



Hunter Environment Lobby Inc.

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East Maitland NSW 2323
3rd December 2017

Planning and Assessment Commission - D493/17 Objection to Wambo Modification 17

Introduction

Hunter Environment Lobby Inc. (HEL) is a regional community-based environmental organization that has been active for well over 20 years on the issues of environmental degradation, species and habitat loss, and climate change.

In October 2006, HEL raised objection to the proposed Modification 6 of Wambo Mine, and the proposition to re-route and destroy North Wambo Creek. HEL warned at that time of irreversible consequences and significant environmental effects.

Further to this 2006 objection to Mod 6, in our submission of objection to the Mod 12 development on 6 May 2016, HEL outlined major concerns and called once again for an independent regional study of mining impacts on the Hunter River, as well as its tributaries and associated groundwater sources

HEL has also had continuing concerns in regard to the cumulative biodiversity impacts of mining in the Hunter Region and the lack of adequate protection of biodiversity offsets and unreliable monitoring and regulation of their management.

Once again, for this Modification 17, HEL presented its concerns to the Department of Planning and Environment (the Department) in May this year, that the mine is very close to the World Heritage listed Wollemi National Park and will severely impact on the Wambo Creek systems, Wollombi Brook and Hunter catchment, surrounding farm land and neighbouring communities, Aboriginal cultural heritage and biodiversity.

HEL submitted an objection to the expansion of underground operations proposed in Mod 12, which has since just been approved in December 2016. Now there is a proposal for another new expansion of underground mining before this PAC.

A large joint venture project, United-Wambo open cut mine (with neighbouring miner Glencore) is currently before the Department. HEL believes that these ongoing extensions and large super pit proposals are not ecologically sustainable developments.

The cumulative impact of mining in this area of the Hunter is vast and the NSW Govt is refusing to adequately assess the long-term costs.

Issues with Wambo Modification 17

This project is closely tied to the United-Wambo proposal and should not be considered until that assessment is complete.

We consider that the Department's Environmental Assessment Report (EAR) is dismissive of many of the key issues raised. These are not adequately addressed or mitigated.

1. Impacts on Wambo Creek and groundwater sources

HEL has major concerns that the EAR recognises that '*The modification would cause surface and sub-surface subsidence impacts, including cumulative subsidence impacts, which could affect a range of surface water and groundwater features*'¹

It is predicted that groundwater levels after the 200 year recovery period will remain below pre-mining levels and that increased flux of saline water from the Permian strata to the alluvium will commence within 100 years

These impacts are not acceptable and do not demonstrate ecological sustainability.

HEL notes that both the Department of Crown Land and Water and the Independent Expert Science Committee have raised issues with the numerical groundwater model. We consider that the Department's response is inadequate and that key issues remain.

HEL commissioned Pell's Consultancy to review information provided by the proponent in regard to impacts on water sources.

The attached report is a key element of our submission for the PAC to consider.

This report also highlighted areas where further clarification of the groundwater model is required. One of these is that the units of the values of 'storage' used in the groundwater model are undefined, and appear to be untenably low for representation of specific storage.

The report also notes that the hydrologic modelling presented does not contribute to the understanding of impacts from subsidence and cracking, as the mining effects are too speculative to meaningfully model.

The report questions whether:

- the predicted impacts to North Wambo creek can be considered as acceptable, and;
- the proposed mitigation measures for North Wambo creek are reasonable

It further states that it is clear that the extent of subsidence and cracking is such that it would greatly disturb the natural values of North Wambo Creek. The predicted changes to stream gradient, extensive bed cracking, and drawdown of adjacent water table by up to 55 metres are all significant impacts.

The report emphasises that these impacts to North Wambo Creek are severe.

¹ EAR p 18

The report considers that the response from the proponent is dismissive of the significance of the impacts and that the proposed mitigation measures are unfeasible or unhelpful.

The report concludes that the proposed longwalls will incur severe impacts to the natural values of North Wambo Creek, and these impacts can neither be dismissed or remediated suitably. The predicted impacts should be taken at face value when appraising the viability of this proposed modification.

