaining Icons = 253 Start Date: 01/01/55 End Date: 12/30/55

Commercial 1

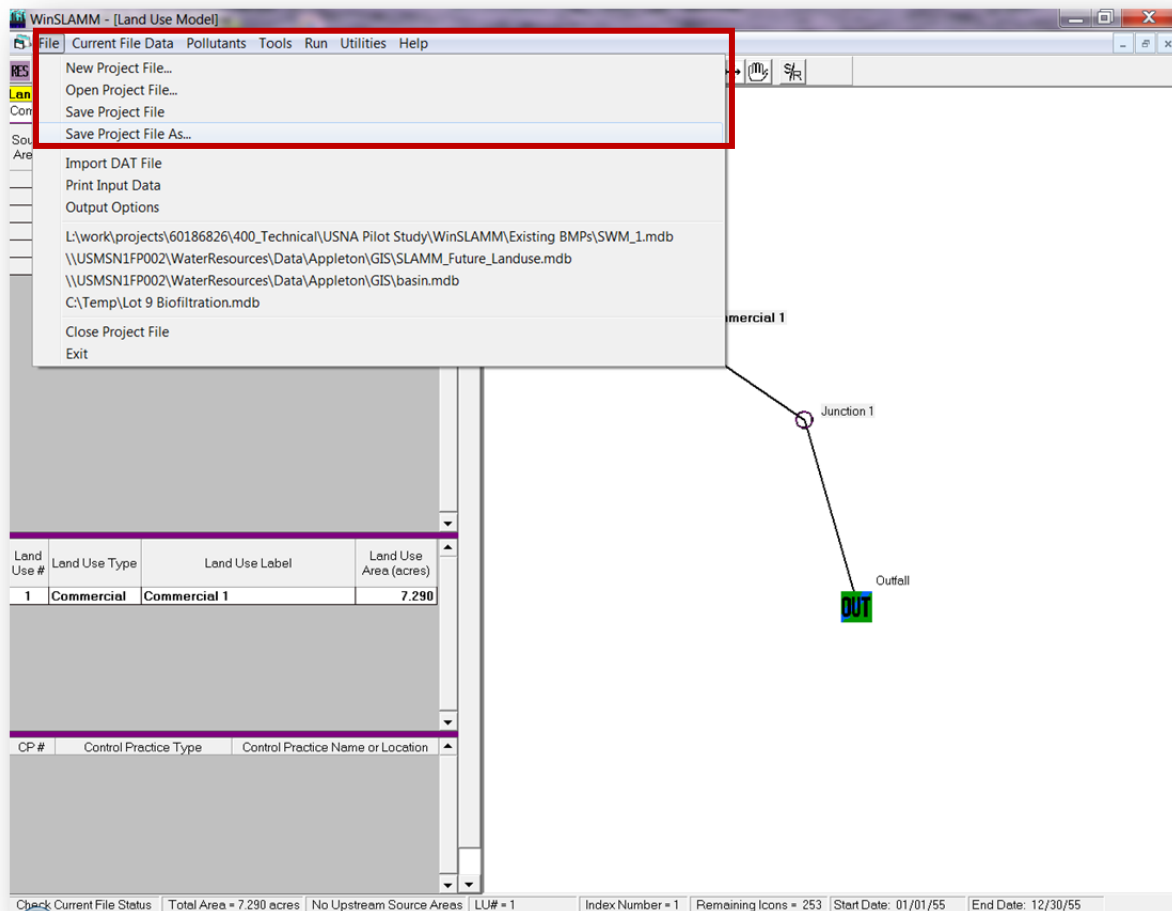
Junction 1

Outfall

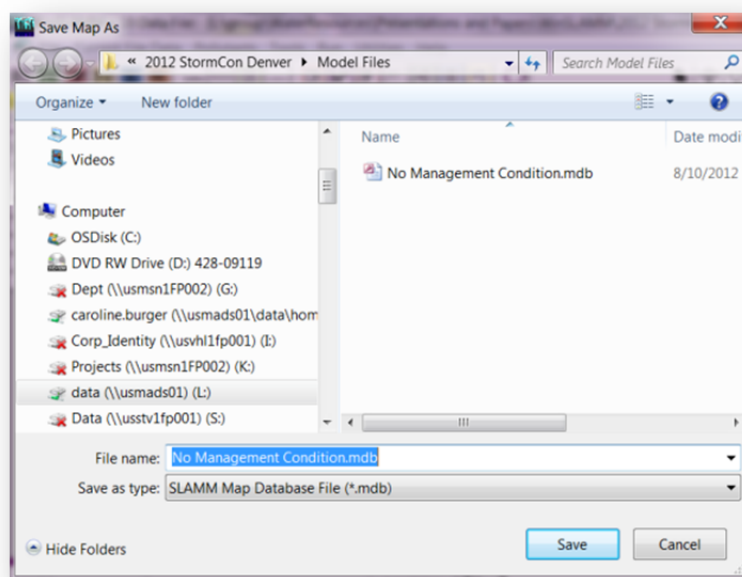
Note: To show only the totals of each major source area heading, either double click on each major source area heading or right-mouse click anywhere