

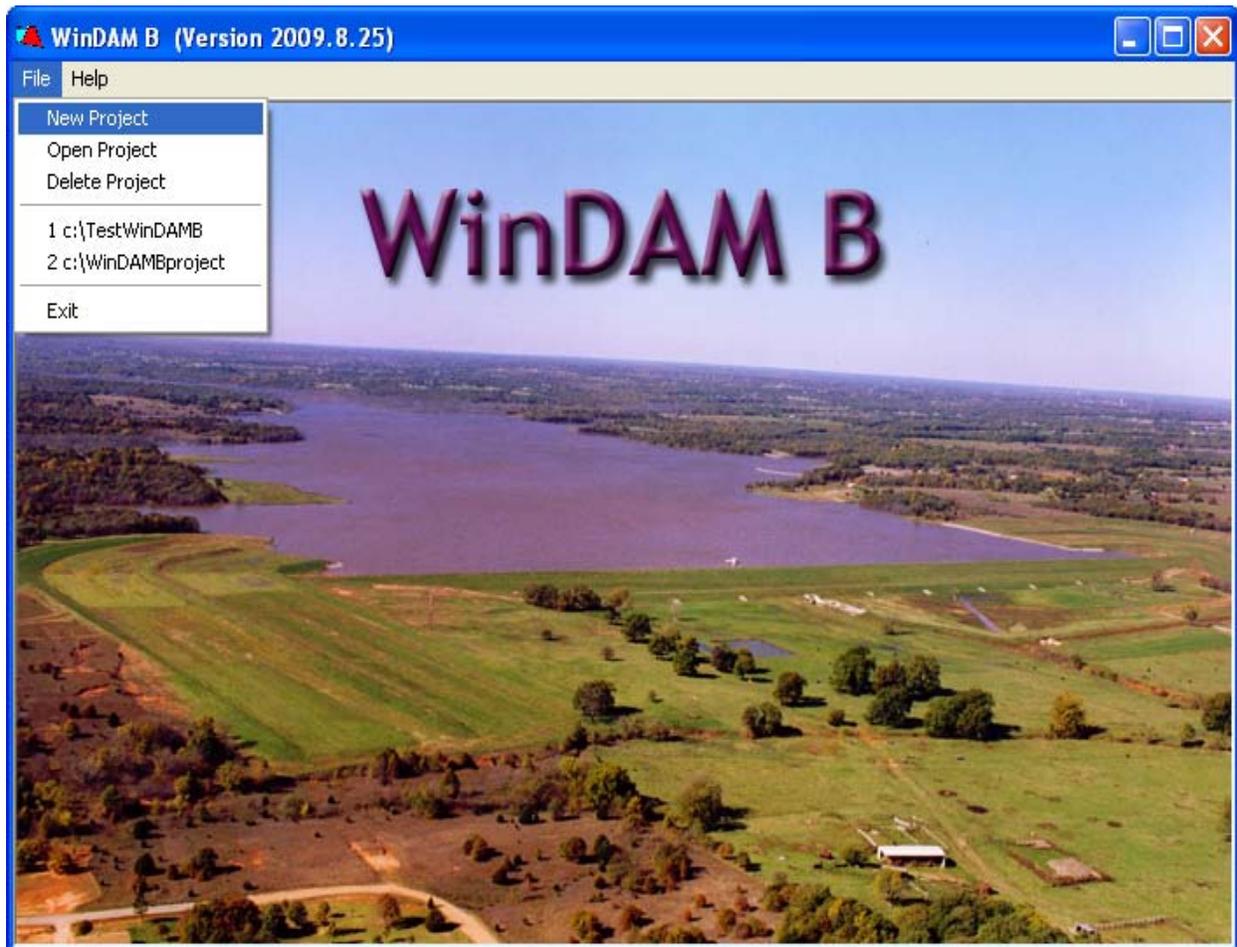


WinDAM B: Quick Start Guide

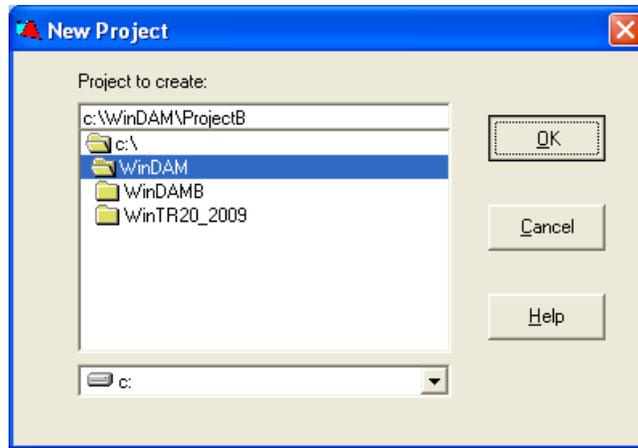
Modules for Dam Design and Analysis

August 2009

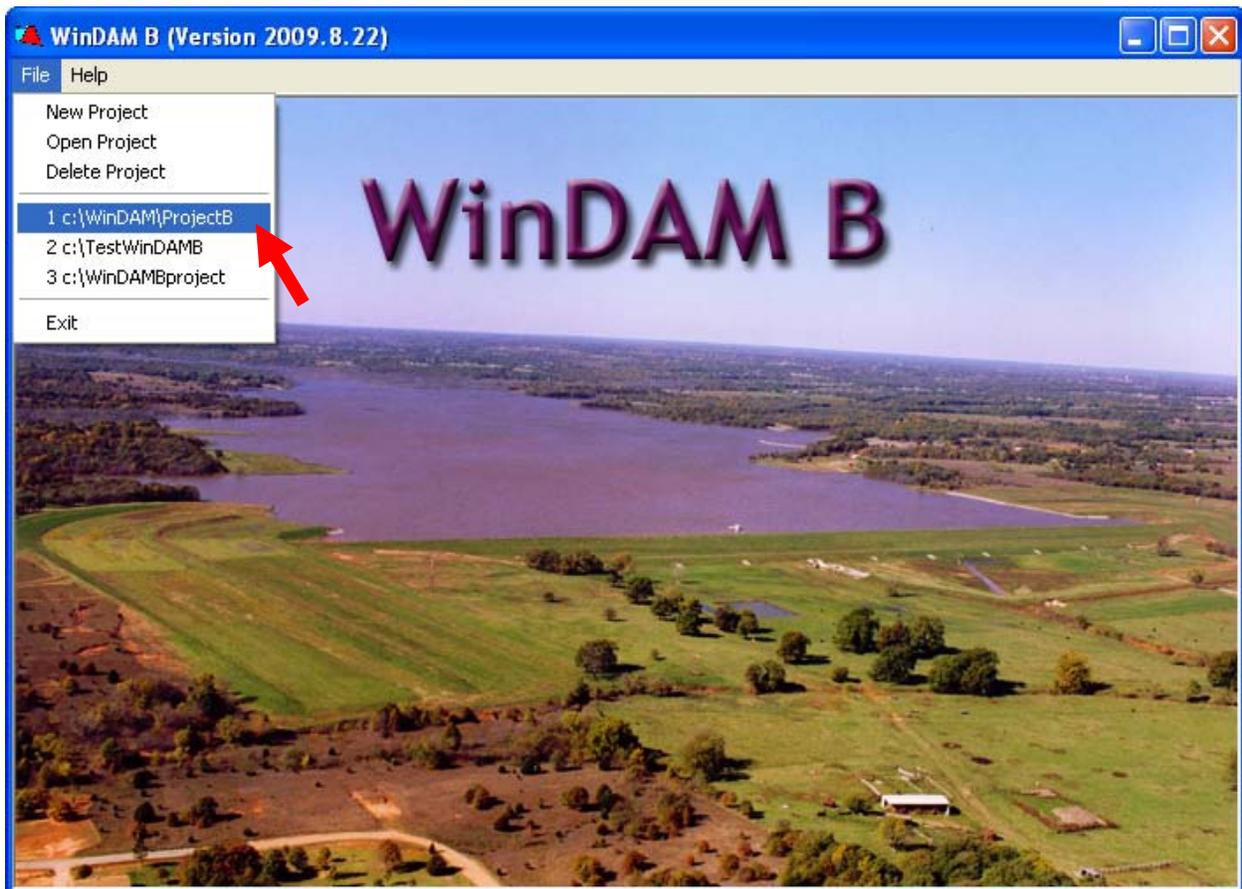
The first step in using the Windows™ Dam Analysis Modules – Version B (**WinDAM B**) Integrated Development Environment (IDE) is to create a new project or open an existing project. Click **File + New Project** to create a new project as shown below. Open an existing project by clicking **File + Open Project**, or by selecting a recently opened project from the History List (for example, C:\WinDAMBproject is an existing project in the History List shown below).



In the **New Project** dialog, enter the name of a new project directory, say ProjectB; e.g., c:\WinDAM\ProjectB. Note that in this example, the directory c:\WinDAM already existed and was created outside of the IDE using Windows Explorer, but the project directory itself, ProjectB, is created by the IDE.



