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NEWS RELEASE
UP Scientist Issues Urgent Call for Clean-up of Toxic Krugersdorp Mine Dumps

Acid mine drainage, a persisting old enemy of the environment

KRUGERSDORP - Young children in Krugersdorp are breathing in uranium, arsenic and mercury fumes wafting over from abandoned legacy mines, while pollutants are seeping into the groundwater and nearby dams and lakes, cautions Dr Alseno Kagiso Mosai, a water remediation expert at the University of Pretoria's (UP) Department of Chemistry.

"If this is not treated now, the effects of legacy mines will continue and the impact will be much more severe," he says. "This means that the government will need large amounts of money to clean the water in order to bring it up to the standard needed for households."

Dr Mosai says that while the mining companies responsible for the pollution are often nowhere to be seen, it is ultimately up to the government to fund acid mine drainage (AMD) clean-ups in order to protect the right of citizens to a healthy environment and clean water.

“Many AMD clean-up technologies do exist,” he adds. “Some are more or less expensive, while others are more or less effective, depending on the local context.”

To help authorities take urgent action in Krugersdorp and other parts of South Africa, Dr Mosai and fellow experts Dr Gebhu Ndlovu, of national mineral research organisation Mintek, and Professor Hlanganani Tutu, of the University of the Witwatersrand, authored a journal article in which they reviewed existing technologies, and recommended a combined approach that is both affordable and effective.

Communities at risk

“Krugersdorp is full of legacy mines, and most residents who live in the vicinity of the mine dumps have had serious health issues, such as asthma,” Dr Mosai says, noting that this is backed up by several research studies.

“I’ve been there and I’ve seen it,” he adds. “It is not only kids – there are dams in this area that are used by older people for recreational activities like swimming, as well as religious activities like baptisms. We talk to them about the dangers, but they’re just doing these things innocently; it’s really sad for me and my colleagues to see.”

Dr Mosai explains that because the toxins can spread in both the air and in the water, even people who live some distance away from mine dumps may be affected.

Call to action

The scientists are calling on authorities to make use of two technologies developed by South African researchers at Mintek: one precipitates unwanted toxins and the other uses microorganisms sourced from plant waste to “eat” heavy metal pollutants. The technologies are trademarked as SAVMINTM and CloSURETM respectively.

Dr Mosai explains that in the case of using microorganisms, there is the double benefit of recycling plant waste while saving costs on water treatment chemicals. Both technologies would also enable precious metals like cobalt, copper and nickel to be recovered for commercial use.

“It is therefore in the interest of municipal decision-makers, industry and other researchers to take note of the review article, so that South Africa doesn’t keep reinventing the wheel when it comes to researching new AMD clean-up technologies, and so that the benefits of mine remediation for governance, business and the safety of our children become clear,” he says.

On a positive note, Dr Mosai adds that UP experts like himself have been supporting remediation efforts by the national Department of Water and Sanitation, which has detected toxic mine elements in several areas.

“If we don’t act now though, this issue is not going to go away,” he says.

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ABOUT THE UNIVERSITY OF PRETORIA

The University of Pretoria (UP) is one of the largest contact and residential universities in South Africa, with its administration offices located on its Hatfield Campus in Pretoria. This 115-year-old institution is also one of the largest producers of research in South Africa.

Spread over seven campuses, it has nine faculties and a business school, the Gordon Institute of Business Science (GIBS). It is the only university in the country with a Faculty of Veterinary Science, which is ranked the best in Africa. UP has 120 academic departments and 92 centres and institutes, accommodating more than 56 000 students and offering about 1 100 study programmes. It has the most academic staff with PhDs (70%), NRF-rated researchers (613).

The 2024 Times Higher Education subject rankings placed UP first in South Africa in the fields of Law, Veterinary Science, Accounting and Finance; Agriculture and Forestry and Electrical and Electronic Engineering. Quacquarelli Symonds (QS) ranked the University among the top five in Africa, as part of their 2024 World University Rankings (WUR). UP was the only South African university featured in the 2023 World University Rankings for Innovation (WURI), falling within in the 101-200 range of innovative universities.

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