# ASSESSMENT REPORT

## AUSTAR COAL MINE

### Modification to Stage 2 Panel A5a (DA 29/95 MOD 5)

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Austar Coal Mine Pty Limited (Austar), a subsidiary of Yancoal Australia Pty Limited, owns and operates the Austar Coal Mine Complex, an underground coal mine and coal handling facility located 6 kilometres (km) south of Cessnock, in the Lower Hunter Valley (see Figure 1).

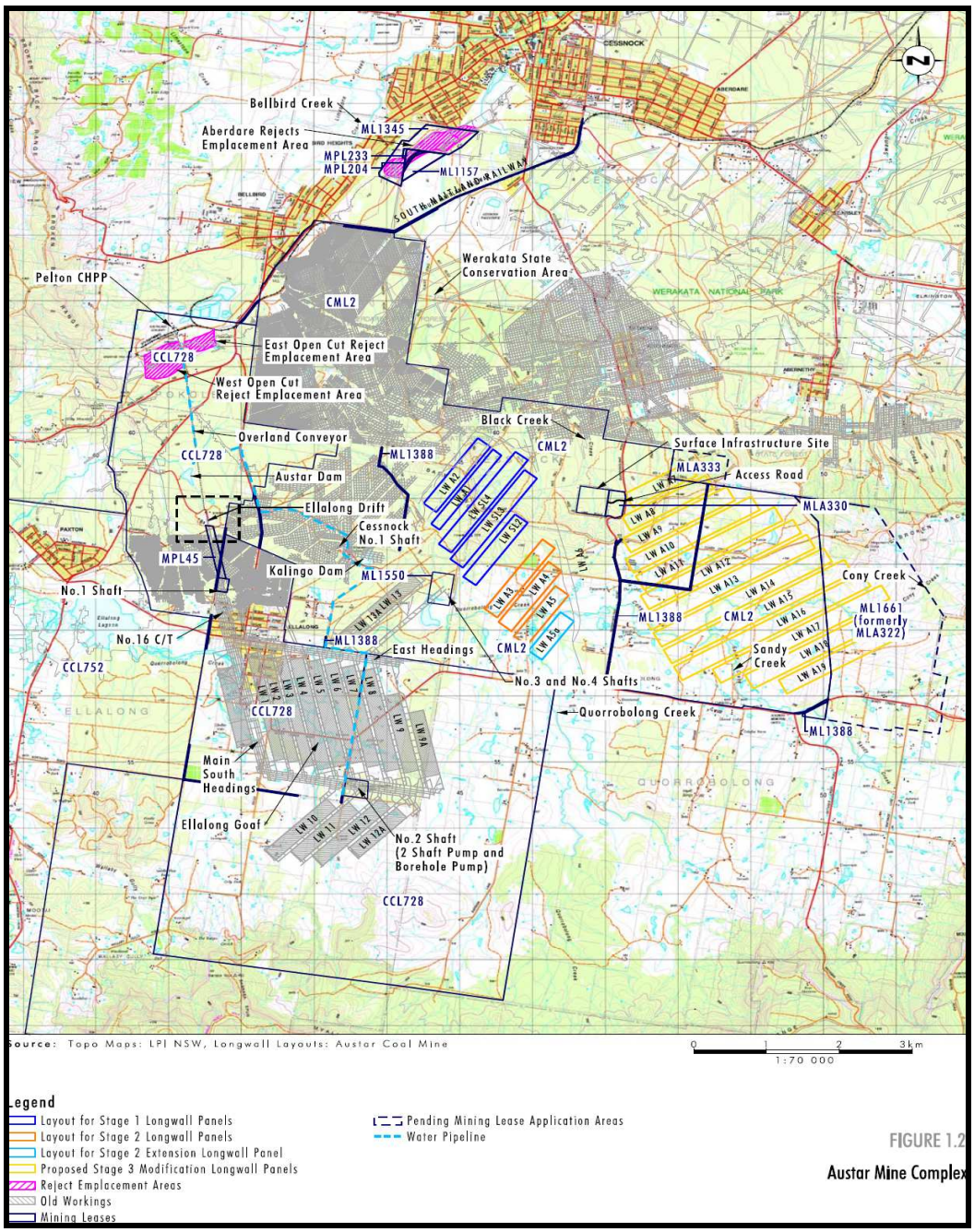


***Figure 1:*** *Location and layout of the Austar Mine Complex*

The mine is an amalgamation of the historic Ellalong, Southland and Bellbird South collieries. The mine and its associated operations, which include coal extraction, handling, processing and transport, collectively form the Austar Mine Complex.

