www.infrastructurenews.co.za
and service delivery

WISA Inspiring Passion For Water
The official magazine of the Water Institute of Southern Africa

Water & Sanitation Africa

Complete water resource and wastewater management

3D SCANNING: A GAME CHANGER

The politics of water: control, power and security in Africa

SLUDGE MANAGEMENT THROUGH A CIRCULAR-ECONOMY LENS

A NEW ERA
FOR WATER AND SANITATION IN EMFULENI

INNOVATIVE SANITATION GIVES IVORY PARK LEARNERS A HEALTHIER FUTURE

Endress+Hauser
advances smart, resilient water systems through digitalisation

NOVEMBER/DECEMBER 2025 • ISSN 1990-8857 • R55.00 (incl. VAT) • Vol. 20 No. 06

RETHINKING AMANZI

securing our future

Water Institute of Southern Africa

22 - 24 July 2026
CTICC | Cape Town

CONNECT *with* AFRICA'S WATER LEADERS AT THE WISA 2026 BIENNIAL CONFERENCE AND EXHIBITION

Registrations are now open for delegates, sponsors and exhibitors!

Be part of Africa's premier water and sanitation event – showcase your innovations, exchange knowledge and engage with industry decision-makers shaping the future of water.

REGISTER HERE

Visit www.wisaconference.co.za or scan the QR Code to find out more

CONTENTS

ON THE COVER

As ageing infrastructure, rising water losses and stricter compliance intensify pressure on water systems, digitalisation has become essential. For Endress+Hauser, one of the world's leading process instrumentation and automation specialists, digitalisation offers a practical, scalable path to more transparent, efficient and resilient water systems. **P6**

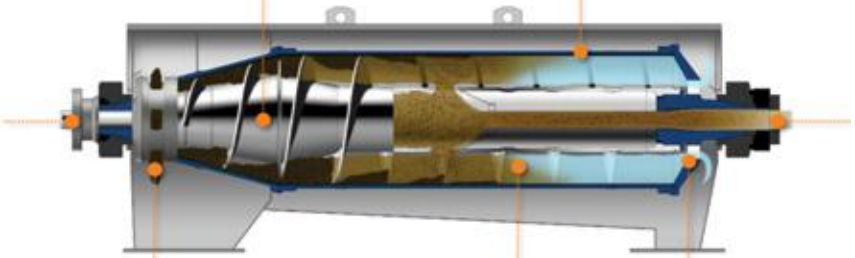
FLOTTWEG DECANTERS IN WATERWORKS AND SEWAGE TREATMENT PLANTS

CENTRIFUGE - HOW IT WORKS

Inside the **bowl,** there is a scroll conveyor for the continuous discharge of the sediment which is packed on the inner surface of the bowl wall.

The **bowl of a decanter** has a cylindrical-conical shape. It rotates at a high speed creating the centrifugal force needed for the separation.

The **scroll conveyor** rotates at a speed relative to the bowl speed. This differential speed is created by a rotating gear box at the drive end of the bowl.



The **sludge** to be separated enters the bowl via a stationary feed pipe. From the feed pipe it enters the separation zone via feed ports in the scroll body.

The **sediment** is delivered out of the pond on the conical end of the machine, also called the dry zone, before it leaves via discharge ports on the conical end of the bowl.

In the **separation zone**, it separates into a sediment layer and a liquid layer.

The **separated liquid** flows to the cylindrical end of the bowl where it is discharged by gravity via an overflow weir.

ADVANTAGES (OSE DECANTER)

Optimized operation through:

- Low energy demand & low or no polymer demand.
- Unattended 24/7 operation.
- No interruption of the cleaning operation.
- Fully controlled digester feed, improves the gas yield.
- Low odour operation.

ADVANTAGES (HTS DECANTER)

Optimized dewatering through:

- Continuous optimal results through full monitoring & control leading to low disposal cost & low consumption of polymer
- No interruption of operation for cleaning.
- No consumables such as filter aids, filter cloth, etc.
- Flexibility: Flottweg HTS Decanters® and Xelletor Decanters can be adjusted to varying feed & operation conditions during operation automatically via PLC or remote control.

THICKENING AND DEWATERING

Process benefits of thickening:

- Optimizing feed to the digester.
- Lower procurement costs for digester.
- Compact design, small footprint, & high capacities.
- Closed design minimizes odor emissions.
- Solids concentration in the discharge is adjustable & controllable.
- Increased gas yield & degradation rate.

Process benefits of dewatering:

- Save enormous amounts of money.
- Dewatering = to lower the amount of sludge (& thus disposal & treatment costs).
- Optimal performance.
- Maximum cake dryness.
- Minimum power consumption.
- Minimum polymer demand.

ENORMOUS ADDITIONAL SAVINGS POTENTIAL IN THE DEWATERING PROCESS

- 10% LESS SLUDGE
- 20% LESS POLYMER
- 15% MORE CAPACITY
- 20% LESS ENERGY

FOR MORE INFO CONTACT

Sakkie Smit | 082 379 3910
Johan De Jager | 079 195 0015

t: 021 862 0232 e: admin@porex.co.za
www.porex.co.za

Flottweg

POREX Filtration & Separation Products SA

Water&Sanitation Africa

Managing Editor: Kirsten Kelly
kirsten@infrastructurenews.co.za
Journalist: Duncan Nortier
Digital Manager: Chelsea Gillespie
digital@infrastructurenews.co.za
Designer: Beren Bauermeister
Contributors: Dr Lester Goldman, Duncan Nortier, Dr Harrison Pienaar, Birger Lundgren, Phillip Majeke, Valerie Naidoo, Anthony Turton
Advertising Sales: Sindi Moni
c +27 (0)82 212 4574
sindi@infrastructurenews.co.za

Publisher
Infrastructure News
47 Grove Road, Orange Grove, Johannesburg
Gauteng, 2192
Tel: +27 (0)83 433 4475
www.infrastructurenews.co.za

ISSN: 1990 - 8857
Annual subscription: R330 (SA rate)
kirsten@infrastructurenews.co.za

WISA
Water Institute of Southern Africa

WISA's Vision
Inspiring passion for water

WISA Contacts:
HEAD OFFICE
Tel: 086 111 9472(WISA)
Fax: +27 (0)11 315 1258
Physical address: 1st Floor, Building 5, Constantia Park, 546 16th Road, Randjiespark Ext 7, Midrand
Website: www.wisa.org.za

BRANCHES
Eastern Cape:
Branch Contact: Dan Abrahams
Company: Aurecon
Tel: +27 (0)41 503 3929
Cell: +27 (0) 81 289 1624
Email: Dan.Abraham@aurecongroup.com

Gauteng
Branch Lead: Zoe Gebhardt
Cell: +27 (0)82 3580876
Email: zoe.gebhardt@gmail.com

KwaZulu-Natal
Chairperson: Lindelani Sibiya
Company: Umgeni Water
Cell: +27 (0)82 928 1081
Email: lindelani.sibiya@umgeni.co.za

Limpopo
Chairperson: Mpho Chokolo
Company: Lepelle Northern Water
Cell: +27 (0)72 310 7576
Email: mphoc@lepelle.co.za

Western Cape
Chairperson: Natasia van Binsbergen
Company: AL Abbott & Associates
Tel: +27 (0)21 448 6340
Cell: +27 (0)83 326 3887
Email: natasia@alabbott.co.za

DIVISIONS
- Anaerobic Sludge Processes
- Industrial Water
- International Water Association-Southern Africa (IWA-SA)
- Innovation for Water Supply & Sanitation
- Mine Water Lead
- Process Controllers
- Small Wastewater Treatment Works
- Water Distribution
- Water Reuse Division
- Modelling and Data Division

EMPOWERMENT PLATFORMS
- Women In Water
- Young Water Professionals

The ABC logo is a valued stamp of measurement and trust. **WASA** is ABC audited and certified.

Talks that flow, TAPS THAT DON'T

We've reached the end of another busy conference season again – an endless circuit of lanyards, presentations, and polished panel discussions. Air conditioning hums, water flows freely, and spotless bathrooms await every delegate.

Coffee in hand, we move between sessions without pausing to consider how extraordinary this everyday comfort really is in a country battling water and sanitation failures.

Between the filtered water and functioning toilets, someone inevitably raises the phrase "South Africa's service delivery issues" Heads nod solemnly. Yet inside these immaculate venues, that crisis feels far removed – an abstract topic rather than a lived experience. The irony is hard to ignore: we speak passionately about sanitation access while standing on polished tiles with an endless flush at hand.

Change the venue

Perhaps it's time for a change of venue. Imagine holding a water conference in Emfuleni, where sewage seeps into classrooms and homes. Or in Ivory Park Primary School, where over a thousand learners share toilets that cannot be flushed. Or maybe in Hammanskraal, where delegates queue for water – paying for each litre drawn from a dubious tanker whose quality is anyone's guess.

It would be uncomfortable. It should be. Because comfort breeds complacency, and complacency is something we can no longer afford. If we truly want to fix the system, maybe we first need to feel the system's failures – smell them, see them, live them, even for a day. Only then will our conversations about "access" and "equity" move beyond air-conditioned empathy into the realm of real, grounded action.

The truth is that our sector's brilliance is often trapped within boardrooms. We build PowerPoint slides about "resilience" and "service delivery improvement", yet the people we claim to serve rarely see us outside those four walls. We have become too accustomed to comfort – to bottled water on tables instead of buckets in hand.

Imagine the symbolism if, one day, the "Water and Sanitation Indaba" were held not in Midrand or Cape Town, but in a township school courtyard. Where delegates walk past the pit latrines, talk to the learners, and see what a day without water actually looks like. Where engineers and policymakers queue for the same tap as the community. The conversations would change – and so, I suspect, would the outcomes.

We often say that water connects us all. But right now, it's dividing us – between those who live with abundance and those who live with absence. Conferences are meant to inspire change, but inspiration without discomfort is hollow. So next season, maybe the best venue isn't the one with the perfect air conditioning. Maybe it's the one where the heat, the smell, and the desperation remind us why we're here in the first place. ●

Kirsten

COVER OPPORTUNITY

In each issue, **Water&Sanitation Africa** offers companies the opportunity to get to the front of the line by placing a company, product or service on the front cover of the magazine. Buying this position will afford the advertiser the cover story and maximum exposure. For more information, contact Sindi Moni on +27 (0)82 212 4574, or email sindi@infrastructurenews.co.za.

You said it in *WASA*

The opinions and statements shared by thought leaders in the water industry to **Water&Sanitation Africa.**

"One of the biggest barriers to digital transformation is the perception that it is too complex or requires replacing entire systems. The process can be gradual, practical and minimally disruptive. Digitalisation doesn't have to happen all at once. Sometimes it starts with one device, tested over a few months. If it works, the client expands gradually." **Terene Govender, Junior Water & Wastewater Industry Developer, Endress+Hauser**

PAGE 06

"The King V Code on Corporate Governance for South Africa was published on 31 October 2025. Given the country's ongoing water crisis, the text should be taken to heart by every entity involved in water services management. Technical fixes and infrastructure development will fail if governance at national, provincial and municipal levels remains weak, especially in water services management." **Dr Lester Goldman, CEO, WISA**

PAGE 08

"Following a surge of national and international water and sanitation events since WISA 2024, the sector's growing collaboration is clear. Yet, true success must be measured not by attendance, but by how effectively these gatherings advance SDG 6 through real, data-driven implementation and measurable progress on agreed outcomes." **Dr Harrison Pienaar, chairman, WISA**

PAGE 09

"We don't only need scientists and engineers. For every young person who hasn't made it to university, there is still a path forward: technical training, on-the-job experience, entrepreneurial development. We believe that everyone can learn a skill. Everyone can build something. When community members have access to skills and knowledge, they have the power to transform the environment, the economy and the future." **Nkanyezi Blose, project manager, EWSETA**

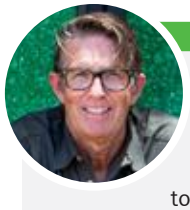
PAGE 10

"When I encountered circumstances or people that tried to hinder my growth, I would say to myself: 'They do not know what I am made of, I have a calling.' Working in the water sector truly is a calling. Water is far more than what flows from a tap – it is the thread that connects every aspect of life. It sustains a child's health and ensures that hospitals can perform life-saving procedures like dialysis. It enables farmers to grow crops and produce the food we eat. It keeps schools clean and functioning, industries running, and cities alive. It cools power stations, supports ecosystems, and provides dignity through sanitation. Every drop represents health, opportunity, productivity, and life itself." **Dr Esper Ncube, manager: Process Technology, Rand Water**

PAGE 11

"Essential for survival, water can just as easily become a leading cause of death. More people die from unsafe water than from all forms of violence, including war. Water related diseases like cholera, typhoid, dysentery and diarrheal diseases cause 3.5 million deaths a year. The bulk of these deaths are children under five years old. This is equivalent to a jumbo jet aeroplane carrying children crashing every hour. Diarrheal disease caused by unsafe water and poor sanitation kill more children than AIDS, war, Malaria and Measles combined." **Shelley Humphreys, CEO, Save Our Schools Non-Profit Organisation (SOSNPO)**

PAGE 14



"Container Based Sanitation fills the huge gaps pipes can't reach. Rural schools. Flood zones. Clinics. Coastal communities. Informal settlements where infrastructure dreams go to die. What governments actually need is reliability. Predictable service. Standard treatment every time. No surprise failures. No nutrient pollution when the power cuts. No chemical shock that wipes out a whole plant. Just clean toilets, safe treatment and no drama." **Birger Lundgren, CEO and founder of Sanitation Ambassadors**

PAGE 18

"Current wastewater treatment plants currently have anaerobic digesters which can stabilise sludge and produce biogas for use. However, the Water Research Commission (WRC) is also exploring emerging technologies based on sludge typologies such as primary sludge, waste activated sludge, digested sludge, and faecal sludge. Such technologies are proving that sludge is not merely a liability but a potential resource which could produce products such as soil conditioners, fertilisers, biochar, biogas, activated carbon and new materials to be used in agriculture, water, energy and construction industries. Such products if generated at community level can be used by communities for energy, and agriculture alleviating energy and food insecurity. These innovations minimise environmental pollution and support sustainable waste management principles, which considers disposal as the last resort." **Valerie Naidoo, executive manager, Water Research Commission (WRC)**

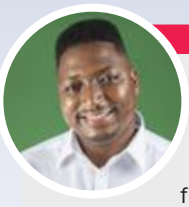
PAGE 20

"South Africa continues to spend billions of rands annually, importing equipment that could and should be produced locally. In sectors such as water infrastructure, energy, and mining, imported pumps and related systems account for a significant share of procurement budgets. KSB Pumps and Valves is deliberately working to reverse this trend — to build industrial depth, protect supply chains from global disruptions, create skilled jobs, and retain value within our borders. Our new Imvubu pump supports the public procurement bill's intent to prioritise local content." **Hugo du Plessis, market area manager: water, wastewater and irrigation, KSB Pumps and Valves**

PAGE 25

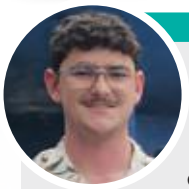
"The Vaal Corporation Water Utility is South Africa's first special purpose vehicle. It is a ring-fenced, professionally managed water and sanitation utility jointly owned by Emfuleni Local Municipality and Rand Water, aimed at halting the decline of Emfuleni's water and sanitation infrastructure, restoring functionality and putting the region on a sustainable, long-term recovery path. This special purpose vehicle offers a way to depoliticise water services and will be governed by a professional, skills-driven board — including engineers, accountants, scientists, environmental specialists and business strategists — ensuring decisions are made on expertise rather than political influence." **Ramateu Monyokolo, chairperson, Rand Water**

PAGE 31



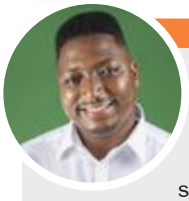
"More customers are embracing the idea of sludge as a resource. Hydrocarbon sludge has been trialled successfully in brickmaking, where it contributes to kiln firing and final product strength. Treated sewage sludge from water treatment plants is being used as lawn-dressing material. High-calorific sludges are blended for alternative fuel use in cement kilns, reducing reliance on coal, while alumina-rich fractions are reclaimed for refractory lining, ceramics and other high-temperature applications. These initiatives support broader (environmental, social and governance) ESG goals and strengthen participation in the circular economy." **Hugh Khumalo, national Haztech and inland southern commercial manager, EnviroServ**

PAGE 22



"Within this virtual space, APE's engineers can conduct plant walk-throughs, tag equipment name plates, store maintenance records and generate complete as-built drawing packs for clients who no longer have original plans and records. The APE team uses the digital scan to overlay pump models and re-route piping, configure motors, or reposition bases – all virtually – before a single tool is lifted on site. With this information, clients can plan maintenance, replacements and upgrades with confidence. 3D scanning enables us to work faster and with far greater precision. It speeds up design decisions, eliminates measurement errors, and dramatically improves retrofit planning." **Keagan Morris, technical coordinator, APE Pumps**

PAGE 28



"Disputes over rivers, from the Chobe and Orange rivers in southern Africa to the Nile in the north, show that being able to access water and control water sources can determine social stability, migration, investment and even international relations." **Anthony Turton, professor at the Centre for Environmental Management, University of the Free State**

PAGE 35

"TCTA's statement of financial position largely comprises borrowings and tariff receivables, which are designed to align over the life of projects. Movements during the year were driven mainly by additional loan drawdowns to fund the Vaal River System and by increased tariff receivables and social grant funding from the government to cushion users from higher costs. Borrowings linked to the Vaal River System remain the largest component of the balance sheet, reflecting its scale and the authority's original mandate, with growth driven by Phase 2 (Lesotho Highlands Water Project) funding requirements and higher royalty payments under the Lesotho treaty." **Andisa Zinja, chief financial officer, TCTA**

PAGE 40

DRIVING SMARTER, MORE RESILIENT WATER SYSTEMS:

ENDRESS+HAUSER ON DIGITALISATION IN SOUTH AFRICA

As ageing infrastructure, rising water losses and stricter compliance intensify pressure on water systems, digitalisation has become essential. For Endress+Hauser, one of the world's leading process instrumentation and automation specialists, digitalisation offers a practical, scalable path to more transparent, efficient and resilient water systems.