on the source area grid and select "Collapse Source Area List" from the popup menu.

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Save the File by selecting “File”, then “Save Project File As...”



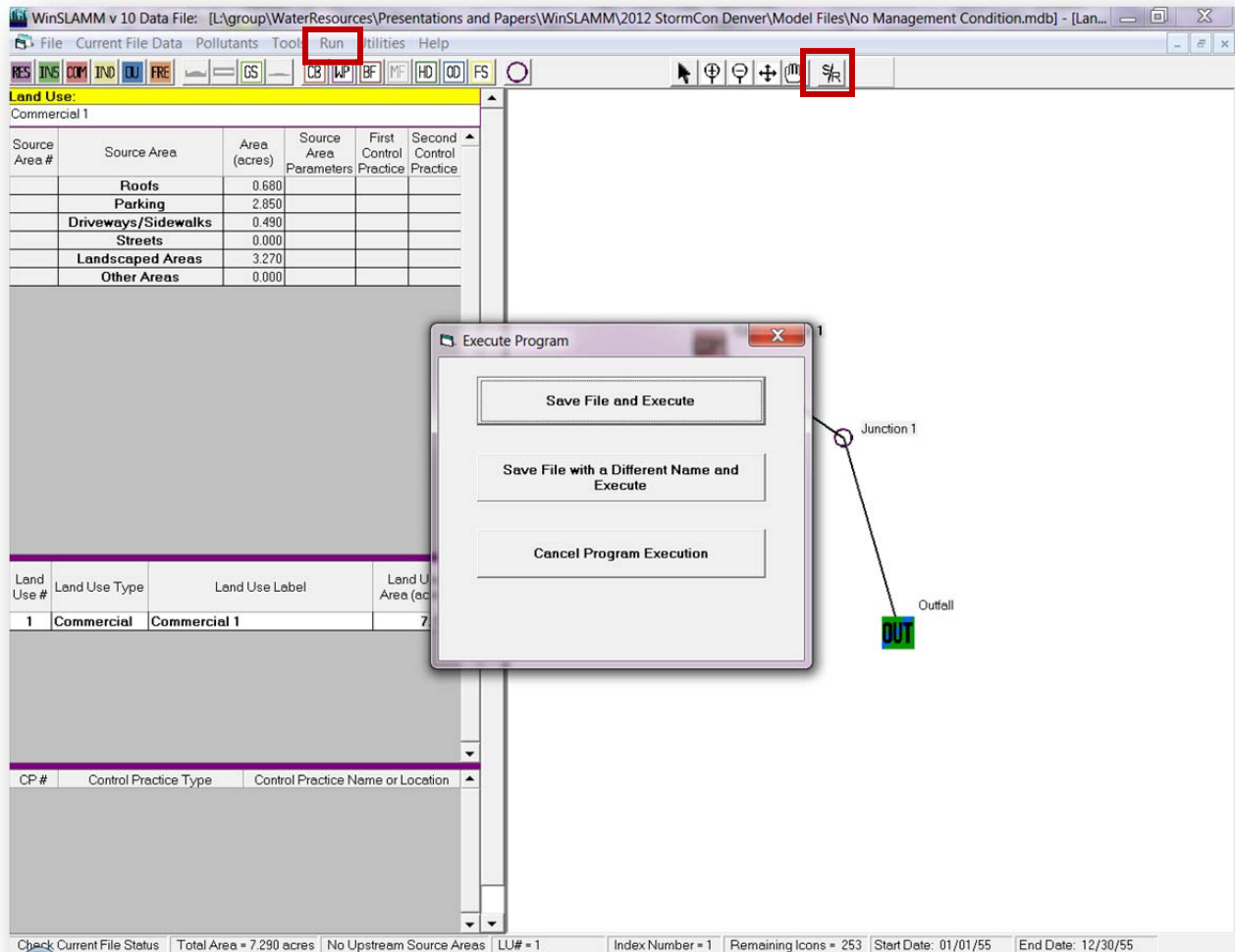
Navigate to your project folder, name the model file, and select “Save”.