HEL considers that further subsidence under North Wambo Creek and the creek diversion including the associated alluvial aquifers is too great a cumulative impact. Increased ponding, cracking and loss of base flows cannot be approved.

Peabody Energy has not fulfilled current commitments to address long term subsidence impacts on Wambo Creek. There is no confidence that any commitments to meet subsidence impacts on North Wambo Creek will be met.

2. Increased coal and carbon emission production

HEL maintains that the proposal to extend the mine life to produce 11.3 mtpa of coal for another 7 years until 2039 is a climate injustice. It is unacceptable that both government and industry can put their collective heads in the sand on such an important issue as climate change.

The Wambo mine produces large quantities of gas that is released into the atmosphere or flared. The greenhouse gas emissions from the operation are seen to be too high, by any standards. This volatile source of methane must be left undisturbed in the ground. We do not consider that the predicted greenhouse gas emissions from this proposal, as assessed in Appendix J accurate. Even so, the stated increase of 0.05% of national emissions over the period of mining will threaten Australia's ability to meet the Paris Agreement.

3. Biodiversity Impacts

The area of the proposed new mine expansion contains habitat for 37 threatened fauna species, including 11 listed for protection under Federal environmental legislation. The majority of the area of impact is covered by the critically endangered *Central Hunter Valley Eucalypt Forest and Woodland* ecological community. We do not support the conclusion that subsidence impacts will be negligible, particularly on the steep slopes.

The development of a new mine with nine longwall panels within 120m of the World Heritage listed Wollemi National Park is unacceptable. This will cause rock falls and instability of cliff lines and steep slopes. The photos of subsidence damage at the Dendrobium mine, as appear in Appendix A, increases our concern that subsidence from this proposal will not be negligible.

4. Aboriginal Cultural Heritage

It is unacceptable that 34 hectares of the area of impact have not yet been surveyed for Aboriginal cultural heritage sites. This assessment work must be conducted and exhibited for public comment prior to any further progress of the planning process for this proposal.

5. Planning Issues

The project should be a new project proposal, not a 75W modification, because a new mining lease is required and an extension of the development application area. The proposal will impact 508 hectares of land in addition to the current mine footprint. The scale of the proposal with 9 new longwall panels is significant and should be fully assessed as a new extension project, not as a modification.

Wambo Mine already has approval for the extensive Wambo South underground mine that has not yet commenced. This approval was only granted in December 2016 and already Peabody Energy has changed the justification for this modification by proposing to delay it. There is no confidence in the socio-economic analysis or predicted public benefit of projects that form the main basis of approval, when approved projects can be delayed indefinitely.

HEL does not have confidence that Peabody Energy can be trusted to meet mine closure and rehabilitation commitments. This is shown in the recent recapitalisation under Chapter 11 in the US that included reneging on \$2.7b of rehabilitation liabilities.

Conclusion

HEL has raised the issues of cumulative impacts on environments and communities for well over twenty years to date, these issues are very important for the health of populations, environments, rivers and aquifers.

Cumulative impacts on Aboriginal cultural heritage, water sources, biodiversity, neighbours and Wollemi National Park have not been assessed to include surrounding large mines at Hunter Valley Operations, Warkworth –Mt Thorley Complex, United and Bulga operations.

This seventeenth modification of the Wambo Mine cannot be justified. It should not be further considered or assessed until such time as the full assessment of the United-Wambo project is complete.

This proposal should be assessed as a new extension to the Wambo Mine and not as a 75W modification of existing operations.

HEL recommends that the modification be rejected.

Yours sincerely

A black rectangular redaction box covering the signature of Jan Davis.

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UNITED WAMBO OPEN CUT COAL MINE PROJECT

COMMENTS ON SUBSIDENCE, GROUNDWATER AND SURFACE WATER ASSESSMENTS, WAMBO MOD 17

TO: BEVERLEY SMILES

FROM: STEVEN PELLIS

OUR REF: S015.L2

DATE: 7 July 2017

1. INTRODUCTION

The Wambo Development Project (approved in February 2004) has historically applied for various modifications to its approval. This report has been prepared in response to a request by the Hunter Environment Lobby to provide a review of subsidence, groundwater and surface water aspects of the 17th modification, termed "MOD 17".

