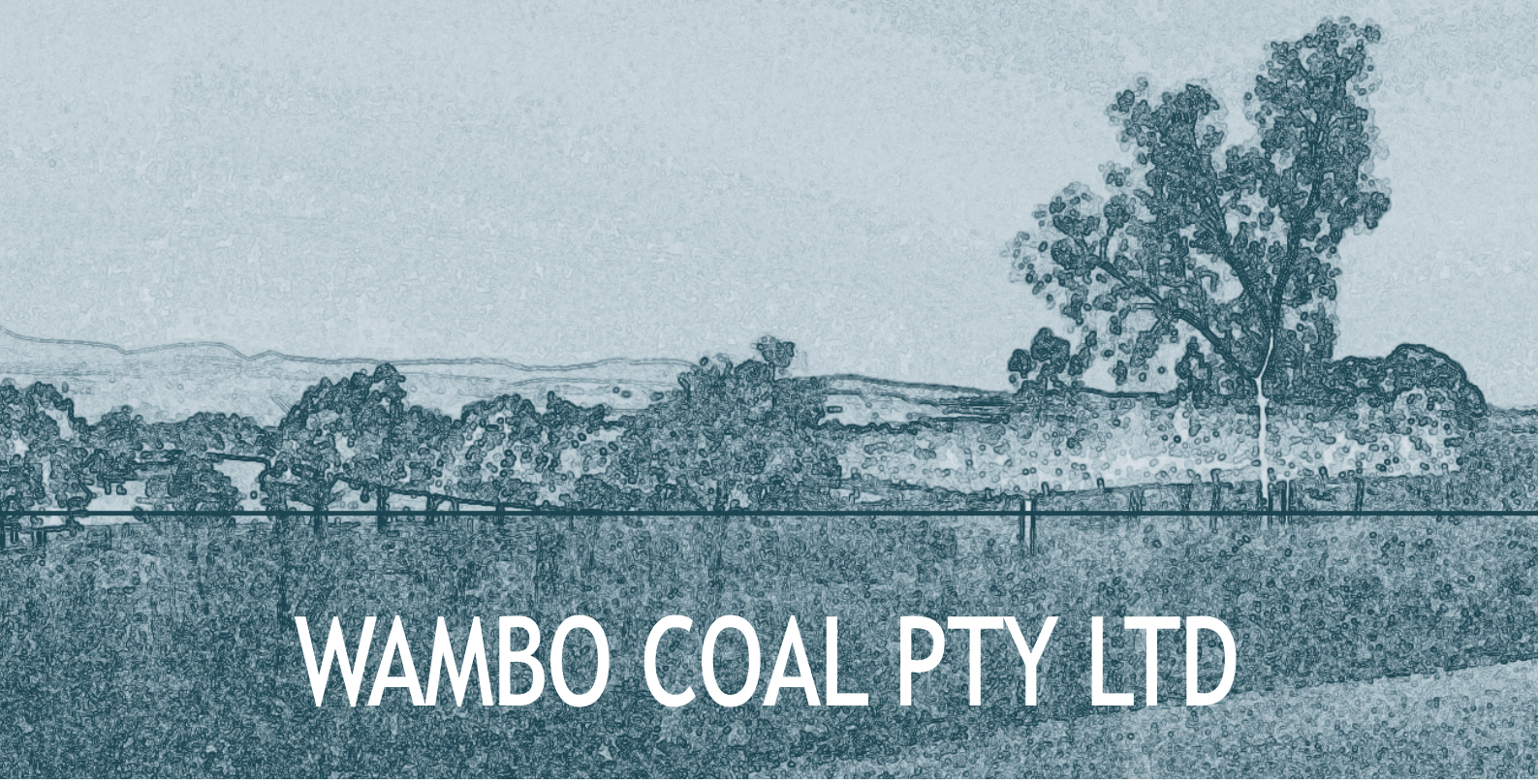

WAMBO COAL PTY LTD

NORTH WAMBO UNDERGROUND MINE MODIFICATION

RESPONSE TO SUBMISSIONS

FOR THE MODIFICATION OF DA 305-7-2003 (MOD 13)
THE ADDITION OF NORTH WAMBO UNDERGROUND MINE
LONGWALLS 9 AND 10

April 2013

Peabody ENERGY

RESPONSE TO SUBMISSIONS

Wambo Coal Pty Limited (WCPL), a subsidiary of Peabody Energy Australia Pty Limited (Peabody), prepared the *North Wambo Underground Mine Modification Environmental Assessment* (EA) to support an application to modify the Wambo Development Consent (DA 305-7-2003) under section 75W of the New South Wales (NSW) *Environmental Planning and Assessment Act, 1979*.

