



As part of a comprehensive water system master plan, Dufresne Group (DG) updated an out-of-date computer water model of the Manchester water system using a GIS basemap developed for the master plan. Fire flow and C-value tests were performed to calibrate the model. Pressure recorders were installed during the fire flow testing period in areas with anticipated pressure deficiencies. The tank levels were measured and compared to SCADA data to identify discrepancies. Pressure reducing valves were observed during fire flows to verify settings.

The completed water model was then used to evaluate the existing water system and identify hydraulic deficiencies such as high velocity, high headloss and low pressure. DG also used the computer water model to identify solutions to resolve the hydraulic deficiencies. These solutions included relocating a pressure reducing valve to modify the pressure zone extents, installing a new pressure reducing valve to create a new area of high pressure and replacing four key areas of aging 4-inch diameter cast iron pipe with larger diameter ductile iron pipe.

The computer water model is a valuable tool to evaluate available fire flow and system pressure effects of proposed projects.

### KEY FEATURES

- Modeled approximately 37.7 miles of transmission and distribution system piping as well as two source pumps, three pressure reducing valves and two water storage tanks.
- Calibrated water model using field and SCADA data.
- Utilized the calibrated water model to:
  - \* Evaluate existing conditions and identify deficiencies.
  - \* Evaluate available fire flow and system pressures for new connections.
  - \* Evaluate hydraulic effects of new projects.