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Water Balance Peer Review

21 December 2017

Principal
Hansen Bailey
via Email

Attention: Nathan Cooper

Dear Nathan

RE: Peer Review of Surface Water Assessment for the Bylong Project

Hydro Engineering & Consulting Pty Ltd were commissioned by Hansen Bailey to undertake an independent peer review of the various surface water assessment documents compiled in support of the EIS and supplementary information provided in response to submissions. The results of our review and our opinions in regard to the robustness of this documentation were provided to Hansen Bailey.

Our concluding opinion from the initial review was that the water balance modelling conducted was not sufficiently robust to provide confident support to the conclusions reached. The key limitations in the water balance modelling we identified were:

There had been insufficient allowance made for uncertainty in model parameters and their possible effects on model predictions. The key uncertainties we identified were:

- Runoff generated from mine/Project area catchments could have been sufficiently greater than was being modelled to compromise the conclusion reached regarding containment security. Higher than modelled runoff could also compromise conclusions reached regarding the manageability of open cut water accumulation during the open cut only phase of the project.
- The likely uncertainty in calculated mine void volume and as placed reject volume in the Eastern mine void could easily compromise the conclusion reached regarding containment security.

The likely effect of averaging groundwater inflows in the model, resulted in significant over estimation of inflows in PY11 to PY14 and significant under-estimation in the final 5 years of the Project. We considered that this averaging could compromise both the conclusions reached regarding borefield use and containment security.

The effect of uncertainty in groundwater inflow predictions, and its significance to project water management, was worthy of careful assessment. We considered it might be found that applying a reasonable range of likely groundwater inflows could compromise the conclusions reached regarding water management performance.

We have subsequently reviewed the document produced by WRM Water & Environment Pty Ltd (WRM) entitled Bylong Project Report – Response to PAC Report (December 2017).

The WRM PAC Response Report contains some important changes to modelling including refined time stepping which more accurately reflects the variations in predicted groundwater inflows and the addition of a sensitivity analysis incorporating both surface and groundwater components.

In our opinion the methodology and approach undertaken by WRM in the PAC Response Report are appropriate. The inclusion of a sensitivity analysis provides an appropriate basis for assessing the uncertainty inherent in the water balance modelling. In our opinion the results provide a robust basis for assessing the likely performance of the water management system over the credible range of conditions which could occur.

Yours faithfully



Lindsay Gilbert

Principal Water Resources Engineer