

The Southern African Institute of Mining and Metallurgy: 21st Century Challenges to the southern African coal sector, Emperors Palace Convention Resort Johannesburg, 4-5 March 2014

Aquatic ecosystems in the coal mining landscape of the upper Olifants River, and the way forward

P.J. Oberholster*[†] and A.R. de Klerk*

**CSIR Natural Resources and the Environment*

†Department of Paraclinical Sciences, Faculty of Veterinary Science, University of Pretoria

Abstract

Although coal mining can bring economic benefits by stimulating the local economy of the upper Olifants River catchment and creating more employment opportunities, it can also have adverse effects on the aquatic ecosystems of this catchment. Coal mining has the potential to affect and disturb water ecosystems throughout the life cycle of a mining operation, by point and non-point source pollution. Direct impacts of water pollution can result from any activities that involve direct discharges into water bodies (e.g., riverine tailings, tailing impoundment releases, or acid mine drainage from abandoned mines). Indirect pollution can result from activities that involve, for example, land clearance. Despite the significant potential for negative impacts on aquatic systems by mining operations, there is a great deal that mining companies can do to minimize or prevent such impacts in areas identified through a study by the Olifants River Forum that was conducted from 2010 to 2013 in the upper Olifants River catchment. Evaluating the importance of aquatic ecosystems is essential to understanding the significance of potential aquatic ecosystem impacts and therefore the priorities for mitigation. Data generated from the Olifants River Forum study can provide guidance on managing water ecosystems in the future at various stages of mining operations, which include understanding the interface between water ecosystems and coal mining activities, assessing the likelihood of coal mining activities having adverse effects on aquatic ecosystems, and mitigating potential impacts on aquatic systems, especially abandoned coal mines. From the Olifants River Forum study it was evident that regular reassessment and review of the aquatic ecosystem impacts, including primary, secondary, and cumulative impacts, should be undertaken throughout coal mining operations to ensure better management of aquatic ecosystems in this region in the future.