Metric Tutorial 5 - Results

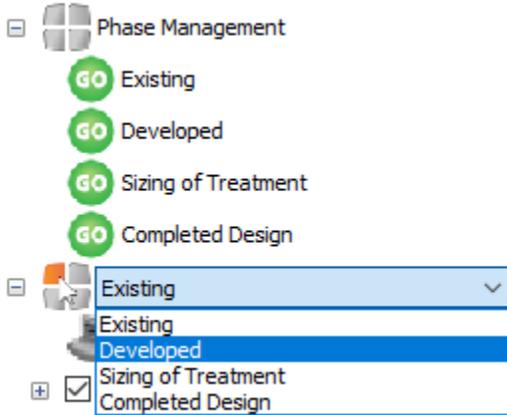| File/s needed: |
| --- |
| Click to download the **METRIC model files**. |

Open XP_Tutorial4.xpdx

You can carry on from the previous Chapter by checking that Developed is selected from the drop-down list on the left **Tree View** panel.

1. Now that the Treatment Train is laid out you can review the **Analysis Criteria** and **Rainfall** set up by browsing to the **Analysis** ribbon and selecting **Analysis Criteria.**
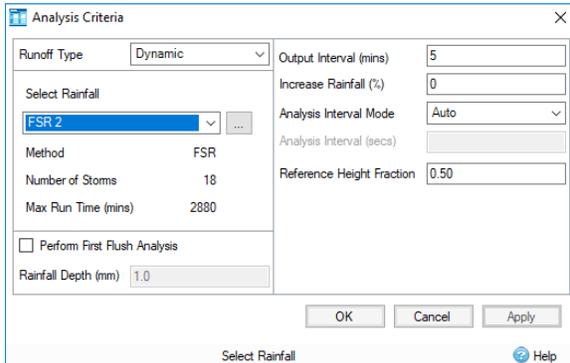
2. The Rainfall used in the **Analysis Criteria** can be modified by selecting **...** next to the **Select Rainfall** field. This opens the **Rainfall Manager** dialog, where a variety of rainfall types can be created, modified, or imported into the software to be used for analysis.
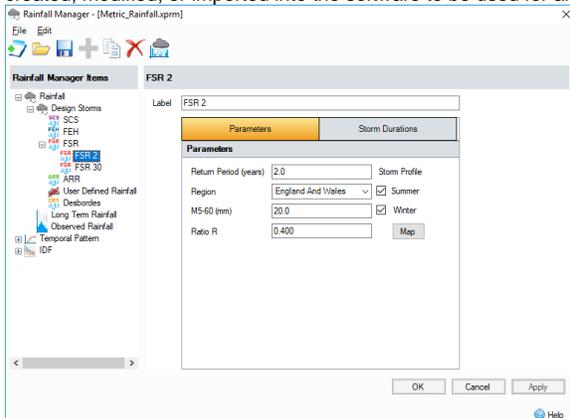
Rainfall Manager allows management of rainfall data. Multiple rainfall events can be created under one file which allows much greater ease in switching between rainfall types for analysis. It

also enables entire sets of rainfalls to be loaded in to the manager, allowing standard sets of rainfall profiles to be used for varying jobs. Also found in **Rainfall Manager** is the ability to build IDF Profiles, or Temporal Patterns which can be used in conjunction with previously defined rainfalls.

3. For this tutorial, we are going to be using a pre-existing set of rainfall profiles, which are present in the file **Metric_Rainfall.xprm**. If the **Rainfall Manager** is empty this file will need to be loaded

   in using the [folder icon] button at the top of **Rainfall Manager**.

4. If we need to create a new rainfall profile we would select the required rainfall type and then

   select the [plus icon] button at the top of the window. This then populates the right hand side with the relevant data entry fields that need to be populated.

   The default **Analysis Criteria** and **SCS Rainfall** events do not need to be updated before running the model. For more information about the **Analysis Criteria** dialog and the **Rainfall Manager**, go to **Analysis Criteria**.

