

**Re: Russell Vale Colliery (formerly NRE No 1 mine) - Wollongong Coal
Preliminary Works Project Modification 2 - Longwall 6
Report prepared by AECOM April 2014**

Attention: Jessie Giblett

I understand the company's desire to have a short-term approval granted. I reiterate the comments I made in April 2013 concerning the Underground Expansion Project:

- 1. I strongly support the incorporation into the approval conditions of active, iterative adaptive mining and the commitment to change the mine plan or stop mining if impacts exceed specified limits.**
- 2. The standards set for this proposal need to be appropriate for any future extensions to the mine**

Adaptive mining

The reality is that adaptive mining may well be useful in response to monitoring of Cataract Creek, if the closure does happen at about 12mm/100m of mining, as for LW5. This would allow intervention before the 200mm limit was reached - if closure reached anywhere near this level when only 400m of mining is proposed.

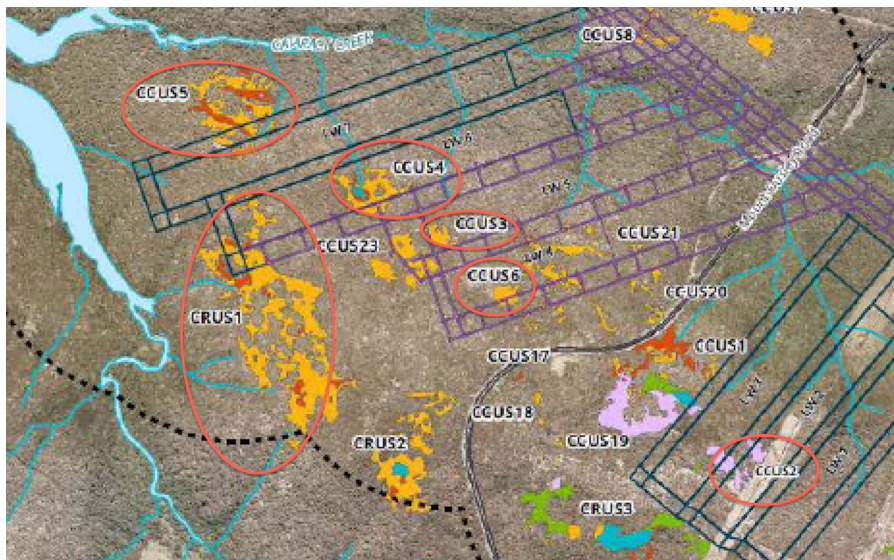
However it will be of no value for the upland swamps. No 'deterioration in the health' of the swamps will be observable within the time of mining - unless 'health' is defined as loss of piezometric head in the swamp sediments, there will be no opportunity for 'proactive amendments..to extraction activities'. I support defining health by the maintenance of piezometric head but am only too well aware that is not done elsewhere in the Southern Coalfield.

Standards set

The standard of monitoring of environmental impacts is one part of this issue. If approval is given, the monitoring needs to provide information that can inform adaptive mining in the future. The other part is setting performance standards - what does the community consider to be an acceptable level of impact and what criteria measure the performance?

How much impact is likely on the upland swamps?

Two swamps are directly above LW6, and both meet the draft criteria for special significance - CCUS4 and CRUS1. Monitoring of CCUS 2, 3, 5 and 6 is considered.



This and preceding analyses of the swamps draw a series of conclusions that suggest impacts are not important:

