

Threats and opportunities for post-closure development in dolomitic gold-mining areas of the West Rand and Far West Rand (South Africa) – a hydraulic view

Part 2: Opportunities

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Abstract

Largely dependent on gold mines for their economic survival, many mining towns in the Far West Rand fear the effects of the inevitable impact of mine closure, not only on the economy but also on social stability. Large-scale environmental degradation in the form of sinkholes and widespread radioactive pollution exacerbate such fears. Based on an analysis of mining impacts and potential threats for post-mining developments provided in Part I, this 2nd paper in a 3-part series aims to stimulate thought, through the discussion of potential opportunities centred on the rich water resources of the area. This is in full recognition of a subsequent need to assess the economic and technical feasibility of identified opportunities in more detail. Many opportunities are based on the concept that perceived mining liabilities may have the potential to be turned into assets. Examples include the restoration of dewatered karst aquifers and their use for storing large volumes of water, protected from evaporation losses, combined with artificial groundwater recharge and harvesting as well as underground generation of hydropower. This could well be complemented by other water-based developments such as aquaculture, agriculture and different forms of tourism relating to water, karst and mining. Possibilities for using waste land such as sinkhole areas and slimes dams include the establishment of a large game reserve on donated land as well as using tailings for biofuel production and generating solar- and wind-based electricity. Lastly, the re-establishment of a uranium-related industry is explored; this could capitalise on existing infrastructure and former expertise and benefit from the envisaged development of uranium as a strategic resource in SA. In view of the current media attention given to negative environmental and health effects, it is, however, questionable whether such development would be acceptable to local residents.

Keywords: post-mining development, karst, groundwater storage and harvesting, subterranean hydro-energy generation, tourism, wasteland transformation, uranium industry, research opportunities