Submission Ulan Coal Mine MOD6

I object to the Ulan Coal Mine (UCML) Modification 6 proposed development. This is the third coal mine expansion this year affecting the Ulan-Wollar area and Goulburn River catchment.

The cumulative impacts on an already stressed groundwater system of further extensions to underground mining is unacceptable and based on short term reasoning. MOD6 will extend the depressurisation of groundwater system into new areas, further intercepting and permanently distorting the groundwater network. The cumulative groundwater drawdown will cause loss of additional base flows to both the Goulburn River to the east and the Talbragar River to the west. This latest incremental mine expansion application is 'death by 1000 cuts' to the Goulburn River water system.

The groundwater systems and biodiversity of this area are being severely compromised by the expansion of all three coal mines with a current footprint of ~ 200 sq kms. Mine reports ignore the many unknown consequences of the regional groundwater drawdown that over time is predicted to extend 50+kms from the mine footprint. Permanent lowering of levels have reversed hydraulic gradients diverting groundwater discharge away from the river causing a reduction of baseflow critical to stream health during extended dry times (Table 8.6). This most recent mine modelling indicates >3000 years for the system to reach some type of *'new equilibrium'*.

The MOD6 extension will compound impacts on the groundwater network that crosses the Great Dividing Range linking the fractured and porous rock groundwater sources of the eastern fall with the Talbragar and Murray-Darling Basin water systems. The further degradation of this valuable water system extends well past the lifetime of all peoples currently alive. The sterilisation of this irreplaceable water resource that could potentially support a range of more sustainable industries is of greater value than the short term returns and long term damage from mining the coal.

Where is the cost benefit analysis that factors in the loss of resilience and future potential water resource for communities in an increasingly stressed and challenging climate?

Mine modelling of impacts on the groundwater system has varied considerable over the decades since approval with a more than quadrupling of actual mine water inflows. The latest MOD6 report predicts the changes in hydraulic properties due to fracturing above longwall panels will result in a quite different '*uniform*' groundwater network post mining. Discrete aquifer layers will be lost with the long-term predicted residual drawdown or '*new equilibrium*' forming different high and low groundwater levels from pre-mining (7.4 p. 91). As levels slowly return this mixing of water sources, both fresh and saline, combined with increased contact with crushed rock and exposure to air would inevitably contaminate and lower ground water quality.

MOD6 groundwater modelling predicts baseflow loss in the Upper Goulburn Water Source of approximately 100 ML/year greater than previously predicted in earlier models, with post mining take increasing by 86.97 ML/year (p.103). This further demonstrates the uncertainty in accurately determining baseflow loss due to mining. With no pre-mining baseline data or reliable way of measuring actual baseflows, the modelled estimates could well be out by a factor of 10 or greater.

The characterisation of groundwater resources in the Ulan Wollar area as low value – poor quality and unproductive is an unsupported disingenuous claim. For 30+ years the Ulan Mine has produced +15ML/day groundwater inflows of relatively good quality groundwater. The Electrical Conductivity EC range for Triassic aquifers is well within the potable range of 466-613 µS/cm, and Permian 398-1040 µS/cm (Table 5.4).

The evidence provided by UCML does not substantiate the claim that The Drip GDE groundwater source is not connected to lower Triassic regional groundwater system[1]. Figure 5.22 (GIA) misrepresents groundwater flow within the Triassic (lower quartzose). A most probable discharge point would include the boundary between the lower Triassic quartzose and less permeable lithic sandstone layer which coincides with the seepage zone at The Drip cliff-face (387-381mAHD).

Archival groundwater data that would have captured mine related lowering of the regional Triassic groundwater to the north of The Drip is not available as monitoring bore PZ29 was only installed in 2016. Even so Fig 5.20 (GIA p.56) PZ29 hydrograph responses indicates a decline in the regional Triassic groundwater levels at 50-90m (399mAHD).

The proposed new underground expansion will allow continued access to more coal resources to the north of current operations further contributing to greenhouse gases and climate change. Coal mining at UCML must cease no later than 2033 to allow for the necessary global decarbonisation to avoid a 1.5C rise in global temperatures and catastrophic climate change.

Considering the clear scientific advice on climate change and strong likelihood of future water shortages we must protect this water resource from further degradation. Science is telling us society will become increasingly dependent on groundwater – especially in Australia where we have limited surface water sources. The precautionary principle must be comprehensively and transparently applied to this project application.

Dr Julia Mullins Imrie

15 December 2022

[1] Independent Advisory Panel Underground Mining – Advice on Moolarben Coal Complex UG4 Longwalls 401-408 p.17