

Drakenstein proves small municipalities can save water

The Drakenstein Municipality has earned countrywide respect for its efforts to reduce non-revenue water, boasting one of the lowest water loss percentages in the country. Sue Matthews found out why.



Sue Matthews

Delegates at the Third Regional African Water Leakage Summit held in August 2013 were clearly impressed with a presentation by Drakenstein Municipality's water services engineer, André Kowalewski, demonstrating their approval with extended applause. The presentation, entitled 'Water demand management and conservation successes since 2000', revealed how non-revenue water in this Western Cape municipality had been reduced from 34% to only 12% over a 13-year period, using a range of interventions. Non-revenue water refers to physical (real) losses through leaks and overflows, and commercial (apparent) losses through meter under-registration, billing errors, theft and unbilled authorised consumption.

The Drakenstein Municipality includes the towns of Paarl and Wellington, as well as the small settlements of Hermon, Gouda and Saron, dotted along the Berg River as it makes its way to the Atlantic Ocean. It is home to approximately 255 000 people, whose water supply is delivered via some 650 km of pipes, 28 reservoirs of 0.8 to 100 Mℓ capacity, and 16 booster pump stations. The decision to implement water demand management interventions in 2000 was taken in light of an average annual growth in demand of 3.5%, high water losses and per capita consumption rates, and the knowledge that the local storage capacity was only enough to sustain Paarl and Wellington for 36 and 28 hours respectively (bulk water supply is from Wemmershoek Dam).

Pressure management was the first aspect to be addressed, because system pressures were excessively high in places, resulting in numerous pipe bursts. Apart from the increased frequency of water leaks, the elevated leak flow rates associated with high pressures and the need for repairs added to the costs.

The two pressure zones in Paarl were increased to six on the advice of GLS Consulting, contracted for hydraulic modelling of the municipality's entire water reticulation network. Seven new pressure reducing valves with hydraulic controllers were installed in 2000 at a capital cost of R2.8-million.

"That cost had been paid back within four and a half months," says Kowalewski. "We've undertaken various interventions to reduce water

losses since then, but pressure management has had the largest impact, accounting for about 80% of our savings.”

The other interventions include metering of all unmetered water connections – such as firewater connections, irrigation systems in public parks, and standpipes and toilets in informal areas – as well as refurbishment or replacement of the existing water network, both in reacting to leaks and proactively replacing old pipes.

“You need to look after the assets,” stresses Kowalewski. “You have to keep your hand on it all the time, carrying out constant repairs and preventative maintenance.”

In the three years up to July 2013 alone, more than 57 km of pipe have been replaced in the Drakenstein area, and three maintenance teams are on standby at all times to ensure that any burst pipes are fixed within eight hours of being reported. Detailed records are kept, which reveal that the average reaction time from reporting a burst pipe to closure of the municipal mains is only 30 minutes, ensuring that water losses are minimised.

The introduction of a rising block tariff scheme in the 2001/2002 financial year has also played a major role in curtailing water demand and encouraging consumers to repair leaks. For the 2012/2013 financial year, for example, water use above 80 kℓ per month was billed at R20.96 per kilolitre, while the 11-30 kℓ rate was only R7.52 (the first 10 kℓ is not tarified in accordance with the national free basic water policy). Public awareness of the need to conserve water has been raised through leaflets distributed with accounts, waterwise pamphlets, and annual Water Week activities such as exhibits, educational puppet shows, and poster and song competitions.

A more hands-on approach was used amongst the poor community of Saron, where water consumption was an excessive 354 ℓ per person per day. An analysis of the minimum night



A pressure management installation in Paarl. Pressure management has had the largest impact on reducing Drakenstein's water demand.

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flow indicated that leaks were the main culprit and so – using a R2 million Water Affairs grant and R500 000 prize – a pilot project was initiated in which a contractor was appointed to liaise with residents through home visits, conduct a plumbing audit, and repair water leaks.

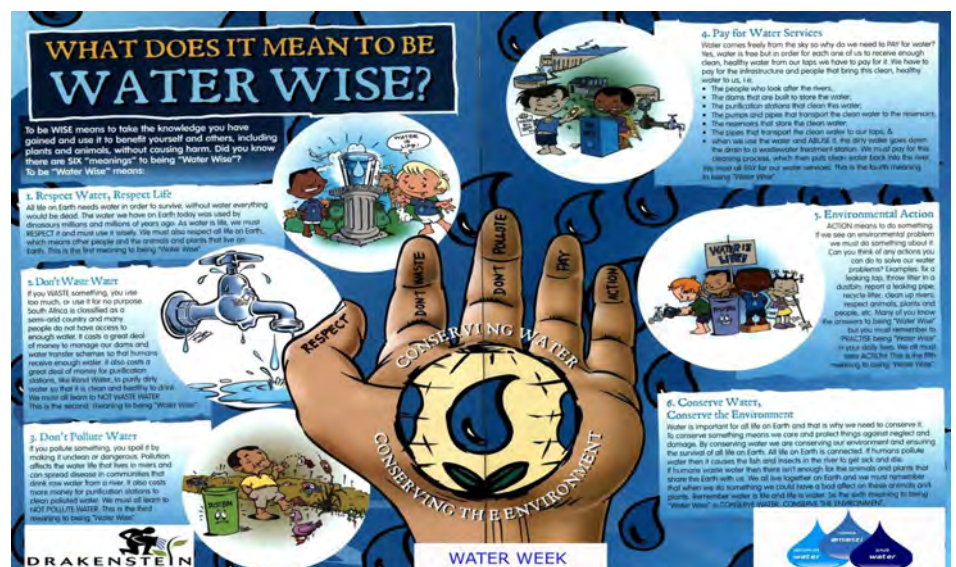
A total of 1 413 properties were visited, of which 83.4% had leaks, and repair work included the installation of 1 352 taps and 8 335 metres of pipe. Residents were provided with a pamphlet containing water-saving tips and information on identifying and repairing leaks. The project resulted in a savings of 120 Mℓ for the 2010/2011 financial year, postponing the need for an additional reservoir.

