



Image: 123rf.com

Balancing act

Water usage management vital for a sustainable future

The United Nations Sustainable Development Goal 6 calls for safe access to water for all. Many parts of Africa are water-scarce nations and this is why there is strong demand for mines to effectively manage their water usage. How do they get this right? **GERARD PETER** finds out more from **AMELIA BRIEL**, Environmental Section Manager and **AMANDA CASSA**, Senior Civil Engineer at **Knight Piésold**.

Briel explains that, given the fact that mines are now compelled to adhere to ESG best practices, there is greater emphasis on mine water management. "Today, there is not only a focus on how water is used in a mining operation but also how it impacts the environment and communities. In addition, the buyers of a mine's commodities place great emphasis on ESG and this includes water management."

Cassa adds, "It is also about ensuring the effective use and reuse of water through water balance modelling. There is a focus on how mines can reuse the water they process and take less potable/raw water out of the environment."

South African mines are required to have a Water Use Licence issued by the Department of Water and Sanitation. This license has both general and specific conditions, explains Briel. "The specific conditions often call for a detailed water balance model that shows reuse of process water and reduction in freshwater

usage. It also has specific monitoring parameters such as water quality and aquatic biomonitoring the latter of which means monitoring the receiving rivers upstream and downstream of the mine to ensure that there is no negative impact on the aquatic and terrestrial biodiversity."

It is not just about ensuring that water reuse benefits a mine's operations, we also need to consider the cost to the environment and on human health.

AMELIA BRIEL



Briel adds that the introduction of the Global Industry Standard on Tailings Management (GISTM) is also compelling mines to think about their impact on the environment during rehabilitation and post-closure. "Mines now have to take an integrated lifecycle approach, from pre-construction to post-closure, and Knight Piésold fully supports the implementation of GISTM."

While many of the large mining houses subscribe to GISTM, it is not an absolute requirement yet. However, Cassa explains that the South African Bureau of Standards (SABS) along with industry advisors are currently updating its SANS 10286 legislation which is the mandatory code of practice on mine residue to include GISTM compliance among other updates. "Most mining companies are amenable to this, however, there

is a reluctance from junior miners with small operations that view the regulations as too stringent.”

Proper implementation of systems will conserve water

While dry tailings is a more environmentally friendly option, Cassa points out that this is expensive and as such, particularly in South Africa, a conventional slurry deposition tailings dam, which contains a lot of water, is the preferred deposition method. “If designed and managed properly, this will work. However, it is not only about the design of a system but how effectively it can be implemented and managed. In my experience, there is often a disconnect. A ‘perfectly’ designed tailings dam and return water system does not necessarily equate to a system that can be easily or even practically implemented and managed.”

“Ultimately, it is up to the mining company, with advice from the Engineer of Record (EoR), to determine how to effectively reduce the water in a tailings dam and store it in a return water dam before reusing it within the mine’s circuit,” she says.

Knight Piésold specialises in helping mines maintain their water usage. Cassa says that this is done through dynamic water balance modelling and, using this technology, the company can help mines make more informed decisions. “For example, if there is too much water, they may want to add a facility (ie. an additional return water dam) or return more water directly into the mine’s circuit. We advise on management and/or operational procedures such as the rate of slurry pumping or the slurry density and how tweaking certain parameters can



“There is a reluctance from junior miners with small operations that view the regulations as too stringent.”

AMANDA CASSA



create a more effective water balance model and help improve future decision making regarding the mine water circuit,” she adds.

Knight Piésold has consulted with mines in both the wettest parts of Africa such as Ghana and the driest like Namibia. Its wealth of experience and expertise offered by the likes of Briel and Cassa has helped mines throughout the continent reduce their reliance on clean water.

Briel explains that the company’s approach to each region is different. “In South Africa, we’ve got both a blessing and a curse in that we are a water scarce country so we have to be very efficient with our water. Meanwhile, in other jurisdictions where there is a positive water balance such as the DRC and Ghana, we have to ensure that the tailings dams do not keep too much water on the dam or they could become unstable.

“At the end of the day, it is not just about ensuring that water reuse benefits a mine’s operations, we also need to consider the cost to the environment and on human health,” she concludes. **MBA**



#mybooyco

www.booyco-electronics.co.za