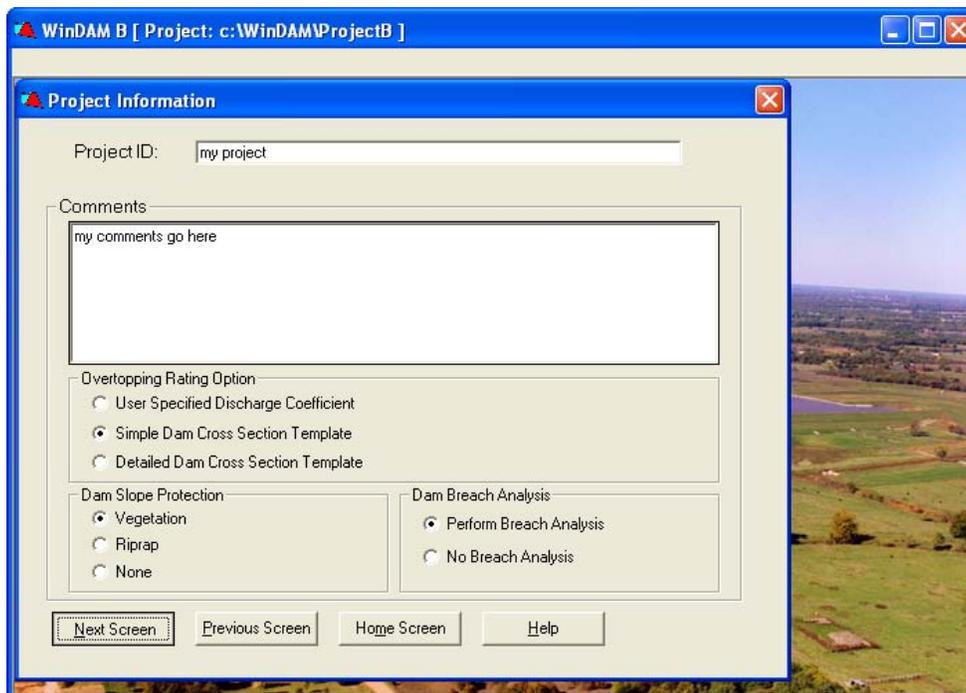
After exit from the project, **File + Exit**, the newly created project will be displayed in the History List. Open the newly created project by clicking on the new entry in the History List as shown below:



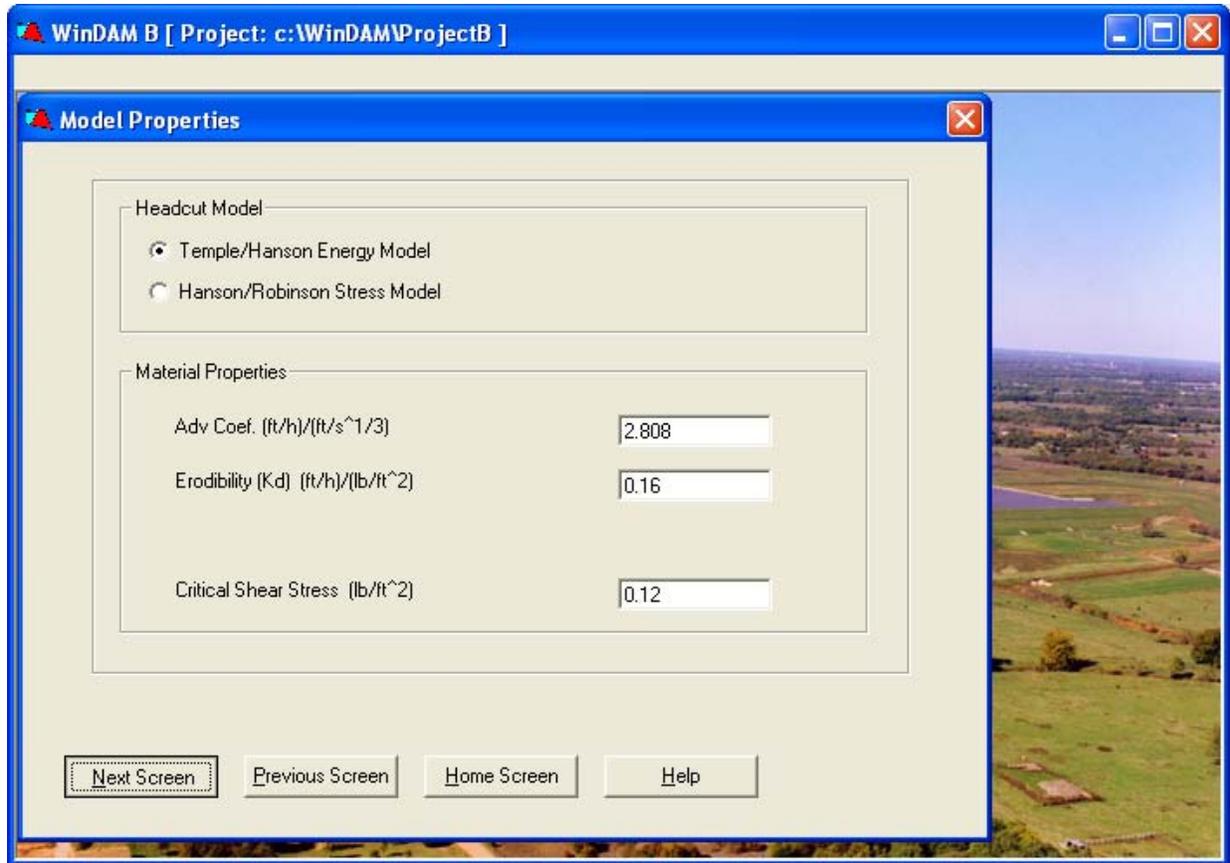
The next step is to open an existing control file or to create a new control file. To create a new file, click on **File + New File** as shown below.



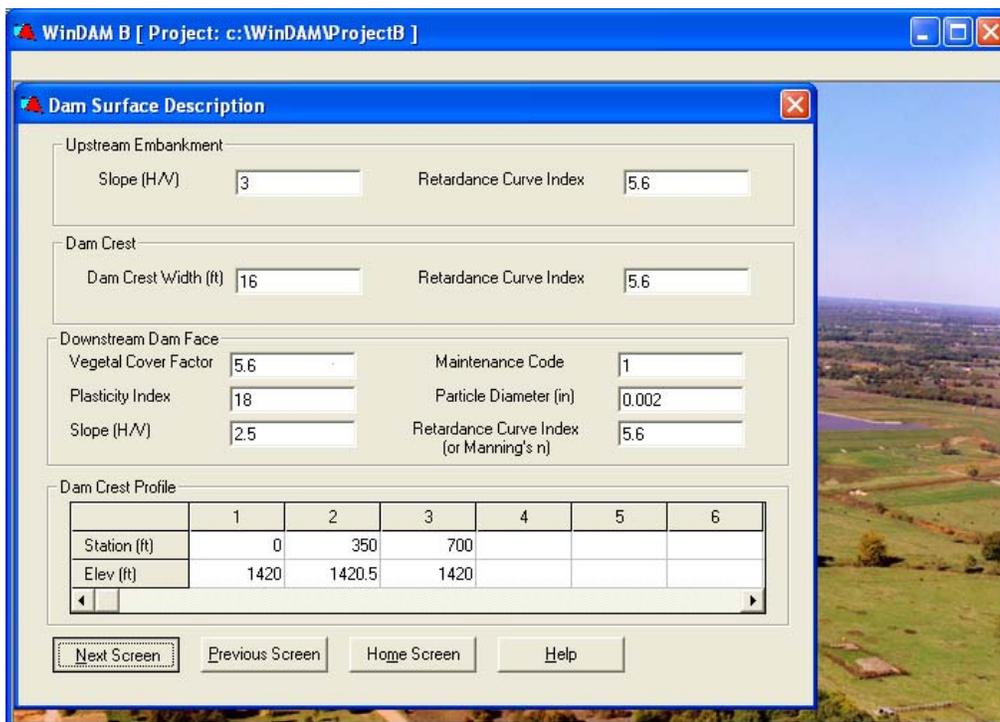
Then, enter **Project Information**. There are three options for **Overtopping Rating**, three for **Dam Slope Protection**, and two for **Dam Breach Analysis**. For each, only one option may be selected. Finally, click on **Next Screen** to go onto the next screen and continue entering data.



If breach analysis is to be performed, then the **Model Properties** screen is displayed. Specify the model to be used for breach analysis as shown below:



Next, the **Dam Surface Description** screen is displayed. Enter data describing the dam surface as shown below:



The next screen is used to enter **Structure Table** information:

WinDAM B [Project: c:\WinDAM\ProjectB]

File Edit

Structure Table

Structure Identifier: 6

Principal Spillway Rating and Reservoir Stage-Storage

| | Elevation, ft | Principal Spillway Discharge, cfs | Reservoir Storage Volume, acre-ft | Reservoir Surface Area, acres |
|---|---------------|-----------------------------------|-----------------------------------|-------------------------------|
| 1 | 1380 | | | 0 |
| 2 | 1385 | | | 2.18 |
| 3 | 1390 | | | 6.24 |
| 4 | 1400 | | | 10.42 |
| 5 | 1405 | | | 16.83 |
| 6 | 1410 | | | 24.00 |
| 7 | 1415 | | | 30.81 |
| 8 | 1420 | | | 38.80 |

Elevation to Start Routing, ft: 1398.12 Elevation of Valley Floor, ft: 1378

Next Screen Previous Screen Home Screen Help

Scroll down to add the last row in the grid table. Then, click **Next Screen** to continue.