Overall, the water demand management initiatives implemented in the Drakenstein municipal area have saved 158 600 Mℓ of water since 2000, worth some R790-million. The average Infrastructure Leakage Index (ILI) is only 2.1, with Saron the lowest at 1.9. By international standards, an ILI of 1-2 is considered excellent for developed countries, 2-4 is good, 4-8 poor and >8 bad.

Inevitably, finding sufficient funding to sustain the water demand management efforts is one of a number of challenges encountered by the municipality.

“Our capital budget for this year is not enough to keep up with the replacement of old pipes, for

One of the posters used to increase awareness of water conservation among municipal constituents.



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Water demand management

More than 57 km of pipe have been replaced in the Drakenstein area and even more repaired in the last three years.



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example,” explains Kowalewski. “Vandalism is a huge problem too, because much of the infrastructure we put in the ground, such as fittings and man-hole covers, is sold as scrap metal.”

Retaining and training skilled personnel is another concern, but Kowalewski is particularly excited about an arrangement made with the FET (Further Education and Training) College in Paarl to offer plumbing courses from 2014, allowing municipal staff as well as local unemployed people that show potential to receive training and earn qualifications, such as the national certificate.

Kowalewski’s take-home message to other municipalities wanting to emulate Drakenstein’s successes is to keep to the basics, as there is no need

to outsource everything to expensive consultants. “Water demand management is not rocket science,” he says. “It’s simple things you do that make a difference.”

In October, the municipality’s achievements were recognised at the Water Conservation and Water Demand Management Sector Awards, when Drakenstein was named runner-up in the Local Municipality category. First place went to Gauteng’s Emfuleni Municipality, which aims to achieve a 15% water saving through Project Boloka Metsi, co-funded by Sasol and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

At the award ceremony, held at Gallagher Convention Centre in Midrand, Deputy Minister of Water

and Environmental Affairs, Rejoice Mabudafhasi, referred to the recent Water Research Commission (WRC) study on non-revenue water conducted by WRP Consulting Engineers, which estimated that South Africa ‘loses’ 36.8% or 1 580 million m³ of the water supplied per year, worth some R7-billion. Of this non-revenue water, 25.4% is considered to be losses through physical leakage, and the average ILI value for South African municipalities is a high 6.8.

During her speech, the Deputy Minister noted that the Department of Water Affairs (DWA) has allocated a little over R20-million to the War on Leaks programme, which creates employment and skills development for unemployed youth. These funds will allow for pilot projects in nine district municipalities countrywide, namely West Rand (Gauteng), Kenneth Kaunda (North West Province), Fezile Dabi (Free State), Waterberg (Limpopo), Ehlanzeni (Mpumalanga), Amathole (Eastern Cape), Central Karoo (Western Cape), Amajuba (KwaZulu-Natal) and Pixley ka Sereme (Northern Cape).

“Local indigent youth are trained and appointed as ‘water conservation warriors’ to implement the education and awareness programme as well as the retrofitting and leak repair initiative,” she explained. “These water warriors undergo basic training on plumbing, water leak repair and other



The town of Paarl, which falls under the Drakenstein Municipality

skills that would help them to develop small businesses which would service the communities to create more permanent employment.”

Another initiative by DWA to encourage municipalities to address the issue of non-revenue water is the No Drop assessment tool, which builds on the success of the Blue Drop and Green Drop schemes for drinking water quality and wastewater services management, respectively. It will be implemented across all municipalities from October 2013 to March 2014, with the results published in the Blue Drop Report of 2014. Future reports will be released every second year to allow municipalities time to implement the recommendations from the previous assessment, ensuring continual improvement.

“No Drop was developed as an incentive-based system to support municipalities on the one hand, but also to show the rest of South Africa what’s happening within a particular municipality, not only in terms of non-revenue water but also focusing on water conservation and water demand management,” says Paul Herbst, DWA Director for Water Use Efficiency. The idea is to expand upon and verify the research findings of the WRC report on non-revenue water, which was based on usable datasets submitted by only 132 of the 237 local municipalities targeted countrywide.

A significant number of the municipalities could not even provide



The Lelifontein booster pump at Wellington was upgraded as part of Drakenstein’s water demand management efforts.

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a system input volume, let alone more detailed information, and very few had a comprehensive water conservation and water demand management strategy that set targets, intervention programmes and budget requirements.

The new Blue Drop score will be made up of five key performance areas for Blue Drop aspects and one – water use efficiency and water loss management – for No Drop, the latter making up only 3% of the overall score. Compliance with 90% of seven criteria is required to be awarded No Drop status. However, the weighting on these criteria, namely strategy, planning and implementation; asset management; technical skills; data credibility; compliance

and performance; local regulation and customer care, will shift slightly over the next four cycles. In this first round, criteria that reflect a municipality’s understanding of its current situation and performance against compliance-related criteria are prioritised.

“We did a trial run of No Drop in several municipalities, and they were quite satisfied that it is adequately designed to fulfil its role as a supporting tool,” says Herbst. “From our side, we’re hoping that the No Drop system is taken seriously by the municipalities as an incentive-based system, and that municipalities will start making headway in the implementation of water conservation and water demand management.” □

