

# Investigation of potential water quality and quantity impacts associated with mining of the shallow Waterberg coal reserves, west of the Daarby Fault, Limpopo Province, South Africa

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## **Abstract**

From South African and international experience, it is known that coal mining has a pronounced impact on surface and groundwater quality and quantity. The influx of water may be as low as 1% of rainfall for underground mines to as much as 20% for opencast mines. Such differences may influence the quantity and quality of surface water and groundwater resources at the local scale and further afield. The Waterberg coal reserves represent the only area with proven coal reserves which are still available for development in South Africa. These reserves are targeted for large-scale mining in the near future, and are situated in a relatively dry part of South Africa. In view of the low rainfall and limited surface water resources, the necessary level of safeguard measures to ensure the quantity and quality of existing water resources is unclear. Experience from other areas cannot necessarily be extrapolated directly. A scoping level study was performed to consolidate the existing information on the geohydrology and pre-mining water quantity and quality of water resources associated with the Waterberg coal reserves. New data regarding water quality and acid-base potential for the different geological areas (through field investigations) and geology and mining methods were obtained. Findings showed a significant likely impact on groundwater resources, with a potential for generation of acid mine drainage, although low transmissivities will in all probability prevent decant after back-filling is complete.

**Keywords:** Waterberg Coalfield, water quality, water quantity, recharge, acid-base accounting, geohydrological modelling