Waterway Analysis Model Batch Processing Program - WAM BPP

Lock Capacity Analysis

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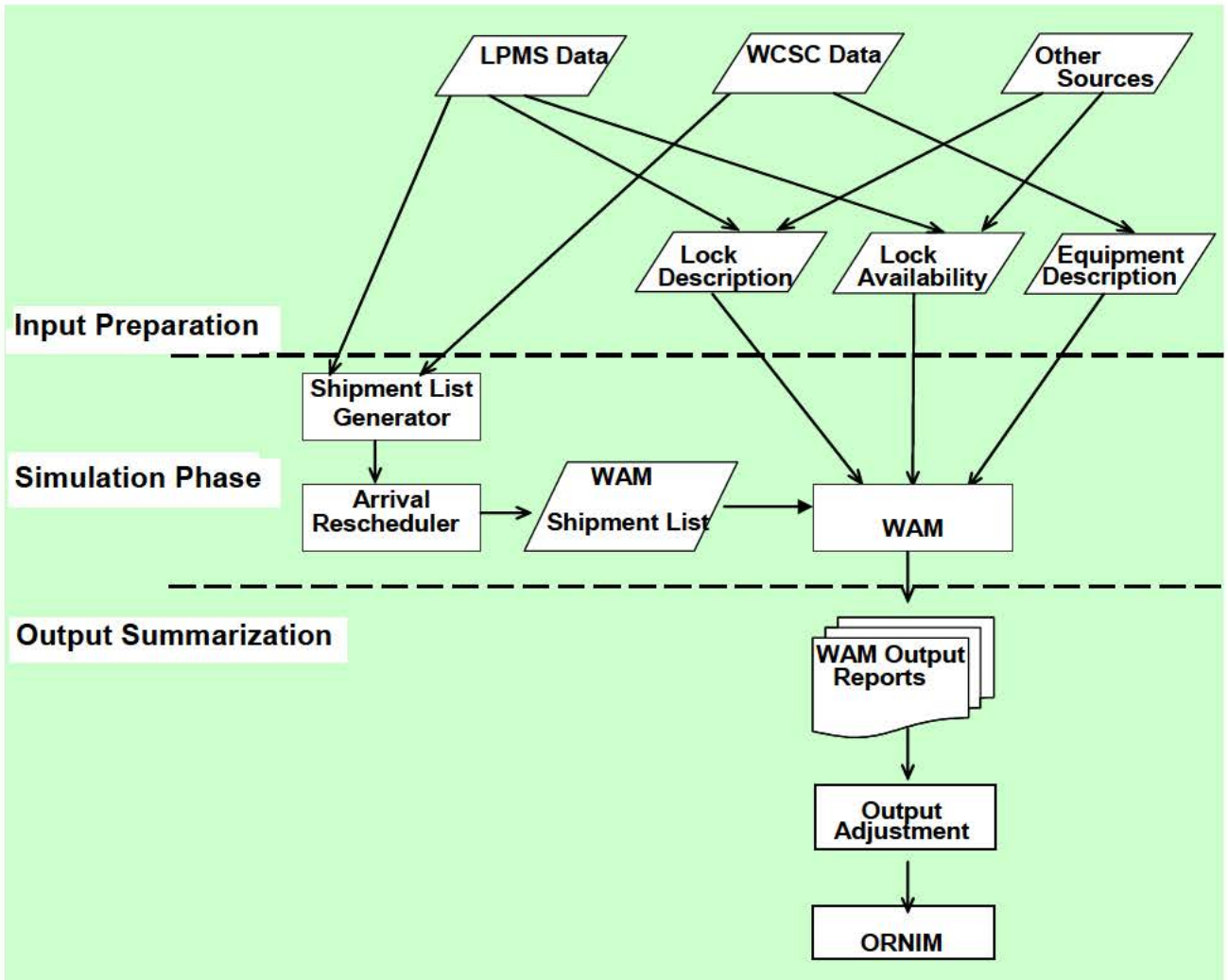
Waterway Analysis Model – WAM

- **WAM is a Simulation Model developed by the Corps to determine the impact of tow movements on the inland waterway system**
  - *simulates tow (towboat plus barges) movements through navigation locks based on the model configuration.*
- **4 Major Components of WAM**
  - **System Description Input Data – waterway network, tow fleet, cargo**
  - **External Event Input Data – tow arrivals, lock downtimes**
  - **Simulation Program - processes tows through the waterway network from origin to destination (O-D pairs) ports.**
  - **WAM Model Output - detailed lock database tables**

Waterway Analysis Model Process Overview



Waterway Analysis Model (WAM) Lock Capacity Analysis

- Purpose of WAM is to create Lock Capacity Curves.