The Austar Mine Complex operates within a number of mining leases, and under 12 separate development consents issued by the Minister and Cessnock City Council between 1974 and 2002. The mine plan involves 3 stages. Stage 1 has been completed, and mining currently occurs in Stage 2 (panels A3 – A5a). Stages 1 and 2 are regulated under a development consent issued by the then Minister for Urban Affairs and Planning in 1996 (DA 29/95 – see Appendix A). Stage 3 (panels A7 – A19) is under development and is expected to commence in 2013. The Stage 3 project approval (MP 08_0111), granted in August 2009, regulates the mine complex's coal production rate, coal processing, coal rejects and tailings emplacement, transporting coal by rail to the Port of Newcastle, and transporting coal by road to specialist end users.

DA 29/95 has been modified four times:

- in 2006 and 2008 to allow the introduction of Longwall Top Coal Caving (LTCC) technology in Stage 1 and Stage 2 respectively;
- in 2009 to widen the Stage 2 panels; and
- in 2010 to expand the Stage 2 mining area to include panel A5a.

The mine complex is approved (under MP 08_0111) to produce and transport up to 3 million tonnes of coal per annum until 2030.

## 2. PROPOSED MODIFICATION

On 13 January 2012, Austar lodged a modification application (DA 29/95 MOD 5) with the Department, under section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

A dyke structure consisting of two igneous intrusions, occurs in an area north-northeast of the Stage 2 panels, and between the Stage 2 and Stage 3 mining areas. The dyke is a hard rock structure and therefore difficult to mine through. The dyke has influenced Austar's mine planning, by limiting the lengths of the Stage 2 panels, and has resulted in the recent removal of panel A6 from the Stage 3 mine plan.

Following completion of the panel A5 maingate roadway (ie the eastern roadway between panels A5 and A5a), Austar undertook exploratory drivage through the dyke structure to access the area where extraction in panel A5a would commence. The exploration found that the eastern part of the dyke structure did not intersect the corner of the maingate roadway, as previously anticipated. The results of the exploration show that the commencing (northern) end of panel A5a could be safely extended by 127 metres (m) (see Figure 2), allowing an additional 175,000 tonnes of coal to be extracted from panel A5a.

Austar therefore proposes to modify DA 29/95 to extend the length of panel A5a by 127 m (ie from 735 m to 862 m, an increase of approximately 15%). The width of the panel would remain as approved (ie 227 m). The proposed increased extraction from panel A5a would not affect the overall production rate at the mine, or its life. Therefore the amount of coal reject requiring emplacement also would not increase. No changes to the mine complex's other approved activities would result from the proposed modification, such as the mining method, processing activities or transportation systems.

## 3. STATUTORY CONTEXT

### 3.1 Section 75W

This application is a proposal to modify development consent DA 29/95. Under clause 8J(8)(c) of the *Environmental Planning and Assessment Regulation 2000*, DA 29/95 can be modified under section 75W of the Act (ie under Part 3A). The modified development consent however remains a development consent under Part 4 of the EP&A Act.

