

# Criticality Assessment Manager - Based on GIS Layer Elements

Valve elements for assessment are selected from a GIS layer that stores point features for line valves. In some circumstances, all line valves are imported into the model as junctions or valves. In this case, valves elements can also be defined by selection sets that contain junctions or valves. Selection sets need to be predefined before running the Criticality Assessment Manager. The selected valve elements can be further filtered for the purpose of user-customized valve assessment. For details about how to select valve elements, please refer to the dialog box of Set Valve Sources. Note that pumps and valves in the model can be included into the set of assessment elements.

For the mode of Based on GIS Layer Elements, all valves selected from the GIS layer are imported into the model as assessment junctions. Any pipe associated with one or more GIS layer valves is broken into several segments dependent upon the number of GIS layer valves associated with the pipe. Each segment of a divided pipe is treated as an individual pipe in the assessment model, and identified as a default combination of the original pipe's ID, "\_", and a zero based number.

The Criticality Assessment Manager (CAM) automatically conducts a snapshot hydraulic assessment for each assessed valve. It can run a steady (snapshot) simulation at assessment time. The Criticality Assessment Manager also checks hydraulic parameters such as pressure and velocity against the specified thresholds.

**Criticality Assessment Manager**

Based on Model Elements | Based on GIS Layer Elements

Assessment Method

Based on Assessment Elements | Based on Connecting Sectors :  Upstream  Downstream  Both

Assessment Element Data

Valving Elements: Set Sources ...

Subset Management

Assess All Elements

Assess Element Range : 1 to 1

Assess Selected Elements : Select Elements ...

Add Model Elements

Pumps/Valves ...

Pipes ...

Assessment Threshold Data

High/Max. Pressure (psi) : 90

Low/Min. Pressure (psi) : 20

No Water Pressure (psi) : 0

Max Velocity Threshold (ft/s) : 5

Assessing Performance Element Scope

All Junctions/Pipes

From Domain

From Selection Set : CLOSABLE

Assessment Time (hrs:mins) : 00:00

Show Results Automatically

Run

Result ...

Close

Running Criticality Assessment Manager. Please wait ...

> Missing assessment ID entry

## Assessment Method

**Based on Assessed Elements** - Hydraulic assessment is based solely on an assessment element. A hydraulic simulation is run after closing all pipes connecting to the target assessment element.

**Based on Connecting Sectors** - Hydraulic assessment is based on both an assessment element and its connecting sectors. There might be one or more pipes that connect to the assessment element and are in either upstream sector or downstream sector. For each connecting pipe either downstream or upstream of the assessment element, CAM closes the connecting pipe and runs a hydraulic simulation for hydraulic assessment. The upstream and downstream sectors are defined by the related pipe's geometric direction. Only one connecting pipe is closed in a hydraulic simulation, and there are multiple hydraulic simulations for a specified assessment element.

- **Upstream** - Hydraulic assessment by closing one upstream connecting pipe at a time.
- **Downstream** - Hydraulic assessment by closing one downstream connecting pipe at a time.
- **Both** - Hydraulic assessment including both upstream option and downstream option.

## Assessment Element Data

### Valving Elements

- **Set Sources** - Use this button to Set Valve and Hydrant Data Sources.

### Subset Management

Further select a portion of the already selected valves.

- **Assess All Elements** - Select this option to assess all selected elements.
- **Assess Element Range** - Select this option and enter the range to assess a portion of the elements.
- **Assess Selected Elements** - Select this option to assess those valves manually chosen from a list of the previously selected valves. For details about the selected valve list, please click on the **Selected Elements** button to view the following Extended Assessing Element Selection dialog box.

	Assessment ID	Selection
1	V0	<input type="checkbox"/>
2	V1	<input type="checkbox"/>
3	V2	<input type="checkbox"/>
4	V3	<input type="checkbox"/>
5	V4	<input type="checkbox"/>
6	V5	<input type="checkbox"/>
7	V6	<input type="checkbox"/>
8	V7	<input type="checkbox"/>
9	V8	<input type="checkbox"/>
10	V9	<input type="checkbox"/>
11	V10	<input type="checkbox"/>
12	V11	<input type="checkbox"/>
13	V12	<input type="checkbox"/>
14	V13	<input type="checkbox"/>
15	V14	<input type="checkbox"/>
16	V15	<input type="checkbox"/>
17	V16	<input type="checkbox"/>
18	V17	<input type="checkbox"/>
19	V18	<input type="checkbox"/>
20	V19	<input type="checkbox"/>
21	V20	<input type="checkbox"/>
22	V21	<input type="checkbox"/>
23	V22	<input type="checkbox"/>
24	V23	<input type="checkbox"/>
25	V24	<input type="checkbox"/>
26	V25	<input type="checkbox"/>
27	V26	<input type="checkbox"/>
28	V27	<input type="checkbox"/>
29	V28	<input type="checkbox"/>
30	V29	<input type="checkbox"/>
31	V30	<input type="checkbox"/>
32	V31	<input type="checkbox"/>

- **Sort Ascending** - Sort selected column in ascending order.
- **Sort Descending** - Sort selected column in descending order.
- **Include All** - Click on this button to create check marks in the Selection column for all selected items.
- **Include Highlighted** - Click on this button to create check marks in the Selection column for all highlighted items.
- **Exclude All** - Click on this button to remove all check marks from the Selection column for selected items.
- **Exclude Highlighted** - Click on this button to remove all check marks from the Selection column for the highlighted items.
- **Selection** - Click on this checkbox to create a check mark for an item in the Selection column. Note: To remove a selection, deselect the checkbox per item.