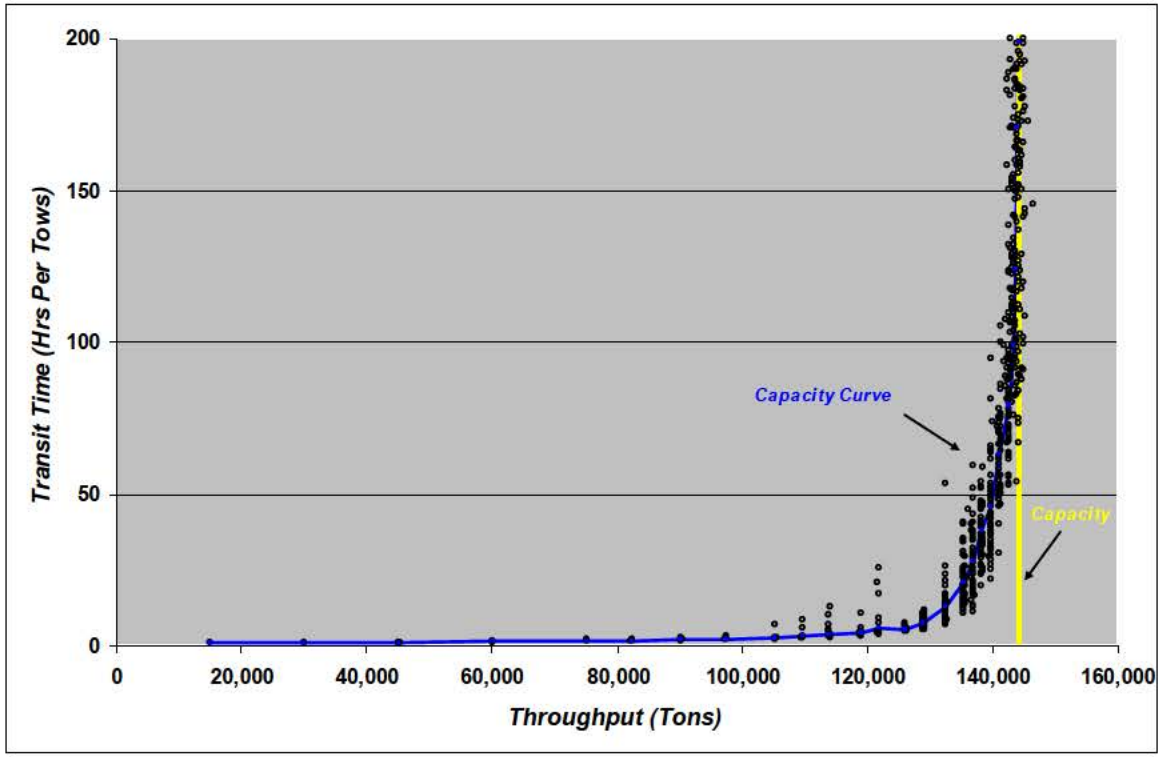
- Capacity Analysis - relationship between traffic demand (tonnage) and expected tow transit times (delay + processing times).

- Transit time includes the time the vessel is "delayed" and the time needed to "process" the vessel through the lock.

- Tow arrives at a lock & either "waits" (facility is busy) or is "processed" (moves tonnage) through a lock chamber.

- During chamber downtimes, vessels must either use another chamber or wait until the downtime ends - causing increased processing times and high delays at the lock projects.