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Running the File:

To run the file either select “Run”, then “Current Project File”. Then, select “Save File and Execute”. Or, select the “S/R” Icon in the Main Tool Bar



It will resave the file with the same name originally chosen in the project directory it was created.

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Results:

Runoff Volume: 173,467 cu ft
 Particulate Solids Concentration: 64.8 mg/L
 Particulate Solids Yield: 702 lbs
 Particulate Solids Percent Reduction: N/A
 Total Phosphorus Concentration: 0.60 mg/L
 Total Phosphorus Yield: 6.51 lbs
 Rv: 0.43
 Approx. Urban Stream Classification: Poor
 Annualized Value of: \$0

commercial no controls.mdb] - [WinSLAMM Model Output]

HD OD FS [Icons]

Land Uses Junctions Control Practices Outfall **Output Summary**

File Name:
C:\WinSLAMM Files\Example Files\Oakland\commercial no controls.mdb

Outfall Output Summary

	Runoff Volume (cu. ft.)	Percent Runoff Reduction	Runoff Coefficient (Rv)	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of All Land Uses without Controls	173467		0.43	64.80	701.8	
Outfall Total with Controls	173467	0.00 %	0.43	64.81	701.8	0.00 %

Current File Output: Annualized Total After Outfall Controls 190137 Years in Model Run: 0.91 769.2

Pollutant	Concentration - No Controls	Concentration - With Controls	Concentration Units	Pollutant Yield - No Controls	Pollutant Yield - With Controls	Pollutant Yield Units	Percent Yield Reduction
Particulate Solids	64.80	64.81	mg/L	701.8	701.8	lbs	0.00 %
Total Phosphorus	0.6009	0.6009	mg/L	6.507	6.507	lbs	0.00 %

Total Area Modeled (ac) 7.290

Total Control Practice Costs

Capital Cost	\$ 0
Land Cost	\$ 0
Annual Maintenance Cost	\$ 0
Present Value of All Costs	\$ 0
Annualized Value of All Costs	\$ 0

Receiving Water Impacts Due To Stormwater Runoff (CWP Impervious Cover Model)

	Calculated Rv	Approximate Urban Stream Classification
Without Controls	0.43	Poor
With Controls	0.43	Poor

Because this is a model file without control practices the Total of All Land Uses without Controls will be the same as the Outfall Total with Controls.