The EA was placed on public exhibition by the NSW Department of Planning and Infrastructure (DP&I) from 1 February 2013 to 18 February 2013.

Table 1 provides a reconciliation of the submissions received from State and Local Government agencies. Table 2 provides a reconciliation of public submissions.

WCPL has prepared a response to the issues raised in the submissions. Responses to submissions made by Government agencies and the public are provided in Tables 3 and 4, respectively.

Table 1
Reconciliation of Agency Submissions

Agency	Date
NSW Environment Protection Authority (EPA)	17 December 2012
Office of Agricultural Sustainability and Food Security (O AS&FS) within the NSW Department of Primary Industries (DPI)	8 January 2013
NSW Office of Environment and Heritage (OEH)	11 January 2013
Division of Resources and Energy (DRE) within the NSW Department of Trade and Investment, Regional Infrastructure and Services (NSW Trade & Investment)	14 January 2013
DPI (including NSW Office of Water [NOW] and Fisheries NSW)	9 April 2013

Table 2
Reconciliation of Public Submissions

Name	Date	Nature of Submission
Construction Forestry Mining and Energy Union (Mining and Energy Division) Northern District Branch	18 February 2013	Support
Mr R Fenwick	18 February 2013	Objection

Table 3
Response to Agency Submissions

Comment	Response
NSW Environment Protection Authority (EPA)	
The EPA advised that no additional Environment Protection Licence conditions would be required for development of the additional longwall panels.	Noted.
The EPA advised it has no objections to the project proceeding as described in the EA.	Noted.
Office of Agricultural Sustainability and Food Security (O AS&FS) within the NSW Department of Primary Industries (DPI)	
The O AS&FS stated the Agricultural Impact Statement (AIS) had adequately described the quality of soils and potential impacts from subsidence for agriculture.	Noted.
The O AS&FS recommended the suggested mine subsidence strategies (pages 25-26 of Appendix F of the EA) are included in the consent conditions to enable continued agricultural use of the land above the longwall mining.	WCPL proposes to incorporate the management measures to mitigate potential impacts on agricultural activities in the Extraction Plan for Longwalls 9 and 10.
The O AS&FS recommended DP&I seek advice from the NSW Office of Water (NOW) whether the predicted loss of 0.3 megalitres per day of water from Wollombi Brook would impact on irrigation/stock water from downstream agriculture.	The Modification is consistent with the *Aquifer Interference Policy* (NSW Government, 2012) as described in Attachment 2 of the EA. WCPL also holds adequate licences to account for the potential take of water associated with the approved operations and Modification. Heritage Computing Pty Ltd (2012) concluded the Modification would have no discernable impact on stream baseflow beyond the effects of approved mining for Wollombi Brook, North Wambo Creek, Wambo Creek and Stony Creek (Appendix B of the EA). No privately owned registered bores in alluvium or regolith are predicted to incur more than 0.1 metre incremental drawdown due to the Modification.

Table 3 (Continued)
Response to Agency Submissions

Comment	Response
Office of Environment and Heritage (OEH)	
The OEH noted that a variation of the existing Aboriginal Heritage Impact Permit (AHIP) No. 2222 would be required for the portion of the Modification area outside the existing AHIP area.	WCPL plans to apply for the existing AHIP No. 2222 to be slightly expanded to cover the Modification areas outside the existing consent area (Section 4.6.2 of the EA). WCPL has initiated consultation with the OEH in this regard. The Cultural Heritage Impact Assessment was prepared in accordance with the consultation process to be undertaken before applying for AHIP outlined in the *National Parks and Wildlife Regulation, 2009* (NP&W Regulation) and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (Department of Environment, Climate Change and Water [DECCW], 2010a).
The OEH recommended that WCPL consult with and involve all the registered local Aboriginal parties for the project in the ongoing management of Aboriginal cultural heritage values.	Consultation with Aboriginal stakeholders is conducted in accordance with the approved Salvage and Management Programme (Navin Officer Heritage Consultants, 2005) that formed part of the original AHIP application. In accordance with the approved Salvage and Management Programme, representatives from the local Aboriginal stakeholder community groups are invited to observe and, where appropriate, participate in the salvage works (e.g. recording, collection, storage and replacement of artefacts).
The OEH recommended that the existing Heritage Management Plan for the North Wambo Underground Mine is updated in consultation with the registered Aboriginal parties for managing all cultural heritage values associated with the broader development area.	The Heritage Management Plan for the North Wambo Underground Mine would be updated to include the Modification longwalls (Longwalls 9 and 10) as part of the Extraction Plan process. The Heritage Management Plan would reflect the management and mitigation measures presented in the Cultural Heritage Impact Assessment for the Modification and the approved Salvage and Management Programme. Consultation undertaken for Cultural Heritage Impact Assessment for the Modification was undertaken in full compliance with the NP&W Regulation and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a). No additional consultation with registered Aboriginal parties is considered necessary during the revision of the Heritage Management Plan as all of the proposed management and mitigation measures for Longwalls 9 and 10 have been subject to a comprehensive and contemporary consultation process with registered Aboriginal parties as part of the original AHIP application and the development of the Cultural Heritage Impact Assessment for the Modification.

