



KEY POINTS

- 30% reduction in capital costs
- Pipe optimization for residential water distribution system
- Pressure management for reduction of leakage and mains bursting

“Together, Three Valleys Water and Optimatics achieved a 30% reduction in capital outlay over the preliminary design, with the added benefit of promising ongoing savings in terms of reduced leakage and fewer interruptions due to pipe bursts.”

Three Valleys Water DMA Mains Renewal Program

Network optimization of mains replacement and renewal

Three valleys water supplies over eight hundred million litres of water to customers daily. Optimatics assisted Three Valleys Water to optimize pipe replacement for security of supply to reduce capital cost and improve levels of service.

BACKGROUND

- Two existing DMAs
- Typical outer London area
- Total pipe length 55.3kms

Owned by Veolia Water UK, Three Valleys Water (TVW) is the largest water-only supplier in the United Kingdom, providing over 800 million litres of water every day to over three million customers. In order to reduce the risk of interruptions in supply, Three Valleys Water periodically undertakes renewals programs for the replacement of aging mains in its system.

THE PROJECT

Optimatics was contracted by Three Valleys Water to carry out a pilot study for reducing the capital investment required for the Whitton Avenue District Metered Area (DMA) located in Middlesex, UK, which was earmarked for renewal. An initial study performed by Three Valleys Water identified the mains requiring replacement or abandonment

based on burst records and the probability of future failures. A design for the replacement pipe sizing was produced for Three Valleys Water by a third-party consultant, which called for the replacement of aged cast iron, ductile iron and asbestos concrete water pipes with HPPE pipes of a suitable diameter to satisfy all demand and pressure criteria for the network.

STUDY OBJECTIVE

Optimatics was asked to investigate where capital savings could be achieved over the preliminary design through optimization of the diameters of the replacement mains.

KEY OUTCOMES

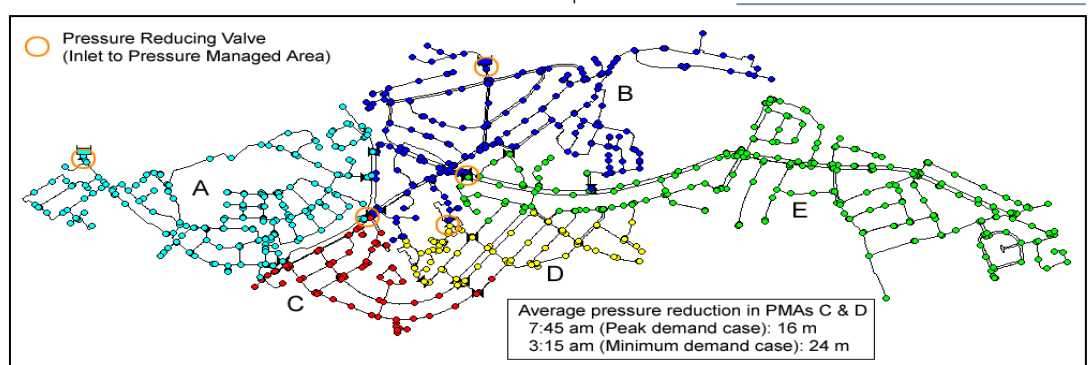
Optimatics performed an optimization of the target DMA utilising the Optimatics GA (OGA) software. The design consisted of pipelines of a variety of diameters, with only those pipelines designated for replacement being considered for optimization. The construction techniques used

included pipe bursting and open cut, as well as slip-lining which was not considered in the preliminary design. Optimatics produced a number of network designs which not only satisfied network demands and minimum allowable pressure criteria as specified by Three Valleys Water, but also satisfied fire flow requirements at all hydrant locations within the DMA. Furthermore, Optimatics proposed designs incorporating several new pipes and two new pressure managed areas which allowed for considerable reduction of pressures and consequently lower leakage rates and lower mains burst risk.

BENEFITS

Together, Three Valleys Water and Optimatics achieved a 30% reduction in capital outlay over the preliminary design, with the added benefit of promising ongoing savings in terms of reduced leakage and fewer interruptions due to pipe bursts.

Network showing optimal location of zone boundaries and PRV's



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