

MINING

REVIEW AFRICA



**DRIVING GLOBAL
GROWTH THROUGH
ENGINEERING
EXCELLENCE**

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EAST AFRICA**

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“There's a lot of work to be done to make sure that we're consistent with the market.”

Ed Toms, CEO, GTMI

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Council for Geoscience



Knight Piésold

Driving integrated water management for mining's future

As climate pressures, stricter regulations and evolving tailings standards reshape the mining industry, water management is becoming a critical priority for mines across Africa.

ROBERT GREYLING, technical director, Water and Power at **Knight Piésold**, says mining companies must treat water management as a strategic part of the entire mining lifecycle rather than a secondary environmental function. **CONSTANCE SITHOLE** reports.

Greyling says water management today extends far beyond supplying process water to a mine, influencing operational stability, tailings safety, environmental performance and long-term sustainability. "Water on mines should be treated as a strategic resource. Water scarcity, climate change impacts, stricter water quality standards and increasing scrutiny from regulators and investors are driving mines to reduce freshwater intake, minimise discharge and develop credible no-net-harm strategies," he explains. Mining companies must balance operational demands with environmental protection amid increasingly unpredictable climate conditions, while managing significant volumes of water through effective recirculation, storage, separation and treatment systems.

Water balance and tailings design

Knight Piésold addresses this challenge through integrated water management strategies that connect hydrology, hydrogeology, water infrastructure, tailings management and treatment systems. These include water balance modelling, groundwater investigations,

river diversions, mine dewatering, water treatment planning and tailings storage facility integration.

"At the core of the mine water management plan is its life-of-mine water balance model. Instead of relying on static estimates, engineers can simulate dynamic inflows, outflows and storage under a range of wet, dry and climate-change scenarios," says Greyling.

These models help mining companies plan for extreme rainfall, drought and operational demands while reducing flooding, overtopping and seepage risks. Hydrological assessments also improve tailings storage facility design by determining spillway sizing, flood routing, freeboard allowances and seepage controls.

"The result is a tailings storage facility layout that minimises pond size, keeps water away from embankments and ensures flood storage and discharge capacities remain appropriate throughout operation," Greyling notes.

He adds that water management has become increasingly important under the Global Industry Standard on Tailings Management, which emphasises water control, dam safety and long-term closure planning.

Water reuse and recycling are also central to mining operations as

companies seek to reduce freshwater use and improve ESG performance, with Knight Piésold supporting clients through optimised storage layouts, return water systems, pumping infrastructure and targeted treatment technologies.

Greyling says effective water management requires long-term planning from project development through to closure and rehabilitation. The company integrates climate risks, future water demands and post-closure requirements into mine design while helping clients move from static designs to active water governance through monitoring systems, forecasting tools and trigger-action response plans.

As mining companies face growing pressure to improve sustainability and operational performance, Greyling believes integrated water management will remain a central role in building safer mines across Africa. By embedding water planning across the full mining lifecycle, companies can improve resilience, reduce environmental risk and strengthen long-term operational performance. **MRA**

