

Towards better water management



MechChem Africa talks to Chetan Mistry, strategy and marketing manager at Xylem Water Solutions SA, about South Africa's urgent need for better water management to mitigate against climate change and the fast evolving set of solutions becoming available to support more efficient and more local wastewater handling and recycling.

"These are not alarmist notions. They are facts, and the situation is likely to become much more aggravated owing to climate change. While South Africa receives enough rain on average, we do a poor job of capturing and managing water resources and such neglect will have severe social and political consequences," Mistry says.

"We at Xylem come into play when it comes to abstracting water; transporting it; treating, measuring and controlling its distribution; and then collecting the wastewater and developing different ways of recycling it to make it suitable for consumption again," he tells MechChem Africa.

"The water management conversation is around waste and the need to massively reduce it, both to conserve the water itself and to better recover the revenue lost through leakage," he suggests, adding that in South Africa 25% of our drinking water is estimated to be lost to leaks, while globally, a "staggering" 46-billion litres of drinking water is lost every day.

"As a scarce resource, we should be fighting to preserving every drop and to plug every leak in every part of the transportation system," he urges, adding that efficient modern leak detection is an essential weapon in this battle.

"South Africa has taken a centralised approach with respect to water distribution,

where water is collected, stored, treated in designated plants and then transported to urban and rural end-users. A high percentage is lost before arriving at these users and, from a billing perspective, this can represent a substantial percentage of lost income for the water provider, which raises the overall costs of water provision.

"Many kilometres of piping are required to interlink these systems and damaged and eroded pipes are everywhere. It also takes a long time to detect and repair pipe leaks. Trenches have to be dug to find and repair pipe leaks, roads are blocked causing traffic disruption and substantial amounts of time and energy are wasted, over and above the water loss, itself. In addition, many leaks go undetected for long periods of time," he says.

Based on global experience of finding water leaks, Xylem has developed a SmartBall® technology, which massively simplifies the task. "SmartBall is a free swimming, tennis ball-sized sensing device designed to be carried with the water in a pipeline. The ball contains wireless-connected acoustic sensors, accelerometers and gyroscopes and a GPS tracker that enables leaks and other pipe condition issues to be identified and accurately located.

"SmartBall tracks the movement of water within the pipe, identifies blockages and leaks and sends the data back to Xylem for analysis. It can place a problem to within 1.8 m and it can inspect up to 40 km of piping a day," Mistry tells MechChem Africa.

"No cutting into pipework is required. The ball is simply put onto the pipework at one end and recovered when it exits the catchment at the other. It offers more economical and less disruptive and intrusive ways of finding leaks – and the revenue loss of the leak will usually far outweigh the investment cost of applying the technology," he says.

According to Mistry, another important area for raising water management standards in South Africa is metering. "If we are to value water more highly and use it more sparingly, we have to also be obsessed with metering water use. For this, accurate and modern water meters are needed to enable us to account for any losses and to help us to identify ways of reducing consumption.

"Pre-paid meters, for example, are known to change usage behaviour. Every running tap needs to be metered and paid for, but it is only

when people know and understand this that their usage behaviour will begin to change," he notes, adding that making people aware of water losses is an essential starting point for water conservation.

He cites the numerous attitudinal changes that have been adopted by Capetonians following their crisis, such as buckets under showers for use in toilets and harvesting grey water for use in gardens. "It often takes a crisis to develop attitudinal changes with lasting effects," says Mistry.

With respect to grey water collection, he says that Xylem's Cape Town office is now also collecting storm and rain water from its roof for recycling. "We have installed a filtration and an ozone-based water purification system to create potable water onsite for consumption by our staff on a daily basis," he continues.

"We believe water systems are going to evolve from being centralised to having many more decentralised elements. Systems such as the one installed at our offices demonstrate how water can be accessed and processed onsite for consumption onsite. This can be true of a house, a factory or a mine and it enables a significant proportion of the local water required to be made available for direct use at its point of collection," he informs MechChem Africa.

A particular advantage is that wastewater contamination tends to be different depending on where and how it is generated. By treating at the generation point, the process can be tailored to specifically suit the wastewater involved, making the treatment process more efficient than if transporting and combining different wastewaters together for centralised and more multi-faceted processing.

