
InfoSWMM

Methodology

Polygon Extraction - spatial summation of consumption category area polygons

With this method, the total DWF Allocator at each Manhole

node is calculated by summing all of the individually assigned Load categorization polygons into a single Load field.

The polygon extraction process is generally applicable in those instances where Load area polygons have already been intersected with a land base or other class/classification polygon boundary. This means that consumption data is already integrated with demographic information and ERROR: Variable (Platform) is undefined.

DWF Allocator Allocator

provides the necessary tools to distribute Loads to the designated Manhole nodes.

Polygon Intersection - spatial intersection of multiple polygon layers

ERROR: Variable (Platform) is undefined.

DWF Allocator Allocator

also offers a highly efficient polygon processing engine for the intersection and allocation of Loads between two polygon layers. Loads at Manhole nodes are allocated according to polygon classes/classifications (e.g., residential, commercial, industrial, recreational, governmental, schools) tributary to a specific Manhole node.

Each of these classes has its own unique water duty factor characteristics.

Each class also consumes water within similar diurnal Load patterns. Therefore, categorization on consumer classes and the subsequent spatial allocation of Loads is instrumental in estimating an accurate hydraulic model.

Typically, each Load area polygon is assigned to a single Manhole node and represents one to many classes/classifications. Independent of this Load area assignment, each class/classification categorization is also represented by a

polygonal boundary definition. Typically, land use (zoning) categorization is the most common polygon layer for allocating Load. Superimposing the areas of influence from the classes/classifications categorization over the Load area polygon coverage, the ERROR: Variable (Platform) is undefined.

DWF Allocator Allocator

engine allocates the Loads of individual Load classes to the designated DWF Allocator node. Involved

in this process is a lookup table where classes/classifications are assigned water duty factors. The multiplication of these water duty factors with the composite Load area polygon generates the summation of Loads for a single analysis node that is applied to the hydraulic model.

ERROR: Variable (Platform) is undefined.

DWF Allocator Allocator

considers the Load area polygons as the "Primary" polygon coverage while the classes/classifications layer is represented as a "Secondary"

polygon definition. During the allocation process, the program intersects polygons of the "Primary" layer with those of the "Secondary"

layer. Additional secondary layers can be further appended to the system evaluation, thus expanding the consideration into a multi-dimensional problem. One typical application of an additional secondary layer is the phase of development, such as existing zoning, the five year general plan, the ten year general plan, etc. The combination of these multiple "Secondary"

layers with the "Primary" layer enables sophisticated Load evaluation over a range of planning horizons, making ERROR: Variable (Platform) is undefined.

DWF Allocator Allocator

an incredibly powerful analysis tool.

Geocoded meter billing data (meter consumption database)

Customer/meter billing data (each with a distinct X and Y coordinates) provide an accurate measure of localized Loads imposed on the water

distribution system. ERROR: Variable (Platform) is undefined.

DWF Allocator Allocator

uses GIS technology to geocode

consumption data to designated Manhole nodes. The program identifies and sums up Loads imposed by meters on each of the Manhole

nodes associated to Load (service) area polygons.

Load area polygons can either be digitized within ERROR: Variable (Platform) is undefined.

DWF Allocator Allocator

or imported as a shapefile from a third party GIS software package. Load area polygons that are assigned to a specific Manhole node will have a unique identifier for which Load are assigned. After a spatial intersection, the program sums the consumption of the total number of meters contained within that Manhole 's Load area polygon and assigns that Load to the hydraulic model Load database.

Closest Manhole – locates the closest Manhole and allocates Loads

The closest Manhole

method works in conjunction with customer/meter data. This method provides a means to assign Loads to the Manhole s closest to the water meter. Advanced algorithms are used to locate and allocate Loads to the closest Manhole

. For each of the Manhole

nodes, the Loads are then summed up to establish localized Loads imposed on each of the nodes.

Domains may be created to selectively apply this method to user specified Manhole s.

Closest Link – locates the closest Link and allocates Loads

The Closest Link

method also works synergistically with billing meter data. For each of the meters, the closest Link

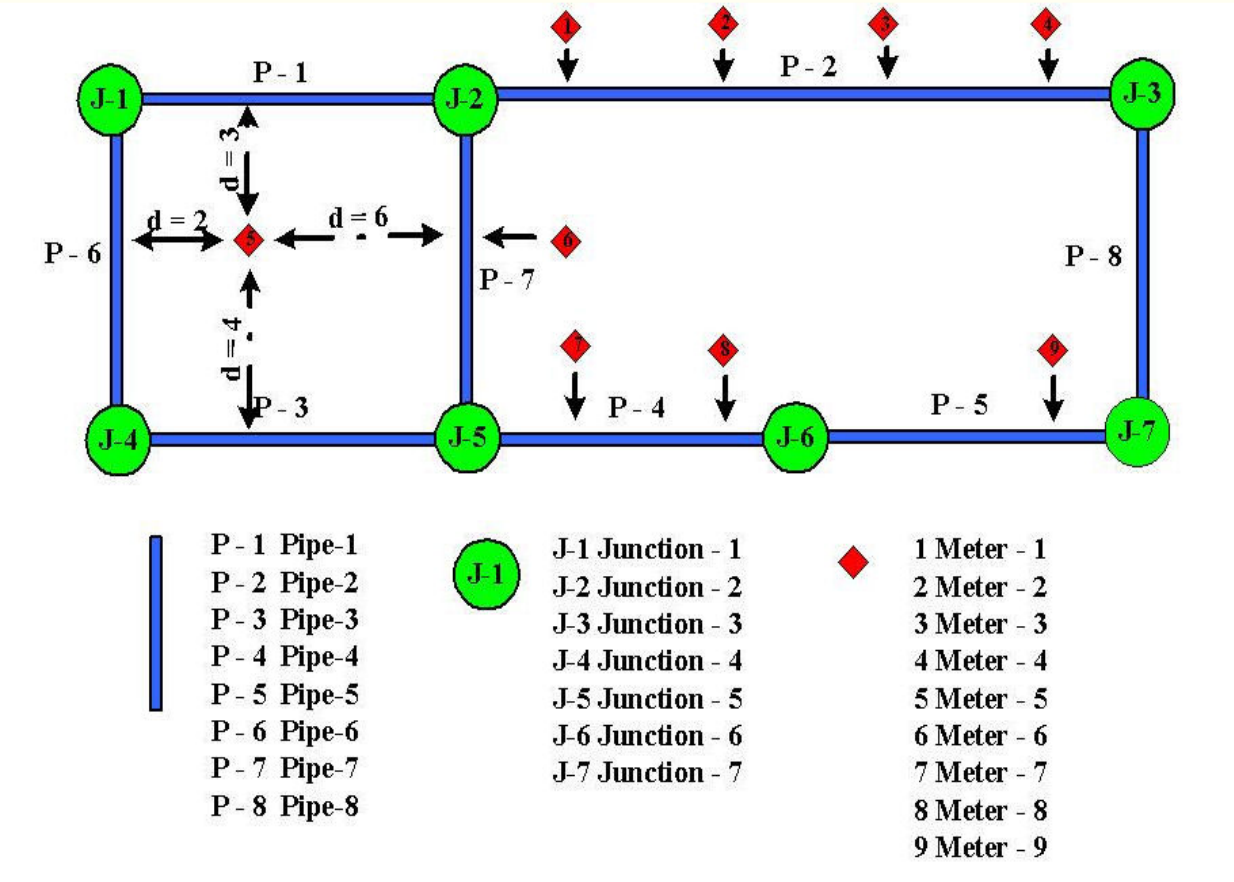
is first located. Advanced search algorithms are used to aid in this process.

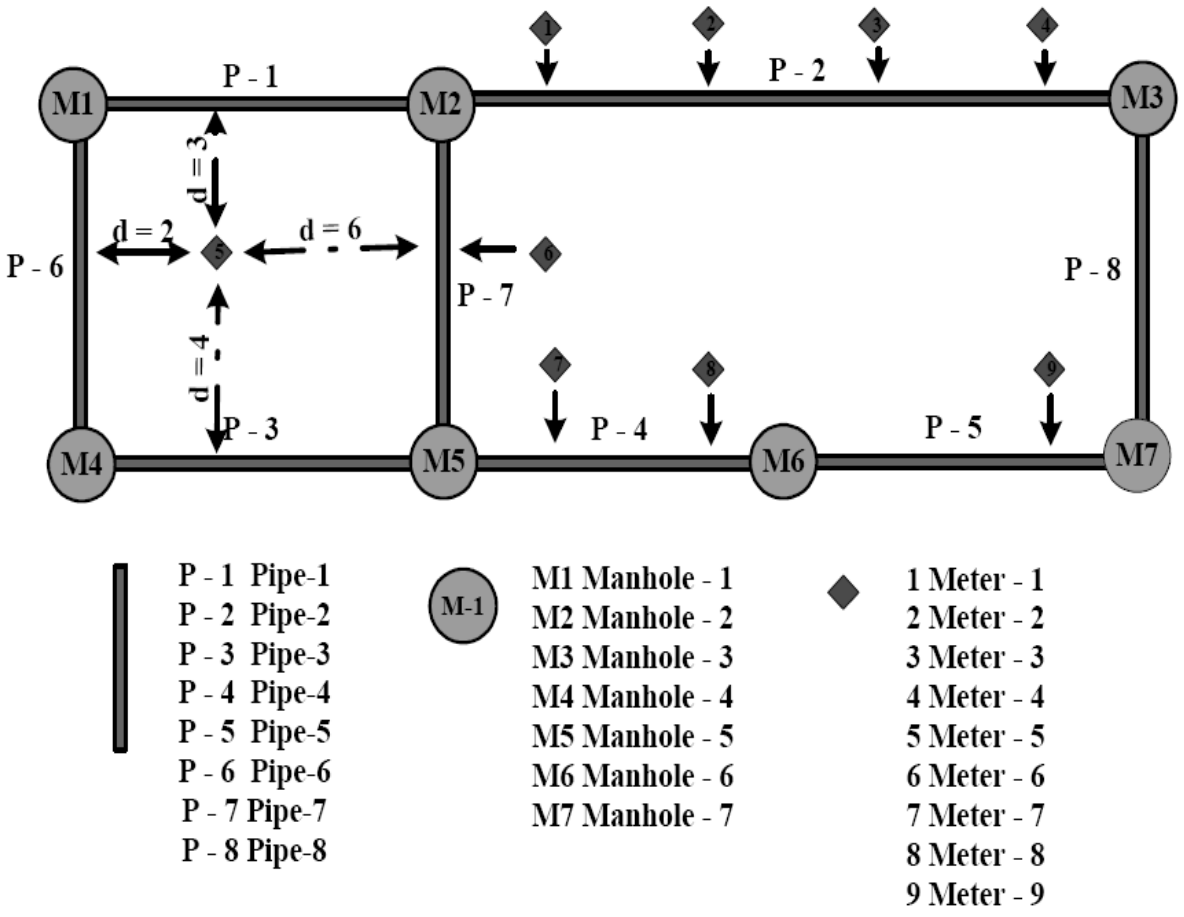
The meter Loads are then assigned to either the closest upstream or downstream nodes for each of the selected Link

.

The Loads that are routed to the nearest Manhole may be assigned in full or may be split in a weighted fashion between the two nodes connecting the Link

. For each of the nodes, all contributing meters are summed to represent the total Load imposed on that node.





In final, ERROR: Variable (Platform) is undefined.

DWF Allocator Allocator

also provides the flexibility to manually create and modify any of the above nodal allocation data, including meter locations, land use polygons, Load area polygons, or composite polygon boundaries. You can directly “activate” the layer you choose to edit/modify and use the customized editing tools available within the ERROR: Variable (Platform) is undefined.

DWF Allocator Allocator

toolbar to make the desired changes.

Meter-Manhole Allocation – User-defined meter allocation to system Manhole

This method is similar to the Closest Manhole methods, except it allocates Loads according to a user-defined meter allocation.

For example, the Closest Manhole

method uses GIS technology to automatically determine how Loads from meters will be assigned. In this method, the user is able to graphically assign which meters will be allocated to which Manhole . The ability to assign meters to specific Manhole nodes is achieved through the use of the Meter Assignment dialog box.

For each of the meters assigned to specific Manhole nodes, Loads are then summed to establish localized Loads imposed on each of the Manhole

nodes.

Meter-Link Allocation – User-defined meter allocation to system Link

This method is similar to the Closest Link method, except it allocates Loads according to a user-defined meter allocation.

For example, the Closest Link

method uses GIS technology to automatically determine how Loads from meters will be assigned to system pipes. In this method, the user is able to graphically assign which meters will be allocated to which Link s. The ability to assign meters to specific Link

s is achieved through the use of the Meter Assignment dialog box. Load allocation from the meters to the respective upstream and downstream nodes of the Link

can also vary according to the meter assignment option selected by the user.

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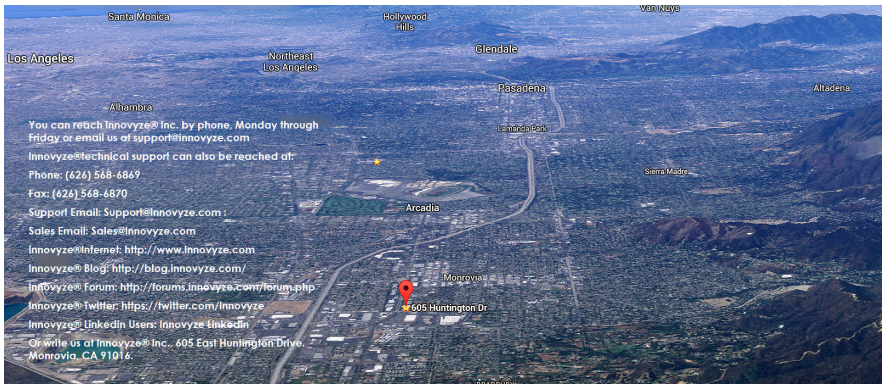

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DWF Allocator Allocation Toolbar

The DWF Allocator Allocation Toolbar will be launched when the extension is initialized from the Add-On Manager button ().

Note: Please click anywhere on this dialog box to learn more.

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Polygon Layer Registration

The Polygon Layer Registration dialog box is used to register layers which will be used by the Polygon Intersection and Polygon Extraction methods of DWF Allocator allocation.

Description of the tool:

NAME	**DESCRIPTION**
Active Polygon Layer	Displays the currently active polygon layer
Registered Layers Table	Name - The name of the registered file Type - The type of the registered file. 0:Primary – Load area polygon layer 1:Secondary – Load class polygon layer (land use, zoning, etc.) 2:Intersected – An intersected polygon coverage has already been established. File - The path of the registered file
Make Active	Make the chosen layer the Active/Editable Layer upon closing the dialog box
New	Click this button to register a new layer
Unregister	Unregister the selected polygon layer
Clear All	Remove all registered layers

Close	Close the tool

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Options

The Options dialog allows you to set various options that effect the operation of the DWF Allocator Allocation.

Description of the tool:

NAME	**DESCRIPTION**
Overwrite Existing Manhole ID During Auto Manhole Assignment	The currently assigned Manhole ID's will be overwritten during the automatic Manhole assignment routine.
Overwrite Existing Load When Allocating DWF Allocator	Manhole loads will be overwritten during the load allocation process. If unchecked, the computed loads will be added to the existing Manhole load.
Distribute Allocated DWF Allocator Automatically	Use this option when the load area polygons contain more than one Manhole per polygon and you wish to uniformly distribute the total load to all the Manhole within each polygon. This option is only available with the Polygon Intersection and Meter Summation allocation methods.
Target DWF Allocator Set	This listbox allows you to select a different DWF Allocator set than the currently active scenario's

	DWF Allocator set if you like. You can also create a new one from here if needed.
Purge All DWF Allocator	This option will erase all DWF Allocator in the current (or specified) DWF Allocator Set.

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Load Factor Developer

Use this function to determine Load Factors (load per unit area, i.e. gpm/acre, Lps/hectare, etc.) automatically based on spatially located loads and polygonal landuse boundaries.

There are no existing standards for Land Use Load Factor Factors; they vary from City to City and from Water Agency to Water Agency. As an example, there are typically multiple Land Use designations for a Residential Land Use and are typically separated based on densities (R-1, R-2, R-3, etc.). However, an R-2 Land Use in one City may be defined as 3-6 dwelling units per acre (du/ac), in another City as 2-5 du/ac, and in a third City as 3-5 du/ac – this makes determining specific loading factors a daunting task. The Load Factor Developer combines the areas present in a polygon layer of Land Use data with either (1) geo-coded billing data or (2) Manhole loading data to automatically determine Load Factor Factors for every Land Use polygon.

Description of the tool:

NAME	**DESCRIPTION**
Manhole Layer	This option uses the total load present in the Manhole Hydraulic database table, summing all loads prior to performing the Load Factor calculation
Meter Layer	Specify the appropriate point layer and the database load field
Landuse Layer	Select the land use layer to be used to develop load factors
Load Factor Field	Enter a value to modify loads. Loads will be multiplied by the number entered

New Field	This button allows the user to create a new data field in the Land Use layer to store the calculated Load Factors
Load Scaling Factor	Select the field within the Land Use layer that is to be used to store the calculated Water Load Factors
Develop Load Factors	Create the load factors according to the user's specifications

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Meter Assignment

Allows the user to review which meters are currently assigned to which pipes and nodes and to manually assign meters to specific meters and nodes.

Clicking on the Meter Assignment button from the DWF Allocator Allocation Toolbar

launches the Meter Assignment dialog box.

Description of the tool:

NAME	DESCRIPTION
Meter Layer	Shows path and filename of the currently selected Meter Layer in the TOC/Legend. This is the layer that will get acted upon by the tool.
Manhole -Meter Association	
Manhole ID Field	Select the Manhole ID field from the Meter Layer
Assign Manhole	Step 1: Select a Manhole to assign meters to. After clicking the button, select a Manhole from the map then right-click and choose Enter to complete the assignment.
Select Meter(s)	Step 2: Select meters. After clicking the button, select one or more meters to assign to the Manhole . To complete the meter selection, right-click and choose Enter.

Select Manhole	You can review results by clicking this button then select a Manhole from the map. Temporary lines will be drawn on the map to show which meters are assigned to the Manhole .
Link -Meter Association	
Pipe ID Field	Select the Link ID field from the Meter Layer
Assign Link	Step 1: Select a Link to assign meters to. After clicking the button, select a Link from the map then right-click and choose Enter to complete the assignment.
Select Meter(s)	Step 2: Select meters. After clicking the button, select one or more meters to assign to the Link . To complete the meter selection, right-click and choose Enter.
Select Link	You can review results by clicking this button then select a pipe from the map. Temporary lines will be drawn on the map to show which meters are assigned to the Link .
Auto Redraw	If this option is selected, then each time you preform a new action the linkage display from the previous action will be cleared (the actual linkage will remain but

	and only the visual display of it will be cleared).
Reset Map	Clears the map of linkage display. When you click the Close button, you will be asked if you want to Reset the map before closing.

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DWF Allocator Allocation Manager

Closest Link

Closest Manhole

Meter-Link Allocation

Meter-Manhole Allocation

Meter Summation

Polygon Extraction

Polygon Intersection

Note: Please select an allocation method to learn more.

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Polygon Intersection

The Polygon Intersection method of DWF Allocator Allocation, allows you to quickly extrapolate loads from commonly available background layers.

Required Input:

- Primary Layer

  - This is layer that has

  been added to the project as a background layer and has been 'registered'

  as a 'Primary' layer. If this type of layer is not available, an automatically generated polygon layer can be created with the Create Thiessen Polygon too. The polygons in this layer represent the area that contributes DWF Allocator to individual nodes in the model. There must be a field in the layer that is populated with the Manhole ID that the calculated flow will be assigned to.

