

WATER & WASTEWATER

Water science can help municipalities sustain groundwater supply

Indiscriminate borehole drilling is undermining the future water supply, food security and economic survival of South Africa's small towns.

With several small towns running out of water, there have been many borehole drilling projects initiated by municipalities. However, where these are conducted without the professional input of a qualified geohydrologist, there is the danger that the water supply is not sustainable, said Gert Nel, partner and principal geohydrologist at SRK Consulting.

Without proper scientific planning and management, Nel said boreholes can deplete the underground aquifers, leaving local residents and businesses vulnerable. Speaking after the recent Groundwater Conference in Port Elizabeth, he said the solution is to better control groundwater use and manage the expectations of the water users in these towns. Hosted by the Groundwater Division (GWD) of the Geological Society of South Africa (GSSA), the conference focused on groundwater's potential as a sustainable water supply source.

"There is too large a gap between groundwater science, on the one hand, and implementation and management on municipal level, on the other," explained Nel, who is also chairman of the GWD's Eastern Cape branch and chaired the groundwater conference.

"There are several competent groundwater consultancies based in the Eastern Cape and countrywide who are more than able to provide sustainable solutions, if allowed to do so."

Nel noted that there remained a widespread perception that groundwater use was simply a matter of appointing drilling contractors to drill more boreholes, and then pumping as much water as users required. He highlighted that this was not a sustainable approach, and that groundwater development and management required specific expertise and experience.

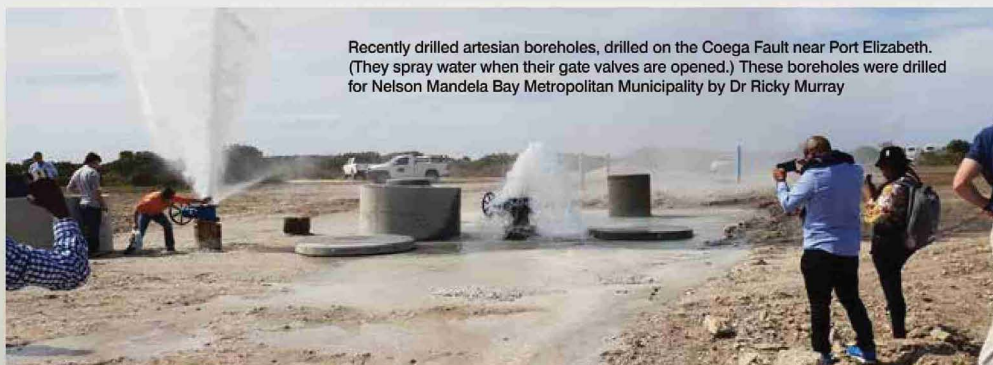
In her opening address to the groundwater conference, Eunice Kekana, executive mayor, Sarah Baartman District Municipality, made a plea to the over 200 attendees, including experienced geohydrologists, asking them to assist in solving the desperate water shortages currently being experienced in large parts of the Eastern Cape, including her own district.

Closer public and private engagement needed

Nel said the time had come for government to engage more closely with the various groundwater organisations and private geohydrological businesses in South Africa. Funding agencies could play a valuable role in ensuring water sustainability by insisting



Gert Nel is a partner and principal hydrogeologist at SRK Consulting in East London, with 28 years' experience in the field. His expertise includes groundwater resource evaluation at local and regional scale, groundwater supply, groundwater management, on-site sanitation, as well as environmental impact assessments. Nel is also involved in groundwater exploration drilling and borehole construction, waste disposal investigations and environmental hydrogeology, groundwater contamination investigations, groundwater awareness training and education, and hydrocarbon contamination risk assessments and remediation.



Recently drilled artesian boreholes, drilled on the Coega Fault near Port Elizabeth. (They spray water when their gate valves are opened.) These boreholes were drilled for Nelson Mandela Bay Metropolitan Municipality by Dr Ricky Murray



Delegates at the Groundwater Conference in Port Elizabeth

that every borehole drilled with their funds should be accompanied by a geohydrological report, signed off by a qualified and registered geohydrologist.

"Government has already made efforts to ensure that water projects are more sustainable, and these need further development," he said. "The term tender issued three years ago by the Department of Water and Sanitation, for example, identified those consulting geohydrological firms that had the necessary expertise and experience to ensure sustainable water projects."

This was a valuable tool at the service of municipalities, so that projects could rely on a registered scientist to sign off in their capacity as a 'Competent Person'. Nel said the use of a Competent Person in designing and implementing projects was a well-established requirement in the mining sector and made sure that an accredited professional took responsibility for project results. Often, the same requirement for a Competent Person to sign off on projects does not apply to water projects at municipal level.

The intention of the department's term tender, he said, was to make the procurement process simpler for a municipality when it initiated a groundwater supply project. The department leveraged its extensive in-house technical expertise to set standards and requirements, and to screen the service providers who could meet these demands. Unfortunately, not many municipalities took advantage of this to guide their own groundwater projects.

"The department is the custodian of the nation's water resources, so it is committed to ensuring sustainability in the way that these resources are managed," he said. "For instance, the department stipulates in its term tender that production boreholes be accompanied by monitoring boreholes, which continuously assess the borehole's usage so that the source is sustained."

Role of funding agencies

One of the options for rolling out the necessary best practice in groundwater management could be for the agencies providing water-related funding to play an integral role in setting out a range of technical requirements or parameters for these projects, he said. This would help to guide the standards applied at project level, and give the public confidence that funds were being well employed while safeguarding sustainability.

"There is a tendency for groundwater projects to be viewed simply as borehole drilling contracts – leading some municipalities to require only contracting experience and expertise from service providers," he said. "These projects are far more than this, as our water resources are not infinite and there needs to be substantial planning and monitoring involved."

He highlighted that geohydrology was a niche sector with highly specialised skills, qualifications and experience required by practitioners. As demonstrated by the attendance at the Port Elizabeth conference,



L to R: Seen at the Groundwater Conference in Port Elizabeth were Matthys Dippenaar (2019 chairman of the GWD SA), Jaco Nel (executive committee of the GWD), Eunice Kekana (executive mayor, Sarah Baartman Municipality), Gert Nel (conference chair, chair of the Eastern Cape division of the GWD, and partner and principal hydrogeologist at SRK Consulting), and Julian Conrad (SA chair of the International Association of Hydrogeologists)

there were many well-equipped professionals ready to make their contribution in the field of groundwater management and utilisation.

"The event reinforced our conviction that government could gain substantially by recognising and utilising the scientists in the groundwater sector and their respective professional bodies," Nel continued. "We constitute an important intellectual asset in the country and are available to work with the public sector to find solutions to our various water challenges."

He noted that some municipalities have even purchased adjacent farms purely for their boreholes and warned that this could cause a breakdown in the agricultural production on these purchased farms.

"It is time that the agricultural sector realised the damage caused by municipalities when they buy out productive farms for their groundwater potential, but do not maintain the existing agricultural activities," he added.

"The farming and business communities must engage closely with municipalities and politicians to help arrest the negative economic growth in small towns as a result of water insecurity," Nel concluded. **35**