WinDAM B [Project: c:\WinDAM\ProjectB]

File Edit

Structure Table

Structure Identifier: 6

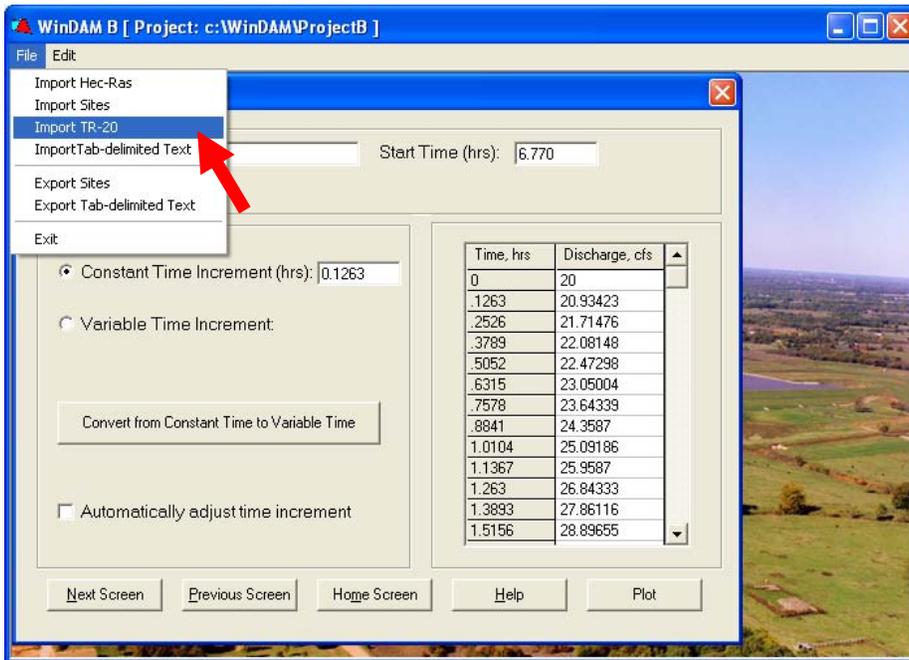
Principal Spillway Rating and Reservoir Stage-Storage

| | Elevation, ft | Principal Spillway Discharge, cfs | Reservoir Storage Volume, acre-ft | Reservoir Surface Area, acres |
|---|---------------|-----------------------------------|-----------------------------------|-------------------------------|
| 1 | 1380 | | | 0 |
| 2 | 1385 | | | 2.18 |
| 3 | 1390 | | | 6.24 |
| 4 | 1400 | | | 10.42 |
| 5 | 1405 | | | 16.83 |
| 6 | 1410 | | | 24.00 |
| 7 | 1415 | | | 30.81 |
| 8 | 1420 | | | 38.80 |

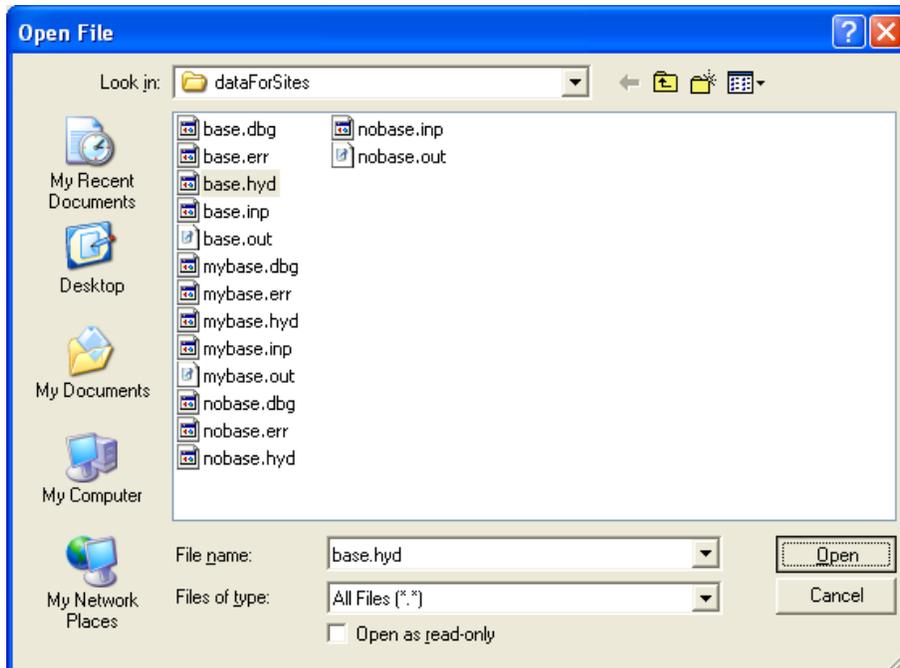
Elevation to Start Routing, ft: 1410 Elevation of Valley Floor, ft: 1380

Next Screen Previous Screen Home Screen Help

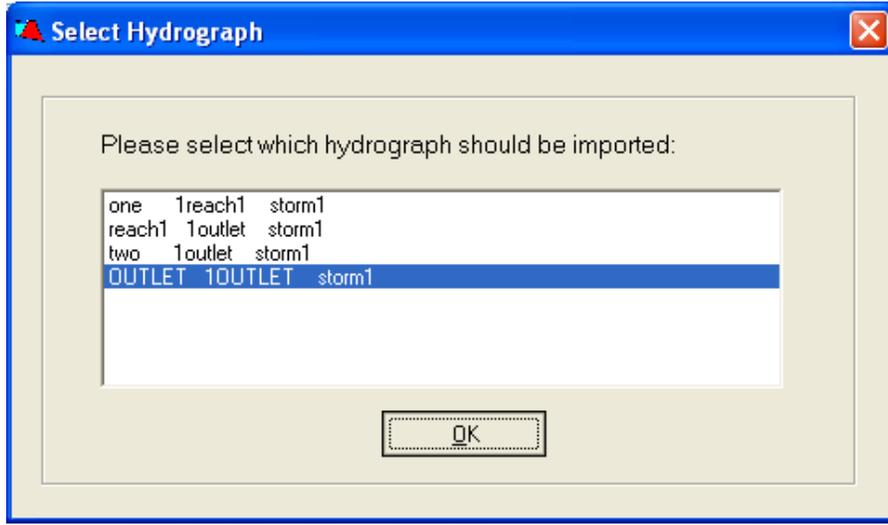
The **Hydrograph Data** screen is used to enter an inflow hydrograph. The data can be entered directly or imported from other applications including Hec-Ras, Sites 2005.1.3, TR-20, or spreadsheets (tab-delimited text). For example, to import an inflow hydrograph from Sites, select **File + Import TR-20**:



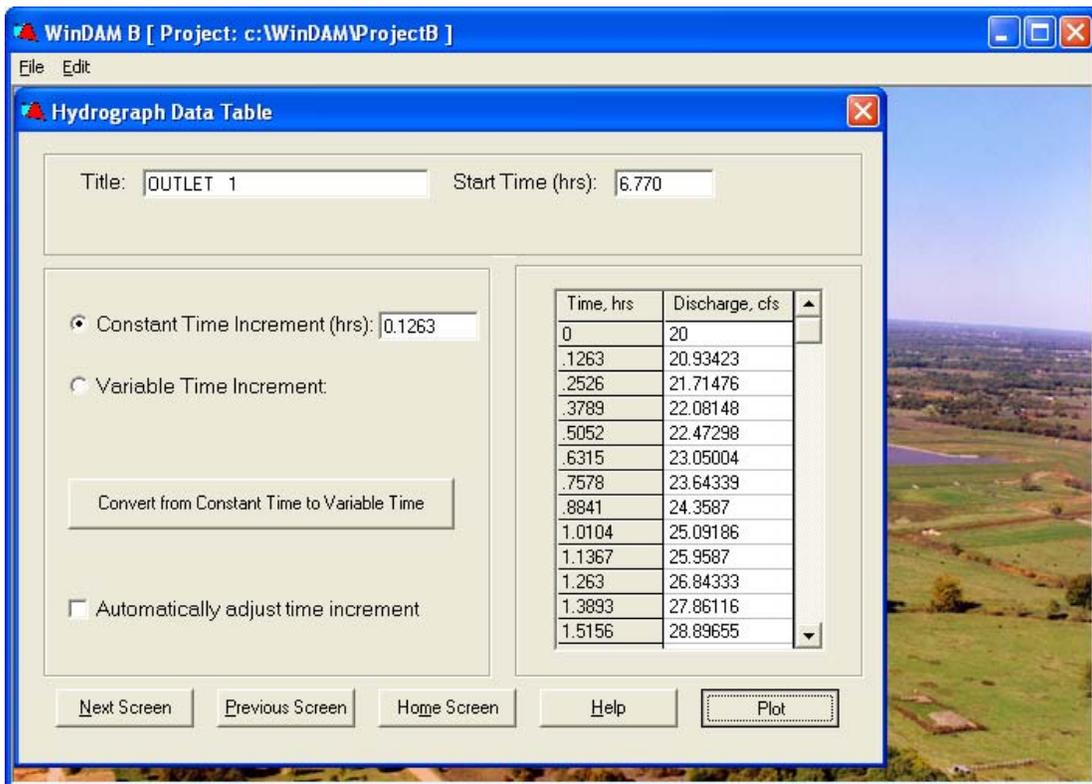
Select the input source file, in this example a **WinTR-20 Hydrograph Data File (*.hyd)** file, called base.hyd, is selected.