MOD 17 is for an extension to the South Bates Underground Mine in the form of nine additional longwall panels in the Whybrow Seam. The application for MOD 17 has been accompanied by Environmental Assessments¹. The comments provided in this letter are based on review of the following documents:

- EA 01 Environmental Assessment.pdf
- EA 02 Appendix A Part A – Subsidence Assessment.pdf
- EA 03 Appendix A Part B – Subsidence Assessment.pdf
- EA 04 Appendix B Part A – Groundwater Assessment.pdf
- EA 05 Appendix B Part B – Groundwater Assessment.pdf
- EA 06 Appendix B Part C – Groundwater Assessment.pdf
- EA 07 Appendix C – Surface Water Assessment.pdf

The locations of the proposed longwalls are shown in Figure 1. The thickness of extraction and cross-sections through the panels are shown in Figure 2 and are indicative of relatively low depths of cover (as shallow as 50 metres) and high extraction heights (generally in the order of 3 metres). This is expected to result in relatively large subsidence - as shown in Figure 3 subsidence up to approximately 2 metres is predicted in the EA. The subsidence predictions were made by MSEC

¹ http://majorprojects.planning.nsw.gov.au/page/development-categories/mining--petroleum---extractive-industries/mining/?action=view_job&job_id=8124

using the Incremental Profile Method – a reasonable explanation of this method is provided in Section 3 of EA 02.