**OK** - Use the above selection and close this dialog box.

**Cancel** - Cancel the above operation and close this dialog box.

### Model Pumps/Valves

- **Add** - See Extended Model Pump/Valve Assessment Selection below.

### Assessment Pressure Threshold

- **High/Max Pressure** - Enter the desired pressure value for High Pressure reporting. The CAM module will report all junctions receiving more than this threshold. Unit for High Pressure Threshold is defined in the Simulation Options, Pressure Unit.

- **Low/Min Pressure Threshold** - Enter the desired pressure value for Low Pressure reporting. The CAM module will report all junctions receiving less than this threshold but more than the No Water Threshold. Unit for Low Pressure Threshold is defined in the Simulation Option, Pressure Units.
- **No Water Threshold** - Enter the desired pressure value for for reporting excessively low pressure. The CAN module will report all junctions receiving less than this threshold. Unit for Low Pressure Threshold is defined in the Simulation Options, Pressure Unit.

## Assessment Criteria Data

- **Assessment Time** - Enter the desired run time for all assessments. Run time only takes 24 hour clock time (e.g. 8, 8:00). Unit for Assessment Time is defined in the Simulation Options.
- **Maximum Velocity Threshold** - Enter the maximum velocity for maximum velocity reporting. The InfoWater Pro CAM will report all pipes with a velocity above this threshold. Unit for Maximum Velocity Threshold is defined in the Simulation Options.
- **Show Records Automatically** - Click on this checkbox to automatically open the CAM modeling results screen after a successful run.

**Run** - Click on this button to run a valve criticality analysis. The CAM module will evaluate your network based on the Active Network and Simulation Options defined in the Analyzer. The CAM module progress is displayed on the progress bar. A summary is displayed in the Message Board on the Input Data Screen.



The CAM module results are automatically stored after each successful CAM analysis and saved with your project. Valve Criticality Modeling Reports can be viewed at any time by starting The CAM module in the Add On Extension Manager, and selecting the **Result** button.

**Results** - Click on this button to view the output of the valve criticality analysis. **Note:** Clicking on this button is not required after a successful run if the Show Results Automatically option is checked.

**Close** - Click on this button to close the valve criticality modeling dialog box.

## Set Valve Data Source

The dialog box of Set Valve Data sets data sources for valves for use in the InfoWater Pro CAM valve assessment. Valve data is populated from a specified data sources, possibly with certain selecting criteria.

Set Valve Data Source ✕

Valve GIS Layer:

Valve ID Field:

Pipe ID Field:

Use Closable Valves from Query:

Use Assessing Valves in ArcGIS Selection

## Valve Data Source

- **GIS Layer** - Indicate that valve data is from a GIS layer.
- **Valve GIS Layer** - Select a GIS Layer as valve data source, which is preloaded into ArcGIS. The GIS layer can be a point feature class or shape file. Enabled only for the data source option of GIS layer.
- **Valve ID Field** - Select a field as Valve ID for use in valve assessment. Enabled only for the data source option of GIS layer.
- **Pipe ID Field** - Select a field as Pipe ID for use in valve assessment. The Pipe ID Field is used to store the ID of a particular pipe that is associated with a given valve. Enabled only for the data source option of GIS layer.
- **Use Closable Valves from Query** - Enter a where clause as a query that filters out closable valves from the selected GIS layer. Enabled only for the data source option of GIS layer.
- **Use Assessing Valves in ArcGIS Selection** - Click on this checkbox to use the selected features of the GIS layer in ArcGIS. Enabled only for the data source option of GIS layer.
- **Assign Pipe IDs** - Clicking on this button will cause a spatial join to occur and it will also assign a pipe ID of the nearest pipe into the corresponding Pipe ID field of each valve.
- **Populate Connectivity Data** - Click on this button to populate connectivity data such as FROM and TO node for those newly-added pipe segments.
- **Close** - Click on this button to close the dialog box.

## Extended Model Pump/Valve Assessment Selection

Any pumps or valves in the model can be added into the set of assessment elements through the dialog box of the Extended Model Pump/Valve Assessment Selection.

Extended Model Pump/Valve Assessment Selection

Element Type :

	Model Element ID	Model Element Type	Selection
1	300	TCV: Throttle Control Valve	<input type="checkbox"/>
2	200	Three Point Pump	<input type="checkbox"/>
3	210	Three Point Pump	<input type="checkbox"/>

Element Selection

Include All

Exclude All

Include All

Include Highlighted

Exclude All

Exclude Highlighted

OK

Cancel

- **Sort Ascending** - Sort selected column in ascending order.
- **Sort Descending** - Sort selected column in descending order.
- **Include All** - Click on this button to create check marks in the Selection column for selected items.
- **Include Highlighted** - Click on this button to create check marks in the Selection column for the highlighted items.
- **Exclude All** - Remove all check marks from the Selection column for selected items.
- **Exclude Highlighted** - Remove all check marks from the Selection column for highlighted items.

**Select by Element Type** - To select by element type, select the element type from the pull-down menu. Elements listed with the Model Element Type chosen will be selected or removed from selection.

- **Element Type**: Select the element from the pull-down menu. The menu will reflect the Model Element Types available.
- **Include All** - This option will check the element types selected.
- **Exclude All** - This option will remove the check mark on the element types selected.

**Model Element ID** - Lists the ID of the model element.

**Model Element Type** - List the type of the model element.

**Selection** - Indicates if the element is selected for assessment.

**OK** - Use the above selection and close dialog box.

**Cancel** - Cancel the above operation and close dialog box.