- Secondary Layer

  - This is a polygon layer that has been added to the project as a background layer and has been 'registered'

  as a 'Secondary' layer. The polygons in this layer are typically landuse or zoning polygons. The properties/attributes such as area, development ratio and population of each polygon are used in the calculation of the DWF Allocator

  . The attributes of development ratio and/or population must already be populated prior to DWF Allocator allocation. Three options are available:

  - Build Out Ratio

    - If you have a field in the Secondary Layer that is populated with the ratio of developed land to total land, you can specify this field and DWF Allocator

    will be calculated as: DWF Allocator

= (intersected polygon area) X (intersected Build Out Ratio) X

(Load Factor for the Usage Type) X (Allocation Scaling Factor)

- Population

  - If you have a field in the Secondary Layer that is populated with the human population for each polygon, you can specify this field and DWF Allocator

    will be calculated as: DWF Allocator

    = (intersected polygon area fraction) X (intersected polygon Population) X (Load Factor for the Usage Type) X (Allocation Scaling Factor)

- No field specified

  - Same as 'Build Out Ratio' option except no Build Out Ratio is applied (i.e. DWF Allocator

    = (intersected polygon area) X (Load Factor for the Usage Type) X (Allocation Scaling Factor))

Description of the tool:

Name	Decription
Allocation Methods	Polygon Intersection - The Polygon Intersection method uses spatial intersection of a usage class polygon with load area polygon coverage to determine the Manhole load allocation. The primary layer represents the load area polygon and the secondary layer represents the usage categorization polygon.

Polygon Extraction - The Polygon Extraction method is used when an intersected polygon layer has already been established and registered into the ERROR: Variable (Platform) is undefined.

DWF Allocator Allocator.

Meter Summation - The Meter Summation method is used when customer billing data is available.

The primary layer represents the load area polygon layer. Additionally, the meter configuration data needs to be specified as well. When using consumer/meter data to estimate Manhole

loads, this data must first be configured. The DWF Allocator Field represents the field that contains the demand at each of the consumer meters. The Usage Type Field designates the field that contains the usage type data. The Meter Layer specifies the desired consumer/meter layer.

Closest Manhole

- The Closest Manhole

method is used when customer/meter-billing data is

available. The meter layer needs to be configured. The Demand Field and Usage Type Field contain load and water duty data at each of the meters.

Closest Link

- The Closest Link method

works with customer billing data and requires meter configuration. The DWF Allocator Field and

Usage Type Field contain load and usage data at each of the meters.

Meter-Manhole

Allocation - The Meter-Manhole Allocation

method is similar to the Closest Manhole method, except the user is able to assign which meters will be allocated to which Manhole

nodes. In order for the Meter-Manhole

method to be employed, the user must specify which fields possess (or will possess) the Manhole

ID's. Use the “Assign Manhole”

button to designate a meter(s) to a Manhole and the “Select Meter(s)” and “Select Manhole”

buttons to see which meters are assigned to which Manholes and vice-versa.

Meter-Link

Allocation - The Meter-Link Allocation method is similar to the Closest Link method, except the user is able to assign which meters will be allocated to which Links. In other words, it is a user-defined version of the Closest Link method (which generates meter demands automatically). In order for the Meter-Link

method to be employed, the user must specify which fields possess (or will possess) the Link

ID's. Specify which field contains (or will contain) the Link ID using the Link ID Field drop down box for each meter in the system. Use the “Assign Link”

button to designate a meter(s) to a Manhole and the “Select Meter(s)” and “Select Link"

buttons to see which meters are assigned to which Links and vice-versa.

All options available in the Closest Link methodology are

	also available in the Meter-Link Allocation method. See the Closest Link section to learn more about each option.
Usage Data Tab	Click the Usage Data tab to set up the tool to allocate DWF Allocator appropriately based on usage type
Primary Layer	The area from which each Manhole receives dry weather flow (load area). This layer should have a field relating each area to a Manhole ID
Secondary Layer	The land use in the service area of the collection sewer system. This layer should contain a field with the land use covering the system
Build Out Ratio	Specify a Build Out percentage field within the registered shapefile that will be used to estimate loads based upon the amount of land that is developed
Population	Specify a population field within the registered shapefile that will be used to calculate loads based on population
Allocation	Use this box to normalize demand data. The default value

Scaling Factor	is set to unity (1.0) and may be changed to reflect the actual demand multiplier. It will be necessary to apply scaling factors when water duty factors are expressed in gpm/acre and acreages calculated from a polygon intersection are expressed in sq. ft. In this instance, use an allocation scaling factor of 1/43560.
Allocate Load	This button will run the DWF Allocator according to the user's specifications and will display the Allocation Report & Load Factor Calculator report/tool
Options	Opens the Allocation Options dialog to allow you to select some tool customization options

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Polygon Extraction

The polygon Extraction method of DWF Allocator Allocation is very similar to the Polygon Intersection method except that it assumes that the 'primary' and 'secondary' layers have already been intersected in an external GIS function.

Required Input:

- Intersected Layer - This is a polygon layer that has been generated by an external GIS function that intersects a primary and secondary layer. The typical Intersected Layer as described in the Methodology will have fields for Manhole Linkage and Usage Type. Optional fields are Build Out Ratio and Population. The options for DWF Allocator calculation (depending on the specified fields) are:
    - Build Out Ratio - If you have a field in the Secondary Layer that is populated with the ratio of developed land to total land, you can specify this field and DWF Allocator will be calculated as: DWF Allocator = (polygon area) X (Build Out Ratio) X (Load Factor for the Usage Type) X (Allocation Scaling Factor)
    - Population - If you have a field in the Secondary Layer that is populated with the human population for each polygon, you can specify this field and DWF Allocator will be calculated as: DWF Allocator = (polygon area fraction) X (polygon Population) X (Load Factor for the Usage Type) X (Allocation Scaling Factor)
    - No field specified - Same as 'Build Out Ratio' option except no Build Out Ratio is applied (i.e. DWF Allocator = (polygon area) X (Load Factor for the Usage Type) X (Allocation Scaling Factor))

Description of the tool:

NAME	**DESCRIPTION**

Allocation Methods	Polygon Intersection - The Polygon Intersection method uses spatial intersection of a usage class polygon with load area polygon coverage to determine the Manhole load allocation. The primary layer represents the load area polygon and the secondary layer represents the usage categorization polygon. Polygon Extraction - The Polygon Extraction method is used when an intersected polygon layer has already been established and registered into the ERROR: Variable (Platform) is undefined. DWF Allocator Allocator. Meter Summation - The Meter Summation method is used when customer billing data is available. The primary layer represents the load area polygon layer. Additionally, the meter configuration data needs to be specified as well. When using consumer/meter data to estimate Manhole loads, this data must first be configured. The DWF Allocator Field represents the field that contains the demand at each of the consumer meters. The Usage Type Field designates the field that contains the usage type data. The	

Meter Layer specifies the desired consumer/meter layer.

Closest Manhole

- The Closest

Manhole

method is used when customer/meter-billing data is available. The meter layer needs to be configured. The Demand Field and Usage Type Field contain load and water duty data at each of the meters.

Closest Link

- The Closest

Link method

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Allocation - The Meter-Link Allocation method is similar to the Closest Link method, except the user is able to assign which meters will be allocated to which Links. In other words, it is a user-defined version of the Closest Link method (which generates meter demands automatically). In order for the Meter-Link

method to be employed, the user must specify which fields possess (or will possess) the Link

ID's. Specify which field contains (or will contain) the Link ID using the Link ID Field drop down box for each meter in the system. Use the “Assign Link”

	button to designate a meter(s) to a Manhole and the “Select Meter(s)” and “Select Link" buttons to see which meters are assigned to which Links and vice-versa. All options available in the Closest Link methodology are also available in the Meter-Link Allocation method. See the Closest Link section to learn more about each option.
Usage Data Tab	Click the Usage Data tab to set up the tool to allocate DWF Allocator appropriately based on usage type
Intersected Layer	A polygon layer containing fields with information on load areas, land use % within each area, and related Manhole ID
Build Out Ratio	Specify a Build Out percentage field within the registered shapefile that will be used to estimate loads based upon the amount of land that is developed
Population	Specify a population field within the registered shapefile that will be used to calculate loads based on population

Allocation Scaling Factor	Use this box to normalize demand data. The default value is set to unity (1.0) and may be changed to reflect the actual demand multiplier. It will be necessary to apply scaling factors when water duty factors are expressed in gpm/acre and acreages calculated from a polygon intersection are expressed in sq. ft. In this instance, use an allocation scaling factor of 1/43560.
Allocate Load	This button will run the DWF Allocator according to the user's specifications and will display the Allocation Report & Load Factor Calculator report/tool
Options	Opens the Allocation Options dialog to allow you to select some tool customization options

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Meter Summation

Water meter billing data can provide an accurate measure of localized DWF Allocator s imposed on the collection network. If you have a water meter point layer you can use it in conjunction with a load area layer (primary layer) to allocate loads to Manhole s.

Required Input:

- **Primary Layer** - This is layer that has been added to the project as a background layer and has been 'registered' as a 'Primary' layer. If this type of layer is not available, an automatically generated polygon layer can be created with the Create Thiessen Polygon too. The polygons in this layer represent the area that contributes DWF Allocator to individual nodes in the model. There must be a field in the layer that is populated with the Manhole ID that the calculated flow will be assigned to.
- **Meter Layer** - This is a point layer with flow information data.

Description of the tool:

NAME	DESCRIPTION
Allocation Methods	**Polygon Intersection** - The Polygon Intersection method uses spatial intersection of a usage class polygon with load area polygon coverage to determine the Manhole load allocation. The primary layer represents the load area polygon and the secondary layer represents the usage categorization polygon.

Polygon Extraction - The Polygon Extraction method is used when an intersected polygon layer has already been established and registered into the ERROR: Variable (Platform) is undefined. DWF Allocator Allocator.

Meter Summation - The Meter Summation method is used when customer billing data is available. The primary layer represents the load area polygon layer. Additionally, the meter configuration data needs to be specified as well. When using consumer/meter data to estimate Manhole loads, this data must first be configured. The DWF Allocator Field represents the field that contains the demand at each of the consumer meters. The Usage Type Field designates the field that contains the usage type data. The Meter Layer specifies the desired consumer/meter layer.

Closest Manhole - The Closest Manhole method is used when customer/meter-billing data is available. The meter layer needs to be configured. The Demand Field and Usage Type Field contain load and water duty data at each of the meters.

Closest Link - The Closest Link method works with customer billing data and requires meter configuration. The DWF Allocator Field and Usage Type Field contain load and usage data at each of the meters.

Meter-Manhole Allocation - The Meter-Manhole Allocation method is similar to the Closest Manhole method, except the user is able to assign which meters will be allocated to which Manhole nodes. In order for the Meter-Manhole method to be employed, the user must specify which fields possess (or will possess) the Manhole ID's. Use the “Assign Manhole” button to designate a meter(s) to a Manhole and the “Select Meter(s)” and “Select Manhole” buttons to see which meters are assigned to which Manholes and vice-versa.

Meter-Link Allocation - The Meter-Link Allocation method is similar to the Closest **Link** method, except the user is able to assign which meters will be allocated to which Links. In other words, it is a user-defined version of the Closest Link method (which generates meter demands automatically). In order for the Meter-Link method to be

	employed, the user must specify which fields possess (or will possess) the Link ID's. Specify which field contains (or will contain) the Link ID using the Link ID Field drop down box for each meter in the system. Use the “Assign Link” button to designate a meter(s) to a Manhole and the “Select Meter(s)” and “Select Link" buttons to see which meters are assigned to which Links and vice-versa. All options available in the Closest Link methodology are also available in the Meter-Link Allocation method. See the Closest Link section to learn more about each option.
Usage Data Tab	Click the Usage Data tab to set up the tool to allocate DWF Allocator appropriately based on usage type
Primary Layer	The area from which each Manhole receives dry weather flow (load area). This layer should have a field relating each area to a Manhole ID
DWF Allocator Field	Pick the field containing **DWF Allocator** data
Usage Type	Select the field from the land use or parcels layer's database that

Field	contains land use type information
Manhole ID Field	Choose the field that relates meters to Manhole
New Field	Press to create a new field in the corresponding layer's database
Purge IDs	Press to remove all ID's from the corresponding database
Meter Layer	Select the layer representing meters in the system
Apply to Manholes in Domain	Use this option when you only wish to consider allocating meter demands to Manholes that are in the current active domain
Allocation Scaling Factor	Use this box to normalize demand data. The default value is set to unity (1.0) and may be changed to reflect the actual demand multiplier. It will be necessary to apply scaling factors when water duty factors are expressed in gpm/acre and acreages calculated from a polygon intersection are expressed in sq. ft. In this instance, use an allocation scaling factor of 1/43560.
Allocate Load	This button will run the DWF Allocator according to the user's specifications and will display the Allocation Report & Load Factor Calculator report/tool

Options	Opens the Allocation Options dialog to allow you to select some tool customization options

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Usage Data

The Allocator can automatically collect the unique usage type for all polygons within a load class layer. Specific load factors for each polygon classification field may be assigned. You can also add and delete classification records at your discretion.

The Usage Data table is used to correlate the different classification types with load factors and then to assign those values to the proper place in the model.

Description of the tool:

BUTTON	NAME	DESCRIPTION
	**Append Row**	Add a new row to the end of the current list of Load Factors to be applied
	**Insert Row**	Insert a row at the currently selected position
	**Set Rows**	Set the number of rows necessary for the chosen usage types.
	**Delete Row**	Deletes the currently selected row
	**Block Edit**	Select more than one cell in a column of data and click this button to edit all selected cells at one time.
	**Sort Ascending**	Sort the table by the selected column of data in ascending order

	**Sort Descending**	Sort the table by the selected column of data in descending order
	**Load**	Browse to a file location and load a file that contains saved usage data
	**Save**	Browse to a file folder location and save a file containing the created usage data. This file can later be loaded back in using the Load button.
	**Check Usage Type**	Automatically load all of the unique usage types from the 'Usage Type Field' of the registered secondary polygon layer (e.g. landuse)
	**Load Factor Calculator**	The Load Factor Calculator allows users to modify water duty factors “on-the-fly” and see the overall system demands fluctuate accordingly
	Table Fields	**Usage Type -** Identifier of the unique load class (e.g. Residential, Commercial, etc.) Load Factor - The loads for each Usage Type can be individually factored by the Load Factor multiplier **Description -** Enter a

		description for the load class (optional)
	Default Load Factor	This value will be used for any usage type that does not have an assigned load factor.
	Allocation Scaling Factor	This is a global multiplier, typically used for unit conversions.
Options...	**Options**	Set options for the Allocation
Close	**Close**	Close the tool

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INFOSWMM DWF ALLOCATOR CAPABILITIES

Sewer loads represent wastewater refuse and are assigned to junctions in a sewer network model. These loads must be accurately estimated and distributed geographically to properly represent and simulate the sewerage system. The process of allocating loads at the junctions is known as “loading” the network model. Proper network loading is essential prior to the utilization of a sewer model, either for planning/design purposes or operational studies.

The evolution of GIS and information management systems has led to the availability of efficient geospatial tools for loading sewer network models. InfoSWMM DWF Allocator works synergistically with InfoSWMM to accurately process detailed geospatial data for loading the network model based on loading type, location, and areas of contribution. The program uses advanced geometric polygon processing algorithms derived from computational geometry to automate the process of allocating representative loads and associated patterns and transferring this data to the appropriate fields in the network model.

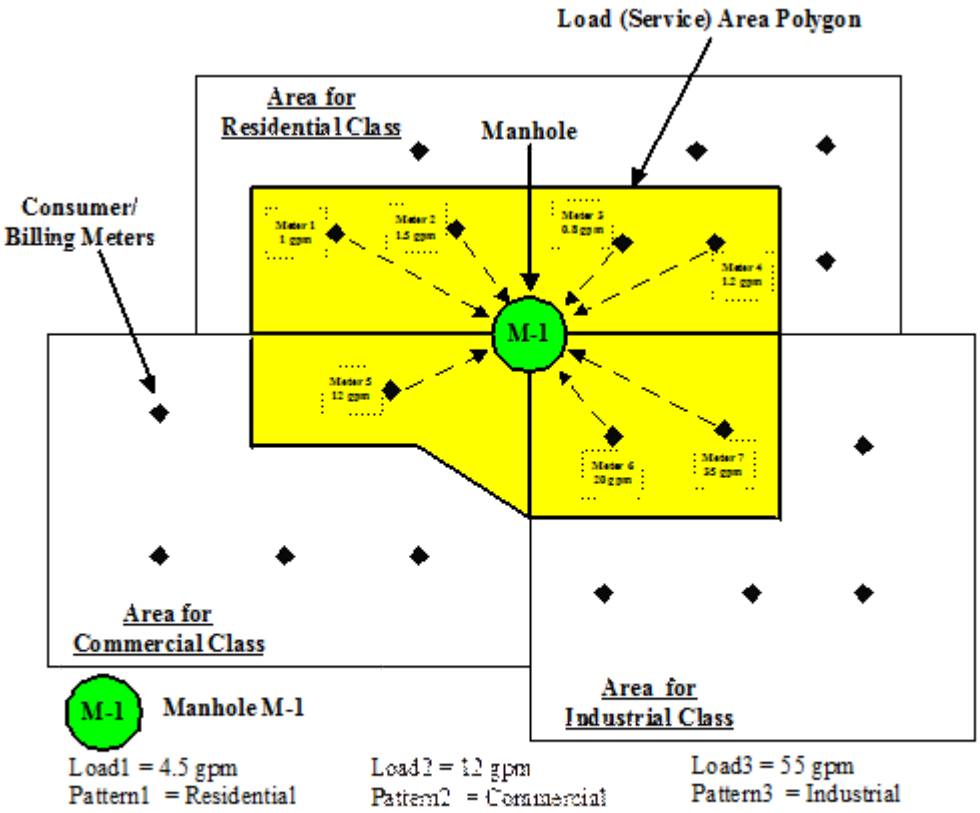
2.1 METHODS FOR ALLOCATING LOAD

InfoSWMM DWF Allocator offers seven powerful and fully automated geospatial methods for accurately computing and loading network models based on loading type, location, and areas of contribution:

ded meter billing data

Customer/meter billing data (each with distinct X and Y coordinates) can provide a reasonable measure of localized loads imposed on the sewer collection system. InfoSWMM DWF Allocator uses advanced GIS technology to assign geocoded load data to designated junctions (manholes). For each assigned junction in the network model, the program identifies and sums the loads from all the meters within its associated load area polygon. These loads may be adjusted as desired to reflect the actual sewage production within a load area polygon. Load area polygons can be digitized using InfoSWMM DWF Allocator or defined by a shapefile. Load area polygons that are assigned to a specific junction will have a unique identifier for which loads are assigned. Utilizing spatial intersection, the program sums the consumption of each meter contained within that junction's load area polygon and assigns that total load to the sewer model load database.

Many customer-billing systems keep track of the type of user for each account (i.e. residential, commercial, industrial, irrigation, agricultural, park, school, etc.). When InfoSWMM DWF Allocator assigns billing loads to junctions, it maintains the load summation for each loading type. Therefore, the final load that is determined will maintain the load for each loading category (e.g. land use). This approach is especially useful for developing diurnal load patterns for each load category as some load categories will need to be reduced in greater proportion to others (e.g. commercial vs. residential). If no load types are specified then all loads will be summed together.