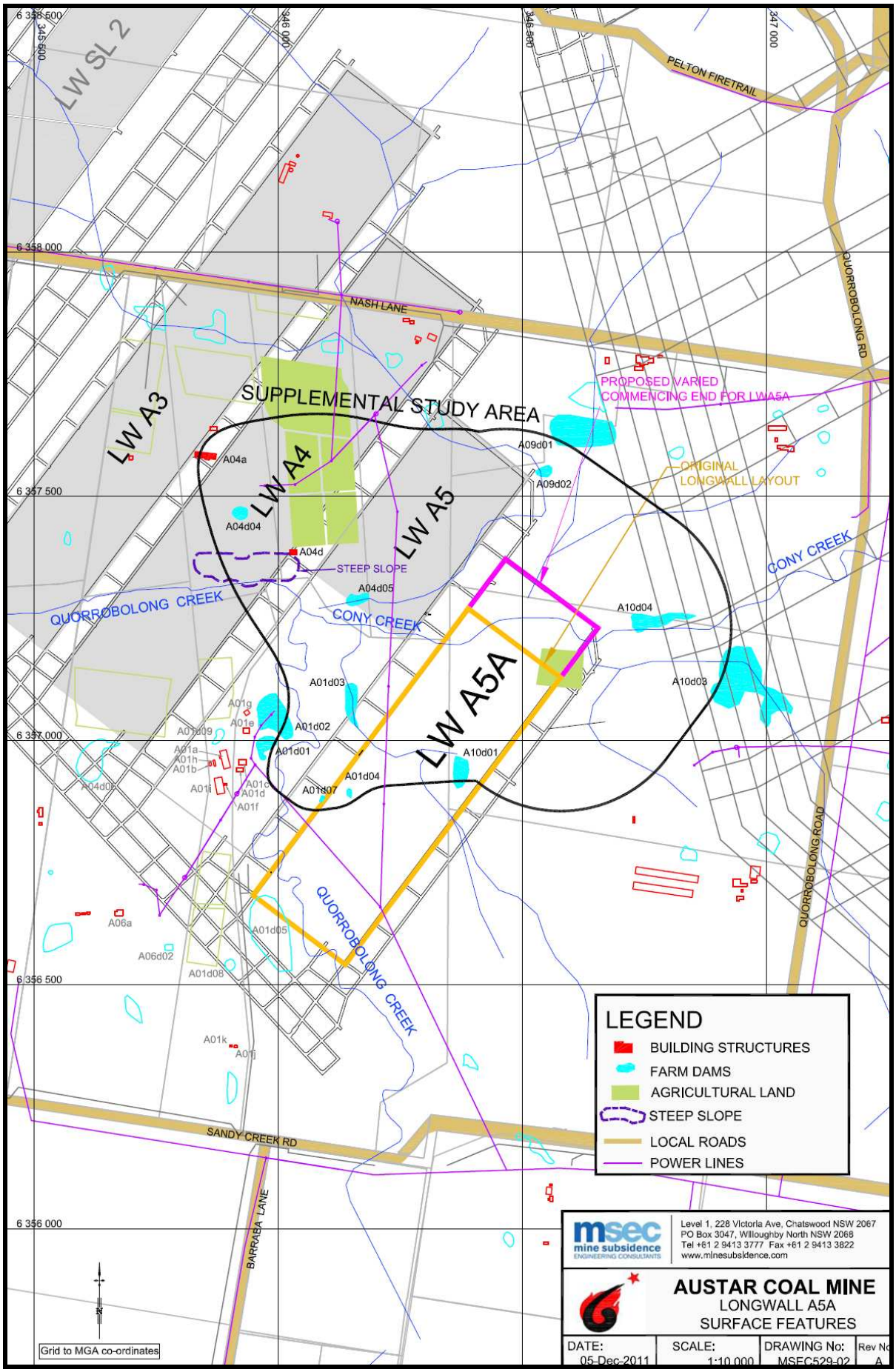


***Figure 2:*** *Stage 2 mining area (pink line shows the proposed modification area)*

### 3.2 Approval Authority

The Minister for Planning and Infrastructure is the approval authority for the proposed modification. However, under the Minister's delegation of 14 September 2011, the Executive Director, Major Development Assessment may determine the modification application, as less than ten community objections were received, Cessnock City Council did not object to the proposal, and no political donations have been reported by the applicant.

## 4. CONSULTATION

### 4.1 Exhibition and Agency Consultation

Under section 75W, the Department is not obliged to undertake any consultation relating to the proposed modification. However, the Department placed the EA on its website, and sought comment from key government agencies. The Department also wrote to landowners who would potentially be impacted by the proposal to give them the opportunity to comment.

### 4.2 Submissions

The Department received six submissions (see Appendix C), which included four submissions from public authorities, and two submissions from potentially affected landowners. The Department referred the submissions to Austar, which provided a response to the issues raised (see Appendix D).

*Public Authorities*
The **Environment Protection Authority** did not object to the proposed modification. However, it requested that Austar monitors the condition of the two Endangered Ecological Communities (EECs) which occur in the additional section of Cony Creek that would be undermined by the proposed extension to panel A5a.