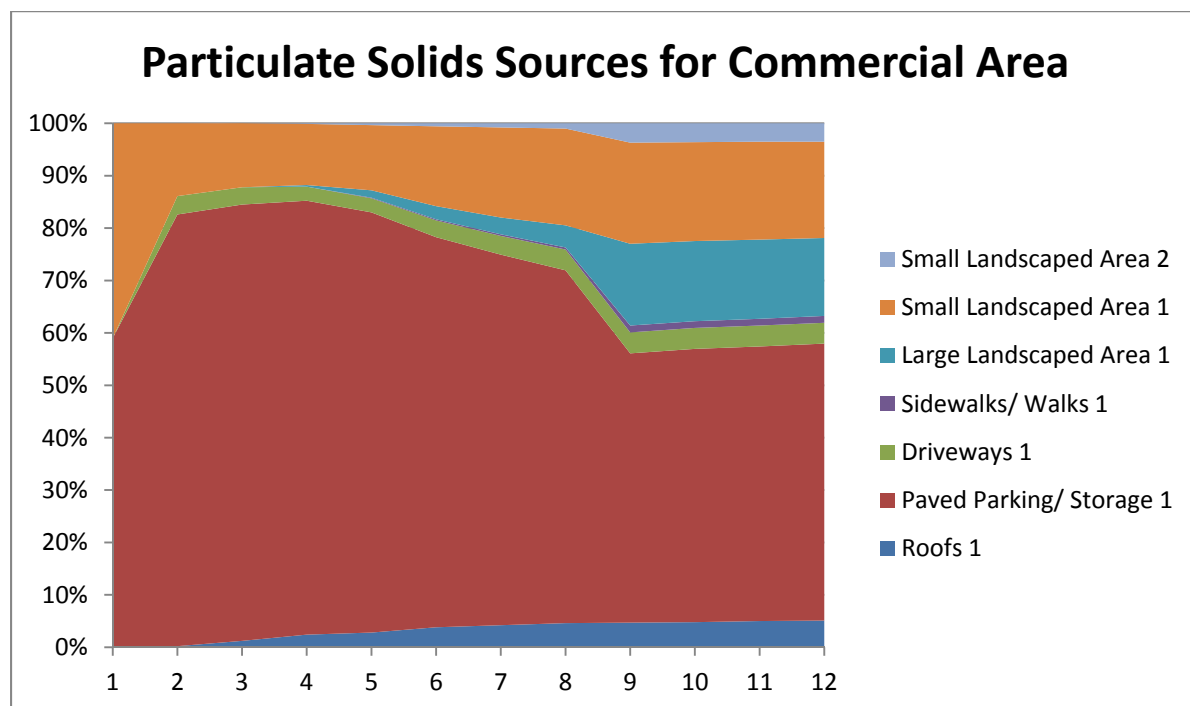
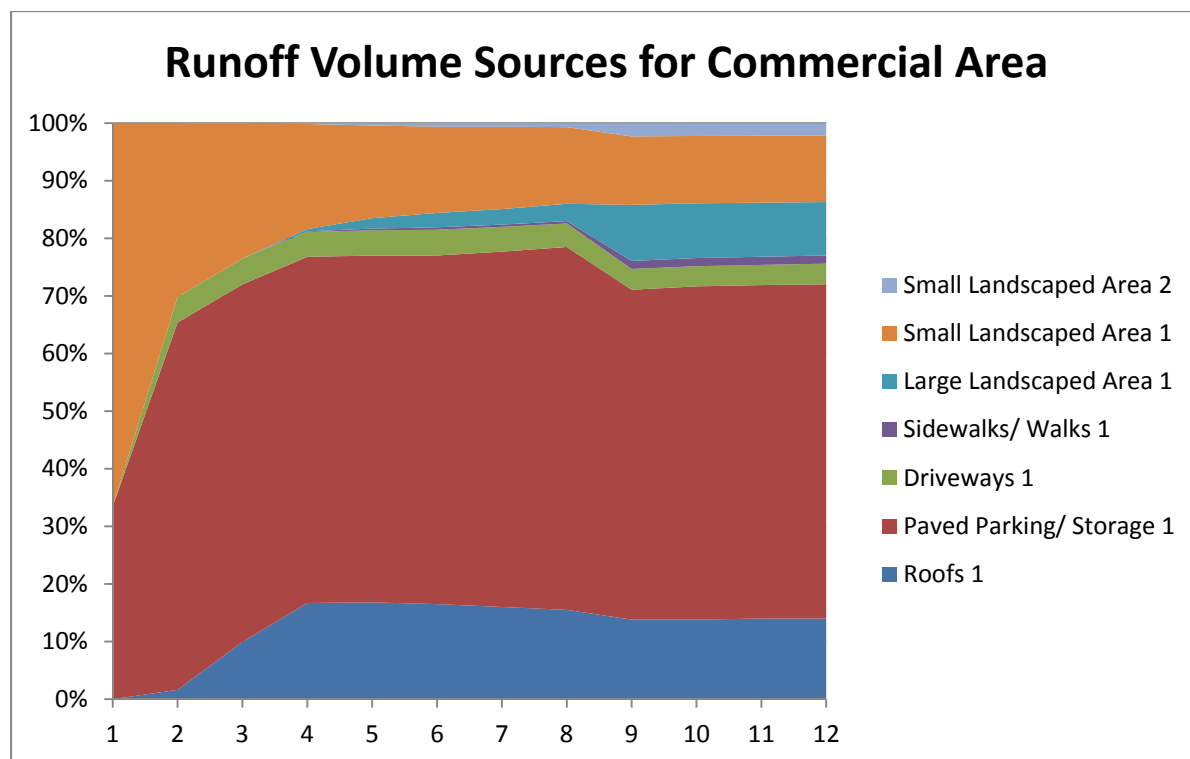
The various output tabs display results at various locations in the modeled network.

