

# Water System Modeling Requirements (Updated 04/12/07)

A water system model will be required on all final plan reviews. The following guidelines are provided.

## **Modeling Instructions:**

In order to conduct hydraulic modeling, the developer will need to contact the City Water Division (801) 253-5230 to make arrangements to field test the water pressure at the site. The lower pressure between the field-test pressure and the pressure zone map (attached to this document and on the city website) should be used for design. The development engineer can assume that this source node serves as a fixed grade node or tank supply. Hydraulic modeling results will be provided to the City as part of the final development review submittal.

City staff will integrate the development water model within the overall City system water model and evaluate the proposed development to ensure that the proposed development meets the required hydraulic conditions. In the event that development creates additional upstream impacts from the City supplied source node, the development engineer may be required to work with the City to identify appropriate system improvements to adequately serve development needs.

## **Deliverables:**

- The developer must submit an electronic version of the water model in the most updated version of EPANET or WaterCAD.
- The water model must contain **five (5) scenarios** showing Peak Instantaneous Flows, Peak Day Flows, Average Day Flows, Low Demand Flows, and Peak Day with Fire Flows.
- A report containing applicable spreadsheets showing all calculations stamped and signed by a Professional Engineer.
- A Utility Plan (11" X 17" is fine) containing waterline plans for the site.
- A Vicinity or Site Map of the area under review.

## **Demand Summation:**

For purposes of compiling the projected demand of any given development, calculate and compile the demand associated with each component noted above. The developer must provide a spreadsheet summary that identifies each demand component and sums the total demand components for each flow condition required for modeling.

## **Scenario Demand Assumptions:**

### **For Pressure Zones 1,2,3: (See attached map)**

<b>Flow Demand Scenario</b>	<b>Peaking Factor</b>	<b>Recommended Values for Water Demand Modeling</b>
Average Daily (ADF)	1.0	0.5 gpm/ERC (Equivalent Residential Connection)
Peak Daily (PDF)	2.3	1.15 gpm/ERC
Peak Instantaneous (PIF)	4.6	2.3 gpm/ERC
Low Demand	0.4	0.2 gpm/ERC

### **For Pressure Zones 4,5,6: (See attached map)**

<b>Flow Demand Scenario</b>	<b>Peaking Factor</b>	<b>Recommended Values for Water Demand Modeling</b>
Average Daily (ADF)	1.0	0.4 gpm/ERC
Peak Daily (PDF)	2.3	0.92 gpm/ERC
Peak Instantaneous	4.6	1.84 gpm/ERC

(PIF)		
Low Demand	0.4	0.16 gpm/ ERC

**Fire Flow Demand Assumptions:**

Fire Flow Demand Condition	Required Flow	Required Duration
Small Residential (< 3600 SF)	1000 gpm	2 hours
Large Residential (> 3600 SF)	1750 gpm	2 hours
Other Uses	As determined by Fire Marshal on a case by case basis.	As determined by Fire Marshal on a case by case basis.

**Non-Residential Assumptions per Land Use Type:**

In some instances there could be a land use type incorporated within a development that will require consideration within demand allocations. For example, a park or open space area contained within a residential development. In order to consider these types of uses, the following conversion table is provided to estimate flows.

Future Land Use Designation	Average Day Demands (Multiply by Peaking Factor for Different Scenarios)
C-C, C-N, C-F (Commercial)	2.0 gpm/acre*
MN-RD, M-U south, MU-Gate, M-UN Gate, MU-Comm, M-U city, BH-MU (Mixed Use)	2.6 gpm/acre*
PC (Large Master Planned Com)	1.73 gpm/acre*
OS (Office Space)	1.22 gpm/acre*
CI, IF (Industrial)	2.0 gpm/acre*

\*Based on the South Jordan City Culinary Water Master Plan dated September of 2006.

**Demand Summation:**

For purposes of compiling the projected demand of any given development, calculate and compile the demand associated with each component noted above. The developer must provide a spreadsheet summary that identifies each demand component and sums the total demand components for each flow condition required for modeling.

**Flow Modeling Assumptions:**

The hydraulic model must be compiled in a data format compatible with either EPANET or WaterCAD. EPANET was chosen for use by the City due to the fact that it is public domain software and may be acquired free of charge. In order to obtain the software, please access one of the two sources below:

- 1) This software is available online at the following URL:  
<http://www.epa.gov/ORD/NRMRL/wswrd/epanet.html>
- 2) The software is also available on CD from the South Jordan City Water Division at a cost of \$5.00 (to cover the cost of reproduction).

In completing the modeling, the development engineer will need to demonstrate that a number of conditions are met with the original model.

- 1) Demonstrate that dynamic pressures within any portion of the pipe network do not drop below 20 psi at any time.
- 2) Demonstrate that pipe velocities under Peak Day and Peak Instantaneous conditions do not exceed 7 feet per second (fps).