"Digitalisation in the water sector is sometimes framed as a complex concept, but at its heart it is simply about using smart technologies to improve how water and wastewater industries operate. Examples include smart meters, cloud platforms to centralise and analyse operational data in real time as well as various sensors and monitors for predictive maintenance and to optimise processes. In essence, digitalisation makes it easier to manage your plant, understand the health of your infrastructure and make informed decisions," states Terene Govender, Junior Water & Wastewater Industry Developer, Endress+Hauser.

Terene Govender, Junior Water & Wastewater Industry Developer, Endress+Hauser

Making non-revenue water more manageable

According to the 2022/23 No Drop Report, South Africa loses 2.08 billion m^3 of non-revenue water each year. With conditions worsening over the past three years, this now translates into losses of more than R35 billion annually.

Endress+Hauser is already supporting several municipalities with cloud-based monitoring platforms trials that provide pressure monitoring and leak detection in real time. Although adoption is not yet widespread, early results show promise.

"In many cases, leaks happen underground and can continue for days or weeks before anyone knows about them. Our monitoring platforms can detect these losses immediately and then issue alerts. This helps our clients to better plan their maintenance activities," she says.

Real-time monitoring also empowers utilities and companies to respond faster to quality changes in treatment processes, ensuring compliance with Blue Drop and other regulatory frameworks.

Improving energy efficiency

Pumps remain some of the biggest energy users in water treatment and distribution. Digital tools allow operators to run pumps only when necessary and at optimal performance settings.

"You're able to optimise pump usage, reduce operational costs and avoid unnecessary wear. Digitalisation helps you run your equipment only when it is needed," explains Govender.

Better data also improves service delivery. With accurate information on asset condition, maintenance backlogs, and critical equipment, utilities or private companies can prioritise repair work more effectively and reduce disruptions to consumers or their businesses.

Compliance

Digital records further support compliance. Endress+Hauser instruments are fully traceable to ISO 9001 standards and include smart verification capabilities that check whether instruments are working properly and generate tamper-proof audit documents. These instruments can support the audit trail needed for Blue Drop, Green Drop and No Drop submissions.

"You cannot manipulate the data. There are dashboards, logbooks and full transparency of what happens on each device," Govender notes. This transparency helps rebuild trust between utilities, regulators and communities.

Endress+Hauser instruments provide continuous, accurate water-quality measurement – including turbidity, pH, chlorine and conductivity – ensuring that water treatment processes remain within SANS 241 limits.

In addition, asset-health monitoring and predictive-maintenance tools assist with risk management and improving overall treatment-system stability. Through integrated dashboards, operators can access clear trends, alarms and downloadable reports that can be incorporated directly into all Drop evidence packs.

Where South Africa is on its digital journey

South Africa's progress is mixed. Some metros and water boards are far ahead, while many smaller municipalities are only beginning to explore digital solutions.

"It is still early days for South Africa and Southern Africa," adds Govender. "Most entities are open to digitalisation, but funding remains a challenge. Fortunately, new regulatory requirements may push more municipalities to adopt digital tools sooner rather than later."

Several ongoing municipal pilot projects, supported by Endress+Hauser, are already demonstrating value – especially for utilities managing multiple sites spread across a province. "From trials – especially with multiple sites – customers can identify which sites need more attention from a maintenance perspective and what additional monitoring they may need," adds Govender.

Helping customers embrace digitalisation without being overwhelmed

One of the biggest barriers to digital transformation is the perception that it is too complex or requires replacing entire systems. According to Govender, the process can be gradual, practical and minimally disruptive. "Digitalisation doesn't have to happen all at once. Sometimes it starts with one device, tested over a few months. If it works, the client expands gradually."

The first step is always understanding the customer's problem – not pushing a product.

"We don't go in with a one-size-fits-all approach. We start by understanding their end goal, their specific issues, and then suggest a solution that aligns with their infrastructure and their people," advises Govender.

Many of Endress+Hauser's devices can also be retrofitted to existing tanks, pipes and systems. However, where a plant relies on extremely old PLCs or outdated SCADA systems that use old communication protocol, upgrading the communication layer may be necessary.

"We begin by assessing a client's current infrastructure and the people (in terms of skills) who will operate the instrumentation. It's essential to optimise what is already in place – ensuring systems and equipment are used as efficiently and cost-effectively as possible – before expanding or scaling any digitalisation strategy," says Govender.

Cyber security, theft and vandalism

With global attacks on utilities increasing, cybersecurity cannot be ignored. Endress+Hauser uses cybersecurity standards equivalent to those used in the banking sector. Importantly, its cloud system communicates only with the device – not directly with a customer's PLC or SCADA – significantly reducing risk.

Instrumentation theft is also a growing concern in South Africa. Endress+Hauser addresses this by offering devices designed for high-risk environments, including units that can be buried underground or run on batteries without external cabling. "With no visible cables, there is nothing to steal," adds Govender.

Innovations in the market

Endress+Hauser have a number of new technologies in the market. Netilion is a cloud-based Industrial Internet of Things (IIoT) ecosystem. It is designed to connect physical field devices (sensors, flowmeters, analysers) with digital platforms, enabling real-time monitoring, diagnostics, analytics and lifecycle management of assets. They have also developed Liquiline CM44X transmitters that are fitted with an edge module that sends data straight to the cloud instead of through PLCs.

"We have also recently launched a new controller for levels and flow that is fitted with Wi-Fi capabilities and Ethernet to view trends," states Govender.

Beyond instrumentation, Endress+Hauser positions itself as a long-term partner to utilities, backing up its technology with training, after-sales support, cloud-based monitoring solutions and practical implementation strategies.

As South Africa moves toward modernised water systems, digitalisation offers a realistic, scalable route to improved compliance, reduced losses, greater resilience and more reliable service delivery. ●

Endress+Hauser

People for Process Automation

www.za.endress.com

WATER SECTOR FACES RENEWED SCRUTINY AS KING V TAKES EFFECT

The King V Code on Corporate Governance for South Africa was published on 31 October 2025. Given the country's ongoing water crisis, the text should be taken to heart by every entity involved in water services management.

By Dr Lester Goldman, CEO, WISA

Technical fixes and infrastructure development will fail if governance at national, provincial and municipal levels remains weak, especially in water services management.

The Code is as relevant as ever but will have little effect if it falls on deaf ears that don't care to adopt its principles. However, even good adoption at the top demands ethical leadership and professional competence all the way down to succeed.

Leadership and professionals

Whether attorneys, accountants, engineers or water process controllers, professionals are meant to bring ethical assurance and technical competence to their environment and work.

So, where are these ethical professionals in government and why don't we see their influence in whatever setting they find themselves - have they been muzzled through intimidation or are they just too afraid of losing their jobs to speak out against corruption and malpractice?

Whether against tender fraud, financial mismanagement or other misconduct, the voice of ethical professionals in the public sector is deafeningly silent.

There's a glaring need for ethical leaders who will empower and support them in bringing order and integrity to the sector, as they are meant to.

The second principle in King V makes the governing body responsible for creating an ethical culture, and this is sorely needed at all levels of government.

The role of professional bodies

As for professional competence, this is where professional bodies come in, providing governance for their related profession and the practitioners in it.

Their functions include, among other things, setting high standards for competency to which their members must adhere, supporting and managing continuing professional development (CPD) of those members, and providing independent oversight and disciplinary processes that protect the profession and the public from misconduct and corruption within its ranks.

The result of these rigorous requirements is embodied in one or other professional designation, such as WISA's Professional Water Process Controller (Pr. PC Water). And holders of such titles are expected to be both competent and ethical.

Any member who is found guilty of misconduct will be struck from WISA's register.

Unfortunately, this does not mean the offender would be unable to continue working in their current role, only that they could not operate as a Supervisor in terms of Regulation 3630. The decision to terminate or penalise them would be at the discretion of their employing municipality or organisation.

A sign of assurance

However, professionalisation - especially when backed by legislation requiring a designation be held in order to practice - offers assurance that the practitioner is subject to independent oversight.

Members who have invested significant time and effort into maintaining their designation are less likely to jeopardise it by becoming involved in malpractice.

This gives a designation greater effect than a mere qualification because its loss can have a major impact on one's career, and is therefore a meaningful deterrent to misconduct. ●

BEYOND THE PODIUM: TRANSFORMING WATER AND SANITATION DIALOGUE INTO ACTION

Following a surge of national and international water and sanitation events since WISA 2024, the sector's growing collaboration is clear. Yet, true success must be measured not by attendance, but by how effectively these gatherings advance SDG 6 through real, data-driven implementation and measurable progress on agreed outcomes.

By Dr Harrison Pienaar, chairman, WISA

These key events in the form of conferences, dialogues, training series/workshops are all crucial for knowledge sharing, professional networking and skills development. However, organizing such key events requires substantial investment in time, money, and resources. To ensure these investments yield the desired outcomes, it's important that we keep measuring success and effectiveness of these events, against the successful implementation and traction of agreed solutions and identified actionable outcomes, as it relates to the Sustainable Development Goal 6: clean water and sanitation for all (SDG 6) in particular.

While one of the most straightforward metrics for evaluating the success of such events is attendance numbers, as high attendance indicates strong interest and relevance. Moreover, some of these events have been oversubscribed, reading from registration information and actual attendance data. These events also have specific aims and emphases, ranging from youth empowerment, skills development, job creation, launching of new partnerships and networks, and innovative water and sanitation technologies among other.

On the other hand the SDG 6 goal and targets aim to achieve universal access to safe and affordable drinking water, adequate and equitable sanitation and hygiene, and to improve water quality by reducing pollution. This goal is crucial for global health, gender equality, and poverty reduction, and is considered central to achieving other development goals as well. Hence, the success of actionable outcomes emanating from water and sanitation events must continue to be measured against the agreed set of SDG 6 targets:

- Universal and equitable access – by providing safe, affordable drinking water and access to adequate sanitation and hygiene for everyone, ending open defecation.
- Improved water quality – by reducing pollution, eliminate dumping, and minimize the release of hazardous chemicals and materials.
- Water-use efficiency – by increasing water-use efficiency across all sectors and ensure sustainable withdrawals to address water scarcity.
- Water resource management – by implementing integrated water resource management at all levels.
- Ecosystem protection – by protecting and restore water-related ecosystems, including mountains, forests, wetlands, and rivers.
- Capacity building – by increasing the capacity of local communities to improve water and sanitation management.

Ultimately, a data-driven approach to evidence-based progress against SDG 6 targets must be the norm when organising or participating in key water and sanitation events, as these platforms serve as an important reminder that genuine progress against SDG 6 targets is measured by successful implementation of actionable outcomes emanating from such strategic conversations, as opposed to the number of important water and sanitation events being (successfully) organised. Lest we forget, SDG 6 is fundamental for public health and is directly linked to reducing diseases. It is a key enabler for other SDGs, including those related to hunger, gender equality, and education. It addresses climate change by ensuring the sustainable management of water resources in the face of increasing stress. ●

Empowering South Africa's process controllers through knowledge and collaboration

Fezeka Zwane, technical trainer, Tshwane University of Technology (left) and Dewald van Staden, lead: Process Controller Division, WISA

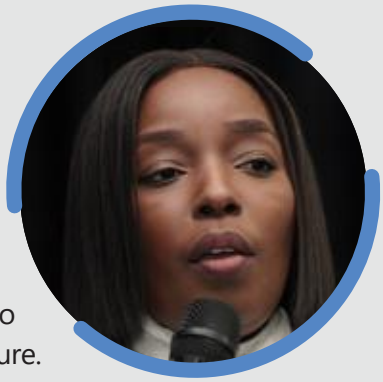
The process controller division of WISA held workshops in Gauteng, Limpopo and Western Cape to empowering and recognise process controllers, while creating a platform for knowledge exchange and professional growth.

"WISA acknowledges the vital role played by all water and wastewater process controllers in safeguarding the provision of safe drinking water and ensuring sustainable sanitation services for communities across South Africa. These workshops highlighted critical areas within water and wastewater treatment that directly impact operational efficiency an essential component in aligning with best practice standards set out by the Blue Drop and Green Drop Programmes," explains Dewald van Staden, lead: Process Controller Division, WISA.

"The Gauteng leg of the workshop was held at the Tshwane University of Technology (TUT). It provided a platform for professional development, peer-to-peer learning, and dialogue on compliance, safety, and innovation in water services. TUT's involvement and support positioned the institution as a key partner in advancing technical excellence and operational sustainability in the sector," adds Fezeka Zwane, technical trainer, Tshwane University of Technology.

SHAPING COMMUNITIES THROUGH SKILLS FOR A SUSTAINABLE WATER FUTURE

Speaking at Water Wise's Drop-by-Drop Water Conservation Outreach Project in Soweto – Nkanyezi Blose, project manager, EWSETA – highlights that communities are central to building a sustainable future.



Nkanyezi Blose, project manager, EWSETA *(credit: Brandscapers Africa)*

The Energy and Water Sector Education and Training Authority (EWSETA) is one of South Africa's 21 Sector Education and Training Authorities (SETAs) established under the Skills Development Act.

"We are proud to work together with all of these stakeholders to build a sustainable community in Soweto. When community members have access to skills and knowledge, they have the power to transform the environment, the economy and the future," says Blose.

EWSETA builds, plans and manages skills development and training in the energy and water sector. The organisation researches the skills needed for both sectors and implements learnerships, internships, apprenticeships and skills programmes in different communities and also collaborates with different government departments and organisations.

Blose adds that townships in particular have a shortage of skilled and qualified water and sanitation artisans. "Municipalities often lack the skills to maintain infrastructure and detect and repair leaks. There is also a phenomenon where skilled people are retiring and leaving the workplace and we need people to replace them."

In the water space, EWSETA focuses on skills around water conservation and management, water quality and treatment, infrastructure maintenance, wastewater treatment, water reuse and recycling, water monitoring and data management.

"We don't only need scientists and engineers. For every young person who hasn't made it to university, there is still a path forward: technical training, on-the-job experience, entrepreneurial development. We believe that everyone can learn a skill. Everyone can build something. And it is these skills that will build a new tomorrow," concludes Blose.

A LIFE SHAPED BY WATER

THE REMARKABLE JOURNEY OF DR ESPER NCUBE

Dr Esper Ncube's journey from a rural village to a leadership position at Rand Water is a testament to resilience, purpose and an unshakable belief in education's power to transform lives.

By Kirsten Kelly

Growing up in a rural community with no access to safe drinking water and sanitation services, Dr Esper Ncube knew the daily burden of fetching water long before she knew the science behind it. She recalls waking up before dawn to join other women and girls, who would walk long distances with 25-litre containers balanced on their heads. "You could fill your container faster from a river just after the rains when the water level was high. At a well, however, the flow was often slow, and getting water depended on who arrived first – those at the end of the queue sometimes went home empty-handed. I know the experience of waking up in the morning and not knowing where I will find water to fill my 25-litre container. These experiences drew me to the water sector."

She finds it heartbreaking that, decades later, the same scenes still play out across Africa. "Governments in general are overwhelmed. Factors like climate change, population growth, industrialisation, urbanisation, poverty and malfunctioning wastewater treatment plants (resulting in pollution) make it extremely difficult to achieve

CAREER SNAPSHOT AND PROFESSIONAL IMPACT

EDUCATION

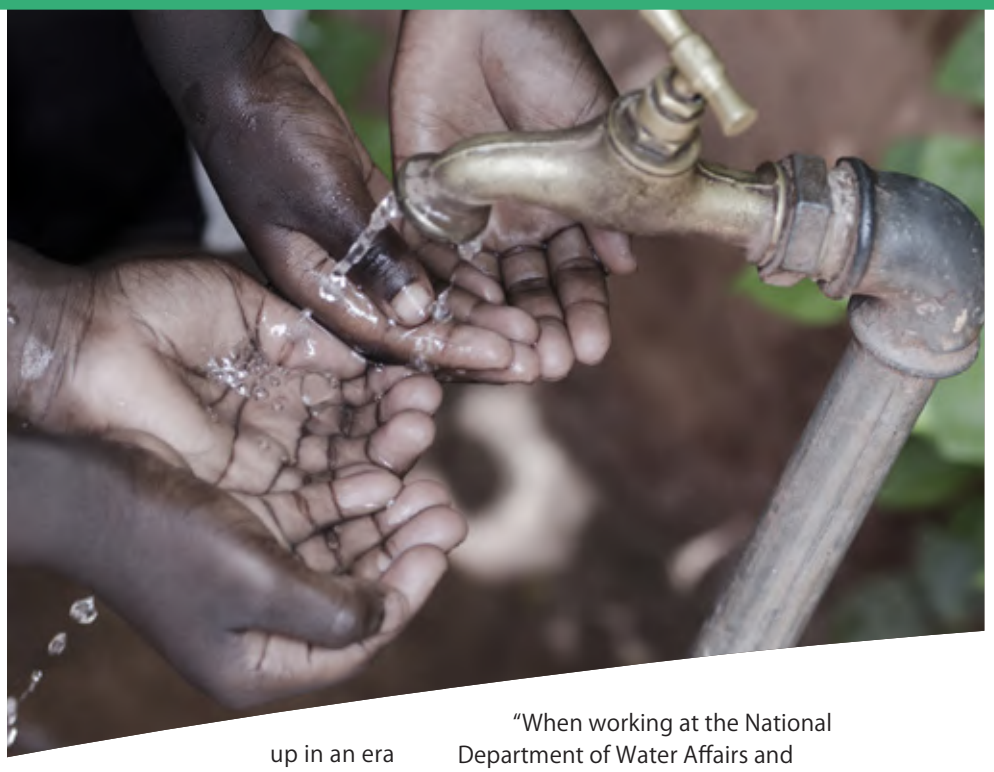
- PhD Public Health, University of Pretoria (UP)
- MSc Water Utilisation, UP
- BSc (Hons) Water Utilisation, UP
- BSc (Hons) Chemistry, University of Cape Town (UCT)
- BSc Chemical Sciences Education, Cuba
- Project Management, North-West University (NWU)
- Management Advanced Programme, Wits Business School
- Master of Business Leadership, UNISA
- Certificates in Coaching and Mentoring

RESEARCH AND ACADEMIC CONTRIBUTIONS

- Presented 75+ papers at national & international conferences since 1998
- Research topics: fluoridation, water-quality monitoring, disinfection, by-products, waterborne diseases, emerging contaminants, water reuse
- Supervised: 7 PhD, 8 Master's students + 1 Postdoctoral Fellow
- Publications in peer-reviewed journals on water chemistry, microbiology, environmental health, and water/wastewater quality assurance frameworks

PROFESSIONAL LEADERSHIP AND MEMBERSHIPS

- Senior Fellow, Water Institute of Southern Africa (WISA)
- Co-founder & former Chairperson, WISA Water Reuse Division (est. 2013)
- Chairperson, SABS TC 0224 (Drinking water & wastewater systems)
- Member, SABS TC 0147 (Drinking water quality)
- Member, Institute of Directors SA (IoDSA)
- Associate Member, South African Institution of Civil Engineers (SAICE)
- Member, Public Health Association of SA (PHASA)
- Member, Education Association of SA (EASA)
- Member, International Water Association (IWA); session chair & reviewer for WWCE since 2022
- Management Committee of the IWA Disinfection Specialist Group
- Member, Coaches and Mentors of SA (COMENSA); mentors & coaches water-sector professionals across Africa
- Member, Rural Water Supply Network (RWSN)
- Chairperson, Tshwane University of Technology Advisory Committee for Water Care
- Member, UNISA iNanoWS Advisory Board
- Member, African Water and Sanitation Association (AfWASA); Strategic & Technical Council reviewer



Sustainable Development Goal (SDG) 6: clean water and sanitation for all. An increasing number of people are converging in urban areas in search of better access to services and resources – water being one of the most essential."