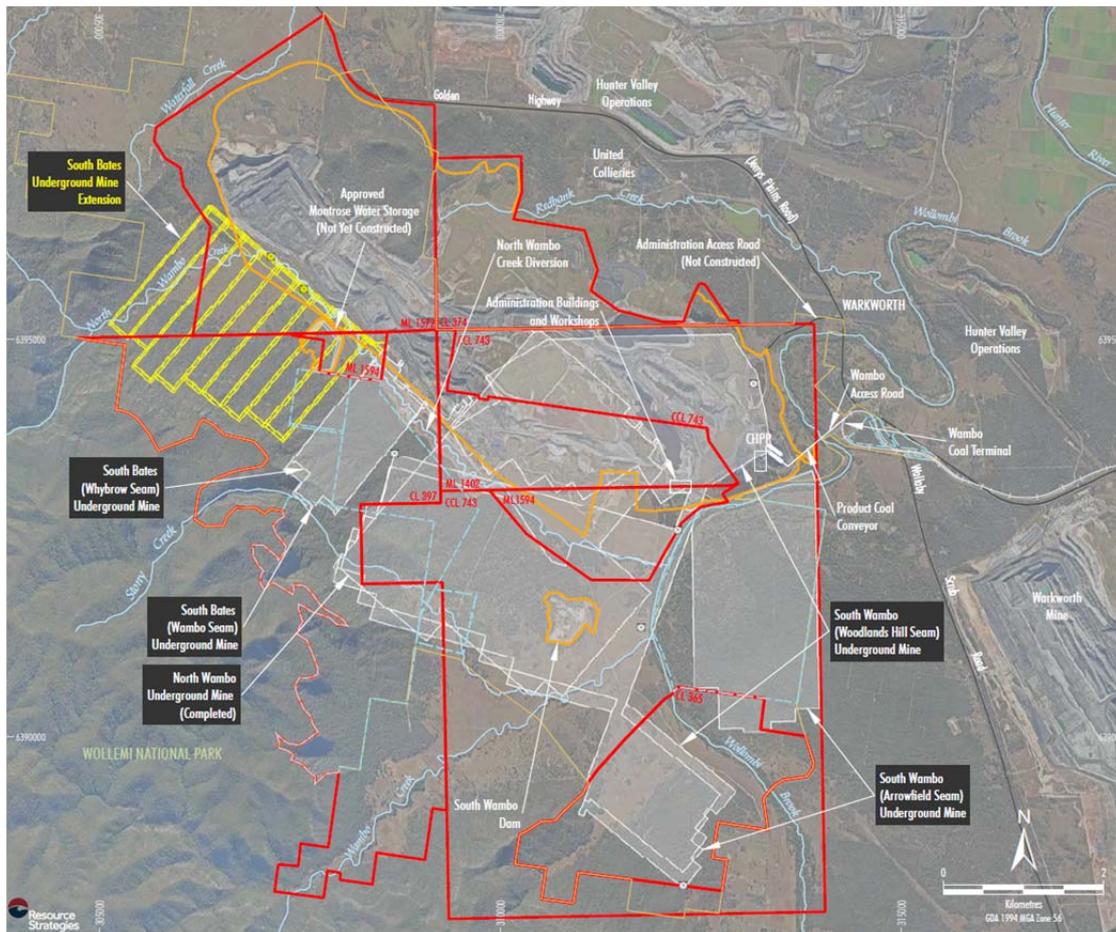


Figure 1 – Overview of Proposed longwalls (from EA 01 Figure 3)

Natural features above the longwall include the natural (undiverted) section of North Wambo Creek and tributaries, as shown in Figure 4. An excerpt from EA 02 (pg 36) describes North Wambo creek as follows:

North Wambo Creek crosses directly above the proposed WYLW23 to WYLW25. This section of creek is a fifth order ephemeral stream with a shallow incision into the natural surface soils. The total length of North Wambo Creek located directly above the proposed longwalls is 2.7 km. The natural surface level along the creek falls from a high point of 130 mAHd to a low point of 106 mAHd above the mining area, representing an average natural grade of approximately 9 mm/m (i.e. 0.9 % or 1 in 110).