Table 3 (Continued)
Response to Agency Submissions

Comment	Response
Office of Environment and Heritage (OEH) (Continued)	
The OEH raised concerns regarding the consultation process for the Aboriginal cultural heritage assessment and the level of response from registered Aboriginal parties regarding the proposed management recommendations.	The Aboriginal cultural heritage consultation process for the Modification is outlined in Section 2 and Appendices 2 to 4 of the Cultural Heritage Impact Assessment (Appendix C of the EA). The consultation undertaken for the Modification is consistent with the requirements of the NP&W Regulation and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a). The consultation log (Appendix 4 of the Cultural Heritage Impact Assessment) provides a summary of all consultation undertaken with the registered Aboriginal parties. A draft Cultural Heritage Impact Assessment was sent to all the registered Aboriginal parties on 23 December 2011. Following changes in the mine layout, an amended draft Cultural Heritage Impact Assessment was sent on 30 August 2012. Cacatua Culture Consultants and Wonn 1 Contracting provided written comments on the draft report. All other registered Aboriginal groups were contacted by phone to request comments (verbal or written) on the draft Cultural Heritage Impact Assessment. The following groups specified on the calls that they had no comments on the draft Cultural Heritage Impact Assessment: • Bullem Bullem Heritage Consultants. • Gidawaa Walang Cultural Heritage Consultancy. • Muswellbrook Cultural Consultants. • Wattaka Wonnaruah Cultural Consultants. • Wonnarua Culture Heritage. It is noted that all other registered Aboriginal parties either provided comments which were addressed in Section 2 of the Cultural Heritage Impact Assessment, or did not respond to the request for comments, despite attempts by WCPL to obtain comments either verbally or in writing. The consultation process undertaken for the Cultural Heritage Impact Assessment is therefore considered adequate to support an AHIP variation application.

Table 3 (Continued)
Response to Agency Submissions

Comment	Response
Office of Environment and Heritage (OEH) (Continued)	
The OEH recommended that in the event that ground disturbance identifies a new Aboriginal object/s within the project area, all works must halt in the immediate area.	Consistent with WCPL's on-site procedures, if any previously unrecorded Aboriginal sites are identified during the course of the Modification, surface works in that area would cease until the site has been recorded (Section 4.7.2 of the EA). Any additional Aboriginal heritage sites (not yet recorded) would be managed in a consistent manner to the existing site types. If a new site type (i.e. a site type not previously recorded at the Wambo Coal Mine or a site type not considered in the development of the approved Salvage and Management Programme) is recorded, appropriate management would be developed by an appropriately qualified archaeologist in consultation with the Aboriginal community.
The OEH recommended that if human remains are located in the event that surface disturbance occurs, all works must halt in the immediate area to prevent further impacts to the remains and the NSW Police are to be contacted immediately.	Noted. This is consistent with WCPL's on-site procedures (see Section 4.6.2 of the EA).
The OEH recommended all Aboriginal site impacted by the project must have an Aboriginal Site Impact Recording form completed and submitted to OEH's AHIMS Register within three months of being impacted.	Noted. This is consistent with WCPL's on-site procedures.
The OEH recommended an Aboriginal Cultural Education Program is developed for the induction of all personnel and contractors involved in the construction activities on site, and that records are kept of which staff/contractors were inducted and when. The OEH also recommended the Aboriginal Cultural Education Program is developed and implemented in collaboration with the registered Aboriginal parties.	WCPL's on-site induction includes education on Aboriginal cultural heritage management in accordance with the approved Salvage and Management Programme (Navin Officer Heritage Consultants, 2005). WCPL is in the process of updating the Aboriginal cultural heritage component of its on-site induction. The updated induction material will be provided to registered Aboriginal parties for comment.

