

IMPACTS OF GOLD AND URANIUM MINING ON WATER RESOURCES IN DOLOMITIC KARST AREAS IN SOUTH AFRICA - EXAMPLES FROM THE WONDERFONTEINSPRUIT CATCHMENT

FRANK WINDE, POTCHEFSTROOM

SUMMARY

For more than a century deep level gold mining in the Witwatersrand basin created extensive and interlinked underground mine voids of which many are now filled with poor quality water that, in places, started to drain into surface water systems. Combined with large amounts of uraniferous tailings polluting surface and groundwater this poses serious threats to the long-term water quality and availability in many mining regions. Problems are exacerbated in dolomitic areas where gold mines dewatered potent karst aquifers in order to secure safe and economical underground operations. Associated problems include drying up of karst springs and boreholes used for irrigation, large-scale re-distribution of water on surface and underground including a 30km-long stream diversion into a pipeline, catastrophic sinkhole occurrence, extensive pollution of surface and groundwater as well as irreversible changes of natural flow patterns and water balances. This paper attempts a quantified overview of historical and current impacts as well as future implications focussing on examples in the Wonderfontein spruit catchment.