Lock Capacity Curve
One Set of WAM Runs
(average of 50 runs at 27 different traffic levels)



Family of Curves –
Lock Chamber Downtimes & Closure Events

- **Family of Curves - *collection of 26 curves created using lock chamber downtimes & unique long closure events***

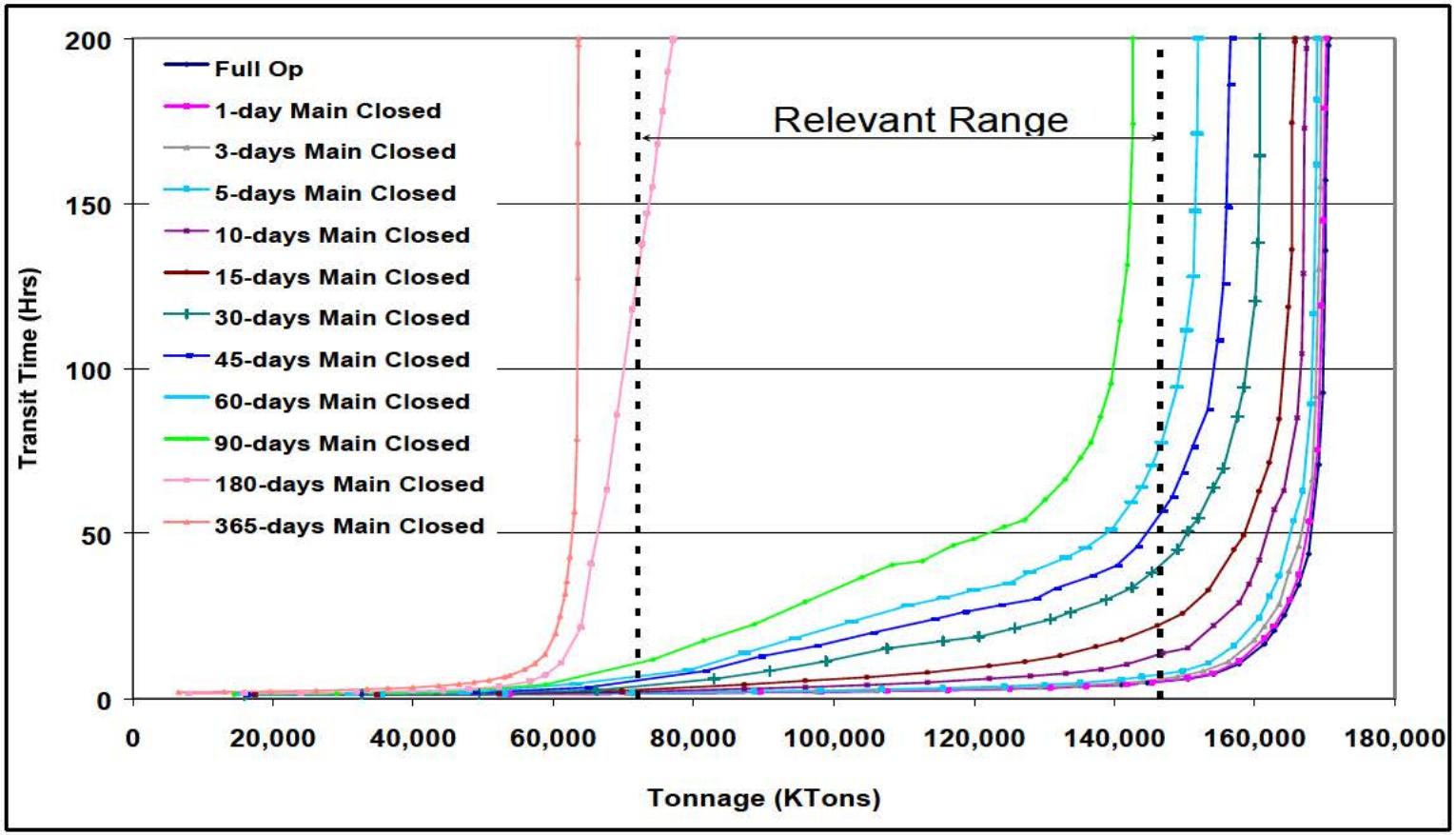
- **Two Types of Closure Events**

1. **Random Minor Stalls (unscheduled events < 1 day)**
   - **Full OP Curve – *Main & Auxiliary Chambers Open***