Table 3 (Continued)
Response to Agency Submissions

Comment	Response
Office of Environment and Heritage (OEH) (Continued)	
The OEH raised concerns regarding the proposed change in wording from "nil" to "negligible" and the potential for significant impacts on threatened species, populations and communities.	The Subsidence Impact Performance Measure for the Wollemi National Park is proposed to be modified from "nil impact" to "negligible impact" for consistency with recent determinations by the NSW Planning Assessment Commission. The Subsidence Impact Performance Measure does not apply to a magnitude of subsidence effect or impact, but applies to the environmental consequence. Therefore, a negligible impact on the Wollemi National Park would not be consistent with a significant impact on threatened species, populations and communities. WCPL is proposing no change to the commitment that the Wollemi National Park escarpment would not be subsided by the extraction of longwall panels at the Wambo Coal Mine (Section 4.2 of WCPL, 2003).
The OEH recommended a monitoring programme to measure subsidence impacts on vegetation including: control sites in which data on vegetation composition and structure, soil surface features, and other variables as appropriate are collected in the same vegetation communities and in the same position in the landscape as the areas to be undermined; that data collection in all sites commence more than 12 months prior to undermining any sites; and that appropriate statistical analysis of the data is conducted.	In accordance with the approved *Flora and Fauna Management Plan* (WCPL, 2010), WCPL undertakes annual monitoring of Remnant Woodland Enhancement Programme (RWEP) areas overlying WCPL underground mining areas and an *Acacia pendula* remnant. The monitoring aims to identify any isolated surface disturbances, assess the level of disturbance to native vegetation and the condition of the vegetation (e.g. health and vigour of species and communities), and assess any changes in drainage lines or watercourses (that may be attributable to subsidence). The current monitoring programme in RWEP areas includes 34 permanent flora quadrats, which are monitored annually for flora species diversity (including total number of flora species, number and percent of native flora species and number and percent of introduced flora species) and flora species abundance (modified Braun-Blanquet 1-6). The *A. pendula* population is inspected and notes taken with regard to age cohorts, recruitment levels, health, infestations, senescence, as well as soil and drainage attributes. Searches are also undertaken within the *A. pendula* habitat areas for any changes that may be attributable to subsidence.

Table 3 (Continued)
Response to Agency Submissions

Comment	Response
Office of Environment and Heritage (OEH) (Continued)	
	Results from the annual monitoring programme are reported in WCPL's Annual Environmental Management Reports. RPS Australia East Pty Ltd (2011) concluded that there was no evidence to suggest that current management practices or mining activity was having any effect on the flora species within the RWEP areas. WCPL considers that the existing monitoring programme is adequate and no changes are required.
The OEH recommended that the Flora and Fauna Management Plan is made available on the WCPL website.	The approved Flora and Fauna Management Plan has been placed on the WCPL website.
The OEH requested that consultation requirements for the OEH were not included in consent conditions by DP&I.	Noted.
The OEH recommended that for any vegetation clearing required for the Modification, impacts on threatened species, populations or communities, or their habitats, outside any existing consent be offset in accordance with OEH offsetting policy.	Dewatering bores for the Modification would be located within already cleared farmland, and would not impact any remnant vegetation (Section 3.1 of the EA). There are no other surface activities proposed as part of the Modification.
Division of Resources and Energy (DRE) within the NSW Department of Trade and Investment, Regional Infrastructure and Services (NSW Trade & Investment)	
The DRE noted that a Subsidence Management Plan (SMP) must be submitted and approved by the Director General of NSW Trade & Investment prior to the commencement of mining.	Noted. WCPL would prepare necessary documentation required under the modified Development Consent (if granted) and relevant mining titles.
The DRE recommended a condition is incorporated into the Development Consent requiring a Rehabilitation Plan.	WCPL supports this recommendation, noting that Condition 94C, Schedule 4 of the existing Development Consent (DA 305-7-2003) requires preparation of a Rehabilitation Management Plan to the satisfaction of the Executive Director Mineral Resources.