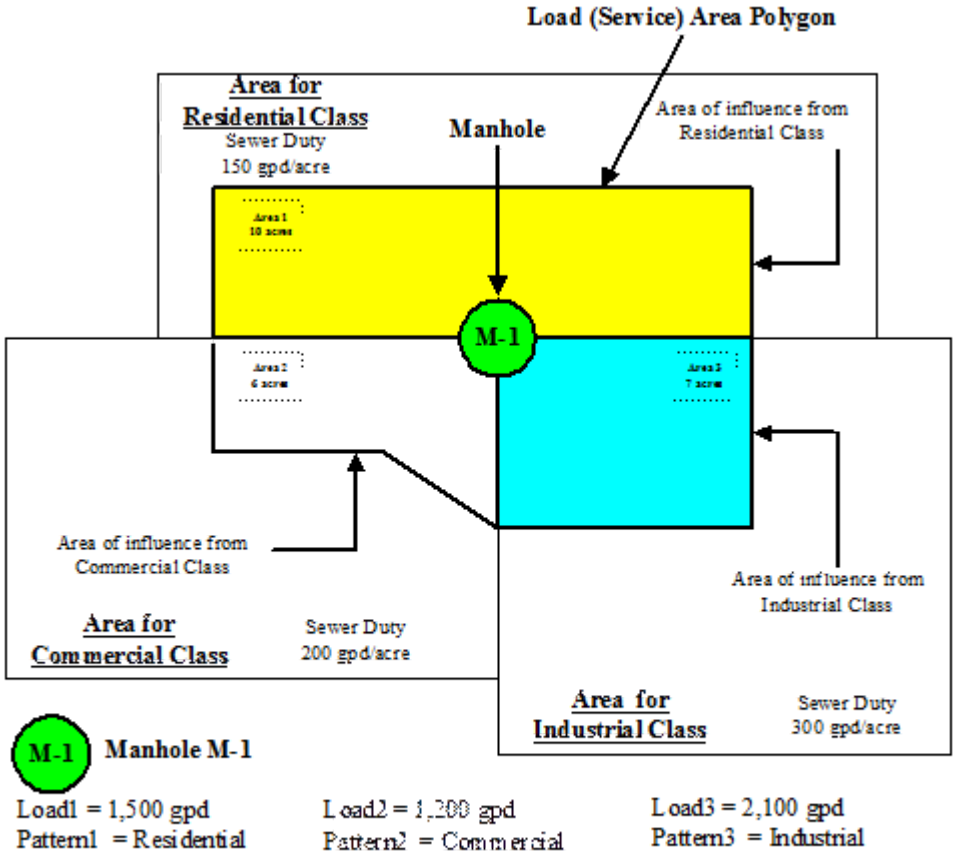


2. Polygon intersection

InfoSWMM DWF Allocator offers a highly efficient polygon processing routine for the intersection and allocation of loads between two polygon layers. Loads at junctions are allocated according to polygon classes (e.g., in the case of land use information residential, commercial, industrial, recreational, governmental, schools, etc.) collected at a specific junction. By design, each class has its own unique sewer load factor and four distinct diurnal patterns. Therefore, categorization on consumer classes and the subsequent spatial allocation of loads are instrumental in developing a representative sewer network model.

Typically, each load area polygon is assigned to a single junction and represents one to many load classes. Independent of this service area assignment, each load class categorization is also represented by a polygonal boundary definition. Land use (zoning) categorization is the most commonly used representation of load categorization. Superimposing the areas of influence from the load categorization polygon layer over the load area polygon coverage, InfoSWMM DWF Allocator automatically derives the respective influence of individual load classes upon the given junction and subsequently allocates the loads of the individual load classes to the designated junction. Involved in this process is a lookup table where classes are assigned load factors. The multiplication of these load

factors with the composite polygon generates the total load for each load class for each analysis junction.

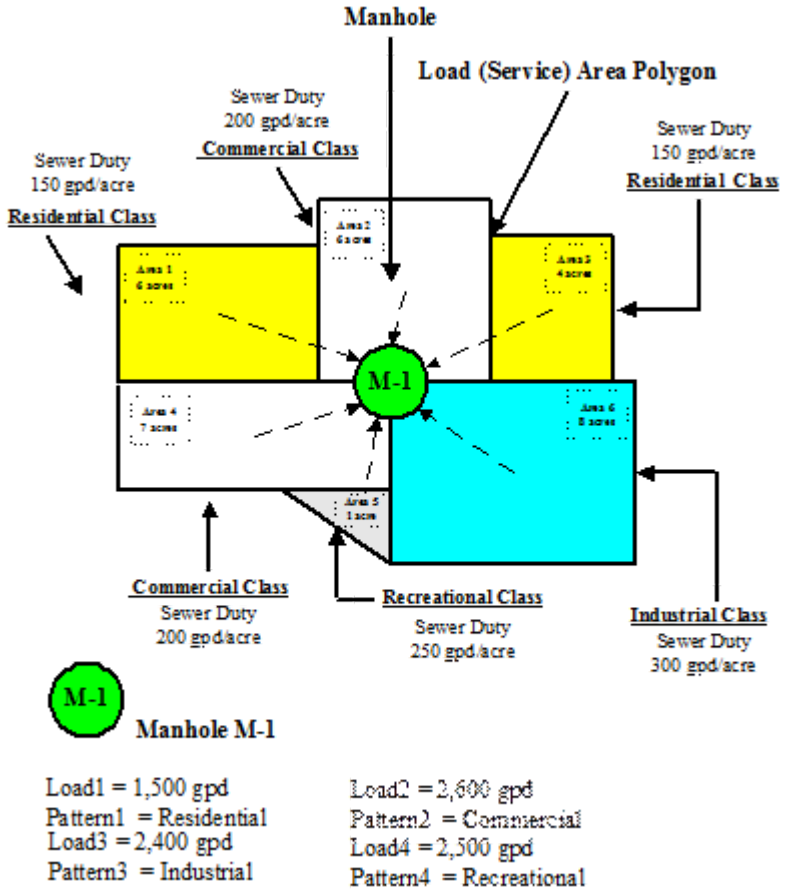


InfoSWMM DWF Allocator considers the service area polygons as the “Primary” polygon coverage while the load class layer is represented as a “Secondary” polygon definition. During the allocation process, the program intersects polygons of the “Primary” layer with those of the “Secondary” layer. Additional secondary layers can be further appended to the system for evaluation, thus expanding the allocation process into a multi-dimensional solution. One typical application of an additional secondary layer is the phasing of development, such as alternative zoning, the five year general plan, etc. The combination of these multiple “Secondary” layers with the “Primary” layer enables sophisticated load evaluation over a range of planning horizons, making InfoSWMM DWF Allocator an invaluable load analysis and master planning tool.

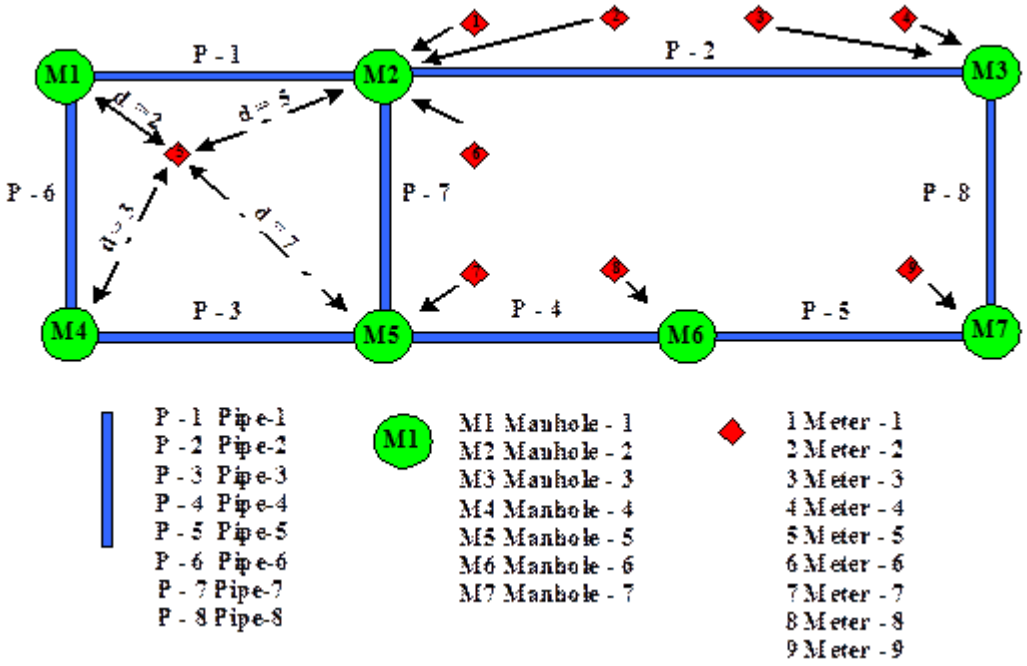
3. Polygon extraction

With this method, the total load at each junction is calculated by summing all of the individually assigned load categorization polygons assigned to each junction. Individual class loads can be

summed to total pattern loads. The polygon extraction process is applicable in instances where load area polygons have been intersected with a land base or other load class polygon boundary, i.e. load data is already integrated with demographic information.



4. Closest Junction – locates the closest junction and allocates loads



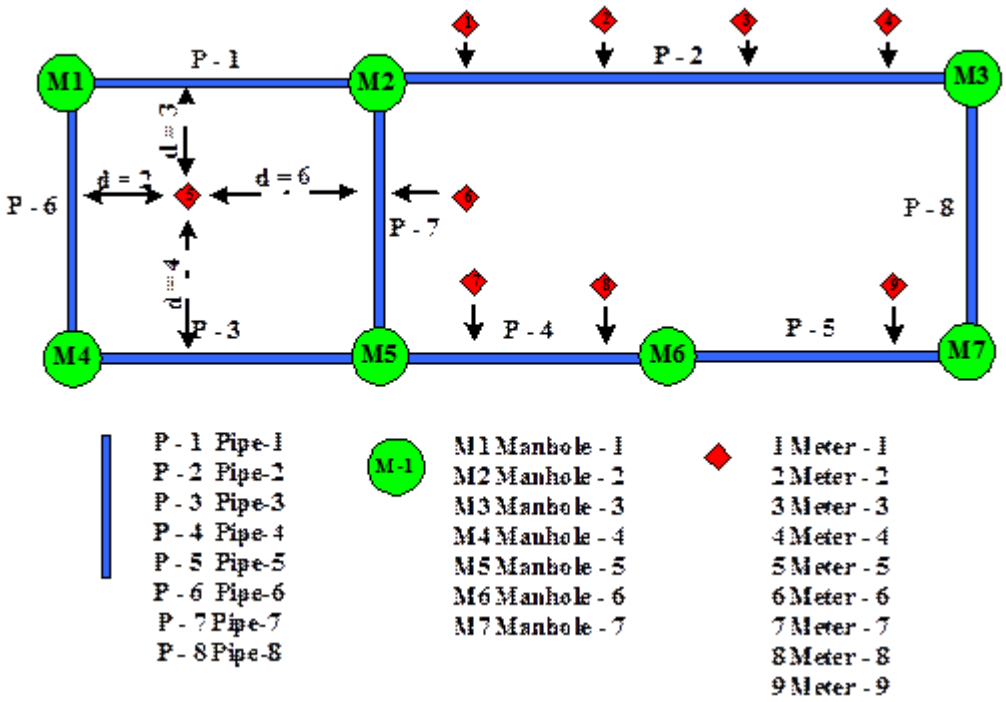
The closest junction method works in conjunction with customer/meter data. This method provides a means to assign loads to the junctions closest to the billing meter. Advanced algorithms are used to locate and allocate loads to the closest junction. For each of the junctions, the loads are then summed by customer type (industrial, residential, etc.) to establish localized loads imposed on each of the junctions.

Domains may be created to selectively apply this method to user specified junctions.

5. Closest conduit

The closest conduit method also works synergistically with billing meter data. For each of the meters, the closest conduit is first located. Advanced search algorithms are used to aid in this process. The meter loads are then assigned to either the closest upstream junction, downstream junctions, or both for each of the selected conduits.

The loads that are routed to the nearest junction may be assigned in full or may be split in a weighted fashion between the two junctions connecting the conduit. For each of the junctions, all contributing meters are summed to represent the total load imposed on that junction.



6. Meter-junction allocation

This method is similar to the closest junction method, except it allocates loads according to a user-defined meter allocation. For example, the closest junction method uses GIS technology to automatically determine how loads from meters will be assigned. In this method, the user is able to graphically assign which meters will be allocated to which junctions. The ability to assign meters to specific junction nodes is achieved through the use of the meter assignment dialog box. For each of the meters assigned to specific junctions, loads are then summed to establish localized loads imposed on each of the junctions.

7. Meter-conduit allocation

This method is similar to the closest conduit method, except it allocates loads according to a user-defined meter allocation. For example, the closest conduit method uses GIS technology to automatically determine how loads from meters will be assigned to system conduits. In this method, the user is able to graphically assign which meters will be allocated to which conduits. The ability to assign meters to specific conduits is achieved through the use of the Meter Assignment dialog box. Load allocation from the meters to the respective upstream and downstream nodes of the conduit can also vary according to the meter assignment option selected by the user.

Finally, InfoSWMM DWF Allocator provides the flexibility to manually create and modify any of the above data, including meter locations, land use polygons, load area polygons, or composite polygon boundaries. You can directly “activate” the layer you choose to edit/modify and use the customized editing tools available within the InfoSWMM DWF Allocator toolbar to make the desired changes.

2.2 THE CORE INTERFACE

InfoSWMM DWF Allocator is designed to work synergistically with InfoSWMM to create and simulate realistic network models of sewer collection systems. InfoSWMM supports the mapping of multiple layers that can be imported from many data sources. Load data may consist of independent load class polygons, customer/meter billing data, or composite service area polygons. To estimate loads using InfoSWMM DWF Allocator, all polygon layers must first be registered.

To register polygon layers, they must first be added to the map using the Add Data ( ) tool. Subsequently, the polygon layer may be registered ( ) as either a “Primary” (load area polygon) or “Secondary” (land use, etc.) layer. When a new layer is created using InfoSWMM DWF Allocator, it is automatically registered.

Make Active Make the selected polygon layer active.

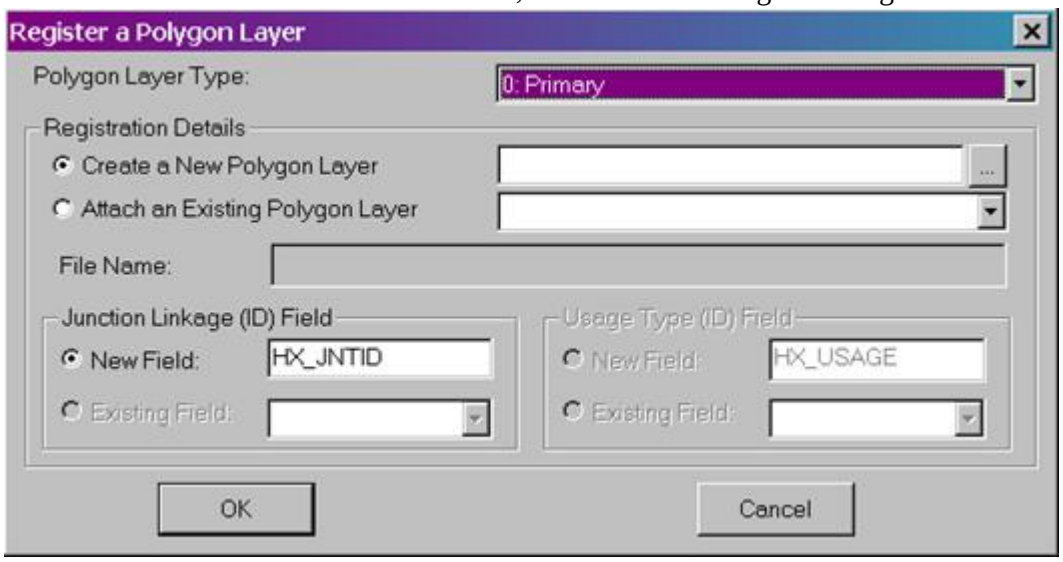
New... Create a new polygon layer or register an existing polygon layer.

Unregister Unregister a registered polygon layer.

Clear All Unregister all registered polygon layers.

Close Exit the *Polygon Layer Registration* dialog box.

When New... is selected, the following dialog box is displayed:



Polygon Layer Type: Specify polygon layer type: · *0:Primary* – Load area polygon layer · *1:Secondary* – Load class polygon layer (land use, zoning, etc.) · *2:Intersected* – An intersected polygon coverage has already been established.

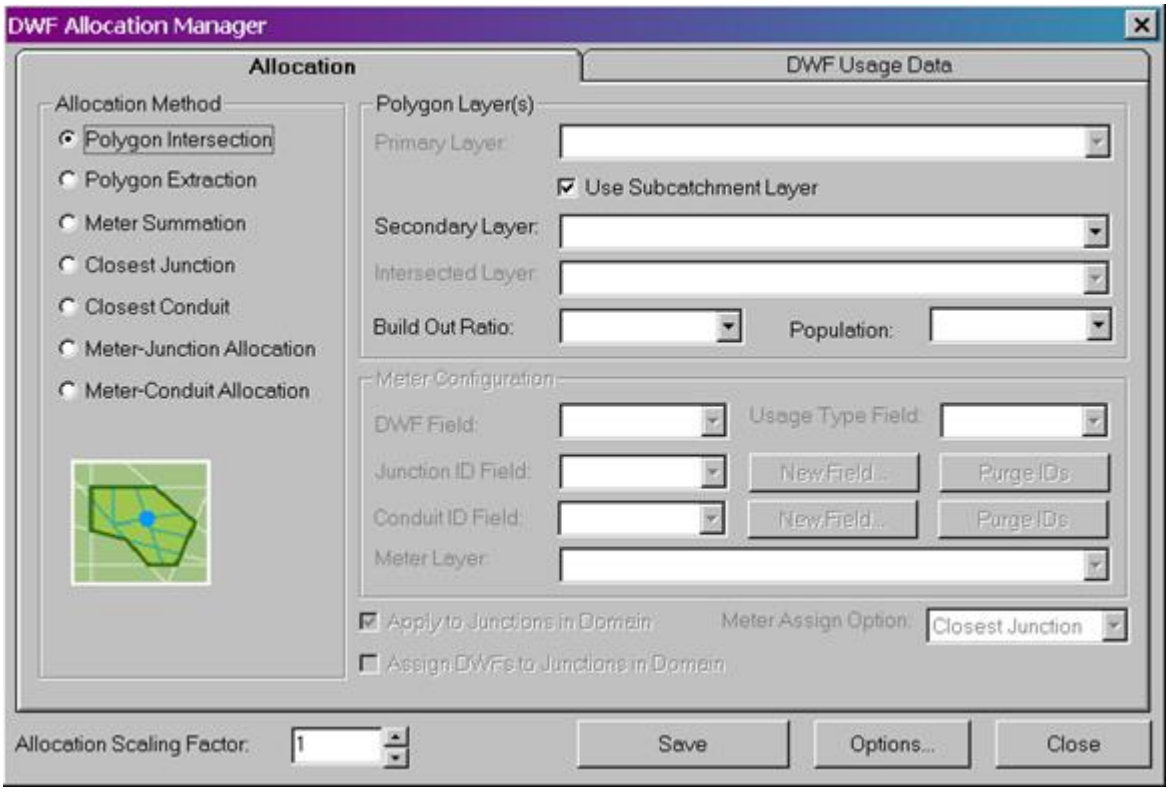
Registration Details Select whether you are creating a new polygon layer or registering an existing polygon layer.

Junction Linkage (ID) Field Refers to the junction ID fields in the *0:Primary* polygon layer. Select an existing attribute field in the existing load area polygon layer where the junction ID is mapped or specify a new attribute field to assign the junction node ID.

Usage Type (ID) Field Refers to the field in the *1:Secondary* layer representing the land use classification. Select an existing attribute field in the existing load class polygon layer where the junction ID is mapped or specify a new attribute field containing classes.