5. Click **OK** or **Cancel** to close the **Rainfall Manager** and **Analysis Criteria** forms.

6. Expand the **Phase Management** section of the **Tree View** and click the **Go** icon to turn off the **Sizing of Treatment** and **Completed Design** phases from **Analysis**.
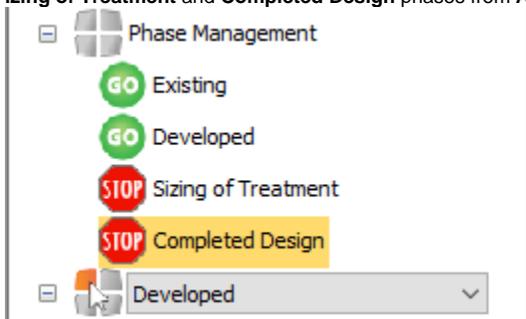
7. Validate the project by selecting **Validate** under the **Analysis** ribbon. This carries out a check to make sure that all values in your network are within suitable ranges. Once the validation is complete, a window will open displaying any errors or warnings found during the validation.
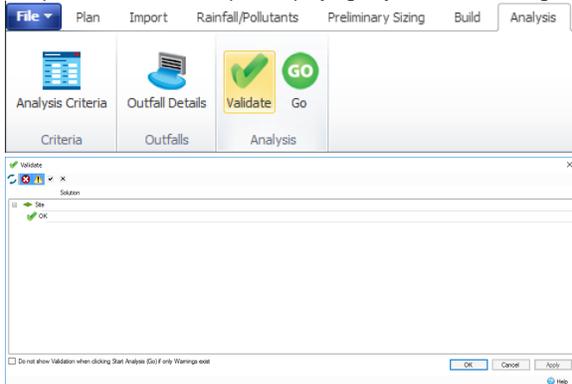
8. Now that we know our network is valid, we can run the analysis. This can be done by selecting **Go** under the **Analysis** ribbon.
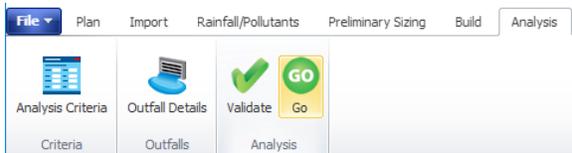

   (i) Validation is automatically run when selecting **Go**.

9. The **Stormwater Controls Summary** result table appears automatically after an analysis has been completed. These results indicate at a glance if the stormwater controls in the design are suitably sized. The **Stormwater Controls Summary** result table can also be selected on the **Re**

10. The different storm events simulated can be selected by using the **Storm Selection** list at the bottom of the screen or on the **Results** ribbon.
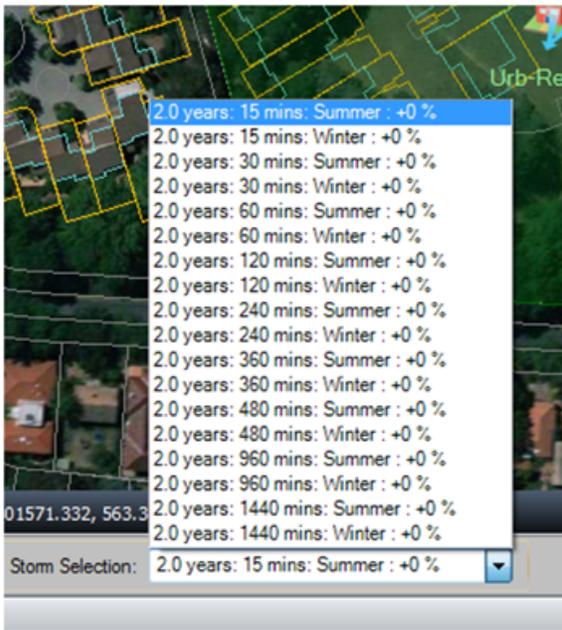

11. The Critical Storm for the SWC can be determined by selecting **Critical Storm** at the top of the window.


> ⚠ Note the **Percentage Available** volume in the Dry Pond and if there are any Flood Risk or Flooded status for each Storm.

12. Viewing a long section profile of the entire Treatment Train is often the easiest way to check the volume performance on a site. Select **Profiles > Show Profile** in the **Results** ribbon. The profile animation playback is located at the bottom of the **Profile** view.

