



BN-Aqua Solutions

ENTREPRENEUR: Boitumelo Nkatlo

ESTABLISHED: 2016

TEAM: 1 full time (2 directors)

LOCATION: Pretoria, Gauteng, South Africa

CONTACT: boitumelonkatlo@gmail.com

www.bnaqua.co.za



BN-Aqua Solutions is a water treatment company which processes acid mine drainage (water that has been contaminated by mining activities) to drinking stage. Using a groundbreaking innovation, the company treats waste using waste while also retrieving valuable minerals which would otherwise be discarded. They present a cost effective, environmentally responsible and circular way of dealing with these mining waste streams while contributing to water and food security.

“Circularity for me is about accountability and responsibility. We shouldn't just discard water irresponsibly. Everything should be done in a responsible manner from A-Z.”

Words and photography by Chris de Beer-Procter

ABOUT THE BUSINESS



Nkatlo set about intense research and development in partnership with the University of Johannesburg and the City of Johannesburg, as well as other organizations. In 2016, their first prototype was designed, assembled and commissioned and has since been scaled from 3500 to now 20 000 litres per day. "We have developed a technology that uses a waste material called metallurgical slag to treat another waste stream, the acid mine drainage. After much trial and error, we are now at the stage where we can safely treat acid mine drainage (AMD) to drinking quality."

This was a significant victory in proving the viability of the concept, since the process could effectively treat the AMD at scale and resulted in high quality water which could be fed into the grid at a competitive price. It's a win for mining companies, local municipalities and even for the low-income communities surrounding the mines. But the benefits only grew once Boitumelo encountered the concept of circularity. "I didn't know about the circular economy before starting BN-Aqua.

My objective in the beginning was to solve the water problem," he says, "but once you've embarked on a project you grow as you go as an innovator." Learning about the concept encouraged Boitumelo to investigate the problem of waste at every level in the process. "We did a mineralogy analysis on the residual slag that is left after we've treated the water," he says. And the results were exciting.

"We found incredibly useful minerals that we could sell. We don't throw it away. Actually, gypsum can be used for plaster, soil fertilizer and also in road construction. Magnetite can be used in a coal washing plant. Synthetic lime can be used for pH control."

Following his first few years in the mining industry, metallurgist and innovator, Boitumelo Nkatlo was stunned after witnessing the millions of liters of water which are contaminated by mining activities in South Africa every day. Acid mine drainage, as it's called, which poses a significant environmental risk as well as compliance and productivity headaches for mining companies, struck Boitumelo as an opportunity. What if that water could be treated beyond the usual neutralization needed to make a mine compliant and instead be used to increase our country's water capacity?

"I identified this problem as a business opportunity," reflects Boitumelo. "Water is a scarce resource, but we have millions of liters of contaminated mine water underground. The problem is that it's contaminated and we can't do much about it." And so, BN-Aqua Solutions was established in June 2016. Over the next 7 years, Boitumelo and co-founder Ntaoleng

"For us to live we need water, for animals and for plants to live they need water. It's not just about water security, it's about food security."

Along the journey, Boitumelo has learned more than just what is possible with science. "From the circular economy, I've learned that accountability is number one," he says. "The environment wasn't all that important to me in the beginning, but now I've learned that you can't just discard as you wish. You need to be accountable for your process from A to Z. You can't just discard waste into the environment."

The journey has been a challenging one for Boitumelo, who says that he is most proud of his persistence and patience. "That's the nature of innovation," he says. "Sometimes your ideas don't work, and sometimes they do. You must keep

going even when the odds are against you because you believe in the project." His drive to solve the national water crisis kept him going even when times were tough. And he knows there's more for other innovators to learn from his business's story.

"To find value in the valueless, in what is considered waste. That is the biggest inspiration I think people can get from my story."

VISION FOR THE FUTURE

"We hope to build a number of modular plants to treat acid mine drainage. Modular because we want the flexibility to move around. For society, we'd like to 1. Increase water capacity. 2. Provide employment to hosting communities. And 3. build a number of different plants in South Africa and beyond. This problem is not only a South African problem, it's also an African problem and beyond."



ADVICE ON CIRCULARITY FOR ENTREPRENEURS

"Hard work pays. We should all follow our passions, work hard towards our goals and never shy away because to get to where I am now, (to my prototype) I've had more 'nos' than 'yesses'."

What's kept me going is my passion to solve our water problem. Those 'nos' kept me going, I wanted to prove them wrong. Dedication, curiosity for the results, and what we could achieve kept me going.