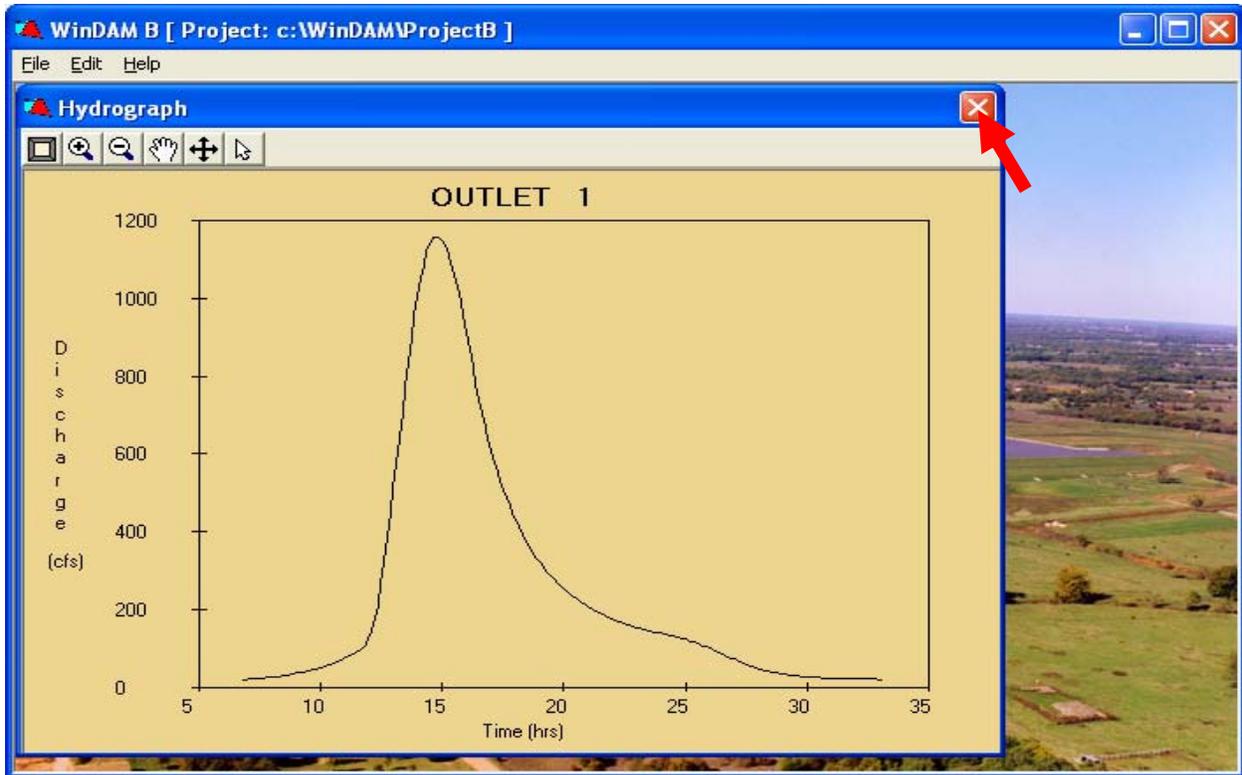
If the file contains more than one hydrograph, the user is prompted to select one for import:



In general, the data is considered to have a variable time increment, and the user should specify a constant time increment and convert the hydrograph to constant time. For this example, the hydrograph has a constant time increment of 0.1263 hours.

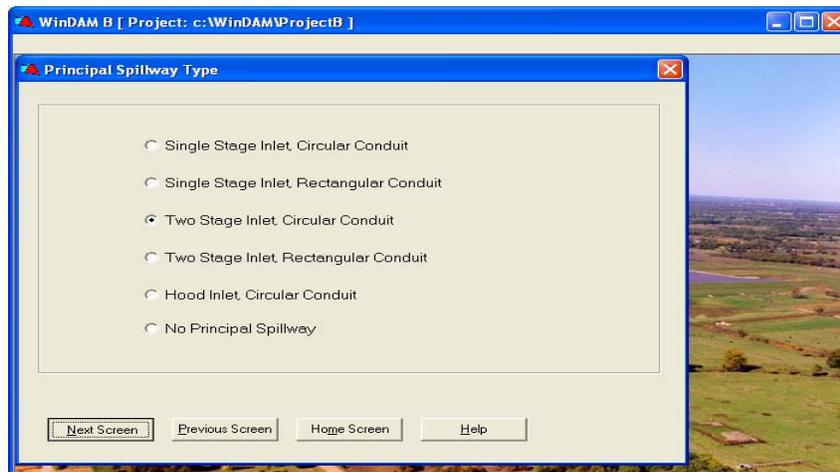


The hydrograph can be plotted by clicking on the **Plot** button. Close the Hydrograph Plot screen to return to the Hydrograph Data Table screen.

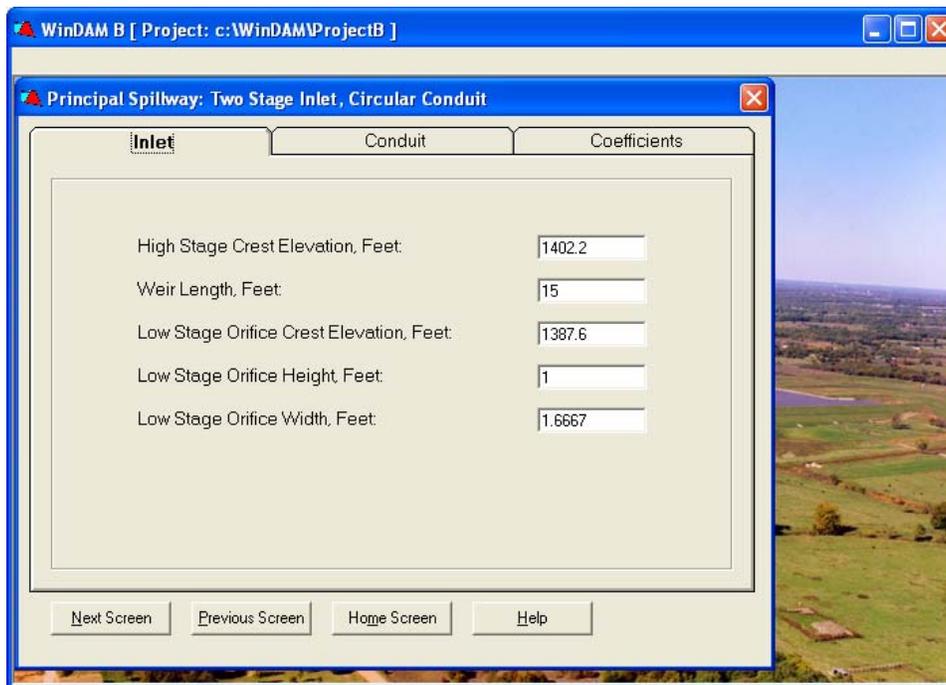


Finally, the user can select **Automatically Adjust Time Increment** to cause the simulator to adjust the time increment so that the simulations converge. The time increment is set to be half of the previous time increment. This is repeated until the subsequent run of the simulation converges to the current simulation. Thus, at least two runs of the simulation will be performed. For this example, DO NOT click on the check box to automatically adjust the time increment.

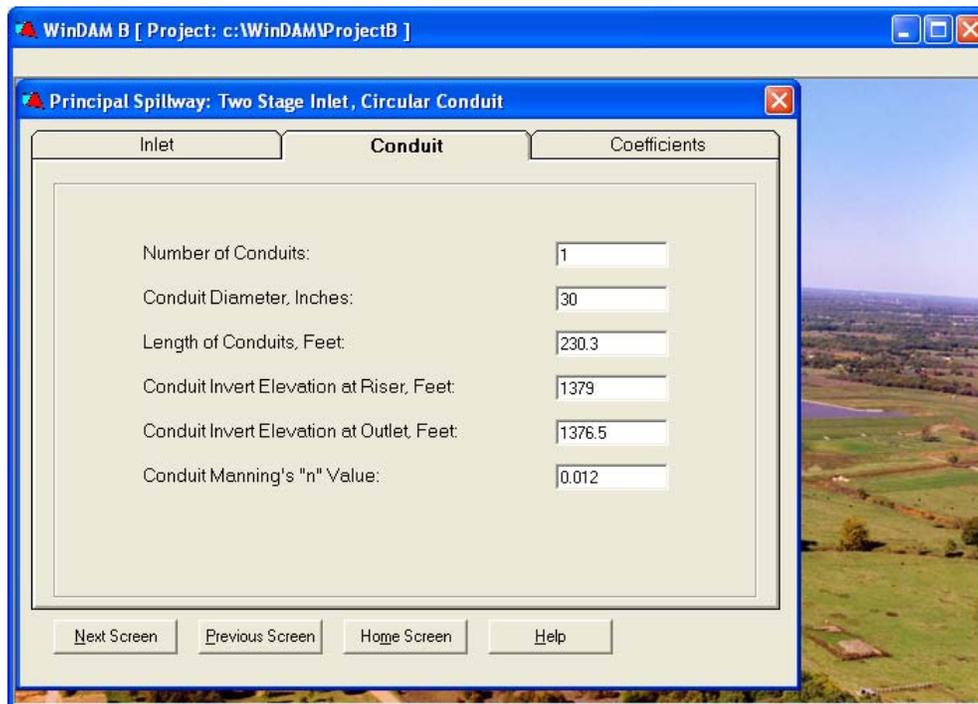
Next, the following screens are used to enter information about the Principal Spillway followed by the Auxiliary Spillway(s). First, the type of principal spillway is entered. Here, select a Two Stage Inlet with a Circular Conduit.