Career

At a time when cultural expectations dictated that girls leave school after the early grades to marry, Dr Ncube's parents chose a different path. "I grew up in an era where men were seen as the heads of families, and women were expected to focus on domestic duties. My mother's education ended at standard one (grade 3) because that was considered enough for a girl. But my father was determined that his daughters would go further – and that changed everything," she recalls.

While some girls in the city were able to continue their studies, Ncube grew up in a village where it was almost unheard of for a girl to attend high school, let alone university. Determined to challenge that mindset, she made it her mission to break the cycle and inspire change.

Her path to the water sector was far from direct. "I'm a teacher by profession," she explains. "But the water sector called me. While teaching in Cape Town District Six, I was disturbed by the polluted streams of Khayelitsha, Gugulethu and Langa and the lack of sanitation and decided to return to university to study BSc (Hons) in Chemistry (UCT) and, later, BSc (Hons) Water Utilisation (UP)."

Dr Ncube has held various management positions within the Department of Water and Sanitation (then called the National Department of Water Affairs and Forestry) as well as Rand Water and taken part in numerous projects to address the needs of women and children who do not have a consistent, safe supply to water and sanitation.

"When working at the National Department of Water Affairs and Forestry, I noticed that rural students were unable to complete their technical diplomas because they lacked access to work-integrated learning placements. To change that, I launched (with the support of the Department) a national experiential-learning programme targeting previously disadvantaged students in1998. We recruited learners from all nine provinces, mostly from rural areas, townships and placed them in the water sector for practical training. Receiving graduation photos of these students with their families celebrating, was to me, my greatest achievement. Many of those graduates are now professionals across government departments, mining, research councils as well as the private sector and institutes of higher learning — from water managers, educators, engineers, groundwater specialists to pollution control officers. I am still mentoring many of these individuals to this very day as my aim is that they do not fail and they get the support that I never got."

Dr Ncube's research work was equally impactful. Concerned about South Africa's debate over fluoridating drinking water supplies, she conducted a master's study mapping fluoride concentrations in water nationwide and demonstrating the impact of dental fluorosis and skeletal fluorosis. Her findings revealed naturally high fluoride levels in several regions, prompting her to argue against adding more. "I recommended alternative ways of improving dental health, and ultimately South Africa decided not to directly add fluoride to drinking water supplies," she notes.

Rand Water

After joining Rand Water in 2002 as head of water quality and environmental projects, Ncube continued to expand her expertise – completing a PhD that combined water science with public-health disciplines such as introduction to toxicology, learning in public health, environmental health, health risk assessment, exposure assessment, endocrine disruption, biostatistics and environmental epidemiology. "I didn't want to be a paper doctor," she laughs. "I wanted to understand how water quality directly affects people's health. For example, when I'm calculating a guideline value for a contaminant in drinking water or when I'm developing a standard and calculating the value of a standard, a lot of things have to come into that calculation, the average weight of the population, the risk, the degree of uncertainty, how the population is exposed, effect and no adverse effect values and the total daily intake dimension."

At Rand Water, she found a professional home that valued both her scientific rigour and her human-centred vision. "This organisation supported me from day one – from funding professional memberships to allowing me to mentor and collaborate internationally. I like solving problems, and I cannot solve problems by working alone, so I like to network and collaborate." One highlight was representing Rand Water under the UN-Habitat programme, training utilities in Ethiopia and Kenya on water-safety planning. "Seeing the enthusiasm in their eyes reminded me why I do this work – it's not about money, it's about the calling." Recently, I saw myself being one of the pioneers in getting into the Zanzibar, Tanzania space in helping the organisation fulfil one of its strategic objectives.

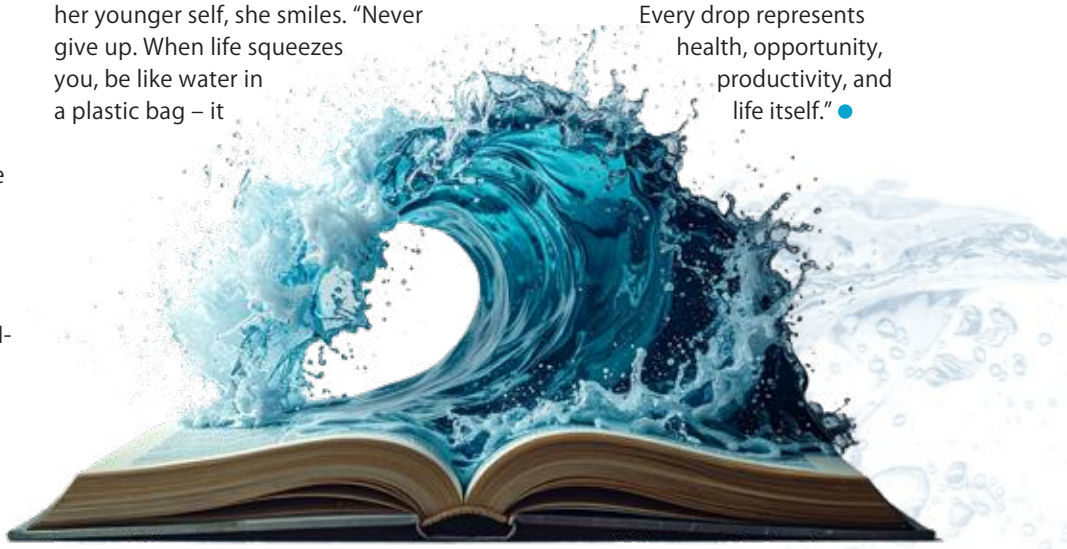
That sense of purpose drives her view of the sector's challenges and opportunities. She points to population growth, climate change and ageing infrastructure as critical pressures, but believes innovation can unlock progress. "We need to think circular economy – reuse treated wastewater, recover nutrients, generate biogas, and diversify our water sources," she says. "Rand Water's vision of becoming a continental supplier of safe water reflects that forward thinking. I want to be a part of that. I want to change lives for the better in Africa."

Advice to younger professionals

Dr Ncube tells all of her mentees to treat themselves as a brand. To do regular SWOT (strengths, weaknesses, opportunities and threats) analyses and Porter's five forces and constantly look forward to what more can be achieved.

Asked what advice she would give her younger self, she smiles. "Never give up. When life squeezes you, be like water in a plastic bag – it doesn't escape, it simply finds another space to move." Her story embodies that metaphor. From rural hardship to national leadership, Dr Ncube continues to prove that perseverance, purpose and education can change not only one woman's life, but the lives of countless others across Africa. She portrayed this by being a recipient of a Continental Lifetime Achiever in Capacity Building in Africa in 2015.

"When I encountered circumstances or people that tried to hinder my growth, I would say to myself: 'They do not know what I am made of, I have a calling.' Working in the water sector truly is a calling. Water is far more than what flows from a tap – it is the thread that connects every aspect of life. It sustains a child's health and ensures that hospitals can perform life-saving procedures like dialysis. It enables farmers to grow crops and produce the food we eat. It keeps schools clean and functioning, industries running, and cities alive. It cools power stations, supports ecosystems, and provides dignity through sanitation. Every drop represents health, opportunity, productivity, and life itself." ●



School children and teachers at the opening of the new, safe toilets and handwashing facilities

INNOVATIVE SANITATION GIVES IVORY PARK LEARNERS A HEALTHIER FUTURE

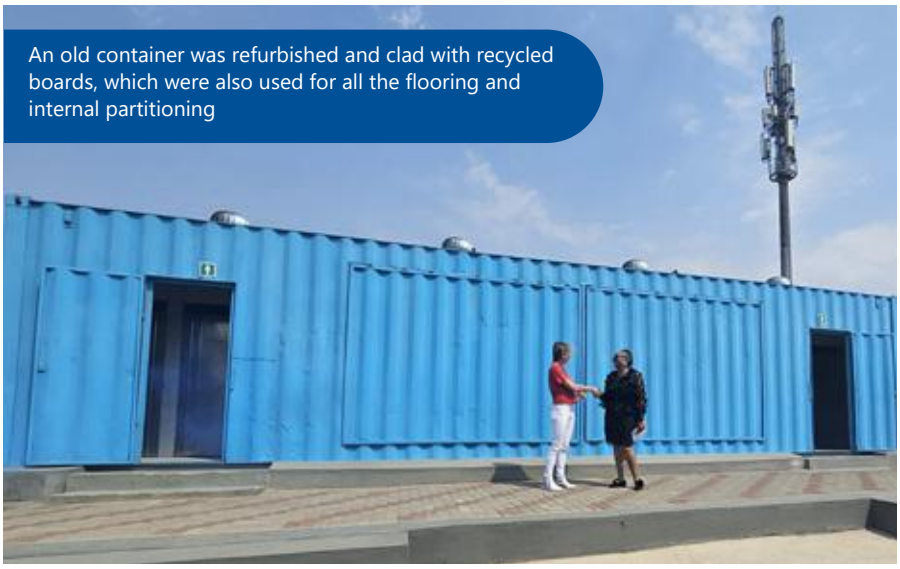
In an ironic twist, a community protest about water shortages almost prevented me from attending the opening of the new, safe toilets and handwashing facilities for Ivory Park Primary School. **By Kirsten Kelly**

Despite the blockade, the situation was calm, and I managed to find a back road to Ivory Park Primary School. The principal – Poppy Ngwenya – explains: "Ivory Park has long struggled with intermittent water supply. Households often endure days without running water, forcing residents to rely on communal taps, water tankers, or unsafe alternatives – making water and sanitation shortages one of the community's most pressing daily challenges."

Home to more than 2 360 learners and close to 100 teaching and school staff, Ivory Park Primary School is among the largest in Gauteng. "This school size is equivalent to that of a small South African town. These water shortages have therefore turned what should be a place of learning into a daily struggle for health and dignity. In order to prevent learners from getting sick, we have had to halt

The Dignity Hub

The SOSNPO and Amalooloo team (from left to right): Dylan de Klerk, Rene Frank, Rocky Malebogu, Shelley Humphreys and Lumar Fourie



An old container was refurbished and clad with recycled boards, which were also used for all the flooring and internal partitioning

schooling for the equivalent of 40 full days this year," adds Ngwenya.

Children miss their daily school meals, wander the streets hungry, and parents, struggling to make ends meet, often cannot be there to care for them. Teachers are left in an impossible position, never knowing if tomorrow's school day will happen.

"Essential for survival, water can just as easily become a leading cause of death. More people die from unsafe water than from all forms of violence, including war. Water related diseases like cholera, typhoid, dysentery and diarrheal diseases cause 3.5 million deaths a year. The bulk of these deaths are children under five years old. This is equivalent to a jumbo jet aeroplane carrying children crashing every hour. Diarrheal disease caused by unsafe water and poor sanitation kill more children than AIDS, war, Malaria and Measles combined," states Shelley Humphreys, CEO, Save Our Schools Non-Profit Organisation (SOSNPO).

Joining forces to make a difference

Founded during Cape Town's 2017 Day Zero crisis, SOSNPO was created to assist government and municipalities with water and sanitation needs in under-resourced schools and communities.

While working on a sanitation project in Makause Informal Settlement near Germiston, SOSNPO heard from its residents about how many of their children were missing schooling at Ivory Park Primary School due to lack of water. In this case, SOSNPO mobilised private stakeholders to take action and construct a new water and sanitation system for the primary school. Comprising Amalooloo, Infinite Industries, KSB Pumps, Dischem, PDJF (Grundfos Foundation) and SOSNPO, the partnership installed safe, containerised sanitation and handwashing facilities, repaired the school's borehole and also introduced a dignity hub.

Rene Frank, the chairman of SOSNPO addressed the school children at the launch: "This partnership between business and civil society formed a movement, Out Of The Blue, which is more than a project – it's a promise of care. We all have a shared vision for dignity, education, and sustainability. We want each of you to have the strongest possible start to your future and that begins with something simple, yet powerful: consistent access to clean water and dignified sanitation."

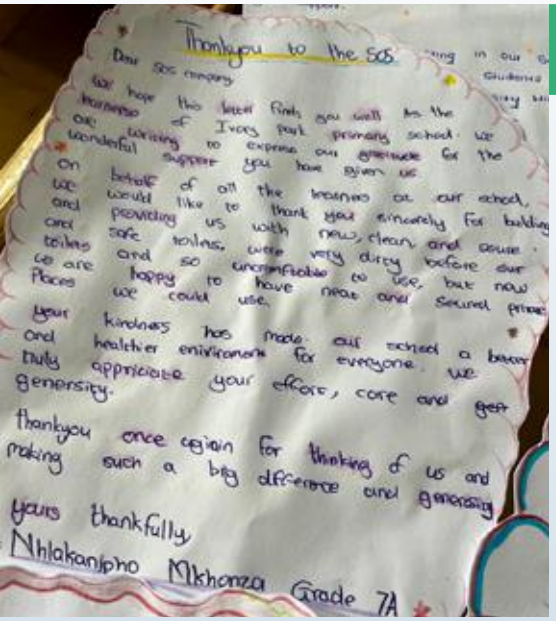
Sanitation technology

Amalooloo is at the forefront of addressing sanitation challenges in urban, peri-urban and rural areas, which is why SOSNPO selected the company as its strategic research and development partner.

"Working largely in rural communities with minimal infrastructure, SOSNPO recognised that there is seldom a 'one-size-fits-all' sanitation solution. This led to the signing of a memorandum of understanding between the two organisations, built on a shared vision to uplift communities and restore dignity," explains Lumar Fourie, operational director, Amalooloo.

He adds that Amalooloo supplies a range of sanitation technologies, including low-flush, waterborne and dry sanitation systems, with its flagship solution being the MyLoo dry sanitation system implemented at Ivory Park Primary School. "MyLoo is an aerobic, natural composting sanitation system that safely treats human waste at source: solids fall into a lined vault or container while liquids are diverted to a soakaway, preventing odours and reducing groundwater risk. A vent pipe with a solar powered extraction fan significantly increases natural airflow,

Maggie Infante, cofounder, Infinite Industries


Thankyou to the SOS
Dear SOS company
We hope the latest finds you well as the learners of Ivory park primary school we are writing to express our gratitude for the wonderful support you have given us on behalf of all the learners at our school, we would like to thank you sincerely for building and providing us with new, clean and secure toilets. safe toilets, were very dirty before our we are and so uncomfortable to use, but now Places happy to have neat and secured private we could use.
Your kindness has made our school a better and healthier environment for everyone. we truly appreciate your effort, care and generosity.
thankyou once again for thinking of us and making such a big difference and generosity
yours thankfully
Nhlakanipho Mkhonza Grade 7A

One of the many letters of thanks from Ivory Park Primary learners to SOSNPO

which dries and decomposes the waste while keeping insects out. Once the organic waste has dried out, it can be safely removed and further processed into biochar or fertiliser. By reducing the moisture content of waste by 85%-95%, the system prevents faecal-sludge generation and eliminates the need for costly transport and disposal. This is a huge advantage because faecal sludge is extremely difficult to transport and poses a real threat to the health of the learners."

Engineered in line with ISO 30500, the MyLoo pedestal features a patented automatic flap that opens and closes as the user sits and stands, ensuring hygienic and dignified separation of urine, faeces and common incidentals such as toilet paper, sanitary products and nappies. The system operates entirely without water, apart from handwashing for hygiene.

At Ivory Park Primary, The Out Of The Blue Movement's containerised WASH (water, sanitation and hygiene) Hub extends this circular model by diverting urine and containerised hard waste for conversion, into fertiliser and eco-char used for cooking and heating. The urine/water diversion system is piped beneath food gardens to support crop growth, giving learners practical environmental education opportunities, while supplying fresh produce for school meals and the surrounding community.

"We have also formed a unique partnership with Kohler, a company that operates in more than 50 countries and is considered one of the most influential brands in bathroom and sanitation design. As seen at Ivory Park Primary, Kohler's innovative cleanse handwashing solution can be integrated into Amalooloo's MyLoo sanitation system. This pairing combines water-efficient handwashing with waterless toilet technology, making every drop count while improving hygiene," states Fourie.