NOTE: *When allocating loads based on metered billing records, a secondary layer is not required (Primary only).*

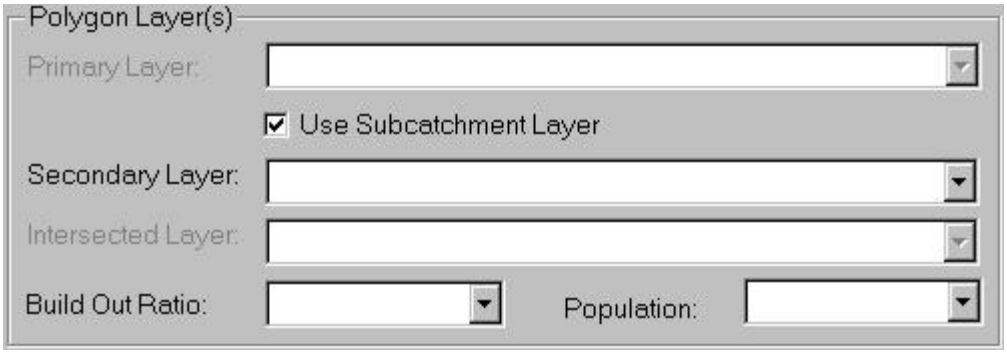
Once a layer has been registered, the polygon layer may be modified or the allocation process may be started. Use Allocate Load ( ) to display the load allocation manager dialog box as shown below.



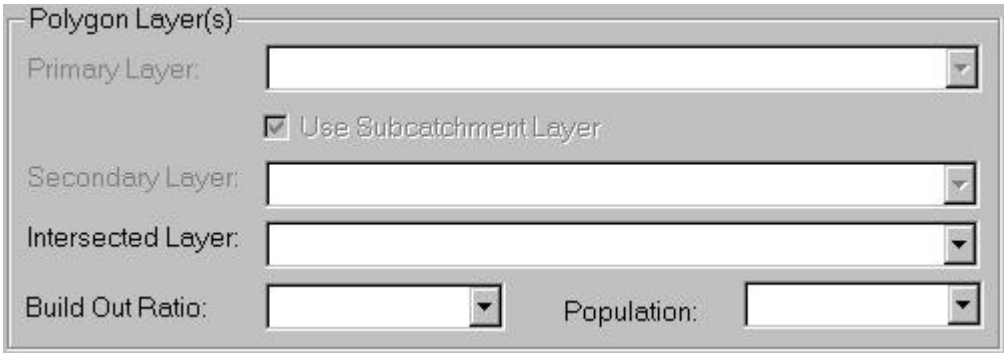
The allocation methods are explained below:

Allocation Method Defines the method used to allocate junction loads.

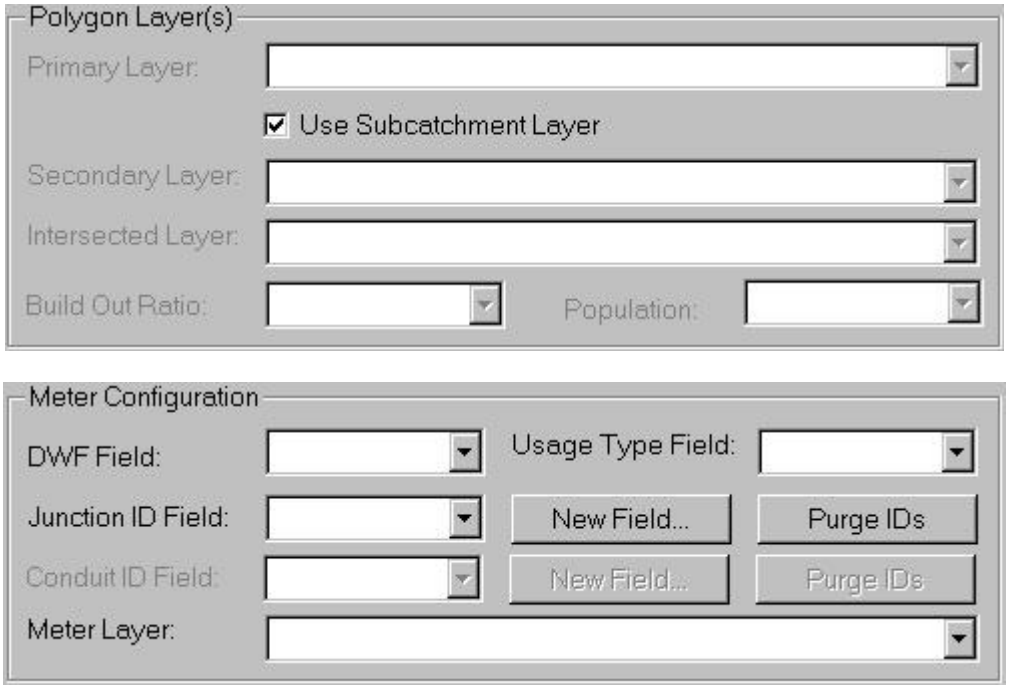
Polygon Intersection Primary and secondary polygon layers must be specified using this method. The subcatchment layer may be used as the primary layer.



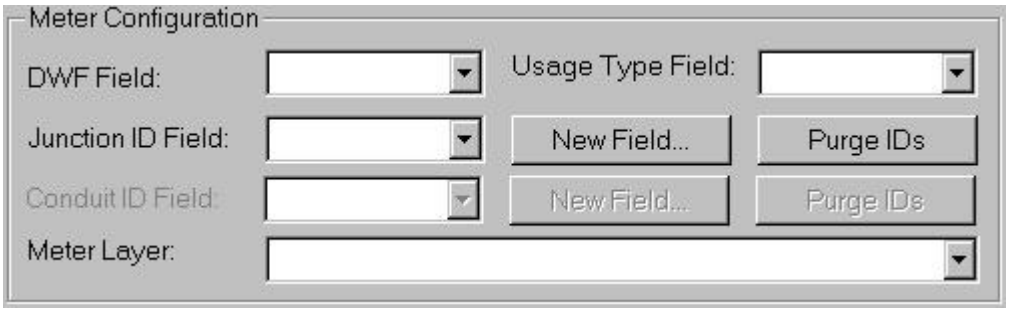
Polygon Extraction Only the intersected layer must be specified for this method.



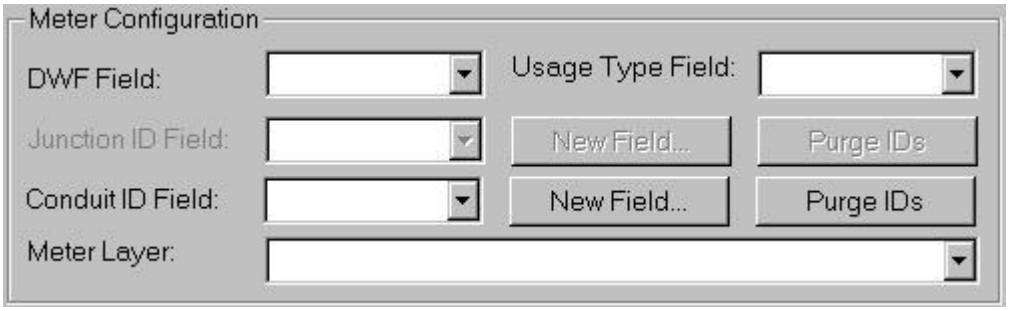
◉ Meter Summation Only the primary layer must be specified for this method. The subcatchment layer may be used as the primary layer. Additionally, the meter configuration data must be specified.



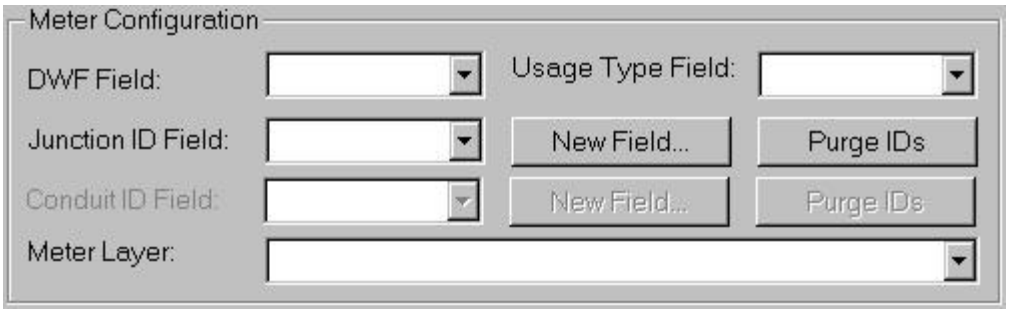
◉ Closest Junction The DWF Field, Usage Type Field, and Meter layer must be specified.



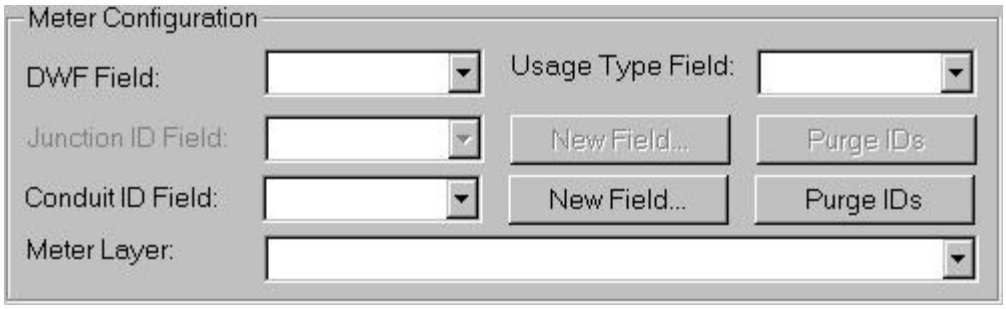
◉ Closest Conduit The DWF Field, Usage Type Field, and Meter layer must be specified.



Meter-Junction Allocation The field which possesses the junction ID's associated with each meter must be specified.



Meter-Conduit Allocation The field which possesses the conduit ID's associated with each meter must be specified.



The allocation options and features are explained below: Primary Layer: Select the loading area layer Secondary Layer: Choose the land use layer ☑ Use Subcatchment Layer Check to use the subcatchment layer as the primary layer Intersected Layer: Specify the preprocessed layer Build Out Ratio: Select the field containing percent developed Population: Choose the field containing population DWF Field: Select the field containing base flow Usage Type Field: Choose the field containing land use type Junction ID Field: Select the field relating meters to junction ID's Conduit ID Field: Choose the field relating meters to conduit ID's Meter Layer: Select the meter layer New Field... Press to create a new field in the polygon layer Purge IDs Press to remove all ID's from the specified field ☑ Apply to Junctions in Domain Allocate DWF only to junctions in the domain ☑ Apply to Pipes in Domain Allocate DWF only to conduits in the domain

☑ Assign DWFs to Junctions in Domain Allocate DWF only to junctions in the domain that are connected to pipes receiving loads from the closest conduit operation.

Meter Assign Option: During the closest-conduit and meter-conduit allocation process, this option specifies the technique used to allocate meter loads to the upstream and downstream junctions of a conduit. Those options are as follows: · **Evenly Divided** - The total loads determined from all meters assigned to a particular conduit will be divided by 2 and assigned equally to both the upstream and downstream junctions of the conduit.

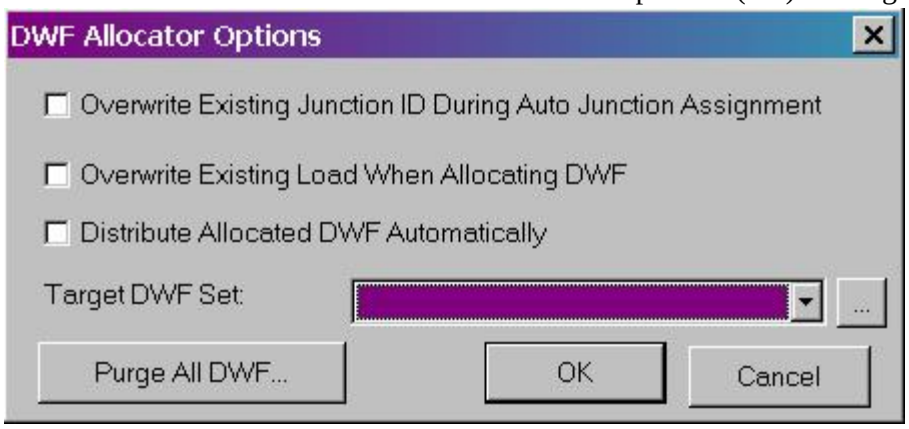
· **Distance Weighted** - A geometric analysis is conducted for each meter assigned. Loads are then divided between two nodes according to their weighting. For example, if a meter has 10 gpm and is 3/4 way down a conduit, 1/4 of 10 gpm will go to one junction while 3/4 of 10 gpm will go to the other.

· **Closest Junction** - Meters will be allocated to the junction (connected to the closest conduit) closest to them.

· **Furthest Junction** - Opposite of closest junction, closest meters will be assigned to the furthest junction node.

Allocation Scaling Factor: Normalize load data to appropriate units (e.g., English units, SI units). The default value is set to unity (1.0) and may be changed to reflect the actual load multiplier.

Options... Launch the load allocator options () dialog box as shown below



☐ Overwrite Existing Junction ID During Auto Junction Assignment Junction IDs will be overwritten during automatic junction assignment.

☐ Overwrite Existing Load When Allocating DWF Junction loads will be overwritten during the load allocation process. If unchecked, the computed loads will be

added to the existing junction loads.

☐ Distribute Allocated DWF Automatically Use this option when the load area polygons contain more than one junction per polygon and you wish to uniformly distribute the total load to all the junctions within each polygon. This option is only available with the Polygon Intersection and Meter Summation allocation methods.

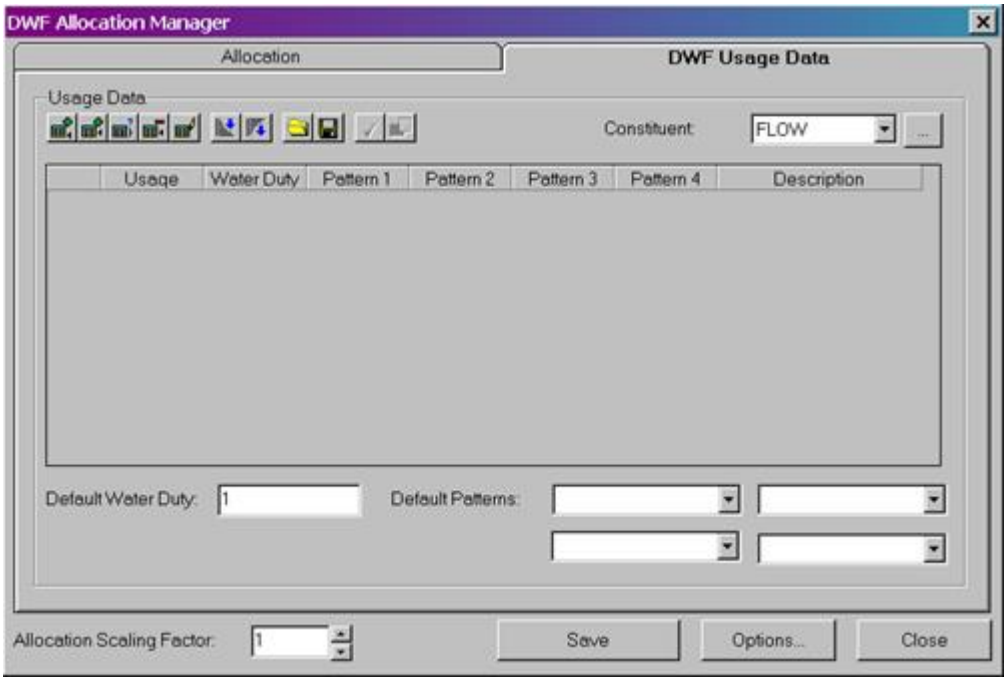
Purge All DWF... Erase all dry weather flows from the database

Target DWF Set: Choose the dataset to enter the flows into Allocate DWF InfoSWMM DWF Allocator will perform the analysis and apply the calculated loads to the designated network nodes.

InfoSWMM DWF Allocator can automatically collect the unique usage type for all polygons within a load class layer. This is done by selecting the  icon. Next, specific load factors to each polygon classification field may be assigned. You can also add and delete classification records at your discretion.

The DWF usage data table is used to correlate the different classification types with load factors and then to assign those values to the desired InfoSWMM DWF database field. These load fields are used internally by InfoSWMM when running a network simulation.

When using the “Meter Summation” allocation method, the loads for each meter within a distinct load area polygon are summarized and applied to the appropriate load field. For “Polygon Intersection” and “Polygon Extraction” methods, the load factor for each unique class field is multiplied by its composite acreage found by spatial intersection.



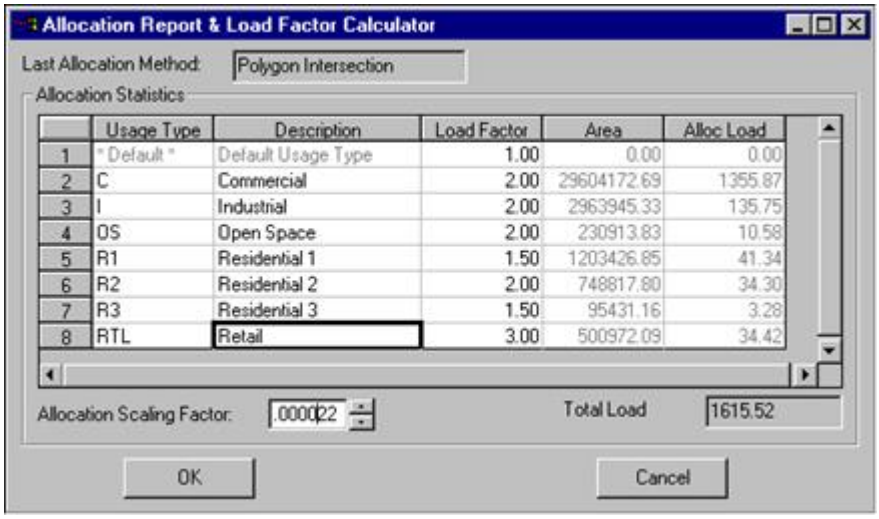
Some DWF Usage Data options are explained below: *Load*: This command is used to bring in saved usage data file (*.wdf file).

Save: This command is used to save changes made to the usage date table.

Check Usage Type: Allows the user to automatically generate a list of unique classes/classifications from a "Secondary" layer or meter billing record GIS layer. When the "Usage Type" field is already populated, click this button to re-verify and update the listed usage types with those that are stored in the class/classification polygon coverage.

Load Factor Calculator: The Load Factor Calculator allows you to alter load factors as necessary to generate a Total Load that matches the Average Day Load (ADL) value from your utility's production/purchase records. The Allocation Report & Load Factor Calculator dialog box can be accessed only after loads have been allocated. This dialog box is also launched automatically every time InfoSWMM DWF Allocator is run.

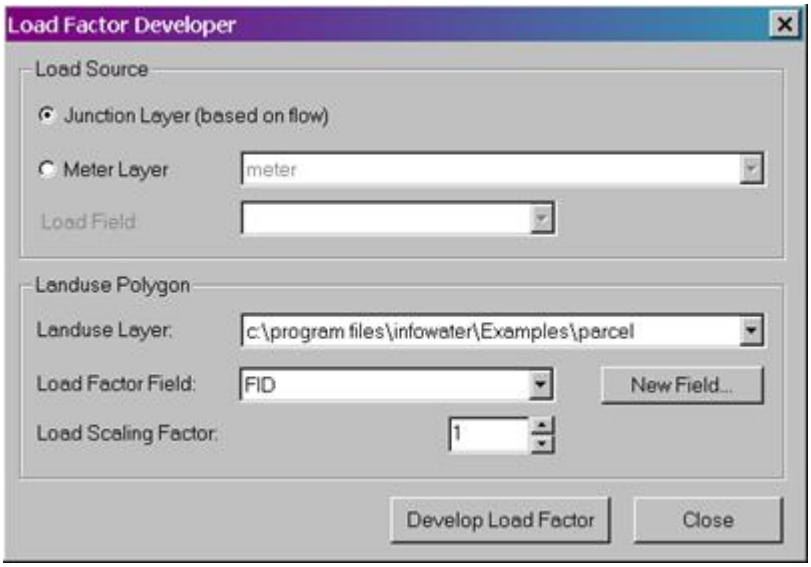
Constituent: Choose flow or a pollutant Default Patterns: Specify patterns to be assigned to all loads during allocation Default Water Duty: Enter the default loading factor On allocating loads successfully, the Allocation Report & Load Factor Calculator dialog box is launched as shown below. The Load Factor Calculator dialog box allows you to alter load factors as necessary to generate a Total System Load that matches a known system load value from a sewer treatment plant or other flow metered device.


