Intermediate Rainfall Zone Trial Mining Project

Statement on the review by Water and Environmental Consultants

Bauxite Hydrology Committee

Background

The Trial Mining Project (TMP) is located within the intermediate rainfall zone (IRZ) area of the Serpentine Reservoir catchment. It was undertaken to assess the suitability of the modelling and mining and rehabilitation methods developed during a 25-year research programme for application in the IRZ area of Alcoa's mining lease. The purpose of the TMP is to provide an operational demonstration of the impacts of mining in the IRZ on water resources, and to provide a basis from which to assess future mining in the IRZ.

The TMP is undertaken in the Jayrup catchment, with two additional experimental catchments, Cameron West and Cameron Central, nested within it. The control catchment, Gordon, is located adjacent to the southern boundary of Jayrup. Groundwater level and salinity, streamflow and stream salinity monitoring is undertaken at all of these catchments.

The TMP was approved by the MMPLG in 1996, and mining began in 2004. Final rehabilitation of the mined areas is scheduled for 2012 and haul road rehabilitation is expected to be completed by 2014.

This review brings the TMP to completion.

Results

The study undertaken by Water and Environmental Consultants shows that the results of the TMP are dominated by the below-average rainfall conditions that have occurred in the south-west of WA since 1968. Groundwater recharge under the native forest seems to now be less than discharge; groundwater levels in the Cameron area have been generally declining by about 0.5 m per year since the mid-1990s. A number of piezometers within the treated catchments of Cameron West, Cameron Central and Jayrup did have positive responses in groundwater level to mining, but none caused the groundwater to rise in the valley floor to such an extent that groundwater discharge could occur into streams.

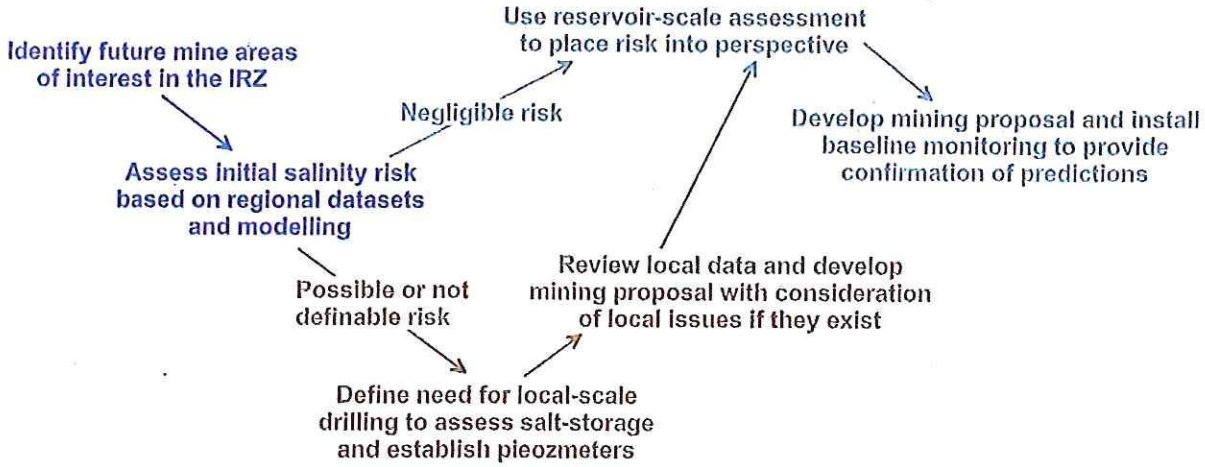
There was almost no response to mining in the streamflow and stream salinity records for the Cameron experimental catchments. The only clear response was a streamflow increase for the Jayrup catchment in 2006. The lack of stream response for the Cameron experimental catchments demonstrates the need for groundwaters to be close to the surface in the stream zone for conditions to be suitable for a significant mining-related response.

Conclusions

As long as the present below average rainfall conditions continue, there is little to no potential for a significant streamflow or stream salinity response to mining in situations similar to those of the catchments of the TMP. However, it should be noted that the hydrology of catchments across the IRZ is diverse and other areas may be very different, such as the O'Neil-to-McCoy area to the north of Jayrup.

The study concludes that a decade of above average rainfall would be required to redress the present soil-water deficit. Given the uncertainty associated with determining future rainfall, the study proposes that current monitoring be continued until at least the end of 2012. At that point the rehabilitation will be at least one year old, and should above average rainfalls return from 2013 there will likely be only a small salinity response, or none.

In terms of implications for future mine planning within the IRZ, a simple flowchart of steps to assess any new mine area was proposed, shown below. In particular, emphasis was placed on an upfront salinity-risk assessment and using this to determine the level of risk posed by a new mine area in the IRZ.



The Bauxite Hydrology Committee concurs with the report by Water and Environmental Consultants, and endorses the findings therein.

Signed

Tim Sparks
Chair, Bauxite Hydrology Committee

Dated 26/7/2011 .