In addition to the toilets, Amalooloo also supplied a Dignity Hub. "I am extremely excited about this project. Sanitation is not just about toilets – it's about people, their dignity and wellbeing. We have, therefore, also built a dignity hub that includes water storage of up to 1200 litres, a rainwater harvesting system as well as an integrated shower facility. There are many hard-working people in this country that have to wake up at three in the morning and wash themselves in a room that is shared with numerous other people. Our Dignity Hub provides people with privacy and respect," maintains Fourie.

Recycled plastic

With the desire to make the WASH Hub as environmentally friendly as possible, SOSNPO also partnered with Infinite Industries – a company that converts waste products into recycled environmentally friendly products, such as recycled plastic boards and roofing sheets for low cost housing, cable and pipe protection covers as well as school desks and benches.

An old container was refurbished and clad with recycled boards, which were also used for all the flooring and internal partitioning. "The boards are manufactured by repurposing difficult-to-recycle materials such as toothpaste tubes, toothbrushes, washing powder bags, long life milk cartons and multi-layered packaging – items that typically

The urine/water diversion system is piped beneath food gardens to support crop growth, giving learners practical environmental education opportunities, while supplying fresh produce for school meals and the surrounding community

The boards are manufactured by repurposing difficult-to-recycle materials such as toothpaste tubes, toothbrushes, washing powder bags, long life milk cartons and multi-layered packaging—items that typically end up in landfills

Amalooloo's WASH Hub at Ivory Park Primary closes the loop by turning diverted urine and solid waste into fertiliser and eco-char

Amalooloo supplies a range of technologies, including Non Sewered Sanitation (NSS) low-flush and no-flush systems, with its flagship solution being the MyLoo dry sanitation system that was implemented at Ivory Park Primary School

end up in landfills. Nearly one million discarded toothpaste tubes, washing powder bags and long life milk cartons were repurposed to build the WASH Hub – material that would otherwise have ended up in landfill," explains Maggie Infante, the cofounder of Infinite Industries.

Infinite Industries also runs the Infinite Indloo project, which offers a private, insulated, ventilated and self-composting toilet solution that can be installed almost anywhere. "We have already built structures for more than 60 toilets using our recycled boards," says Infante. "These boards are flame retardant, water and UV resistant, and highly durable. Their strong thermal insulation ensures that the structures remain comfortable – staying cool in summer and warm in winter," says Infante.

The boards undergo rigorous testing, including UV, fire and water resistance assessments, as well as flexural and strength tests to confirm their performance and reliability.

"There is little value in installing sanitation systems that use minimal or no water and support circular-economy principles, if the structures housing them are not made from recycled, sustainable materials. Infinite Industries closes this gap by designing units built from high-recycled-content boards that are durable, insulating and environmentally responsible – making them the ideal partner for truly circular, dignified sanitation solutions," she adds.

Restoring a borehole

KSB Pumps restored a long-dormant borehole and supplied a new pump system to supply consistent water to the school. KSB Pumps worked closely with their sales partner, Matthews Msiza from Sanitation and Projects (S&P) who installed and connected everything. A multistage vertical high-pressure centrifugal pump (Movitec), as well as a submersible borehole pump, solar panels and filters were supplied.

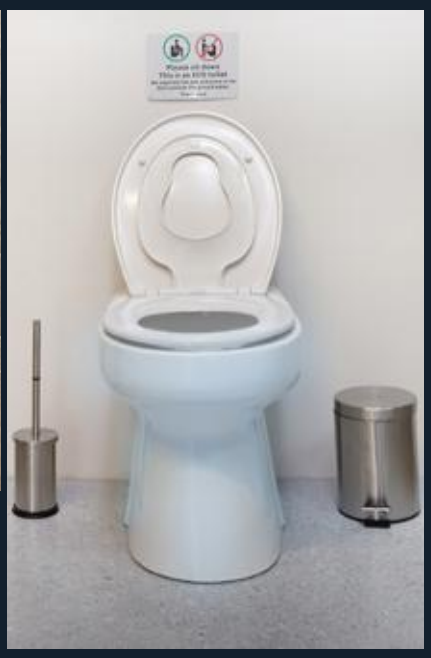
"Making a lasting difference to children and communities is something that we do not take lightly. This is a powerful reminder of what is possible when corporates and communities come together with a shared purpose. Water is one of our most valuable resources – yet it's often taken for granted until the moment it's no longer available," explains Hugo du Plessis, market area manager: Water, Wastewater and Irrigation, KSB Pumps & Valves.

For Ivory Park Primary, these interventions are more than infrastructure upgrades – they restore dignity, stability and opportunity for over two thousand children. With clean water, safe toilets and community-driven support, the school can finally focus on learning rather than survival.

"The key ingredient to a school's success is a good principle. Poppy is extremely invested in the school and students. It has been refreshing to see the school acting like a partner and participant and not a beneficiary. Thanks to the dynamic principal and dedicated school governing body, I knew form the very beginning that this project would be a success," concludes Humphreys. ●

KSB Pumps restored a long-dormant borehole and installed a new pump system to supply consistent water to the school

FROM PIPES TO SERVICE: **WHY SANITATION NEEDS THE SAME MINDSET** AS EMPTYING BINS



For a hundred years the solution was always the same: lay more pipes, build a bigger wastewater plant, pray it all behaves. On drawings it looks fantastic. On the ground it leaks, breaks and dumps waste into rivers and oceans every single day.

By Birger Lundgren, CEO and founder of Sanitation Ambassadors

Most wastewater plants in developing regions are already overwhelmed. Flows come in higher than the design ever allowed. Pumps scream. Aeration can't keep up. Sludge piles up. The biology collapses. Operators fight fires while the load keeps rising.

Then comes the knockout punch. A truck dumps a load from chemical toilets. The chemicals kill the microbes that actually do the treatment. The whole plant crashes. Raw sewage pours straight into rivers, wetlands and the ocean. Fish die. Corals choke under nutrients. And communities downstream pay for a system that ran out of road years ago.

And this is not a 'South Africa only' story. Globally about 80% of wastewater entering the ocean is completely untreated. The remaining 20% still carries valuable nutrients that fuel algal blooms instead of feeding soils.

Container based sanitation

This is exactly why container based sanitation (CBS) is growing fast. It doesn't depend on a perfect grid, a perfect operator or a perfect stormwater season. It doesn't collapse when a pump station floods. It doesn't send shock loads into fragile plants. It's sealed, predictable and beautifully boring.

It works like waste collection. You keep the waste contained. You swap the container before anything goes wrong. You treat it safely and get the same result every time. Wastewater plants haven't delivered that kind of reliability for decades. CBS is now one of the fastest growing parts of sanitation. Faster than solar. Faster than most WASH tech. The Container Based South Africa Report (CBSA) says it clearly: 'CBS works in the real world where things break, not in the fantasy world where everything works.' And CBS isn't here to fight advanced WESS systems. It supports them. WESS is brilliant where it fits, but it is expensive and slow to roll out.

CBS fills the huge gaps pipes can't reach. Rural schools. Flood zones. Clinics. Coastal communities. Informal settlements where infrastructure dreams go to die. What governments actually need is reliability. Predictable service. Standard treatment every time. No surprise failures. No nutrient pollution when the power cuts. No chemical shock that wipes out a whole plant. Just clean toilets, safe treatment and no drama.

This is how we protect ecosystems. This is how we keep fish alive and stop corals from suffocating under the nutrient soup leaking from broken infrastructure. Sanitation isn't a construction competition. It's a service. And CBS is the upgrade we need if we want healthy schools, clean rivers and oceans that stop drowning in human waste. Let's fix this sh*t!

WATER-EFFICIENT TOILET MAKES A splash

The Arumloo is designed to use 70% less water than 'regular' toilets

Arumloo, a water-efficient toilet company, has been implementing its water-conscious toilets in both residential and commercial spaces. The company's signature toilet uses less than two litres of water per flush, as opposed to conventional toilets that use between six and nine litres per flush

This represents a 70% decrease in water usage. Arumloo offers a calculator on their website that calculates an estimated cost savings based on their flushing system versus a traditional one. In an average middle-income household with five people and two toilets, the total savings amount to R3 422 per year, roughly 68,438 litres, which is a two-year return on investment.

The design is inspired by the Arum Lily, and uses a vortex flush with a water seal to prevent odours and blockages. Arumloo designed their toilet in both ceramic and plastic formats to look and behave like a 'regular' toilet, an important factor for their consumer base.

Recognition

Arumloo was recently awarded the Gold Award in the Eco-Friendly Home Products category by the Eco-Logic Award committee. The Eco-Logic Awards recognise South African companies that truly embody the principles of resource efficiency, sustainability, and circular economic thinking.

Awards like these matter as they highlight the work done in South Africa to address the issues the country faces. In the case of Arumloo, the Eco-Logic Awards committee say, "this is a remarkable achievement in sustainable living and water-efficient bathroom design", noting that the company makes a practical solution to both environmental and cost concerns. ●

Community partnership can drive leak reduction in Soweto

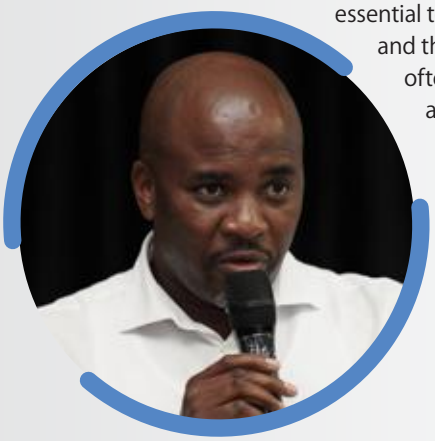
Johannesburg Water is strengthening its water demand management efforts in Soweto through technology, education and community collaboration – helping residents detect leaks, install water-saving devices and protect precious infrastructure.

"Water demand management is absolutely crucial to ensuring the sustainability of water supply," explains Xolisa Bonkolo, senior engineering technician, Johannesburg Water. Speaking at Water Wise's Drop-by-Drop Water Conservation Outreach Project, he highlighted the need for collective responsibility in conserving water resources. "Community participation is essential – residents are often the first to notice a burst pipe or a leaking street valve."

In Soweto – one of the city's oldest and most water-challenged regions – the utility is rolling out several initiatives to detect and repair leaks. Non-visible leaks are detected through advanced acoustic and pressure monitoring technologies. "We search for leaks that are not visible and repair them quickly. But many leaks are first reported by residents themselves," explains Bonkolo.

Bonkolo adds that is important to receive a reference number so that the turnaround time taken to attend to a complaint can be tracked. "Within the Soweto region, we're working hard to fix every leak – not just because of wasted water, but because leaks also damage roads and even nearby houses,". Every report helps protect both infrastructure and homes."

Johannesburg Water are also educating and encouraging residents to replace ageing fittings, use water-efficient devices to restrict flow in toilets and showers and utilise rainwater harvesting to water the garden and flush toilets. "We have also installed prepaid water meters. Water meters are an essential tool in managing leaks, and these prepaid meters often save residents money as they will pay for their actual water use and not depend on estimates that can be inaccurate," he adds. ●



Xolisa Bonkolo, senior engineering technician, Johannesburg Water
(Credit: Brandscapers Africa)

Residents of the City of Johannesburg can report a water leak:

Phone: 086 056 2874 or 011 688 1699 **SMS:** 45201

SOUTH AFRICA'S SLUDGE CHALLENGE BECOMES A RESOURCE OPPORTUNITY

South Africa is running out of space, time and options to manage its growing sludge volumes. Yet what is treated as waste is a valuable resource. With rising regulatory pressure and new decentralised technologies, sludge can be transformed into products that support the circular economy, improve sustainability and unlock local opportunities. **By Phillip Majeke (commercialisation manager) and Valerie Naidoo (executive manager) from the Water Research Commission**

The WRC and eThekwini Municipality entered into a partnership to demonstrate a sludge beneficiation technology, namely LaDePa at the KwaMashu WWTW

The LaDePa plant was commissioned in September 2025 and is processing both faecal sludge and wastewater treatment works sludge at scale

Sludge is a byproduct within wastewater treatment plants when treating human waste. The sludge generated continues to be stockpiled, while faecal sludge from Ventilated Improved Pit (VIP) toilets poses persistent pollution and public health concerns. It is estimated that South Africa's large treatment plants produce about 638 750 dry tons per year. Furthermore, it is estimated that sludge from smaller plants and VIPs can range between 378 000 and 567 000 dry tons per year.

South Africa cannot afford to overlook these challenges any longer. What is currently seen as waste is, in fact, an untapped resource that can deliver significant environmental and economic value. This is where decentralised sludge beneficiation innovations become essential in reshaping the future faecal sludge management and growing local economic opportunities.

The sludge economy opportunity

Sludge can be treated and converted to beneficial products such as compost, but it requires careful management of temperature to render the final product safe from pathogens.

Current wastewater treatment plants currently have anaerobic digesters which can stabilise sludge and produce biogas for use. However, the Water Research Commission (WRC) is also exploring emerging technologies based on sludge typologies such as primary sludge, waste activated sludge, digested sludge, and faecal sludge. Such technologies are proving that sludge is not merely a liability but a potential resource which could produce products such as soil conditioners, fertilisers, biochar, biogas, activated carbon and new materials to be used in agriculture, water, energy and construction industries. Such products if generated at community level can be used by communities for energy, and agriculture alleviating energy and food insecurity. These innovations minimise environmental pollution and support sustainable waste management principles, which considers disposal as the last resort.

Regulations driving sustainable approaches

In 2019, the Department of Forestry, Fisheries and Environment (DFFE) declared a national ban on liquid wastes to landfills, which is pushing municipalities to seek alternative treatment and disposal methods and encouraging beneficial use and transitioning towards the circular economy. Thus, DFFE supports the beneficial use of wastewater sludge and to encourage this, the DFFE can grant an exclusion from the legal definition of waste for specific beneficial uses, provided certain conditions are met.

The WRC and eThekwini Municipality entered into a partnership to demonstrate a sludge beneficiation technology, namely LaDePa at the KwaMashu WWTW

Technologies can help modernise the approaches to sludge treatment while generating revenue from the products it produces, which seek to close the nutrient and carbon loops while reducing pollution. These approaches also create new opportunities linked to sustainable energy generation, material recovery and job creation.

The Department of Water and Sanitation has published a National Faecal Sludge Management (FSM) Strategy (2023), which aims to ensure safe, regulated and sustainable faecal sludge management across all on-site sanitation systems in South Africa. The strategy emphasises:

- Safe collection, transport, treatment and end-use of faecal sludge
- Adoption of appropriate and affordable technologies
- Resource recovery and circular economy principles
- Reduction of environmental and public health risks
- Building municipal capacity for FSM operations
- Developing regulatory pathways for end-products such as soil conditioners and fertilisers

A sludge demonstration project with national significance

The WRC and eThekwini Municipality entered into a partnership to demonstrate a sludge beneficiation technology, namely LaDePa at the KwaMashu WWTW. LaDePa stands for Latrine Dehydration and Pasteurization, a technology that converts sludge into a soil restoration material and if blended with nutrients, can be used as a fertiliser. Pasteurisation heats the sludge to kill the pathogens. This technology was developed by local partners who understand South Africa's context, designing systems with capacity ranges of 5 to 30 tons per day and supports the transition to circular economy.

The objective of the large-scale demonstration of LaDePa is to upscale a sludge valorisation technology that addresses both pit latrine sludge and wastewater treatment sludge, assessing operation and maintenance and production regimes and evaluating final product quality. The inclusion of market analysis is especially important. By understanding the regulatory environment, market size, pricing and revenue potential of valorised products, municipalities and private partners can adopt sustainable business models that reduce long-term operating costs and unlock local entrepreneurship opportunities.

The LaDePa plant was commissioned in September 2025 and is processing both faecal sludge and wastewater treatment works sludge at scale. This demonstration project strongly aligns with the Department of Water and Sanitation's National FSM Strategy. Given South Africa's growing regulatory, environmental and infrastructure pressures, such solutions are no longer optional, but are essential.

The large-scale sludge beneficiation demonstration project is more than a technical pilot, it is a national opportunity to transition towards sustainable, circular and economically feasible sludge management. For sludge valorisation to scale, the market demands and pricing must be clearly understood and the public sector institutional models that will enable entrepreneurs to enter and generate products must be fully unpacked for the markets to grow. These insights will help municipalities move beyond the traditional view of sludge as a burden to a regulated, circular and sustainable management approach. ●

Sludge can be treated and converted to beneficial products such as compost but it requires careful management of temperature to render the final product safe from pathogens

This technology was developed by local partners who understand South Africa's context, designing systems with capacity ranges of 5 to 30 tons per day and supports the transition to circular economy

SLUDGE MANAGEMENT THROUGH A CIRCULAR-ECONOMY LENS

Hugh Khumalo, national Haztech and inland southern commercial manager, EnviroServ

As sludge volumes continue to rise across South Africa's water, wastewater and industrial sectors, organisations are shifting from purely disposal-based practices towards approaches that focus on value recovery. EnviroServ's national Haztech and inland southern commercial manager, Hugh Khumalo, outlines how the company is advancing sludge management practices.

Sludge remains one of the most complex waste streams in the water and industrial sectors. Its composition varies widely – from organic hydrocarbon sludge to inorganic, mineral-rich residues – each with different densities, viscosities and odour characteristics. These factors influence how sludge is removed, transported and treated. "Sludges are managed and transported using a range of methods. In some cases, sealed tankers are used instead of tippers, and additional treatment processes – such as odour-control measures – may be required, with certain sludges ultimately needing incineration," explains Khumalo.

Before any treatment or disposal route is considered, EnviroServ conducts a detailed assessment through its accredited laboratory working alongside the company's alternatives team and hazmat specialists. Samples are analysed to determine whether sludge should be stabilised, dewatered, incinerated or landfilled. "These departments work together to determine the safest and most responsible solution before any proposal is presented to a customer," says Khumalo.

EnviroServ uses several treatment technologies depending on the classification of the sludge and prevailing legislation. Treatment at EnviroServ's Holfontein Waste Management Facility range from ash blending to more technical applications using lime, ferro-sulphate or specialist stabilisers for difficult waste streams. Wherever possible, alternatives to landfill are prioritised. Holfontein is South Africa's largest hazardous waste management facility. It is engineered to safely take Type 1 to Type 4 wastes, and is equipped with treatment processes capable of treating even Type 0 materials before disposal.