Table 3 (Continued)
Response to Agency Submissions

Comment	Response
Department of Primary Industries (DPI) (Including NSW Office of Water [NOW] and Fisheries NSW)	
NOW noted that WCPL currently holds licence entitlements sufficient to account for the predicted maximum take.	Noted.
NOW considered that there is a post-mining risk for the uncontrolled and increased release of poor quality saline groundwater into the alluvial and surface water sources, based on a conceptualisation that: • Fracturing to the surface could exacerbate the degree of hydrological connection between the deeper and shallow coal seams and the alluvial aquifer which is a highly productive groundwater source. • The groundwater of the Permian aquifer is driven under a pressure gradient to discharge to the alluvial aquifer and surface water drainage features.	The following response has been prepared with Heritage Computing. It is noted that the Groundwater Assessment (Appendix B of the EA) concluded the Modification would have minimal impact on the recovery of groundwater levels compared to the approved Wambo Coal Mine: *For the hydrographs shown in Figure 5.12, there is no difference between drawdown and recovery hydrographs for the Approved layout and the Modification. The localised drawdown impacts show that the Modification does not have a significant impact on the regional groundwater regime (Figures 5.5 to 5.8). Therefore, the Modification could not be considered to have a significant impact on the recovery of groundwater levels.* Based on the Groundwater Assessment (Appendix B of the EA), it cannot be considered that the alluvium and surface water sources would receive an increase in poor quality saline groundwater from the Permian aquifer post-mining for the following reasons: • The conceptualisation of the groundwater regime included in the Groundwater Assessment cites the alluvium as a recharge source for the Permian aquifer (as opposed to the NOW conceptualisation). Section 2.6.1 of the Groundwater Assessment specifically states: *Evidence from temporal groundwater monitoring hydrographs (Attachment A) within the alluvium indicates that the shallow aquifer is responsive to rainfall recharge and it is likely that the alluvium plays an important role in supplying recharge to the underlying Permian strata as well as contributing to baseflow of the perennial surface water features.* [emphasis added].

Table 3 (Continued)
Response to Agency Submissions

Comment	Response
Department of Primary Industries (DPI) (Including NSW Office of Water [NOW] and Fisheries NSW) (Continued)	
	Further, recharge from the Permian aquifer is not considered a significant recharge source for the alluvial aquifer. Section 2.6.3 states: *Groundwater may discharge to rivers and creeks and much of this discharge occurs due to shallow 'interflow' (i.e. movement of perched groundwater through regolith layers or alluvium after rainfall recharge has occurred). The discharge rates from deeper, hard rock aquifers to surface water features is limited due to the very low vertical permeability of the Permian strata.* [emphasis added]. • In support of the conceptualisation, the Groundwater Assessment found that, although there would be upflow in places and downflow in other places, net groundwater leakage from the alluvium to the underlying rock occurred under pre-mining conditions. Section 5.5 of the Groundwater Assessment states: *Prior to mining, there was a natural downwards flow of groundwater of about 0.025 ML/day on average.* • The Groundwater Assessment included a post mining recovery run simulation. This simulation found that groundwater levels in the Permian overburden would reach a new equilibrium at levels lower than those occurring under pre-mining conditions. On this basis, any discharge from the Permian system to the alluvial system occurring post-mining would be less than that occurring under pre-mining conditions. • The predicted incremental 20 millimetre subsidence contour due to the extraction of the Modification longwall panels is located well outside the estimated limit of alluvium for Wollombi Brook (Section 4.2.2 of the EA). As fracturing would not occur beneath the Wollombi Brook alluvium, the degree of hydrological connection between the coal seams and the Wollombi Brook alluvial aquifer would not be exacerbated.

Table 3 (Continued)
Response to Agency Submissions

Comment	Response
Department of Primary Industries (DPI) (Including NSW Office of Water [NOW] and Fisheries NSW) (Continued)	
NOW noted that the Modification may not fall within Level 1 minimal impact considerations for water quality within the *Aquifer Interference Policy* with respect to mining activity below the natural ground surface within 200 metres laterally from the high bank or 100 metres beneath of a highly connected surface water source that is defined as a reliable water supply.	A detailed assessment of the Modification against the minimal impact considerations in the *Aquifer Interference Policy* was conducted and was documented in Attachment 2 of the EA. Wollombi Brook was the only highly connected surface water source defined as a "reliable water supply" identified in the vicinity of the North Wambo Underground Mine. Section A2.4 of Attachment 2 of the EA describes: *The water quality minimal impact considerations for aquifer interference activities within highly productive alluvial water sources are presented in Table A2-1 and include:* *...* • *consideration of the location of mining activities in relation to a highly connected surface water source defined as a "reliable water supply" (i.e. Wollombi Brook); and* *...* *The Modification is located approximately 450 m from Wollombi Brook at its closest point and therefore would not result in a mining activity below the natural ground surface within 450 m of Wollombi Brook. In regard to underground mining proximal to Wollombi Brook the EIS states (WCPL, 2003):* *Mining of the longwall panels would be constrained by the subsidence exclusion zone limited to an angle of 26.5 degrees from the vertical to "Protected Land" (i.e. within 40 m of Wollombi Brook in accordance with the Rivers and Foreshore Improvement Act, 1948).* *The Modification is located outside of this subsidence exclusion zone.*
NOW states there is uncertainty as to whether groundwater drawdown and pressure changes within the alluvial and porous rock water sources will exceed 2 metres at neighbouring water users bores. NOW state the assessment of impacts was restricted to the additional impact due to the Modification rather than the cumulative impacts.	The numerical groundwater model included cumulative assessment of historic and future mining activities in the model domain including: Wambo Coal Mine activities; Lemington Open Cut; Lemington Underground; Riverview; Cheshunt; United Open Cut(s); United Underground; Mt Thorley Warkworth; and Homestead and Wollemi Underground (Appendix B of the EA). The Groundwater Assessment (Appendix B of the EA) includes cumulative drawdown contours (Figures 5.1 to 5.4) and incremental drawdown contours (Figures 5.5 to 5.8).