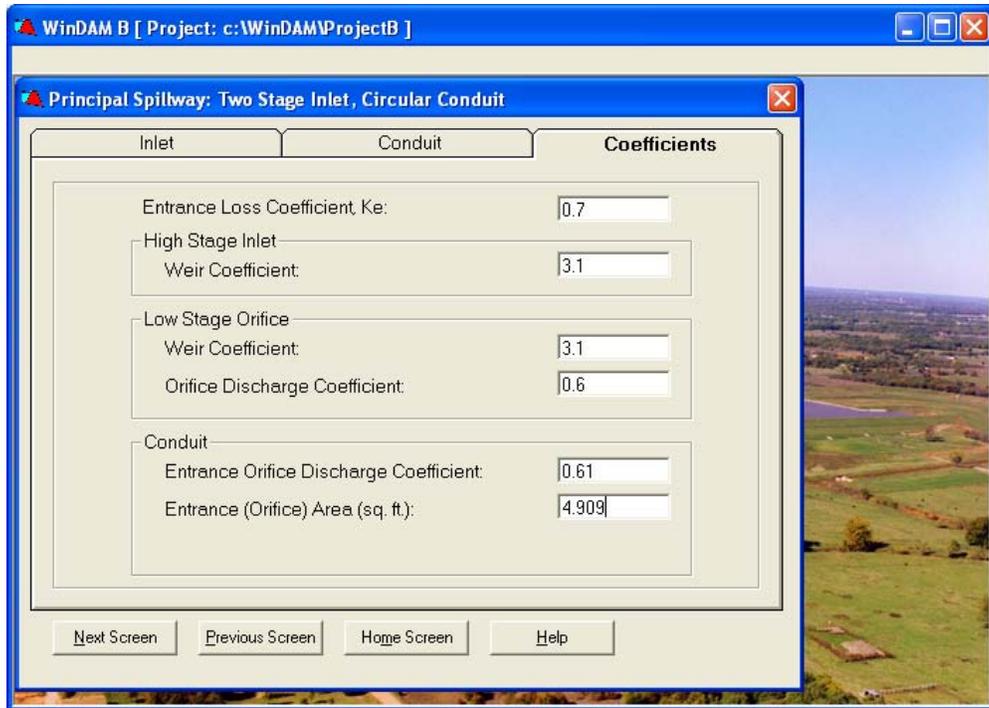
Principal Spillway information is divided up into three tabs for Inlet, Conduit, and Coefficients:



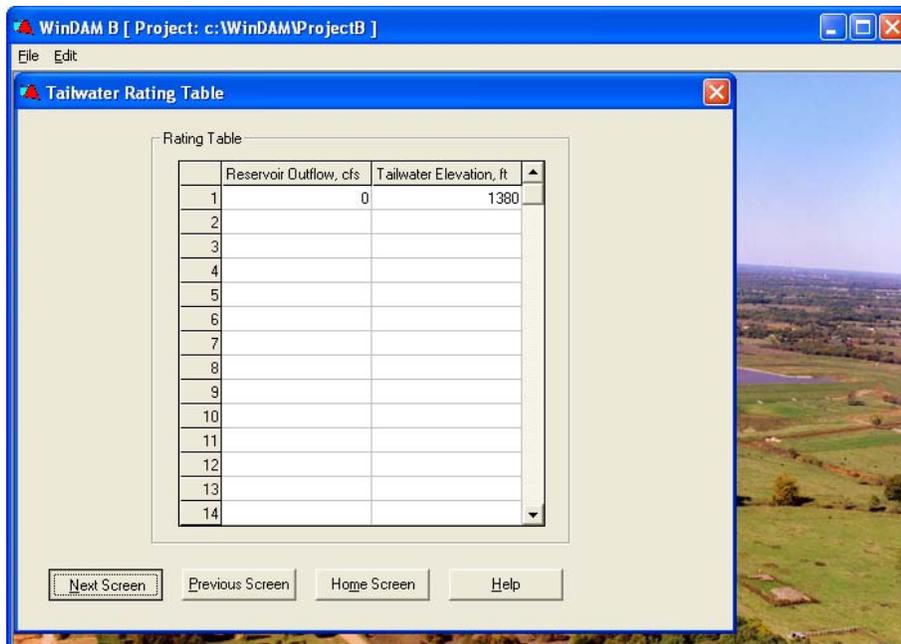
Click on the **Conduit** tab to enter information regarding the conduit(s):



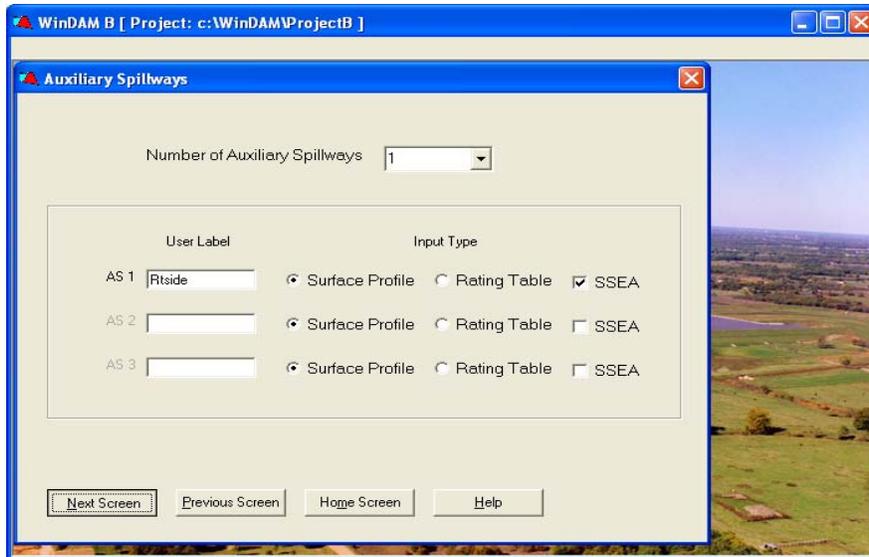
Finally, click on the **Coefficients** tab to enter the remaining principal spillway information:



The next screen is used to enter a **Tailwater Rating**, which is optional.

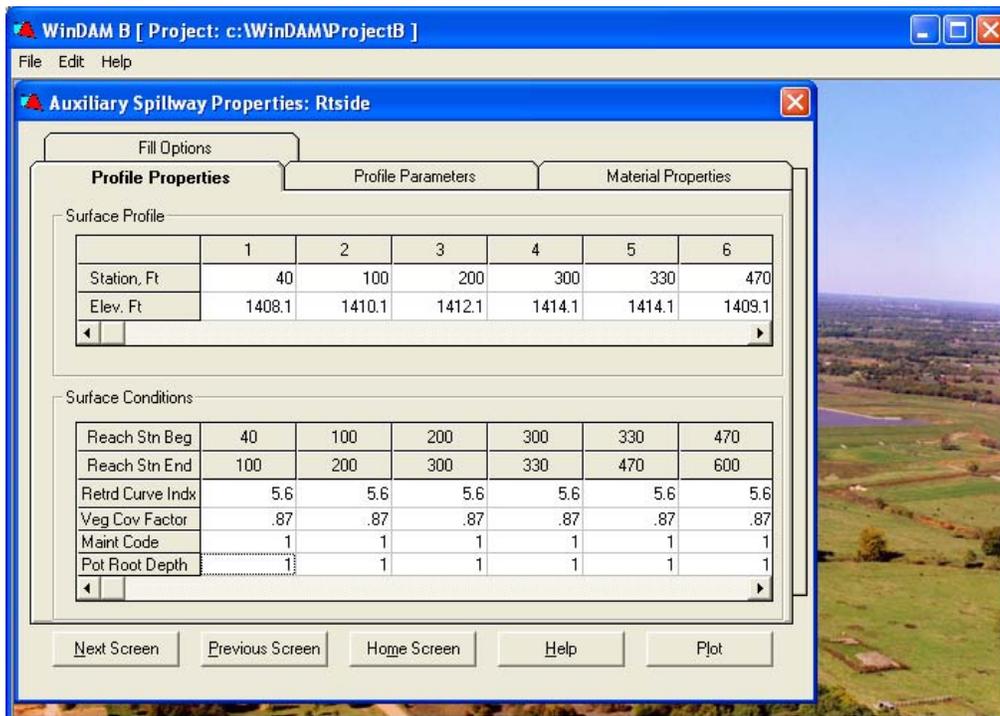


Next, information for up to three **Auxiliary Spillways** can be entered. First, the number of Auxiliary Spillways must be selected (0-3):



Information can be entered as a **Surface Profile** or by using a **Rating Table**. In addition, **Sites Spillway Erosion Analysis (SSEA)** can be performed on one or more of the spillways specified by clicking on the SSEA checkbox.