Dewatering

Transporting sludge carries inherent risks. EnviroServ selects sealed tankers or RoRo bullet tankers where necessary and uses advanced digital systems for route planning, manifest control and compliance with UN/TREM requirements. These UN-aligned Transport Emergency (TREM) protocols ensure that drivers have the hazard information and emergency actions needed to move dangerous goods safely and transparently.

A major focus area in recent years has been reducing the transport and disposal of water-rich sludge. EnviroServ has developed a sludge dewatering system in partnership with a specialist supplier. This system extracts sludge from dams, dewaters it, and returns low-solids water to the client's process. "This approach significantly reduces the number of trucks on national roads, lowers carbon emissions and ensures that prohibited liquid wastes

Transporting sludge carries inherent risks, thus a reliable and compliant supplier is required

Treated sewage sludge from water treatment plants may be used as lawn-dressing material

do not reach landfill," notes Khumalo. In one project, belt presses were used to extract sewage sludge from an overloaded treatment dam, helping the client restore capacity and avoid compliance issues.

More customers are embracing the idea of sludge as a resource. Hydrocarbon sludge has been trialled successfully in brickmaking, where it contributes to kiln firing and final product strength. Treated sewage sludge from water treatment plants is being used as lawn-dressing material. High-calorific sludges are blended for alternative fuel use in cement kilns, reducing reliance on coal, while alumina-rich fractions are reclaimed for refractory lining, ceramics and other high-temperature applications. These initiatives support broader (environmental, social and governance) ESG goals and strengthen participation in the circular economy.

Several projects highlight the value of this approach. At one of EnviroServ's petrochemical clients, dam dewatering yielded significant disposal savings, while pond harvesting helped prevent wet sludge from reaching landfill. Hydrocarbon and alumina-rich sludges have also been supplied to cement producers for fuel blending and raw material use.

Khumalo believes that the next decade will see sludge increasingly recognised as a feedstock rather than a liability. "Clients are investing more in alternatives and research. With tighter landfill restrictions ahead, solutions like dewatering, sludge blending and waste-to-energy will become standard practice. The public and private sectors will need to partner and invest in infrastructure to support this transition."

Sludge management is no longer merely an operational requirement but a strategic opportunity. Through rigorous assessment, flexible treatment technologies, and a strong focus on circular-economy value, EnviroServ is helping industries move beyond disposal towards sustainable resource recovery. ●

The VEGAPULS-Air series can monitor intermediate bulk storage containers without opening

SELF-SUFFICIENT LEVEL SENSORS ENABLE SEAMLESS INTEGRATION INTO IOT PROJECTS

In the past, inventory management was difficult, from inaccurate readings to economically unfeasible instrumentation. For plant operators, logistics companies, suppliers, and manufacturers of reagents, additives, and other chemicals, the industrial application of newer technology like the Internet of Things (IoT) has become vital for inventory management.

Sensor manufacturing company VEGA introduced self-sufficient level sensors to digitise and simplify the measurement of bulk liquids and bulk solids in individual vessels, accurately down to the last drop. By doing so, it became clear that battery-powered radar sensors could easily provide and facilitate integration into IoT projects for manufacturers and logistics service providers. The centralisation and digitisation of processes and infrastructure along the supply chain offer various benefits.

The VEGAPULS-Air series includes self-contained radar sensors that deliver accurate measurements with a scalable solution for a wide range of measuring and logistics tasks. These sensors use high-performance 80 GHz radar technology, are energy efficient, and provide optimised measuring performance with radio data transmission. One notable feature of the VEGAPULS-Air sensors is their ability to reliably measure and wirelessly transmit fill levels for up to 10 years. This capability is useful in various scenarios, such as measuring fill levels in storage tanks containing chemicals, monitoring cleaning agent containers that require regular exchanges, or tracking residual material containers awaiting collection.

These sensors can be attached to the outside of intermediate bulk containers (IBC) to measure the fill level without opening the vessel. When stacked on each other, VEGA sensors can record individual container current fill levels and positions several times daily and upload this data wirelessly to the cloud. The devices transmit the measured values via the NB-IoT, LTE-M, and LoRa standards. The sensors utilise a multi-communication model, equipping the sensor with several low-power radio standards and using the standard that's available at the time. Also, future standards can be seamlessly integrated.

The networking and automation of logistics processes across entire supply chains can be complex. Clemens Hengstler, product manager for Digital Solutions at VEGA, explains, "Large IoT projects often fail due to overly ambitious plans and the attempt to implement everything at once." To remedy this, Hengstler suggests that a more prudent approach would be to proceed step by step.

VEGAPULS-Air series

VEGA offers a scalable solution in which assets are first equipped with VEGAPULS Air sensors that will transmit the measured values to the VEGA Inventory System. The software would then determine optimal order quantities based on the data received and trigger an order in the ERP system. This keeps the implementation effort low and allows for a gradual analysis and adaptation of existing processes to create value through optimisation. Once these processes are functional and tested, they can be integrated into ERP systems such as SAP.

"There is great potential in utilising automation and IoT in processes where fill level plays a critical role. Customers can use fill-level sensors and the VEGA Inventory System to make logistics more efficient and demand-oriented. This leads to greater profitability and helps to reduce the CO_2 footprint," says Hengstler. Most companies experience challenges with inventory management and level measurement in tanks and silos, as they are not equipped with measuring technology because wired installation of sensors would be too expensive. With the VEGA self-sufficient radar sensors and the VEGA Inventory System in place, companies can now optimise processes and save on resources.

LOCAL INNOVATION DELIVERS A NEW SELF-PRIMING PUMP FOR AFRICAN WASTEWATER CONDITIONS

Although KSB Pumps began in Germany more than 150 years ago, the company has established a substantial South African footprint over the past several decades, with local manufacturing and service facilities – a presence that enabled its South African operation to lead the full design and development of a self-priming wastewater pump for local conditions.

The new ELN 150 pump is also known as Imvubu – the isiZulu word for 'hippo'. It takes its name from an animal known for its toughness and resilience, qualities reflected in the pump's ability to handle demanding wastewater conditions. Imvubu is the result of several years of design work, prototyping, hydraulic optimisation and field testing.

"South Africa's wastewater infrastructure is under immense strain with limited resources and ever-rising sewage volumes. We listened to the market. Customers highlighted issues ranging from frequent clogging and solids carry-over to difficult seal replacement, maintenance complexity, thin casings that wear quickly and designs unable to handle raw, unscreened sewage. The KSB Pumps and Valves team used this input as the foundation for Imvubu's design," says Hugo du Plessis, market area manager: water, wastewater and irrigation, KSB Pumps and Valves.

Applications extend beyond municipal wastewater to mining sumps, industrial effluent, pulp and paper, agricultural waste dams, river abstraction and portable dewatering units

Bigger free passage for fewer blockages

To avoid frequent clogging, Imvubu features a large 77.3 mm free passage to handle the wipes, rags and debris commonly found in municipal networks, reducing the risk of blockages and spillages. This exceeds the global raw sewage benchmark of 76 mm. "The free passage is what sets it apart. This design is market leading and equates to the fact that if a pump can pass a bigger solid, it will clog less. It is that simple, and less clogging means less callouts, less downtime and less cost. In real-world operation, that 1.3 mm can be the difference between uninterrupted pumping and a costly blockage," adds du Plessis.

"This pump was designed for African conditions, which is why it can be maintained with basic tools and speed-adjusted through simple pulley changes. It can also do the job of two pumps simply by moving from low to high heads and low to high flows easily with no need for a second pump. It can even be mounted on diesel skids for remote pumping or flood emergency use. It is versatile, strong and practical," he states.

Hugo du Plessis, market area manager: water, wastewater and irrigation, KSB Pumps and Valves

Tough, versatile and easy to maintain

With flows up to 430 m³/h and heads of up to 48 m, the pump offers high efficiency, grease-for-life bearings (eliminating oil changes), and a rotating assembly that can be removed without disturbing pipework. An inspection hatch allows quick access through just two bolts, making routine maintenance faster and safer. Designed from first principles and extensively tested in local plants, Imvubu provides a durable, energy-efficient and environmentally responsible solution for wastewater applications.

Municipalities and industry operators often have to deal with pump failures in

OPERATING CHARACTERISTICS OF ELN 150/IMVUBU:

- Maximum flow: 429.4m³/h
- Maximum head: 47.6 m
- Suction size: 150 NB (6")
- Discharge size: 150 NB (6")
- Solids handling: 77.3 mm
- BEP flow: 305 m³/h
- BEP head: 33 m
- BEP ŋ: 65%
- Temperature: up to 80°C

With flows up to 430 m³/h and heads of up to 48 m, the pump offers high efficiency, grease-for-life bearings (eliminating oil changes), and a rotating assembly that can be removed without disturbing pipework

remote areas and need equipment that is easy to service in places where skills are often scarce and uptime is critical to prevent spills.

The Imvubu pump therefore features bearings-for-life with no oil lubrication required. Unlike competing pumps that require oil chambers, top-up checks and contamination risk, the KSB Imvubu pump uses grease-for-life bearings and KSB's own mechanical seal which is lubricated by the pumped medium itself. This makes the pump environmentally cleaner, safer to maintain and significantly simpler to service. The pump body is also cast with thick, heavy-duty volute walls to resist erosion and extend operating life, while its smart design includes an inspection hatch that allows staff to clear blockages without removing the suction cover which is a major advantage for treatment plant technicians and municipal maintenance teams.

High efficiency proven in real-world trials

The Imvubu pump was developed using advanced CFD (Computational Fluid Dynamics) modelling and efficiency redesigns of the impeller, volute and hydraulic passageways. The result is significantly improved pumping performance, now reaching more than 65% hydraulic efficiency which places it well ahead of competitor self-priming pumps currently in service.

Applications extend beyond municipal wastewater to mining sumps, industrial effluent, pulp and paper, agricultural waste dams, river abstraction and portable dewatering units.

Two long-term field trials were completed before the launch. At the Drakenstein wastewater treatment works, the pump ran for more than 5 000 hours with almost no measurable wear on the impeller and minimal wear on the wear plate. At a paper mill in Nelspruit, the pump achieved more than 1 300 operating hours without blockage, even while handling high-pH effluent.

By comparison, competing imported pumps at the same sites typically experience weekly blockages. Several operators reported that the reduced clogging lowers the risk of spills, reduces operational downtime and limits emergency maintenance.

KSB is already seeing regional interest from other African countries. Utilities in Nigeria have placed initial orders, and the pump is being positioned for broader sub-Saharan markets where robust, low-maintenance wastewater equipment is in demand.

A South African development

"The launch of Imvubu demonstrates our commitment to localisation and showcases the country's growing engineering capabilities. Imvubu is the first solid-handling self-priming pump developed within KSB's global group to be engineered and manufactured outside Europe or Asia," adds du Plessis.

He adds that South Africa continues to spend billions of rands annually, importing equipment that could and should be produced locally. "In sectors such as water infrastructure, energy, and mining, imported pumps and related systems account for a significant share of procurement budgets. Through initiatives led by the Department of Trade, Industry and Competition (DTIC), and with partners like KSB, we are deliberately working to reverse this trend – to build industrial depth, protect supply chains from global disruptions, create skilled jobs, and retain value within our borders. We are proud of that fact that Imvubu will be registered on the DTIC Local Content Register within the new year. This new pump supports the public procurement bill's intent to prioritise local content."

To avoid frequent clogging, Imvubu features a large 77.3 mm free passage to handle the wipes, rags and debris commonly found in municipal networks, reducing the risk of blockages and spillages

The KSB factory in Johannesburg features advanced multi-function machining centres capable of turning, milling, drilling and tapping components in a single setup, significantly improving accuracy and reducing production time

Du Plessis emphasizes that localisation cannot succeed in isolation; it relies on sustained collaboration across the sector. "Government must provide policy certainty and enforce local content requirements, while industry invests in capacity and innovation. State-owned enterprises play a key role by integrating local content into procurement planning, and research and training institutions must continue to develop the artisans and engineers needed to support long-term industrial growth. The message to all stakeholders is clear: localisation is not about protectionism, but about improving competitiveness, strengthening capability and ensuring long-term sustainability."

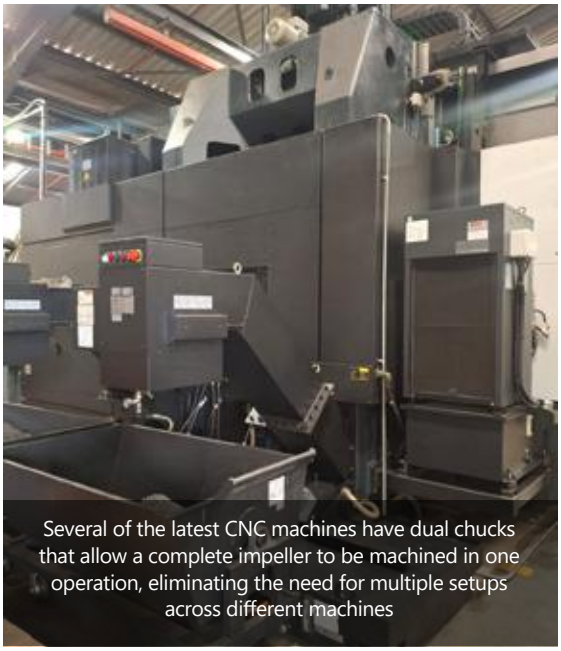
Local engineering driving regional growth

As one of the top three pump companies in the global wastewater sector, the KSB Group now extends that strength through Imvubu, which positions the South African operation as a significant exporter of high-value engineered products into sub-Saharan Africa and other regions needing similarly robust, versatile pumps.

KSB's Johannesburg operation employs more than 400 people and manufactures between 50 and 70 pumps per day, with the ability to double output by 2030. The company is also expanding capacity with new machinery, upgraded testing facilities and plans for a larger factory across the road from the current site. The factory sources castings from several South African foundries and maintains extensive machining, testing, coating and assembly facilities. KSB invests in new machining technology annually to maintain production accuracy and consistency and has a Level 1 Broad-Based Black Economic Empowerment (BBBEE) rating.

"The development of the ELN 150/Imvubu shows that South African facilities can not only assemble equipment but also design, engineer and test high-performance wastewater technologies from first principles. The project demonstrates the value of investing in local capability and the opportunities available when manufacturers respond directly to local operating conditions. Our Imvubu pump is a direct answer for many of the failures making national headlines and the timing in this period of regeneration could not be more significant. Municipalities and utilities urgently need equipment that can keep working away with minimum attention and maintenance to clear the backlog – and we are proud to say the answer is the KSB Imvubu. As municipalities continue to face blockages, spills and infrastructure strain, the availability of a robust locally built solution provides a practical step toward improved wastewater reliability and industrial competitiveness," concludes du Plessis. ●

KSB invests in new machining technology every year, replacing older machines and expanding production capability; recent purchases exceed R15 million per year



Several of the latest CNC machines have dual chucks that allow a complete impeller to be machined in one operation, eliminating the need for multiple setups across different machines

3D SCANNING: A GAME CHANGER FOR THE WATER SECTOR

APE Pumps, one of South Africa's oldest and most respected pump manufacturers, has quadrupled its turnover and increased its workforce by 56% in five years. This rapid growth is driven by continuous innovation, with 3D scanning being one of the key technologies the company already adopted in 2022. **By Kirsten Kelly**

"3D scanning is a non-invasive method of capturing precise spatial data to create accurate digital models of physical environments, enabling detailed analysis, design, and visualisation of complex infrastructure. In the water sector, this is invaluable as an entire pump station or treatment plant can be recreated in vivid, three-dimensional detail – every bolt, flange and pipe is captured down to a 1.9 mm error tolerance over 10 m," explains Keagan Morris, technical coordinator.

Keagan Morris, technical coordinator, APE Pumps

Advanced mobile 3D laser scanner

APE Pumps has invested in one of the most advanced mobile 3D laser scanners available in South Africa. Chosen for its accuracy, in-depth reporting abilities and compact design, the 3D laser scanner provides accurate measurements and rapid data capture. Each scan takes roughly two minutes and reaches up to 2 million data points captured per second.

The scanner's visual inertial system (VIS) automatically tracks its position as it moves between setups, stitching each scan into a unified 3D environment. This eliminates manual alignment work, speeds up data capture, and ensures a seamless, highly accurate point cloud. A point cloud is a digital collection of millions of individual points in space, each representing an exact location on the surface of a real-world object or environment.

Advantages

Within this virtual space, APE's engineers can conduct plant walk-throughs, tag equipment name plates, store maintenance records and generate complete as-built drawing packs for clients who no longer have original plans and records. The APE team uses the digital scan to overlay pump models and re-route piping, configure motors, or reposition bases – all virtually – before a single tool is lifted on site. With this information, clients can plan maintenance, replacements and upgrades with confidence.

This 3D scanner was chosen for its accuracy, in-depth reporting abilities and compact design

"3D scanning enables us to work faster and with far greater precision. It speeds up design decisions, eliminates measurement errors, and dramatically improves retrofit planning," says Morris.

The scanner's visual inertial system (VIS) automatically tracks its position as it moves between setups, stitching each scan into a unified 3D environment

Each scan takes roughly two minutes and reaches up to 2 million data points captured per second

He adds that adds that instead of sending a person to site to physically capture measurements – such as flange sizes, bolt patterns, base dimensions and wall clearances – engineers now retrieve that information directly from the scan. "Now, engineers simply open the point cloud and take accurate measurements within minutes. The same applies to projects beyond South Africa's borders. After scanning multiple pump stations in Malawi, APE Pumps returned with every detail needed Remote work becomes possible because the entire plant exists digitally."

By understanding access constraints, verifying measurement accuracy and simulating installations, the APE Pumps can prevent costly mistakes and plan refurbishments more effectively. "CAD modelling and point cloud overlays revealed that a proposed vertical motor installation would collide with overhead structures, avoiding rework. There was also a situation where a scan revealed that site conditions were too muddy for a heavy truck to reach the pump floor, allowing APE Pumps to advise on logistics ahead of time," states Morris.