Allocation Report & Load Factor Calculator
Last Allocation Method:
Polygon Intersection
Allocation Statistics
Usage Type
Description
Load Factor
Area
Alloc Load
1 * Default * Default Usage Type 1.00 0.00 0.00
2 C Commercial 2.00 29604172.69 1355.87
3 I Industrial 2.00 2963945.33 135.75
4 OS Open Space 2.00 230913.83 10.58
5 R1 Residential 1 1.50 1203426.85 41.34
6 R2 Residential 2 2.00 748817.80 34.30
7 R3 Residential 3 1.50 95431.16 3.28
8 RTL Retail 3.00 500972.09 34.42
Allocation Scaling Factor:
.000022
Total Load
1615.52
OK
Cancel

2.3 ADDITIONAL INFOSWMM DWF ALLOCATOR OPTIONS

Other options provided in InfoSWMM DWF Allocator menu bar are explained as below: *Load Factor Developer*: Use this function to determine Load Factors (load per unit area) automatically based on spatially located loads and polygonal landuse boundaries.

There are no standards for a Land Use Load Factor; they vary from Agency to Agency. As an example, there are typically multiple Land Use designations for a Residential and are typically separated based on densities (R-1, R-2, R-3, etc.). However, an R-2 Land Use in one City may be defined as 3-6 dwelling units per acre, while in another City it is 2-5 du/ac. This makes determining specific Load Factor a daunting task. The Load Factor Developer combines the areas present in a polygon coverage of Land Use data with either (1) geo-coded billing data or (2) load demand data to automatically determine Load Factor Factors for every Land Use polygon.



Load Source Specify the point source to be used in load development Junction Layer (based on flow) This option uses the total load present in the Junction Hydraulic database table, summing all loads prior to performing the Load Factor calculation.

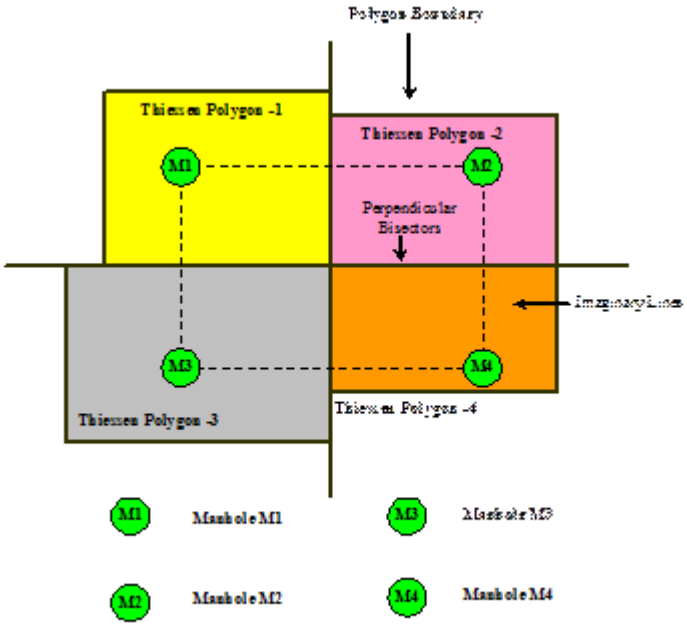
Meter Layer Specify the appropriate point layer and the database field (Load Field:) where the loads are stored Landuse Polygon Identify the information needed from the Land Use data.

Landuse Layer: Choose the Land Use layer Load Factor Field: Select the field within the Land Use polygon theme layer that stores the calculated Load Factors New Field... Create a new field in the Land Use layer to store the calculated Load Factors.

Load Scaling Factor: Allows the user to apply a multiplication factor as a global adjustment.

Develop Load Factor Activates the Load Factor calculation and populates the selected Load Factor Field with the determined Load Factors.

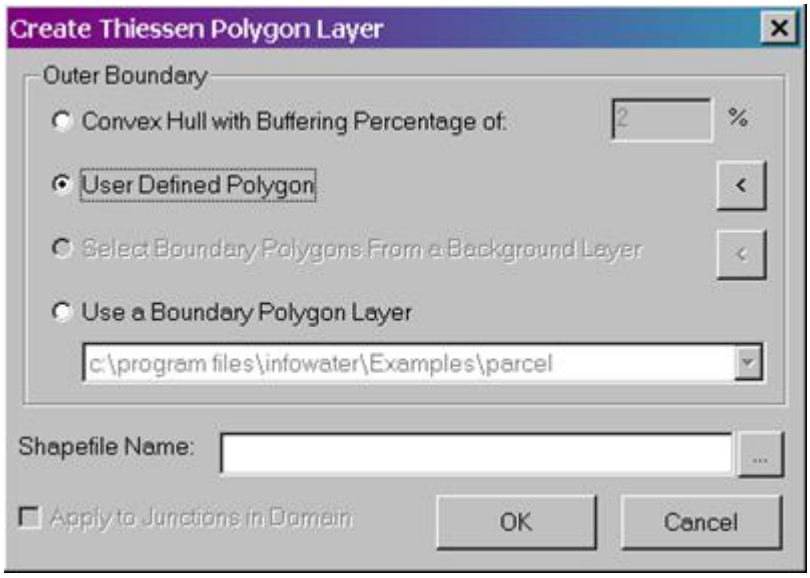
Other buttons on the DWF Allocator toolbar are detailed below: *Edit Polygon Attribute*: Edit attributes of a polygon layer. The shapefile of interest must be selected in the pull-down box.



Import Meter Data: Use this icon to import existing meter data. This feature allows you to convert any text file into a point theme shapefile representing your meter data. The text file must have coordinates (X,Y), ID and a load for each record. Optionally, a usage type may be included (e.g., residential, commercial, industrial).

Create Thiessen Polygon: Use this icon to create Thiessen polygons. Thiessen polygons divide an area into polygons by creating regions that bisect known points. Imaginary lines are first drawn between the different junctions and then perpendicular bisectors are constructed from each of these imaginary lines. The bisectors are then extended to one another to form Thiessen polygons.

Options for creating Thiessen polygons are described below.



Outer Boundary Select a method for defining the outer boundary of the polygon layer. This option controls how far past the outermost junctions the polygons will extend.

Convex Hull with Buffering Percentage of: The convex hull technique determines the junctions that lie on the "outer perimeter" of your network model. Specify a buffering percentage to add to the polygon area beyond these points.

User Defined Polygon Use this technique to manually define the polygon boundary. Thiessen polygons are created inside the user defined area.

Select Boundary Polygons From a Background Layer Select the outer boundary polygons to be used in the boundary definition from an existing background layer. The existing layer needs to be first added to the ArcMap table of contents.

Use a Boundary Polygon Layer Select the outer boundary from an existing background layer. The outer boundary of that layer will be used for the boundary definition. The existing layer needs to be first added to the ArcMap table of contents.

Shapefile Name: Select a name for the polygon shapefile  *Auto Junction Assignment*: Automatically assign the first encountered junction ID within each polygon to be the junction for that service area polygon  *Assign Contributing Polygon*: Allows you to manually assign a junction ID to selected contributing polygon(s)  *Add Loading Junctions to Domain*: Place all junctions with assigned contributing polygons to the current domain Finally, the polygon editing tools provided in InfoSWMM DWF Allocator toolbar are explained below: *Add Rectangle*: Draw rectangular polygons. Polygon attributes will need to be specified.

 *Add Polygon*: Draw multi-vertex polygons. Polygon attributes will need to be specified.

 *Append Polygon*: Create a new polygon by snapping the edges of the drawn polygon to edges of existing polygons. Smart topology allows the user to draw a polygon without having to match the edges of existing polygons  *Split Polygon*: Split a polygon into two distinct polygons. First select a polygon to be split, than draw a line through the polygon identifying the split location.

 Union: Merge two separate polygons into a single polygon. Adjacent polygons must have a common side. Common sides will be dissolved during the process.

 *Subtract*: Cookie-cut the first selected polygon with the second selected polygon.

 *Intersec*t: Reduce two overlapping polygons to their overlapping area only. Select two overlapping polygons one by one.

 *Delete Polygon*: Delete selected polygons.

 *Move Polygon*: Move selected polygon from one location to another.

NOTE: *Any changes made to the external shapefiles are automatically saved, even if InfoSWMM is closed without saving your current project.*

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Innovyze DWF Allocator User Guide

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InfoSWMM

Introduction

Determining

accurate, representative dry weather flows (DWF) and the spatial distribution

of load throughout the network model is a key element of sanitary and

combined sewer collection modeling. DWF data can be derived from many

sources including flow metering, water consumption records, telemetered

system flows, and estimates from consumer characteristics, such as population,

land use, traffic counts, or other parameters. These data are assigned

as DWF values at individual junctions within the network model, where

selected junctions collect flows from a distinct service area polygons.

InfoSWMM

DWF Allocator brings you unprecedented speed, accuracy, and flexibility

for calculating, distributing, and managing DWF data in your sewer network

model. It fully automates the geographical allocation of sewer loads to

ensure the development and simulation of credible sewer network models.

An

indispensable master planning tool, InfoSWMM DWF Allocator gives you seven

highly advanced and efficient geospatial methods for processing geometric

polygons to accurately compute and load network models based on load type,

location, and variation:

1. Geocoded meter

billing data (meter DWF database)

2. Polygon intersection

– spatial intersection of multiple polygon layers

3. Polygon extraction

– spatial summation of DWF category area polygons

4. Closest Junction

– allocate loads to the nearest junction

5. Closest Conduit

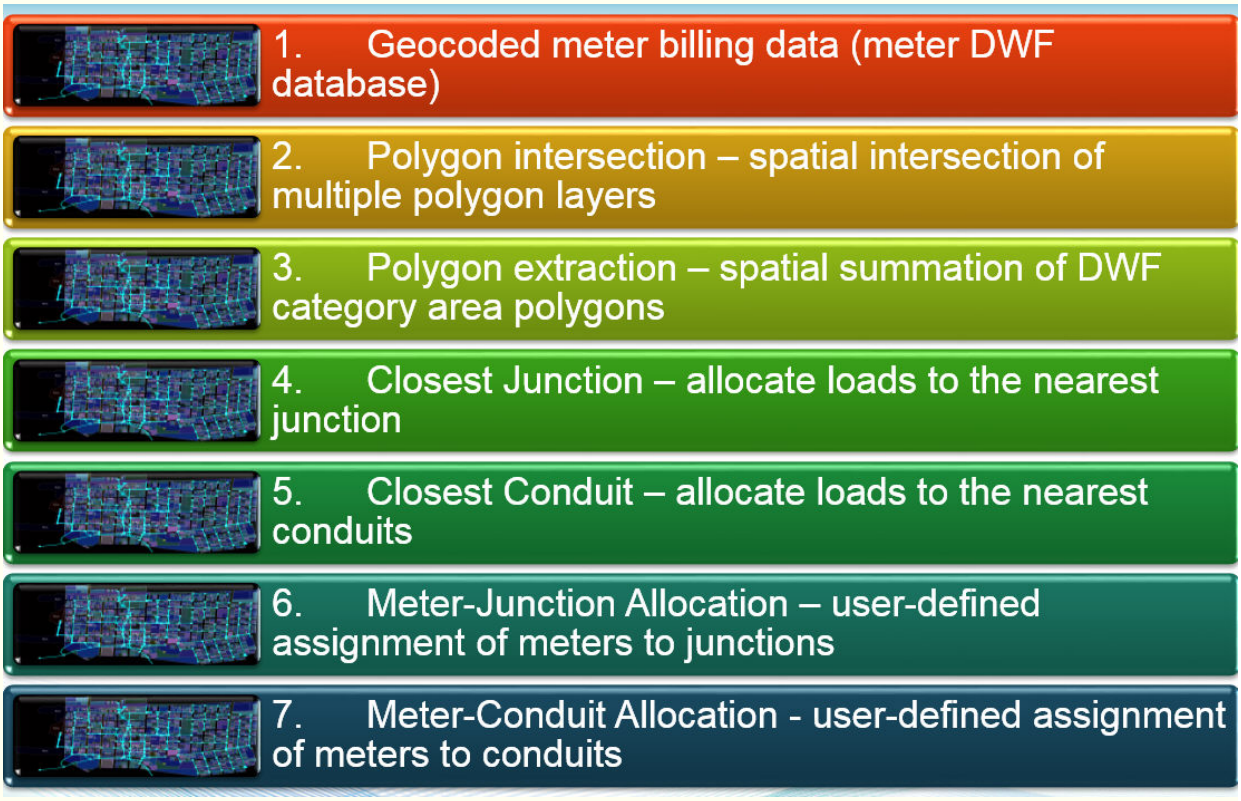
– allocate loads to the nearest conduits

6. Meter-Junction

Allocation – user-defined assignment of meters to junctions

7. Meter-Conduit Allocation - user-defined

assignment of meters to conduits



The first method uses geographic

information system (GIS) layers to automatically allocate geocoded load data. Here,

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DWF Allocator determines the flow at each network junction by identifying and summing all the customers/meters in its associated load area polygon. These loads include customers such as residential, commercial, industrial, schools, parks, golf courses, hospitals, etc. which are drawn directly from their spatially located water consumption records. In the second method,

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DWF Allocator automatically calculates flows based on a direct spatial intersection between load categorization polygons (e.g., land use polygons, population polygons, pressure zone polygons, TAZ polygons, census tract polygons, meter route polygons, and others) and load area coverage polygons (service area polygons). In the third method, junction flows are calculated by summing individually assigned load category polygons.

The fourth and the fifth methods work in conjunction with geocoded customer/meter data. The fourth method locates the junction closest to the meter by using advanced search algorithms and then allocates loads. In the fifth method, search algorithms are used to locate the closest conduit to each meter. Loads are then assigned to the nearest junction on either side of the conduit or divided based on a distance-weighted approach. The last two methods are similar to the closest conduit and the closest junction methods, except the user is able to determine which meters will be assigned to

which junctions and conduits in the system. The meter-junction and the meter-conduit allocation methods allow the user the freedom to graphically determine which meters are tributary to which junctions and conduits in the sewer collection system.

Within a true GIS environment, InfoSWMM DWF Allocator allows you to edit, manipulate, and manage all your GIS polygons and their associated data with incredible ease and speed. It also considers both existing systems and future system conditions such as build-out and phased land use projections – a necessary feature for effectively staging your capital improvement program. These comprehensive capabilities will allow you to effectively utilize your engineering experience to leverage your existing GIS data investments and to strategically define your network loads for various planning horizons in your master planning effort.

You can now readily build and analyze more complete, representative, and reliable sewer network models than ever before and in record time. Without that credibility, the most complex and theoretically sound model that could be developed would not be effective in helping you plan a sound system. Accurate load estimation and distribution will not only result in more precise simulations, but will also greatly assist you in operating and managing your sewer collection systems and in developing rigorous capital improvement programs.

We are happy to bring you this practical and highly sophisticated load allocation geospatial application tool to continue to effectively support your sewer collection management activities.

Our high-level, state-of-the-art research and development effort in GIS-based network modeling is continuing at a rapid pace and we intend to update and refine InfoSWMM DWF Allocator to reflect this progress. We are pleased to be at the forefront of this computer technology and to continue to advance it to an unprecedented level of reliability and performance.

Colby T. Manwaring, P.E.

Chief Executive Officer,

Innovyze Inc.

Portland, Oregon USA January 30, 2019

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InfoSWMM

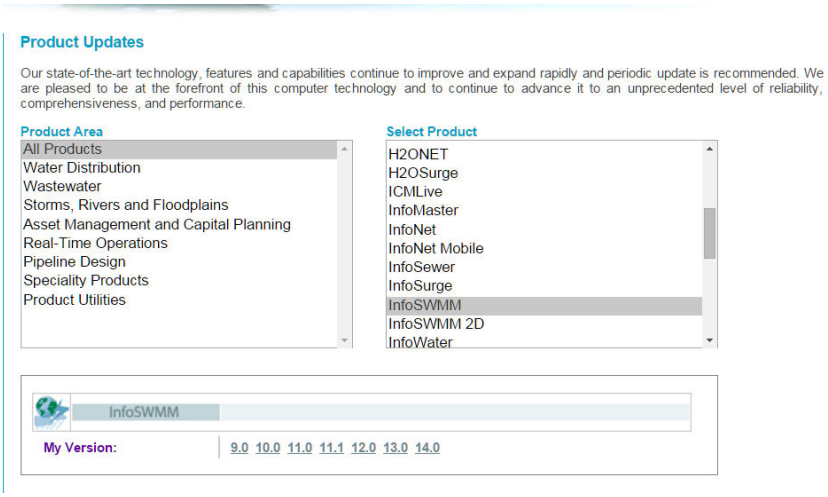
Installation Guide

System Requirements for InfoSWMM/InfoSewer w ArcGIS, H2OMap Sewer/SWMM does not need ArcGIS	
Compatible 32-bit OS:	Windows Server 2008 R2, Windows Server 2012 R2, Windows 7/8/8.1/10 pro or above
Compatible 64-bit OS:	Windows Server 2008 R2, Windows Server 2012 R2, Windows 7/8/8.1/10 pro or above
Compatible ArcGIS:	10.0, 10.1, 10.2 and 10.3 - 10.4(**Check your PC ability to run ArcGIS**)
Prerequisites:	**Microsoft Visual C++ 2008 Redistributable - x64 v9.0.30729.17**/**Microsoft Visual C++ 2008 Redistributable - x86 v9.0.30729.17**, **Microsoft Visual C++ 2010 Redistributable - x86 v10.0.40219.1**/**Microsoft Visual C++ 2010 Redistributable - x64 v10.0.40219.1** and **Windows Internet Explorer 7 or later**
Hardware Requirements:	CPU Speed: 2.2 GHz minimum or higher; Hyper-threading (HHT) or Multi-core recommended Processor: Intel Pentium 4, Intel Core Duo, or Xeon Processors; SSE2 (or greater) Memory/RAM: 2 GB or higher Screen Resolution: 1024 x 768 recommended or higher at Normal size (96dpi) Disk Space: 500 MB of free space to accommodate a full setup installation and additional disk space - keep as much free disk space available as possible. Its virtual memory system needs additional free disk space when working on large projects Video/Graphics Adapter: 64 MB RAM minimum, 256 MB RAM or higher recommended. NVIDIA, ATI and INTEL chipsets supported Networking Hardware: Simple TCP/IP, Network Card or Microsoft Loopback Adapter is required for the License Manager

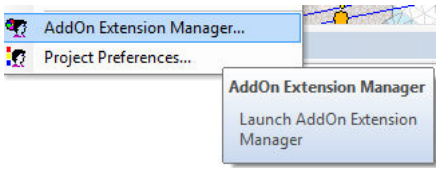
Installing Innovyze Software Add On's and Extensions

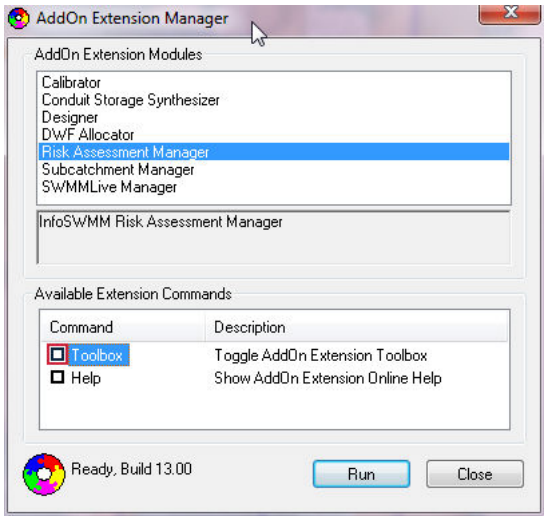
Innovyze programs can only be installed from our Internet website. To install this program or a single user, perform the following procedure:

- Turn on your computer and start Windows. Close any other applications that are currently running.
- Start your Internet Browser software and go to http://www.Innovyze.com. Once on Innovyze® Inc's homepage, please go to http://www.innovyze.com/updates/ Choose the *program* tab and click on the link. This will launch the File Download dialogue box.
- Choose the *SAVE THIS PROGRAM TO A Directory* option and follow the on-screen instructions. When saved on your hard drive run the Execute (*.exe) file from the folder that was downloaded and follow the on-screen instructions.