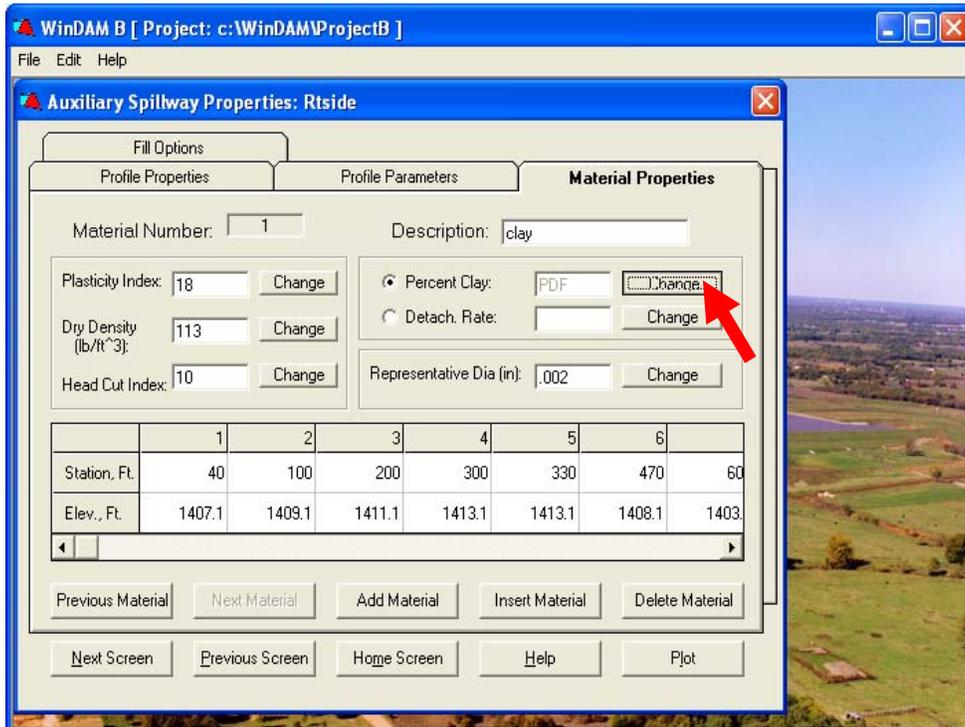
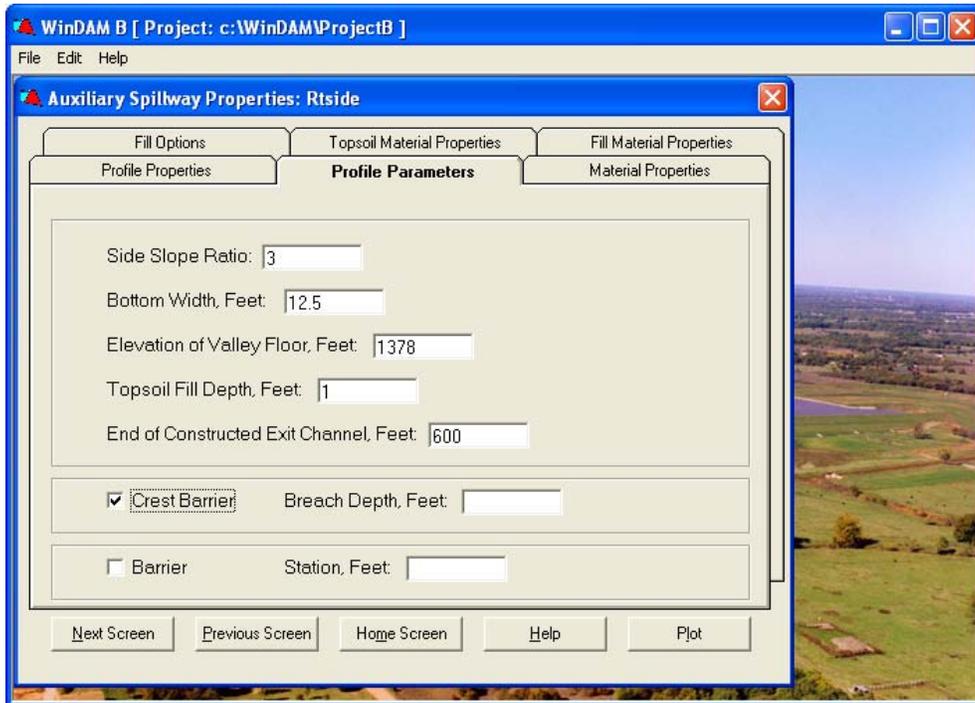
The Surface Profile for Auxiliary Spillway is entered on the Aux. Spillway Properties screen:



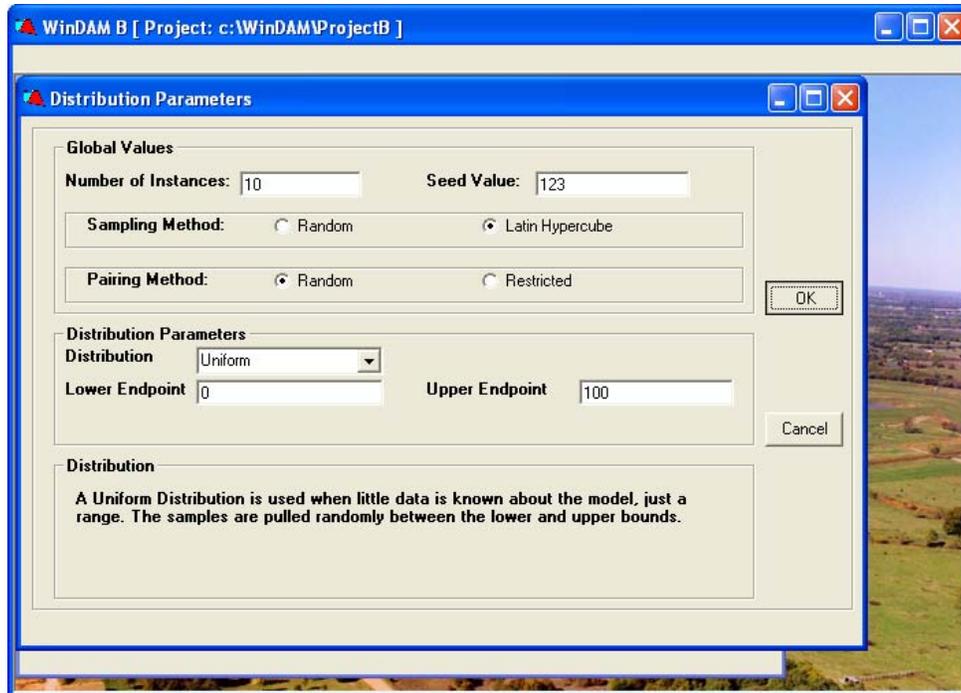
The Surface Profile is given by:

40 100 200 300 330 350 470 600 860
 1408.1 1410.1 1412.1 1414.1 1414.1 1414.1 1409.1 1404.1 1375

Scroll to the right to enter the last three (Station, Elevation) pairs.

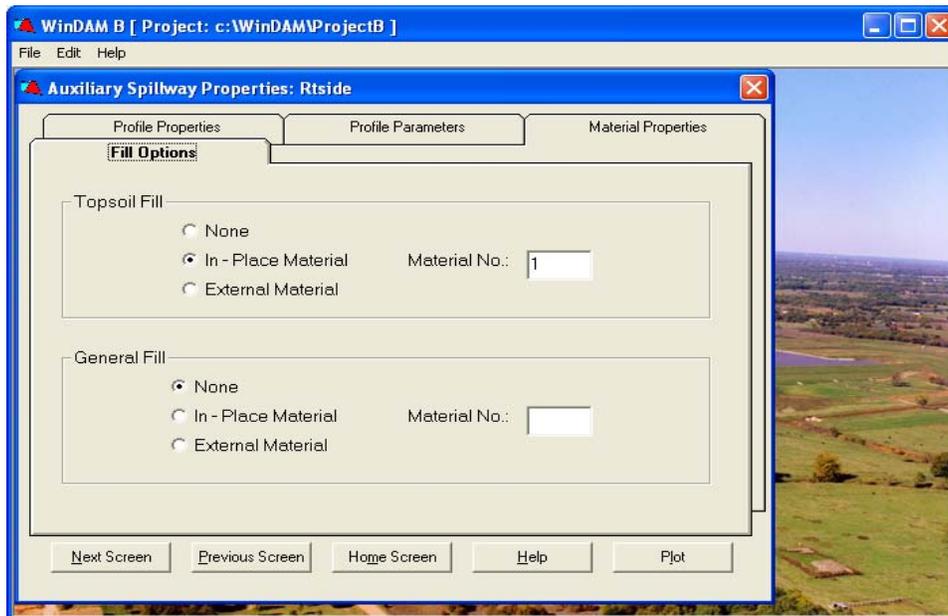


Click on the **Change** button beside the variable to be defined using Probabilistic Input.

