Waste rock management the second time around – cost lessons from the Rum Jungle project

D O'Toole (RPEQ, MIEAust CPEng, MAusIMM), B Tarrant, J Hartnett, A Neubauer, M Manoharan

1. Technical Director – Geotechnics and Mine Waste Engineering, SLR Consulting, Townsville, QLD 4810. dotoole@slrconsulting.com
2. Associate – Geotechnics and Mine Waste Engineering, SLR Consulting, Wollongong, NSW 2500. btarrant@slrconsulting.com
3. Principal Project Manager, Rum Jungle Stage 2A, Department of Primary Industry and Resources, Northern Territory Government, Darwin, NT, 0801. Jackie.Hartnett@nt.gov.au
4. Associate – Closure & Environment, SLR Consulting, Brisbane, QLD 4000. aneubauer@slrconsulting.com
5. Associate Director – Natural Resources, Turner & Townsend, Brisbane, QLD 4000. Mahesh.Manoharan@turntown.com

ABSTRACT

The former Rum Jungle uranium mine site operated between 1954 and 1971 and underwent rehabilitation from 1983 to 1986. Rehabilitation addressed significant environmental impacts caused by acid metalliferous drainage (AMD) and achieved objectives related to aesthetic improvements and reducing public health hazards. More recent studies document the gradual deterioration of the original rehabilitation works meaning further rehabilitation work is required for site closure and relinquishment.

Since 2009, the Northern Territory and Australian governments have completed investigative works to develop an improved rehabilitation strategy that is consistent with the views and interests of stakeholders and meets contemporary environmental and mined-land rehabilitation standards.

Potentially acid forming (PAF) waste rock is currently stored across a number of dumps. The AMD seeping from the dumps continues to detrimentally impact downstream groundwater and surface water. Additionally, the dump locations are adjacent to Aboriginal sacred sites and are considered culturally insensitive landforms.

Part of the rehabilitation strategy includes relocating waste rock to backfill a flooded former pit and to new dumps that have been designed to integrate into the surrounding landscape, including consideration of sacred sites.

Waste rock relocation will require significant volumes of lime to neutralise the existing and potential future AMD, and in the case of the new dumps, a robust cover design suitable for erosion design life and revegetation goals. Treatment of impacted surface and groundwater is also required.

A comparison is made here of sufficiently characterising, handling and storing PAF waste rock the first time around against a scenario of a post operations rehabilitation, using lessons learnt from the Rum Jungle rehabilitation strategy the second time around.