Table 3 (Continued)
Response to Agency Submissions

Comment	Response
Department of Primary Industries (DPI) (Including NSW Office of Water [NOW] and Fisheries NSW) (Continued)	
	Cumulative drawdown at the end of approved mining in the alluvium and regolith is shown on Figure 5.1 of the Groundwater Assessment. Cumulative drawdown in the alluvium and regolith does not exceed 2 metres at privately-owned bores within the vicinity of the North Wambo Underground Mine. Heritage Computing has confirmed that the effects of the Modification added to the effects of cumulative approved mining remain less than 2 metres at privately-owned bores within the vicinity of the North Wambo Underground Mine. Loss of aquifer pressures in the Permian strata is not predicted to impact any existing licensed water supply bores within the coal measures, as water supply bores in the vicinity of the Project are within the shallow alluvium aquifer system (Section 4.7.2 of WCPL, 2003). Notwithstanding, WCPL has an approved Surface and Groundwater Response Plan which includes 'make good' provisions: *In the event that a trigger level is exceeded, or a complaint is received in relation to loss of groundwater supply, an investigation will be undertaken. The investigation will involve the following steps.* 1. *Review of monitoring data trends and climatic information along with operational activities will be reviewed to determine whether a more detailed investigation is required.* 2. *If the investigation identifies actual groundwater impacts and attributes those impacts to Wambo Coal's activities, appropriate measures will be developed and implemented in consultation with DECCW, DoP and any affected adjacent landowners.* 3. *Existing management measures will be modified, if required, to minimise the potential for a recurrence. Any modifications will be made in consultation with DoP and other relevant authorities.*

Table 3 (Continued)
Response to Agency Submissions

Comment	Response
Department of Primary Industries (DPI) (Including NSW Office of Water [NOW] and Fisheries NSW) (Continued)	
NOW requested further information groundwater dependent ecosystems.	As described in Section 4.4.2 of the EA: *The Groundwater Assessment (Appendix B) concluded that the Modification would have no discernible impact on stream baseflow or natural river leakage beyond the effects of approved mining for Wollombi Brook, North Wambo Creek, Wambo Creek and Stony Creek.* FloraSearch has advised that *Central Hunter Paperbark Soak Woodland* (Community 4) is the only vegetation community present above the Modification area that has any potential to be groundwater dependent. *Central Hunter Paperbark Soak Woodland* occupies areas that are seasonally wet (i.e. have wet soils primarily in winter) but likely also after heavy rainfall events at other times. Field observations by FloraSearch indicate these areas are not permanently wet as would be expected if they are driven by groundwater recharge. Rather, the episodic wetness is most likely due to impeded drainage. Observations by FloraSearch of *Central Hunter Paperbark Soak Woodland* in previously undermined areas indicate there has been no obvious effect on community health as a result of the mining.
Fisheries NSW advised that the Modification raised no issues in terms of that Division's responsibilities.	Noted.