As more utilities recognise the value of accurate digital data, scanning is rapidly becoming a standard line item in new contracts. Rand Water, uMngeni-uThukela Water, Eskom and several municipalities have already incorporated it into project specifications. For APE Pumps, the vision is clear: the future will include more scanners, more trained operators and increasingly sophisticated digital models. ●

MUNICIPAL PROACTIVE WATER DEMAND MANAGEMENT

Within any water system, there will be some leakage. One of the tasks of water demand management is to address the leaks responsibly, ensuring that this loss is kept to a minimum, and fix any excess bursts and leakages.

The International Water Association (IWA) suggests that acceptable loss should be between 8-10%, a target that South Africa misses by some margin. While suffering from high water loss due to leaks and bursts, Johannesburg Water has implemented several water demand strategies to aid its mandate of delivering water.

Thega Kandasamy, acting physical loss manager at Johannesburg Water, says, "With South Africa facing increasing water scarcity and ageing infrastructure, the entity has adopted a more proactive and high-tech approach to managing leaks."

Tech forward

A key piece of technology that Johannesburg Water adopts as part of its physical loss management is pressure-reducing valves (PRVs), which lower the pressure from the incoming bulk water significantly to adequately reflect the pressure needed for residential use. This ensures that the pressure is never too great, which would result in bursts otherwise.

While PRVs provide an effective first line of defence, Johannesburg Water also deploys specialised industry technology to pinpoint leaks. Operators use an acoustic device known as a "listening stick" to detect distinctive sounds in the water network that signal a potential leak. For wider areas, a similar device called a Correaltor is used, which uses two 'listening' modules placed at strategic points to determine differences in noises across the water infrastructure, which could indicate a leak or burst. The Correaltor is fed information such as pipe material and diameter to accurately detect leaks across large areas.

These pieces of technology are useful in pinpointing leaks, but time-consuming. To lessen the time it takes to detect leaks, the entity has been rolling out noise loggers at various locations throughout the city, which continually "listen" to the pipes for specific noises. The data is then collected in a report, which can be used to accurately determine leak locations. These are smart devices and can determine whether noises are related to leaks or just normal system noise over time, increasing their accuracy. If a noise is logged in a pattern rather than continuously, the device understands that this irregular noise is not a leak.

Adding to the 'smart' capabilities of their system, Johannesburg Water also uses smart controllers which reduce pressure at specific times to reflect demand. This further allows for leak detection, as irregular water pressure at low demand times would indicate a leak.

Johannesburg Water has thus far installed 51 smart controllers and 225 noise loggers across the City, with plans to install additional smart controllers, noise loggers, and leak detection equipment.

These technologies enable Johannesburg Water to adopt a proactive rather than a reactive approach, significantly reducing response times, preventing avoidable bursts, and improvingservice reliability.

Kandasamy adds, "Johannesburg Water is leveraging advanced technology and specialised equipment to find and fix leaks faster, ultimately reducing non-revenue water and improving service reliability for residents." ●

1. Jimmy Callander, operations: water demand management, and Thega Kandasamy, water demand manager, both from Johannesburg Water
2. The covers to the valves are welded shut to prevent theft
3. Jimmy Callander demonstrating a "listening stick"
4. The Corealator, a listening device used to detect leaks across a large area
5. A smart noise logger

A NEW ERA FOR WATER AND SANITATION IN EMFULENI

The launch of South Africa's first public–public Special Purpose Vehicle (SPV) marks a decisive turning point in Emfuleni's long struggle with water and sanitation failures. The partnership between Rand Water and Emfuleni Local Municipality aims to stabilise collapsed systems, restore dignity, and rebuild trust between communities and the state. **By Kirsten Kelly**

Vaal River

For more than two decades, residents of Emfuleni have endured some of the worst water and sanitation failures in South Africa. Entire neighbourhoods regularly lived with sewage flowing through streets, homes and schoolyards. Pump stations collapsed and pipes burst unchecked while water outages were frequent and unpredictable, sometimes lasting days. Residents were forced to queue at tankers or rely on unsafe water sources. Businesses closed, property values declined, and a once-vibrant manufacturing region slipped into deep distress.

Department of Water and Sanitation's Deputy Minister, David Mahlobo, summed it up perfectly: "The children born in Emfuleni Municipality in the early 2000s only know the smell of sewage." The South African Human Rights Commission repeatedly flagged the situation as a violation of constitutional rights, citing environmental devastation, chronic infrastructure failure, and the collapse of basic municipal services.

David Mahlobo, Department of Water and Sanitation Deputy Minister

Ramateu Monyokolo, chairperson, Rand Water

Section 63 – a temporary intervention

The depth of Emfuleni's collapse made the case for intervention unavoidable. The Department of Water and Sanitation (DWS) invoked Section 63 of the Water Services Act – a rarely used but powerful intervention mechanism that allows the Minister to assign water service functions to a competent institution when a municipality can no longer fulfil them. Under the Section 63 intervention, Rand Water's engineers stabilised 51 critical pipelines, restored key pump stations, refurbished electrical and mechanical equipment, and brought major wastewater treatment works back into operation. Effluent volumes were once again able to reach treatment

A ring-fenced, professionally managed water and sanitation utility jointly owned by Emfuleni Local Municipality and Rand Water, the Vaal Corporation Water Utility is purpose-built to halt the decline, restore functionality and put the region on a sustainable, long-term recovery path

plants rather than spilling across neighbourhoods. The quality of drinking water improved to meet SANS 241 standards. The DWS allocated a R1.5 billion budget towards the Section 63.

Yet these gains were always going to be temporary without a long-term institutional solution. "The decay occurred over two decades, and it was impossible to rectify everything in a matter of months. In fact, it was estimated that the municipality needed R7.6 billion and the DWS simply did not have this money," explains Mahlobo. Infrastructure failures remained severe, non-revenue water exceeded 70%, and billing systems were unreliable. Illegal connections and vandalism continued to undermine operations, costing millions in security alone.

SPV – a flagship programme and long term intervention

This led to the creation of the Vaal Corporation Water Utility- South Africa's first special purpose vehicle. A ring-fenced, professionally managed water and sanitation utility jointly owned by Emfuleni Local Municipality and Rand Water, the Vaal Corporation Water Utility is purpose-built to halt the decline, restore functionality and put the region on a sustainable, long-term recovery path.

Designed to break the cycle of decline, the SPV introduces a utility model with the autonomy, governance and technical capability needed to manage a complex water network. The model formalises the separation between the Water Services Authority (Emfuleni) and the Water Services Provider (the Vaal Corporation Water Utility), in line with the Water Services Act and reforms before Parliament. Under this arrangement, the municipality will set tariffs and oversee a performance contract, while the Vaal Corporation Water Utility delivers services and reports on measurable outcomes.

"This marks a defining moment for the country. While public–private partnerships are well known, this is the first time we are implementing a public–public partnership. And this model extends far beyond Emfuleni – we are building a sustainable framework that can be replicated across South Africa and even internationally as an effective mode of water service provision," says Ramateu Monyokolo, chairperson, Rand Water.

The Vaal Corporation Water Utility will assume responsibility for operations, maintenance, infrastructure upgrading and long-term planning. "An SPV offers a way to depoliticise water services. It will be governed by a professional, skills-driven board – including engineers, accountants, scientists, environmental specialists and business strategists –ensuring decisions are made on expertise rather than political influence," he adds.

All municipal staff working in the water and sanitation division of Emfuleni

Money collected for water and sanitation will flow directly into the Vaal Corporation Water Utility, instead of being absorbed into municipal accounts

Vaal Dam

Emfuleni residents often had to queue at tankers or rely on unsafe water sources

Non-revenue water exceeded 70%

will transition into the SPV without job losses – although performance standards will be higher, and training will be compulsory. Jobs will be advertised, merit-based and overseen by the board.

A defining feature is the ring-fencing of revenue. Money collected for water and sanitation will flow directly into the Vaal Corporation Water Utility, instead of being absorbed into municipal accounts. This is intended to strengthen financial integrity, improve billing accuracy, and create the predictable revenue base needed to raise capital for major upgrades. Section 63 interventions are expected to end by April 2027.

Municipal debt

"Four days after I was elected as mayor, Emfuleni Municipality's account was attached by Rand Water due to a R1.7 billion debt. The magnitude of the debt was overwhelming, and it became clear that we were facing a severe crisis. As we worked to confront the situation, it was evident that we needed a long-term, sustainable solution. While in consultation with different stakeholders, the concept of an SPV surfaced as a practical way forward," says Councillor Sipho Radebe, executive mayor, Emfuleni Municipality.

However, Monyokolo cautions that the SPV is not a debt relief mechanism. "This is not designed to wipe away what municipalities owe. It is a collaboration to rescue service delivery, professionalise operations and rebuild sustainability. SPVs can safeguard the future of both water boards and municipalities."

Water boards are collectively owed more than R28 billion, with Rand Water alone owed over R8.4 billion. This debt is far more than an accounting problem – it threatens the ability of water boards to operate, maintain and upgrade critical infrastructure. Without consistent payment, utilities cannot invest in new capacity, respond to breakdowns, or plan long-term projects, which weakens water security and delays essential maintenance. The risk cascades through the entire value chain: service reliability declines, infrastructure failures increase, and public trust erodes. Ultimately, municipal debt places both communities and the broader economy at risk, as water boards cannot sustainably deliver the services required for growth, health and dignity.

This is why payment compliance is so critical at every level. As Mahlobo emphasises: "Regarding the citizens of our country: the culture of non-payment must fall. Those who can afford to pay for water must pay and they must pay on time. When people choose not to pay, the strain falls on already vulnerable communities, as funds that should support repairs, upgrades and service reliability simply disappear. Restoring a culture of payment is essential to building a water system that works for everyone."

Not an overnight project

But payment alone cannot stabilise a failing system. Long-term, structural reform was needed to ensure that water services could be delivered efficiently and sustainably. "We cannot direct funding into an institution that lacks proper governance," states Mahlobo.

Establishing the SPV required a series of regulatory steps to guarantee the new utility could operate legally, transparently and in line with national reforms.

Because water services are a municipal responsibility, the Minister of Water and Sanitation first had to approve the

assignment of water services provider functions to the SPV in terms of the Water Services Act. This included compliance with Section 19 (performance-based contracts) and Section 63 (intervention and assignment of functions), ensuring that the SPV could lawfully take on operational duties previously held by the municipality.

National Treasury then had to approve the financial and governance model in accordance with the Municipal Finance Management Act. Forming a new municipal entity requires a detailed business case, risk assessment, governance structure and funding plan. Treasury's approval ensured that the SPV met all requirements for financial integrity, revenue management and oversight.

Once the regulatory approvals were in place, the SPV had to be established as a legally constituted municipal-owned entity jointly owned by Rand Water and Emfuleni Local Municipality. This involved drafting a founding memorandum, shareholder compact and governance framework, as well as defining clear roles between the Water Services Authority (the municipality) and the Water Services Provider (the SPV). A key requirement was that all water and sanitation revenue had to be ring-fenced within the SPV, ensuring money collected from residents is used exclusively for water and sanitation operations, maintenance and upgrades.

Entire neighbourhoods regularly lived with sewage flowing through streets, homes and schoolyards

Finally, the Vaal Corporation Water Utility had to sign a performance-based service-level agreement with the municipality, setting measurable targets for service delivery, response times, operations, billing and customer care. Labour transfers also needed to comply with the Labour Relations Act to ensure continuity of employment where required. Together, these regulatory steps created a legally compliant, financially transparent and professionally governed structure capable of operating as an independent water and sanitation utility.

Generating revenue and attracting investment

The SPV is not an ending – it is a beginning. Decades of decay cannot be undone overnight. Much of Emfuleni's water and sanitation infrastructure cannot be maintained, it must be replaced. Bulk lines will still burst as pressure is stabilised. Treatment plants will require major upgrades.

Rand Water's Group Chief Executive, Sipho Mosai, described the model as a commitment to long-term infrastructure stewardship. "There are no quick fixes in water. You plan, you operate, you maintain, and you reinvest." Plans include a R7.5 billion investment programme over the next decade. The Vaal Corporation Water Utility is expected to attract this investment through the strength of its governance, transparent procurement processes and a professional board.

With the skills and expertise that Rand Water will bring, there will be significant improvements in billing, revenue collection and the reduction of non-revenue water. This will, in turn, generate the financial capacity needed to properly operate and maintain water services in Emfuleni. Grants given by national government related to the provision of water and sanitation will be transferred from Emfuleni Municipality to the SPV.

Combined with reduced non-revenue water, stronger billing and improved revenue collection, and the continuation of these grants, the SPV will have a solid financial foundation. This will enable major improvements in operations and maintenance, while also giving the entity the ability to leverage its revenue base to raise finance from the market – and to service those loans responsibly.

Community trust will be earned, not assumed. Leaders acknowledged that Emfuleni residents have endured years of failure and false promises. Business representatives made clear that support would be conditional on visible performance.

Rebuilding confidence requires not only improved service delivery, but shared responsibility. As Mahlobo stressed, the people of Emfuleni must take an active role in protecting their infrastructure. "South Africa is facing a nationwide surge in vandalism, and every damaged pump, pipe or substation sets communities back. Money that should be invested in improving water and sanitation services is instead being diverted to either secure infrastructure from theft and damage or replace stolen or vandalised infrastructure. Protecting these assets is essential if we are to channel resources where they are most needed. At times, during the section 63 intervention, we were spending more time and money fighting criminality than fixing infrastructure. In the early stages, the project faced resistance from certain community members and councillors who attempted to obstruct progress for personal gain."

Conclusion

"Over its 123-year history, Rand Water has maintained strong financial health, enabling continuous investment in infrastructure and reliable service delivery. We are committed to extending this expertise to the Vaal Corporation Water Utility. Rand Water has never failed South Africa – and we are determined not to fail this SPV," concludes Monyokolo.

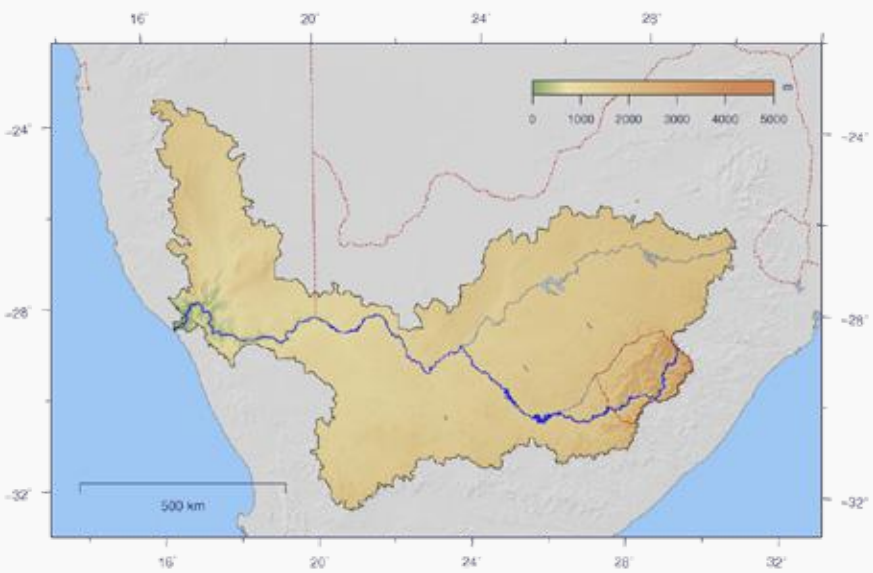
"Without a doubt the biggest beneficiaries of the Vaal Corporation Water Utility are the residents of Emfuleni Municipality. This is a significant milestone towards improving water services in the region. This initiative is about your lives, the lives of your children as well as health and dignity," concludes Radebe.

For now, Emfuleni holds the nation's attention as a test case for whether South Africa can rebuild water institutions that truly serve the people they exist to protect. Its success will not be measured in speeches or ceremonies, but in flowing taps, quiet pump stations, clean streets, green riverbanks and communities able to trust their water system once again. ●

THE POLITICS OF WATER: CONTROL, POWER AND SECURITY IN AFRICA

Egypt claims sovereign rights over the Nile. But this clashes with the sovereign rights of Ethiopia, which has constructed a dam on the river. Egypt has accused Ethiopia of having captured the resource. *(Image used under Creative Commons licensing)*

Water is often taken for granted, if you're lucky enough to have it coming out of taps. Yet it lies at the heart of national security. Controlling water means having control over a key resource that keeps an economy running and stable. Water supports jobs, businesses and livelihoods. When it is managed well, countries' economies are stronger and more secure. **By Anthony Turton, professor at the Centre for Environmental Management, University of the Free State. Originally published in *The Conversation***



The course and watershed of the Orange River with topography shading and political boundaries. (*Map used under Creative Commons licensing*)

Anthony Turton, professor at the Centre for Environmental Management, University of the Free State

I'm an academic specialist in the field of transboundary rivers and national security. This field of research studies the clash between the legal concept of sovereign equality (that all countries are equal under international law), and rights associated with river flows and border demarcations.

Disputes over rivers, from the Chobe and Orange rivers in southern Africa to the Nile in the north, show that being able to access water and control water sources can determine social stability, migration, investment and even international relations.

How changing rivers create border disputes

A good example is the small island in the Chobe River between Botswana and Namibia. This island is named Kasikili in Botswana and Sedudu in Namibia. Who owned the island became an important question after Namibia became

independent and took the case to the International Court of Justice in 1996, claiming that the island was its territory because it always had been.

The thalweg is the deepest part of a river channel, but in fast-changing rivers, this deepest point can change over time, even after a single big flood. In this case, the island was on the Botswana side of the thalweg and therefore belonged to Botswana.

This legal demarcation can be highly contested, especially when determining which country has access to minerals contained in rivers and the sea (border demarcation extends out to the oceans at estuaries).

Another example is the 2200-kilometre Orange River, the longest river in South Africa. It passes through four countries – Lesotho, South Africa, Botswana and Namibia – and in 1890, the border between Namibia and South Africa was defined as running along the Namibia bank of the river (the high-water mark) rather than the thalweg (centre line).