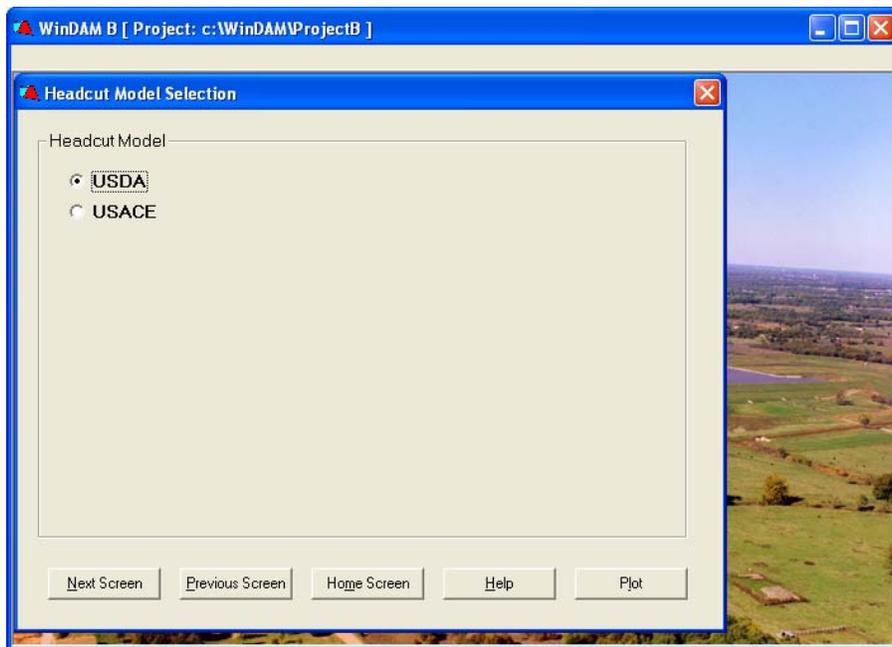


Use the **Distribution Properties** screen to define the type of distribution to be used to describe the Head Cut Index, and the number of random samples to be generated.

The **Fill Options** tab is used to specify the type of Topsoil Fill and General Fill to be used. If External Material is selected, then additional tabs are displayed to enter Material Properties for Topsoil and/or General Fill.



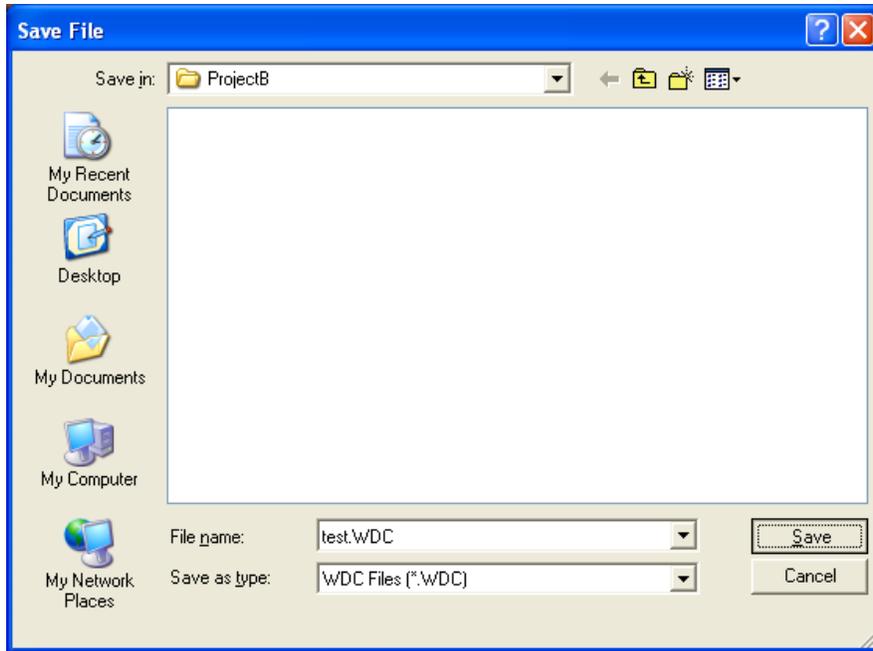
The Next Screen button takes the user to the Headcut Model Selection screen. This screen is only displayed if the user has elected to perform Spillway Analysis.



The US Army Corps of Engineers (USACE) Headcut Model allows for parameterized input, whereas, the USDA Model uses fixed input for the headcut model. Clicking on Next takes the user back to the Home Screen:



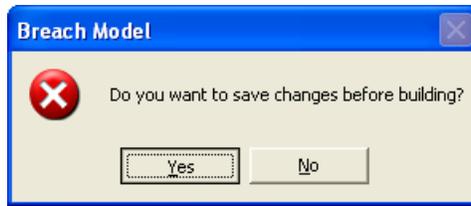
The next step is to save the input data by selecting selecting **File + Save As...**



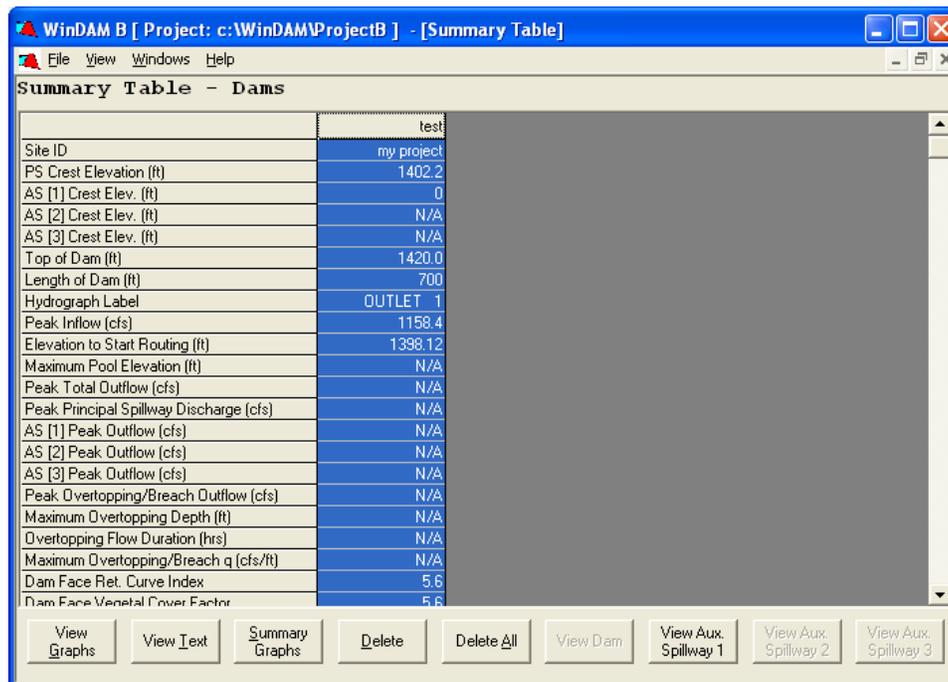
After saving the file as **test.WDC**, the simulation can be performed by selecting **Build + Build File**:



If changes have been made to the data set since the file was last saved, the user will be prompted to save the changes. The simulation is performed on the data saved in the input control file.



After performing the simulation, output results can be examined in both Text and Graphical format by selecting **View + Summary Table**. The Summary Table contains key summary information in tabular format. In this example, only one column of data for test.WDC is displayed. Select the column, and the **View Aux. Spillway 1 Button** is enabled as shown below:



Click on the **View Aux. Spillway 1 Button** to jump to the Auxiliary Spillway Summary Table:

WinDAM B [Project: c:\WinDAMProjectB] - [Auxiliary Summary Table]

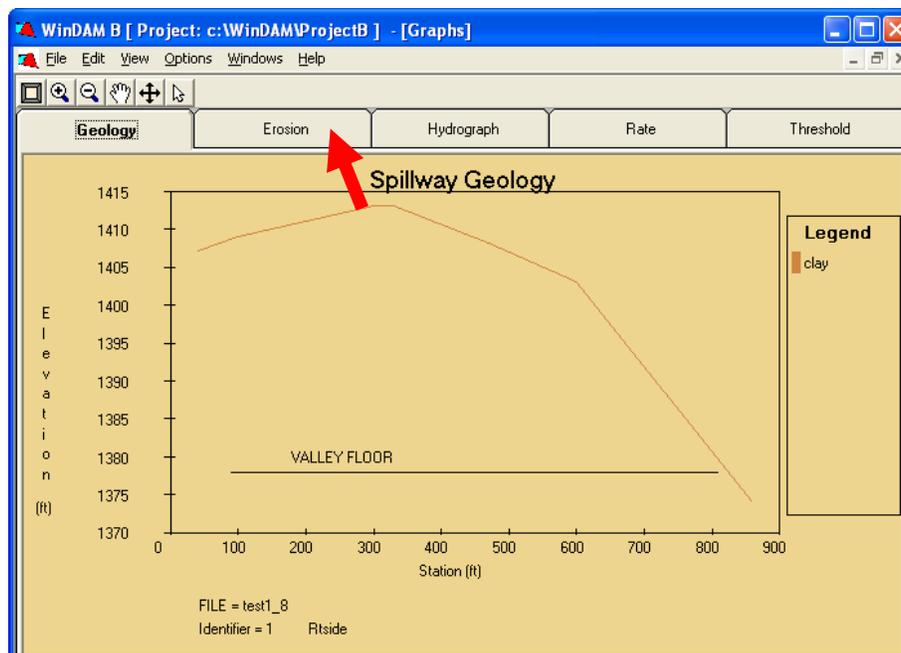
File View Windows Help

Summary Table - Aux. Spillway

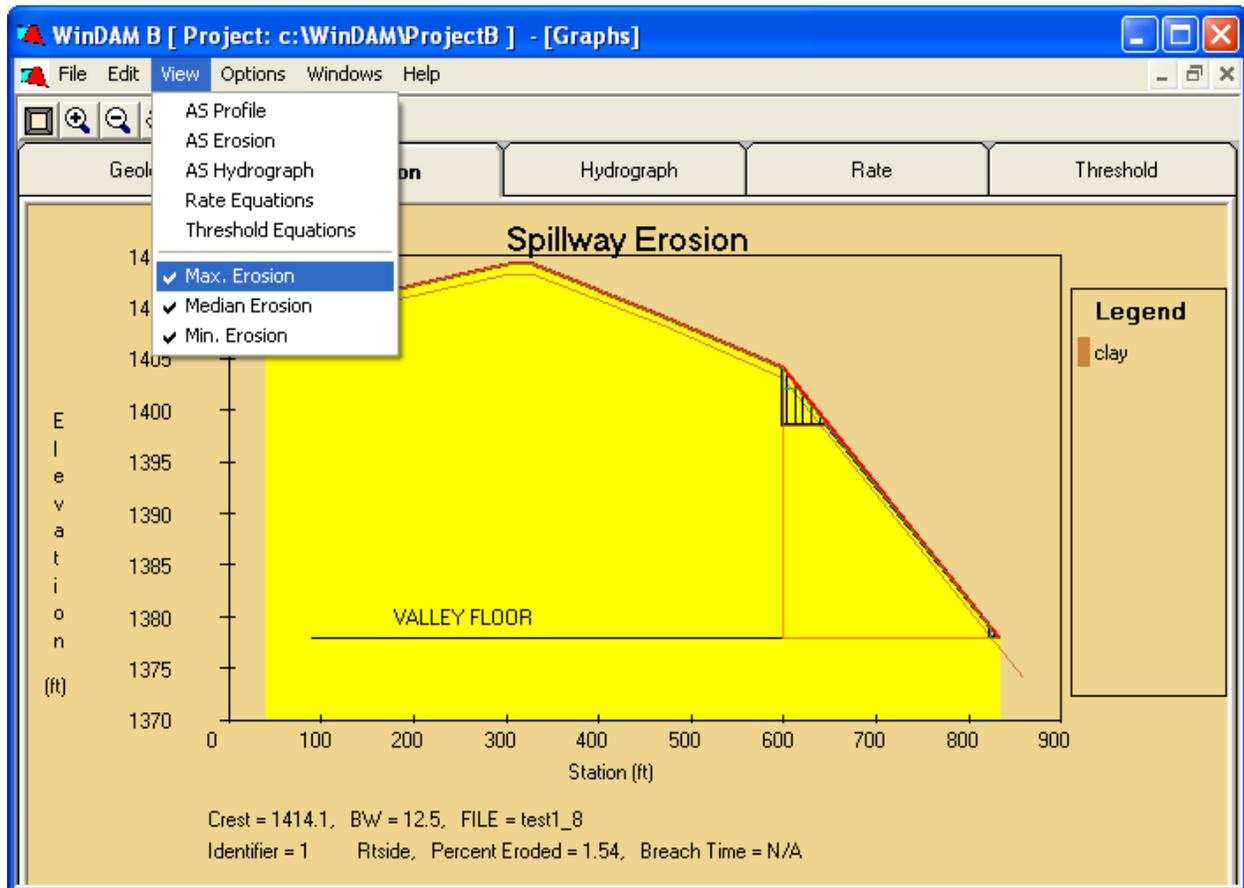
| | test1_5 | test1_8 | test1_3 |
|--|---------|---------|---------|
| Type | Max. | Median | Min. |
| AS Peak Discharge (ft ³ /s) | 346. | 346. | 346. |
| AS Flow Duration (hours) | 18. | 18. | 18. |
| AS Crest Elevation (ft) | 1414.1 | 1414.1 | 1414.1 |
| AS Width (ft) | 12.5 | 12.5 | 12.5 |
| Final Station, Most Upstream Headcut | 600. | 600. | 600. |
| AS Integrity Distance (ft) | 300. | 300. | 300. |
| Breach Time (hours) | N/A | N/A | N/A |
| Final Height, Most Upstream Headcut (ft) | 26.1 | 5.7 | 2.1 |
| Time, Initiation of Upstream Headcut (hours) | 13.36 | 13.36 | 13.36 |
| Station, Initiation of Upstream Headcut | 600.0 | 600.0 | 600.0 |
| AS Exit Slope (%) | 11.2 | 11.2 | 11.2 |
| AS Ret. Curve Index | 5.6 | 5.6 | 5.6 |
| AS Veg. Cover Factor | 0.87 | 0.87 | 0.87 |
| AS Maintenance Code | 1 | 1 | 1 |
| AS Rooting Depth (ft) | 1.0 | 1.0 | 1.0 |
| Station, Maximum Erosion Depth | 600.0 | 600.0 | 600.0 |
| Maximum Erosion Depth (ft) | 26.1 | 5.7 | 2.1 |
| Valley Floor Elevation (ft) | 1378.00 | 1378.00 | 1378.00 |
| Barrier Station (ft) | N/A | N/A | N/A |
| Elevation, Eroded Surface (ft) | N/A | N/A | N/A |
| Threshold Coefficient (ft ³ /s) | N/A | N/A | N/A |

View Graphs View Text Summary Graphs Delete Delete All View Dam View All

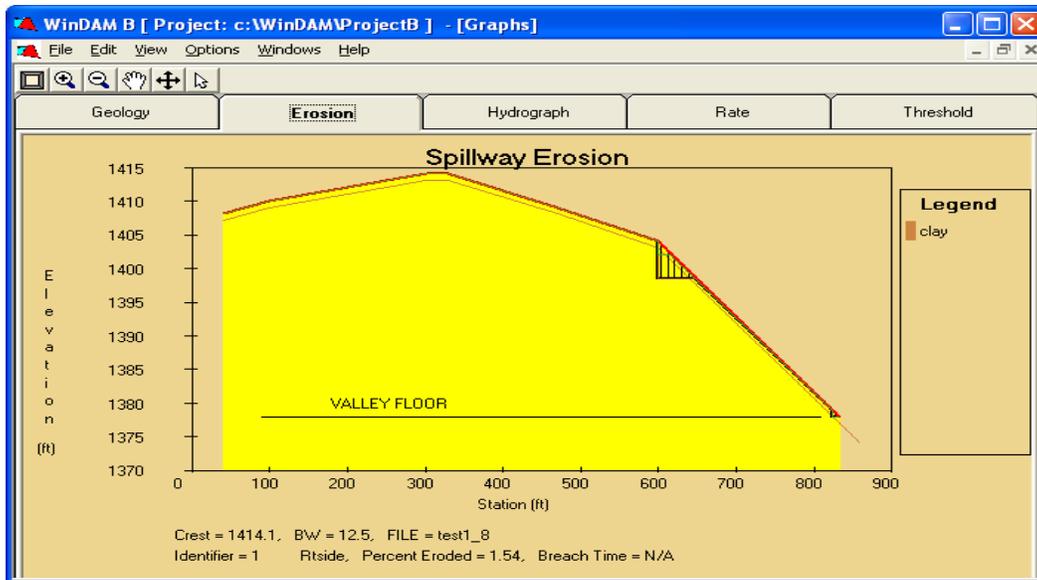
Click on the **View Graphs Button** to jump to the Auxiliary Spillway Graphs:



Click on the **Erosion Tab**, or select **View + ASErosion** from the menu bar.



Click on View + Max. Erosion to remove the red Max. Erosion Line:



A standard set of tools can be used to Frame, Zoom In, Zoom Out, Pan, Center, and Point out values on the graph displayed.

A snapshot of any image can be saved as a Windows® Bitmap using **File** and **Save As...**, sent to printer using **File** and **Print**, or copied to the Windows® Clipboard using **Edit** and **Copy to Clipboard**. After copying to the clipboard, the file can be pasted into any other application, such as Microsoft® Word®, as we have here, using **Edit** and **Paste** (or Ctrl-V).