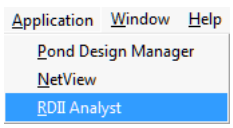
Upon successful installation of the program, the program is initialized from inside InfoSWMM by using the "AddOn Extension Manager" tool. From the Tool Menul, select an Add On as shown below.

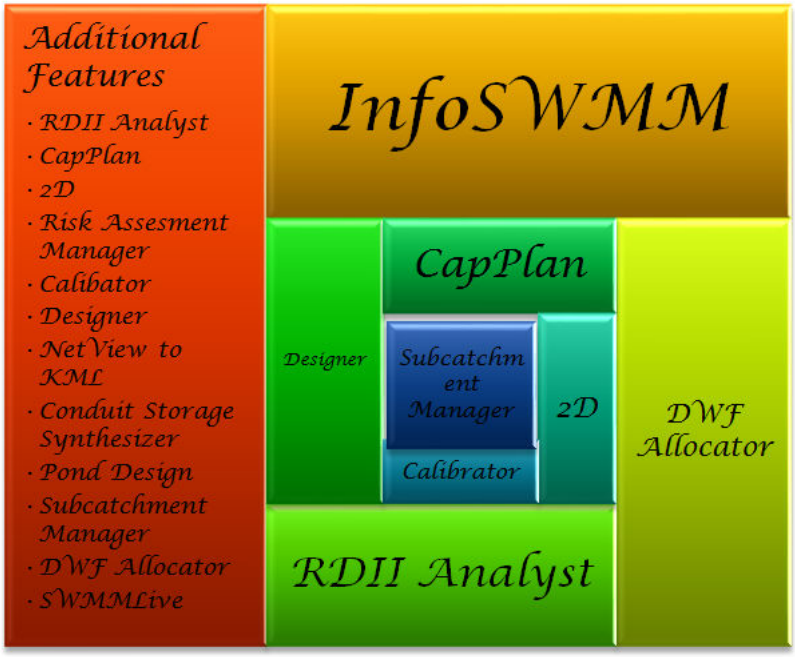




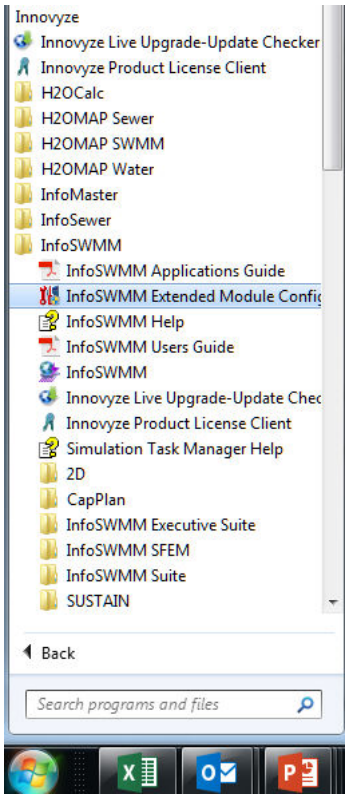
The selected run dialog appears, and it is now available for use. Section 2 discusses each icon and the menu shown below in detail. This program is part of the InfoSWMM Suite.

Or use the Application Window where there are additional AddOns for InfoSWMM





If you do not see the AddON's or Applications for the InfoSWMM Suite version of then you can use the InfoSWMMExtended Module Configuration from Windows Start.



Using the On Line Help

Innovyze provides on-line Help with extensive information about modeling features and capabilities. The documentation includes numerous topics, each including narrative descriptions, illustrations, and diagrams describing the features of each program.

The on-line Help offers the ability to search for a desired topic rapidly or to move between related topics in a fast, efficient manner. An extensive index is available allowing you to search on any number of words, phrases, or commands. Innovyze Help includes several major sections, each identified by a magenta book in the Help Contents. Each section contains numerous related topics.

StartingInnovyze Help

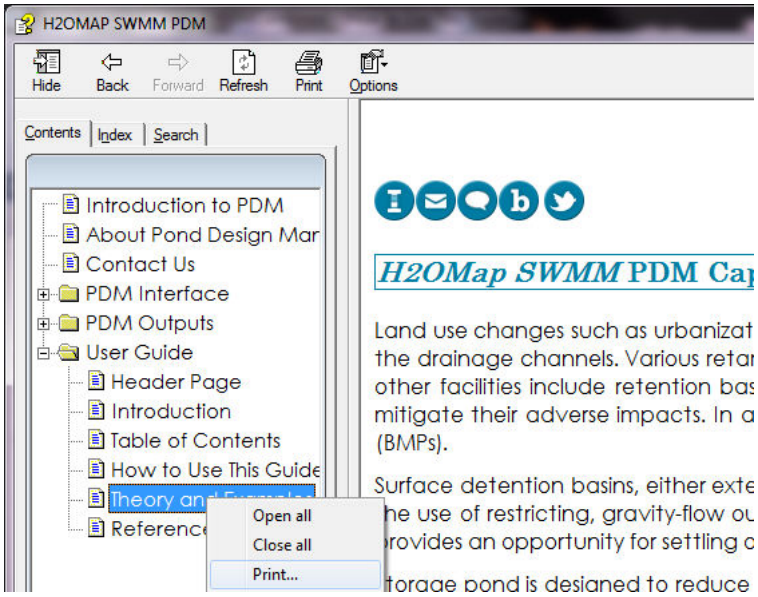
Innovyze Help is available by opening any Innovyze dialog box and pressing the F1 key. You may click on any portion of the dialog box in the help topic for more information.

Navigating the On Line Help

Use either Innovyze Help Contents or the Index to navigate to the desired topic. Choose the Help Topic button in the upper left-hand corner of the Help window to access the Help contents and index. Embedded in the text of each topic are numerous *links*, identified as underlined blue text, to related topics. Simply click on the desired link text with the mouse to move immediately to the related topic.

Printing the OnLine Help

You may print any Innovyze Help topics you desire. To do so, navigate to the desired Help topic and then choose the Print Topic command from the Help window File menu.



Instructions to Renew the CD and License Keys for the Innovyze (MWH Soft) Floating License Server

Below are instructions to renew the CD and License Keys for the Innovyze (MWH Soft) Floating License Server and the floating licenses to reflect the current expiration date.

1. Open the Innovyze (MWH Soft) Floating License Server.
2. Go to the **Help** -> **About** menu in the upper left corner.
3. Go to the Request License Key On-line for dropdown menu and select Renewal. Press the **Go** button. This will open our On-Line License Registration page.

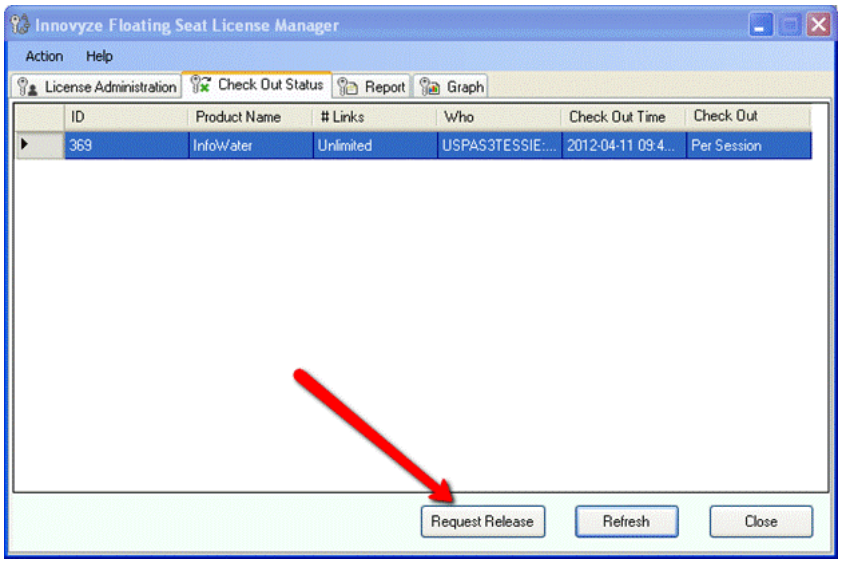
4. Complete the requested information and press the **Submit** button. This should return to you a new CD Key and License Key.
5. Copy and paste the new keys into the appropriate boxes in the **About** dialog box.
6. Press the **Apply License Changes** button. A new Subscription Expiration Date should appear.
7. Close the **About** box and the Innovyze (MWH Soft) Floating License Server.
8. Download and run the update for the Innovyze (MWH Soft) Floating License Server from the attached link:
    - Innovyze Floating License Server 5.0 Update 020 (22.03 MB), 12/10/2015
9. Open the Innovyze (MWH Soft) Floating License Server.
10. If your FLM is installed on a virtual server, go to the upper left corner and select **Action** -> **Register Virtual Environment …**
11. Select the License Administration tab.
12. Go to the Request License Key On-Line for dropdown menu and select **Renewal**. Press the **Go** button. This will open our On-Line License Registration page.
13. Complete the requested information and press the **Submit** button. This should return to you a new CD Key and License Key.
14. Copy and paste the new keys into the appropriate boxes in the License Administration tab.
15. Press the **Apply** button. A new Expiration Date should appear.

Press the Close button

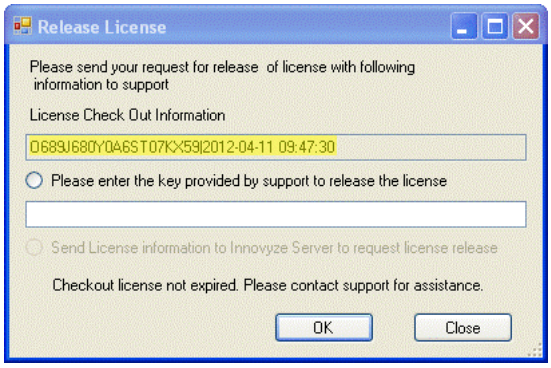
Please follow the instructions below to request a license release key for a floating license.

Please follow the instructions below to request a license release key for a floating license. Most likely this will need to be forwarded to someone who has access to the Innovyze Floating Seat License Manager on a server.

1. Open the Innovyze Floating Seat License Manager and select the Check Out Status tab.
2. Select the license to release and press the Request Release button.



Copy the License Check Out Information generated and paste into an email to support@innovyze.com



- We will return to you a code to enter in to the second field.
- Once both fields are populated in the Release License dialog box, press the OK button to release the license.

Technical Support On the Web and by Email

See the Help file Topic Contact Us for detailed Innovyze Technical Support information.

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InfoSWMM

Introduction

The Quick-Start tutorial is designed for first-time users of InfoSWMM DWF Allocator and provides a guided tour to core commands and functions used for loading network models. The estimated time to complete the Quick Start tutorial is approximately 20 minutes.

The Quick Start tutorial will help first-time users become familiar with the following: **1.** Register polygon layers **2.** Allocate loads at junctions using polygon intersection, meter summation, closest junction, and closest conduit.

During the Quick Start tutorial, the user will modify a project named “SampleAlloc”. This project is provided with InfoSWMM DWF Allocator software installation and can be found in the InfoSWMM Examples directory: C:\Program Files\InfoSWMM x\Examples\SampleAlloc.mxd (May be different for custom installations).

The project modified in this tutorial illustrates how InfoSWMM DWF Allocator automatically calculates and distributes sewer loads.

The model schematic is shown on the next page. The model consists of the following components: · Two wet wells · Two pumps · Two outlets · Two dividers · 54 junctions · 56 conduits · One reference file containing the parcel data for the area (not shown in the illustration below)

margin-top: 0pt; margin-bottom: 4.5pt; font-weight: bold;">

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Step 1: Open The Samplealloc Project

1. Open InfoSWMM

2. Choose Browse for maps..., select OK, and browse to the SampleAlloc file **3.** Initialize InfoSWMM

4. Save the project using a new name. If you wish to restart the tutorial, the original project will be available.

5. Press  , select DWF

Allocator, and click Run

6. Choose Add Data () and add the following shapefile

C:\Program Files\InfoSWMM\Examples\parcel.shp

(the path may be different for custom installations)

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Step 2: Create Thiessen Polygons To Define Load Areas

1. Press 
2. Choose 

3. Click  and draw a polygon around the outside of the junctions
4. Select a 

(such as load area) and press OK

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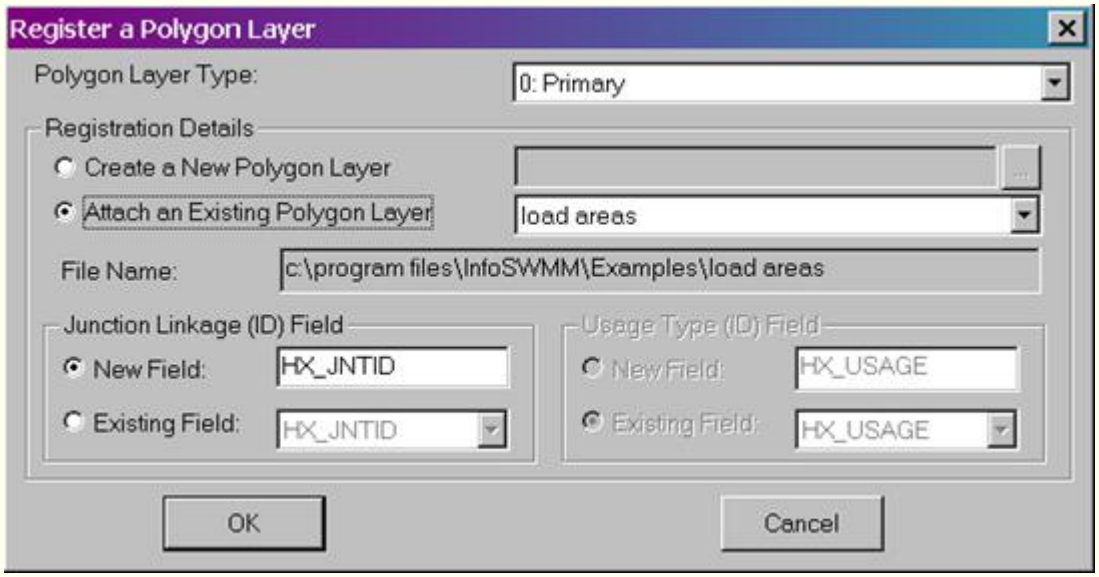
Step 3: Register Polygon Layers

1. Click 

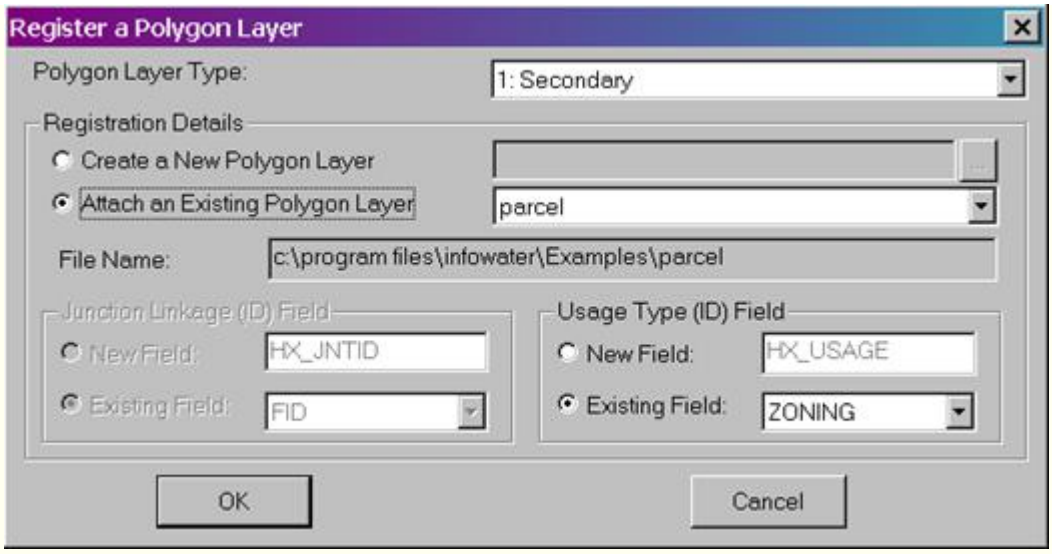
2. Press 

3. Set the dialog box to match the one below then click OK



4. Press 

again **5.** Set the dialog box to match the one on the next page then click OK



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Step 4: Set Load Factors

1. Press 

2. Click the DWF Usage Data tab and press  to populate the *Usage* column in the Usage Data table **3.** Click on the *Usage* column header and sort it ascending () **4.** Enter the following *Load Factor* values for the different usage types as shown in the table below. Select the appropriate *Load Field* options for the different usage types as shown in the table below. Finally, populate the description fields as shown below. The Load Factors are expressed as cfs/acre.

	Usage Type	Load Factor	Description
1	C	0.022	Commercial
2	I	0.025	Industrial
3	OS	0	Open Space
4	R1	0.017	Residential 1
5	R2	0.022	Residential 2
6	R3	0.029	Residential 3
7	RTL	0.012	Retail

5. Change Allocation Scaling Factor: from 1.0

to 0.0000229 for unit consistency. This converts square feet to acres (1/43,560).

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Step 5: Run The DWF Allocator

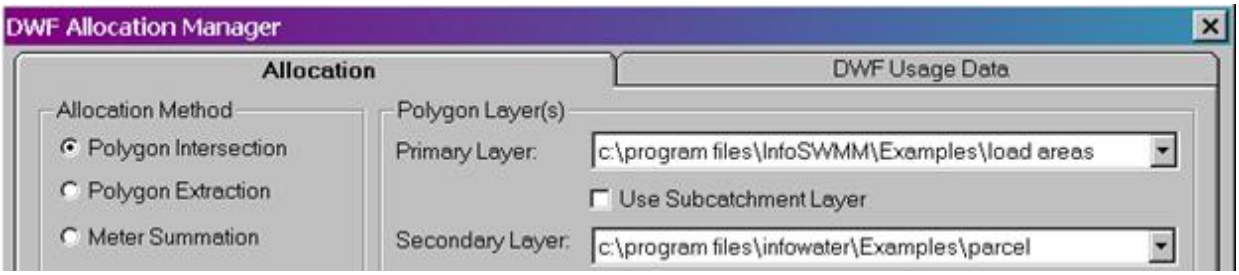
You will now run InfoSWMM DWF Allocator. Four different methods are available as follows: the polygon intersection method, the polygon extraction method, the meter summation method, the closest junction method and the closest conduit method.