The reason that this particular border demarcation ignores the international legal norm of using the thalweg dates back to the colonial era. At that time, hostilities existed between Britain and Germany. The British colonial authorities in the Cape Colony believed that a permanent German settlement could be prevented by denying, then, German South-West Africa access to reliable water flows from the Orange River.

The driver of this decision was national security and perceptions of threat. In my research, I've seen this type of thing quite often.

The Lesotho Highlands Water Project is an example of a mutually beneficial transboundary agreement

How borders in water affect a country's security

Control of water creates security, of which there are many forms. Control over floodwaters creates security from being flooded and drowned. Flood control usually involves building one or more dams to reduce the size of the biggest floods.

Controlling captured water in dams means that during drought, society will still have a water supply and be able to continue with business as usual. Control over water, therefore, generates security upon which society can start to flourish.

It is also a highly contested issue, as we see in the Nile River. At 6 650 km long, it is one of the world's longest rivers, draining 10% of the entire African continent. There are 11 riparian states – Burundi, Democratic Republic of Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, South Sudan, Sudan, Tanzania and Uganda – which share the Nile, and the Grand Ethiopian Renaissance Dam is the latest of many points of contention.

Egypt claims sovereign rights over the Nile. But this clashes with the sovereign rights of Ethiopia, which has constructed the dam. Egypt has accused Ethiopia of having captured the resource. The matter is legally complicated and politically fraught.

Water can also make a country, city or town more secure. In 2018, Cape Town in South Africa approached a Day Zero crisis that made international headlines. The city was faced with the reality of literally running out of water. This was because the water resources of many local rivers had been captured through a series of inter-basin transfers, and together with drought, made the city vulnerable.

Today, the city administration has developed a long-term strategy that includes the recovery of water from waste and the development of seawater desalination capabilities at a utility scale.

National security depends on water security

People are migratory in nature, so they will naturally move from areas of low security to areas of greater security. Migrating people bring capital with them – human skills and financial resources. They flow from areas of low security to areas of higher security.

Water management needs to be based on the natural flow of humans. Internal movement of people in South Africa was once controlled by a policy called influx control. This was rejected as a violation of human rights and lay at the heart of the armed struggle for liberation.

Over the past four decades, the population has almost tripled, leading to uncontrolled migration from rural areas to cities. This has overwhelmed infrastructure, while water supply and sanitation services have lagged behind, creating a new form of national security crisis.

Capital is needed to create jobs and bring about social stability in a population shaped by migration. But investors are increasingly unwilling to flow into areas overwhelmed by migration that outstrips water supply and sanitation services.

In this way, we can see that national security depends on water security, because social stability and economic well-being are directly linked to the flow of people with skills and capital. Understanding water as a national security risk is key to the policy reforms needed to create conditions in which humans can flourish. Capital always flows to places where people can thrive, and water policy needs to be aligned with this simple fact. ●

Rocla supplied 1,037 x 100D standard 2.44 m long interlocking joint (IJ) stormwater pipes ranging from 450 mm up to 1200 mm in diameter

LEBOWAKGOMO INTERNAL STREETS AND STORMWATER UPGRADES

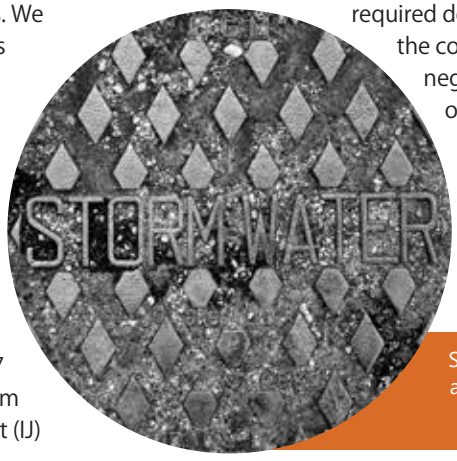
Lebowakgomo, a residential area and part of the Sekhukhune District Municipality in Limpopo Province, recently had four kilometres of gravel road upgraded to a tar surface, which included the laying of new stormwater pipes supplied by Rocla.

The project, which forms part of important infrastructure upgrades in the area, is an ongoing project that will offer the local community safer and more reliable roads and walkways and services.

Karel Komape, project manager on the Lebowakgomo project for Ditlou Suppliers and Services, says "Infrastructure maintenance plays a crucial role in the upliftment of communities who in the past have had to utilise deteriorating roads and walkways and drainage systems. We believe, as contractors to the project, that infrastructural components must meet the standards required by our programme, and Rocla's Interlocking Joint stormwater pipes did just that."

Rocla supplied 1,037 x 100D standard 2.44 m long Interlocking Joint (IJ) stormwater pipes ranging from 450 mm up to 1 200 mm in diameter.

"We at Rocla view all projects, large or small, with the same focus towards delivering a solution that meets customer requirements," says Matthews Ntjie, sales consultant for Rocla, Polokwane. "Initially, we were not aware of the volume of pre-existing stormwater piping needing to be replaced, but upon discovery, we revised this quantity internally and engaged with our manufacturing plant to formulate a game plan to meet the required deadlines set by the contractor, without negatively impacting other projects/ customers, which we managed to achieve successfully," says Ntjie.



Stormwater drains are essential infrastructure that collect rainwater and other surface runoff from impervious surfaces like streets and parking lots to prevent flooding

"Our interlocking joint pipe is manufactured specifically for use in stormwater applications, as opposed to sewer applications. The male/female type joint is formed inside the wall of the pipe, which prevents any widening of the pipe, ensuring the outside dimensions of the pipe remain constant. The joint itself is used for centring the pipe during laying operations. The joint is sealed with a sealant and/or a membrane with a bitumen sealant or similar. A rubber collar, placed around the outside of the pipe diameter, can be supplied to prevent any soil particle movement into the pipe and enhance the watertightness of the joint. Therefore, the rubber collar should be specified where groundwater ingress must be avoided, and a more expensive rubber ring joint pipe is not necessary," explains Ntjie.

Komape commented that the product supplied by Rocla was a locally manufactured and high-quality stormwater pipe that met their requirements for the project. "The interlocking joint stormwater pipes were delivered on time, which enabled us to keep the project on schedule. We would work with Rocla again on future projects," says Komape.

PROTECTING THE REDFIN THROUGH PRESERVING THE HUIS RIVER

The rapidly declining number of the Tradouw or Barrydale redfin fish is raising concerns about the quantity and quality of water in the Langeberg Mountain catchment in the Western Cape.

To address this, a three-year WWF Nedbank Green Trust project launched in November 2024 aims to promote collective water resource management in the Huis-Tradouw River system. It is within the Langeberg Strategic Water Source Area (SWSA), which is one of 21 SWSAs in South Africa. These SWSAs either supply a disproportionate quantity of mean annual surface water runoff to their size and so are considered nationally important, or have high groundwater recharge and where the groundwater forms a nationally important resource.

The project aims to implement collective water resource management in the Huis-Tradouw River System to prevent further degradation of the water in the area.

Heading this project is Aileen Anderson, a water resource and business management specialist, and the general manager of a large conservancy in the area called the Grootvadersbosch Conservancy (GVBC). The conservancy has 19 members, including private landowners and farmers, and is the oldest conservancy in the Western Cape.

"The specific watershed in the region," she explains, 'is the Huis-Tradouw river system, which is highly contested as there are multiple users, including commercial and small-scale wheat, dairy, fruit, vegetable and vegetable seed farmers, as well as conservation areas, and the communities of Smitsville and Barrydale."

Collective resource management

"The WWF Nedbank Green Trust project aims to get all the users to share the water fairly, not only for human use but also to improve the ecological flow. In other words, maintaining the amount of water in the system to keep it flowing and healthy," explains Poovi Pillay, executive head of corporate social impact at Nedbank.

Community members during an invasive plant clean up, so far 8 km of invasive species have been cleared

Anderson adds, "If we look at the Huis River, for example, it has reached a state where its water resources are insufficient to meet the area's water needs. Some estimates have shown that the river could be overallocated by more than 80% but more information is needed to verify this claim." The effects of water scarcity are felt primarily in the drier summer months and are exacerbated by drought and climate change.

The redfin fish

The Huis River is the last refuge for an isolated population of critically endangered Tradouw or Barrydale redfin that survives in isolated pools near Barrydale and in the Tradouw Pass.

"The redfin is our flagship species, and the key to its survival is to keep the base flow of the water constant so that there is interconnectedness between all the different pools, which also maintains the ecological flow throughout the Huis-Tradouw System," says Anderson. Partners supporting the redfin project are the International Union for Conservation of Nature, the International Climate Initiative, CapeNature, the Gouritz Cluster Biosphere Reserve, and the Species Survival Commission.

Anderson explains that there is no way to improve the system management until the exact amount of water coming in, through rain and runoff, and out, through municipal diversion, domestic irrigation, and agricultural use, is quantified. She also says that this must be measured against how much of the system can be used while maintaining its own ecological flow.

With the WWF Nedbank Green Trust project funding, they have started putting in monitoring systems, led by three specialists in partnership with the Swellendam Municipality. These are a water engineer Frankie A'Bear, aquatic ecologist Bruce Paxton from the Freshwater Research Centre (FRC) and hydrologist Gerald Howard, in partnership with the Swellendam Municipality

They have decided on the best locations for the monitoring equipment and have installed the loggers. "Once we have enough information, we will work closely with all stakeholders involved to help them manage the system for the benefit of the users and the environment,' Anderson explains.

Part of the conservation efforts includes getting the community involved in planting native species after alien species removal

Other conservation efforts

To increase water flow, the conservancy has also been involved in invasive clearing and restoration in the broader catchment for 11 years, with periodic funding from the Department of Forestry, Fisheries and the Environment; the Department of Agriculture, Land Reform and Rural Development; and landowners. To date, eight km have been cleared in the Huis and Tradouw catchments.

They have also released biological control of hakea species in the mountains around Barrydale. This is a fungus that naturally controls the species. There are several alien invasive species in this area, including eucalyptus, black wattle and sesbania, hakea and pine.

"An important part of this initiative is the creation of green jobs in alien clearing and indigenous vegetation restoration to stabilise the riverine areas and re-establish wetlands," says Anderson, who continues, "Through our local contractor teams, we employ over 120 people a year, and this is now expanding on the Barrydale side."

Part of the work is addressed at natural solutions to help improve the functioning of the wastewater treatment works outside Barrydale, which discharges into a tributary of the Tradouw River.

Part of this work is looking to natural solutions that improve the functionality of the wastewater treatment works outside of Barrydale, which discharges into the tributary of the Tradouw River. "Its current undersized capacity makes it a point source of pollution for the system," says Anderson. "We are helping the municipality to restore a sizeable wetland there to polish the water before it flows into the river.' This restoration process includes propagating wetland species that are suited to this environment. While the wastewater treatment works are scheduled for an upgrade, the polishing wetland will provide an additional buffer to improve water quality and protect the river during and after the upgrade.

"Over the years, we have developed a positive working relationship with the farmers and community members from Barrydale and Smitsville, who are all concerned about the water supply and the implications for their lives and livelihoods," explains Anderson. "Everyone can play their part along the whole catchment to collectively manage the shared water resource."

She says their willingness is evident, but they require technical assistance and support to achieve this. The project aims to be a catalyst for this collective effort by empowering local stakeholders with the tools and knowledge needed to better understand and more effectively manage their water resources. ●

The critically endangered refin fish, raising a red flag over water quantity and quality

TCTA OUTLINES PROJECT PROGRESS AND FINANCIAL DISCIPLINE AS WATER SECTOR REFORMS ACCELERATE

South Africa's Trans-Caledon Tunnel Authority (TCTA) outlines its operational performance, financing track record and preparedness for a major institutional transition, as the country moves towards the establishment of a consolidated National Water Resources Infrastructure Agency (NWRIA).

The update was provided during the launch of TCTA's Integrated Annual Report for the financial year ending 31 March 2025, alongside a detailed State of the Organisation and financial presentation delivered by TCTA's Chief Executive Officer, Percy Sechemane. The briefing brought together government representatives, commercial lenders, development finance institutions, water sector stakeholders and the media, both in person and virtually.

Opening the engagement, the chairperson of the TCTA board, Precious Sibiya, described the event as more than a formal reporting exercise, positioning it as a moment of accountability and trust. She emphasised that water security remains a national priority with long-term implications for households, industry and economic stability.

"This is a point where we account to our shareholders, our funders, our partners and the citizens of the country for how we manage the resources placed in our care," says Sibiya. "No filters, no embellishment, only a clear record of our stewardship."

Operating in a period of reform

The 2024/25 financial year unfolded against a backdrop of increased scrutiny of infrastructure delivery, mounting concern over water security and the acceleration of institutional reform within the water sector. Sibiya noted that legislation enabling the creation of the NWRIA is now in full force, marking what she described as a "meaningful and irreversible" shift in how national water infrastructure will be governed and financed.

The Department of Water and Sanitation (DWS) is leading the transition process through five workstreams covering governance, finance, operations, information technology and human resources. Sibiya adds, "The TCTA remains responsible for ensuring uninterrupted operations until all obligations are formally transferred. We must ensure that TCTA remains fully operational until its responsibilities migrate seamlessly to the new agency. Not a single project should be delayed, because delays are economically and socially costly."

She added that maintaining lender and market confidence during the transition has been a central priority. "While the institution is changing, the mandate continues."

Mandate and structural constraints

In his 'State of the Organisation' address, Chief Executive Officer Percy Sechemane provides a detailed overview of TCTA's legislative position and operating model. Established initially to deliver South Africa's participation in the Lesotho

The Lesotho Highlands Water Project is instrumental to South Africa's economy, servicing 33% of the population

Chairperson of the TCTA board, Precious Sibiya

Chief Executive Officer Percy Sechemane

TCTA's Chief Financial Officer, Andisa Zinja

Highlands Water Project, TCTA currently functions as a special-purpose vehicle implementing water infrastructure strictly under ministerial directives.

"Unless the minister issues a directive, we can't act," Sechemane said. "The position of the TCTA is that we have technical authority, but limited autonomy."

He explains that TCTA operates within a complex governance environment that requires concurrence from the Minister of Water and Sanitation, National Treasury and its own board. As a result, project initiation, funding approvals and tariff determinations require extensive coordination.

"The Minister of Water and Sanitation says 'deliver', the Minister of Finance says 'watch the balance sheet', the board expects performance, and then we still need to go to the market and raise the money," Sechemane explains.

The forthcoming agency model is intended to resolve these constraints by creating a consolidated Schedule 2 entity with its own balance sheet, decision-making authority and long-term planning capability.

Financial discipline and audit outcomes

Despite structural limitations, TCTA reported strong financial and governance performance. The authority received an unqualified audit opinion for the year, with no findings raised by the Auditor-General in relation to performance information.

"The Auditor-General did not identify any findings related to our performance information," Sechemane said. "That tells us we are doing what we said we would do with the money raised."

TCTA's Chief Financial Officer, Andisa Zinja, presented a high-level overview of the organisation's financial position as at the end of March 2025.

She confirmed that the TCTA received an unqualified audit opinion, consistent with previous years. Still, she explains that a new emphasis in the Auditor-General's report related to a material uncertainty linked to going concern. Zinja says this disclosure does not reflect financial distress, but rather the anticipated disestablishment of TCTA in its current legal form once the Minister formally establishes the new National Water Infrastructure Agency. Until that point it remains "business as usual," with all core functions, including project finance, treasury, and project implementation in South Africa and Lesotho, continuing uninterrupted, albeit under a future institutional structure.

Turning to financial performance, Zinja says, "TCTA's statement of financial position largely comprises borrowings and tariff receivables, which are designed to align over the life of projects. Movements during the year were driven mainly by additional loan drawdowns to fund the Vaal River System and by increased tariff receivables and social grant funding from the government to cushion users from higher costs." She highlighted that borrowings linked to the Vaal River System remain the largest component of the balance sheet, reflecting its scale and the authority's original mandate, with growth driven by Phase 2 funding requirements and higher royalty payments under the Lesotho treaty. Zinja also addresses the restatement of prior-year financials,

explaining that this resulted from changes in accounting treatment under IFRS 9 relating to tariff calculations and cash flow re-estimates, which required a technical adjustment rather than reflecting operational weakness. While the restatement resulted in a reported deficit for the prior period, the 2024/25 year closed with a surplus. She confirms that cash flows remain sufficient to support operations and project funding, with investment activities used strategically to offset debt servicing costs. On compliance, Zinja reports "significant progress in reducing irregular expenditure, such expenditure reflected procedural lapses rather than fraud, losses or failed service delivery, and the majority of outstanding matters had been resolved by October 2025." She concludes by reaffirming the TCTA's commitment to transparency, accountability and continuous strengthening of financial controls.

The cost of constitutional water provision

A recurring theme in the CEO's presentation was the tension between water's constitutional status as a basic right and the commercial realities of infrastructure funding.

"Water is enshrined in the Constitution, yet people still ask why it costs so much," says Sechemane. "On one side, lenders look at profitability and repayment. On the other hand, communities expect affordability."

He emphasises that water infrastructure is inherently expensive, particularly in a country where water must be transferred over long distances, often through tunnels, dams and pumping systems. Climate change has further increased uncertainty and variability.

"Production is increasingly unpredictable. Yet everyone expects water to flow when they open a tap. That contradiction defines our operating environment."

Major infrastructure programmes

The CEO's presentation outlines progress across several nationally significant projects.

- **Lesotho Highlands Water Project – Phase 2**
  The Vaal River System programme remains TCTA's largest and most strategically important responsibility. Phase 2 of the Lesotho Highlands Water Project will add approximately 480 million cubic metres of water per annum to the system, supplying Gauteng and several other provinces.

  "This system underpins 46 per cent of the economy and serves around 33 per cent of the population," Sechemane says. Cost estimates for Phase 2 have increased to approximately R53 billion, reflecting scope expansion, inflation, environmental requirements and the complexity of high-altitude construction. TCTA has fulfilled all its financial obligations to the Lesotho Highlands Development Agency, which implements the project on the Lesotho side.

