Barwon Water Uses WaterGEMS® to Improve Productivity, Asset Management, and Customer Service

Software’s Analysis Tools Identify Critical Mains, Saving Utility about AUD 200,000

From Manual Identification to Simulation Analysis

Barwon Water, the largest regional urban water corporation in the state of Victoria, Australia, provides world-class water, sewerage, and recycled water services to more than 275,000 people across 8,100 square kilometers. Its AUD 1.138 billion asset base includes 5,781 kilometers of pipes, 10 major reservoirs, 10 water treatment plants, and nine water reclamation plants. The utility deployed Bentley’s WaterGEMS water distribution modeling software, integrated with their geographic information system (GIS), to simulate shutdowns and measure the impact on system performance.

A key performance indicator (KPI) for customer service is the number of customers affected by planned and unplanned supply interruptions. WaterGEMS helped Barwon Water identify critical mains, defined as pipes that would interrupt service for a large number of customers should shutdowns occur. Prior to deploying WaterGEMS, identifying and quantifying every critical element in the utility’s water distribution system would have been too manually intensive and required a great deal of analysis.

Hydraulic Modeling for Criticality

The use of hydraulic modeling capabilities has made it easier for the utility to “fail” a pipe and assess its impact on the system. The criticality analysis tool in WaterGEMS allows users to automatically simulate the shutdown of each individual segment of the system and determine the impact on performance.

How critical each pipe is to the system is automatically based on the number of customers that would be affected should the pipe fail. The criticality analysis results are then presented graphically in Barwon Water’s GIS system. This helps operations and planning personnel to access the information and to more efficiently plan network improvements and optimize asset management decisions.

Barwon Water’s system includes 30 network models. Pressure zones range from as few as 100 properties to more than 20,000. The report generated from WaterGEMS is based on the percentage of the zones’ water demand that’s not meeting defined minimum pressure levels. (The analysis is run with three defined minimum pressure scenarios.) In the Oracle database, the percentage of demand affected is

An illustration of segmentation in WaterGEMS.
“WaterGEMS helped Barwon Water identify critical mains, defined as pipes that would interrupt service for a large number of customers should shutdowns occur.”

Linked to the number of lots affected. A scoring number is utilized based on the number of affected customers. A weighting factor is allocated on each defined minimum pressure. This score is then used to classify the level of criticality.

**Improved Productivity**

A critical pipe layer was created in Barwon Water’s GIS Oracle Spatial database, which the utility had successfully integrated with WaterGEMS. The use of GIS data via a direct connection to the Oracle Spatial database has made the model building process more efficient. Because the criticality analysis results are visualized in the GIS system, the distribution of vital information to planning, operations, and management staff in Barwon Water has been accelerated.

The efficient schematic process of critical mains identification, shown below, has enabled Barwon Water to save an estimated two years of work, which corresponds to a cost saving of about AUD 200,000, while improving the accuracy of the results when compared to a manual, error-prone process.

**Community Impact**

Another of Barwon Water’s objectives was to ensure that all water and sewerage systems and services are efficient and effective, and that they meet both legal and government requirements, as well as community expectations. This project enabled Barwon Water to optimize asset management decisions and more reliably meet customer service targets for planned/unplanned interruptions to supply, which will improve the overall quality of service to customers.

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**Schematic process for critical mains identification.**

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