POLYGON INTERSECTION

1. Go back to the Allocation tab and press Options...

2. Check ☑ Overwrite Existing Load When Allocating DWF and press OK

3. Set the DWF Allocation dialog as shown below then press Allocate DWF

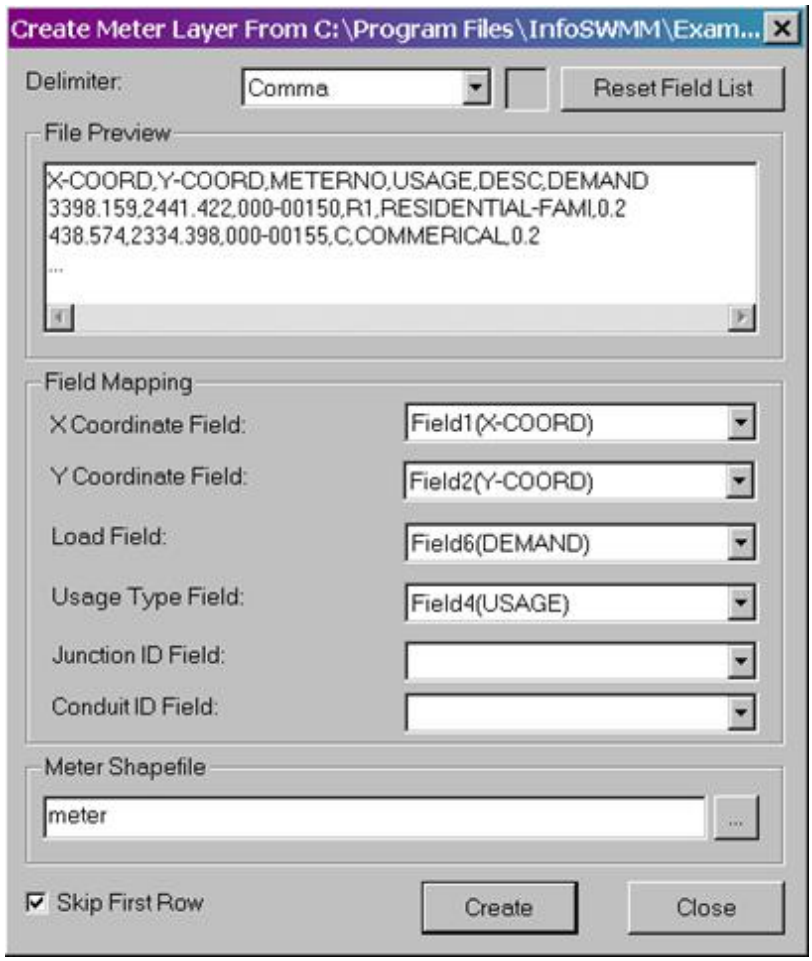


4. To verify results, the Total Load: should be approximately 1.4 cfs. Use this opportunity to change various load factors and witness the Total Load value changes. The calculator is an invaluable tool as it allows for factors to be changed “on-the-fly” to match a known value entering a sewage treatment plant.

METER SUMMATION

1. Press  and select C:\Program Files\InfoSWMM x\Examples\meter.csv

2. Set up the dialog box as shown on the next page then click 



3. Press 

4. Click 

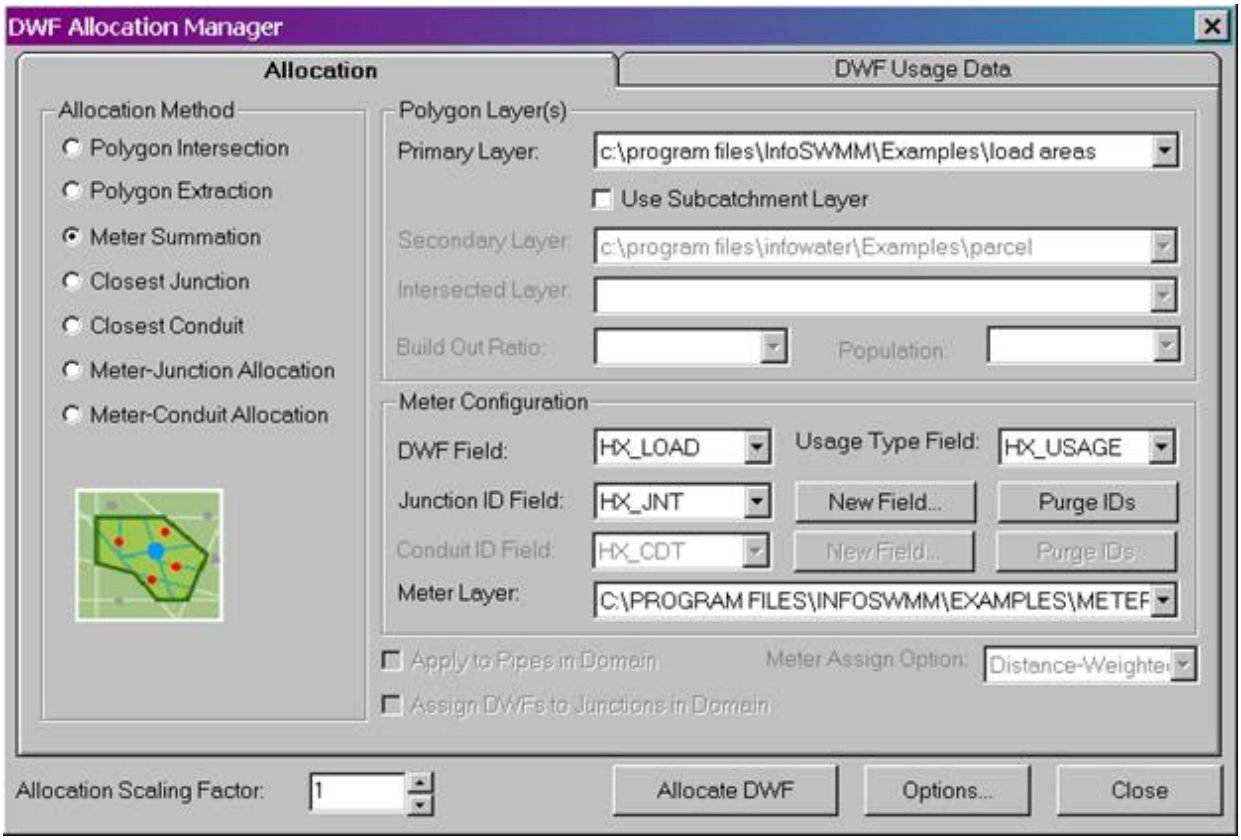
5. Select 

then OK twice

6. Set the DWF Allocation dialog as shown on the next page and then press 

(Notice the change to the 

)



7. To verify results, the Total Load: should be approximately 1.7 cfs.

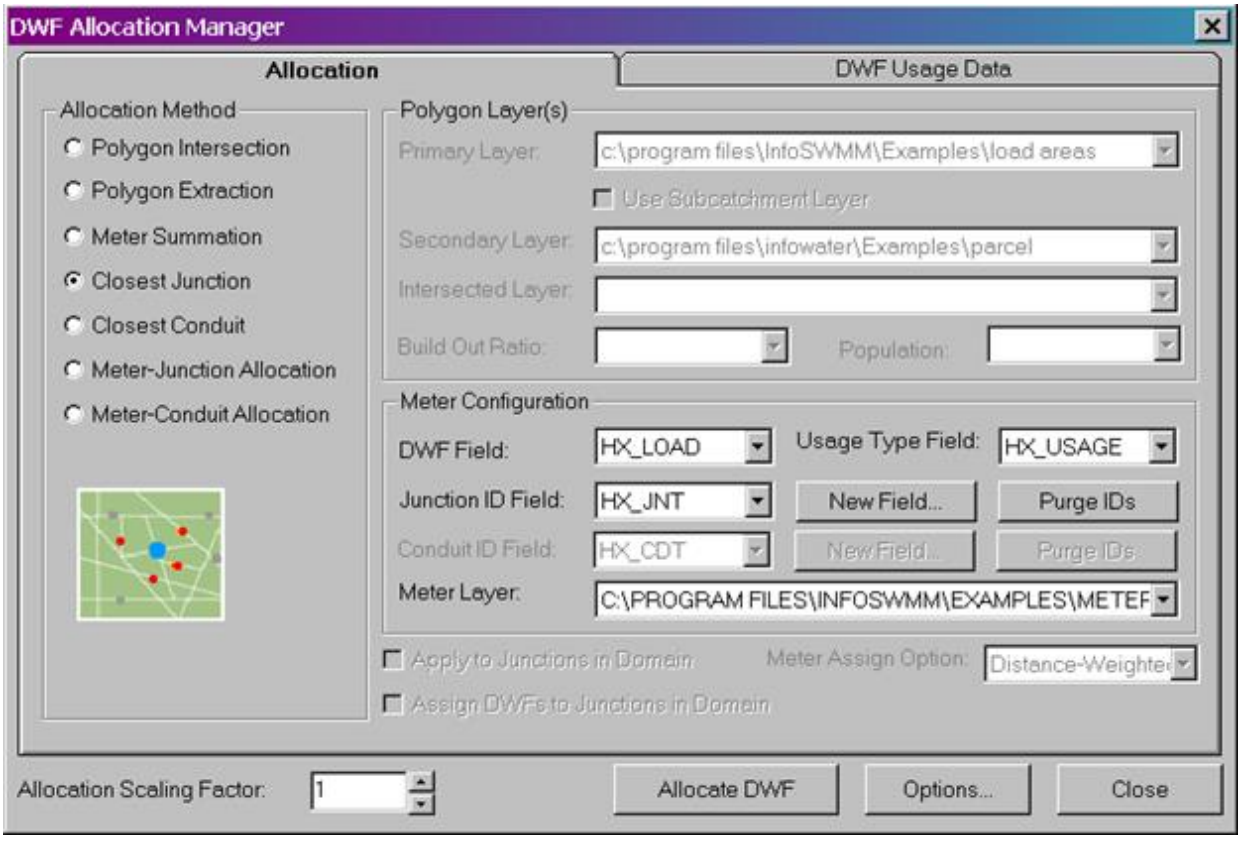
CLOSEST JUNCTION

1. Press 

2. Click Options...

3. Select Purge All DWF... then OK twice

4. Set the DWF Allocation dialog as shown below and then press Allocate DWF (Notice the change to the Allocation Scaling Factor:)



5. To verify results, the Total Load: should be approximately 1.7 cfs.

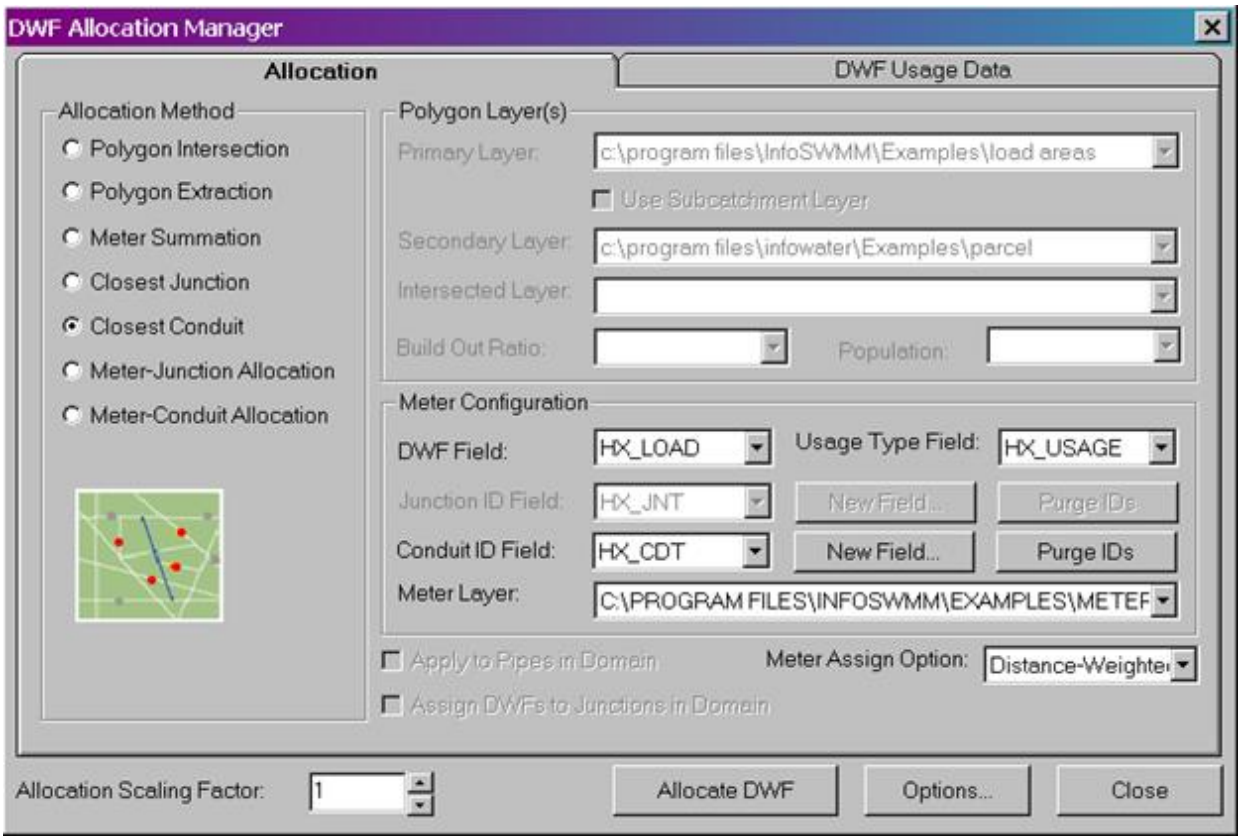
CLOSEST CONDUIT

1. Press 

2. Click Options...

3. Select Purge All DWF... then OK twice

4. Set the DWF Allocation dialog as shown below then press Allocate DWF (Notice the change to the Allocation Scaling Factor:)



5. To verify results, the Total Load: should be approximately 1.7 cfs.

6. Run a simulation of the current loads and review results.

Congratulations! You have now completed the Quick-Start tutorial.

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Introduction to DWF Allocator

Welcome to the DWF Allocator

for the Innovyze Sewer and SWMM Products

DWF Allocator Allocator Toolbar	Meter Summation
• Polygon Layer Registration	• Closest Manhole
• DWF Allocator Allocation Manager	• Closest Link
• Polygon Intersection	• Meter-Manhole Allocation
• Polygon Extraction	• Meter-Link Allocation

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Register a Polygon Layer

This dialog box allows the user to 'register' a polygon layer to be used with the Polygon Intersection and Polygon Extraction DWF Allocator allocation methods. It also has functionality to create a new layer that can then be edited with the provided polygon editing tools.

Description of the tool:

NAME	**DESCRIPTION**
Polygon Layer Type	There are three types of polygon layer that can be registered: • Primary - The polygons in a primary layer represent the area that contributes DWF Allocator to individual nodes in the model. separate Primary Polygon layer is specified or created for the purpose. This is needed for use in the Polygon Intersection and Meter Summation methods of DWF Allocator allocation. • Secondary - A Secondary Polygon layer is necessary for the Polygon Intersection method of DWF Allocator allocation. The polygons in this layer are typically landuse or zoning polygons. A Usage Type field is specified or created.

	• Intersected - An Intersected Polygon layer is necessary for the Polygon Extraction method of DWF Allocator allocation. This type of layer is typically generated by an external GIS function that intersects a primary and secondary layer. A Manhole Linkage and Usage Type field need to be specified or created.	
Create a New Polygon Layer	If you do not have access to an appropriate polygon layer already created for you, you can use this tool to create a new empty ESRI Shapefile polygon layer. You can then user the polygon editing tools available from the Allocator toolbar to create and edit polygons.	
Attach an Existing Polygon Layer	If you have an existing appropriate polygon layer added to the map as a background layer, you can specify it here.	
File Name	This area displays the path and filename of the layer to be created or specified	
Manhole Linkage (ID) Field	Specify an existing field that contains data linking the polygon to a Manhole or you can create a new field which you can then use the DWF Allocator Allocator toolbar tools to populate Manhole linkage data	

Usage Type (ID) Field	Specify an existing field that contains usage (e.g. land use) data or create a new field which you can then use to populate the appropriate data

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Meter-Link Allocation

This method is similar to the Closest Link method, except it allocates DWF Allocator s according to a user-defined meter allocation. For example, the Closest Link method uses GIS technology to automatically determine how DWF Allocator s from meters will be assigned to system Link .

In the Meter-Link method, the user is able to graphically assign which meters will be allocated to which Link . The ability to assign meters to specific Link is achieved through the use of the Meter Assignment dialog box. DWF Allocator allocation from the meters to the respective upstream and downstream Manhole of the Link can also vary according to the meter assignment option selected by the user.

An example of efficiently using this tool would be to use the Closest Link method first to automatically populate Link IDs and then use the Meter Assignment tool to manually alter some areas. Lastly the Meter-Link method would be used to complete the DWF Allocator allocation.

Description of the tool:

NAME	DESCRIPTION
Allocation Methods	**Polygon Intersection** - The Polygon Intersection method uses spatial intersection of a usage class polygon with load area polygon coverage to determine the Manhole load allocation. The primary layer represents the load area polygon and the secondary layer represents the usage categorization polygon. **Polygon Extraction** - The Polygon Extraction method is

used when an intersected polygon layer has already been established and registered into the ERROR: Variable (Platform) is undefined. DWF Allocator Allocator.

Meter Summation - The Meter Summation method is used when customer billing data is available. The primary layer represents the load area polygon layer. Additionally, the meter configuration data needs to be specified as well. When using consumer/meter data to estimate Manhole loads, this data must first be configured. The DWF Allocator Field represents the field that contains the demand at each of the consumer meters. The Usage Type Field designates the field that contains the usage type data. The Meter Layer specifies the desired consumer/meter layer.

Closest Manhole - The Closest Manhole method is used when customer/meter-billing data is available. The meter layer needs to be configured. The Demand Field and Usage Type Field contain load and water duty data at each of the meters.

Closest Link - The Closest Link method works with customer

billing data and requires meter configuration. The DWF Allocator Field and Usage Type Field contain load and usage data at each of the meters.

Meter-Manhole Allocation - The Meter-Manhole Allocation method is similar to the Closest Manhole method, except the user is able to assign which meters will be allocated to which Manhole nodes. In order for the Meter-Manhole method to be employed, the user must specify which fields possess (or will possess) the Manhole ID's. Use the “Assign Manhole” button to designate a meter(s) to a Manhole and the “Select Meter(s)” and “Select Manhole” buttons to see which meters are assigned to which Manholes and vice-versa.

Meter-Link Allocation - The Meter-Link Allocation method is similar to the Closest **Link** method, except the user is able to assign which meters will be allocated to which Links. In other words, it is a user-defined version of the Closest Link method (which generates meter demands automatically). In order for the Meter-Link method to be employed, the user must specify which fields possess (or will

	possess) the Link ID's. Specify which field contains (or will contain) the Link ID using the Link ID Field drop down box for each meter in the system. Use the “Assign Link” button to designate a meter(s) to a Manhole and the “Select Meter(s)” and “Select Link" buttons to see which meters are assigned to which Links and vice-versa. All options available in the Closest Link methodology are also available in the Meter-Link Allocation method. See the Closest Link section to learn more about each option.
Usage Data Tab	Click the Usage Data tab to set up the tool to allocate DWF Allocator appropriately based on usage type
DWF Allocator Field	Pick the field containing **DWF Allocator** data
Usage Type Field	Select the field from the land use or parcels layer's database that contains land use type information
Link ID Field	Choose the field that relates meters to Links
New Field	Press to create a new field in the corresponding layer's database

Purge IDs	Press to remove all ID's from the corresponding database
Meter Layer	Select the layer representing meters in the system
Meter Assign Option	During the Closest Link and Meter-Link allocation processes, the user has the option of specifying how meter demands are to be allocated to the upstream and downstream Manholes of a Link. Those options are as follows: **Evenly Divided** - The total loads determined from all meters assigned to a particular Link will be divided by 2 and assigned equally to both the upstream and downstream Manholes of the Link. **Distance Weighted** - A geometric analysis is conducted for each meter assigned. Loads are then divided between two Manhole nodes according to their weighting. For example, if a meter has 10 gpm and is 3/4 way down a Link, 1/4 of 10 gpm will go to the farthest Manhole while 3/4 of 10 gpm will go to the other. **Closest Manhole** - Meters closest to one end of Link will be allocated to the Manhole closest to them.