Table 4
Response to Public Submissions

Name	Comment	Response
Construction Forestry Mining and Energy Union (Mining and Energy Division) Northern District Branch	Noted support for the Modification as proposed, in consideration of environmental, social and economic impacts. Noted the Modification is consistent with the subsidence impact performance measures in the existing Development Consent.	Noted.
Mr R Fenwick	Raised concerns that community consultation was not comprehensive.	WCPL provided an overview of the proposed Modification at the Community Consultative Committee (CCC) meeting in March 2011. At the time of the meeting a fact sheet was provided and issues concerning subsidence on surrounding land were discussed. A letter providing a further update on the Modification was distributed to members of the CCC in October 2012. A hard copy and electronic copy of the EA was distributed to all CCC members.
Mr R Fenwick	Raised concerns regarding subsidence impacts on the right of way.	Mine Subsidence Engineering Consultants (MSEC) concluded that, based on the predicted subsidence impacts, the right of way (in favour of two privately-owned properties) could be maintained in safe and serviceable condition throughout the mining period using normal road maintenance techniques (Section 6.2 of Appendix A of the EA). The Extraction Plan for Longwalls 9 and 10 would include: • a risk assessment, including consideration of potential public safety impacts; • detailed monitoring program for all built features, including the right of way; and • mitigation measures for any subsidence impacts, including trigger action response plans. WCPL has a demonstrated commitment to safety. It is a requirement of the Development Consent that subsidence at the North Wambo Underground Mine must not cause any additional risk to public safety (Condition 22A, Schedule 4 of the Development Consent DA 305-7-2003). It should also be noted that the position of the right of way in favour of the two privately-owned properties may be varied by WCPL, acting reasonably.

Table 4 (Continued)
Response to Public Submissions

Name	Comment	Response
Mr R Fenwick	Raised concerns regarding potential subsidence impacts on South Wambo Dam and the requirement for appropriate monitoring and response mechanisms.	WCPL would develop management strategies for the South Wambo Dam as part of the Extraction Plan process, which could include lowering the water level or completely draining the dam prior to directly mining beneath it. South Wambo Dam is a Prescribed Dam under the NSW *Dams Safety Act, 1978*. Therefore, management strategies for South Wambo Dam would be developed in consultation with the Dams Safety Committee.
Mr R Fenwick	Raised concerns regarding the accurate prediction of subsidence impacts.	The predicted subsidence effects for the approved and modified mining layout were calculated by MSEC using a calibrated Incremental Profile Method (MSEC, 2012). The Incremental Profile Method was calibrated to local conditions using ground monitoring data from the North Wambo Underground Mine and from other nearby collieries. This has been achieved by comparing the observed mine subsidence movements along monitoring lines with those back-predicted using the standard Incremental Profile Method for the Hunter Coalfield (Appendix A of the EA). Therefore, the Incremental Profile Method used to calculate the Modification subsidence predictions is more likely to be accurate than subsidence prediction methods used for the 2003 Wambo Development Project Environmental Impact Statement.
Mr R Fenwick	Raised concerns regarding the assessment of cumulative impacts on groundwater resources.	The numerical groundwater model included historic and future mining activities in the model domain including: Wambo Coal Mine activities; Lemington Open Cut; Lemington Underground; Riverview; Cheshunt; United Open Cut(s); United Underground; Mt Thorley Warkworth; and Homestead and Wollemi Underground (Appendix B of the EA). Transient calibration against groundwater levels was carried out for the period January 2003 to December 2009 which includes the period when North Wambo Underground Mine Longwalls 1 and 2 were mined (Appendix B of the EA). The Groundwater Assessment assesses potential groundwater impacts associated with the Modification only and the cumulative groundwater impacts associated with mining activities in the region.

Table 4 (Continued)
Response to Public Submissions

Name	Comment	Response
Mr R Fenwick	Raised concerns regarding the impacts of the Modification on Wollombi Brook, North Wambo Creek, Wambo Creek and Stony Creek.	Wollombi Brook is located 450 metres east of the proposed Longwall 10, at its closest point to the Modification longwalls. At this distance, Wollombi Brook is not expected to experience any measurable tilts, curvatures or strains (Section 4.2.2 of the EA). In addition to this, the predicted additional 20 millimetre subsidence contour, due to the extraction of the proposed Modification longwalls, is located well outside the mapped limit of alluvium for the Wollombi Brook (Section 5.2 of Appendix A of the EA). North Wambo Creek and Wambo Creek (also known as South Wambo Creek) are located outside the extent of the Modification longwall panels. These creeks are not expected to experience any measurable tilts, curvatures or strains resulting from the extraction of the Modification longwall panels (Section 4.2.2 of the EA). Stony Creek is also located outside the extents of the Modification longwall panels, but it is situated immediately adjacent to the southern corner of the proposed Longwall 10. Stony Creek could experience small additional subsidence in the vicinity of the proposed longwalls, however, this is negligible when compared with the predicted total subsidence where the creek is located directly above the longwalls in the Wambo, Arrowfield and Bowfield Seams further upstream (Section 4.2.2 of the EA).
Mr R Fenwick	Raised concerns regarding the assessment of agricultural suitability, in particular the perceived reliance on desktop information.	It is noted that agricultural productivity is dependent on land management practices. The land capability is also influenced by inherent soil conditions. The soil condition across the Modification area was reviewed by a Certified Professional Soil Scientist as part of the agricultural resource assessment. A site inspection and soil survey was conducted, involving eight backhoe soil pits across the Modification area and laboratory analysis of soil samples (Section 4.2 of Appendix F of the EA).