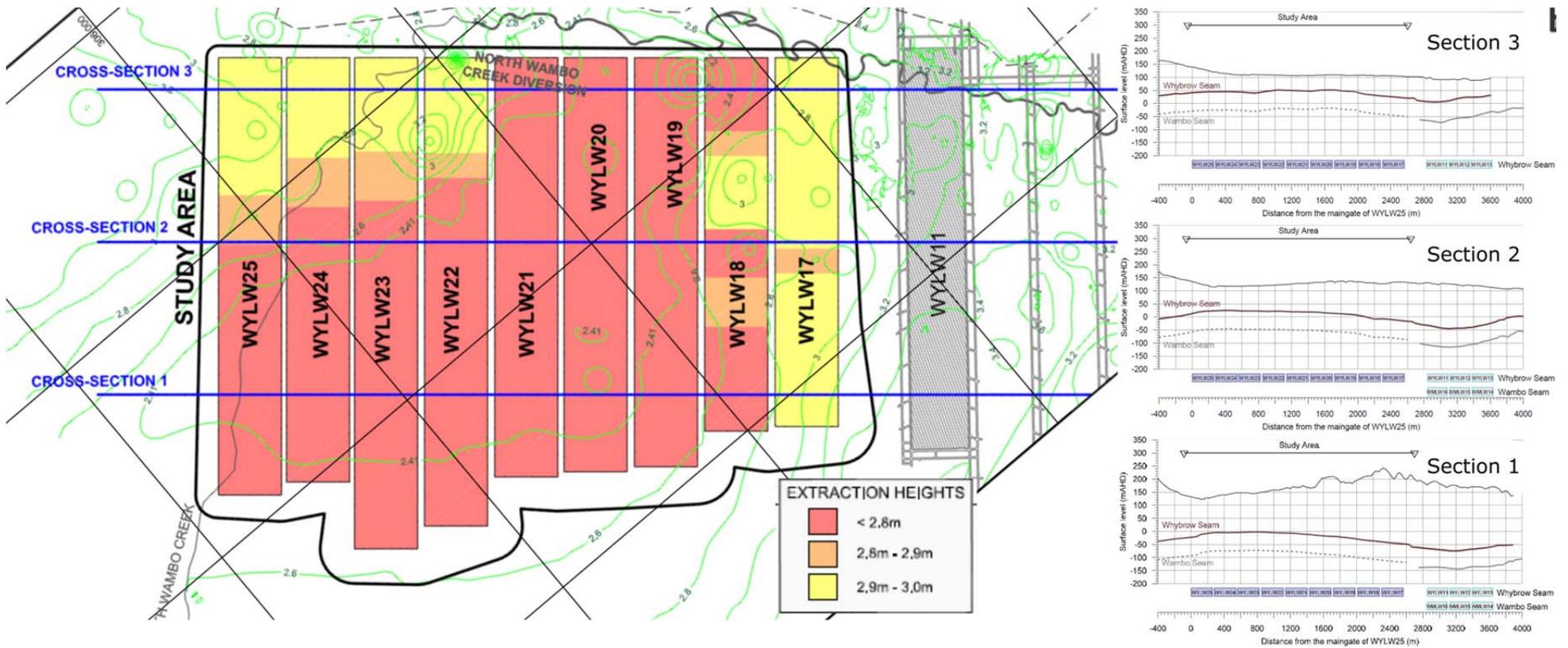


Figure 2 – Longwall extraction depths and cross sections (from EA 03 MSEC Dwg 848-05 and EA 02 Figures 1.2, 1.3 and 1.4)

