

Poison gas threat to informal settlements

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Residents of informal settlements across greater Joburg may be exposed to the dangerous radioactive gas, radon, from rising mine water levels in the central mining basin and be exposed to severe health risks.

Professor Frank Winde, of the School of Environmental Sciences and Development at North West University, believes communities in informal settlements living in the 40km mining belt, which runs beneath central Joburg and extends to between Germiston and Roodepoort, could be most at risk of exposure to the carcinogenic gas.

This is because the gas can easily accumulate in their low-lying, poorly ventilated shacks, which typically lack concrete flooring that could limit a "radon influx".

Winde led a study of the Mine Water Research Group assessing the risk of rising mine water levels in the central basin to the Standard Bank and Absa basements in central Joburg.

Contrary to the predictions of a report prepared for the government by a group of specialist scientists, Winde's study, commissioned by the banks and released this week, found there was no risk that acid mine drainage would flood the basements.

He believes the government's report has "exaggerated" the risks of rising water levels in the central basin and critically has overlooked several "rather obvious risk exposure pathways".

Regarding radon exposure, Winde finds that where the rising mine water will come into contact with the near surface aquifer, uranium contamination is "at least initially, to be expected".

He says there is strong evidence that mine water in the central basin contains uranium.

"It (radon exposure) might be happening and may have started long ago," he explains.

"Those mining shafts (in the central basin) provide a direct link between the underground water and people on the surface."

Since mine shafts are directly connected to the mine water and "act as preferred conduits for equalising barometric pressure differences between the void and the surface" it is likely that radon can reach the surface relatively quickly and well before it decays (radon has a half life of 3.8 days) even in areas where the water table is deep below the surface.

"Thus, radon is likely to already escape from shafts well before the flooding of the mine void is complete. This renders shafts potential hot spots for radon exposure of surrounding areas."

With more than 100 shafts distributed across the mining belt, he finds the potential for radon exposure to be "considerable".

“The identification of affected areas may be difficult especially where old shafts have been covered with soil, or other material.”

As radon is odourless and the covered shafts invisible, such spots are particularly dangerous for nearby residents. “

The associated radon risk needs to be assessed especially for informal settlements where the radioactive gas can easily accumulate in low-lying, poorly ventilated shacks which often lack concrete floors that could limit a radon influx. As a leading cause of lung cancer in uranium miners, radon exposure constitutes a severe health risk.”

He points out that people could be exposed as they sleep. “The major exposure time is when they’re sleeping – the problem is many shacks are not well ventilated and people close the doors to try to keep the cold out.”

The exposure may not be confined only to informal settlements but also to people living and working in the mining belt, which is home to low-class residential areas and light industrial activity. “Radon is quite penetrating,” he says.

His report also identifies the possible subsidence of tailings, structures incorporated into infrastructure such as the M2 highway “due to liquefaction of unconsolidated fill material” in low lying reef outcrop zones.

Importantly, it also finds tailings reclamation activities on the surface could contribute to the ingress of water in the central basin, a fact which has been omitted in the government’s report.

“That is a huge potential source which nobody else has pointed out.”

Winde is critical of the government’s plans to pay huge amounts to pump and treat underground mine water.

“Our main focus should be on removing the surface pollution of water.

“If you have clean water entering the mine void, there is little chance of bad water running out,” he says. - Saturday Star