13. All objects shown in the **Profile** view can be edited by double-clicking an individual item. The image below shows editing the **Dry Pond** SWC.
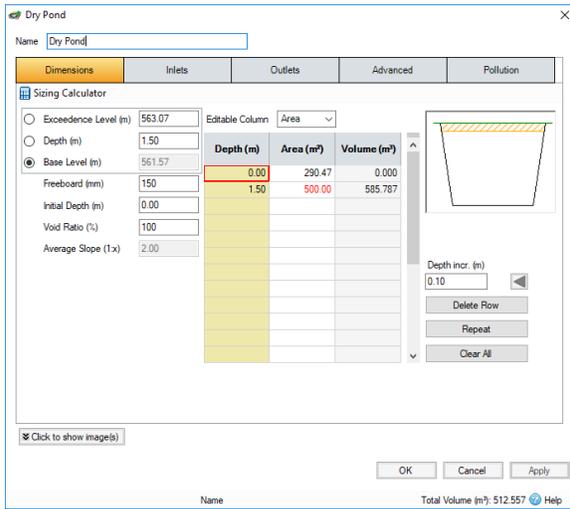
14. A quantified comparison between the **Existing** and **Developed** phases can be made using the **Phases Report** option under the **Results** ribbon.
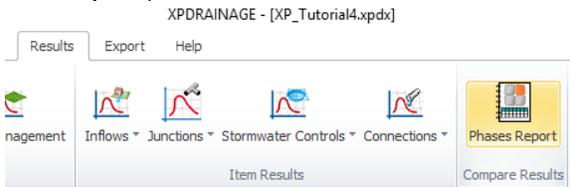

15. Select the **Comparison** tab and fill out the **Phases Report** window as below, then select the **Update Preview** button to display both tabular and graphical comparisons. By scrolling down through the storm events, you will find whether or not the **Developed** conditions design meets or exceeds the **Existing** site discharge. Depending on how the initial Treatment Train was laid out, small differences between the comparisons shown below may be observed.
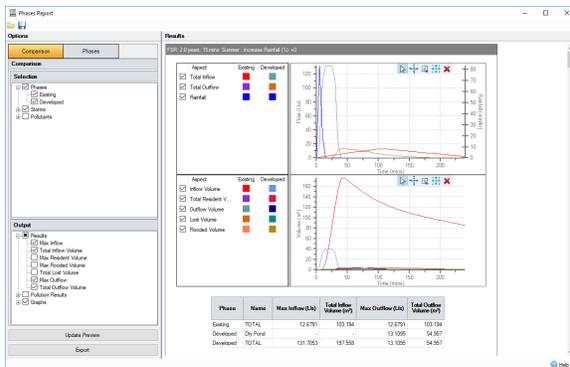
As we can see from the results, our developed phase discharge rates are currently a lot higher than our existing site, therefore we will have to size our treatment system to try and reduce these rates to existing site conditions.

16. We can also look at the results for our connections, to see how well they are coping with the flows. To do this, select **Connections** from the **Summaries** section of the **Results** tab.
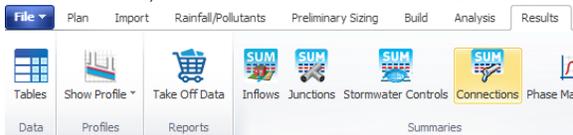
17. This opens the following window that displays the status in the pipes for either all items or specific connections. As we only have one flow path, it does not matter if the **Select Filter** option is selected as **All Items** or **Flow Path**.

The Critical Storm for pipes can be determined by selecting **Critical Storm** at the top of the window. This allows you to analyse which storms provide the worst conditions for the pipes in your network.

18. Navigate back to the **Profile** view of the flow path and select any storm. Use the **Playback Animation** toolbar to view the inundation across the system. Note the red horizontal lines indicate the Maximum Hydraulic Grade Line (HGL) for the elements in the system and the orange icon, as shown in the screenshot below, indicates that the manhole, and therefore the pipe downstream, is experiencing surcharging.
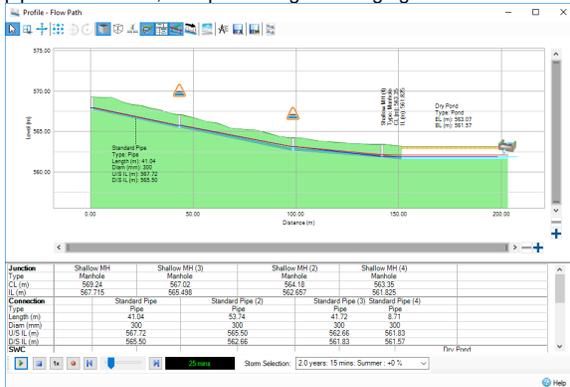
19. We can also run simulations for the 1:30 year storms, which can be done by changing the rainfall in **Analysis Criteria**. Change the rainfall to **FSR 30** and rerun the analysis.

20. After running the analysis the **Stormwater Controls Summary** window is automatically displayed, within this window we can select **Critical Storm**, just like with the pipes, to show us the worst case scenario.

From these results, we can see that the stormwater control is coping with the volume of water, even with the critical storm. However, as we previously saw with the **Phases Report**, we are discharging at too high a rate. Therefore, we will alter the pond in the next section to mitigate this.

21. Save your work as **XP_Tutorial5.xpdx**