

## Pressure management in municipalities

Sebokeng and Evaton, South Africa

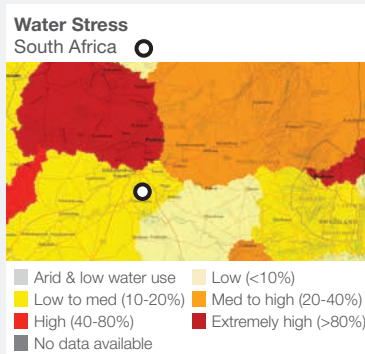
### water scarcity impact

Reduced withdrawal	●
Reduced consumption	●
Improved water quality	
Increased productivity	●
Net basin benefit	●

volumetric impact  
**10 000 000m<sup>3</sup>/yr**

capital cost  
**\$1 350 000**

estimated unit cost of water  
**<5¢/m<sup>3</sup>**



**Water Stress Map:**  
Gassert, F., M. Landis, M. Luck, P. Reig, and T. Shiao. 2013. "Aqueduct Global Maps 2.0."

**Confidence level**  
● Low ● Medium ● High

**Water Scarcity Impact Key**  
● Main ● Minor

**Credits**  
We wish to acknowledge the input of the Sebokeng and Evaton local municipalities in the preparation of this case study.

### Project Overview

Maintenance of water supply networks in many low income urban areas in South Africa has been neglected over the last 30 years and has resulted in serious service delivery problems and wastage of water. The project area in the industrial heartland of South Africa comprised around 70 000 predominantly low income household connections supplying around 500 000 people. A combination of low income and high unemployment levels have resulted in general deterioration of internal plumbing fittings causing high levels of leakage, which were almost entirely responsible for a night flow of 2 800m<sup>3</sup>/hr. Under normal circumstances a night flow of only 900m<sup>3</sup>/hr would have been anticipated. It was estimated that before the project, approximately 80% of the water supplied to the area was wasted, representing a water bill of around \$20m annually. Due to the fact that very few consumers pay their bills, this had to be paid by the utility and municipality. The pressure management system was installed to control the pressure of the incoming bulk water allowing reduction of supplied water to Sebokeng and Evaton during off-peak periods with a consequent reduction in leakage. The project was built using labour-based methods and a high level of stakeholder consultation ensured good support from the affected communities. Most significantly, the project was fully funded by a private development team with the cost being recovered out of a small percentage of the water savings over a period of five years.

### Key Elements

- The need for the municipality to reduce its bulk water bill of \$20m/year.
- The need to reduce wastage of water, estimated at 80%.
- The need to reduce inflow to the overextended sewerage treatment plant.
- Installation of an advanced pressure management unit at the inlet to the network to reduce pressures during off-peak periods.
- Private sector funding based on a payment mechanism linked to saved bulk water costs.

### Key Outcomes

- 10 000 000m<sup>3</sup>/year of reduced withdrawals from bulk water sources.
- Operating costs of approximately \$0.15m over the project's five-year period.
- Deferment of infrastructure upgrades in the form of a ten-year reprieve on the upgrading of water supply and sanitation infrastructure.
- The improved status of the municipality enabled access to additional funding for water demand management activities.
- Catalyst for other water demand interventions; using some of the savings, the municipality was able to improve the distribution network in the area.



South Africa

## Intervention Features

- Pressure management in municipalities
- Stakeholder engagement

## Project Levers

### (1) Advanced Pressure Management:

Advanced Pressure Management is much more than simply reducing the pressure of the water entering the system; pressure has to be reduced without compromising the required levels of service for consumers and firefighting during peak periods of demand. An advanced pressure management control device together with real-time monitoring systems and customised management software were installed at the inlet to the network. This enabled pressures to be reduced during off-peak periods and restored to original pressures during periods of high demand. This reduction of the pressure resulted in reduced leakage and fewer burst pipes.

### (2) Institutional model:

The municipality was unable to access funding for water demand management activities and so implementation was carried out through a public-private partnership in which the developer planned, designed, constructed and managed the project and also secured financing through the commercial banking system. This was paid back from savings arising from the interventions, together with a performance related bonus by the Emfuleni Municipality and the Metsi-a-Lekoa utility. This process can and is already being applied for other municipalities around the country where pressure management is a viable solution.

### (3) Community support:

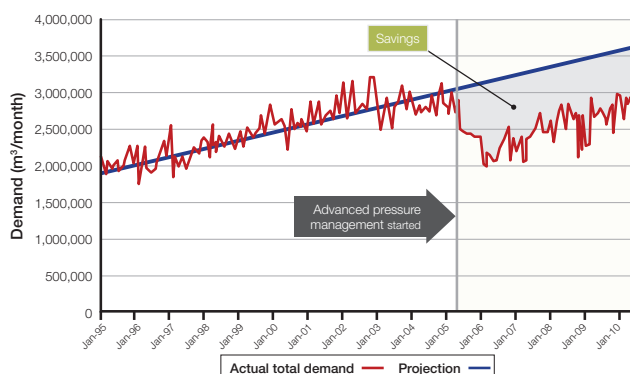
The project enjoyed a high level of support within the community mainly because of job creation through the use of labour-based construction methods and extensive stakeholder consultation.

## Outcomes and Challenge

The intervention resulted in major savings on water purchases. Savings were so large that, based on the water charges avoided alone, the installation had a pay-back period of less than two months. The rapidly increasing historical water consumption in Sebokeng and Evaton for the ten years prior to the project intervention and during the five year project period is shown below. This equated to total savings of just over \$20m achieved over the same period and these savings continue to accrue since project support ended in January 2010.

The project has resulted in a number of other benefits, some of which only became evident during the course of the project. They included:

- Deferment of infrastructure upgrades in the form of a ten year reprieve on the upgrading of water supply and sanitation infrastructure.
- Identification of bottlenecks in the system and problem infrastructure. When pressures were reduced it was found that some areas unexpectedly had supply problems. The causes of these problems included poor maintenance and operational practices as well as problem infrastructure which would not have been identified under normal circumstances.
- Identification of errors in bulk water metering (from the bulk supplier) also became evident as a result of the project's own monitoring systems.
- Opening up of further funding opportunities and improved status of the municipality enabling the municipality to access funding for water demand management activities.
- Catalyst for other water demand interventions; using some of the savings, the municipality was able to improve the distribution network in the area.



Above: Water savings in Sebokeng and Evaton (Source: WRP (Pty) Ltd)

Advanced Pressure Management projects of this type can bring major water and financial savings rapidly. They can be implemented rapidly through private-public partnerships and benefits are almost immediate. The advanced level of monitoring that is required with this type of intervention will usually result in the identification of additional water demand management opportunities.