	Furthest Manhole - Opposite of Closest Manhole, closest meters will be assigned to the furthest Manhole node. When using consumer/meter data to estimate nodal loadings, this data must first be configured.
Apply to Link s in Domain	Use this option when you only wish to consider allocating meter demands to Links that are in the current active domain.
Allocation Scaling Factor	Use this box to normalize demand data. The default value is set to unity (1.0) and may be changed to reflect the actual demand multiplier. It will be necessary to apply scaling factors when water duty factors are expressed in gpm/acre and acreages calculated from a polygon intersection are expressed in sq. ft. In this instance, use an allocation scaling factor of 1/43560.
Allocate Load	This button will run the DWF Allocator according to the user's specifications and will display the Allocation Report & Load Factor Calculator report/tool
Options	Opens the Allocation Options dialog to allow you to select some tool customization options

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Meter-Manhole Allocation

This method is similar to the Closest Manhole method, except it allocates DWF Allocator s according to a user-defined meter allocation. For example, the Closest Manhole method uses GIS technology to automatically determine how DWF Allocator s from meters will be assigned (and assign a Manhole ID to the Manhole ID field).

In the Meter-Manhole method, the user is able to graphically assign which meters will be allocated to which Manhole . The ability to assign meters to specific Manhole nodes is achieved through the use of the Meter Assignment dialog box. For each of the meters assigned to specific Manhole nodes, DWF Allocator s are then summed to establish localized Loads imposed on each of the Manhole nodes.

An example of efficiently using this tool would be to use the Closest Manhole method first to automatically populate Manhole IDs and then use the Meter Assignment tool to manually alter some areas. Lastly the Meter-Manhole method would be used to complete the load allocation.

Description of the tool:

NAME	DESCRIPTION
Allocation Methods	**Polygon Intersection** - The Polygon Intersection method uses spatial intersection of a usage class polygon with load area polygon coverage to determine the Manhole load allocation. The primary layer represents the load area polygon and the secondary layer represents the usage categorization polygon.

Polygon Extraction - The Polygon Extraction method is used when an intersected polygon layer has already been established and registered into the ERROR: Variable (Platform) is undefined. DWF Allocator Allocator.

Meter Summation - The Meter Summation method is used when customer billing data is available. The primary layer represents the load area polygon layer. Additionally, the meter configuration data needs to be specified as well. When using consumer/meter data to estimate Manhole loads, this data must first be configured. The DWF Allocator Field represents the field that contains the demand at each of the consumer meters. The Usage Type Field designates the field that contains the usage type data. The Meter Layer specifies the desired consumer/meter layer.

Closest Manhole - The Closest Manhole method is used when customer/meter-billing data is available. The meter layer needs to be configured. The Demand Field and Usage Type Field contain load and water duty data at each of the meters.

Closest Link - The Closest Link method works with customer billing data and requires meter configuration. The DWF Allocator Field and Usage Type Field contain load and usage data at each of the meters.

Meter-Manhole Allocation - The Meter-Manhole Allocation method is similar to the Closest Manhole method, except the user is able to assign which meters will be allocated to which Manhole nodes. In order for the Meter-Manhole method to be employed, the user must specify which fields possess (or will possess) the Manhole ID's. Use the “Assign Manhole” button to designate a meter(s) to a Manhole and the “Select Meter(s)” and “Select Manhole” buttons to see which meters are assigned to which Manholes and vice-versa.

Meter-Link Allocation - The Meter-Link Allocation method is similar to the Closest **Link** method, except the user is able to assign which meters will be allocated to which Links. In other words, it is a user-defined version of the Closest Link method (which generates meter demands automatically). In order for the Meter-Link method to be

	employed, the user must specify which fields possess (or will possess) the Link ID's. Specify which field contains (or will contain) the Link ID using the Link ID Field drop down box for each meter in the system. Use the “Assign Link” button to designate a meter(s) to a Manhole and the “Select Meter(s)” and “Select Link" buttons to see which meters are assigned to which Links and vice-versa. All options available in the Closest Link methodology are also available in the Meter-Link Allocation method. See the Closest Link section to learn more about each option.
Usage Data Tab	Click the Usage Data tab to set up the tool to allocate DWF Allocator appropriately based on usage type
DWF Allocator Field	Pick the field containing **DWF Allocator** data
Usage Type Field	Select the field from the land use or parcels layer's database that contains land use type information
Manhole ID Field	Choose the field that relates meters to Manhole

New Field	Press to create a new field in the corresponding layer's database
Purge IDs	Press to remove all ID's from the corresponding database
Meter Layer	Select the layer representing meters in the system
Apply to Manholes in Domain	Use this option when you only wish to consider allocating meter demands to Manholes that are in the current active domain
Allocation Scaling Factor	Use this box to normalize demand data. The default value is set to unity (1.0) and may be changed to reflect the actual demand multiplier. It will be necessary to apply scaling factors when water duty factors are expressed in gpm/acre and acreages calculated from a polygon intersection are expressed in sq. ft. In this instance, use an allocation scaling factor of 1/43560.
Allocate Load	This button will run the DWF Allocator according to the user's specifications and will display the Allocation Report & Load Factor Calculator report/tool
Options	Opens the Allocation Options dialog to allow you to select some tool customization options

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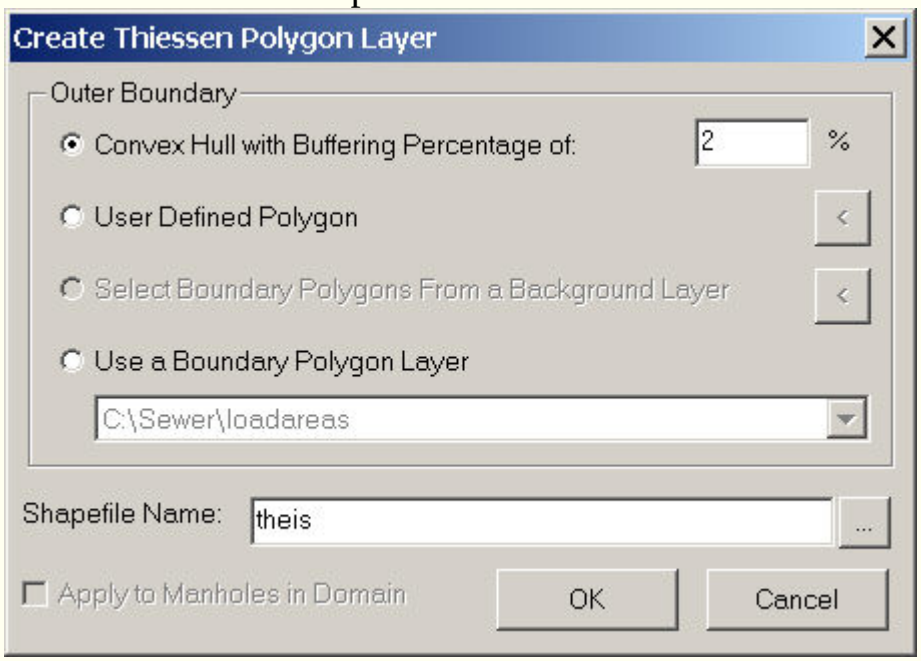
Create Thiessen Polygons

Thiessen polygons provide a means to divide an area into polygons by creating regions that bisect known points. This can be a quick way to create the primary polygon layer required for use in the Polygon Intersection and Polygon Extraction methods of DWF Allocator allocation.

Imaginary lines are first drawn between the different Manhole nodes and then perpendicular bisectors are constructed from each of these imaginary lines. The bisectors are then extended to one another to form Thiessen polygons. This process is also known as dynamic segmentation, whereby polygons are dynamically created from nodal topology. (Be sure to register the new layer as a primary polygon through the Register Polygon Layers dialog box.) Three inputs are needed to create a new Thiessen Polygon layer:

- Define an outer boundary for the extents of the new layer. Four options are available:
  - Convex Hull with Buffering Percentage - This method basically creates an imaginary "rubber band" around all of the Manhole s in the model. This imaginary line (rubber band) will form the outer boundary of the Thiessen Polygon layer. The Buffering Percentage affects the distance the actual boundary will be created outside the imaginary "rubber band" boundary.
  - User Defined Polygon - You will be allowed to draw the boundary directly on the map. After choosing this option, click the  button to gain access to the map. Click at each point you want a vertex and double-click on the final vertex to complete the boundary.
  - Select Boundary Polygons From a Background Layer - Before using the Create Thiessen Polygon Layer tool, select a background polygon layer in the TOC/Legend. After selecting this option, click the  button to gain access to the map and select the appropriate polygons from the background layer. Right-click and choose 'Enter' to complete the process.

    - Use a Boundary Polygon Layer - If you already have a background polygon layer with a single polygon that defines the outer boundary for the new Thiessen Polygon layer you can pick this option and select the background layer from the list box.
- Specify a path and name for the new Thiessen Polygon layer
- If you want to exclude some Manhole s from being part of the Thiessen Polygon creation process, select a domain of Manhole s that you want to include before using the Create Thiessen Polygon tool then select this option.



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Closest Manhole

The closest Manhole method works in conjunction with customer/meter data. This method provides a means to assign DWF Allocator to the Manhole closest to the water meter. Advanced algorithms are used to locate and allocate DWF Allocator to the closest Manhole . For each of the Manhole nodes, the DWF Allocator s are then summed up to establish the localized DWF Allocator imposed on each of the nodes.

Required Input:

- **Meter Layer** - This is a point layer with flow information.

Description of the tool:

NAME	DESCRIPTION
Allocation Methods	**Polygon Intersection** - The Polygon Intersection method uses spatial intersection of a usage class polygon with load area polygon coverage to determine the Manhole load allocation. The primary layer represents the load area polygon and the secondary layer represents the usage categorization polygon. **Polygon Extraction** - The Polygon Extraction method is used when an intersected polygon layer has already been established and registered into the ERROR: Variable (Platform) is undefined. DWF Allocator Allocator.

Meter Summation - The Meter Summation method is used when customer billing data is available. The primary layer represents the load area polygon layer. Additionally, the meter configuration data needs to be specified as well. When using consumer/meter data to estimate Manhole loads, this data must first be configured. The DWF Allocator Field represents the field that contains the demand at each of the consumer meters. The Usage Type Field designates the field that contains the usage type data. The Meter Layer specifies the desired consumer/meter layer.

Closest Manhole - The Closest Manhole method is used when customer/meter-billing data is available. The meter layer needs to be configured. The Demand Field and Usage Type Field contain load and water duty data at each of the meters.

Closest Link - The Closest Link method works with customer billing data and requires meter configuration. The DWF Allocator Field and Usage Type Field contain load and usage data at each of the meters.

Meter-Manhole Allocation - The Meter-Manhole Allocation method is similar to the Closest Manhole method, except the user is able to assign which meters will be allocated to which Manhole nodes. In order for the Meter-Manhole method to be employed, the user must specify which fields possess (or will possess) the Manhole ID's. Use the “Assign Manhole” button to designate a meter(s) to a Manhole and the “Select Meter(s)” and “Select Manhole” buttons to see which meters are assigned to which Manholes and vice-versa.

Meter-Link Allocation - The Meter-Link Allocation method is similar to the Closest **Link** method, except the user is able to assign which meters will be allocated to which Links. In other words, it is a user-defined version of the Closest Link method (which generates meter demands automatically). In order for the Meter-Link method to be employed, the user must specify which fields possess (or will possess) the Link ID's. Specify which field contains (or will contain) the Link ID using the Link ID Field drop down box for each meter in the system. Use

	the “Assign Link” button to designate a meter(s) to a Manhole and the “Select Meter(s)” and “Select Link" buttons to see which meters are assigned to which Links and vice-versa. All options available in the Closest Link methodology are also available in the Meter-Link Allocation method. See the Closest Link section to learn more about each option.
Usage Data Tab	Click the Usage Data tab to set up the tool to allocate DWF Allocator appropriately based on usage type
DWF Allocator Field	Pick the field containing **DWF Allocator** data
Usage Type Field	Select the field from the land use or parcels layer's database that contains land use type information
Manhole ID Field	Choose the field that relates meters to Manhole
New Field	Press to create a new field in the corresponding layer's database
Purge IDs	Press to remove all ID's from the corresponding database
Meter Layer	Select the layer representing meters in the system

Apply to Manholes in Domain	Use this option when you only wish to consider allocating meter demands to Manholes that are in the current active domain
Allocation Scaling Factor	Use this box to normalize demand data. The default value is set to unity (1.0) and may be changed to reflect the actual demand multiplier. It will be necessary to apply scaling factors when water duty factors are expressed in gpm/acre and acreages calculated from a polygon intersection are expressed in sq. ft. In this instance, use an allocation scaling factor of 1/43560.
Allocate Load	This button will run the DWF Allocator according to the user's specifications and will display the Allocation Report & Load Factor Calculator report/tool
Options	Opens the Allocation Options dialog to allow you to select some tool customization options

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Closest Link

The closest Link method also works synergistically with billing meter data. For each of the meters, the closest pipe is first located. Advanced search algorithms are used to aid in this process. The meter Loads are then assigned to either the closest upstream or downstream nodes for each of the selected pipes.

The tool will populate the Link ID Field' with the Link ID of the closest Link . One way to use this tool is to use it as a starting point for the Meter-Link Allocation tool. After using the Closest Link tool to assign Link IDs to meters, the Pipe IDs can be edited where needed and then the Meter-Link Allocation tool can be used to get a more accurate allocation.

Required Input:

- **Meter Layer** - This is a point layer with flow information.

Description of the tool:

NAME	DESCRIPTION
Allocation Methods	**Polygon Intersection** - The Polygon Intersection method uses spatial intersection of a usage class polygon with load area polygon coverage to determine the Manhole load allocation. The primary layer represents the load area polygon and the secondary layer represents the usage categorization polygon. **Polygon Extraction** - The Polygon Extraction method is used when an intersected

polygon layer has already been established and registered into the ERROR: Variable (Platform) is undefined. DWF Allocator Allocator.

Meter Summation - The Meter Summation method is used when customer billing data is available. The primary layer represents the load area polygon layer. Additionally, the meter configuration data needs to be specified as well. When using consumer/meter data to estimate Manhole loads, this data must first be configured. The DWF Allocator Field represents the field that contains the demand at each of the consumer meters. The Usage Type Field designates the field that contains the usage type data. The Meter Layer specifies the desired consumer/meter layer.

Closest Manhole - The Closest Manhole method is used when customer/meter-billing data is available. The meter layer needs to be configured. The Demand Field and Usage Type Field contain load and water duty data at each of the meters.

Closest Link - The Closest Link method works with customer billing data and requires meter

configuration. The DWF Allocator Field and Usage Type Field contain load and usage data at each of the meters.

Meter-Manhole Allocation - The Meter-Manhole Allocation method is similar to the Closest Manhole method, except the user is able to assign which meters will be allocated to which Manhole nodes. In order for the Meter-Manhole method to be employed, the user must specify which fields possess (or will possess) the Manhole ID's. Use the “Assign Manhole” button to designate a meter(s) to a Manhole and the “Select Meter(s)” and “Select Manhole” buttons to see which meters are assigned to which Manholes and vice-versa.

Meter-Link Allocation - The Meter-Link Allocation method is similar to the Closest **Link** method, except the user is able to assign which meters will be allocated to which Links. In other words, it is a user-defined version of the Closest Link method (which generates meter demands automatically). In order for the Meter-Link method to be employed, the user must specify which fields possess (or will possess) the Link ID's. Specify

	which field contains (or will contain) the Link ID using the Link ID Field drop down box for each meter in the system. Use the “Assign Link” button to designate a meter(s) to a Manhole and the “Select Meter(s)” and “Select Link" buttons to see which meters are assigned to which Links and vice-versa. All options available in the Closest Link methodology are also available in the Meter-Link Allocation method. See the Closest Link section to learn more about each option.
Usage Data Tab	Click the Usage Data tab to set up the tool to allocate DWF Allocator appropriately based on usage type
DWF Allocator Field	Pick the field containing **DWF Allocator** data
Usage Type Field	Select the field from the land use or parcels layer's database that contains land use type information
Link ID Field	Choose the field that relates meters to Links
New Field	Press to create a new field in the corresponding layer's database

Purge IDs	Press to remove all ID's from the corresponding database
Meter Layer	Select the layer representing meters in the system
Meter Assign Option	During the Closest Link and Meter-Link allocation processes, the user has the option of specifying how meter demands are to be allocated to the upstream and downstream Manholes of a Link. Those options are as follows: **Evenly Divided** - The total loads determined from all meters assigned to a particular Link will be divided by 2 and assigned equally to both the upstream and downstream Manholes of the Link. **Distance Weighted** - A geometric analysis is conducted for each meter assigned. Loads are then divided between two Manhole nodes according to their weighting. For example, if a meter has 10 gpm and is 3/4 way down a Link, 1/4 of 10 gpm will go to the farthest Manhole while 3/4 of 10 gpm will go to the other. **Closest Manhole** - Meters closest to one end of Link will be allocated to the Manhole closest to them.

	Furthest Manhole - Opposite of Closest Manhole, closest meters will be assigned to the furthest Manhole node. When using consumer/meter data to estimate nodal loadings, this data must first be configured.
Apply to Link s in Domain	Use this option when you only wish to consider allocating meter demands to Links that are in the current active domain.
Allocation Scaling Factor	Use this box to normalize demand data. The default value is set to unity (1.0) and may be changed to reflect the actual demand multiplier. It will be necessary to apply scaling factors when water duty factors are expressed in gpm/acre and acreages calculated from a polygon intersection are expressed in sq. ft. In this instance, use an allocation scaling factor of 1/43560.
Allocate Load	This button will run the DWF Allocator according to the user's specifications and will display the Allocation Report & Load Factor Calculator report/tool
Options	Opens the Allocation Options dialog to allow you to select some tool customization options

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Load Factor Calculator

Show the last allocation method and load factor assignments. The Load Factor Calculator allows users to modify water duty factors “on-the-fly” and see the overall system demands fluctuate accordingly. After the user has allocated a demand, the Load Factor Calculator will appear, allowing the user to modify water duties to match a known Total Load.

What is the Purpose of The Load Factor Calculator?

The ability to intersect GIS data sets and allocate Load is integral in today’s master planning environment. However, the reason these spatial intersections and allocations are conducted in the first place is to load the hydraulic model with a known system Load. In many instances, the known system Load is generated from wastewater collection records which are accumulated over an entire calendar year.

This “annual production data” is then divided by 365 days (or 366 in a leap year) to generate the Average Day Load which is then used by the engineer to load a hydraulic model. Spatial intersections allow the model to be loaded according to geographical consumption; however, engineers have traditionally spent many hours attempting to correlate the appropriate water duty factors to match the exact average day load.

How Does the Calculator Work?

The Load Factor Calculator allows you to alter water duty factors as necessary to generate a Total Load that matches the average daily load value from your utility’s production/purchase records. The following represents a work order process of how to use the DWF Allocator Allocator and Load Calculator dialog boxes.

1. Once GIS data sets are ready to intersect, open the DWF Allocator Allocator Manager box and assign any known load factors. Factors do not necessarily matter at this juncture as the Calculator will be used to modify and refine these values to match a known production value.
2. Click the Allocate Load button to use the entered water duty factors and allocate Loads. By clicking the Allocate Load button, spatial data sets are intersected and their resulting acreages are determined for use in the Load Factor Calculator.

3. Open the Load Factor Calculator and begin altering water duty factors as desired. Adjust factors as necessary in order to generate a “Total Load” that matches a known average daily load value. When all adjustments have been made, click the “OK” button to automatically update all water duty factors in the Load Allocator Manger dialog box with the most recent values entered in the Load Factor Calculator.
4. Click the Allocate Load button on the Load Allocator Manager once again to load the hydraulic model with the new Load values generated from Load Factor Calculator.

Upon completion of the Allocator process, you will have loaded the system model with an average day Load geographically dispersed according to the GIS intersection between two polygon coverages.

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Help File Updated January 30, 2019

InfoSWMM uses the EPA SWMM 5.1.013 Engine More

Questions? Further Help Can be Found by Emailing Support@Innovyze.com **or by Using Our Social Media Websites or Searching the Internet for #INFOSWMM**