- the swamps in Wonga East are headwater and not valley infill swamps, and do not contribute significantly to stream base flow. Obviously valley infill swamps are larger and usually have deeper sediments and are in 2nd/3rd order rather than 1st order valleys; so a higher contribution from them to base flow is logical. However the combined contribution of a large number of headwater swamps should not be discounted, especially if they lie in the same sub-catchment (see CCUS6 in Figure 3 of Annex Q of the Underground Expansion Project documents). Even if the headwater swamps' water tables respond rapidly to rainfall and their interaction with near-surface groundwater is negligible, they are still important components of the catchment hydrology - or so we should assume until we at least have a water balance model which disproves the observational evidence.
- the swamps are relatively dry, dominated by Banksia thicket, with thin dry soils which have low humic content. In short, although they both have some tea tree thicket (ie biodiversity indication), they are relatively unimportant. Yet both of those which would be affected by LW6 qualify as swamps of special significance. If this is to be discounted, then we need to have an open discussion about the criteria for assessing acceptable damage to the environment.
- and furthermore, it is asserted that *'previous mining of the Bulli and Balgownie seams has occurred beneath CRUS1 and CCUS4 with no adverse impacts documented. During the extraction of coal from LW5, CCUS4 subsided approximately 0.8 metres with no observable adverse impacts (Hansen Bailey, 2014)' (p. 46). Indeed no adverse impacts have been documented - until very recently, none were measured!* And the Hansen Bailey report is an in-house report, not a published document. A more measured statement is given on p 14 of Evans Peck's January 2014 review of the PPR Surface Water - *Given that the previous mining occurred 30 years ago, it is possible that the existing vegetation has had time to adapt to any change in swamp hydrology. Overall, it appears that the majority of the headwater swamps that have been subject to subsidence from previous mining have maintained a perched groundwater system that does not show evidence that cracking may have occurred.* The present swamps may in fact be drier than they would have been if there had not been previous mining.
- Note the statement that there is no evidence that cracking may have occurred. The Evans Peck report quotes a Biosis report - Attachment A to the PPR (which I have not found) - *"It is worth noting that all of the upland swamps listed above have been subject to significant tilts and strains from past mining (see Table 13 and Table 14), substantially above what has been predicted by MSEC to result in fracturing of bedrock in waterways (DoP 2010) and the criteria listed in OEH (2012) for assessing the risk of negative environmental consequences to upland swamps. These levels of tilts and strains are likely to have resulted in fracturing of the bedrock beneath these upland swamps from past mining. However, monitoring data is not available to confirm whether this has occurred.* The implication is clear - cracking occurred under previous mining under subsidence of about 1m and the swamps were not destroyed. But the Underground Expansion EA records 'no subsidence record' for the Bulli Seam bord & Pillar, and maximum strain of 3mm/m for the Balgownie Seam longwalls (1.4m subsidence). The OEH strain criteria are <0.5 mm/m tensile and < 2mm/m compressive strains; the predicted values are for CCUS4 6.7 and 13.4 mm/m; and 9.2 and 18.5 mm/m, both with 1.4m subsidence. So it is with good cause that the Mod2 report says that the predicted strains above LW6 are likely to cause 'perceptible cracking'. There is good reason to anticipate further damage to the swamp hydrology and thence vegetation; and no clear evidence presented about the past impacts.

- I notice that there has been no search for the giant dragonfly, but I do not accept that the changed layout for the PPR entirely removed the possibility of there being useful habitat in the area.
- Subsidence has increased the conductivity of the ridge south of Cataract Creek - that is, between Cataract Creek and Cataract River - to a depth of 140m. Cracking and lamination of the sandstone has allowed drainage to divert laterally from parts of the Creek (Appendix D1). The clear implication is that the near-surface of the sandstone is being dehydrated and it is not just loss of water from the swamp sediments but from the upper Hawkesbury Sandstone which should concern us.

The case has not been made satisfactorily either that the swamps under threat are not significant or that impacts on them will be no greater than has already occurred.

To return to the question of setting standards:

- I reject the idea that the swamps under consideration are of little value and are anyway unlikely to be damaged any more than they have been by previous mining. Some of the swamps in Wonga East area are small and have low biodiversity eg CCUS3, but the ones to be affected by LW6 are not in that category. I have not visited CRUS1 but I commented last year that *'I have been to CCUS4. It is a wet swamp in good condition, and the monitoring of the piezo and the stream site here will be crucial to understanding the impact of subsidence. The data in the Geoterra report (Annexure P Fig 14) show that water levels declined from June to September 2012 during a period of low rainfall. The question is whether the levels respond to rainfall after the swamp is undermined by LW5.'* It is disappointing to see no updated results from the piezometers presented in the current report. **Monitoring data should be presented and used to inform decisions about the proposal.**
- I consider that the available evidence strongly suggests that there will be loss of water from the swamps sediments in CCUS4 and CRUS1 (or at least part of the latter). This will lead over time to poor swamp health and potential loss of habitat for threatened species. The question then becomes - **how does the Government explicitly set and maintain criteria for deciding how to balance the impacts on swamps and water catchment values against the economic benefits of coal mining?** This is obviously a wider question than may seem relevant to a small proposal, but there are two reasons to consider it here. Firstly, does approval of a small activity (400m of LW6) imply tacit approval of the larger project (the Preferred Project and later extension into Wonga West)? Secondly, how are the cumulative impacts of multiple activities within the catchment being considered?