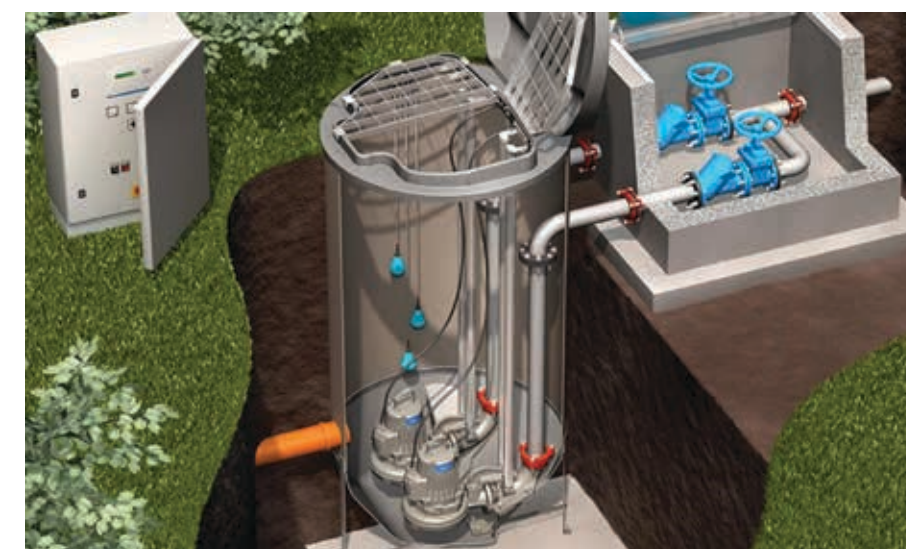
In addition, if the water is to be reused at the point of generation, then the water quality level can be tailored for its intended use. Factory water may not need to be processed to potable quality, for example. Instead of having centralised wastewater treatment plants that have to cater for every conceivable contaminant, each wastewater type can have a customised and simpler solution to make it suitable for its intended reuse.

"This is an investment opportunity that circumvents the need for sending rainwater back for treatment at the centralised plants, while reducing local water bills. It's the same basic principle as having solar panels on the roof for generating electricity at the point of need," Mistry argues.

The same principle applies in industrial spaces, but the scale can be far more cost-effective and/or less punitive. Onsite treatment of industrial wastewater is often a prerequisite to avoid polluting the river systems, but if taken a step further, treatment can be tailored to enable the water to be locally recycled for the industrial process being employed, reduc-



Based on global experience of finding water leaks, Xylem-owned Pure Technologies has developed a SmartBall® technology, which massively simplifies the task.



Globally, Xylem offers a wide range of pre-engineered packaged pump stations including pumps, tank, piping and valve systems, along with all the required installation accessories and monitoring and control equipment.

ing the depletion of scarce local water sources and saving on municipal bills.

"The benefit of Xylem's approach is that we operate across the water cycle, with comprehensive solutions from abstracting and treatment to transporting, metering of consumption, wastewater treatment, and water recycling to whatever quality is required.

"In mining, for example, our solutions are geared for the harsh conditions. We offer highly flexible pumping, treatment and water management solutions that enable the water to be repurposed within the mine's operations. We strive to find ways to increase productivity, reduce costs and turn water management from an expense into a strategic advantage," he says.

He adds that this is equally true for agriculture. "It is important to avoid overwatering and this is now economically achievable by installing efficient modern flow and pressure controlled irrigation systems. These smart pumping solutions can measure exactly how much water is being applied and can automati-

cally shut off when the required daily amount of irrigation has been delivered," Mistry says.

Water audits are another key service on offer in order to better ascertain how best to conserve and reuse scarce resources. "Regular water balance audits are vitally important to ensure optimum water usage, equipment efficiencies, maintenance planning and to minimise waste and costs.

"At Xylem, through our solutions and global initiatives such as our Water Mark system, our CSR programme, we are striving to raise awareness about the importance of water among every Xylem employee and the communities in which they live, helping to implement water efficient solutions, cleaning rivers and helping communities with access to clean water.

"Through partners such as Engineers Without Borders, we are striving to make water accessible to every human being, while implementing management solutions that preserve every drop we can," Mistry concludes. □



Xylem solutions for mining are geared for harsh conditions, offering highly flexible pumping, treatment and water management solutions that enable water to be repurposed within the mine's operations.