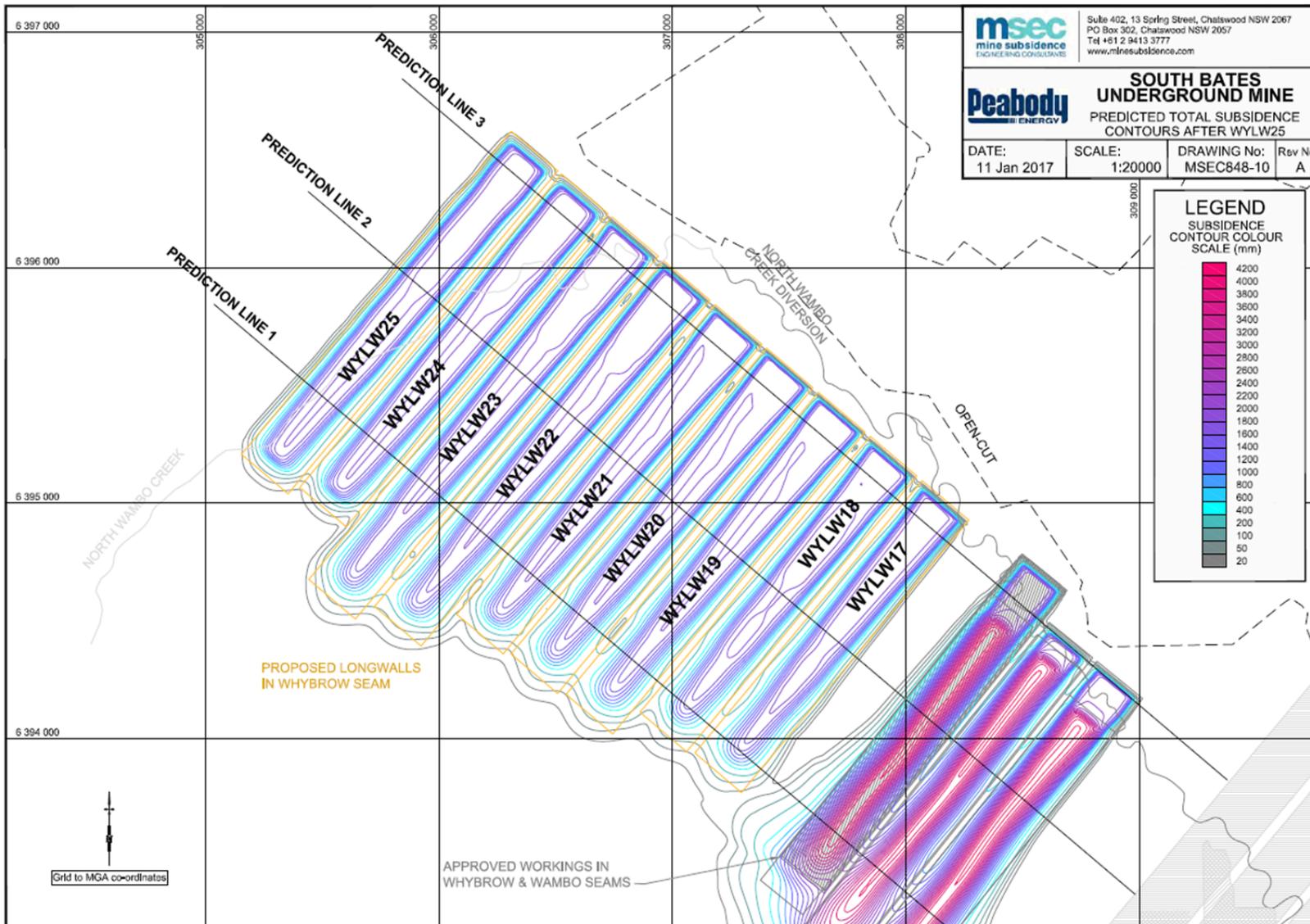


Figure 3 – Predicted subsidence (from EA 03 MSEC Dwg 848-10)

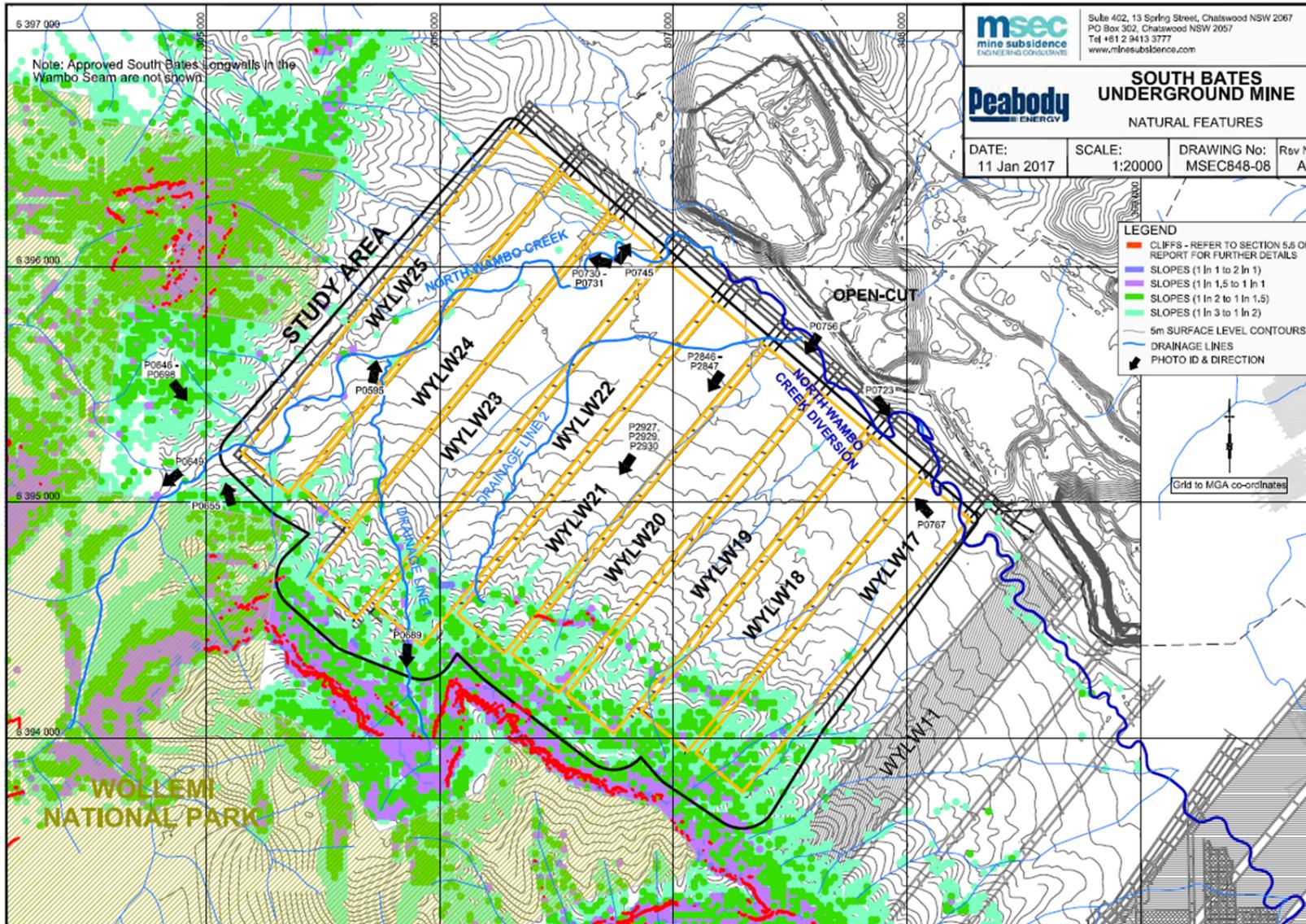


Figure 4 – Natural features above longwalls (from EA 03 MSEC Dwg 848-08)

A summary of predicted subsidence characteristics pertaining to North Wambo Creek is reproduced below (from EA02 pg 38)

Table 5.1 Maximum Predicted Total Subsidence, Tilts and Curvatures for North Wambo Creek

| Location | Longwall | Maximum Predicted Total Subsidence (mm) | Maximum Predicted Total Tilt (mm/m) | Maximum Predicted Total Hogging Curvature (km ⁻¹) | Maximum Predicted Total Sagging Curvature (km ⁻¹) |
|-------------------|--------------|---|-------------------------------------|---|---|
| North Wambo Creek | After WYLW21 | < 20 | < 0.5 | < 0.01 | < 0.01 |
| | After WYLW22 | 50 | 4 | 0.8 | < 0.01 |
| | After WYLW23 | 1,850 | 80 | > 3.0 | > 3.0 |
| | After WYLW24 | 1,950 | 80 | > 3.0 | > 3.0 |
| | After WYLW25 | 1,950 | 80 | > 3.0 | > 3.0 |

The maximum predicted conventional strains for North Wambo Creek, based on applying a factor of 10 to the maximum predicted curvatures, are greater than 30 mm/m tensile and compressive. The predicted strains for the creek based on the 95 % confidence levels (refer to Section 4.4) are: 5 mm/m tensile and 4 mm/m compressive near the commencing end of WYLW25; and 12 mm/m tensile and 17 mm/m compressive near the finishing end of WYLW22.

The following effects from subsidence to North Wambo creek are described in EA 02:

1. Changes to stream gradient – ponding and scouring:

There are five ponding areas predicted to develop along the North Wambo Creek, as a result of the proposed longwalls, having maximum depths varying between 0.3 and 1.4 m and overall lengths varying between 100 and 350 m. There are two ponding areas predicted to develop along Drainage Line 2, as a result of the proposed longwalls, having maximum depths of 0.9 and 1.3 m and overall lengths of 100 and 175 m. Ponding areas are also likely to develop along other drainage lines within the Study Area.

2. Cracking in stream beds:

It is expected that fracturing of the topmost bedrock would develop along the sections of the streams located directly above the proposed longwalls. North Wambo Creek and the drainage lines have shallow incisions into the natural surface soils. Cracking in the beds of the streams would be visible at the surface where the depths of the surface soils are shallow, or where the bedrock is exposed.

The mining induced compression can also result in dilation and the development of bed separation in the topmost bedrock. The dilation is expected to develop predominately within the top 10 to 20 m of the bedrock. Compression can also result in buckling of the topmost bedrock resulting in heaving in the overlying surface soils.

3. Connective cracking in stream beds:

It is not expected that there would be a hydraulic connection between the surface and seam over the majority of the mining area, as none was observed after the extraction of the first seven longwalls at the NWUM, which were extracted directly beneath North Wambo Creek at a depth of cover down to approximately 75 m. It is possible that hydraulic connection between the surface and seam could develop above the finishing (i.e. north-eastern) ends of the proposed longwalls, where the depths of cover are less than 100 m, which is discussed in Section 5.3.

Numerical groundwater modelling for MOD 17 did not employ the regional groundwater model utilised for the MOD 15 (United Wambo Open Cut Coal Mine Project Model) application. It was stated that this previous model was optimised for open-cut operations. The MOD 17 model is of smaller extent, but was reported to include better representation of the underground works and 'more rigorous height-of-fracturing calculations'. The groundwater model nonetheless adopted previously presented hydraulic conductivity values. The value of specific storage used is unclear. In Table 12 of EA03 "storage coefficients 'S' " of 1×10^{-4} to 5×10^{-4} were stated to be used throughout the model, but the units were unstated. This is an

untenably high value for Specific Storage, if the units of 1/m used. The specific storage values selected have a strong influence on predicted effects on groundwater.

The following summary of predicted drawdown above the proposed longwall panels is given in EA 03, pg 47):

In the Whybrow Seam overburden, mining is expected to generate cumulative maximum drawdowns of up to 55 m over the South Bates Extension footprint (Figure 53) all of which is attributable to the Modification, that is the longwall mining of the Whybrow Seam (Figure 59).

The findings of the surface water study (EA 07) with regard to North Wambo Creek appear to be adequately summarised in EA 02, as presented above. The surface water study attempts to quantify the impacts of these effects using modelling. The present writer finds it difficult to accept that these hydrologic studies can quantify the impacts from subsidence. This is because prediction of pool location and sizes, and crack location, size and connectivity are very speculative. For example, the discharge through cracks that may occur in the creek bed may vary enormously depending on the location and geometry of the crack – subsidence modelling cannot predict these locations and geometry, and hence discharge through these cracks cannot be reasonably predicted in hydraulic modelling.

2. ISSUES

We have reviewed the subsidence, groundwater and surface water reports given for MOD17. We accept that the subsidence prediction methodology for the proposed works are reasonable. A detailed review of the numerical groundwater model is beyond the scope of this document, and hence we present the following comments on the assumption that the model is reasonably defined and honestly interpreted. However, one point of clarification is required:

- The units of the values of 'storage' used in the groundwater model are undefined, and appear to be untenably low for representation of specific storage. Clarification is required.

We do not consider that hydrologic modelling presented in EA 07 contributes to the understanding of impacts from subsidence and cracking, as the mining effects are too speculative to meaningfully model. Nonetheless, we accept the summary of postulated impact mechanism that are presented.

In summary, while we do not take issue with the methodology of the subsidence and groundwater studies, we question:

- whether the predicted impacts to North Wambo creek can be considered as acceptable, and;
- whether the proposed mitigation measures for North Wambo creek are reasonable.

It is clear that the extent of subsidence and cracking is such that it would greatly disturb the natural values of North Wambo Creek. The predicted changes to stream gradient, extensive bed cracking, and drawdown of adjacent water table by up to 55 metres are all significant impacts. While it is not our role to make a determination of the acceptability of these impacts, it is emphasised that these impacts to North Wambo Creek are severe.

The proposed responses from the proponent appear to be either: dismiss or reduce the significance of these impacts, or; to propose unfeasible or unhelpful mitigation measures.

Example of unreasonable dismissal of impacts include:

- as regards changes to stream gradients and development of ponding –
 - “the pools have the ability to enhance the diversity of habitat” (EA 07 pg 37).
- as regards cracking of stream beds –
 - “in times of heavy rainfall, the majority of runoff would flow over the natural surface soil beds” (EA 03 pg 40).
 - “it would be expected that fracturing ... would .. fill naturally” (EA 04 pg 40 and 41)
- as regards connective cracking it is stated that
 - “direct hydraulic connection (connective cracking) between the surface and seam is not expected ... although there is some potential above the north-eastern end of longwalls” (EA 07 pg 39).

Following this statement, there is no consideration given to connective cracking for North Wambo Creek – the notion of ‘not expected’ appears to be sufficient for dismissal of this risk.

These dismissals of impacts are not considered to be acceptably founded. The citation of ‘similar experiences’ where cracking has not occurred (EA 03) is not considered sufficient to dismiss those cases where it has in fact occurred.

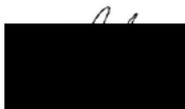
The proposed mitigation measures include:

- excavation of beds,
- regrading of the stream,
- infilling or sealing of cracking
- rock armouring

Such hard-engineering approaches are not considered viable for management and protection of a natural stream system.

In summary, the proposed longwalls will incur severe impacts to the natural values of North Wambo Creek, and these impacts can neither be dismissed or remediated suitably. The predicted impacts should be taken at face value when appraising the viability of this proposed modification.

Yours faithfully,



STEVEN PELLIS
BE (Civil) MEngSci PhD