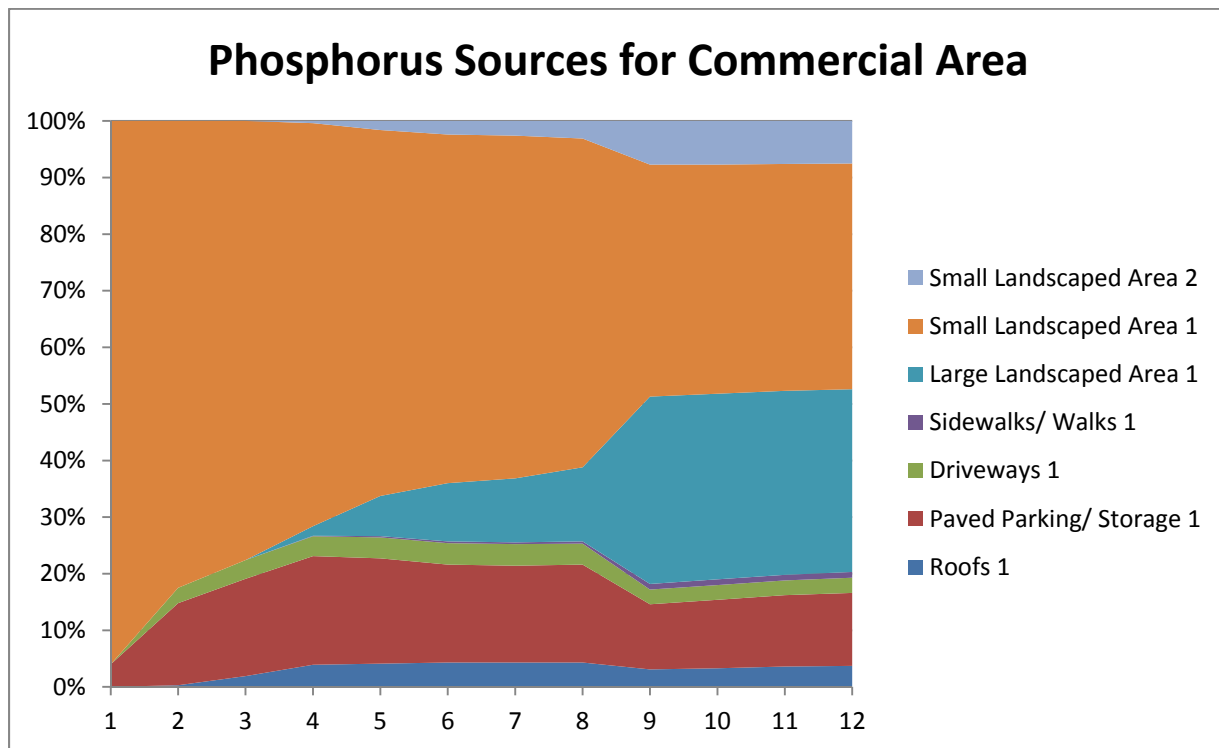
Relative Sources of Contaminants

A simple rain file is available that has 12 events ranging from 0.01 to 4 inches, as shown in the following table.

Rain Number	Rain Total (in.)
1	0.01
2	0.05
3	0.1
4	0.25
5	0.5
6	0.75
7	1
8	1.5
9	2
10	2.5
11	3
12	4

The model calculates the percentage contributions of flows and pollutants for each rain. These data can be imported into a spreadsheet and simple area plots created to illustrate the relative contributions of these constituents for different rain conditions, as shown on the following plots. The paved parking areas contribute about 50 to 75% of the runoff volume and particulate solids for rains from about 0.5 to 2 inches in depth. In contrast, the landscaped areas contribute most of the phosphorus for most rain conditions. This is important information in helping to select an effective stormwater control program. Controls for the parking lot can reduce flows and particulates, while complete drainage area controls may be needed for phosphorus (or fertilizer reduction programs).





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