  "We raise the funding, but construction happens in another country with a different legal framework," Sechemane said. "That balance is not simple."

The uMkhomazi Water Project carries an estimated cost of R27.5 billion

- **uMkhomazi Water Project**
  In KwaZulu-Natal, the uMkhomazi Water Project aims to increase system yield from 394 to 608 million cubic metres per annum, supplying approximately six million people and supporting industrial growth.

  The project carries an estimated cost of R27.5 billion. To mitigate tariff impacts, a blended funding model was secured, comprising 25 per cent grant funding, 25 per cent interest-free loans and the remainder from off-budget borrowing.

  "To make this project affordable, the state had to come to the party," Sechemane said.

- **Mokolo-Crocodile Water Augmentation Project Phase 2A**
  The Waterberg region's Mokolo-Crocodile project reached financial close in May 2024, with funding secured for a R19.7 billion investment. Construction has commenced following the National Treasury's exemption allowing procurement to proceed alongside funding processes.

  The project supports power generation, mining, municipal supply and industrial development.

- **Berg River–Voëlvlei Augmentation Scheme**
  In the Western Cape, the Berg River-Voëlvlei scheme will improve drought resilience by transferring surplus winter flows to Voëlvlei Dam. Detailed design

work is underway, with construction expected from 2027.

Operations, maintenance and environmental obligations

Beyond new infrastructure, TCTA plays a critical operational role. It operates the Delivery Tunnel North under the Lesotho treaty and completed a planned six-month maintenance shutdown between October 2024 and March 2025 without disrupting supply.

"We knew how critical that intervention was," Sibiya adds. "There could be no failure."

TCTA also manages three acid mine drainage treatment plants in Gauteng. Treatment volumes ranged between 80 and 90 per cent of target levels, with performance impacted by theft and power supply disruptions. Sechemane points to growing interest in upgrading treated mine water to potable standards as a future water security solution. He says, "We need to rethink whether treating water just to release it back into the system makes sense."

Environmental compliance, including biodiversity offsets, was highlighted as a growing contributor to project timelines and costs. "These are not optional processes," Sechemane explains. "Until they are completed, projects cannot be closed."

Advisory role and funding pipeline

Under ministerial directives, TCTA also provides advisory services on projects such as the uMzimvubu and Nwamitwa dam developments, focusing on funding models and commercial viability.

Sechemane confirmed that TCTA plans to raise approximately R15 billion from the market in 2025/26 to support ongoing programmes, particularly the uMkhomazi scheme.

Sechemane clarifies, "Unless funders are comfortable, the system doesn't work; their confidence is critical."

Preparing for the new agency

The transition to the National Water Resources Infrastructure Agency will involve engagements with lenders, staff, labour unions, the National Treasury and the Government of Lesotho.

A transaction adviser will oversee organisational design, asset migration and contractual continuity. Reassuring the financial sector, he adds, "We won't move until funders are satisfied," Sechemane said. "Your money has to be safe."

Throughout the briefing, TCTA leadership repeatedly returned to the broader national stakes.

"We cannot allow water to go the way electricity did," Sechemane warns. "Water security is now sitting much higher on the state's agenda and rightly so."

Despite institutional uncertainty, TCTA maintains that it is entering the transition phase from a position of operational stability, financial discipline and delivery credibility. ●

SIZABANTU
PIPING SYSTEMS
Official distributor of MOLECOR South Africa

A FIRST FOR AFRICA

and a giant leap for infrastructure

Sizabantu Piping Systems launches Africa's first locally manufactured pipes, with capability from 710mm to 1200mm, now in full production.

In a landmark moment for local manufacturing, Sizabantu Piping Systems and Molecor have successfully produced large-diameter PVC-O pipes, with future capability of up to 1200mm.

This giant step puts world-class water infrastructure solutions within Africa's reach, serving both local and global markets with unmatched strength, efficiency, and quality.

- WITH CAPABILITY FROM 710MM TO 1200M NOW IN PRODUCTION
- FIRST OF IT'S KIND ON THE CONTINENT
- PROUDLY MADE IN SOUTH AFRICA

www.sizabantu.com

THE **FINANCIAL LANDSCAPE** FOR **SOUTH AFRICAN WATER BOARDS** 2025-2030

South Africa's bulk water sector enters the 2025-2030 planning cycle facing a convergence of operational resilience and systemic fragility. While water boards continue to deliver potable water at scale and meet regulatory standards, their financial sustainability is increasingly undermined by municipal non-payment, inherited liabilities and ageing infrastructure.

This tension is evident across recent five-year plans and oversight assessments, which collectively point to a sector that remains technically capable but structurally exposed.

Speaking to the Water and Sanitation Committee parliament group, Deputy Minister of Water and Sanitation David Mahlobo frames the state of the sector through a differentiated risk assessment of the country's water boards. He indicates that Rand Water is assessed as "low to no risk". At the same time, Vaal Central Water is categorised as "high risk", primarily due to liabilities inherited from the dissolution of the former Sedibeng Water. Amatola Water, he says, is assessed as "medium to high risk", although recent operational improvements are encouraging.

Mahlobo stresses that water boards must be evaluated against their statutory functions as defined in the Water Services Act. He confirms that all three boards submit compliant corporate plans and acknowledges Parliament's role in reinforcing accountability and governance discipline. "The Department appreciates the consistent support it receives from the Committee," he says.

He highlights the establishment of special purpose vehicles as a key reform instrument, describing the launch of Rand Water's SPV as "an important milestone for sector transformation". However, he cautions that not all municipalities are positioned to participate. "Some municipalities may not be able to participate because of internal governance and operational challenges," Mahlobo notes.

The Deputy Minister also reports progress on infrastructure delivery, citing the commissioning of a new water treatment plant that unlocks previously stalled public investment. While welcoming good rainfall, he warns that weather variability introduces new risks, particularly flooding in settlements located in flood-prone areas. Addressing these risks, he says, requires close

Deputy Minister of Water and Sanitation David Mahlobo

Chief Executive of Vaal Central Water, Luvuyo Ntoyi

Rand Water's investments into infrastructure like Zuikerbosch 5A have made the entity stable, but growing municipal debt is a concern for them

coordination with municipalities and the South African Weather Service.

Department of Water and Sanitation overview: Aggregate performance and risk

Providing an institutional overview, chief director for Institutional Oversight, Thoko Sigwaza, outlines the Department's regulatory and financial oversight framework, anchored in the Water Services Act and the Public Finance Management Act. She confirms that all water boards submit plans that comply with legislative requirements and align with the national priorities set out in the National Development Plan and the National Water and Sanitation Master Plan.

Sigwaza points to measurable achievements across governance, audit outcomes, strategic planning and infrastructure investment. "There are strong achievements in governance and infrastructure delivery," she says. However, she emphasises that these gains are uneven and remain vulnerable to external pressures.

From a financial perspective, water boards project total revenue of R117.3 billion over the medium term, with capital expenditure of R21.75 billion planned between 2025 and 2028. Despite this scale, Sigwaza identifies municipal non-payment as "the single largest threat" to financial sustainability. Under-capacitated entities, particularly those affected by amalgamations and inherited debt, face heightened risk exposure.

She cautions that funding constraints persist, especially where section 63 interventions are required to stabilise distressed boards. Without improved payment discipline downstream, she warns, capital investment and operational resilience will remain constrained.

Rand Water: Operational strength amid escalating financial exposure

Rand Water's five-year outlook reflects the profile of a technically robust institution operating under increasing financial strain. Strategy executive Vusi Kubheka outlines strong performance across water quality compliance, infrastructure reliability and governance indicators. The entity continues to operate as Africa's largest bulk water supplier, supplying millions of consumers across a vast geographic footprint.

Kubheka reports full compliance with all statutory water quality requirements and confirms that no unplanned supply interruptions occurred during the reporting period. Major infrastructure milestones include the commissioning of a new purification facility and continued progress on system augmentation and refurbishment projects.

Financially, Rand Water projects steady revenue growth over the planning horizon, supported by capital investment of approximately R27 billion. While key financial ratios remain stable, Kubheka flags receivables as a growing concern. "Debtors' days stand at 125, significantly above the 70-day target," he says. Municipal debt has risen to R8.7 billion, placing pressure on cash flow and long-term capital certainty.

Municipal non-payment is described as the organisation's most significant risk, with a small number of municipalities accounting for a large share of arrears. While Rand Water continues to deliver services, Kubheka acknowledges that delayed payments undermine infrastructure investment and increase reliance on borrowing.

Beyond finance, he highlights operational risks, including infrastructure vandalism, illegal mining, servitude encroachment and electricity instability. Project delivery performance also remains uneven, with only half of capital projects completed within planned timeframes.

At the same time, Rand Water continues to pursue diversification and regional engagement. International operational partnerships and the establishment of SPVs aimed at stabilising distressed municipalities are positioned as part of a broader strategic response.

Amatola Water: Stabilisation and service continuity under constraint

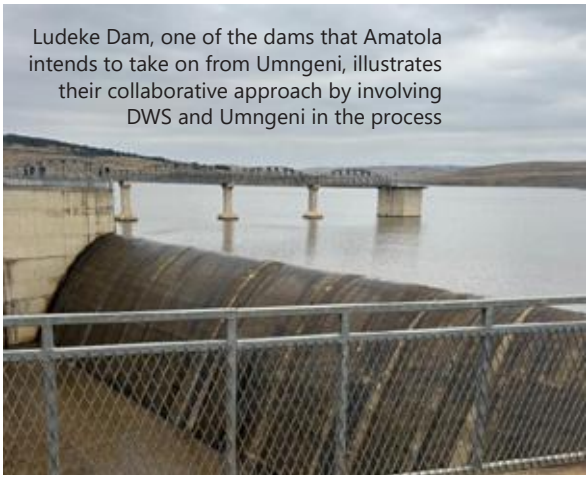
Amatola Water's medium-term outlook reflects cautious consolidation in a challenging operating environment. Chief Financial Officer for Amatola Water, Jonathan Jackson, outlines a strategy focused on maintaining supply continuity, strengthening governance and improving operational efficiency, while preparing for potential institutional reconfiguration.

Jackson confirms that Amatola Water maintains compliance with national water quality standards and retains South African National Accreditation System accreditation for its laboratory services. Governance improvements have translated into better audit outcomes and enhanced performance monitoring across the organisation.

Strategic partnerships form a central part of Amatola's approach. Collaboration with the Department of Water and Sanitation, municipalities and sector education bodies

Matjhabeng Local Municipality, supplied by Vaal Central Water, defaulted on payments, placing further financial pressure on the cash-flow-stressed water board

The Department of Water and Sanitation is estimated to spend R21 billion over the next 3 years



Ludeke Dam, one of the dams that Amatola intends to take on from Umngeni, illustrates their collaborative approach by involving DWS and Umngeni in the process

supports skills development, technical cooperation and institutional capacity building. Community engagement and environmental compliance initiatives continue alongside core service delivery.

Nevertheless, Jackson acknowledges persistent challenges. Ageing infrastructure remains the primary operational risk, contributing to system failures and service disruptions. Project implementation delays and stakeholder dissatisfaction persist in some areas, particularly where infrastructure degradation limits emergency response capacity.

While recent operational stability is viewed positively, Amatola's financial and asset constraints continue to shape a conservative investment posture going forward.

Vaal Central Water: inherited liabilities and acute financial risk

Vaal Central Water presents the most structurally fragile outlook of the three entities. Chief Executive Luvuyo Ntoyi situates the organisation's current position within the disestablishment of the former Sedibeng Water, which he describes as insolvent and unable to service its obligations. The subsequent amalgamation process, he says, was not funded, leaving the new entity to absorb assets, staff and liabilities without capital support.

At amalgamation, inherited liabilities amounted to approximately R6 billion. Since then, municipal debt has escalated to around R10 billion. "This represents a major sustainability risk," Ntoyi says, attributing the increase to chronic non-payment, high indigence levels and weak municipal revenue collection.

Vaal Central Water supplies bulk water across three provinces through 13 water treatment works with a combined capacity of 854 Ml per day. Despite this footprint, financial stability is severely undermined by customer concentration. Mangaung Metropolitan Municipality accounts for up to half of total water sales, while Matjhabeng Local Municipality contributes up to 40%. The default of Matjhabeng, Ntoyi says, has had a "severe impact" on the organisation's finances.

Governance improvements, including unqualified audit outcomes and strengthened internal controls, are offset by persistent liquidity weakness. While solvency ratios improve following debt write-offs by the Department, liquidity remains below healthy norms.

Operational pressures include infrastructure backlogs, rising water losses estimated at 20%, and escalating electricity and chemical costs. Non-payment has resulted in deferred maintenance, postponed capital projects and difficulties settling raw water accounts.

Ntoyi details the severity of municipal breaches, particularly in Matjhabeng, where recovery rates range between 15% and 25% against monthly costs far exceeding payments received. Similar patterns are evident in Kopanong and Phokwane municipalities, despite restrictions, legal action and intergovernmental interventions.

National Treasury, he notes, has warned that repeated bailouts are unsustainable. Conditional debt relief, stricter enforcement of payment behaviour and deeper municipal turnaround interventions are increasingly viewed as unavoidable.

Systemic risk beyond individual performance

Taken together, the presentations reveal a sector that continues to perform its core technical functions, but within an increasingly unstable financial ecosystem. Governance reforms and operational excellence at the water board level mitigate risk, but cannot substitute for payment discipline, infrastructure protection and effective municipal administration.

As climate pressures intensify and infrastructure continues to age, water security becomes ever more dependent on coordinated action across the entire water services value chain. Without decisive intervention, the strain reflected most acutely at Vaal Central Water risks spreading further across the system, threatening the reliability of the bulk water supply in multiple regions.

The coming years will test whether reform instruments, enforcement mechanisms and cooperative governance can translate into sustainable outcomes, or whether structural fragility continues to erode even the strongest institutional foundations. ●

Vaal Central Water inherited R6 billion in municipal debt, which puts the entity on shaky ground; despite this, the water board intends to focus on enforcement options and finding a way forward

ENGINEERING SAFER TANKS WITH FUSION-BONDED EPOXY COATINGS

Steel tank pioneers, Aquadam, are transitioning away from galvanising their ladders, pipes, and flanges. Instead, they now coat these components with Fusion-Bonded Epoxy (FBE) – a durable, non-toxic alternative that offers superior protection without contributing to excessive zinc in water systems.

Zinc is a naturally occurring metal, essential to human health in small amounts. However, excessive zinc in water sources has become a growing concern, especially in environments where galvanised steel is widely used. Here is how zinc finds its way into water:

•Natural weathering: Zinc-bearing minerals in rocks and soil can leach into rivers, lakes, and groundwater over time.

- Industrial and agricultural activity: Mining, metal processing, and the use of zinc-based fertilizers can all contribute to elevated zinc levels in surface and groundwater.
- Corrosion of galvanised materials: Galvanised steel, often used in plumbing and fittings, can corrode over time, releasing zinc into water supplies.
- Old household plumbing: Many older buildings still contain galvanised pipes that leach zinc as they deteriorate.
- Airborne deposition: Industrial emissions containing zinc particles can settle into water systems through rain or dust.

Why excess Zinc is a problem

While trace amounts of zinc are safe – even necessary – high concentrations can lead to:

- Unpleasant taste or odour in drinking water
- Gastrointestinal discomfort from prolonged exposure
- Potential harm to aquatic ecosystems

As concerns around water quality grow, industries worldwide are re-evaluating materials and methods that may contribute to contamination. Galvanised coatings, though effective for corrosion resistance, have come under scrutiny for this reason.The

The FBE advantage

Fusion-Bonded Epoxy (FBE) is a game-changer for water infrastructure. Applied through an electrostatic process and heat-cured to form a strong, protective barrier, FBE offers several key advantages:

- No zinc leaching: Safe for potable water and food-grade applications
- Superior corrosion resistance: Protects against both internal and external corrosion
- Longer lifespan: More durable in aggressive environments
- Environmentally responsible: Reduces metal contamination risks in water sources

By switching to FBE, Aquadam not only enhances the durability of their products but also contributes to cleaner, safer water systems for everyone.

This transition is part of Aquadam's broader mission to engineer water storage solutions that meet the highest standards of safety, sustainability, and performance. Whether installing a tank in a remote agricultural area or a dense urban environment, customers can trust that every component is built with long-term health and environmental safety in mind. ●

Water&Sanitation Africa

Complete water resource and wastewater management

www.infrastructurenews.co.za
and service delivery

Water Institute of Southern Africa

The official magazine of the Water Institute of of Southern Africa

www.wisa.org.za

Water&Sanitation Africa, **weekly newsletters**, **www.infrastructurenews.co.za** and **social media posts** are the platforms used by your target audience for information on the water and sanitation sector.

OUR READERS ARE YOUR BUYERS

Advertise with us and make your presence known to your target market across our **print** and **digital platforms**.

COMPLETE WATER RESOURCE AND WASTEWATER MANAGEMENT

Engage in conversation with your defined target audiences

SCAN FOR FREE NEWSLETTER SUBSCRIPTION

TO ADVERTISE
Sindi Moni
+27 (0)82 212 4574
sindi@infrastructurenews.co.za

TO SUBSCRIBE
+27 (0)83 433 4475
kirsten@infrastructurenews.co.za

infrastructurenews
infrastructure4
infrastructure-news

MINING | INDUSTRY | MUNICIPAL | AGRICULTURE | FOOD AND BEVERAGE | FIRE FIGHTING

RAINBOW RESERVOIRS (PTY) LTD

Premium quality **Aluzinc steel** sectional tanks for bulk water storage throughout Africa

- High corrosion resistance
- Cost effective
- On-site assembly
- Tough and durable
- Low maintenance
- 5kL to 4000kL
- Steel-domed roofs or open-top tanks
- Human consumption/ food grade certified
- Tanks < 350kL require no concrete foundation





LISTED AND APPROVED SUPPLIER ASIB

South Africa

WISA Water Institute of Southern Africa

FIRE PROTECTION ASSOCIATION OF SOUTHERN AFRICA

www.rainbowtanks.co.za

sales@rainbowres.com | +27 (0)11 965 6016