Table 4 (Continued)
Response to Public Submissions

Name	Comment	Response
		The soil survey identified a broad range of soil constraints for agricultural land use including: soil acidity and associated aluminium toxicity; a lack of waterholding capacity; dispersive subsoil; subsoil salinity; and nutrient deficiencies, particularly phosphorus (Section 4.4. of Appendix F of the EA). The agricultural resource assessment identifies methods to improve soil condition (e.g. addition of agricultural lime and gypsum application) and also notes some of the limitations of these methods (e.g. the required mechanical incorporation of the lime would leave the soil prone to erosion losses). Based on the results of the soil survey, McKenzie Soil Management Pty Ltd (2012) concluded that the Modification area has Land and Soil Capability classification of Class 4 and 5 as all of the soil pits had serious limitations for plant growth (Section 5 of Appendix F of the EA). The O AS&FS (8 January 2013) stated the agricultural assessment had adequately described the quality of soils.
Mr R Fenwick	Raised concerns that the mapped alluvial extent in Figure 8 of the EA was incomplete and inadequate.	Dr David Allen at Groundwater Imaging Pty Ltd (2012) conducted a transient electromagnetic survey of the extent of the Wollombi Brook alluvium. A transient electromagnetic survey uses electrical current to measure the electrical resistivity of the shallow stratigraphic profile. The data is collected by a towed transient electromagnetic device and is limited by access constraints (e.g. the survey cannot be conducted through dense vegetation). The alluvial boundary determined by the transient electromagnetic survey was interpreted with reference to bore logs and field observations and is largely consistent with the regional geological mapping. The results of the transient electromagnetic survey are considered in conjunction with regional geological mapping where access constraints limited site-specific collection of data.

Table 4 (Continued)
Response to Public Submissions

Name	Comment	Response
Mr R Fenwick	Raised concerns regarding the methodology of the cultural heritage impact assessment, including the identification of Aboriginal heritage of significance.	The Cultural Heritage Impact Assessment has been undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010b). The registered Aboriginal parties were asked to provide input regarding the cultural significance throughout the consultation process for the Modification. The Cultural Heritage Impact Assessment only considered the area that would be potentially impacted by subsidence from the Modification longwall panels.
Mr R Fenwick	Raised concerns regarding the assessment of noise impacts	The following approved components of the Wambo Coal Mine would be unchanged by the Modification: • overall life of the mine; • run-of-mine coal production rate; • open cut operations; • coal handling, coal handling and preparation plant and product coal transport operations; and • major surface infrastructure. Therefore, there would be no material alteration to the approved noise impacts of Wambo (Section 4.1 of the EA).

REFERENCES

Department of Environment, Climate Change and Water (2010a) *Aboriginal Cultural Heritage Consultation Requirements for Proponents.*

Department of Environment, Climate Change and Water (2010b) *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*.

Groundwater Imaging Pty Ltd (2012) *A Transient Electromagnetic Investigation of the Extent of the Wollombi Brook Alluvium at the Wambo Coal Mine Site*.

Heritage Computing Pty Ltd (2012) *North Wambo Underground Mine Modification Groundwater Assessment.* Report prepared for Wambo Coal Pty Limited.

McKenzie Soil Management Pty Ltd (2012) *Agricultural Resource Assessment – North Wambo Underground Mine Modification, Wambo NSW.* Report prepared for Wambo Coal Pty Limited.

Mine Subsidence Engineering Consultants (2012) *North Wambo Underground Mine Modification Subsidence Assessment.* Report prepared for Wambo Coal Pty Limited.

Navin Officer Heritage Consultants (2005) *Wambo Development Project – Aboriginal Heritage Research Design and Study Plan (Incorporating Salvage Programme).* Prepared for Wambo Coal Pty Ltd.

New South Wales Government (2012) *Aquifer Interference Policy*. Released September 2012.

RPS Australia East Pty Ltd (2011) *2011 Annual Ecological Monitoring Report – Wambo Coal Mine*. Prepared for Wambo Coal Pty Ltd.

Wambo Coal Pty Limited (2003) *Wambo Development Project Environmental Impact Statement*.

Wambo Coal Pty Limited (2010) *Flora and Fauna Management Plan*.