2. **Long Closures (scheduled or unscheduled events > 1 day)**
   - ***Main or Auxiliary Chambers Closed due to Major Maintenance or Rehabilitation Events***

   - **Family of Curves *(1, 3, 5, 10, 15, 30, 45, 60, 90, 180,& 365 Day Closures)***
   - ***Queue Limits & Half Speeds (30, 45, 60, & 90 Day Closures)***

Lock Capacity Analysis
Typical Family of Curves

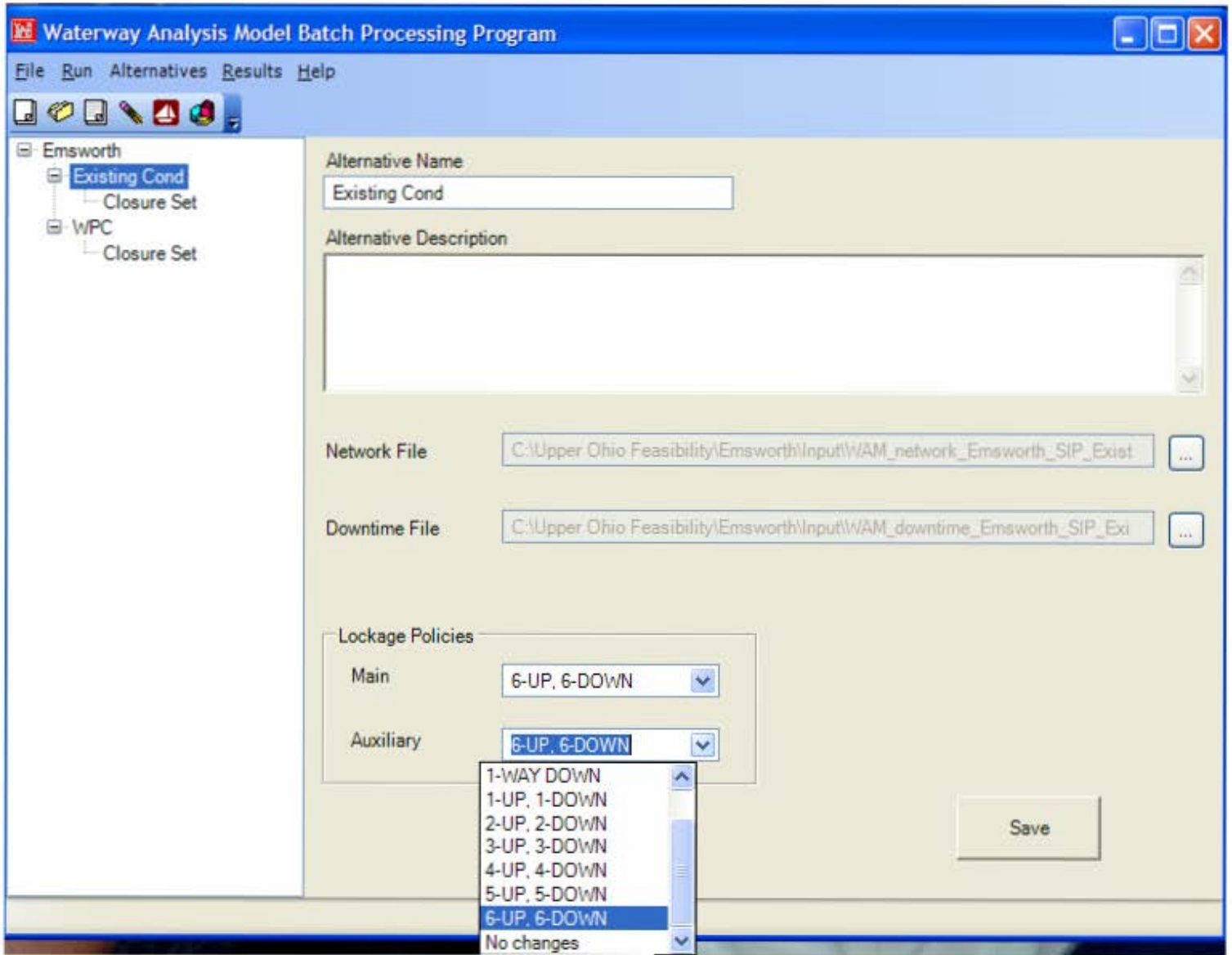


Waterway Analysis Model
Batch Processing Program - WAM BPP

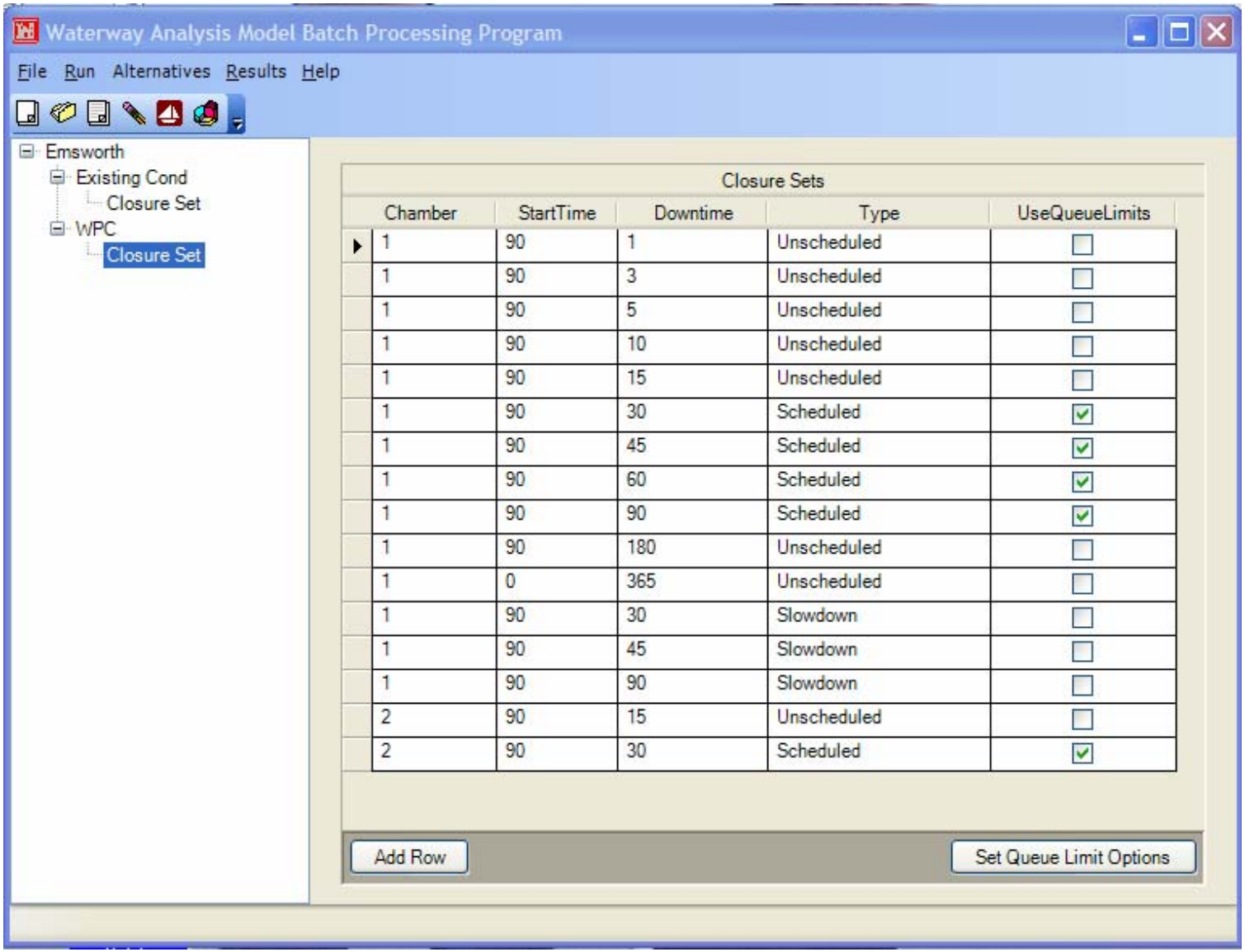
WAM BPP was developed to:

- Eliminate the process of creating separate Downtime & Startup files
- Modify Input Files before a WAM Run
- Specify and save all the Parameters to define a WAM Run
- Execute several programs to make the WAM Run
- Read and Write to and from ASCII text files
- Store the Output Results in Access Database Tables

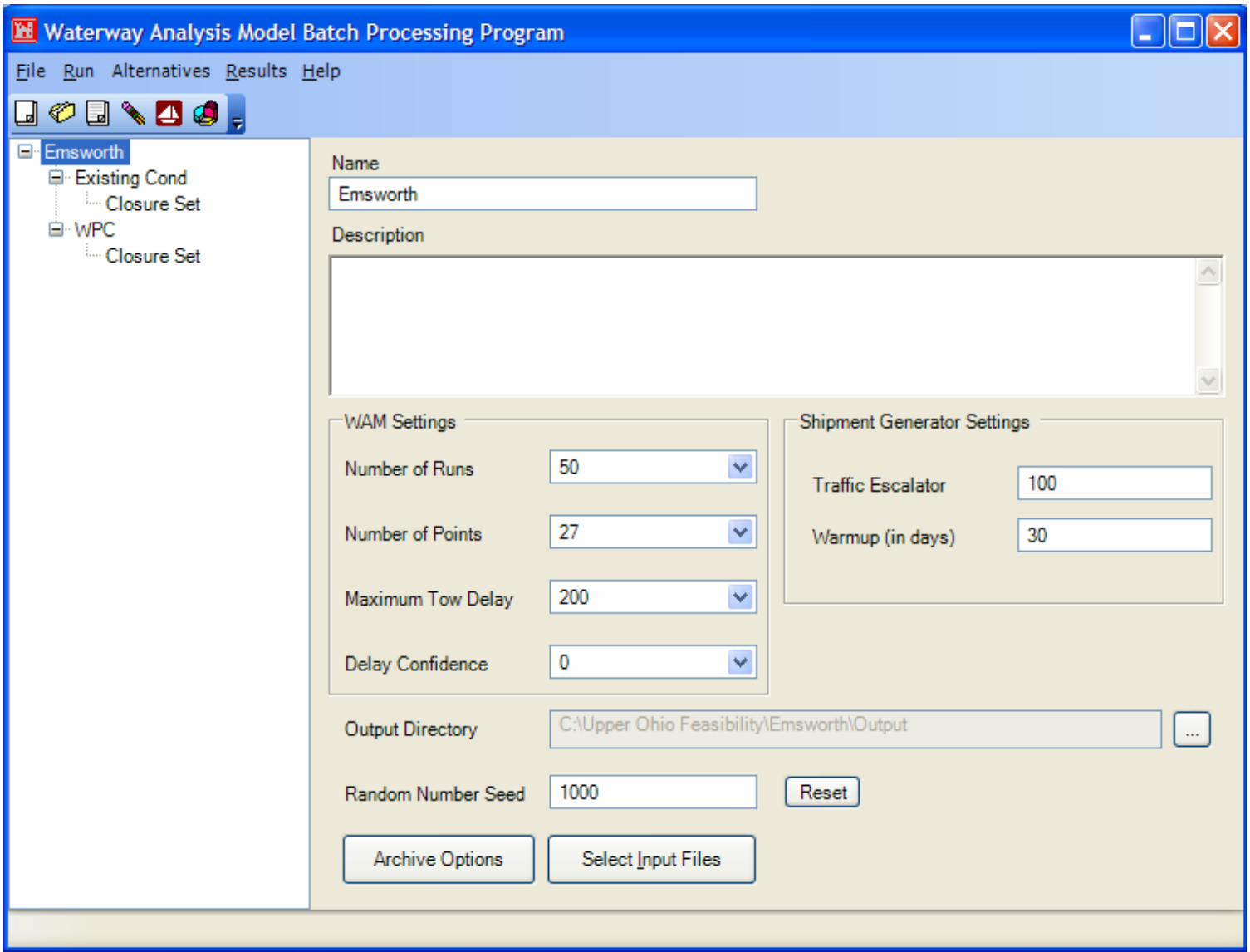
WAM BPP
Project Alternatives



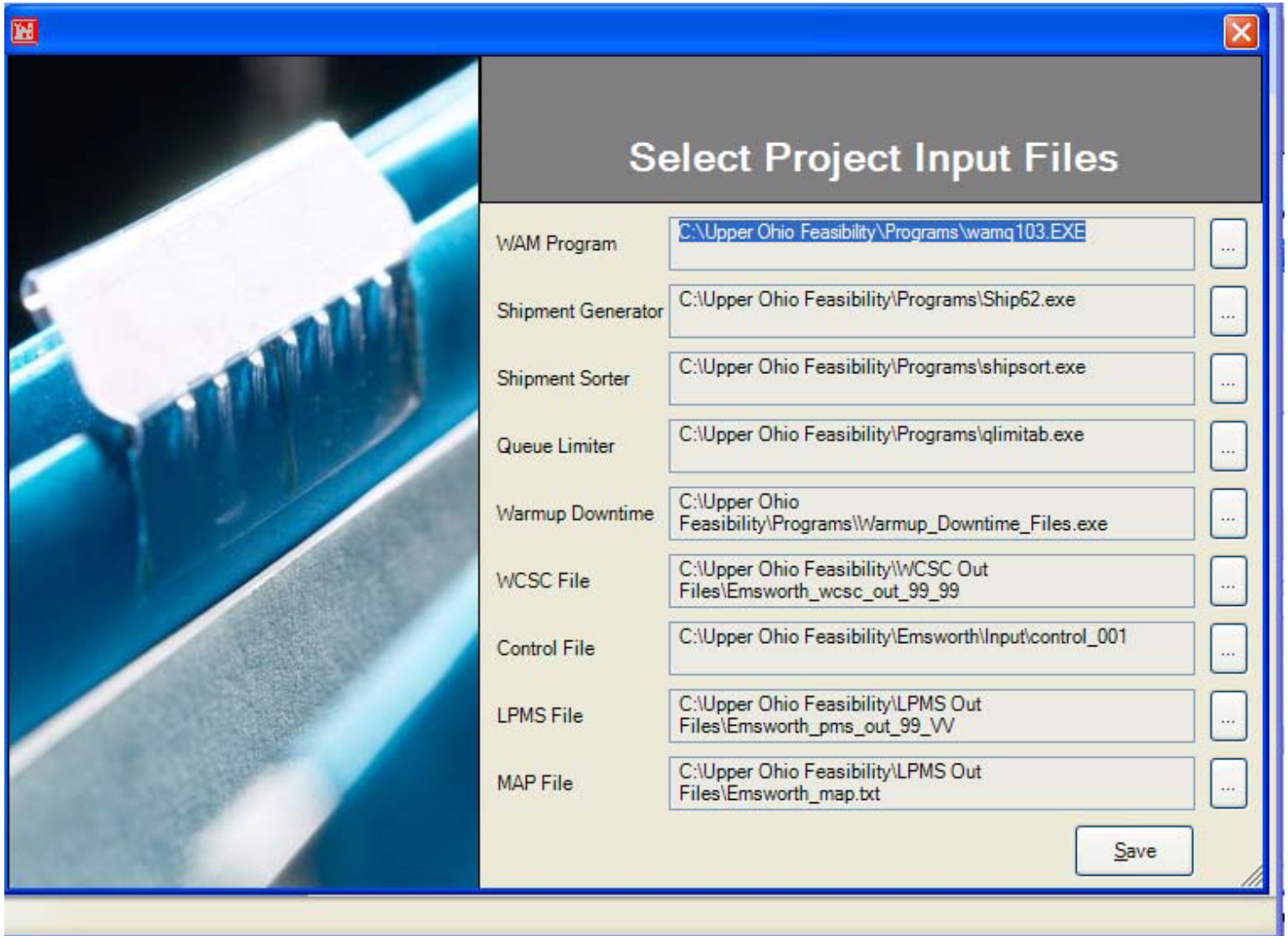
WAM BPP
Lock Closure Scenarios



Waterway Analysis Model Batch Processing Program - WAM BPP



WAM BPP - Executable Programs



Waterway Analysis Model
Batch Processing Program - WAM BPP

Questions ???