The **NSW Office of Water (NOW)** did not object to the proposed modification. NOW recommended that Austar expands its groundwater monitoring network, to quantify additional impacts to alluvial aquifers.

The **Division of Resources and Energy** (within the Department of Trade, Industry, Regional Infrastructure and Services), raised no objection to the proposed modification.

**Cessnock City Council (Council)** did not object to the proposed modification. Council however expressed concern with the potential for increased subsidence impacts, and highlighted the need for adequate conditions of consent to be applied to minimise the environmental impacts of the proposal.

*Landowners*
The owners of two properties that would be undermined by the proposed panel A5a extension raised concerns that the proposed modification would result in increased impacts at their properties. Their submissions stated/asked:

- concerns that the flow regime in Cony Creek could be impacted, which could affect the availability of water for irrigation purposes;
- whether compensation would be available if mining impacted the amount of water available for irrigation;
- concerns with the potential flooding impacts of the proposed modification;
- concerns that increased subsidence could cause damage to residences and farm buildings; and
- concerns regarding the impact on property saleability.

## 5. ASSESSMENT

### 5.1 Subsidence

The proposed modification would potentially increase the area affected by subsidence, as well as the maximum subsidence level for the Stage 2 mining area. Austar's subsidence impact assessment (SIA – see Appendix B), predicted the potential maximum subsidence levels and increase in the area which would potentially be impacted by the proposed modification. The Department notes that no residences or farm structures are located directly above the subject extension area. Austar assessed the risk of increased subsidence impacts at all natural and man-made features in the Stage 2 subsidence impact area (the 20 mm subsidence contours shown on Figure 3), which include:

- Cony Creek and Quorrobolong Creek;
- residences;
- farm structures and farm dams;
- a steep slope above panel A4; and
- powerlines, telecommunications cables and survey control marks.

The cumulative Stage 2 subsidence impact area would increase in size from 2,456 $km^2$ to 2,527 $km^2$ (ie an increase of 3%, see Figure 3) from the proposed modification. The SIA predicted that cumulative subsidence levels following extraction of modified panel A5a would potentially be slightly increased over the levels previously assessed and approved (see Table 1). The predicted increase in cumulative subsidence represents a 5% increase in the previously predicted level, and is considered to be within the order of accuracy of the prediction method.

***Table 1:*** *Cumulative subsidence levels resulting from the extraction of panels A3-A5a*

| ***Area*** | ***Maximum predicted subsidence (m)*** | ***Maximum predicted tilt (millimetres (mm)/m)*** | ***Maximum predicted total hogging curvature ($km^{-1}$)*** | | ***Maximum predicted total sagging curvature ($km^{-1}$)*** | |
|---|---|---|---|---|---|---|
| | | | ***Cony Creek*** | ***Quorrobolong Creek*** | ***Cony Creek*** | ***Quorrobolong Creek*** |
| A3 - A5a (approved) | 1.45 | 5.7 | 0.03 | 0.03 | 0.01 | 0.05 |
| A3 - modified A5a (proposed) | 1.49 | 5.8 | 0.02 | 0.02 | 0.04 | 0.05 |

The SIA concluded that predicted subsidence impacts to all natural and man-made features would be similar in nature and extent to those which were previously assessed. Any increase in impacts would not be significant, and would be adequately monitored and managed under the mine's approved Subsidence Management Plan (SMP), which Austar would be required to update in accordance with the existing conditions of DA29/95.

An additional 800 m section of Cony Creek could potentially be affected by subsidence from the proposed modification, as it is located directly above the proposed extension (see Figure 2). The same length of Quorrobolong Creek is within the area of affectation.

The maximum predicted vertical subsidence levels at these creeks could increase from 1050 mm to 1200 mm at Cony Creek (a 10% increase), and from 1250 mm to 1300 mm at Quorrobolong Creek (a 4% increase). However, any impacts would be dictated by the potential changes in the grade of the land surface (measured as 'hogging' curvature and 'sagging' curvature, or the rate of change of vertical and horizontal grade) and not by vertical subsidence.

Table 1 shows decreased hogging curvature for Cony Creek and increased sagging curvature. This increase is however within the rate predicted for Quorrobolong Creek and not expected to cause significant impacts to Cony Creek. The maximum hogging and sagging curvatures in Quorrobolong Creek from the proposed modification are predicted to be comparable with the approved project.

Therefore the Department is satisfied that the proposed modification would not result in increased impacts at the two creeks, compared to previous assessments. Any unforseen increase in impacts would not be expected to be significant, and any impacts would be able to be appropriately managed under the mine's SMP.

The proposed modification is not predicted to cause any impacts to any additional residences that were not previously predicted to be impacted by the approved mine. Vertical subsidence is predicted to increase within the order of accuracy of the prediction method at one house and one farm building (which are both owned by Austar, and marked as A04a and A04d on Figure 2). These structures are located above panel A4, where mining has already been completed and in an area where no further subsidence movements would be expected to occur. No increased impacts resulting from the proposed modification are expected to eventuate at these buildings.

Impacts at all other residences and farm buildings within the subsidence impact area are not predicted to increase as a result of the proposed modification, and the Department is satisfied that any unforseen additional impacts would be adequately managed under the mine's SMP.

Subsidence levels are also predicted to be slightly higher (again within the order of accuracy of the prediction method) at other man-made structures such as farm dams, overhead powerlines,

telecommunications cables and survey marks. All these features would remain safe, serviceable and repairable, in accordance with Mine Subsidence Board criteria.

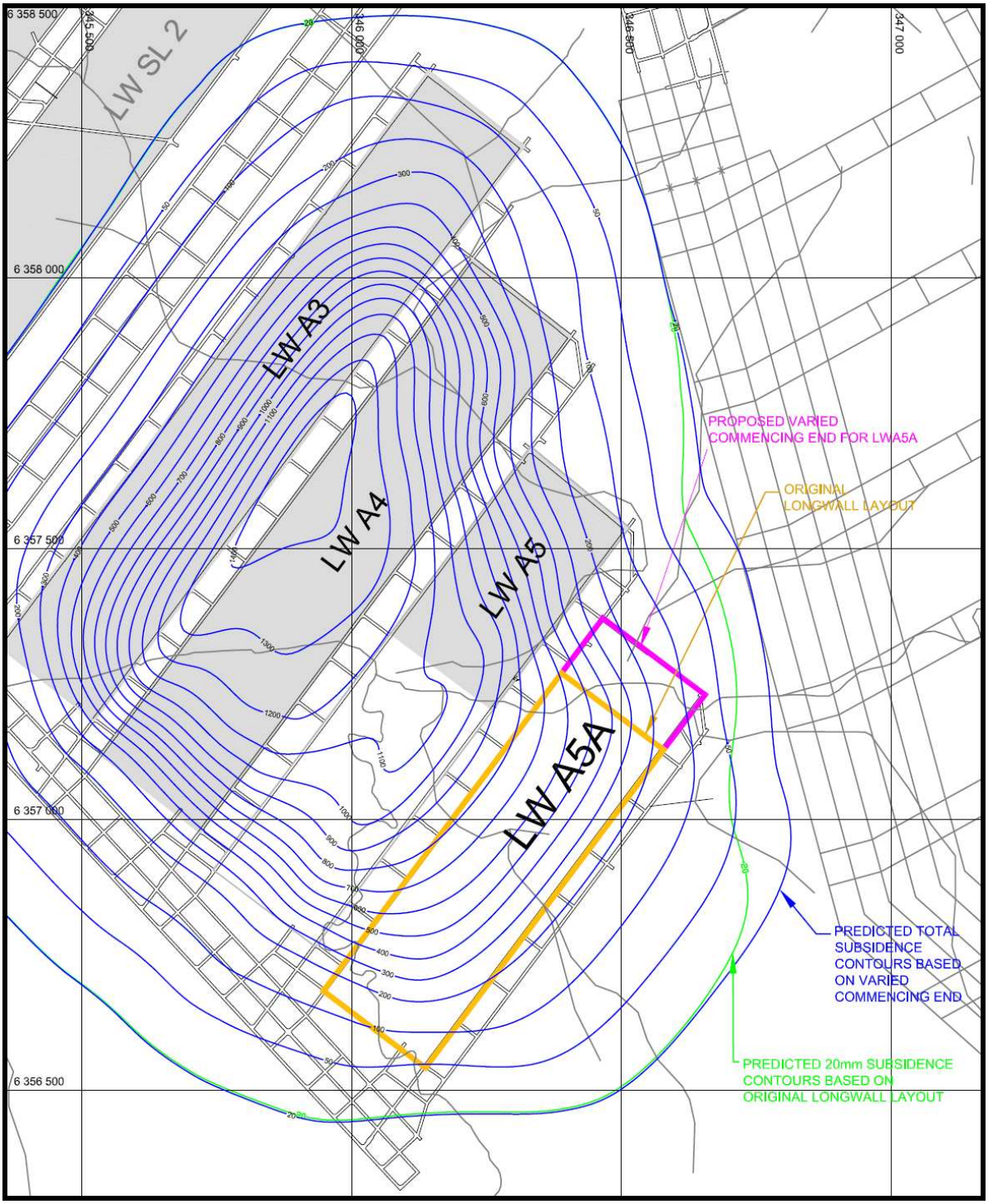


***Figure 3:*** *Stage 2 cumulative subsidence profiles*

Other factors which would act to limit the resulting increased subsidence levels and impacts include that:

- the strong Branxton Formation strata (which overlie the coal measures) restricts the resulting magnitude of vertical subsidence movements; and
- Austar's subsidence predictions are based on the full recovery of a seam height of 6.5 m, which would not eventuate as the maximum seam height in the extension area is 6 m.

Austar would continue to monitor subsidence levels for the proposed modification under its SMP. Its monitoring to date has shown that the actual recorded subsidence levels are less than predicted. Austar is confident that the maximum cumulative vertical subsidence after extraction of modified panel A5a would maintain this trend.

The Department is therefore satisfied that the subsidence levels and resultant impacts during and following mining of modified panel A5a are likely to be similar to those which have been recorded during Stage 2 mining operations. Austar is required to revise and update the approved SMP to incorporate the proposed modification, under the existing conditions of consent. Given that this requirement is already in place, the Department is satisfied that no additional conditions of consent with regard to subsidence management are required.

### 5.2 Surface Water

*Impacts to Watercourses*
As discussed in Section 5.1, subsidence impacts at Cony Creek and Quorrobolong Creek would be negligible. The likelihood of hydraulic fracturing and subsurface flows occurring at either Quorrobolong Creek or Cony Creek is also negligible. The strength of the Branxton Formation and the depth of cover to the mine (530 – 560 m) would limit the total height of the fractured zone to between 235 – 275 m above the coal seam. Therefore connective cracking from the creeks to the mine would be unlikely to occur and significant impacts to flow regimes and availability of water for irrigation purposes are unlikely.

*Flood Impacts*
Austar revised its Stage 2 flood assessment to include predicted flood depths and flood velocities following mining of modified panel A5a. Minor increased maximum flood depths for a 1 in 100 year average recurring interval flood event are predicted within Cony Creek, but only in a short section upstream of the confluence of Quorrobolong Creek. The predicted increased flood depth would not be expected to result in any increase in inundated area or increased flood impacts at dwellings or access roads. Minimal increases in the extent and velocity of flood events are also predicted for Cony Creek, which would not be expected to lead to significant creek scouring or erosion impacts. At Quorrobolong Creek, both the flood extent and flood velocity level are expected to reduce, particularly in the vicinity of the chain pillar between panels A5 and A5a. Despite the increased predictions at Cony Creek, no additional flooding impacts would be expected at any residences or property access roads either in, or in the vicinity of, the Stage 2 mining area.

*Conclusion*
The Department is satisfied that any additional surface water and flooding impacts as a result of mining the modified panel A5a would be very limited and confined to localised areas which would not affect residences or access roads. The Department considers that impacts would be able to be adequately managed under the mine's SMP, and no additional conditions of consent are required to manage surface water and flooding impacts from the proposed modification.

### 5.3 Groundwater

The low permeability of the strong Branxton Formation strata would limit any hydraulic connection from the associated water-bearing zones or aquifers into the coal measures. A potential water-bearing zone occurs to a depth of 70 m – 100 m below the ground surface. As the limit of fracturing above the coal seam is predicted to occur only up to 275 m (ie between 255 m – 285 m below the ground surface), it is unlikely that this fracturing would intercept the water bearing zone.

Austar is required to review and, if necessary, revise its approved Site Water Management Plan to incorporate the proposed modification in accordance with the existing conditions of consent. The plan already includes a comprehensive monitoring program, to monitor groundwater levels in alluvial aquifers, fractured rock aquifers, abandoned mined areas, and in shallow water-bearing zones. The Department is satisfied that negligible additional groundwater impacts would result from the proposed modification, and existing conditions of consent would continue to provide an adequate management framework.

### 5.4 Other Issues

The Department has assessed other potential impacts from the proposed modification, and these impacts are considered in Table 2:

***Table 2:*** *Other issues*

| ***Issue*** | ***Consideration*** |
|---|---|
| *Biodiversity* | Two EEC communities occur along the section of Cony Creek which would be undermined by the proposed modification. However the predicted subsidence levels are not expected to significantly impact these communities. Austar would continue its |

| | |
|---|---|
| | monitoring of these communities as required under the existing conditions of consent. The Department is satisfied that any additional impact would be adequately managed under the mine's approved SMP and Biodiversity Management Plan. |
| *Heritage* | No significant Aboriginal or European heritage sites have been recorded within the Stage 2 mining area, including the area potentially affected by the proposed modification. Austar would manage heritage impacts under the management plans required under its development consent and project approval. The Department therefore considers no additional conditions of consent would be required to manage heritage impacts. |
| *Property Values* | Two local landowners whose properties would be undermined by the proposed modification are concerned that property values in the area will drop due to the potential environmental impacts. The Department considers that all the potential environmental impacts associated with the proposed modification have been addressed and that no noticeable impacts would be likely to occur at any structures. The Department also considers that any residual impacts can be effectively managed such that they do not pose a loss of amenity in the surrounding area. |
| *Socio-economic* | The proposed modification would allow an additional 175,000 tonnes of coal to be extracted from panel A5a. The additional coal recovered would provide additional income to the State through taxes and royalties. Austar would continue to employ 270 people, and would also continue to offer its royalty agreement to any affected landowner (which is not required under the consent, however is offered to landowners who would be undermined) to offset the potential impacts of the mine. |

## 6. NOTICE OF MODIFICATION

The Department reviewed the existing consent, along with both Council and agency submissions in relation to the need or otherwise for additional conditions of consent as a result of the proposal. The Department considers the existing conditions of consent provide an adequate framework for the management of any impacts which may result from the proposed modification. A Notice of Modification has been prepared (see Appendix E), which makes minor administrative changes to the consent (see Appendix A). Austar has considered and accepted the Notice of Modification.

## 7. CONCLUSION

Austar is seeking to modify its development consent for the Austar Coal Mine Stage 2 mining area. The proposed modification seeks to extend the commencing end of approved panel A5a by approximately 127 m. The proposed extension does not require any of the mine's other approved activities to be modified.

The Department has considered the potential impacts of the proposed modification, which include subsidence impacts, water impacts, biodiversity impacts and heritage impacts. The Department is satisfied that impacts from the proposed modification would not be significant, and comparable with the approved development. The Department is satisfied that the proposed modification would be able to be undertaken in accordance with the mine's existing regulatory framework, and would be incorporated its approved management plans (including its SMP).

The Austar coal mine provides significant direct and indirect socio-economic benefits to the Cessnock region. The Department is satisfied that the proposed modification is generally in the public interest, and should be approved, subject to conditions.

## 8. RECOMMENDATIONS

It is RECOMMENDED that the Executive Director, Major Development Assessment, as delegate of the Minister for Planning and Infrastructure:

- **considers** the findings and recommendations of this report;
- **approves** the modification application DA29/95 MOD 5, subject to conditions, under section 75W of the *Environmental Planning and Assessment Act 1979*; and
- **signs** the attached Notice of Modification (Appendix E).

Felicity Greenway 27/4/12
Felicity Greenway
**A/Director, Mining & Industry Projects**

27.4.12
Chris Wilson
**Executive Director, Major Development Assessment**

# APPENDIX A: DEVELOPMENT CONSENT DA29/95 (AS MODIFIED)

# APPENDIX B: ENVIRONMENTAL ASSESSMENT

# APPENDIX C: SUBMISSIONS

# APPENDIX D: RESPONSE TO SUBMISSIONS

# APPENDIX E: NOTICE OF MODIFICATION