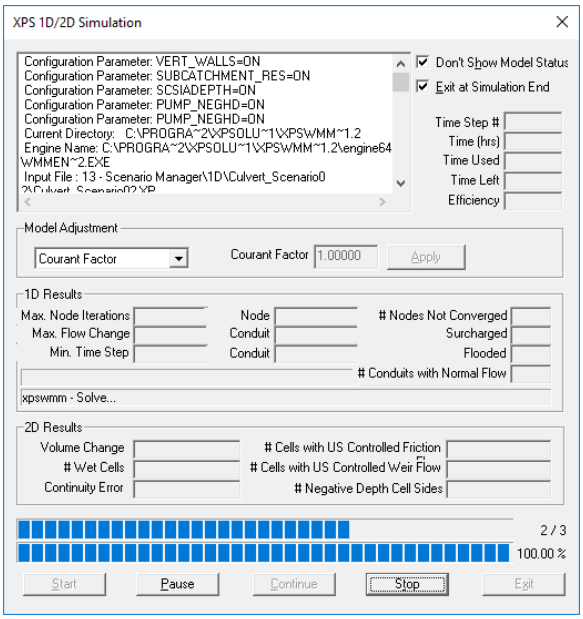
Analytical Engine

The 1D-analytical engine performs all numerical computations for 1D-models. It is based on the EPA SWMM engine and has significant proprietary enhancements.

When the engine is running the window displays statistics on the computational performance and progress of the simulation. Calculations may be paused (to view run time statistics) and then continued or stopped. If stopped before the assigned simulation end the model will contain full output and statistics up to the manually terminated point in time. The run time parameters for a link or node may be viewed graphically.



When the model contains 2D components, the 2D Results displays information regarding the progress of the 2D-simulation. 2D flow calculations are performed by the TUFLOW engine.

TUFLOW is a computer program for simulating depth-averaged, two and one-dimensional free-surface flows such as occurs from floods and tides. TUFLOW, originally developed for just two-dimensional (2D) flows, stands for **T**wo-dimensional **U**nsteady **FLOW**. The fully 2D solution algorithm, based on Stelling 1984 and documented in Syme 1991, solves the full two-dimensional, depth averaged, momentum and continuity equations for free-surface flow. The initial development was carried out as a joint research and development project between WBM Oceanics Australia and The University of Queensland in 1990. The project successfully developed a 2D/1D dynamically linked modelling system (Syme 1991). Latter improvements from 1998 to today focus on hydraulic structures, flood modelling, advanced 2D/1D linking and using GIS for data management (Syme 2001a, Syme 2001b). TUFLOW has also been the subject of extensive testing and validation by WBM Pty Ltd and others (Barton 2001, Huxley, 2004).

TUFLOW is specifically orientated towards establishing flow patterns in coastal waters, estuaries, rivers, floodplains and urban areas where the flow patterns are essentially 2D in nature and cannot or would be awkward to represent using a 1D network model.

A powerful feature of TUFLOW is its ability to dynamically link to the 1D network of the XPSWMM engine. In the xp environment, the user sets up a model as a combination of 1D network domains linked to 2D domains, i.e. the 2D and 1D domains are linked to form one model.

On this section: